Functional Description

DeviceNet™

DN-1600-1

Rev. A.0

| Revision	Date	Change
0.1	8/25/97	Original
0.1	4/14/98	Change Cat. to DN-M1600 & D-1600-IO1
A.0	12/8/2000	Add p/n, update phone #, Cat. to DN-1600-1, rev to A.0

1.   INTRODUCTION

The DN-1600-1 I/O module will multiplex up to 16 input and 16 output devices. The input devices can be proximity sensors, photo-electric sensors, limit switches, or pushbuttons. Output devices can be pilot lights, LED stack lights, or solenoids

Power for the outputs is provided by an auxiliary 24v power supply. DeviceNet power is used for powering the inputs and network interface.

The outputs on the DN-1600-1 are sourcing (PNP). The inputs will operate with with either sourcing(PNP) or sinking(NPN) devices.

The DN-1600 series modules consist of two sub-modules or boards. One board provides the DeviceNet interface and the other provides the I/O. A block diagram of the board configuration is shown below. The diagram shows one board at the top which will contain the network interface. The lower board will contain the I/O circuitry for 16 inputs and 16 outputs. The modular structure allows future implementations will may include different I/O combinations.
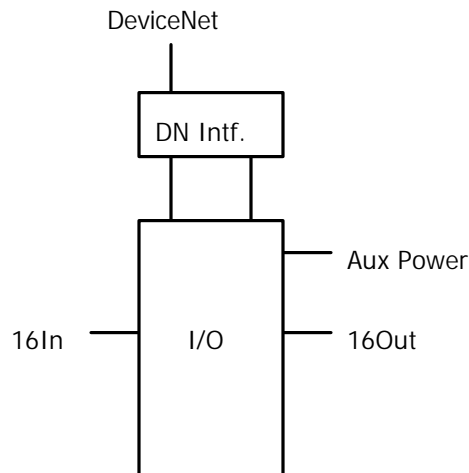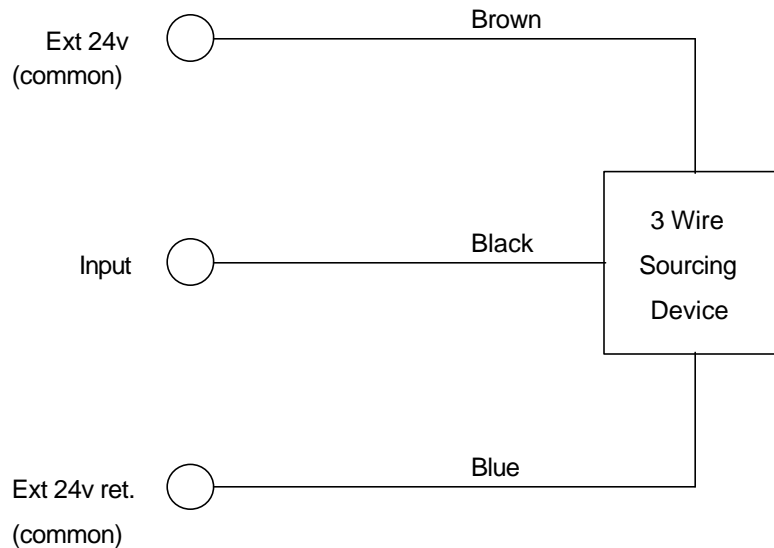

2.   INSTALLATION

2.1. Mounting

The DN-1600-1 can be attached using standard DIN rail or can be purchased without the mounting tray and mounted to a panel via standoffs.

DeviceNet is a trademark of ODVA.

2.2. Wiring

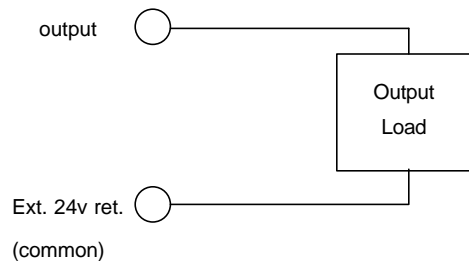#18 wire or smaller should be used to connect the input and output device

Wiring for 3-wire sourcing (PNP) input devices:

Ext 24v (common) — Brown — | 3 Wire Sourcing Device |

Input — Black — | 3 Wire Sourcing Device |

Ext 24v ret. (common) — Blue — | 3 Wire Sourcing Device |

Wiring for inputs such as simple contact closure, limit switches, and push buttons:

Ext 24v (common)

