



## Product Information for the DN50

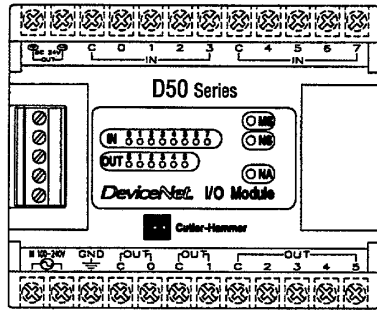


Figure 1 - DN50 Series

### DESCRIPTION

The DN50 I/O is a compact, flexible DeviceNet I/O system operating at 125K, 250K, or 500K baud.

Each DN50 I/O Module is addressed as a single node, and can be expanded from the standard 8 inputs and 6 outputs to as many as 32 inputs and 24 outputs, plus either 4 analog input points or 2 analog output points.

The I/O system is composed of four basic elements, the DeviceNet interface board, the various I/O cards, the 100 – 240V AC to 24V DC power supply, and the expansion modules. These may be mixed many different ways to economically accomplish most any I/O application. The DN50 modules can be mounted directly on a flat panel, or by using the built in DIN rail connection.

The DN50 I/O is supplied in two basic architectures independent of the inputs and outputs required. Figure 2 illustrates the DN50's architecture with built in AC to 24V DC power supplies. Figure 2 also shows the architecture when the units are supplied from a separate DC power supply (the 100-240VAC power source is replaced by the 24VDC source).

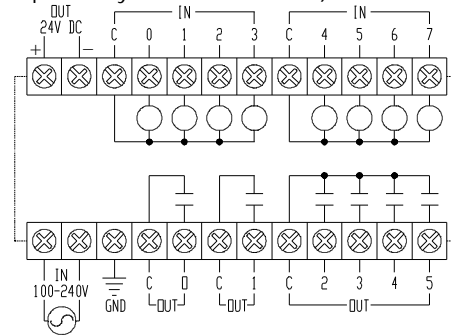


Figure 2 - DN50 with Internal Power Supply

Figure 3 represents the architecture of the expansion modules.

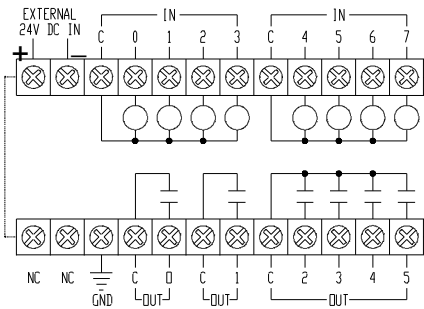
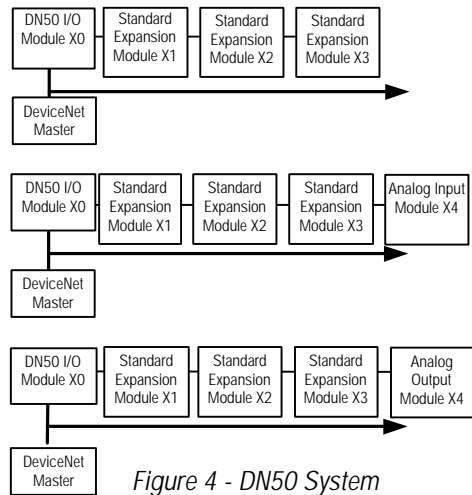


Figure 3 - DN50 Expansion Module

Figure 4 illustrates the basic system configurations which are supported.



**Note** Each DN50 unit can support only 1 Analog Input Module or 1 Analog Output Module.

### AUTO-CONFIGURE SERVICE

As shipped, the DN50 is configured for no expanders of any kind attached. To use expansion modules, use explicit messaging over DeviceNet to perform an Auto-configure. Auto-configure is a service which, when triggered by a DeviceNet message, causes the DN50 to read its present configuration – the number and type of attached expanders. From then on, if the number or type of modules does not match this configuration, the DN50 will fault.

The fault will be indicated by a flashing red Module Status (MS) LED. You can correct the fault by:

1. Checking all expander connections for: correct order, type and number, or damage.
2. Using the Auto-configure service to reconfigure the DN50

For example:

1. If you are Auto-configured for three digital expanders but a cable to one of the expanders is disconnected...
2. You must reconnect the cable, or Auto-configure the DN50 to remove the disconnected expander from the configuration.



## NOTE

CYCLING THE POWER **WILL NOT** CLEAR THE FAULT IN THE DN50. POWER CYCLING WAS ALLOWED TO CLEAR A FAULT IN REVISION A PRODUCTS, BUT AUTO-CONFIGURE IS REQUIRED IN REVISION B.

For example:

After removing a discrete expander, you must use explicit messaging to Auto-configure the DN50 or a fault will occur.

## DN50 MODULES

| Node Interface Modules |   |
|------------------------|---|
| DN50SR14               | 8 VDC IN, 6 RELAY OUT   |
| DN50SRA14              | 8 VAC IN, 6 RELAY OUT   |
| DN50SAA14              | 8 VAC IN, 6 SSR OUT   |
| DN50DSR14              | 8 VDC IN, 6 RELAY OUT<br>(24V Powered)  |
| DN50DSD14              | 8 VDC IN, 6 TRANS OUT<br>(24V Powered)  |
| Expansion Modules      |   |
| D50ER14                | 8 VDC IN, 6 RELAY OUT   |
| D50ERA14               | 8 VAC IN, 6 RELAY OUT   |
| D50ED14                | 8 VDC IN, 6 VDC OUT   |
| D50EAA14               | 8 VAC IN, 6 VAC OUT   |
| Analog I/O Modules     |   |
| D50AIM410V             | -10 to 10, 0 to 10 VDC IN<br>-5 to 5, 0 to 5 VDC IN<br>4-20 mA IN,<br>4 CHANNEL               |
| D50AOM210V             | -10 to 10, 0 to 10 VDC OUT<br>-5 to 5, 0 to 5 VDC OUT,<br>2 CHANNEL<br>4-20 mA OUT, 2 CHANNEL |

Figure 5 - DN50 System Offerings

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**INSTALLATION****WARNING**

DO NOT INSTALL OR PERFORM MAINTENANCE ON THIS DEVICE WHILE EQUIPMENT IS ENERGIZED. DEATH OR SEVERE PERSONAL INJURY CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING WITH INSTALLATION OR MAINTENANCE.

Only qualified persons, as defined in the National Electric Code, who are familiar with the installation, maintenance and operation of this device and the equipment onto which it is to be installed, as well as applicable local, state and national regulations and industry standards and accepted practices regarding safety of personnel and the equipment safety

should be permitted to install, maintain or operate this device. These instructions are provided only as a general guide to such qualified persons and are not all-inclusive. They do not cover every application or circumstances which may arise in the installation, maintenance or operation of this equipment. Users are advised to comply with all local, state and national regulations and industry standards and accepted practices regarding safety of personnel and the equipment safety.

**CAUTION**

BEFORE INSTALLING THE DN50 SYSTEM, PLEASE REVIEW THE FOLLOWING APPLICATION LIMITATIONS. DO NOT INSTALL THE DN50 SYSTEM IF ONE OR MORE OF THESE CONDITIONS EXIST.

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**Application Limitations**

1. Do not install in direct sunlight.
2. Do not install in locations where the temperature at the unit will fall outside the range of 0 –55°C. If the unit is to be installed where the ambient temperature may exceed 55°C, cooling equipment such as a fan should be used to lower the temperature below the 55°C limit. If the unit is to be installed where temperatures below 0°C are expected, heating equipment should be provided to raise the temperature above 0°C.
3. Do not install where the relative humidity will exceed 90%, or where condensation will form due to rapid temperature changes. A heater should be provided to prevent the formation of condensation.
4. Do not install where corrosive or flammable gases are present.
5. Do not install where dust, salt, or iron particle densities are high.
6. Do not install where the unit may be subject to direct impact or vibration.

The DN50 system can be installed in locations with at least 50 mm (1.96") of clearance on all sides around the DN50 to guarantee adequate ventilation. Avoid mounting the DN50 Modules directly over other devices which emit excessive heat.

A clearance of 200 mm (7.87") should be maintained between the DN50 Modules and high voltage and high current conductors. Figure 7 shows the mounting pattern for panel mounting.

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Open the expansion doors and connect the expansion modules. Close the doors after cable installation. Wire from the DC source to the DC input to power outputs.



## CAUTION

DO NOT PLUG IN EXPANSION MODULES UNDER POWER. DN50 RESET MAY RESULT.

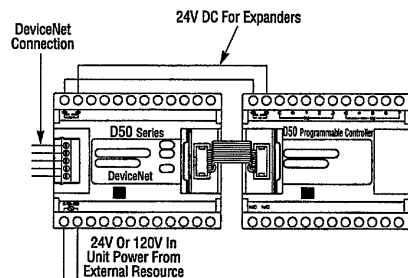


Figure 9 – DN50 Wiring Diagram



## CAUTION

DO NOT USE THE DEVICENET + 24V CONNECTION TO POWER THE DN50 MODULE, EXPANSION MODULES, OR ANY I/O CONNECTED TO THEM.

The DN50 contains isolation to prevent local faults from damaging other nodes on the network. To protect this isolation, wire the DN50 module as shown in Figure 9.

## WIRING CONSIDERATIONS

The five point gray terminal block should be wired with wire that is approved for DeviceNet applications. The colors of wires may be matched to the silkscreened colors on the terminal block. Figure 10 lists some of the DeviceNet cable specifications for the thick and thin cable types.



| Cable Type | Electrical Characteristic                      | Specification at 1 MHz |
|------------|--|------------------------|
| Both       | Impedance                                      | 120 ohm                |
| Both       | Propagation Delay                              | 1.36 nSec/ft max.      |
| Both       | Capacitance between Conductors                 | 12 pf/ft               |
| Both       | Capacitance between a Conductor and the Shield | 24 pf/ft               |
| Thick      | Capacitive Unbalance                           | 370 pf/1000 ft         |
| Thin       | Capacitive Unbalance                           | 620 pf/1000 ft         |
| Thick      | Attenuation at 125 kHz                         | 0.13 db/100 ft         |
| Thin       | Attenuation at 125 kHz                         | 0.29 db/100 ft         |

Figure 10 – Wire Specification Guide

Also, the configuration of the wiring system must comply with the rules for trunk and drop cable configuration and length. These are the basic wiring rules:

Terminating resistors are required on each end of the trunk line.

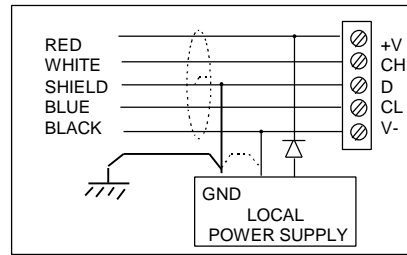
- The trunk must be configured as a linear bus.
- Drop lines may be as long as 6m (20 ft), and may contain branches.
- Maximum cable distance is described in Figure 11.

| Baud Rate | Cable Type | Max. Cable Distance |
|-----------|------------|---------------------|
| 125K      | Thin       | 100m (328 ft)       |
|           | Thick      | 500m (1640 ft)      |
| 250K      | Thin       | 100 m (328ft)       |
|           | Thick      | 250 m (820ft)       |
| 500K      | Thin       | 100 m (328ft)       |
|           | Thick      | 100 m (328ft)       |

*Figure 11 – Maximum Cable Length*

There are two basic power configurations which may be used when wiring the DeviceNet connector.

The first and most common configuration is to supply the DC power along with the DeviceNet signals (Fig. 12).



*Figure 12 – Typical DeviceNet Wiring*

In applications where there are large installation distances or current draws, it may be desirable to supply the DC power from a locally referenced source.



## CAUTION

Do not ground the system in more than one place.

Figure 13 shows how to wire a separate power supply at the DN50 node.

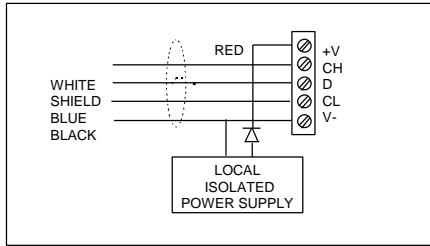


Figure 13 –Optional DeviceNet Wiring with Separate Power Source

Strip back the DeviceNet cable insulation about 1" from the end. Strip each of the wires about 1/4". Tighten the terminals of the DeviceNet connector to 5 – 7 in-lbs. To daisy chain the drop cable, terminate both wires under one screw. When wiring the DN50 module, use at least a 2 square mm (#16 AWG) wire to ground the unit.

Do not run the I/O wiring in the same duct as, or bundled together with the power cables. This restriction is particularly true for the wiring to the expansion modules. I/O wiring length must not exceed 30m (98.4 ft). These wire lengths may be extended to 100m (328 ft) by separating the input wiring from the output wiring.



## NOTE

WHEN WIRING ANALOG EXPANDER MODULES, REFER TO SPECIFICATIONS LISTED IN THE ANALOG MODULE HARDWARE MANUAL SUPPLIED WITH THE UNIT.

Do not rely exclusively on DN50 response in safety related circuits. Provide an externally wired Emergency Stop which places all outputs in a safe state independent of DeviceNet.

A typical Emergency Stop signal is illustrated in Figure 14.

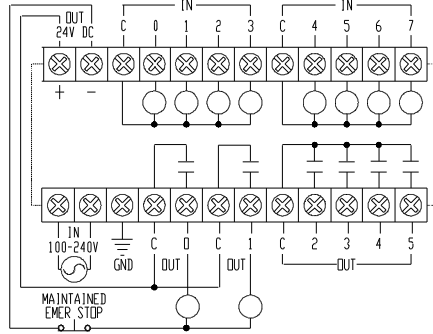


Figure 14 – Typical Emergency Stop Wiring

### CONFIGURATION

There must be a minimum of two nodes with power for the Duplicate MAC ID check to complete successfully.

All units power up with the MAC ID 63 programmed from the factory.

Since the DeviceNet protocol checks for duplicate MAC IDs, the MAC ID of the unit will generally have to be changed. This may be accomplished by using the Cutler-Hammer Configuration tool "NetView." For more information on configuring the unit, setting the MAC ID, and DeviceNet objects and features, see Appendix A.

**POWER-UP**

Apply power to both the DN50 and the DeviceNet network. The DN50 may be powered by plugging the DeviceNet connector into the unit while the network is powered, or by powering the whole network up. The front panel LEDs will play the pattern in Figure 15A and 15B.

|           |  |
|-----------|--|
| <b>MS</b> | — Green for ~.25 Seconds   |
| <b>MS</b> | — Red for ~.25 seconds   |
| <b>MS</b> | — Green  |
| <b>NS</b> | — Green for ~.25 seconds   |
| <b>NS</b> | — Red for ~.25 seconds   |
| <b>NS</b> | — OFF until the Dup_MAC_ID test and a full ROM CRC check is completed. (approx. 7 seconds) |

*Figure 15A —Power-Up LED Pattern*

**NA** — Green for ~.25 seconds

**NA** — Red for ~.25 seconds

**NA** — OFF

The address sequence begins to flash about 14 seconds after power-up.

*Figure 15B —Power-Up LED Pattern*

**LED DEFINITION AND DIAGNOSTICS**

Module Status (**MS**) provides information about the module such as the status of the power or memory systems.

| State               | LED                  | Meaning  |
|---------------------|----------------------|--|
| No Power            | OFF                  | No power to device                                       |
| Operational         | Green                | Device operating normally                                |
| Minor Fault         | Flashing Red         | A recoverable fault has been detected                    |
| Unrecoverable Fault | Red                  | Non-recoverable fault detected, the device may be faulty |
| Self test           | Flashing Green — Red | The device is performing a self test                     |

*Figure 16 –Module Status*

Whenever the number or order of modules on the system changes, you must use the Auto-configure service to re-configure the system.

If a module is removed or added while the unit is powered, it will indicate a minor fault. See *Auto-configure Service* (page 3).

Network Status (**NS**) provides the status of the network connection.

| State                  | LED            | Meaning  |
|------------------------|----------------|--|
| Not Powered Or On-Line | OFF            | MS OFF, No Power MS ON , No device detected on network.    |
| On-Line Or Connected   | Flashing Green | No Connection established                                  |
| Connected OK           | Green          | A Connection has been established                          |
| Connected              | Flashing Red   | I/O timed out  |
| Critical Link Failure  | Red            | Device cannot communicate on the network. DupMac or BusOff |

*Figure 17 –Network Status*

The Node Address (**NA**) LED blinks the MAC ID of the unit while it is powered about every 10 seconds.

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The unit displays the tens digit with red blinks, and the ones digits with green blinks. The unit plays the tens units, then the ones, and finally delays about 2 seconds before repeating the sequence.

An address of zero is not recommended. It causes an "off" state for the NA LED. The Node Address LED will begin to flash the device address after the power-up initialization is complete (about 10 seconds).

#### LOCAL I/O STATUS

Each I/O point has an LED which enunciates its state with respect to the DN50 logic.

The LED state may not agree with the actual output if the +24V power to the I/O modules is not being supplied.

#### TROUBLESHOOTING HINTS

If the DN50 fails to perform as expected then check the following:

1. No LEDs light on the module? Check the AC power input if the unit has an internal power supply, or the +24V if the unit is separately supplied.
2. Does the device NS LED fail to blink green after the power-up check? Make sure there is a minimum of two devices with power on the network.
3. Is the NS LED red after the power-up initialization completed? Check for a duplicate node address on the network, or no power on the DeviceNet network.
4. Does the device fail to make a connection?
5. Check for correct MAC ID in the connection message.

6. Add or remove a module? The MS LED will flash red, indicating a fault. To correct this, you must re-configure using the Auto-configure Service described on page 3.

