

# 2301E

## Digital Load Sharing and Speed Control

### Applications

The Woodward 2301E provides load sharing and speed control of generators being driven by diesel or gaseous engines.

With the flexible configuration software incorporated in the 2301E hardware, application variations can now be selected using an external computer (PC). Changing the application to accommodate engine speed range, gear teeth, and selection of forward or reverse acting is a matter of software setup.

The 2301E is capable of communicating using a Modbus®\* RTU protocol, functioning as a Modbus slave device, via RS-422 drivers.

The 2301E has four operating modes:

#### Speed Control

Has multiple dynamics flexibility. Will work on pumps or compressors. Has capability for remote 4–20 mA speed reference through a configurable analog input.

#### Isochronous Load Sharing

Is compatible with most existing analog load sharing speed control systems. Now with soft load and unload capability.

#### Droop Base Load

Adjustable load control using discrete raise and lower contacts.

#### Isochronous Base Load

Provides constant load level operation against a utility bus. The load setting may be fixed, changed using discrete raise and lower inputs, or a remote 4–20 mA input.

### Description

The Woodward 2301E microprocessor-based control functions like the 2301A load sharing and speed control and 2301D load sharing and speed control.

The control is housed in a sheet-metal chassis for ordinary and hazardous locations, and consists of a single printed circuit board.

The 2301E is configured using a computer with Control Assistant software or a Woodward ToolKit service tool. The configuration software may be downloaded from the Woodward website ([www.woodward.com](http://www.woodward.com)). The computer connects to the 2301E through a 9-pin connector (RS-232 port). Modbus control can be operated through the second serial port (RS-422).

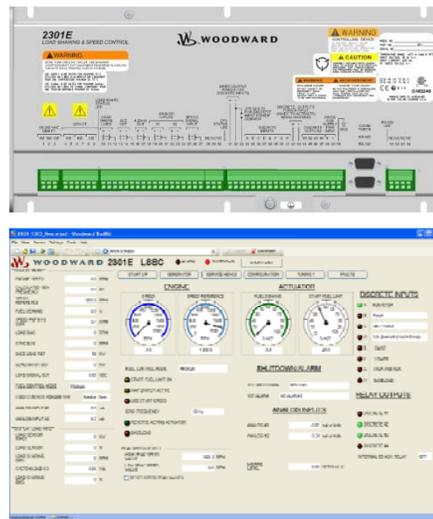
The control operates from a 24 Vdc supply.

The 2301E includes:

- 1 Load Sensor Circuit
- 1 Actuator Driver, 4–20 mA, 0–20 mA, 0–200 mA, or PWM
- 1 MPU Speed Sensor
- 1 Configurable Analog Output
- 2 Configurable Analog Inputs
- 8 Discrete (Switch) Inputs
- 4 Discrete (Relay Driver) Outputs

The 2301E operates within a range of –40 to +70 °C (–40 to +158 °F).

