

# EPC SERIES

## Engine Performance Controller

- Improve engine performance and efficiency
- Electronic control of ignition timing and air/fuel ratio
- User-configurable for any engine
- Fail-safe design features and fault annunciation
- Seven discrete outputs for sequence control
- 8-digit LCD display of status and operating parameters
- RS422 communications interface
- CSA-Certified for Class I, Division 2, Group D Hazardous Areas

The Altronic EPC-200C Engine Performance Controller is designed to maximize engine performance and efficiency. Micro-processor-based, the EPC electronically controls ignition timing and air/fuel ratio replacing the traditional pneumatic control system for these functions. Engine RPM plus up to four other analog inputs can be used as control variables; typically, these would include fuel manifold pressure, air manifold pressure and air manifold temperature. The four inputs and two analog outputs are in the form of 1–5 volt or 4–20 ma signals for easy interfacing with available transducers. The EPC is specially designed to operate in conjunction with Altronic II-CPU and Altronic III-CPU.

In addition to the two analog control functions (ignition timing and air/fuel ratio), the EPC-200C also has six user-programmable solid-state relay outputs related to the common start-up sequencing functions such as purge, overcrank, crank disconnect, flooding, etc. A seventh discrete output provides a signal in the event of overspeed, overload or loss of any input; if this occurs, timing and air/fuel ratio are set to preset values. In addition, there is a manual override mode to allow changing and checking of program data while the engine is running.

The EPC-200C has a RS422 interface for communications capability with other process or control computers.



CERTIFIED  
CLASS I, DIVISION 2,  
GROUP D



## Typical Application

**Example: Turbocharged Gas Engine with Wastegate Controller for Air Manifold Pressure**

INPUT FUNCTION	OUTPUT FUNCTION	
	Ignition Timing	Air/Fuel Ratio
RPM	X	—
Fuel Manifold Pressure	X	X
Air Manifold Pressure	—	X
Air Manifold Temperature	X	X
5th Variable	—	—

The chart indicates the most common input variables used. The fifth input channel gives additional flexibility and capability for more sophisticated control programs.

For Ignition Timing control, the user chooses one input (for example, RPM) as the primary control factor. Other factors are used to appropriately modify the timing curves for load and temperature. For Air/Fuel Ratio control, fuel pressure is the primary control factor with air manifold temperature as a modifier. Other control strategies are possible, for example, based on different inputs such as fuel BTU value or exhaust oxygen content.

## EPC-200 Features

**General Operation** — The EPC-200C performs the functions of a typical pneumatic control system for a gas engine with exhaust-driven turbocharger. The outputs are controlled by RPM and up to four other variables. Response to the inputs is controlled by entries through the the EPC's dealed membrane keyboard, giving the user total access to the operating parameters.

**Keyboard Entry by User** — Operating curves are entered inj (x,y) coordinate format: other data is entered and displayed in common engineering units (RPM, psi, degrees F., etc.). No algebra or computer programming knowledge is required. Access to critical control variables is password-protected so that accidental contact with the keyboard has no effect.

**Diagnostic Capability** — Diagnostic messages warn of various abnormal conditions while the engine is in operation or the first-out fault cause for the error output which can be used to alarmk or shut down the engine. Loss of any specific input or out-of-range conditions are examples of the factors which are specifically annunciated.

**Rs422 Communications Capability** — Communications capability is provided for interfacing to process control computers. The data on any channel can be read, including the ignition timing and wastegate position values. All setpoints can be read and/or altered remotely. RS422 signals have the capability for long distance transmission. In addition, software for direct, readable display and control from a remote IBM-compatible PC will be available.

**4-20mA Outputs** — The two major contol outputs, Ignition Timing Retard and Wastegate Position, are output as 4-20mA (1-5 V.) signals. Additionally, the user has control over the Proportional Band and Reset Time Response values. These determine how the EPC responds to changes in input data; an important feature for any control device interfacing with a large, mechanical machine. The EPC-200C performs the functions of a typical pneumatic control system for a gas engine with exhaust-driven turbocharger. The outputs are controlled by RPM and up to four other variables. Response to the inputs is controlled by entries through the the EPC's dealed membrane keyboard, giving the user total access to the operating parameters.

## Display Capability

- Display value of all analog input signals
- Display the output value for ignition timing, air manifold pressure and waste gate position
- Display all (x,y) coordinate values
- Display PI response values
- Diagnostic channels for error messages when operating or first-out fault

