

Functional Description

DeviceNet™

DN-A102
DN-A102-12
Rev. 1.00

*HURON
NET
WORKS*

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1. INTRODUCTION

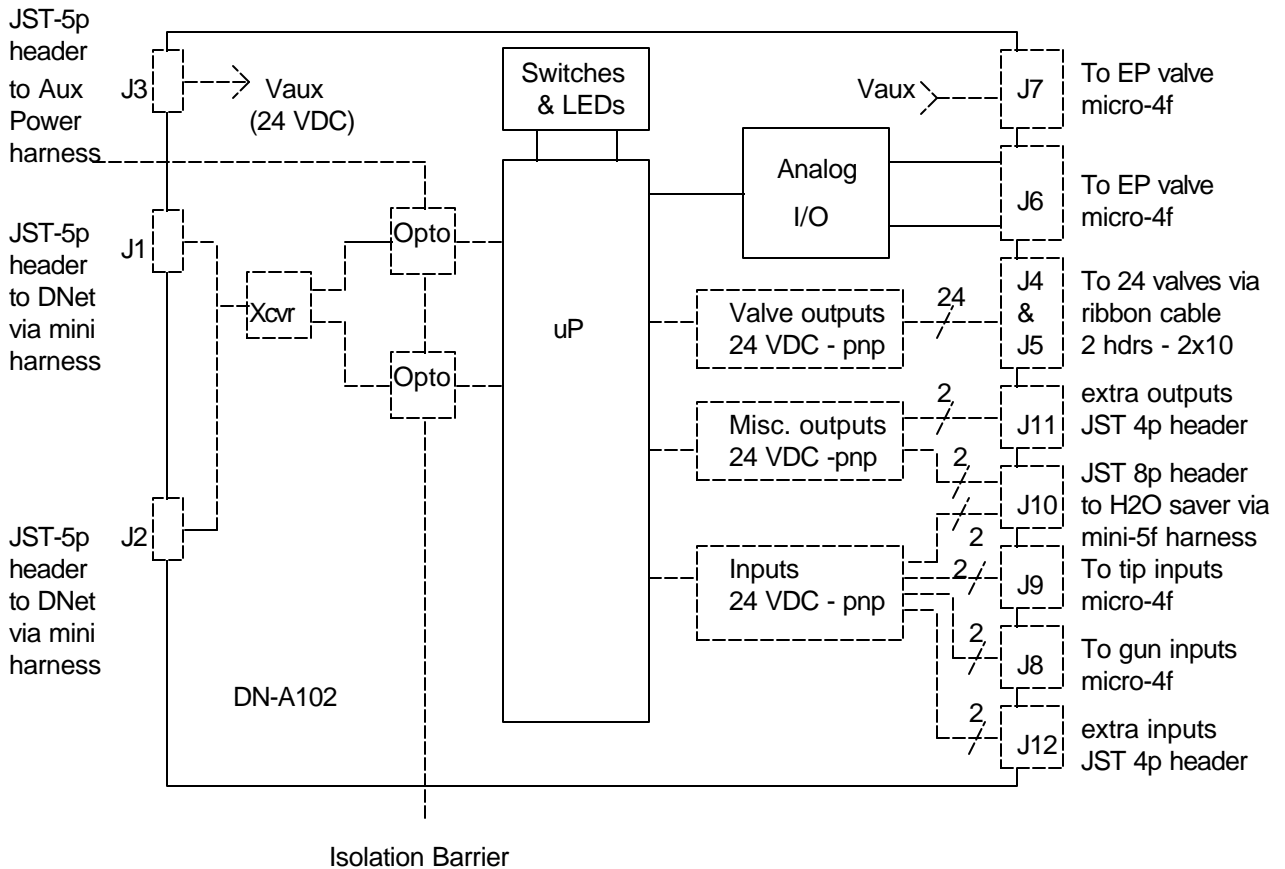
The DN-A102 (-12) is a DeviceNet interface module for a pneumatic valve manifold with support for a proportional valve. It is designed specifically for use with Rexroth valve manifold models 299 560 018 9 and 299 560 019 0 and Rexroth proportional valve model 561 021 451 0.

