APPENDIX

APPLICATIONS

The Woodward 723PLUS Digital Control manages and controls reciprocating engines (gas, diesel, or dual fuel) used in power generation, marine propulsion, and industrial engine and process markets. Standard application software is available which provides a variety of off-the-shelf control solutions for these markets. The following is a listing of the standard (level 1) programmed and configurable 723PLUS Digital Controls:

<table>
<thead>
<tr>
<th>Power Generation</th>
<th>Marine</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>8280-412 DSLC Loadshare, LV</td>
<td>8280-418 Single Engine Propulsion—Low Speed, LV</td>
<td>8280-410 Speed Control, LV</td>
</tr>
<tr>
<td>8280-413 DSLC Loadshare, HV</td>
<td>8280-419 Single Engine Propulsion, LV</td>
<td>8280-411 Speed Control, HV</td>
</tr>
<tr>
<td>8280-414 Analog Loadshare, LV</td>
<td>8280-422 Dual Engine Mechanical Load Share—Low Speed, LV</td>
<td>8280-424 Performance Control ‘424’, LV</td>
</tr>
<tr>
<td>8280-415 Analog Loadshare, HV</td>
<td>8280-423 Dual Engine Mechanical Load Share, LV</td>
<td>8280-598 Performance Control ‘598’, LV</td>
</tr>
<tr>
<td>8280-416 DSLC/MSLC Gateway, LV</td>
<td>8280-466 DSLC Loadshare—Low Speed, LV</td>
<td>8280-464 Process Control, LV</td>
</tr>
<tr>
<td>8280-417 DSLC/MSLC Gateway, HV</td>
<td>8280-467 DSLC Loadshare—Low Speed, HV</td>
<td>8280-465 Process Control, HV</td>
</tr>
</tbody>
</table>

PROGRAMMING

The controls listed above are standard pre-programmed 723PLUS Digital Controls. Woodward and its authorized Distributors can provide custom programming for the 723PLUS/828 Digital Control to meet the need for specialized functions in process, generator plant, engine, and marine applications. The custom version may be a variation of standard control software or totally new. The custom version may be used as a unit control or as a system control for such things as sequencing, load shedding, heat recovery management, and system monitoring and alarming.

ADJUSTMENTS

Adjustments may be made quickly and easily through the Watch Window or Control View PC Interface or an optional hand held programmer. Both adjustment methods are menu-driven and record all set points. More information is on the Industrial Controls section of our website (www.woodward.com).

- Programmed and configurable for off-the-shelf control and monitoring in power generation, industrial engine, process, and marine applications
- 32-bit microprocessor
- 1 Watch Window or hand held programmer communication port
- 2 serial ports with Modbus®* and ServLink protocol choices
- 2 local operating network (LON®**) channels
- Digital reference and ramps for speed, pressure, temperature, etc.
- Configurable update time groups—10 to 80 milliseconds
- UL and cUL listed

*—Modbus is a trademark of Modicon, Inc.
**—LON is a trademark of Echelon Corp.
The 723PLUS Digital Control provides two separate serial interfaces for RS-232, RS-422, or RS-485 communications. In some models both ports feature an industry-standard Modbus protocol (ASCII or RTU) that can interface to a Modbus master device such as a Human/Machine Interface (HMI). In other models one port features an industry-standard Modbus protocol (ASCII or RTU), and the other port features Woodward ServLink protocol for a Watch Window or Control View PC interface. Baud rates are tunable to meet specific user requirements.

The 723PLUS control can also communicate using the local operating network (LON) protocol for digital communications. The 723PLUS/828 control I/O ports may be expanded through LinkNet® nodes. Typical LinkNet nodes include thermocouple, RTD, analog, and discrete type I/O.

**SELF DIAGNOSTICS**

The 723PLUS Digital Control has integrated diagnostics to determine the control integrity. Memories, processor, and baseline power supply monitoring are included in the diagnostic tests.
## SPECIFICATIONS

### Input Power
- **Low Voltage Model**: 18–40 Vdc (24 or 32 Vdc nominal)
- **High Voltage Model**: 90–150 Vdc (125 Vdc nominal)
- **Power Consumption**: 40 W nominal
- **Inrush Current (Low Voltage Model)**: 7 A for 0.1 ms
- **Inrush Current (High Voltage Model)**: 22 A for 15 ms

### Inputs
- **Speed Signal Inputs (2)**
  - **Speed Input Voltage**: 1.0–50.0 Vrms
  - **Speed Input Frequency**
    - Magnetic Pickup: 400 Hz to 15 kHz
    - Proximity Switch: 30Hz 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)**
  - **Discrete Input**: 24 Vdc, 10 mA nominal, 18–40 Vdc range
  - **Response Time**: 10 ms ± 15%
  - **Impedance**: 2.3 kΩ

- **Analog Inputs (4)**
  - **Analog Input**: ±5 Vdc or 0–20 mA, transducers externally powered
  - **Common Mode Voltage**: ±40 Vdc
  - **Common Mode Rejection**: 0.5% of full scale
  - **Accuracy**: 0.5% of full scale

- **Load Sharing Input**
  - **Analog Input**: 0–4.5 Vdc
  - **Common Mode Voltage**: ±40 Vdc
  - **Common Mode Rejection**: 1.0% of full scale
  - **Accuracy**: 1.0% 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)
- **Mechanical Vibration**
  - Lloyd’s Register of Shipping Spec. Humidity Test 1
- **Mechanical Shock**
- **EMI/RFI Specification**
  - Lloyd’s Register of Shipping Specification
  - EN 50081–2 and EN 50082–2

### Compliance
- **UL/cUL Listing**: Class 1, Division 2, Groups A, B, C, D
- **Lloyd’s Register of Shipping**
  - LR Type Approval Test Specification No. 1 (1996) for environmental categories
  - ENV1, ENV2, & ENV3
- **Germanischer Lloyd**
  - Regulations for the Performance of Type Tests;
  - Regulations for the Use of Computer and Computer on Board
- **American Bureau of Shipping (ABS)**
  - Rules (1997) 4/4.11.6, 4/5C2.17, 4/11.3.11 and 4/11.7.2
- **European Union (EU)**
  - Compliant with EMC Directive 89/336/EEC
    - (Low Voltage Model Only)
- **Det Norske Veritas (DNV)**
  - Rules for Classification of Ships and Mobile Offshore Units
DECLARATION OF INCORPORATION

In accordance with the EMC Directive 89/336/EEC and its amendments, this controlling device, manufactured by Woodward Governor Company, is applied solely as a component to be incorporated into an engine prime mover system. Woodward Governor Company declares that this controlling device complies with requirements of EN50081-2 and EN50082-2 when put into service per the installation and operating instructions outlined in the product manual.

NOTICE: This controlling device is intended to be put into service only upon incorporation into an engine prime mover system that itself has met the requirements of the above Directive and bears the CE mark.

For more information contact: