

DEMS-1000 Digital Engine Management System

The DEMS-1000 has friendly, user definable alarm and safety shutdown settings to protect, monitor and control the startup, run-up and shutdown of a local or remote engine installation. The DEMS-1000 can be controlled locally with the built-in keypad or an Ethernet connection to your laptop or PC, and remotely using an Internet connection.



The DEMS-1000 has an Ethernet (for internet) connection for remote or local monitoring and control, viewing/downloading history, and updating firmware and/or configuration. Program any and/or all functions from local keypad or remotely with an Internet connection.

The DEMS-1000 records all engine and generator instrumentation values every 15 minutes, and every 15 seconds when there is an alarm. Instrumentation values and alarm values are saved for the life of the engine, downloadable to your PC via Internet connection.

All circuits and components are protected against reverse polarity and overload.

Dimensions:

Width: 13" Height: 9" Depth: 4½" - LCD: 2 ½" x 2 ½"

Download full specifications and installation manual from:

<http://www.dieselinjinemotor.com/dems>

Features

- Easy install and setup
- Automated Run/Stop engine sequence (float control)
- User friendly setup for shutdown and alarm levels
- RS-485 serial communication between controller display and engine controller (Up to several miles)
- Programmable electric RPM governor
- 2 Programmable RPM settings: Low and High
- Programmable display to display the fields you want to view on each screen
- Start and Stop engine
- Glow plugs On/Off
- Auxiliary electric fuel pump On/Off
- Safety shutdown retains error log for the operator to know the reason for engine shutdown
- Password protection for local and remote access
- Total Engine Hours
- Hours remaining until next engine service
- Enclosed in heavy cast aluminum, watertight enclosure with waterproof keypad

Programmable engine safety shutdowns and alarm set points:

Oil Pressure	Manifold Pressure
Oil Temperature	Engine Over speed
Oil Level	Vibration Alert
Water Temperature	Battery Voltage
Fuel Pressure	Alternator
Fuel Flow	Air Filter Monitor
Fuel Tank Level	Auxiliary Inputs
Water in fuel	Auxiliary Outputs

Programmable generator safety shutdowns and alarm set points:

L1, L2, L3 Voltage, Amperage and Hertz

2 programmable safety shutdown pressure/flow sensors for hydraulic pump or air compressor 0-10000PSI or GPM/GPH
#1 and #2 Hydraulic/Air PSI

Switch Relay Outputs

Glow Plug	100 Amps	Fuel Pump	8 Amps
Alarm (Horn/Light-relay)	8 Amps	Engine Shutdown	8 Amps
RPM Governor (PWM)	6 Amps	Starter Solenoid	8 Amps
RPM Solenoid	70 Amps	Engine Alt Exciter	8 Amps
Generator Exciter Field	8 Amps	Starter Solenoid	8 Amps
Generator Contactor	8 Amps		

Specifications:

Inputs:

Operation Voltage: 10-32VDC

Current Amperage Range: 0-300DC Optional Equipment

RPM Control Range 400-9999 RPM

High/Low RPM Set Points

Oil Temperature: 0-400° F

Vibration Alert

Water Temperature Range: 0-300° F

Water Level: 0-100%

Water in Fuel Detector Yes/No (Optional Detector)

Fuel Level 0-100% Adjustable Thick Film Fuel Senders

Fuel Flow: 0-200 GPH/GPM

Fuel Pressure: 0-100 PSI

Hydraulic/Air PSI Inputs(2): 0-7000 PSI

Manifold Pressure: 0-60 inches of Water

Air Filter Blocked Input: Yes/No Optional Detector

Generator Voltage Inputs(3): 0-600VAC G1 Generator Interface Unit

Generator Current Inputs(3): 0-2000Amps G1 Generator Interface Unit

Manual Start Switch:

Remote Start with On/Off switch:

Supplies initial power to turn on processor to DEMS-1000 from a remote location. Requires remote control panel for this option.