## SPECIFICATIONS

### DeviceNet Connector Ratings

|    |   |
|----|---|
| V+ | Min. voltage 11V, max. voltage +27V<br>Inrush ~ 0.3A, operating 25 mA |
| V- | Common  |
| CH | Reverse wiring protected to $\pm 27V$                                 |
| CL | Reverse wiring protected to $\pm 27V$                                 |
| D  | Shield tie point  |

Note: Tighten Terminals to 5 in-lbs

## POWER SUPPLY AND SYSTEM RATINGS

### Supply Ratings

85 to 264V AC (AC units), 47 to 63 Hz  
20 to 28V DC (DC units)

### Supply Ratings (Cont.)

max. current = 0.6A  
Retention on power loss 20 mS  
60 VA per system  
24V DC @ 0.7A output

DN50DSD14 Power Draw 140 mA @ 24V

Operating Temperature 0 to 55°C  
Storage Temperature -20 to 75°C  
-40 to 75°C pending

Operating Humidity 90% max. non-condensing

Ground Class 3 or higher

Insulation Resistance between AC power terminals and ground 20M ohms minimum using 500V DC Megger.

Vibration: 16.7 Hz @ 3 mm for 2 hours each axis.

Shock: 10G for 2 hours each axis

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**24V DC INPUTS**

|                   |                 |            |
|-------------------|-----------------|------------|
| Nominal Voltage   | 12 – 24V DC     |            |
| Input Voltage     | Min. 9V         | Max. 30V   |
| Input Current     | Min. 5 mA       | Max. 14 mA |
| Input Resistance  | 3.3K ohms       |            |
| Operating Voltage | ON >8V          | OFF <5V    |
| Operating Time    | less than 13 mS |            |
| Insulation Type   | Photo Coupler   |            |

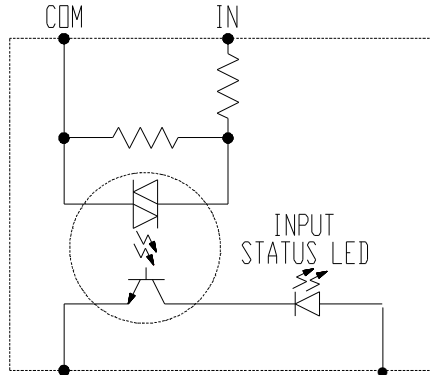


Figure 17 – Typical DC Input

**120V AC INPUTS**

|                   |                 |             |
|-------------------|-----------------|-------------|
| Nominal Voltage   | 120V AC         |             |
| Input Voltage     | Min. 85VAC      | Max. 132VAC |
| Input Current     | Min. 5 mA       | Max. 10 mA  |
| Operating Voltage | ON >85VAC       | OFF <30VAC  |
| Operating Time    | less than 15 mS |             |
| Insulation Type   | Photo Coupler   |             |

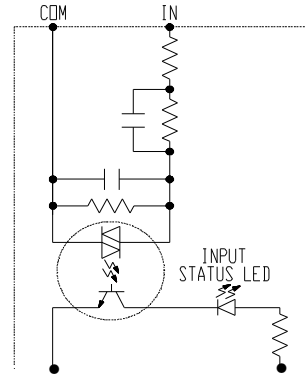


Figure 18 – Typical AC Input

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**RELAY OUTPUTS**

|                   |                               |
|-------------------|-------------------------------|
| Nominal Voltage   | 100/240V AC                   |
| Output Voltage    | Min. 85 – 264V AC             |
| Max. Load Current | 1 Circuit 2A<br>4 Circuits 4A |
| Min. Load Current | 30 mA                         |
| Operating Time    | less than 13 mS               |
| Insulation Type   | Photo Coupler and Relay       |

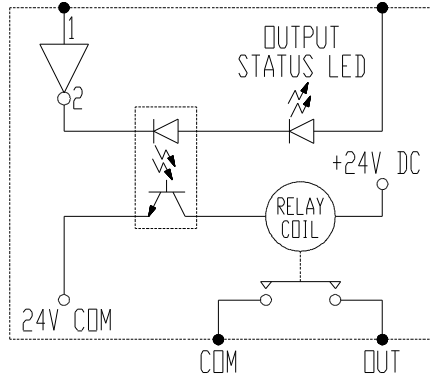


Figure 19 – Typical Relay Output

**TRANSISTOR OUTPUTS**

|                   |                 |
|-------------------|-----------------|
| Nominal Voltage   | 24V DC          |
| Output Voltage    | Min. 5 – 24V DC |
| Max. Load Current | 1 Circuit 0.5A  |
| Min. Load Current | 10 mA           |
| Operating Time    | less than 4 mS  |
| Insulation Type   | Photo Coupler   |

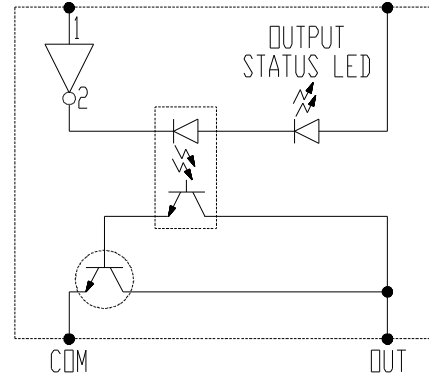


Figure 20 – Typical Transistor Output

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## APPENDIX A

### DEVICENET INFORMATION

The communication module allows a DN50 I/O Block to operate as a slave device on a DeviceNet network. The communication module supports Explicit Messages and Polled I/O Messages of the predefined master/slave connection set.

It *does not* support the explicit Unconnected Message Manager (UCMM).

This appendix defines the DeviceNet message types, class services, and objects that are supported by the communication module.

All message types are described in the table on the following page.

## OBJECT CLASSES

The communication module supports the following objects:

| Name of Object      | DN50 | DN50 + | DN50 + ② | DN50 + ③ |
|---------------------|------|--------|----------|----------|
| Number of Instances |      |        |          |          |
| Identity            | 1    | 1      | 1        |          |
| Msg Router          | 1    | 1      | 1        | 1        |
| DeviceNet           | 1    | 1      | 1        | 1        |
| Assembly            | 2    | 2      | 2        | 2        |
| Connection          | 2    | 2      | 2        | 2        |
| Discrete Input Pt.  | 8    | 8X     | 8X       | 8X       |
| Discrete Output Pt. | 6    | 6X     | 6X       | 6X       |
| Analog Input        |      |        | 4        |          |
| Analog Output       |      |        |          | 2        |

DN50 + "x" Discrete Expansion Modules

② DN50 + "x" Discrete Expansion Modules + Analog Input Expansion Module

③ DN50 + "x" Discrete Expansion Modules + Analog Output Expansion Module

**Note** The number of modules must be the same as was last configured. If a module has been added or removed, the MS LED will flash red. Perform an Auto-configuration as described on page 3.

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**IDENTITY OBJECT****Class Code 0x01 / Class Attributes**

| Attribute ID | Access Rule | Name                    | Data Type       | Value  |
|--------------|-------------|-------------------------|-----------------|--|
| 1            | Get         | Revision                | UNIT            | 1  |
| 2            | Get         | Max. Instances          | UNIT            | 1  |
| 176          | Get         | Class Name              | Short_String    |  |
| 180          | GetMember   | Class Attribute List    | Class Dependent | Specifies the encoding (Vol. 1 Appen. J of DeviceNet) of a single Class Attribute List.    |
| 186          | GetMember   | Instance Attribute List | Class Dependent | Specifies the encoding (Vol. 1 Appen. J of DeviceNet) of a single Instance Attribute List. |

**Number of Instances: 1 / Instance Attributes**

| Attribute ID | Access Rule | Name   | Data Type                       | Value  |
|--------------|-------------|--|---------------------------------|--|
| 1            | Get         | Vendor                                       | UNIT                            | 68   |
| 2            | Get         | Product Type                                 | UNIT                            | 07   |
| 3            | Get         | Product Code                                 | UNIT                            | 5156   |
| 4            | Get         | Revision<br>Major Revision<br>Minor Revision | Structure of:<br>USINT<br>USINT | 3 or greater<br>0 or greater   |
| 5            | Get         | Status                                       | WORD                            | Defined in DeviceNet Spec.<br>Bit 6 = Node_Fault<br>Bit 7 = System_Fault |
| 6            | Get         | Serial Number                                | UDINT                           | Unique Number  |