I/O support on the DN-A102 includes:

DN-A102	DN-A102-12
24 outputs - 24 VDC PNP (sourcing) for use with 2 watt coils	12 outputs – 24 VDC PNP (sourcing) for use with 2 watt coils.
4 outputs - 24 VDC PNP (sourcing) for use with 6 watt coils	
1 output - analog, 8 bits, 4 -20 mA for EP valve control	
1 input - analog, 8 bits, 4 - 20 mA for EP valve feedback	
8 inputs - 24 VDC PNP (sourcing) for position sensing	

The DeviceNet bus power (11 - 25 VDC) is used for the bus transceiver only. All other circuitry will be powered from a separate external 24VDC supply (Aux).

A block diagram of the module is shown below.



DeviceNet is a trademark of ODVA.

2. INSTALLATION

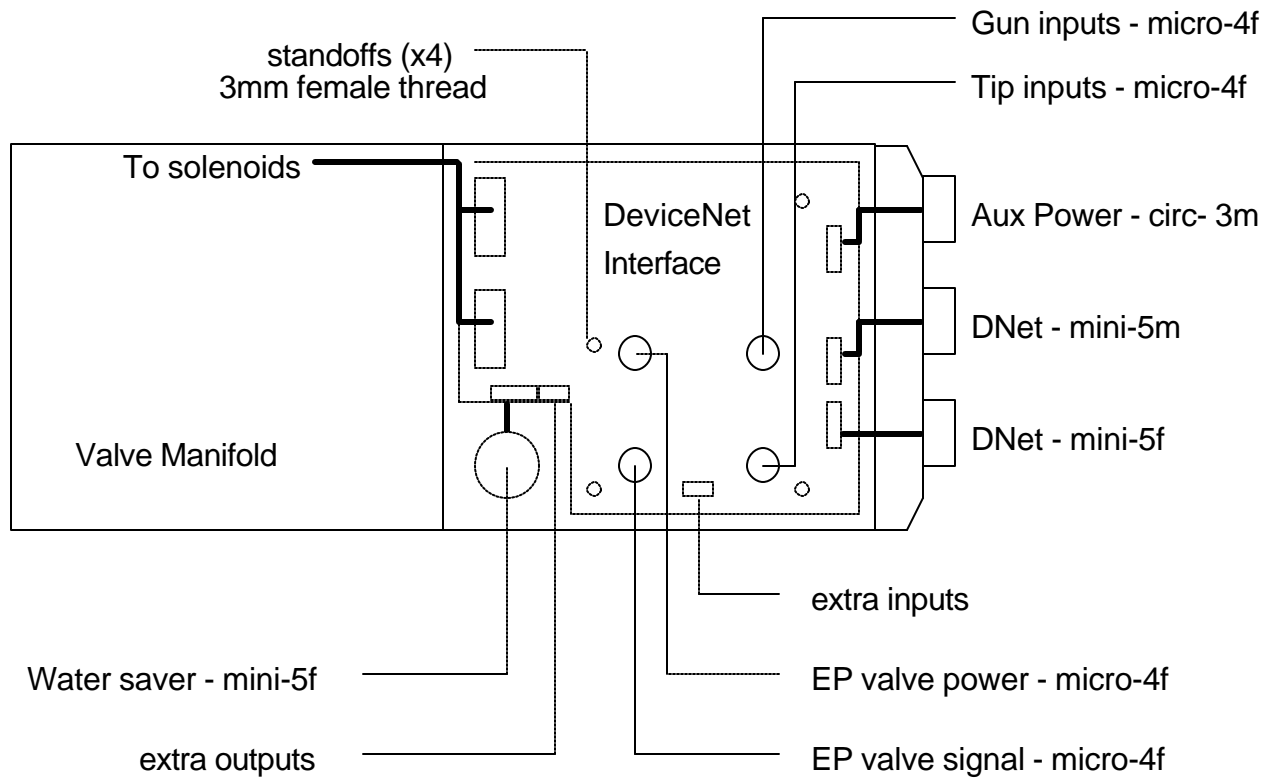
2.1. Mounting

Refer to DN-A102 mechanical drawings

2.2. Connector Wiring

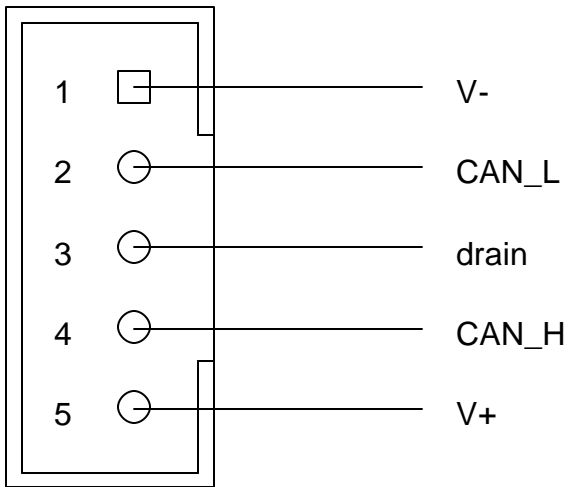
