

EDM-HD

Electronic Distributor Module—Heavy Duty

Application

The OH systems for compressed natural gas include an engine control with ignition control. In the OH1.2 system, the EDM-HD is a replacement for the ICM which works with the ECM control. In the OH2.0 system, the EDM-HD works with the PCM-128HD control. Please note that the PCM-128HD is not compatible with the ICM. The EDM-HD will also work with the ECM control for the new OH1.2MD system.

Description

The EDM-HD is an ignition coil driver that takes cylinder firing commands from an engine controller. The EDM-HD is capable of firing up to six ignition outputs. The EDM-HD interfaces with the OH1.2, OH1.2MD, and OH2.0 control modules (ECM in OH1.2/OH1.2MD, PCM128-HD in OH2.0). The control modules provide a “Trigger” pulse train and a “Reset” pulse train. On a 6-cylinder engine, the Trigger line pulses six times for every Reset pulse. The control module reads an “Imon” feedback signal from the EDM-HD.

The Imon feedback signal allows the control modules to perform diagnostics on the EDM-HD and also allows the control modules to adjust the Trigger pulse timing to minimize the ignition coil current draw and consequent self-heating of the EDM-HD semiconductor switches and the ignition coils.

The EDM-HD is designed to drive the low side of an inductive ignition coil as illustrated in Figure 1. The “low” side of the inductive ignition coil primary is connected to one of the low side switch outputs on the EDM-HD. When commanded by a control module, the EDM-HD turns on the low side switch, which allows current to be pulled from the battery positive through the ignition coil through the EDM-HD low side switch and back through battery negative. The secondary of the inductive ignition coil does not go high until the low side switch is turned off and the inductive coil is allowed to “fly back”. A semiconductor clamp internal to the EDM-HD limits the ignition coil primary flyback voltage.



- Can fire up to 6 cylinders
- Engine mountable
- Ignition coil diagnostics
- Integrated, environmentally sealed Deutsch DT connector
- Backwards compatible with ICM
- Flexible across Woodward OH systems (1.2, 1.2MD, 2.0)
- 12 V and 24 V in one part number
- Use with Woodward approved ignition coils only

Specifications

Power Requirements

Nominal Operating Voltage Range:	10–32 V
Transient Voltage Range:	6–32 V
EDM-HD Logic Current (worst case):	100 mA max
Coil RMS Current (worst case):	4 A (rms) max with a repetitive 7.5 A peak max
Recommended Fusing (for 6 Woodward coils):	7.5 A Fast Blow Automotive Style Fuse

Ignition Coils

- Intended for use with Woodward-approved ignition coils for both 12 V and 24 V applications.
- Contact Woodward for uses with other inductive ignition coils.

ICM Backwards Compatibility

- The EDM-HD maintains timing accuracy that is $\pm 0.5^\circ$ of the ICM (0096-00-000 Rev L).

Environmental Requirements

Engine-mount operation without vibration isolators

Random Vibration Test

- The EDM-HD meets Woodward's RV3 random vibration specification (22.1 Grms / 3 hours per axis) per Woodward procedure 3-04-6231.

Heated Vibration Test

- The EDM-HD operates without interruption in 24-hour, 105 °C, engine vibration test.

Shock Test

- The EDM-HD meets mechanical shock per Woodward's procedure 3-04-6231 (MS1 per MIL-STD 810F, Method 516.5, Procedure 1, 40 G Peak, 11 ms duration sawtooth pulse).

Shock-Drop Test

- The EDM-HD can survive being dropped from 0.9 m onto a concrete floor.

Temperature

Ambient Operating Temperature:	–40 to +105 °C
Mounting Surface Temperature:	–40 to +105 °C
Heat Soak/ Storage Temperature Range:	–40 to +105 °C

Thermal Shock Test

- 250 non-operating thermal cycles between –40 and +105 °C, with a dwell of 1.5 hours at each temperature.

