

E8 Series

Fuel and Ignition Control System

E8 System Description

The HALTECH E8 is a powerful "real-time" programmable fuel injection system computer designed for those seeking optimum performance. The E8 has a total of 8 fuel and ignition outputs. Unused fuel and ignition outputs are available as auxiliary outputs. In addition, the E8 has 4 PWM outputs, 2 auxiliary digital outputs, 3 analogue inputs, 1 digital input, closed loop idle control and dedicated outputs for stepper motor idle control.

With the outputs available for controlling fuel and ignition, the E8 is well equipped to run engines with sequential fuel and modern multi-coil ignition systems.

Most OEM coils and ignitors, and most aftermarket coils and ignitors can be controlled by the E8, all configurable via Halwin.

The programming software for the E8 is the latest Halwin software package that is included with the ECU. This software takes advantage of the Windows™ graphical environment to provide a user friendly software package. The Halwin software allows access to adjustment of all settings and calibration maps. In addition the software is capable of displaying live data in the form of graphical gauges for easy viewing whilst connected to the ECU.

User Configurable Outputs:

- | | |
|----------------------------------|---------------------------|
| *Closed loop idle speed | *Closed loop O2 Sensor |
| *Electronic boost control | *Deceleration fuel cut |
| *Thermo-fan | *NOS enable |
| *Shiftlight | *Aux. fuel pump |
| *Stall saver | *Anti-lag |
| *Turbo timer | *VTECH |
| *Rev limiter | *Air con |
| *Load Switch | *Extra Injector |
| *RPM Switch | *TPS Switch |
| *BAC valve (2 wire & 3 wire IAC) | *Engine Control relay |
| | *Intercooler fan |
| | *Tacho (5v,8v,12v) |
| | *Staging signal |
| | *Torque convertor lock up |
| | *Dual intake valve |
| | *Air Conditioner |
| | *Engine Control relay |

(not all functions are available at the same time)

The **E8 System** has adjustable fuel maps each with 32 load bars and 32 RPM ranges. The **E8** will run up to 16000 rpm with better resolution and greater accuracy than ever before.

Typical Applications:

- Conversion from carburetion to fuel injection
- Control of fuel injection/ignition on modified engines
- Race and rally applications of all descriptions
- Design and development purposes
- Educational use by universities and colleges
- Original equipment in cars and motorcycles

E8 Kit Contents:

- Electronic Control Unit (ECU)
- Choice of flying lead wiring loom or plug-in patch loom
- 3 x Power Relays
- Communication Cable
- Programming Software
- Instruction Manual (on CD)

Optional Extras:

- Air Temperature Sensor
- Coolant Temperature Sensor
- MAP Sensor
- Throttle Position Sensor

System Features:

- Piston Engines: 4, 5, 6 & 8 cylinders
- Rotary Engines: 2 rotor
- Max Operating RPM: 16000 RPM
- Variable RPM range map points
- Map resolution: 32 RPM ranges by 32 load points for all 3D maps

Trigger Signal Type:

- Hall Effect Sensor
- Optical Sensor
- Inductive Magnetic Reluctor

Trigger Pattern:

- Single Pulse per Cycle
- Multi-tooth
- Nissan Optical
- Bosch Motronic
- Subaru
- Mitsubishi Std

Ignition Configuration:

- Single Distributor
- Twin Distributor
- Direct Fire Wasted Spark
- Direct Fire Coil on plug
- Ignition toggle support for rotary engines

Injector Firing Mode:

- Sequential
- Multi-Point
- Throttle Body (Batch)
- Staged

ECU Inputs:

- Crank Position Sensor
- Cam Position Sensor
- MAP Sensor (1,2 and 3 Bar)
- Throttle Position (potentiometer type)
- Coolant Temperature
- Air Temperature
- Barometric Pressure
- Oxygen Sensor
- Road Speed
- Auxiliary Analog Input (x3)
- Auxiliary Digital Input (x1)

ECU Outputs:

- Injector Drivers: 4
- Up to 4 injector Outputs
- Fuel Pump Relay Control
- PWM outputs (x4)
- Idle air control (IAC)
- Auxiliary digital out (x2)

Accessories:

- Boost/Fuel/Ignition Trim module
- Idle Air Control Motor
- Oxygen Sensor
- Electronic boost control solenoid
- Ignition Modules
- Ignition Coils

Data Storage

Features:

- Map Storage and Retrieval
- Laptop Data Logging
- On Board Data Logging

*Available upon special request

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E8 Specifications

Engine Suitability

Up to 16,000 rpm | 4, 5, 6, 8 | 2 rotors
Normally aspirated or supercharged up to 400kPa (60psi). Higher boost pressure MAP sensors available by arrangement.
Load sensing by throttle position or manifold pressure.
Multipoint, Batch, Staged or Sequential injection patterns.
Distributor ignition systems, or direct fire systems with 1 to 4 coils.

Power Requirements

Power Source: 9.5 to 16.5 Volts DC
Consumption
Haltech ECU: 470 mA at 12 Volts
Injector Load: Dependent on injector type. Approx. proportional to injector duty cycle. (Typically 0.6 Amps per injector)

Physical Specifications

ECU DIMENSIONS: Length: 170 mm, Width: 145 mm, Depth: 42 mm
WEIGHT: ECU: 650g (1.5 lb), Sensors: 500g(1.1 lb)

Input Sensors

MANIFOLD ABSOLUTE PRESSURE (MAP) Sensor (SUPPLIED SEPARATELY AT EXTRA COST)

- 1 Bar - 100kPa to 0kPa (Naturally Aspirated)
- 2 Bar - 100kPa to 100kPa (up to 1 Bar or 15 psi boost)
- 3 Bar - 100kPa to 200kPa (up to 2 Bar or 30 psi boost)
- 4 Bar - 100kPa to 300kPa (up to 2 Bar or 45 psi boost)
- 5 Bar - 100kPa to 400kPa (up to 3 Bar or 60 psi boost)

TEMPERATURE SENSORS (Air and Coolant)

NTC temperature dependent resistor type.

Operating Range

- Continuous -40°C to 100°C (-40°F to 212°F)
- Intermittent up to 125°C (257°F)

THROTTLE POSITION SENSOR: 10k rotary potentiometer driven from throttle shaft.

INTERNAL BAROMETRIC PRESSURE SENSOR

ENGINE SPEED PICKUP: Compatible with most trigger systems:

- 5, 8 or 12 volt square wave;
- Pull-to-ground (open collector)

Internal retractor adaptor for magnetic (or 'retractor') triggers.

Support for most standard tooth patterns.

(Please contact Haltech or its representatives for further assistance).

ECU Outputs

INJECTOR DRIVER: 4 x 4/1Amp peak-and-hold current limiting drivers:

Up to four low-impedance injectors or Up to eight high-impedance injectors.

IGNITION OUTPUT: To optional Haltech Ignition Module, trigger by ECU, for directly firing the coil. (MAY ALSO BE COMPATIBLE WITH OTHER IGNITERS. ASK YOUR HALTECH DEALER.)

PULSE WIDTH MODULATED (PWM) OUTPUT: 4 x Dedicated PWM outputs.

Suitable for controlling turbo wastegate, solenoid valves, shift lights, etc.

FUEL PUMP CONTROL: 20A fused relay, features automatic priming and switch-off.

System Programming Requirements

COMPUTER: IBM-PC or compatible, preferably laptop or notebooks, 233MHz processor (preferably >400MHz), VGA colour display, Windows 95, 98, 2000 or XP, 4Mb of memory, 10 MB of free Disk space.

DISK DRIVE: CD-ROM drive.

SERIAL PORT: Standard RS232C port - 9 pin D connector (25 pin cable available on request), COM1 or COM2 (selectable).

Adjustable Features

BASE FUEL MAP: 32 RPM ranges to 16,000rpm, 32 Load points per range, (with programmable ranges) up to 32ms with 6.4us resolution.

IGNITION MAP: 32 RPM ranges, RPM to 16,000rpm, 32 Load points per range (with programmable ranges), up to 60° advance, with 0.1° resolution

CORRECTION MAPS

- FUEL Barometric - 32 points
- Cold Start Prime - 32 points
- Coolant Temperature Enrichment - (2D - 32 points) (3D - 256 points)
- Air Temperature Adjustment - 32 points
- Battery Voltage Correction - 32 points
- Closed Throttle (selectable) - 32 points
- Full Throttle (selectable) - 32 points
- Post Start -32 points
- Throttle Pump Enrich -32 points
- Throttle Pump Sustain -32 points
- Throttle Pump Decay -32 points
- Throttle Pump Temp -32 points
- End of injection - 32 points
- Staged Injection Angle Split Map - 32 points
- Staged Injection Map - 32 points
- Individual Cylinder Trimming +/- 12.5%
- IGNITION Crank Advance - 32 points
- Coolant Temperature Advance/Retard - 32 points
- Air Temperature Advance/Retard - (2D - 32 points) (3D - 256 points)
- Individual Cylinder Trimming +/- 10°

PROGRAMMABLE REV-LIMIT: selectable as either fuel or ignition

FUEL CUT ON DECELERATION

ACCELERATOR PUMP: Enrichment, sustain and decay parameters.

IDLE SPEED CONTROL: Target Idle Speed, Cold Idle-up RPM, Post-start RPM setting

CLOSED LOOP O2 CONTROL: With both cruise and idle settings

Miscellaneous

LAPTOP DATA LOGGING: Engine data information logged at a nominal rate of 40 logs per second, stored to disk. Limited by disk space.

STORAGE FOR APPROX: 2 minutes at 200 logs per second, 6 channels of data. 40 minutes at 10 logs per second, 6 channels, 7 hours at 1 log per second, 6 channels.

REAL TIME PROGRAMMING: Instant, hesitation free adjustment while engine is running.

RUGGED ALUMINIUM CASING: Red anodised with integral cooling fins and mounting brackets.

Optional

HALTUNER: Inexpensive dash mounted Air-Fuel Ratio Meter.

IGNITION COILS: Available as Single, Dual and six pack.

OPTIONAL IGNITION IGNITER WITHOUT DWELL CONTROL: Available as single, dual and triple igniters. CDI ignition available on request

OPTIONAL MIXTURE / IGNITION / BOOST TRIM MODULE

Provides ±12½%, ±25% or ±50% injection time adjustment for fast tuning.

Provides ±5°, ±10° and ±12.5° ignition advance adjustment for fast tuning

Provides 0 - 100% boost trim adjustment.

Optional Boost Control Solenoid.

Optional Dual Hall Effect Sensor Kit.

Optional Four Wire Heated Oxygen Sensor.

Optional Idle Air Control Motor Housing.

Optional Idle Air Control Motor.

Optional Idle Air Control Motor Housing.

Optional Idle Air Control Motor.