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| Attribute ID | Access Rule | Name  | Data Type                        | Value  |
|--------------|-------------|---|----------------------------------|--|
| 7            | Get         | Product Name<br>String Length<br>ASCII String | Structure of:<br>USINT<br>STRING | 5<br>"DN50B"   |
| 9            | Get         | Config_CRC                                    | UNIT                             | CRC value on configuration<br>parameters   |
| 100          | Get         | DN50_type                                     | USINT                            | Identifies the Device. This attribute is<br>stored in non-volatile memory and is<br>configured (written) by the Auto-<br>configure Service described on Page<br>3.<br><br>1=DN50 + no modules<br>2=DN50 + 1 digital module<br>3=DN50 + 2 digital modules<br>4=DN50 + 3 digital modules<br>5=DN50 + 1 AI module & no<br>digital modules<br>6=DN50 + 1 AI module & 1<br>digital module<br>7=DN50 + 1 AI module & 2<br>digital modules<br>8= DN50 + 1 AI module & 3<br>digital modules<br>9= DN50 + 1 AO module & no<br>digital modules<br>10= DN50 + 1 AO module & 1<br>digital module<br>11= DN50 + 1 AO module & 2<br>digital modules<br>12= DN50 + 1 AO module & 3<br>digital modules |

| Attribute ID | Access Rule | Name               | Data Type    | Value   |
|--------------|-------------|--------------------|--------------|---|
| 176          | Get/Set     | User Label         | Short_String | User definable name for the device.   |
| 177          | Get         | Fault_Value        | USINT        | Fault Code for Device fault<br>1 = Transmit Fault<br>2 = Data Overrun<br>3 = Data Size Error<br>4 = Module Fault<br>5 = Config. CRC Fault<br>6 = Transmitter Full<br>7 = Invalid Module Configuration   |
| 178          | Get         | Module Fault Value | USINT        | Module Fault Code for the Device<br>0 = No Configuration Fault<br>1 = Configuration Change<br>2 = Invalid Digital Number<br>4 = Invalid Analog Number<br>5 = Analog Module Fault<br>6 = Location Change |

### Common Services

| Service Code | Implemented for: |          | Service Name         |
|--------------|------------------|----------|----------------------|
|              | Class            | Instance |                      |
| 0x05         | No               | Yes      | Reset                |
| 0x0E         | Yes              | Yes      | Get_Attribute_Single |
| 0x10         | No               | Yes      | Set_Attribute_Single |
| 0x47         | Yes              | No       | GetMember            |
| 0x48         | No               | Yes      | Autoconfigure        |

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**MESSAGE ROUTER****Class Code 0x02 / Class Attributes****Number of Instances: 1 / Instance Attributes**

| Attribute ID | Access Rule | Name                             | Data Type                          | Value                   |
|--------------|-------------|----------------------------------|------------------------------------|-------------------------|
| 1            | Get         | Object List<br>Number<br>Classes | STRUC of<br>USINT<br>Array of UNIT | 07 01 02 03 04 05 08 09 |

**Common Services**

| Service Code | Implemented for: |          | Service Name         |
|--------------|------------------|----------|----------------------|
|              | Class            | Instance |                      |
| 0x0E         | Yes              | Yes      | Get_Attribute_Single |

**DEVICENET OBJECT****Class Code 0x03 / Class Attributes**

| Attribute ID | Access Rule   | Name                       | Data Type          | Value  |
|--------------|---------------|----------------------------|--------------------|--|
| 1            | Get           | Revision                   | USINT              | 1  |
| 176          | Get           | Class Name                 | Short_String       |  |
| 180          | Get<br>Member | Class<br>Attribute List    | Class<br>Dependent | Specifies the encoding<br>(Vol. 1 Appen. J of DeviceNet)<br>of a single Class Attribute List.    |
| 186          | Get<br>Member | Instance<br>Attribute List | Class<br>Dependent | Specifies the encoding<br>(Vol. 1 Appen. J of DeviceNet)<br>of a single Instance Attribute List. |

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**Number of Instances: 1 / Instance Attributes**

| Attribute ID | Access Rule | Name         | Data Type | Value  |
|--------------|-------------|--------------|-----------|--|
| 1            | Get/Set     | Node Address | USINT     | 0 – 63   |
| 2            | Get/Set     | Data Rate    | USINT     | 0 = 125KB, 1 = 250KB, 2 = 500KB                            |
| 3            | Get         | BOI          | BOOL      | 1 = Reset CAN chip and allow Group 4 faulted node recovery |

**Number of Instances: 1 / Instance Attributes**

| Attribute ID | Access Rule | Name  | Data Type                      | Value   |
|--------------|-------------|---|--------------------------------|---|
| 4            | Get/Set     | Bus-off Counter   | USINT                          | 0 – 255   |
| 5            | Get         | Allocation Info<br>Allocation Choice<br>Master Node<br>Addr | Structure Of:<br>BYTE<br>USINT | Allocation_byte<br>0 – 63 = Address 255 = unallocated |
| 192          | Get/Set     | Address<br>Led Contrl                                       | USINT                          | 0 = Off 1 = Green 2 = Red                             |

Allocation\_byte Bit 0 - Explicit Messaging Bit 1 - Polled I/O

**Common Services**

| Service Code | Implemented for: |          | Service Name                             |
|--------------|------------------|----------|--|
|              | Class            | Instance |  |
| 0x0E         | Yes              | Yes      | Get_Attribute_Single                     |
| 0x47         | Yes              | No       | Get_Member                               |
| 0x4B         | No               | Yes      | Allocate_Master/Slave<br>_Connection_Set |
| 0x4C         | No               | Yes      | Release_Master/Slave<br>_Connection_Set  |

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**ASSEMBLY OBJECTS****Class Code 0x04 / Class Attributes**

| Attribute ID | Access Rule | Name       | Data Type    | Value |
|--------------|-------------|------------|--------------|-------|
| 176          | Get         | Class Name | Short_String |       |

**Number of Instances: 2****Instance 1 Attributes** (Input from Device to Master)

| Attribute ID | Access Rule | Name | Data Type   | Value |
|--------------|-------------|------|---|-------|
| 3            | Get         | Data | Defined by instance type. Ref. Connection path for this I/O polled connection |       |

**Instance 2 Attributes** (Output from Master to Device)

| Attribute ID | Access Rule | Name | Data Type   | Value |
|--------------|-------------|------|---|-------|
| 3            | Get/Set     | Data | Defined by instance type. Ref. Connection path for this I/O polled connection |       |

**Common Services**

| Service Code | Implemented for: |          | Service Name         |
|--------------|------------------|----------|----------------------|
|              | Class            | Instance |                      |
| 0x0E         | Yes              | Yes      | Get_Attribute_Single |
| 0x10         | No               | Yes      | Set_Attribute_Single |

**INPUT ASSEMBLIES****Instance Type 4 DN50 with No Expansion Modules**

| Byte | Bit 7                    | Bit 6                    | Bit 5                    | Bit 4                    | Bit 3                    | Bit 2                    | Bit 1                    | Bit 0                    |
|------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 0    | Discrete Input 8<br>X0-7 | Discrete Input 7<br>X0-6 | Discrete Input 6<br>X0-5 | Discrete Input 5<br>X0-4 | Discrete Input 4<br>X0-3 | Discrete Input 3<br>X0-2 | Discrete Input 2<br>X0-1 | Discrete Input 1<br>X0-0 |

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**Instance Type 5 DN50 with One Expansion Module**

| Byte | Bit 7                        | Bit 6                        | Bit 5                        | Bit 4                        | Bit 3                        | Bit 2                        | Bit 1                        | Bit 0                       |
|------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|
| 0    | Discrete<br>Input 8<br>X0-7  | Discrete<br>Input 7<br>X0-6  | Discrete<br>Input 6<br>X0-5  | Discrete<br>Input 5<br>X0-4  | Discrete<br>Input 4<br>X0-3  | Discrete<br>Input 3<br>X0-2  | Discrete<br>Input 2<br>X0-1  | Discrete<br>Input 1<br>X0-0 |
| 1    | Discrete<br>Input 16<br>X1-7 | Discrete<br>Input 15<br>X1-6 | Discrete<br>Input 14<br>X1-5 | Discrete<br>Input 13<br>X1-4 | Discrete<br>Input 12<br>X1-3 | Discrete<br>Input 11<br>X1-2 | Discrete<br>Input 10<br>X1-1 | Discrete<br>Input 9<br>X1-0 |

**Instance Type 6 DN50 with Two or Three Expansion Modules**

| Byte | Bit 7                        | Bit 6                        | Bit 5                        | Bit 4                        | Bit 3                        | Bit 2                        | Bit 1                        | Bit 0                        |
|------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 0    | Discrete<br>Input 8<br>X0-7  | Discrete<br>Input 7<br>X0-6  | Discrete<br>Input 6<br>X0-5  | Discrete<br>Input 5<br>X0-4  | Discrete<br>Input 4<br>X0-3  | Discrete<br>Input 3<br>X0-2  | Discrete<br>Input 2<br>X0-1  | Discrete<br>Input 1<br>X0-0  |
| 1    | Discrete<br>Input 16<br>X1-7 | Discrete<br>Input 15<br>X1-6 | Discrete<br>Input 14<br>X1-5 | Discrete<br>Input 13<br>X1-4 | Discrete<br>Input 12<br>X1-3 | Discrete<br>Input 11<br>X1-2 | Discrete<br>Input 10<br>X1-1 | Discrete<br>Input 9<br>X1-0  |
| 2    | Discrete<br>Input 24<br>X2-7 | Discrete<br>Input 23<br>X2-6 | Discrete<br>Input 22<br>X2-5 | Discrete<br>Input 21<br>X2-4 | Discrete<br>Input 20<br>X2-3 | Discrete<br>Input 19<br>X2-2 | Discrete<br>Input 18<br>X2-1 | Discrete<br>Input 17<br>X2-0 |
| 3    | Discrete<br>Input 32<br>X3-7 | Discrete<br>Input 31<br>X3-6 | Discrete<br>Input 30<br>X3-5 | Discrete<br>Input 29<br>X3-4 | Discrete<br>Input 28<br>X3-3 | Discrete<br>Input 27<br>X3-2 | Discrete<br>Input 26<br>X3-1 | Discrete<br>Input 25<br>X3-0 |

