CDN502
HIGH DENSITY I/O ADAPTER
USER GUIDE

13050201

DN502 INSTALLATION

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DN502 INSTALLATION

DN502 PRODUCT OVERVIEW

The DN502 High Density I/O controller provides 16 digital inputs, 16 digital outputs, 8 analog inputs and 4 analog outputs. The device may be powered from a local power source or from the DeviceNet Power. A configuration switch allows setting the adapter MAC ID and communication speed.

The digital inputs may be specified as either 120 Vac or 24 Vac/dc. Units are available with mixes of input types in groups of 4.

The digital outputs may be specified as either relays (up to 240 Vac, 2 Amp), 120 Vac, 2 Amp TRIACS's or 24 Vdc 2 Amp solid state drivers. Units are available with mixes of output types in groups of 4.

The eight 12 bit analog inputs are software programmable to support 0-5, 0-10, +/-10 or current loop.

The four 12 bit analog outputs are fixed as 0-10 volts.

The DeviceNet channel is optically isolated when the unit is powered from a local power source.

The unit may be powered from a local 120 Vac, 24 Vac/dc or from the DeviceNet power. Minimum input voltage is 16 Volts.

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The DN502 provides 4 mounting screws. See Physical layout.

NOTE: All detachable screw terminals are numbered with pin 1 on the left.

One mounting screw has provides for connecting the DeviceNet Shield to local earth ground through a R/C circuit as specified in the ODVA DeviceNet specifications. To include this circuit install jumper JP1.

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Jumper	Description
JP1	Connect DeviceNet Shield to Mtg. Hole

POWER CONNECTIONS

The DN502 may be powered from a local power source or from the DeviceNet power signals.

NOTE: If the unit is powered from the DeviceNet power connection the analog input common signals will be directly coupled to the DeviceNet BUS - signal.

The local power source is connected to ST3 terminals. These signals are polarity independent for both AC and DC power.

Terminal	Description
ST3-1	Power Source (Polarity independent)
ST3-2	Power Source (Polarity independent) - Fused

The (unregulated) processor power source is current limited (100 mA) and provided on three screw terminals to provide sensor activation power.

Terminal	Description
ST1-1	Sensor Activation power -
ST1-2	Sensor Activation power +
ST1-3	No Connection

Power for the processor circuitry may be provided from an external power source or the DeviceNet BUS+ and BUS- signals.

Jumper	Description
JP3 V24	Power supplied by external power source
JP4 removed	

Jumper	Description
JP3 VBUS+	Power supplied by DeviceNet BUS +/-

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JP4 installed	

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Digital Inputs

Digital inputs are connected to the 24 position connector P5. The inputs are organized as 8 groups of 2, with each group sharing a common input terminal. For DC inputs the input common may be connected to either the positive (sinking input device) or the common (sourcing input device) of the sensor activation power. The DN502 provides a unregulated power source at the ST1 terminals if the sensors require local power.

NOTE: Connecting the ST1 terminals to the local sensors defeats the optical isolation between the digital inputs and the processor power. This will also propagate back to the DeviceNet connections if the unit uses the DeviceNet to provide local power.

Terminal	Description
P5-1	Input 1
P5-2	Input 1 & 2 Common
P5-2	Input 2
P5-4	Input 3
P5-5	Input 3 & 4 Common
P5-6	Input 4
P5-7	Input 5
P5-8	Input 5 & 6 Common
P5-9	Input 6
P5-10	Input 7
P5-11	Input 7 & 8 Common
P5-12	Input 8
P5-13	Input 9
P5-14	Input 9 & 10 Common
P5-15	Input 10
P5-16	Input 11
P5-17	Input 11 & 12 Common
P5-18	Input 12
P5-19	Input 13
P5-20	Input 13 & 14 Common
P5-21	Input 14
P5-22	Input 15
P5-23	Input 15 & 16 Common
P5-24	Input 16

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DIGITAL OUTPUTS

Digital outputs are connected to the 20 position connector P7. The inputs are organized as 4 groups of 4, with each group sharing a common input terminal.

For DC outputs the output common must be connected to the positive power source. The outputs provide Sourcing outputs.

For AC outputs the output common should be connected to the AC L1.

Terminal	Description
P7-1	Output Common 13..16
P7-2	Output 16
P7-2	Output 15
P7-4	Output 14
P7-5	Output 13
P7-6	Output Common 9..12
P7-7	Output 12
P7-8	Output 11
P7-9	Output 10
P7-10	Output 9
P7-11	Output Common 5..8
P7-12	Output 8
P7-13	Output 7
P7-14	Output 6
P7-15	Output 5
P7-16	Output Common 1..4
P7-17	Output 4
P7-18	Output 3
P7-19	Output 2
P7-20	Output 1

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ANALOG INPUTS

Analog inputs are connected to the 16 position connector P2. The inputs are organized as 8 input pairs consisting of the analog signal and analog return. All analog returns are common. No isolation is provided between the analog inputs and the processor ground.