Thermal Endurance / Humidity Test

- 1000-hour, operational, thermal cycling (–40 to +105 °C) endurance test followed by a 120-hour operational humidity cycle test

Ingress Protection Test (Spray Test)

- IEC529 IPX6 spray testing: 12.5 mm nozzle delivering 100 L/min at a distance of 2.5–3 m, sprayed on all sides for 3 minutes

Water Immersion Test

- Unit preheated to 105 °C for two hours, then immersed in room temperature (~18 °C) water for five minutes. Connector pins are not immersed.

Salt Spray Test

- Salt spray per MIL STD 810D, Method 509.2, Procedure I, Aggravated Screening (5 percent solution of NaCl at 35 °C for 48 hours).

Chemical Compatibility

- Tested for exposure to: diesel fuel, lubricant oil, brake fluid, antifreeze solution, transmission oil

Abnormal Conditions / Wiring Fault Robustness

Start Voltage:	Logic circuits work down to 6 V battery voltage
Reverse Voltage:	Can survive reverse voltage of –32 V applied to Vbat+ for 5 minutes
Short to Battery Minus:	Each pin on the EDM-HD connector can be shorted to battery minus without causing permanent damage to the EDM-HD hardware
Short to Battery Plus:	Each pin on the EDM-HD connector can be shorted to battery plus without causing permanent damage to the EDM-HD hardware
Jump Start/Alternator Regulator Failure:	Can survive 36 V applied to Vbat+ for 5 minutes