**NOTE:** When used with two modules byte 3 of this assembly will report a "0" in all bits.

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**Instance Type 108 DN50 with 1 Analog Input Expansion Module**

| Byte | Bit 7                     | Bit 6                 | Bit 5                 | Bit 4                 | Bit 3                      | Bit 2                 | Bit 1                 | Bit 0                 |
|------|---------------------------|-----------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|-----------------------|
| 0    | Analog Input 0 Low 8 Bits |                       |                       |                       |                            |                       |                       |                       |
| 1    | Reserved                  |                       |                       |                       | Analog Input 0 High 4 Bits |                       |                       |                       |
| 2    | Analog Input 1 Low 8 Bits |                       |                       |                       |                            |                       |                       |                       |
| 3    | Reserved                  |                       |                       |                       | Analog Input 1 High 4 Bits |                       |                       |                       |
| 4    | Analog Input 2 Low 8 Bits |                       |                       |                       |                            |                       |                       |                       |
| 5    | Reserved                  |                       |                       |                       | Analog Input 2 High 4 Bits |                       |                       |                       |
| 6    | Analog Input 3 Low 8 Bits |                       |                       |                       |                            |                       |                       |                       |
| 7    | Reserved                  |                       |                       |                       | Analog Input 3 High 4 Bits |                       |                       |                       |
| 8    | Reserved                  |                       |                       |                       | Input Status 3             | Input Status 2        | Input Status 1        | Input Status 0        |
| 9    | Discrete Input 8 XO-7     | Discrete Input 7 XO-6 | Discrete Input 6 XO-5 | Discrete Input 5 XO-4 | Discrete Input 4 XO-3      | Discrete Input 3 XO-2 | Discrete Input 2 XO-1 | Discrete Input 1 XO-0 |

**Instance Type 109 DN50 with 1 Analog Input Expansion Module and 1 Digital Expansion Module**

| Byte | Bit 7                     | Bit 6 | Bit 5 | Bit 4 | Bit 3                      | Bit 2 | Bit 1 | Bit 0 |
|------|---------------------------|-------|-------|-------|----------------------------|-------|-------|-------|
| 0    | Analog Input 0 Low 8 Bits |       |       |       |                            |       |       |       |
| 1    | Reserved                  |       |       |       | Analog Input 0 High 4 Bits |       |       |       |
| 2    | Analog Input 1 Low 8 Bits |       |       |       |                            |       |       |       |
| 3    | Reserved                  |       |       |       | Analog Input 1 High 4 Bits |       |       |       |
| 4    | Analog Input 2 Low 8 Bits |       |       |       |                            |       |       |       |
| 5    | Reserved                  |       |       |       | Analog Input 2 High 4 Bits |       |       |       |
| 6    | Analog Input 3 Low 8 Bits |       |       |       |                            |       |       |       |

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|    |                           |                           |                           |                           |                            |                           |                           |                          |
|----|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|--------------------------|
| 7  | Reserved                  |                           |                           |                           | Analog Input 3 High 4 Bits |                           |                           |                          |
| 8  | Reserved                  |                           |                           |                           | Input Status 3             | Input Status 2            | Input Status 1            | Input Status 0           |
| 9  | Discrete Input 8<br>X0-7  | Discrete Input 7<br>X0-6  | Discrete Input 6<br>X0-5  | Discrete Input 5<br>X0-4  | Discrete Input 4<br>X0-3   | Discrete Input 3<br>X0-2  | Discrete Input 2<br>X0-1  | Discrete Input 1<br>X0-0 |
| 10 | Discrete Input 16<br>X1-7 | Discrete Input 15<br>X1-6 | Discrete Input 14<br>X1-5 | Discrete Input 13<br>X1-4 | Discrete Input 12<br>X1-3  | Discrete Input 11<br>X1-2 | Discrete Input 10<br>X1-1 | Discrete Input 9<br>X1-0 |

**Instance Type 110 DN50 with 1 Analog Input Expansion Module and 2 Digital Expansion Modules**

| Byte | Bit 7                     | Bit 6                 | Bit 5                 | Bit 4                 | Bit 3                      | Bit 2                 | Bit 1                 | Bit 0                 |
|------|---------------------------|-----------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|-----------------------|
| 0    | Analog Input 0 Low 8 Bits |                       |                       |                       |                            |                       |                       |                       |
| 1    | Reserved                  |                       |                       |                       | Analog Input 0 High 4 Bits |                       |                       |                       |
| 2    | Analog Input 1 Low 8 Bits |                       |                       |                       |                            |                       |                       |                       |
| 3    | Reserved                  |                       |                       |                       | Analog Input 1 High 4 Bits |                       |                       |                       |
| 4    | Analog Input 2 Low 8 Bits |                       |                       |                       |                            |                       |                       |                       |
| 5    | Reserved                  |                       |                       |                       | Analog Input 2 High 4 Bits |                       |                       |                       |
| 6    | Analog Input 3 Low 8 Bits |                       |                       |                       |                            |                       |                       |                       |
| 7    | Reserved                  |                       |                       |                       | Analog Input 3 High 4 Bits |                       |                       |                       |
| 8    | Reserved                  |                       |                       |                       | Input Status 3             | Input Status 2        | Input Status 1        | Input Status 0        |
| 9    | Discrete Input 8 XO-7     | Discrete Input 7 XO-6 | Discrete Input 6 XO-5 | Discrete Input 5 XO-4 | Discrete Input 4 XO-3      | Discrete Input 3 XO-2 | Discrete Input 2 XO-1 | Discrete Input 1 XO-0 |

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| Byte | Bit 7                        | Bit 6                        | Bit 5                        | Bit 4                        | Bit 3                        | Bit 2                        | Bit 1                        | Bit 0                        |
|------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 10   | Discrete<br>Input 16<br>X1-7 | Discrete<br>Input 15<br>X1-6 | Discrete<br>Input 14<br>X1-5 | Discrete<br>Input 13<br>X1-4 | Discrete<br>Input 12<br>X1-3 | Discrete<br>Input 11<br>X1-2 | Discrete<br>Input 10<br>X1-1 | Discrete<br>Input 9<br>X1-0  |
| 11   | Discrete<br>Input 24<br>X2-7 | Discrete<br>Input 23<br>X2-6 | Discrete<br>Input 22<br>X2-5 | Discrete<br>Input 21<br>X2-4 | Discrete<br>Input 20<br>X2-3 | Discrete<br>Input 19<br>X2-2 | Discrete<br>Input 18<br>X2-1 | Discrete<br>Input 17<br>X2-0 |

**Instance Type 111 DN50 with 1 Analog Input Expansion Module and 3 Digital Expansion Modules**

| Byte | Bit 7                        | Bit 6                        | Bit 5                        | Bit 4                        | Bit 3                        | Bit 2                        | Bit 1                        | Bit 0                       |
|------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|
| 0    | Analog Input 0 Low 8 Bits    |                              |                              |                              |                              |                              |                              |                             |
| 1    | Reserved                     |                              |                              |                              | Analog Input 0 High 4 Bits   |                              |                              |                             |
| 2    | Analog Input 1 Low 8 Bits    |                              |                              |                              |                              |                              |                              |                             |
| 3    | Reserved                     |                              |                              |                              | Analog Input 1 High 4 Bits   |                              |                              |                             |
| 4    | Analog Input 2 Low 8 Bits    |                              |                              |                              |                              |                              |                              |                             |
| 5    | Reserved                     |                              |                              |                              | Analog Input 2 High 4 Bits   |                              |                              |                             |
| 6    | Analog Input 3 Low 8 Bits    |                              |                              |                              |                              |                              |                              |                             |
| 7    | Reserved                     |                              |                              |                              | Analog Input 3 High 4 Bits   |                              |                              |                             |
| 8    | Reserved                     |                              |                              |                              | Input<br>Status 3            | Input<br>Status 2            | Input<br>Status 1            | Input<br>Status 0           |
| 9    | Discrete<br>Input 8<br>X0-7  | Discrete<br>Input 7<br>X0-6  | Discrete<br>Input 6<br>X0-5  | Discrete<br>Input 5<br>X0-4  | Discrete<br>Input 4<br>X0-3  | Discrete<br>Input 3<br>X0-2  | Discrete<br>Input 2<br>X0-1  | Discrete<br>Input 1<br>X0-0 |
| 10   | Discrete<br>Input 16<br>X1-7 | Discrete<br>Input 15<br>X1-6 | Discrete<br>Input 14<br>X1-5 | Discrete<br>Input 13<br>X1-4 | Discrete<br>Input 12<br>X1-3 | Discrete<br>Input 11<br>X1-2 | Discrete<br>Input 10<br>X1-1 | Discrete<br>Input 9<br>X1-0 |