Terminal	Description
P2-1	Analog input 1
P2-2	Analog return (common)
P2-3	Analog Input 2
P2-4	Analog return (common)
P2-5	Analog Input 3
P2-6	Analog return (common)
P2-7	Analog Input 4
P2-8	Analog return (common)
P2-9	Analog Input 5
P2-10	Analog return (common)
P2-11	Analog Input 6
P2-12	Analog return (common)
P2-13	Analog Input 7
P2-14	Analog return (common)
P2-15	Analog Input 8
P2-16	Analog return (common)

To support current loop applications on-board 500 ohm resistors are provided. These are enabled by installing jumpers.

Jumper	Description
JP8	Install 500 ohm load to Analog input 1
JP12	Install 500 ohm load to Analog input 2
JP16	Install 500 ohm load to Analog input 3
JP20	Install 500 ohm load to Analog input 4
JP10	Install 500 ohm load to Analog input 5
JP14	Install 500 ohm load to Analog input 6
JP18	Install 500 ohm load to Analog input 7
JP22	Install 500 ohm load to Analog input 8

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ANALOG OUTPUTS

Analog outputs are connected to the 12 position connector P4. The outputs are organized as 4 pairs consisting of the analog signal and analog return. All analog returns are common. The analog outputs may be isolated from the processor ground if separate 24 Vdc power is supplied.

Terminal	Description
P4-1	Auxiliary Power -
P4-2	Auxiliary Power +
P4-3	Analog return (common)
P4-4	Analog Output 4
P4-5	Analog return (common)
P4-6	Analog Output 3
P4-7	Analog return (common)
P4-8	Analog Output 2
P4-9	Analog return (common)
P4-10	Analog Output 1

The analog output circuitry may be powered from the processor power or from the auxiliary power connections on connector P4.

Jumper	Description
JP25 - P4	Analog output return powered from P4-1
JP24 - P4	Analog output power from P4-2
JP25 - GND	Analog output return power processor Gnd
JP24 - Vin	Analog output powered from Processor power

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DeviceNet INTERFACE

The DeviceNet interface is connected to connector ST2. The DeviceNet interface may be optically isolated.

Terminal	Description
ST2-1	BUS -
ST2-2	CAN L
ST2-3	Shield
ST2-4	CAN H
ST2-5	BUS +

The interface may be powered from either the local power supply or from the DeviceNet Bus power.

Jumper	Description
JP4 install	Connect local processor Gnd to BUS -
JP5 - GND	Power CAN transceiver from processor (non-isolated)
JP2 - Vcc	Power CAN transceiver from processor (non-isolated)
JP5 - V-	Power CAN transceiver from BUS -
JP2 - V+	Power CAN transceiver from BUS +

LED INDICATORS

The DN502 has two bi-color LED indicators, referred to as the HEALTH (D7) and the COMM (D6) indicator. Refer to the DeviceNet specifications for a complete description of these LED's. During the power up sequence each LED will cycle from RED to GREEN as part of the self diagnostics firmware.

Four light bar indicators are provided to show the state of the digital inputs and the digital outputs.

Indicator	Description
U41	Input 1-8
U43	Input 9-16

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U27	Output 1-8
U34	Output 9-16

CONFIGURATION SWITCH

The DN502 has a 8 position DIP switch used to configure the DeviceNet MACID and communications speed. Switch positions 1-6 configure the MACID to values 0-3F hex. Switch positions 7 and 8 configure the operating speed. If both are on the swtich is disabled and internal non-volatile storage to retains MACID and baud rate information.

Switch S8 S7	Description
Off Off	125 kbit/second
Off On	250 kbit/second
On Off	500 kbit/second
On On	Software Settable baudrate and MacID

SERIAL INTERFACE

The DN502 provides a serial RS232 interface used to load DeviceNet firmware during production using a 10 pin header to DB-9 ribbon cable assembly. The serial channel is configured for 9600 baud, 8 bit, no parity, 1 stop bit.

Connector	Description
P1-3	Rx Data (from HOST to DN502)
P1-4	RTS (not used)
P1-5	Tx Data (from DN502 to HOST)
P1-6	CTS (not used)
P1-9	Ground return

ORDERING INFORMATION

The DN502 may be ordered with optional power, digital input and digital output configurations. Two standard configurations are offered. Please contact D.I.P. Inc. for custom configurations.
:

DN502   - 120 Vac power, 120 Vac Digital inputs, Relay outputs

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DN502-24   - 24 Vac/dc power, 24 Vac/dc Digital inputs, Relay outputs
13050201   - Installation Manual