

# Electronic Digital Governor

## EDG-5500

### Features & Benefits:

- A Near Drop in Replacement of the ESD-5500E
- Identical Mounting Hole Pattern to ESD-5500E
- Simple LCD User Interface
- Fast Setup with 5 Push Buttons, no Potentiometers
- Lockable Display to Prevent Unauthorized Access
- 2 Fixed Speeds (Rated / Idle) and Variable Speed
- Selectable Isochronous or Droop Governing
- Adjustable Starting Fuel Strategy (Black Smoke Reduction)
- Speed Ramping (Idle to Rated, or, any Speed Setting Change)
- Overspeed Sensing
- Magnetic Pickup Speed Input
- Includes Standard GAC AUX Input for Synchronizing and Load Sharing



Manufactured by:



Governors America Corp.

## Digital Governor made simple

GAC's EDG-5500 digital governor is designed to regulate engine speed on diesel and gas reciprocating engines. The EDG system is a suitable replacement for any mechanical governor system that needs flexibility, precision, or control of governed speed. The EDG is an integral part of a closed loop speed control system. When connected to an electric actuator and supplied with a speed sensor signal, the governor will direct the fuel system to the desired engine speed setting. The EDG is designed for industrial engine applications from generator sets, mechanical drives to pumps, or compressors.

The EDG uses an advanced microprocessor to support an enhanced PID control loop and user interface. Being digital, the EDG governor is not subject to analog drift.

The EDG-5500 is designed to be a compatible replacement for GAC's venerable ESD-5500E. The EDG's terminal connections are virtually identical to the ESD. The mounting hole pattern and footprint is the same.

Just like the ESD-5500, the EDG-5500 is rugged enough to be placed in a control cabinet or engine mounted enclosure with other dedicated control equipment. If water, mist, or condensation may come in contact with the controller, it should be mounted vertically to avoid water damage.

The EDG-5500 has a built in user interface (no configuration software required). The EDG-5500 has three configuration menus; QuikSet, Special, and Advanced configuration menu. Parameters are displayed on an LCD. There are five buttons – 3 COLUMN select buttons, 1 UP ARROW, 1 DOWN ARROW.

The EDG-5500 is designed to have the most frequently adjusted parameters on the main display. Selecting and modifying these parameters is performed using the patented Quikset method.

All of the Quikset parameters are on the LCD display in five rows with three parameters in each row. The active row is indicated by the parameters in the row being displayed. To select next row, tap any COLUMN button. Continuously tapping a COLUMN button cycles through all the rows.

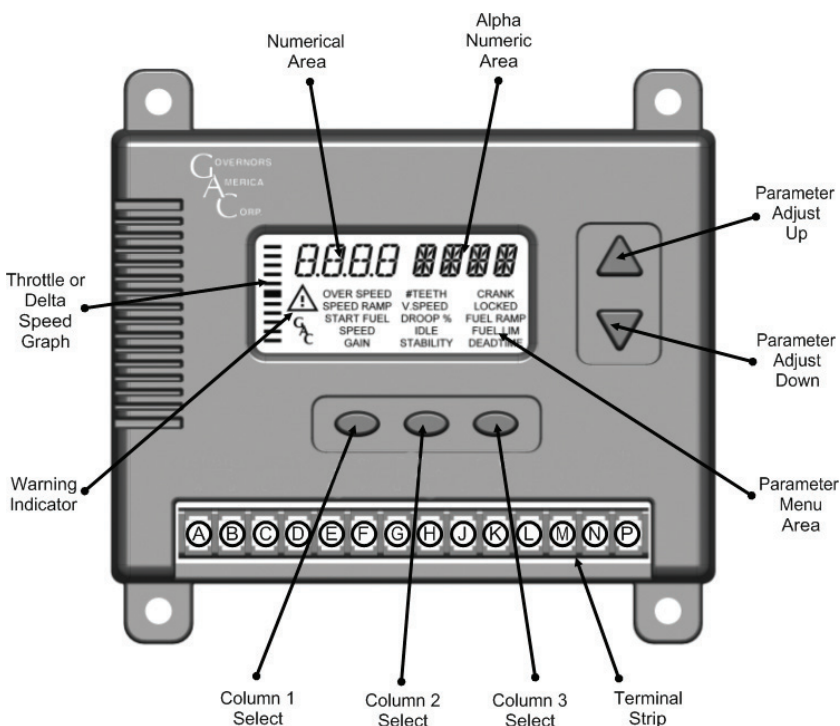
To view the value of a parameter in the current row, press and hold the COLUMN button under the parameter. To change the value of the parameter, while still holding the COLUMN button, tap the UP ARROW to increase the value, or tap the DOWN ARROW to decrease the value. Release the COLUMN button to return to the normal display. Holding down the UP or DOWN ARROW, while changing the value of a parameter, will scroll through the values.