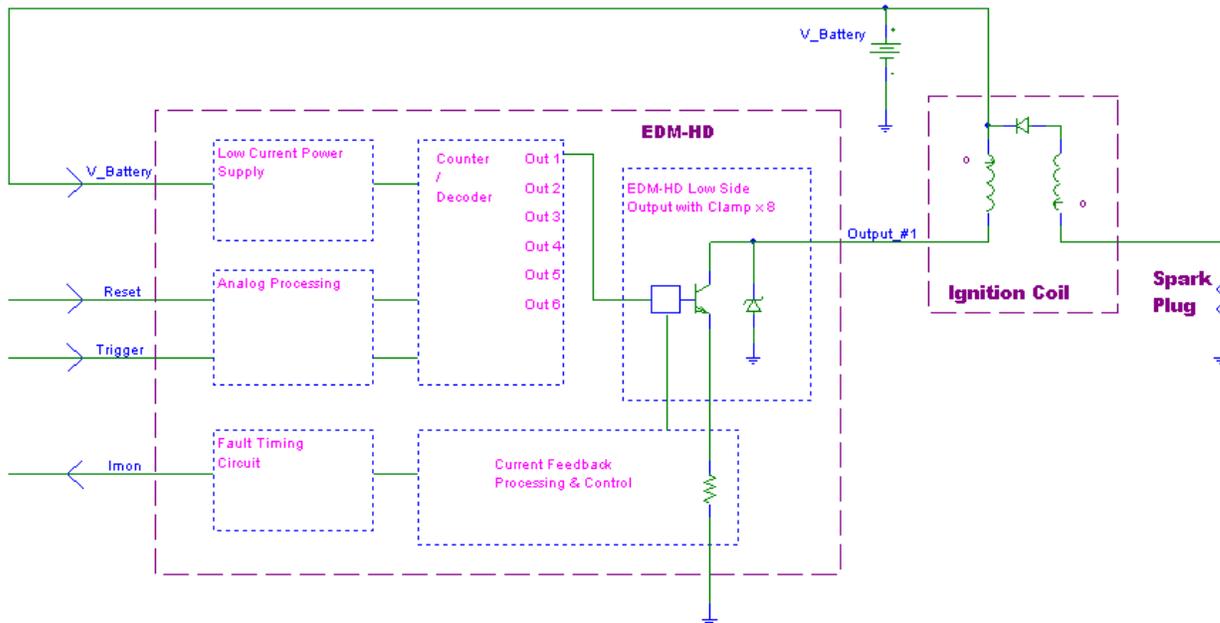


Figure 1. EDM-HD / Inductive Coil Simplified Block Diagram

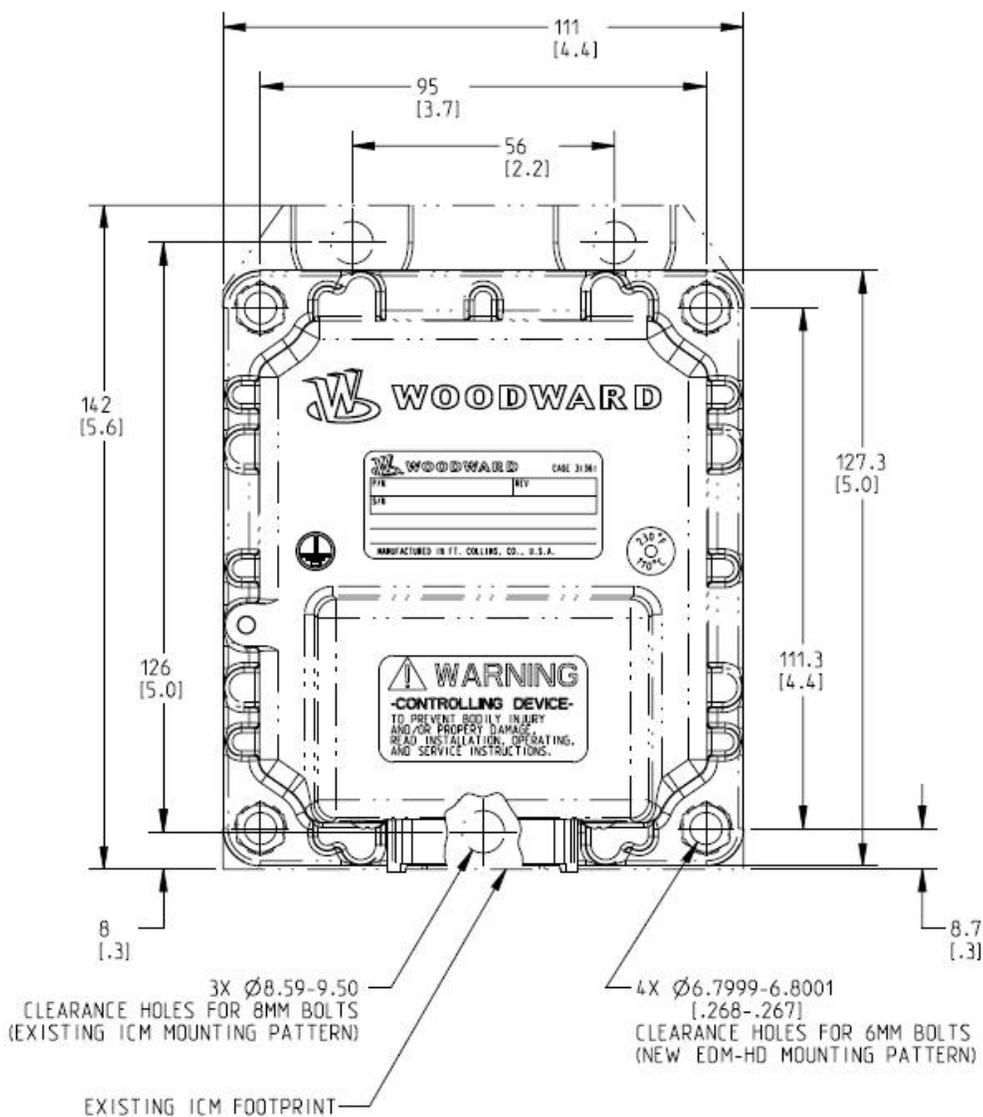


Figure 2. EDM-HD with 3-hole to 4-hole Mounting Bracket (top view)
 (Mounting Bracket only needed for installations with ICM 3-bolt mounting pattern)

