ELECTRONIC INNOVATION Inc.

# DN010-OFE
# DN010-PFE
# DN010-SSE

# 16 Point High Current PWM Output Module

DN010-PFE

DN010-SSE

The Electronic Innovation Inc. “DN” line of modules is intended to provide rugged, reliable, *DeviceNet*™ I/O capability in unusually harsh environments. These include applications such as on-board control of heavy mobile equipment.

The DN line has been designed from the ground up to survive these environments with special attention in the following areas:

- Mechanical design for high shock, vibration, and concussion tolerance, resistance to liquids such as water or oil, and most forms of corrosion, along with wide operating temperature ranges.
- Electrical design to ensure reliable operation in the face of severe electrical transients, which can occur on vehicle electrical systems. All modules have been designed and tested according to automotive standard SAE J1113 and mil spec QSTAG-307
- Electronic design to minimize electromagnetic emissions and provide low susceptibility to external electromagnetic interference.
- Extensive design effort has been expended to ensure that hardware, software, or network faults, if and when they occur, will result in a predictable and timely transition of the module to the safest achievable state.

The DN001 *DeviceNet*™ High Current Pulse Width Modulated (PWM) Analog Output Module provides sixteen outputs, which are well suited to provide high-side control of heavy inductive vehicle loads such as the solenoids that are used for proportional electric control over hydraulic systems. The duty cycle of these outputs may be varied from true 0% to true 100% allowing them to also be used as discrete digital outputs. The wide PWM frequency range available permits operation with a range of available equipment from many manufacturers.

In addition to the usual *DeviceNet*™ parameters, the characteristics of the Pulse Width Modulated (PWM) outputs are also software adjustable through the bus. The most common characteristic is the frequency of the PWM output signal. This can be set to match the requirements of the equipment being driven by the output.

DeviceNet™ CONFORMANCE TESTED

**DeviceNet Communications**

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|---|---|
| Default MAC ID: | 63, Software Selectable |
| Data Rates Supported: | 125, 250, 500 kbps, Software Selectable |
| Master / Slave Connection Set: | Supported, Group 2 Only Server |
| Dynamic Connections (UCMM): | Not Supported |
| Fragmented Explicit Messaging: | Not Supported |

**DeviceNet Power Supply:**

| | |
|---|---|
| Power Supply Voltage: | 9 V to 65 V, continuous operating |
| Power Supply Isolation: | 1.2 kV rms |
| Current Consumption: | 200 mA @ 8.8 V Supply<br>150 mA @ 11.0 V Supply<br>80 mA @ 25.0 V Supply |
| Overvoltage Withstand: | 120V, 20 seconds |
| Applicable Standards: | Exceeds QSTAG-307 & SAE 1113 |

**Aux Power Supply**

| | |
|---|---|
| Operating Voltage: | 4.5 to 39 VDC |
| Maximum Operating Current: | 18 A Total |
| Reverse Polarity Protection: | Series Diode |
| Overvoltage Withstand: | Max. 120V, indefinite duration |
| Operation During Overvoltage: | Outputs turned off to protect load when Aux. Supply > max. operating voltage |
| Applicable Standards: | Exceeds QSTAG-307 & SAE 1113 |

**Pulse Width Modulated (PWM) Outputs**

| | |
|---|---|
| Output Type: | High-Side Switch |
| PWM Frequency: | 20 to 2500 Hz, Software Selectable |
| PWM Frequency Jitter: | 100 ppm |
| PWM Resolution: | 8 bits |
| PWM Duty Cycle Range: | 0% to 100% |
| Overvoltage Shutdown: | 39.5 to 42 VDC |
| Undervoltage Shutdown: | 2.4 to 4.5 VDC |
| Operating Current: | 5 A Max per output, 18 A Max Total |
| Overcurrent Protection: | Auto Reset Electronic Fuse |
| Overcurrent Trip Point: | 7 to 35 A Initial Peak<br>6 to 10 A Repetitive |
| Overcurrent Shutdown Delay: | 80 µs Min<br>400 µs Max |
| Thermal Overload Trip Temp: | 150°C Min |
| Inductive Spike Protection: | Output clamped at 42 VDC, 1500W max. pulse |
| State of Outputs on Power Up: | All outputs off. |
| DeviceNet State Behavior: | All outputs immediately turned off any time the module is not in ***Established*** state. |

**Environmental**

| | |
|---|---|
| Operating Temperature: | -40 °C to +85 °C |
| Storage Temperature: | -55 °C to +125 °C |

**Ordering Information**

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|---|---|
| DN010-PFE | Potted into Polyurethane Enclosure,<br>Mini-style DeviceNet and Aux. Connectors<br>Micro-Style connectors for outputs |
| DN010-SSE | Potted into Stainless Steel Enclosure,<br>Mini-style DeviceNet and Aux. Connectors<br>Micro-Style connectors for outputs |

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