2300 Digital

Load Sharing and Speed Control

- Reciprocating engine or steam or gas turbine applications
- Digital load sharing and speed control
- Programmable using Woodward GAP™ application software
- PC configurable with Woodward Watch Window software
- Designed for 300–32 000 rpm applications
- Actuator current range of 4–20 mA or 20–200 mA
- Modbus® based serial communications

Description

The 2300 Digital Electronic Load Sharing & Speed Control is a microprocessor based hardware platform that is custom programmable to the specific needs of the application. Typically the control is used to provide speed and load control functions for reciprocating engines, or steam or gas turbines. The control consists of a single printed circuit board that is housed in a sheet metal enclosure. Both ordinary and hazardous location versions are available. The unit is intended for bulkhead mounting, and spring-loaded terminal blocks are provided for termination of field wiring. The 2300 is powered from 24 Vdc.

Integral load sensor and load sharing capabilities are available that allow the control to be programmed for a variety of power generation applications. Isochronous load sharing, KW droop, and base load operation can be provided.

The 2300 input/output (I/O) list includes:

- 1 Generator Load Sensor
  3 PT Inputs & 3 CT Inputs
- 1 Load Sharing Line
- 1 Actuator Driver Output
- 1 Magnetic Pickup (MPU) Input
- 1 Analog Output
- 2 Analog Inputs
- 8 Discrete Inputs
- 4 Discrete Relay Driver Outputs
- 1 Serial COM Port (RS-232/RS-422)

The operating temperature range is –40 to +70 °C (–40 to +158 °F), and the 2300 is CE Marked and UL/CSA Listed.

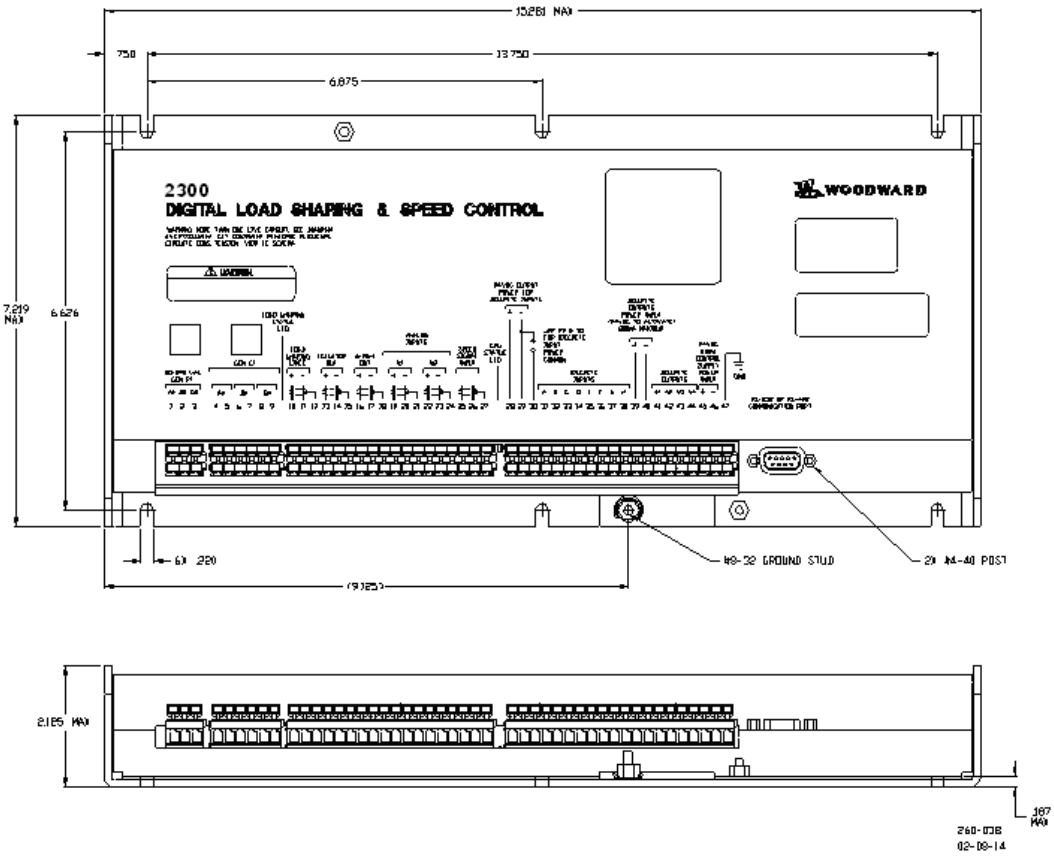
Programming

Woodward provides custom programming for the 2300 Control. Specialized functions are programmed to meet the specific needs for speed control, load management, process control, unit sequencing, and protective monitoring. If desired, the 2300 can be programmed to handle supervisory functions rather than individual unit control.