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|    |                              |                              |                              |                              |                              |                              |                              |                              |
|----|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 11 | Discrete<br>Input 24<br>X2-7 | Discrete<br>Input 23<br>X2-6 | Discrete<br>Input 22<br>X2-5 | Discrete<br>Input 21<br>X2-4 | Discrete<br>Input 20<br>X2-3 | Discrete<br>Input 19<br>X2-2 | Discrete<br>Input 18<br>X2-1 | Discrete<br>Input 17<br>X2-0 |
| 12 | Discrete<br>Input 32<br>X3-7 | Discrete<br>Input 31<br>X3-6 | Discrete<br>Input 30<br>X3-5 | Discrete<br>Input 29<br>X3-4 | Discrete<br>Input 28<br>X3-3 | Discrete<br>Input 27<br>X3-2 | Discrete<br>Input 26<br>X3-1 | Discrete<br>Input 25<br>X3-0 |

**Instance Type 112 DN50 with 1 Analog Output Expansion Module**

| Byte | Bit 7                       | Bit 6                       | Bit 5                       | Bit 4                       | Bit 3                       | Bit 2                       | Bit 1                       | Bit 0                       |
|------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 0    | Reserved                    |                             |                             |                             |                             |                             | Output<br>Status 1          | Output<br>Status 0          |
| 1    | Discrete<br>Input 8<br>X0-7 | Discrete<br>Input 7<br>X0-6 | Discrete<br>Input 6<br>X0-5 | Discrete<br>Input 5<br>X0-4 | Discrete<br>Input 4<br>X0-3 | Discrete<br>Input 3<br>X0-2 | Discrete<br>Input 2<br>X0-1 | Discrete<br>Input 1<br>X0-0 |

**Instance Type 113 DN50 with 1 Analog Output Expansion Module and 1 Digital Expansion Module**

| Byte | Bit 7                        | Bit 6                        | Bit 5                        | Bit 4                        | Bit 3                        | Bit 2                        | Bit 1                        | Bit 0                       |
|------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|
| 0    | Reserved                     |                              |                              |                              |                              |                              | Output<br>Status 1           | Output<br>Status 0          |
| 1    | Discrete<br>Input 8<br>X0-7  | Discrete<br>Input 7<br>X0-6  | Discrete<br>Input 6<br>X0-5  | Discrete<br>Input 5<br>X0-4  | Discrete<br>Input 4<br>X0-3  | Discrete<br>Input 3<br>X0-2  | Discrete<br>Input 2<br>X0-1  | Discrete<br>Input 1<br>X0-0 |
| 2    | Discrete<br>Input 16<br>X1-7 | Discrete<br>Input 15<br>X1-6 | Discrete<br>Input 14<br>X1-5 | Discrete<br>Input 13<br>X1-4 | Discrete<br>Input 12<br>X1-3 | Discrete<br>Input 11<br>X1-2 | Discrete<br>Input 10<br>X1-1 | Discrete<br>Input 9<br>X1-0 |

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**Instance Type 114 DN50 with 1 Analog Output Expansion Module and 2 Digital Expansion Modules**

| Byte | Bit 7                     | Bit 6                     | Bit 5                     | Bit 4                     | Bit 3                     | Bit 2                     | Bit 1                     | Bit 0                     |
|------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| 0    | Reserved                  |                           |                           |                           |                           |                           | Output Status 1           | Output Status 0           |
| 1    | Discrete Input 8<br>X0-7  | Discrete Input 7<br>X0-6  | Discrete Input 6<br>X0-5  | Discrete Input 5<br>X0-4  | Discrete Input 4<br>X0-3  | Discrete Input 3<br>X0-2  | Discrete Input 2<br>X0-1  | Discrete Input 1<br>X0-0  |
| 2    | Discrete Input 16<br>X1-7 | Discrete Input 15<br>X1-6 | Discrete Input 14<br>X1-5 | Discrete Input 13<br>X1-4 | Discrete Input 12<br>X1-3 | Discrete Input 11<br>X1-2 | Discrete Input 10<br>X1-1 | Discrete Input 9<br>X1-0  |
| 3    | Discrete Input 24<br>X2-7 | Discrete Input 23<br>X2-6 | Discrete Input 22<br>X2-5 | Discrete Input 21<br>X2-4 | Discrete Input 20<br>X2-3 | Discrete Input 19<br>X2-2 | Discrete Input 18<br>X2-1 | Discrete Input 17<br>X2-0 |

**Instance Type 115 DN50 with 1 Analog Output Expansion Module and 3 Digital Expansion Modules**

| Byte | Bit 7                     | Bit 6                     | Bit 5                     | Bit 4                     | Bit 3                     | Bit 2                     | Bit 1                     | Bit 0                     |
|------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| 0    | Reserved                  |                           |                           |                           |                           |                           | Output Status 1           | Output Status 0           |
| 1    | Discrete Input 8<br>X0-7  | Discrete Input 7<br>X0-6  | Discrete Input 6<br>X0-5  | Discrete Input 5<br>X0-4  | Discrete Input 4<br>X0-3  | Discrete Input 3<br>X0-2  | Discrete Input 2<br>X0-1  | Discrete Input 1<br>X0-0  |
| 2    | Discrete Input 16<br>X1-7 | Discrete Input 15<br>X1-6 | Discrete Input 14<br>X1-5 | Discrete Input 13<br>X1-4 | Discrete Input 12<br>X1-3 | Discrete Input 11<br>X1-2 | Discrete Input 10<br>X1-1 | Discrete Input 9<br>X1-0  |
| 3    | Discrete Input 24<br>X2-7 | Discrete Input 23<br>X2-6 | Discrete Input 22<br>X2-5 | Discrete Input 21<br>X2-4 | Discrete Input 20<br>X2-3 | Discrete Input 19<br>X2-2 | Discrete Input 18<br>X2-1 | Discrete Input 17<br>X2-0 |
| 4    | Discrete Input 32<br>X3-7 | Discrete Input 31<br>X3-6 | Discrete Input 30<br>X3-5 | Discrete Input 29<br>X3-4 | Discrete Input 28<br>X3-3 | Discrete Input 27<br>X3-2 | Discrete Input 26<br>X3-1 | Discrete Input 25<br>X3-0 |

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The following table indicates the I/O Assembly Data Attribute mapping for Input Assemblies.

| Data Component Name | Class Name | Class Number      | Instance Number | Attribute Name | Attribute Number |
|---------------------|------------|-------------------|-----------------|----------------|------------------|
| Discrete Input 1    | Input      | 08 <sub>hex</sub> | 1               | Value          | 3                |
| Discrete Input 2    | Input      | 08 <sub>hex</sub> | 2               | Value          | 3                |
| Discrete Input 3    | Input      | 08 <sub>hex</sub> | 3               | Value          | 3                |
| Discrete Input 4    | Input      | 08 <sub>hex</sub> | 4               | Value          | 3                |
| Discrete Input 5    | Input      | 08 <sub>hex</sub> | 5               | Value          | 3                |
| Discrete Input 6    | Input      | 08 <sub>hex</sub> | 6               | Value          | 3                |
| Discrete Input 7    | Input      | 08 <sub>hex</sub> | 7               | Value          | 3                |
| Discrete Input 8    | Input      | 08 <sub>hex</sub> | 8               | Value          | 3                |
| Discrete Input 9    | Input      | 08 <sub>hex</sub> | 9               | Value          | 3                |
| Discrete Input 10   | Input      | 08 <sub>hex</sub> | 10              | Value          | 3                |
| Discrete Input 11   | Input      | 08 <sub>hex</sub> | 11              | Value          | 3                |
| Discrete Input 12   | Input      | 08 <sub>hex</sub> | 12              | Value          | 3                |
| Discrete Input 13   | Input      | 08 <sub>hex</sub> | 13              | Value          | 3                |
| Discrete Input 14   | Input      | 08 <sub>hex</sub> | 14              | Value          | 3                |
| Discrete Input 15   | Input      | 08 <sub>hex</sub> | 15              | Value          | 3                |
| Discrete Input 16   | Input      | 08 <sub>hex</sub> | 16              | Value          | 3                |
| Discrete Input 17   | Input      | 08 <sub>hex</sub> | 17              | Value          | 3                |
| Discrete Input 18   | Input      | 08 <sub>hex</sub> | 18              | Value          | 3                |
| Discrete Input 19   | Input      | 08 <sub>hex</sub> | 19              | Value          | 3                |
| Discrete Input 20   | Input      | 08 <sub>hex</sub> | 20              | Value          | 3                |
| Discrete Input 21   | Input      | 08 <sub>hex</sub> | 21              | Value          | 3                |
| Discrete Input 22   | Input      | 08 <sub>hex</sub> | 22              | Value          | 3                |
| Discrete Input 23   | Input      | 08 <sub>hex</sub> | 23              | Value          | 3                |