Each of the DeviceNet mini connectors will attach to the DN-A102 via pigtails terminated in a JST connector to mate with a 5-pin JST header S5B-PH-K. The water saver mini connector will attach to the DN-A102 via pigtails terminated in a JST connector to mate with a 8-pin JST header S8B-PH-K. The Aux Power connector will attach via pigtails terminated in a JST connector to mate with a 4-pin JST header B4PS-VH. Female M12 (single key micro style) connectors will be used for the connectors to EP signal, EP power, and sensor inputs. One or two 20 pin ribbon cable headers (2x10) will allow connection to the valve ribbon cable. Two 4-pin JST headers S4B-PH-K will provide access to two of the three extra outputs and two of the extra inputs.

External view:

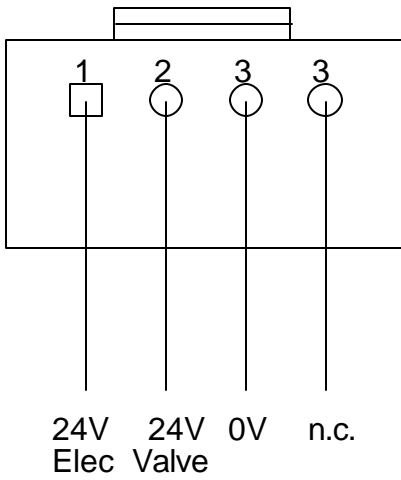


2.3. Pinouts

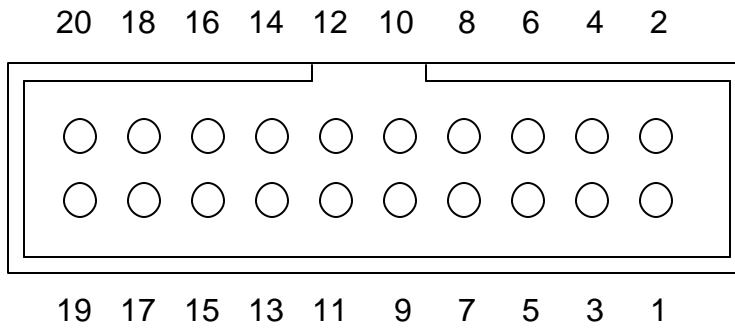
J1,2 - 5 pin JST headers for the DeviceNet connectors:



J3 - 5 pin JST header for Aux Power connector:



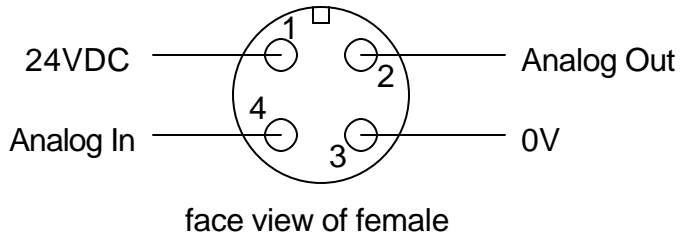
J4 and J5* - 20 pin (2x10) ribbon cable connectors:



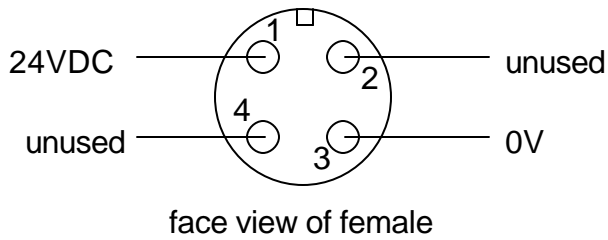
Pin	J4 Signal	J5 Signal*
1	none	none
2	none	none
3	0 V	0 V
4	out1	out13
5	out2	out14
6	0 V	0 V
7	out3	out15
8	out4	out16
9	0 V	0 V
10	out5	out17
11	out6	out18
12	0 V	0 V
13	out7	out19
14	out8	out20
15	0 V	0 V
16	out9	out21
17	out10	out22
18	0 V	0 V
19	out11	out23
20	out12	out24

* J5 not present on the 12 output DN-A102-12

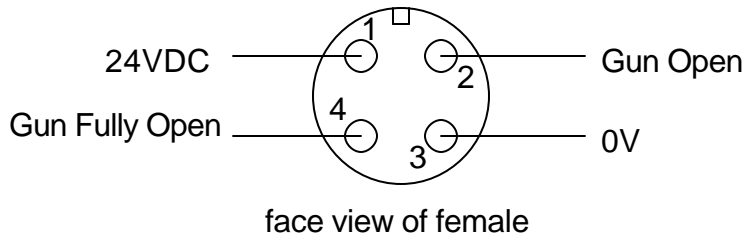
J6 - 4 pin micro EP valve signal connector:



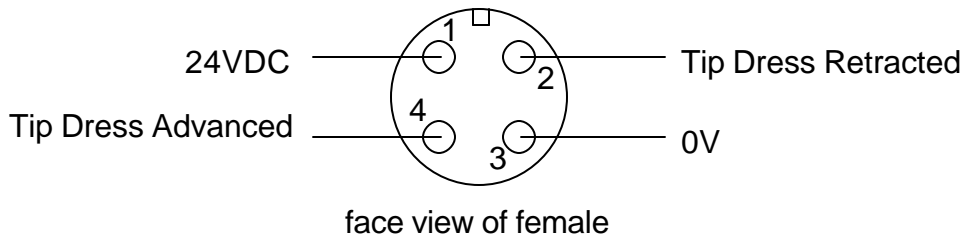
J7 - 4 pin micro EP valve power connector



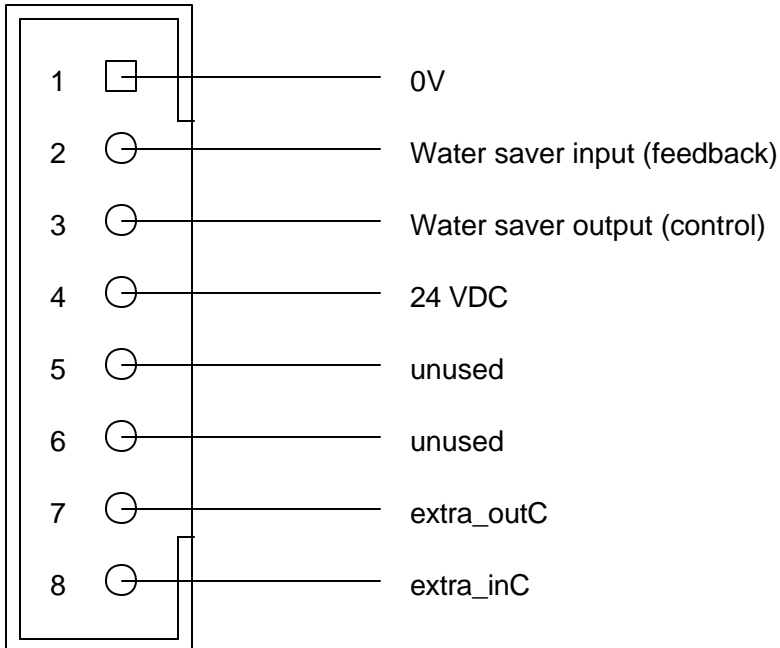
J8 - 4 pin micro - Gun Input sensor connectors:



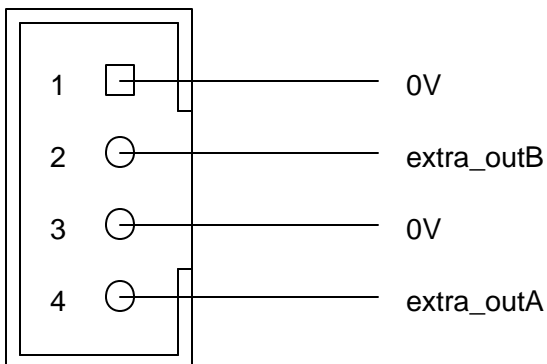
J9 - 4 pin micro - Tip sensor connectors:



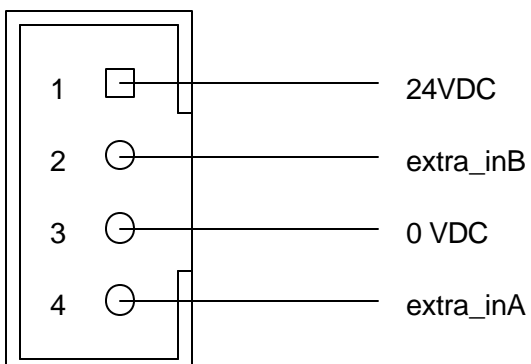
J10 - 8 pin JST header for water saver connector:



J11 - 4 pin JST header for the extra outputs connector:



J12 - 4 pin JST header for the extra inputs connector:



3. CONFIGURATION

To configure the node address, or MAC ID, and the data rate, or baud rate, of the Device Net connection, the on-board DIP switch can be used, or a separate DeviceNet configuration tool can be used to program these values over the network. The DIP switch is labeled on the module indicating which switches are used for baud rate, and which are used for MAC ID. 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 data 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 data rate will not happen until the unit is reset by switching the power on then off, or by a reset service over the network. Several tools are available which can provide the programming function and can be found via the Open DeviceNet Vendors Association (ODVA).

4. SPECIFICATIONS

Overall Dimensions	
Width	105 mm.
Length	127 mm.
Weight	3 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 DIP switch or over the network. Non-volatile storage factory default =125
Node address & configuration	0 to 63 Set via DIP switch or over the network. Non-volatile storage factory default =63
Connectors	see description
Indicators	Module and Network Status LED
Bus power consumption	30 ma avg. (receive) 80 ma max. (xmit)
Protocol capabilities*	Group 2 only slave with Polled I/O, and Explicit Messaging
Device type	0 (Generic)
Analog I/O	
Type	4-20 mA current loop
Loop power source	Aux Power
Input Load impedace	250 Ohms
Resolution	8 bits proportional to current Full scale = 20 mA
Digital I/O	
Voltage	24 VDC PNP (sourcing)
Output Current (valves)	0.1 A nominal, limited at 1 A
Output Current (misc.)	0.25 A nominal, limited at 1 A
Input Load	10 K Ohms

* For a more complete description for the DN-A102 protocol capabilities see the DN-A102 Device Profile, Publication # 2200071.
See below for I/O message content.

I/O Message Content:

There are 5 bytes contained in the Poll Request Message. The I/O Response contains two bytes. The outputs are mapped into the Poll Request and the inputs are mapped into the Poll Response bytes as shown below. A zero(one) in the Poll Request bit 0 indicates that the output is to be turned off(on). The analog values are represented by 8 bit unsigned short integers in the Poll Request and Response messages

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
2	out24	out23	out22	out21	out20	out19	out18	out17
3	Ignored (don't care)				out28	out27	out26	out25
4	analog output value							

Outputs 1..24 control the valves.

Output 25 is the water saver output.

Outputs 26..28 are the extra outputs A, B, and C respectively.

The ignored bits are not used on the interface and will be ignored.

Zero = valve off, one = valve on for all Outputs.

I/O Response format (inputs)

Byte	7	6	5	4	3	2	1	0
0	in8	in7	in6	in5	in4	in3	in2	in1
1	analog input value							

in1: Gun Fully Open

in2: Gun Open

in3: Water Saver Tripped

in4: Tip Dress Advanced

in5: Tip Dress Retracted

in6: Pressure achieved - this value will be true when the input value is greater than a percentage of the output value. The percentage will be configurable with a default of 95 percent.

in7 and in8 : Extra inputs A and B respectively.

in9 is implemented in hardware as extra input C, but not returned in poll response.

* The values in the grayed cells are ignored on the DN-A102-12