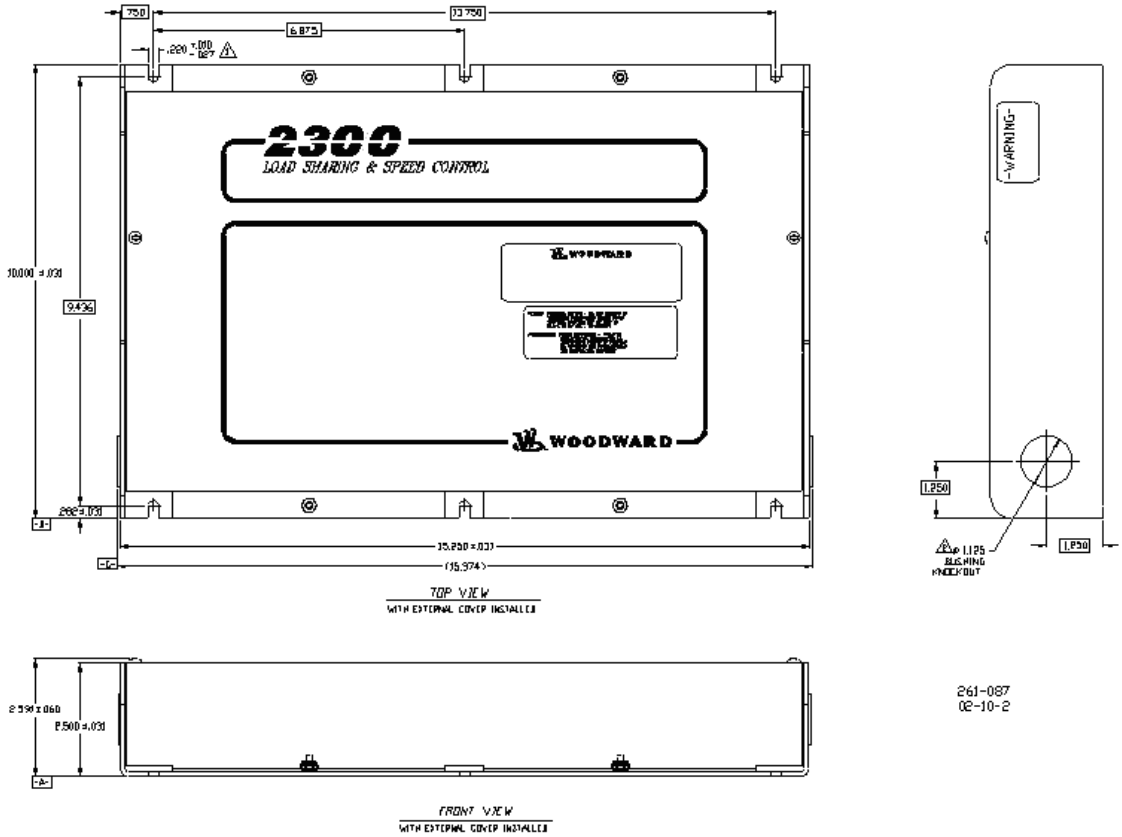
Communications

A 9 pin sub D-connector is available to allow serial communications with other systems. This port is used to interface with the plant DCS, an operator HMI, or printers and data loggers. The standard protocol is serial Modbus® * (RTU), and the maximum communication rate is 38.4 Kbaud. The port's Modbus communications characteristics are defined in the customized application program. In addition, the communications port is used to configure and service the controller by use of the Woodward Watch Window software. This software program can allow users to set and adjust all application-based parameters, plus upload and download configurations to and from the control.

*—Modbus is a trademark of Schneider Automation Inc.



2300 Digital Control Outline Drawing (2300-059 standard version)
(Do not use for construction)



2300 Digital Control Outline Drawing (2300-061 hazardous locations version)
(Do not use for construction)

Specifications

Woodward Part Numbers:	
2300-059	2300 for Ordinary Location
2300-061	2300 for Hazardous Location
8923-932	Watch Window Installation
Power Supply Rating	18–40 Vdc (SELV)
Power Consumption	less than or equal to 20 W nominal
Weight	1.75 kg / 3.86 lb
Input Supply Voltage	Input Supply Current
18 V	589 mA
24 V (nominal)	431 mA
32 V	319.6 mA
Inrush Current	7 A for 0.1 ms (24 Vdc input) 22 A for 15 ms (high voltage model)
Steady State Speed Band	±0.25% of rated speed
Magnetic Pickup	100–24,950 Hz
Discrete Inputs (8)	3 mA at 24 Vdc, impedance approximately 5.2 kΩ
Analog Inputs (2)	4–20 mA, 0–5 Vdc, or ±2.5 Vdc (software configurable)
Actuator Output	4–20 or 20–200 mA to actuator, software configurable
Analog Output	4–20 mA, internally powered
Discrete Outputs (4)	configurable relay drivers, powered by external +12 or +24 Vdc source, max output current 200 mA
Communication Port	RS-232, 9-pin connector, 1200 to 38,400 baud, full duplex
Ambient Operating Temperature	–40 to +70 °C (–40 to +158 °F)
Storage Temperature	–40 to +105 °C (–40 to +221 °F)
Humidity	95% at +20 to +55 °C (+68 to +131 °F) Lloyd's Register of Shipping Specification Humidity Test 1
Mechanical Vibration	Lloyd's Register of Shipping Specification Vibration Test 2
Mechanical Shock	US MIL-STD 810C, Method 516.2, Procedure I (basic design test), Procedure II (transit drop test, packaged), Procedure V (bench handling)
Equipment Classification	Class 1 (grounded equipment)
Technical Manual	26232

Regulatory Compliance

European Compliance for CE Mark:	
EMC Directive	Certified to 89/336/EEC COUNCIL DIRECTIVE of 03 May 1989 on the approximation of the laws of the member states relating to electromagnetic compatibility.
Low Voltage Directive	Certified to the 73/23/EEC COUNCIL DIRECTIVE of 19 February 1973 on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits.
Marine Compliance Certificates:	American Bureau of Shipping, Bureau Veritas, China Classification Society, Det Norske Veritas, Lloyd's Register of Shipping, Nippon Kaiji Kyokai NOTE—These certifications apply to specific models only.
North American Compliance:	
Ordinary Locations (P/N 2300-059 only)	CSA Certified for Ordinary Locations for use in United States and Canada.
Hazardous Locations (P/N 2300-061 only)	CSA Certified for use in Class I, Division 2, Groups A, B, C, D, T4 for United States and Canada. NOTE—Wiring must be in accordance with applicable electric codes with the authority having jurisdiction.

WOODWARD

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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.