Specifications:

Outputs:

Control Output: Linear Actuator (Pulse Width Modulator)

Glow Plug Output: 100 Amps switching capability

Fuel Pump Output: 12 or 24 VDC, contact closer

Starter Output: 12 or 24 VDC, contact closer

Alarm Output: 8 Amps maximum open contact

Engine Shutdown Output: 8 Amps maximum, open contact (NO or NC contact)

Engine Alternator Exciter: 8 Amps maximum, open contact (NO contact)

Generator Exciter Output: 8 Amps maximum, open contact (NO contact)

Generator Contactor Output: 8 Amps maximum, open contact (NO contact)

Communication:

Ethernet port:

Remote start (utilizing twisted pair or fiber)

History

Records all engine and generator instrumentation values every 15 minutes, and every 15 seconds when there is an alarm for the life of the engine.

Enclosure

Height: 13"

Width: 9"

Depth: 4½"

Water Tight with rubber gasket

Removable Key Switch

LCD Display

Alphanumeric graphics

2.5" x 2.5" - 160 x 160 pixels

High temp back lighted Viewable in direct sunlight

Rated -20°C to 70°C

Input Connections:

Note: All connections to sensors can be made with stranded hook-up #16-20 gauge wire.

OILTEMPERATURE:

Sensor located on the engine block. Engine ground provides the return path.

OIL PRESSURE:

Oil pressure sensor located on the engine block. Engine ground provides the return (neg) path.

OIL LEVEL:

Float Switch off the Oil Pan Drain Plug similar to a Sight gauge.

WATER TEMPERATURE:

Water temperature sensor located on the engine.

MANIFOLD PRESSURE:

Manifold pressure sensor located on the engine.

FUEL PRESSURE:

A single wire to a Fuel Pressure sensor located on the engine fuel line. Engine ground provides the return (neg) path

Vacuum Line RPM Sensing (preferred method)

Vacuum RPM sensor: This is a sensor that connects to the vacuum line of the engine intake manifold. This sensor is located within the DEMS-1000 engine control unit. Normally this is a 1/8" NPT connector between the air breather and the air intake manifold. Quick and simple.

Alternator RPM SIG INPUT:

A connection to the alternator coil winding can be used as an input for the controller. This input is a special connection to the alternator. Some alternators may not have this connection and may require a modification or special connector. Contact DieselEngineMotor.Com for more information on this option.

Magnetic RPM Pick-Up Sensor:

This is a single wire input from an optional magnetic type pick-up sensor located on the Bell housing of the engine. This sensor is mounted such as to pick up the teeth of the fly wheel. Spacing of sensor to the teeth of the fly wheel is important, see instructions of sensor. Normal spacing will be between .01 to .035 of an inch. (Optional method of RPM sensing)

Alternator AMPS (optional)

This input is for a 3 wire connection to a current sensor. The sensor is a Non-contact type, it slips or clamps over the positive output wire from the alternator. See instructions included with the sensor. This sensor is a special unit design for this controller. Contact DieselEngineMotor.Com for more information.

HYDRAULIC/AIR/FLOW (optional)

This is a 3 wire input connection from a pressure sensor to measure air or hydraulic pressure. This sensor is connected to the output of an air or hydraulic pump and is used to alarm or shut-down if the pressure is not within the range of the unit.

FUEL FLOW (optional)

sensor is mounted inline with the fuel line to the engine. This is a 3 wire input from a fuel flow type sensor. It is used to measure the rate of fuel used per hour (GPM). This

FUEL LEVEL (optional)

This is a 3 wire connection to a fuel level sensor located in the fuel tank. This sensor is a special unit design by DieselEngineMotor.Com to be used with the DEMS-1000 control units.

LOW ENGINECOOLANT INPUT (optional)

This is a single wire connection to a level switch in the cooling system of the engine. The sensor is mounted in a location to detect a low coolant level within the radiator. The radiator must be grounded to the engine to provide the return path of the sensor.