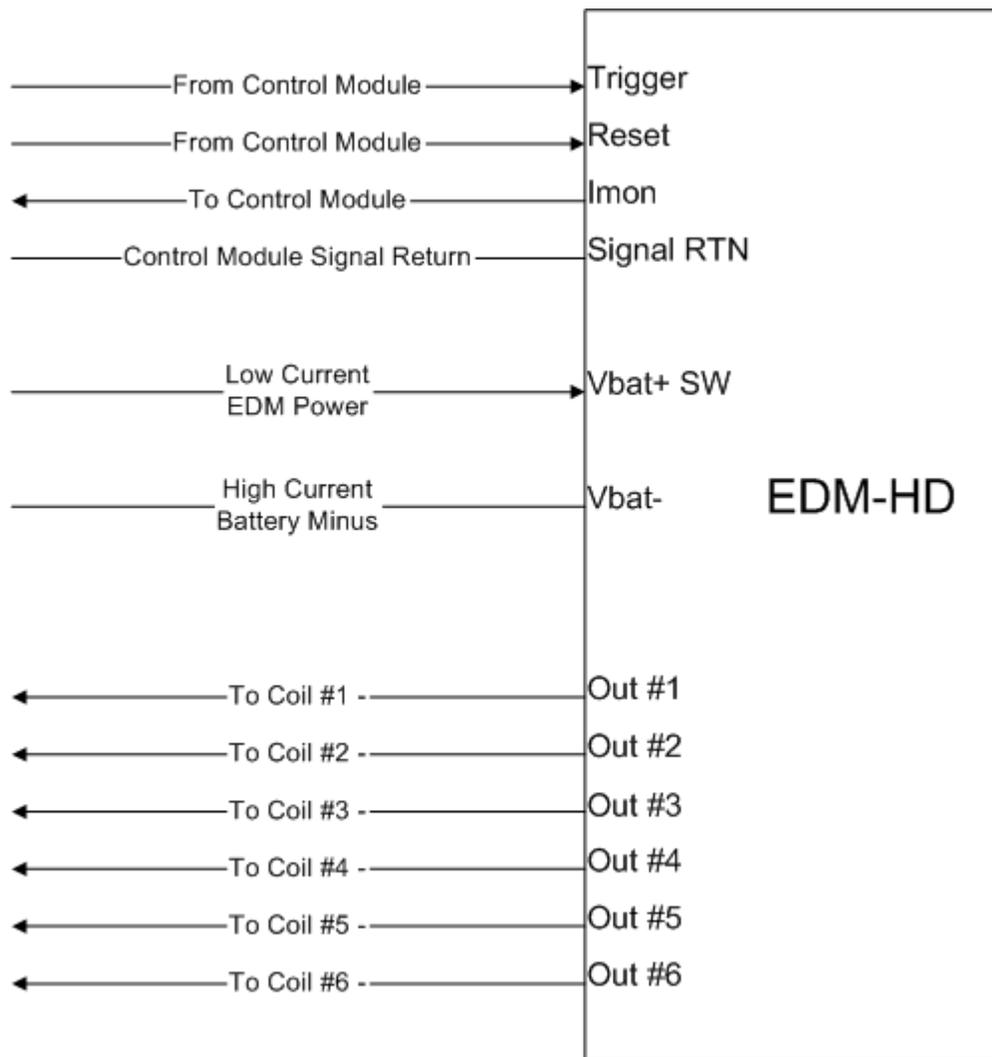


Figure 3. EDM-HD Six Cylinder System Connections

EDM-HD Part Numbers

8408-012	EDM-HD for 6-cylinder engines
5404-1048	6-cylinder adapter harness for OH1.2 retrofit applications
8923-1238	Mounting kit / bracket (for installations with ICM 3-bolt mounting pattern)



PO Box 1519, Fort Collins CO, USA 80522-1519
 1000 East Drake Road, Fort Collins CO 80525
 Tel.: +1 (970) 482-5811 ♦ Fax: +1 (970) 498-3058
www.woodward.com

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