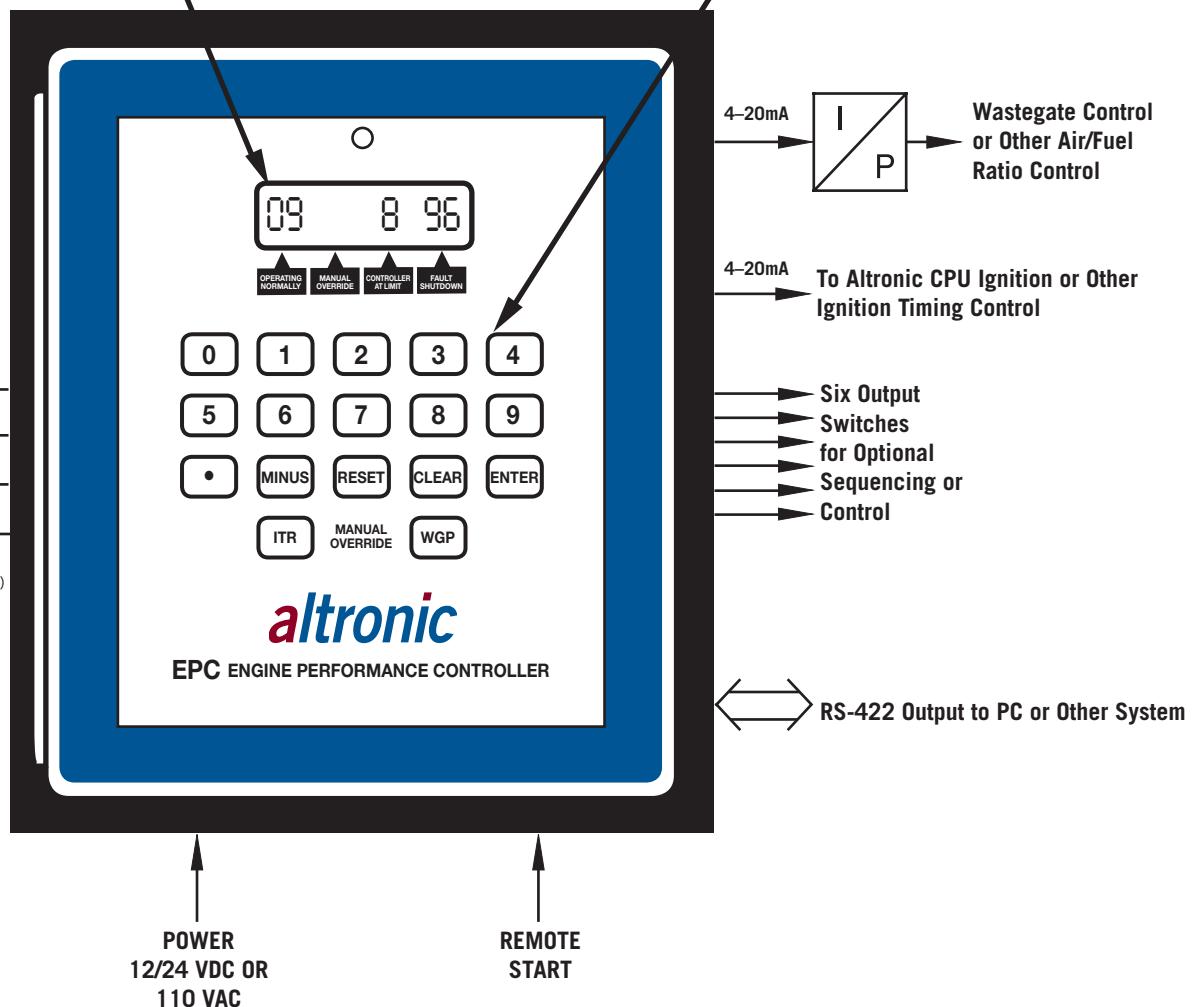
## Data Entered by User

1. Scale input channels for specific transducers used
2. Enter overriding constant values such as start-up retard, full advance timing, default values, etc.
3. The (x,y) coordinates for ignition timing curves
4. The (x,y) coordinates for air/fuel ratio curves
5. The PI response characteristics for the 4–20mA control outputs
6. The specific values controlling the 7 discrete output functions (if used)

**NOTE:** All critical control entries are password-protected to guard against accidental or unauthorized altering of data.

## Typical Inputs

- Engine Speed
- Fuel Manifold Press.
- Air Manifold Press.
- Air Manifold Temp.
- Unspecified Input  
(Fuel, BTU, Oxygen Sensor, etc.)



## General Specifications

### OUTPUTS

- 2 analog ..... Ignition timing 4-20mA  
Air/fuel ratio 4-20mA  
7 discrete ..... Solid-state relays  
10-32 VDC, 3 Amps

### INPUTS

- 1 magnetic pick-up..... Engine RPM  
4 analog ..... 1.5 V. or 4-20mA  
1 discrete ..... Start signal

**DISPLAY** ..... 8-digit, 0.5" LCD

**POWER** ..... 12 VDC, 24 VDC, 110 VAC, 20 watts

**PACKAGE** ..... NEMA 4, weatherproof enclosure  
12" H. x 10" W. x 6" D.

**FIELD CONNECTIONS**..... Plug-in terminal strip

## Panel Option

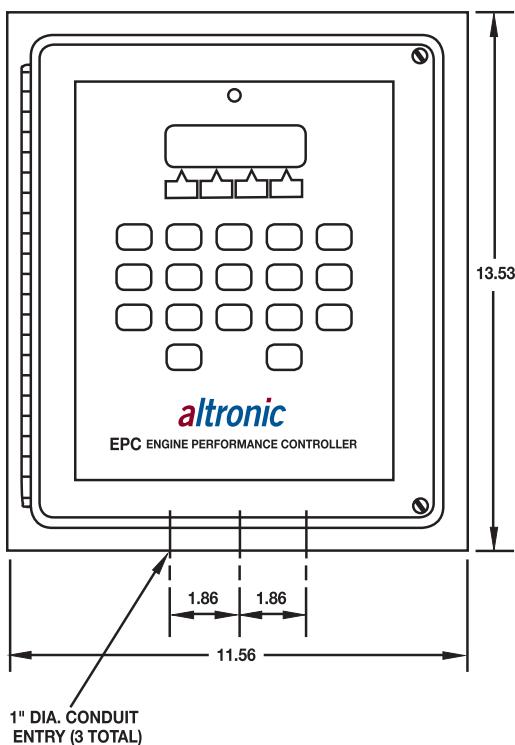
Altronic can furnish the EPC-200C Engine Performance Controller in a complete NEMA 12 panel board package together with the required interface transducers and other desired instruments. Prices for a complete system are furnished upon submission of detailed specification requirements.



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## Dimensions



NOTE: Panel cut-out is 10.12 x 12.12  
All dimensions in inches