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| Data Component Name | Class Name | Class Number      | Instance Number | Attribute Name | Attribute Number |
|---------------------|------------|-------------------|-----------------|----------------|------------------|
| Discrete Input 24   | Input      | 08 <sub>HEX</sub> | 24              | Value          | 3                |
| Discrete Input 25   | Input      | 08 <sub>HEX</sub> | 25              | Value          | 3                |
| Discrete Input 26   | Input      | 08 <sub>HEX</sub> | 26              | Value          | 3                |
| Discrete Input 27   | Input      | 08 <sub>HEX</sub> | 27              | Value          | 3                |
| Discrete Input 28   | Input      | 08 <sub>HEX</sub> | 28              | Value          | 3                |
| Discrete Input 29   | Input      | 08 <sub>HEX</sub> | 29              | Value          | 3                |
| Discrete Input 30   | Input      | 08 <sub>HEX</sub> | 30              | Value          | 3                |
| Discrete Input 31   | Input      | 08 <sub>HEX</sub> | 31              | Value          | 3                |
| Discrete Input 32   | Input      | 08 <sub>HEX</sub> | 32              | Value          | 3                |
| Analog Input 0      | Input      | 0A <sub>HEX</sub> | 1               | Value          | 3                |
| Analog Input 1      | Input      | 0A <sub>HEX</sub> | 2               | Value          | 3                |
| Analog Input 2      | Input      | 0A <sub>HEX</sub> | 3               | Value          | 3                |
| Analog Input 3      | Input      | 0A <sub>HEX</sub> | 4               | Value          | 3                |
| Input Status 0      | Input      | 0A <sub>HEX</sub> | 1               | Status         | 4                |
| Input Status 1      | Input      | 0A <sub>HEX</sub> | 2               | Status         | 4                |
| Input Status 2      | Input      | 0A <sub>HEX</sub> | 3               | Status         | 4                |
| Input Status 3      | Input      | 0A <sub>HEX</sub> | 4               | Status         | 4                |

### Output Assemblies

#### Instance Type 100 DN50 with No Expansion Modules

| Byte | Bit 7    | Bit 6 | Bit 5                     | Bit 4                     | Bit 3                     | Bit 2                     | Bit 1                     | Bit 0                     |
|------|----------|-------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| 0    | Reserved |       | Discrete Output 6<br>X0-5 | Discrete Output 5<br>X0-4 | Discrete Output 4<br>X0-3 | Discrete Output 3<br>X0-2 | Discrete Output 2<br>X0-1 | Discrete Output 1<br>X0-0 |

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**Instance Type 101 DN50 with One Expansion Module**

| Byte | Bit 7    | Bit 6 | Bit 5                      | Bit 4                      | Bit 3                      | Bit 2                     | Bit 1                     | Bit 0                     |
|------|----------|-------|----------------------------|----------------------------|----------------------------|---------------------------|---------------------------|---------------------------|
| 0    | Reserved |       | Discrete Output 6<br>X0-5  | Discrete Output 5<br>X0-4  | Discrete Output 4<br>X0-3  | Discrete Output 3<br>X0-2 | Discrete Output 2<br>X0-1 | Discrete Output 1<br>X0-0 |
| 1    | Reserved |       | Discrete Output 12<br>X1-5 | Discrete Output 11<br>X1-4 | Discrete Output 10<br>X1-3 | Discrete Output 9<br>X1-2 | Discrete Output 8<br>X1-1 | Discrete Output 7<br>X1-0 |

**Instance Type 102 DN50 with Two Expansion Modules**

| Byte | Bit 7    | Bit 6 | Bit 5                      | Bit 4                      | Bit 3                      | Bit 2                      | Bit 1                      | Bit 0                      |
|------|----------|-------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 0    | Reserved |       | Discrete Output 6<br>X0-5  | Discrete Output 5<br>X0-4  | Discrete Output 4<br>X0-3  | Discrete Output 3<br>X0-2  | Discrete Output 2<br>X0-1  | Discrete Output 1<br>X0-0  |
| 1    | Reserved |       | Discrete Output 12<br>X1-5 | Discrete Output 11<br>X1-4 | Discrete Output 10<br>X1-3 | Discrete Output 9<br>X1-2  | Discrete Output 8<br>X1-1  | Discrete Output 7<br>X1-0  |
| 2    | Reserved |       | Discrete Output 18<br>X2-5 | Discrete Output 17<br>X2-4 | Discrete Output 16<br>X2-3 | Discrete Output 15<br>X2-2 | Discrete Output 14<br>X2-1 | Discrete Output 13<br>X2-0 |

**Instance Type 103 DN50 with Three Expansion Modules**

| Byte | Bit 7    | Bit 6 | Bit 5                      | Bit 4                      | Bit 3                      | Bit 2                     | Bit 1                     | Bit 0                     |
|------|----------|-------|----------------------------|----------------------------|----------------------------|---------------------------|---------------------------|---------------------------|
| 0    | Reserved |       | Discrete Output 6<br>X0-5  | Discrete Output 5<br>X0-4  | Discrete Output 4<br>X0-3  | Discrete Output 3<br>X0-2 | Discrete Output 2<br>X0-1 | Discrete Output 1<br>X0-0 |
| 1    | Reserved |       | Discrete Output 12<br>X1-5 | Discrete Output 11<br>X1-4 | Discrete Output 10<br>X1-3 | Discrete Output 9<br>X1-2 | Discrete Output 8<br>X1-1 | Discrete Output 7<br>X1-0 |

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| Byte | Bit 7    | Bit 6 | Bit 5                      | Bit 4                      | Bit 3                      | Bit 2                      | Bit 1                      | Bit 0                      |
|------|----------|-------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 2    | Reserved |       | Discrete Output 18<br>X2-5 | Discrete Output 17<br>X2-4 | Discrete Output 16<br>X2-3 | Discrete Output 15<br>X2-2 | Discrete Output 14<br>X2-1 | Discrete Output 13<br>X2-0 |
| 3    | Reserved |       | Discrete Output 24<br>X3-5 | Discrete Output 23<br>X3-4 | Discrete Output 22<br>X3-3 | Discrete Output 21<br>X3-2 | Discrete Output 20<br>X3-1 | Discrete Output 19<br>X3-0 |

## Instance Type 104 DN50 with 1 Analog Output Expansion Module

| Byte | Bit 7                      | Bit 6 | Bit 5                     | Bit 4                     | Bit 3                       | Bit 2                     | Bit 1                     | Bit 0                     |
|------|----------------------------|-------|---------------------------|---------------------------|-----------------------------|---------------------------|---------------------------|---------------------------|
| 0    | Analog Output 0 Low 8 Bits |       |                           |                           |                             |                           |                           |                           |
| 1    | Reserved                   |       |                           |                           | Analog Output 0 High 4 Bits |                           |                           |                           |
| 2    | Analog Output 1 Low 8 Bits |       |                           |                           |                             |                           |                           |                           |
| 3    | Reserved                   |       |                           |                           | Analog Output 1 High 4 Bits |                           |                           |                           |
| 4    | Reserved                   |       | Discrete Output 6<br>X0-5 | Discrete Output 5<br>X0-4 | Discrete Output 4<br>X0-3   | Discrete Output 3<br>X0-2 | Discrete Output 2<br>X0-1 | Discrete Output 1<br>X0-0 |

## Instance Type 105 DN50 with 1 Analog Output Expansion Module and 1 Digital Expansion Module

| Byte | Bit 7                      | Bit 6 | Bit 5 | Bit 4 | Bit 3                       | Bit 2 | Bit 1 | Bit 0 |
|------|----------------------------|-------|-------|-------|-----------------------------|-------|-------|-------|
| 0    | Analog Output 0 Low 8 Bits |       |       |       |                             |       |       |       |
| 1    | Reserved                   |       |       |       | Analog Output 0 High 4 Bits |       |       |       |
| 2    | Analog Output 1 Low 8 Bits |       |       |       |                             |       |       |       |
| 3    | Reserved                   |       |       |       | Analog Output 1 High 4 Bits |       |       |       |

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| Byte | Bit 7    | Bit 6 | Bit 5                      | Bit 4                      | Bit 3                      | Bit 2                     | Bit 1                     | Bit 0                     |
|------|----------|-------|----------------------------|----------------------------|----------------------------|---------------------------|---------------------------|---------------------------|
| 4    | Reserved |       | Discrete Output 6<br>X0-5  | Discrete Output 5<br>X0-4  | Discrete Output 4<br>X0-3  | Discrete Output 3<br>X0-2 | Discrete Output 2<br>X0-1 | Discrete Output 1<br>X0-0 |
| 5    | Reserved |       | Discrete Output 12<br>X1-5 | Discrete Output 11<br>X1-4 | Discrete Output 10<br>X1-3 | Discrete Output 9<br>X1-2 | Discrete Output 8<br>X1-1 | Discrete Output 7<br>X1-0 |