WATER IN FUEL (optional)

This is a sensor used to detect water in the fuel system. It is a single wire connection to the sensor, return path is via the engine ground. This sensor is mounted in the lowest point of the fuel tank or line from the tank.

AIR FILTER (optional)

This is a sensor used to indicate the air filter of an engine is dirty and needs to be cleaned. This sensor is mounted within the air intake and the filter. This is a single wire connection with the engine ground providing the return path.

REMOTE PWR ON/OFF

This is an input from the remote DEMS display/control unit to control the power of the DEMS engine control unit. This is a four wire connection from the remote display/control unit to the engine control unit. Up to several miles using fiber optics.

MANUAL START

This is an auxiliary manual start push button or key switch.

HIGH RPM INPUT

This is a manual input to change from high or low RPM, to be used in conjunction with a manual start.

AUTO START

Typical use would be a float switch initializing an auto start and shut down sequence.

GENERATOR G1 CARD

This series of connections is connected to a generator input interface box. This box is used to monitor the output of a single or three phase generator. Using Potential and Current Transformers that will monitor up to 5000 amp, 600VAC with DC as an option. User selected 1 or 5 amp terminators. Both current and voltage is monitored of each phase. This is a special option for the DEMS, please contact DieselEngineMotor.com for more information.

BATTERY +

This is the main power connection to power the DEMS located on the right side of the 100 Amp glow plug relay. The connections should be made with #10 gauge wire. The + terminal is connected to the positive terminal of the battery. The - is connected to ground of the engine and to the ground of the DEMS Enclosure.

GLOW PLUG

This is the output contacts of the DEMS to turn on the Glow Plug of an Engine. Use appropriate size wire for the number of glow plugs on the engine. Maximum 100 amp capacity. This relay/contactors is preinstalled in the DEMS engine enclosure. The front panel key is pressed to turn on the glow plug which is timed by the DEMS controller. 15 seconds.

FUEL PUMP

This is an output to drive a fuel pump for priming and starting the engine. The + connection connects directly to the electric fuel pump. Power is supplied from the DEMS controller, 8 amps. The - connection of electric fuel pump connects to engine ground.

ALARM

This is an output contact to be used as an indicator that an alarm status is active on the engine. This output can be used to turn on a light, horn or both, up to 8 amps or optional pager/cell phone/Internet messaging system.

ENGINE SHUTDOWN

This is an output contact to be used to indicate and shutdown the engine. This output contact can be used to shutdown the fuel solenoid which stops the fuel to the engine. The contacts have both normally open and closed contacts available up to 8 amps. Can be configured to energize fuel shutoff solenoid for 30 seconds after key switch (shutdown) is turned off without draining battery.

RPM ACTUATOR

This is a PWM (Pulse Width Modulated). This is the output of the DEMS controller to be used to control the position of the engine throttle. This is a linear actuator supplied by DEMS. This is a two wire connection which connects directly to the actuator A and B terminals of the DEMS-1000 control box.

RPM SOLENOID

This is an output to control a solenoid to open the engine throttle lever to a preset RPM. This is used when not using the RPM Actuator.

ENGINE ALTERNATOR EXCITER

This is an output contact to be used to excite a 12 or 24 Volt engine alternator.

STARTER SOLENOID

This is a single wire that connects and activates the starter solenoid of the engine.

GENERATOR EXCITER

This is an output contact to be used to turn on the generator exciter when the generator is connected to the engine. This contact will close when the engine is within +/- 2% of the desired RPM. This output closes and turns on the generator exciter at this time, and is a latched function.

GENERATOR CONTACTOR

This could be utilized to control a magnetic contactor on the output of the generator.

VIBRATION ALERT: (Optional)

The DEMS controller can monitor vibration of the engine with a vibration sensor mounted on the engine block. Part number of the sensor is MA15 made by Honeywell. This sensor is connected to the controller with a two conductor cable, see drawing on connection. This monitors the input of the optional vibration sensor.

Note: Specifications are subject to change without notice.

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