828 Digital Control
Custom Control

Applications

The Woodward 828 Digital Control manages and controls reciprocating engines (gas, diesel, or dual fuel) used in power generation, marine propulsion, and gas compression/distribution. The control may also be used in cogeneration, power transmission/distribution, process management, pipeline pump stations, utility power generation, emergency standby power, and remote control station operation. The 828 provides state-of-the-art control for new and retrofit situations.

Programming

Your Woodward Distributor provides custom programming for the 828 Digital Control. (Standard preprogrammed versions for power generation, marine, gas engine, mechanical drive, etc. are available on our 723 Plus Digital Control.) The custom 828 Digital Control can be programmed to meet specific needs for specialized functions in process, plant, engine, and marine applications. The custom versions may be used as unit or engine level controls, or as supervisory controls for such things as sequencing, load shedding, heat recovery management, and system monitoring and alarming.

Communications

The 828 Digital Control provides two separate serial interfaces for RS-232, RS-422, or RS-485 communications. The ports feature standard ASCII character handling or an industry-standard Modbus® protocol (ASCII or RTU). Baud rates are programmable to meet specific user requirements. Devices that may be connected include terminals, printers, data loggers, modems, and any other devices that use RS-232, RS-422, or RS-485. The 828 control can also communicate using the Local Operating Network (LON™**) protocol for digital communications. The 828 control’s I/O ports may be expanded through LinkNet® nodes. Typical LinkNet nodes include thermo-couple, RTD, analog, and discrete type I/O.

Adjustments

Adjustments may be made quickly and easily through the 828 control’s standard PC Interface or optional hand held programmer. Both adjustment methods are menu-driven and record all set points.

Self-Diagnostics

The 828 Digital Control has integrated diagnostics to determine the control integrity. Memories, processor, and baseline power supply monitoring are included in the diagnostic tests.

- Configurable for control and monitoring in engine, plant, process, and marine applications
- 32 bit microprocessor
- 3 user-configurable communication ports
- Modbus protocol
- 2 Local Operating Network (LON™**) channels
- Digital reference and ramps for speed, temperature, pressure, etc.
- Configurable update time groups—10 to 80 milliseconds
- CSA Certified
- CE Compliant

* Modbus is a trademark of Schneider Automation Inc.
** LON is a trademark of Echelon Corporation.
## Specifications

### Input Power

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Voltage Model</td>
<td>18–40 Vdc (24 or 32 Vdc nominal)</td>
</tr>
<tr>
<td>High Voltage Model</td>
<td>90–150 Vdc (125 Vdc nominal)</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>40 W nominal</td>
</tr>
</tbody>
</table>

#### Inrush Current

<table>
<thead>
<tr>
<th>Model</th>
<th>Current (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Voltage Model</td>
<td>7 A for 0.1 ms</td>
</tr>
<tr>
<td>High Voltage Model</td>
<td>22 A for 15 ms</td>
</tr>
</tbody>
</table>

### Speed Signal Inputs (2)

- **Speed Input Voltage**: 1.0–50.0 Vrms
- **Speed Input Frequency**:
  - Analog: 400 Hz to 15 kHz; Digital: 30 Hz to 15 kHz
- **Speed Input Impedance**: 10 kΩ ±15%

#### NOTE

EU Directive compliant applications are not currently able to use proximity switches due to the sensitivity of the switches.

### Discrete Inputs (8)

- **Response Time**: 10 ms ±15%
- **Impedance**: 2.3 kΩ

### Analog Inputs (4)

- **Load Sharing Input**:
  - Analog Input: ±5 Vdc or 0–20 mA
  - Common Mode Voltage: ±40 Vdc
  - Common Mode Rejection: 0.5% of full scale
  - Accuracy: 0.5% of full scale

### Outputs

#### Analog Outputs (0–1 or 4–20 mA (2)

- **Analog Output**: 0–1 mA or 4–20 mA (max. 600 Ω load)
- **Accuracy**: 0.5% of full scale

#### Analog Outputs (0–20 or 0–200 mA (2)

- **Analog Output**: 0–20 mA (max. 600 Ω load) or 0–200 mA (max. 70 Ω load)
- **Accuracy**: 0.5% of full scale

### Relay Contact Outputs (3)

- **Contact Ratings**: 2.0 A resistive @ 28 Vdc; 0.5 A resistive @ 125 Vdc

### Environment

- **Operating Temperature**: –40 to +70 °C (–40 to +158 °F)
- **Storage Temperature**: –55 to +105 °C (–67 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 1
- **EMI/RFI Specification**: Lloyd’s Register of Shipping Specification EN 50081-2 and EN 50082-2

### Compliance

- **CSA Certified**: Class I, Division 2, Groups A, B, C, & D
- **American Bureau of Shipping (ABS)**: 2007 Steel Vessel Rules 1-1-4/7.7, 4-2-1/7.3, 4-2-1/7.5.1, 4-9-3/17, 4-9-7/13, 4-9-2/11.7 & 4-9-4/23 (Low Voltage Models only)
- **Bureau Veritas (BV)**: Certified for Environmental Category EC Code: 33
- **Det Norske Veritas (DNV)**: Certified for Marine Applications, Temperature Class B, Humidity Class A, Vibration Class B, EMC Class A, and Enclosure Class B per DNV Rules for Ships Pt. 4, Ch. 9 Control and Monitoring Systems and Pt. 4, Ch.’s 2 & 3, Rotating Machinery Environmental Category C; EMC2 per Type Tests Part 2, Edition 2003: Regulations for the Use of Computer and Computer on Board
- **Germanischer Lloyd (GL)**: Environmental Category C; LR Type Approval Test Specification No. 1:1996 for Environmental Categories ENV1, ENV2, and ENV3
- **Lloyd’s Register (LR)**: Nippon Kaiji Kyokai (NKK): Rules Ch. 1, Part 7, of Guidance for the approval and Type approval of materials and equipment for marine use and relevant Society’s Rules. (Low Voltage Models only)
- **Registro Italiano Navale (RINA)**: RINA Rules for the Classification of Ships – Part C Machinery, Systems and Fire Protection – Ch. 3, Sect. 6, Tab. 1
828 Control Outline Drawing
(Do not use for construction)