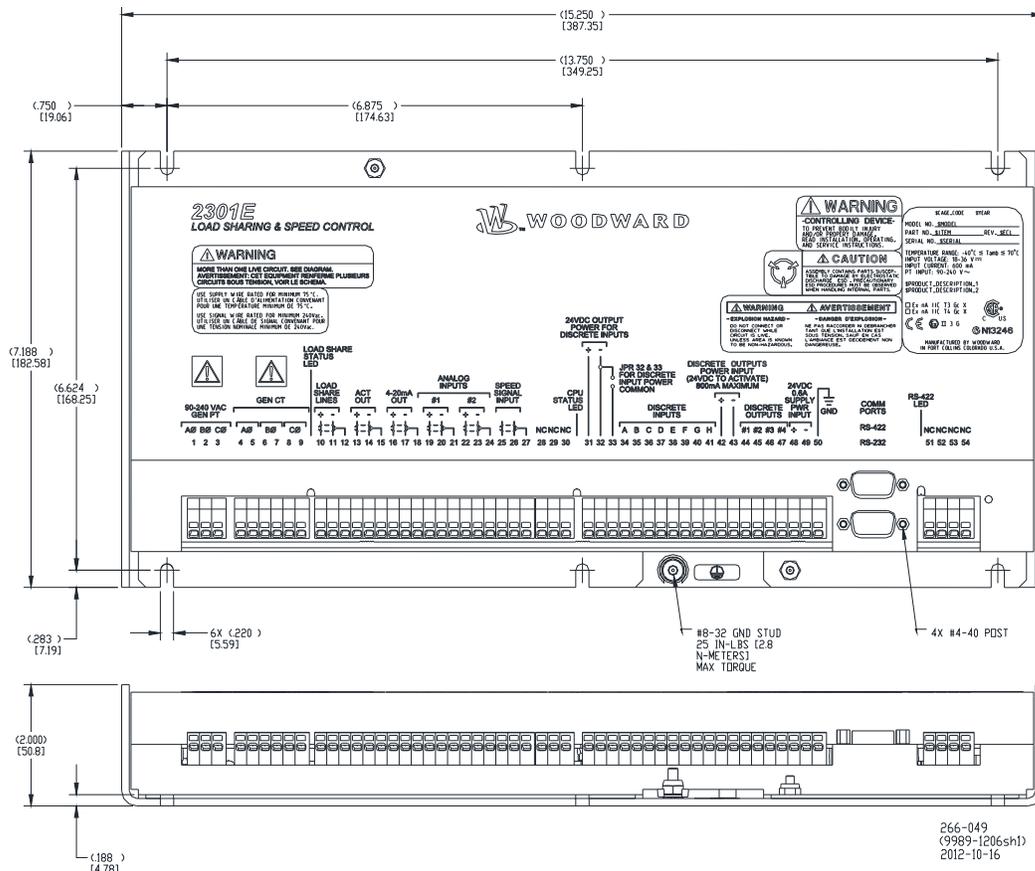
\*—Modbus is a trademark of Schneider Automation Inc.



- Engine / generator or pump applications
- Multiple dynamics
- Manifold Air Pressure (MAP) limiter
- Torque limiter
- Low-speed-sensing functionality
- Remote speed & load reference
- Soft load transfer
- Automatic idle-to-rated switching
- Load rejection / load pulse option
- Idle droop function
- Optional Modbus® serial communications
- Adaptive speed-sensing algorithm
- Two serial ports
- Data-logging capability
- 2301E ToolKit service tool or Control Assistant programmable
- Ordinary or Hazardous Location chassis

# Regulatory Compliance

- NOTE** Some certifications apply to specific models only.
- European Compliance for CE Mark:**  
 EMC Directive: Declared to 2004/108/EC COUNCIL DIRECTIVE of 15 Dec 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility.  
 Low Voltage Directive: Declared to 2006/95/EC COUNCIL DIRECTIVE of 12 December 2006 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.
- ATEX:** Declared to 94/9/EC COUNCIL DIRECTIVE of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.
- Marine Compliance:**  
 Det Norske Veritas: Standard for Certification, No. 2.4, April 2006  
 Lloyd's Register of Shipping: Type Approval System, Test Specification Number 1, 2002  
 American Bureau of Shipping: 2009 Steel Vessels Rules 1-1-4/7.7, 4-2-1/7.3 & 7.5
- North American Compliance:**  
 CSA: CSA Certified for Class I, Division 2, Groups A, B, C, D, T3 or T4, and Ordinary Locations for use in Canada and the United States.
- NOTE** Wiring must be in accordance with applicable electric codes with the authority having jurisdiction. These listings are limited to those units bearing the UL or CSA agency identification.



**2301E Digital Control (ordinary locations version shown) (Do not use for construction)**

**Technical Manual 26641**



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**Distributors & Service**

Woodward has an international network of distributors and service facilities. For your nearest representative, call the Fort Collins plant or see the Worldwide Directory on our website.

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