Limit Switch Push Button or other contacts

input
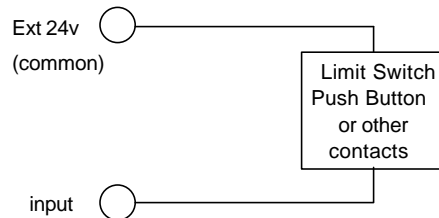
Wiring for outputs such as pilot lights, LED stacks, or solenoids:

output
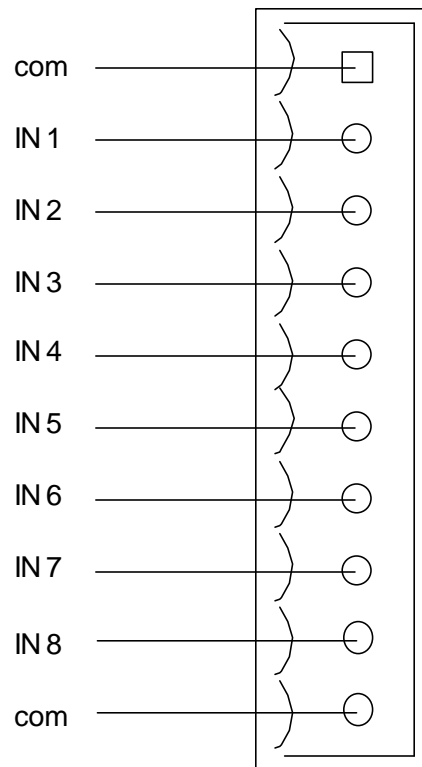
Output Load

Ext. 24v ret. (common)

The DN-1600-1 may be attached to the DeviceNet network in any manner consistent with the DeviceNet Specification.   The open style connector provided allows a simple removable connection to the network.

2.3. Connector Pin Out

J2-DeviceNet Connector is a standard DeviceNet Open Style Connector which will mate with a Phoenix Combicon or equivalent.
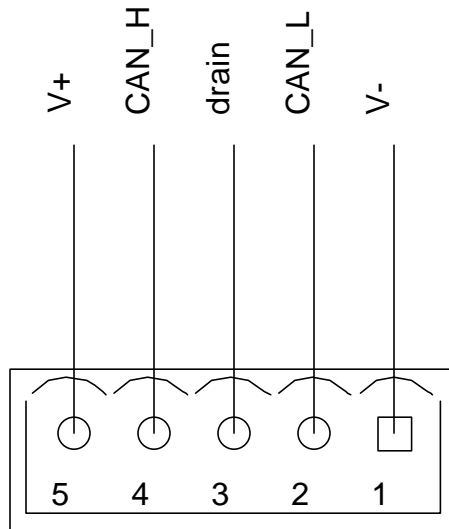
```
   V+   CAN_H  drain  CAN_L   V-

    |     |     |      |      |
  ┌─────────────────────────────┐
  │  ◡     ◡     ◡      ◡    ◡   │
  │  ○     ○     ○      ○    □   │
  │                             │
  │  5     4     3      2    1   │
  └─────────────────────────────┘
```

J4 Input Connector will mate with a Phoenix Mini-Combicon or equivalent.

```
  com  ─────────────  □
  IN 1 ─────────────  ○
  IN 2 ─────────────  ○
  IN 3 ─────────────  ○
  IN 4 ─────────────  ○
  IN 5 ─────────────  ○
  IN 6 ─────────────  ○
  IN 7 ─────────────  ○
  IN 8 ─────────────  ○
  com  ─────────────  ○
```

J5 Input Connector will mate with a Phoenix Mini-Combicon or equivalent.

com

IN 9

IN 10

IN 11

IN 12

IN 13

IN 14

IN 15

IN 16

com

J2 Output Connector will mate with a Phoenix Mini-Combicon or equivalent.

com

OUT 1

OUT 2

OUT 3

OUT4

OUT 5

OUT 6

OUT 7

OUT 8

com

J3 Output Connector will mate with a Phoenix Mini-Combicon or equivalent.