The Special Menu is used to view and change lesser used parameters. These parameters include Variable Speed / Trim select, Soft Coupling (on / off), Lead (on / off), and Dither percent. This menu is entered and exited by simultaneously pressing and holding all three column keys. The values are changed by using the up and down arrows. The next parameter is selected by pressing any one of the column buttons.

While governing, the EDG-5500 will display the current RPM and the percent of the throttle being applied. By default the RPM is displayed in the alpha numeric area, and the % throttle is on the bar graph. By pressing either the UP arrow or DOWN arrow, the user can change the alpha numeric area to display the numerical percent of throttle; the bar graph will then represent the difference between the actual RPM and the desired RPM.

The EDG-5500 provides switch inputs for Droop and Idle and a standard GAC accessory input for connecting to load sharing / synchronizing controls. The EDG also has an analog input. With a 5K potentiometer, this input can be configured as a trim (percentage of speed) or as a variable speed input (speed range).

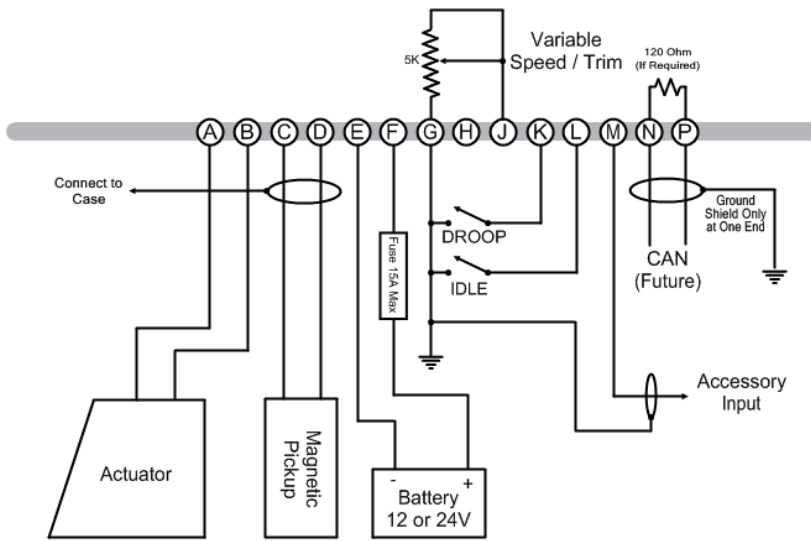
## DIAGRAM 1 USER INTERFACE



### Using the Keypad and LCD:

- The numerical area displays the value of a selected parameter or live running parameter. The alpha numeric area displays the units for the parameter (e.g., 1800 RPM).
- When running, the EDG will by default display the engine RPM in the alpha numeric area and the bar graph will represent throttle position. The EDG can alternatively display the throttle position, and show the difference between commanded RPM and actual RPM on the bar graph.
- To alternate between RPM and throttle position on display and bar graph, press either UP or DOWN.
- If the EDG display is locked, it can be unlocked by simultaneously pressing and holding the UP and DOWN buttons for 10 seconds. The LOCKED indicator will the turn off.

DIAGRAM 2 SYSTEM WIRING / OUTLINE



Terminal	Definition
A & B	Actuator (+ / -)
C & D	Magnetic Pickup (D is ground)
E & F	Battery Power (+ / +)
G	Ground Signal
H	Not Used
J	Variable Speed Input
K	Droop Select (closed to ground)
L	Idle Select (closed to ground)
M	Aux Input (load sharing/synchronizing, 5V nominal)
N & P	Future Option: CAN L & H