com
OUT 9
OUT 10
OUT 11
OUT12
OUT 13
OUT 14
OUT 15
OUT 16
com
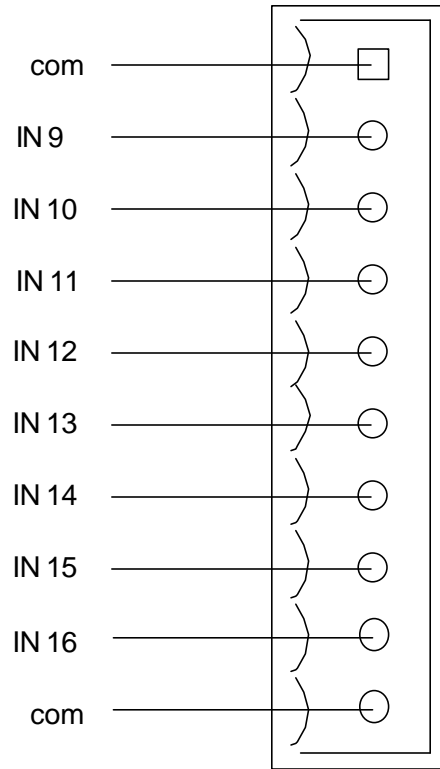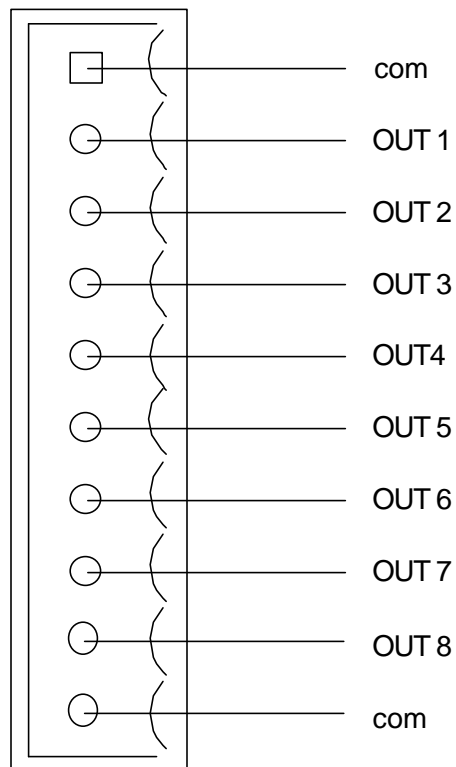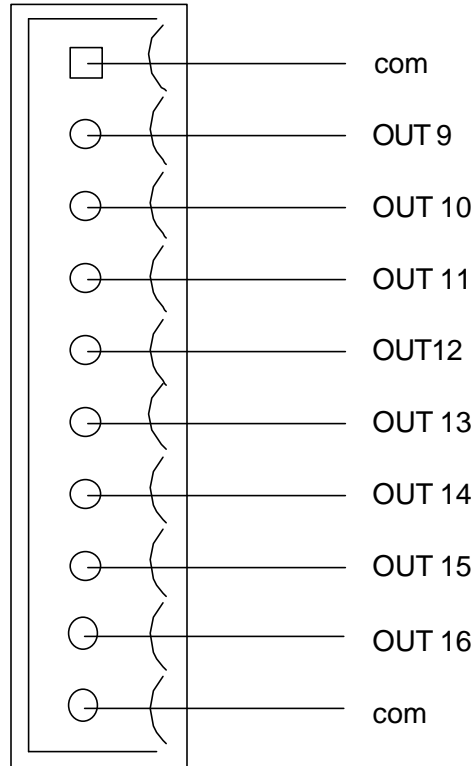
3.   CONFIGURATION

To configure the Node Address (MAC_ID) and the Baud Rate (BR) the on-board switch can be used, or a separate DeviceNet configuration tool can be used to program these values over the network. The switch is labeled on the module indicating which switches are used for Baud Rate, and which are used for Node Address. The binary value of the switches defines these values. For programming over the network, the Baud Rate switches must be set to a binary "11". The factory default values are 63 for the node address and 125 Kbaud for the Baud Rate. Any modification of these values should be done before the module is connected to the DeviceNet network. After the node address has been changed the module will re-start. This can be observed on the Module/Network Status LEDs. The use of a newly set Baud Rate will not happen until the unit is reset by switching the power on then off, or by a reset service over the network.

4. SPECIFICATIONS

Overall Dimensions	
Width	4.9 in. (12.5 cm)
Length	8.1 in. (20.5 cm)
Depth (w/o mating connectors)	2.0 in. (5.0 cm)
Weight	8 oz
Environmental	
Operating temperature range	0 to 60 C
Storage temperature range	-20 to 85 C
Humidity	5 to 95% RH non-condensing
DeviceNet	
Data rates & configuration	125, 250, 500 Set via switch or over the network. Non-volatile storage factory default =125
Node address & configuration	0 to 63 Set via switch or over the network. Non-volatile storage factory default =63
Connector	5 pin open style
Indicators	Module Status LED Network Status LED
Bus power consumption (not including sensor current)	ma avg. (receive) ma max. (xmit)
Protocol capabilities*	Group 2 only slave with Explicit, Polled, COS/Cyclic connections
Device type	0 (Generic)
Inputs	
On/Off threshold voltage	Vin = 12 v
Input impedace	10 K Ohms
Outputs	
Output current limit	1 A
Combined current for each output connector	4 A

* For a more complete description for the DN-1600-1protocol capabilities
see the DN-1600-1 Device Profile, Publication # 2200090.
See below for I/O message content.

I/O Message Content:

There are 2 bytes contained in the Poll Request Message. The I/O Response also contains two bytes. The outputs are mapped into the Poll Request bytes and the inputs are mapped into the I/O Response bytes as shown below. A zero(one) indicates that the input or output is off(on).

Poll Request format (outputs)

Byte	7	6	5	4	3	2	1	0
0	out8	out7	out6	out5	out4	out3	out2	out1
1	out16	out15	out14	out13	out12	out11	out10	out9

I/OResponse format (inputs)

Byte	7	6	5	4	3	2	1	0
0	in8	in7	in6	in5	in4	in3	in2	in1
1	in16	in15	in14	in13	in12	in11	in10	in9

I/O Response format (inputs) for units with optional diagnostics

Byte	7	6	5	4	3	2	1	0
0	in8	in7	in6	in5	in4	in3	in2	in1
1	in16	in15	in14	in13	in12	in11	in10	in9
2	input faults						
3	output faults						
4	output faults						