## CONFIGURABLE PARAMETERS for QUIKSET

<p><b>OVERSPEED</b></p> <p>Over Speed: RPM at which to automatically shutoff the actuator</p> <p>Range: 500 RPM - 9999</p> <p>Default: 2250</p>	<p><b>#TEETH</b></p> <p>Number of teeth on flywheel</p> <p>Range: 50-255</p> <p>Default: 120</p>	<p><b>CRANK</b></p> <p>Crank termination: RPM at which EDG switches from starting to governing</p> <p>Range: 0-500 RPM</p> <p>Default: 400</p>
<p><b>SPEED RAMP</b></p> <p>Speed Ramp: Rate throttle at which is ramped open during start</p> <p>Range: 0-2500</p> <p>Default: 150</p>	<p><b>V.SPEED (See Note1)</b></p> <p>Variable Speed Control - Maximum speed change allowed from trim input</p> <p>Range: 0-100%</p> <p>Default: 5</p>	<p><b>LOCKED</b></p> <p>Lock Configuration: Indicates whether EDG is to be locked when not in use</p> <p>Range: OFF, ON</p> <p>Default: OFF</p>
<p><b>START FUEL</b></p> <p>Starting Fuel: Percent of power to apply to actuator when crank starts</p> <p>Range: 0-100%</p> <p>Default: 65%</p>	<p><b>DROOP%</b></p> <p>Droop Percent: Droop to apply under maximum load (based on duty cycle of the actuator)</p> <p>Range: 0-10.0 (increments of 0.1)</p> <p>Default: 5.0</p>	<p><b>FUEL RAMP</b></p> <p>Percent per second to apply fuel as engine starts</p> <p>Range: 0-100%</p> <p>Default: 10%</p>
<p><b>SPEED (See Note1)</b></p> <p>Fixed speed of engine, expressed in RPM</p> <p>Range: 0-2500</p> <p>Default: 1800</p>	<p><b>IDLE</b></p> <p>Speed (in RPM) of engine when IDLE input is closed</p> <p>Range: 0-9999</p> <p>Default: 1000</p>	<p><b>FUEL LIMIT</b></p> <p>Fuel Limit: Maximum actuator percentage allowed</p> <p>Range: 0-100%</p> <p>Default: 99</p>
<p><b>GAIN</b></p> <p>Proportional (P) set point of the PID control</p> <p>Range: 0-100, 100=Max Gain</p> <p>Default: 30</p>	<p><b>STABILITY</b></p> <p>Integral (I) set point of the PID control</p> <p>Range: 0-100, 100=Longest Time</p> <p>Default: 25</p>	<p><b>DEADTIME</b></p> <p>Derivative (D) set point of the PID control</p> <p>Range: 0-100</p> <p>Default: 5</p>

Note 1: In Trim Mode, V.SPEED represents the % of the SPEED parameter limits of the pot input. For example, if VSPD is OFF, with SPEED set to 1500 RPM and V. SPEED set to 5%, then the lower end of the pot is set to 1425 RPM and the upper end is set to 1757 RPM. The center of the pot is 1500 RPM.

In Variable Speed Mode, V.SPEED represents the maximum speed and SPEED parameter represents the minimum speed. For example, VSPD is ON, and SPEED is set to 1000 and V. SPEED set to 2000, then the lower end of the pot is set to 1000 and the upper end is set to 2000. The center of the pot is 1500 (assuming linear taper).

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## SPECIFICATIONS

### PERFORMANCE

Isochronous Operation .....±0.25%  
Speed Range / Governor.....400 - 10 KHZ (Mag Pickup)  
Idle Adjust ..... Full Range  
Droop Range ..... 1 - 5% regulation  
Speed Trim ..... Programmable 0-100%, (default = 5%)

### ENVIRONMENTAL

Ambient Temperature..... -40° to 85°C (-40 to +180°F)  
Relative Humidity ..... up to 95%  
All Surface Finishes.....Fungus Proof and Corrosion Resistant

### COMPLIANCE / STANDARDS

Agency..... CE and RoHS Requirements  
Communications..... SAE J1939 (Future Option)

### INPUT/OUTPUT

Supply ..... 12-24 VDC Battery Systems (6.5 to 33 VDC)  
Polarity..... Negative Ground (Case Isolated)  
Power Consumption ..... 70mA max. continuous plus actuator current  
Speed Sensor Signal..... 0.5-120 VRMS  
Actuator Current ..... 7 Amps Continuous  
Load Share /  
Synchronizer Input.....0-10 VDC (5V nominal, reversed, 100Hz/V)  
Reverse Power Protection.....Yes  
Transient Voltage Protection.....60V

### RELIABILITY

Vibration ..... 7G, 20-100 Hz  
Shock ..... 20G Peak  
Testing..... 100% Functional Testing

**Local Distributor / Partner:**



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