**Instance Type 106 DN50 with 1 Analog Output Expansion Module and 2 Digital Expansion Modules**

| Byte | Bit 7                      | Bit 6 | Bit 5                      | Bit 4                      | Bit 3                       | Bit 2                      | Bit 1                      | Bit 0                      |
|------|----------------------------|-------|----------------------------|----------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|
| 0    | Analog Output 0 Low 8 Bits |       |                            |                            |                             |                            |                            |                            |
| 1    | Reserved                   |       |                            |                            | Analog Output 0 High 4 Bits |                            |                            |                            |
| 2    | Analog Output 1 Low 8 Bits |       |                            |                            |                             |                            |                            |                            |
| 3    | Reserved                   |       |                            |                            | Analog Output 1 High 4 Bits |                            |                            |                            |
| 4    | Reserved                   |       | Discrete Output 6<br>X0-5  | Discrete Output 5<br>X0-4  | Discrete Output 4<br>X0-3   | Discrete Output 3<br>X0-2  | Discrete Output 2<br>X0-1  | Discrete Output 1<br>X0-0  |
| 5    | Reserved                   |       | Discrete Output 12<br>X1-5 | Discrete Output 11<br>X1-4 | Discrete Output 10<br>X1-3  | Discrete Output 9<br>X1-2  | Discrete Output 8<br>X1-1  | Discrete Output 7<br>X1-0  |
| 6    | Reserved                   |       | Discrete Output 18<br>X2-5 | Discrete Output 17<br>X2-4 | Discrete Output 16<br>X2-3  | Discrete Output 15<br>X2-2 | Discrete Output 14<br>X2-1 | Discrete Output 13<br>X2-0 |

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## Instance Type 107 DN50 with 1 Analog Output Expansion Module and 3 Digital Expansion Modules

| Byte | Bit 7                      | Bit 6 | Bit 5                      | Bit 4                      | Bit 3                       | Bit 2                      | Bit 1                      | Bit 0                      |
|------|----------------------------|-------|----------------------------|----------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|
| 0    | Analog Output 0 Low 8 Bits |       |                            |                            |                             |                            |                            |                            |
| 1    | Reserved                   |       |                            |                            | Analog Output 0 High 4 Bits |                            |                            |                            |
| 2    | Analog Output 1 Low 8 Bits |       |                            |                            |                             |                            |                            |                            |
| 3    | Reserved                   |       |                            |                            | Analog Output 1 High 4 Bits |                            |                            |                            |
| 4    | Reserved                   |       | Discrete Output 6<br>X0-5  | Discrete Output 5<br>X0-4  | Discrete Output 4<br>X0-3   | Discrete Output 3<br>X0-2  | Discrete Output 2<br>X0-1  | Discrete Output 1<br>X0-0  |
| 5    | Reserved                   |       | Discrete Output 12<br>X1-5 | Discrete Output 11<br>X1-4 | Discrete Output 10<br>X1-3  | Discrete Output 9<br>X1-2  | Discrete Output 8<br>X1-1  | Discrete Output 7<br>X1-0  |
| 6    | Reserved                   |       | Discrete Output 18<br>X2-5 | Discrete Output 17<br>X2-4 | Discrete Output 16<br>X2-3  | Discrete Output 15<br>X2-2 | Discrete Output 14<br>X2-1 | Discrete Output 13<br>X2-0 |
| 7    | Reserved                   |       | Discrete Output 18<br>X3-5 | Discrete Output 17<br>X3-4 | Discrete Output 16<br>X3-3  | Discrete Output 15<br>X3-2 | Discrete Output 14<br>X3-1 | Discrete Output 13<br>X3-0 |

The following table shows the I/O Assembly Data Attribute mapping for Output Assemblies.

| Data Component Name | Class Name | Class Number      | Instance Number | Attribute Name | Attribute Number |
|---------------------|------------|-------------------|-----------------|----------------|------------------|
| Discrete Output 1   | Output     | 09 <sub>hex</sub> | 1               | Value          | 3                |
| Discrete Output 2   | Output     | 09 <sub>hex</sub> | 2               | Value          | 3                |
| Discrete Output 3   | Output     | 09 <sub>hex</sub> | 3               | Value          | 3                |
| Discrete Output 4   | Output     | 09 <sub>hex</sub> | 4               | Value          | 3                |
| Discrete Output 5   | Output     | 09 <sub>hex</sub> | 5               | Value          | 3                |

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| Data Component Name | Class Name | Class Number      | Instance Number | Attribute Name | Attribute Number |
|---------------------|------------|-------------------|-----------------|----------------|------------------|
| Discrete Output 6   | Output     | 09 <sub>hex</sub> | 6               | Value          | 3                |
| Discrete Output 7   | Output     | 09 <sub>hex</sub> | 7               | Value          | 3                |
| Discrete Output 8   | Output     | 09 <sub>hex</sub> | 8               | Value          | 3                |
| Discrete Output 9   | Output     | 09 <sub>hex</sub> | 9               | Value          | 3                |
| Discrete Output 10  | Output     | 09 <sub>hex</sub> | 10              | Value          | 3                |
| Discrete Output 11  | Output     | 09 <sub>hex</sub> | 11              | Value          | 3                |
| Discrete Output 12  | Output     | 09 <sub>hex</sub> | 12              | Value          | 3                |
| Discrete Output 13  | Output     | 09 <sub>hex</sub> | 13              | Value          | 3                |
| Discrete Output 14  | Output     | 09 <sub>hex</sub> | 14              | Value          | 3                |
| Discrete Output 15  | Output     | 09 <sub>hex</sub> | 15              | Value          | 3                |
| Discrete Output 16  | Output     | 09 <sub>hex</sub> | 16              | Value          | 3                |
| Discrete Output 17  | Output     | 09 <sub>hex</sub> | 17              | Value          | 3                |
| Discrete Output 18  | Output     | 09 <sub>hex</sub> | 18              | Value          | 3                |
| Discrete Output 19  | Output     | 09 <sub>hex</sub> | 19              | Value          | 3                |
| Discrete Output 20  | Output     | 09 <sub>hex</sub> | 20              | Value          | 3                |
| Discrete Output 21  | Output     | 09 <sub>hex</sub> | 21              | Value          | 3                |
| Discrete Output 22  | Output     | 09 <sub>hex</sub> | 22              | Value          | 3                |
| Discrete Output 23  | Output     | 09 <sub>hex</sub> | 23              | Value          | 3                |
| Discrete Output 24  | Output     | 09 <sub>hex</sub> | 24              | Value          | 3                |

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| Data Component Name | Class Name | Class Number      | Instance Number | Attribute Name | Attribute Number |
|---------------------|------------|-------------------|-----------------|----------------|------------------|
| Analog Output 0     | Output     | OB <sub>hex</sub> | 1               | Value          | 3                |
| Analog Output 1     | Output     | OB <sub>hex</sub> | 2               | Value          | 3                |
| Output Status 0     | Output     | OB <sub>hex</sub> | 1               | Status         | 4                |
| Output Status 1     | Output     | OB <sub>hex</sub> | 2               | Status         | 4                |

**CONNECTION OBJECT****Class Code 0x05 / Class Attributes**

| Attribute ID | Access Rule | Name       | Data Type    | Value |
|--------------|-------------|------------|--------------|-------|
| 1            | Get         | Revision   | UNIT         | 1     |
| 176          | Get         | Class Name | Short_String |       |

Number of Instances: 2

**Instance 1 Attributes** (Explicit Message Connection)

| Attribute ID | Access Rule | Name                    | Data Type | Value   |
|--------------|-------------|-------------------------|-----------|---|
| 1            | Get         | State                   | USINT     | 0 = Nonexistent<br>1 = Configuring<br>3 = Established<br>4 = Timed out<br>5 = Deferred delete |
| 2            | Get         | Instance Type           | USINT     | 0 = Explicit Message  |
| 3            | Get         | Transport Class trigger | USINT     | 0x83  |
| 4            | Get         | Produced Connection ID  | USINT     | 10xxxxxx011<br>xxxxxx = Node Address  |

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| Attribute ID | Access Rule | Name                            | Data Type | Value  |
|--------------|-------------|---------------------------------|-----------|--|
| 5            | Get         | Consumed Connection ID          | USINT     | 10xxxxxx100<br>xxxxxx = Node Address             |
| 6            | Get         | Initial Comm. Characteristics   | USINT     | 0x21   |
| 7            | Get         | Produced Connection Size        | USINT     | 7  |
| 8            | Get         | Consumed Connection Size        | USINT     | 7  |
| 9            | Get/Set     | Expected Packet Rate            | USINT     | Timer Resolution of 8 msec.                      |
| 12           | Get/Set     | Watchdog Action                 | USINT     | 1 = Auto Delete (default)<br>2 = Deferred Delete |
| 13           | Get         | Produced Connection Path Length | USINT     | 0  |
| 14           | Get         | Produced Connection Path        |           | Null (no data)                                   |
| 15           | Get         | Consumed Connection Path Length | USINT     | 0  |
| 16           | Get         | Consumed Connection Path        |           | Null (no data)                                   |

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**Instance 2 Attributes (Polled I/O Message Connection)**

| Attribute ID | Access Rule | Name                            | Data Type | Value  |
|--------------|-------------|---------------------------------|-----------|--|
| 1            | Get         | State                           | USINT     | 0 = Nonexistent<br>1 = Configuring<br>3 = Established<br>4 = Timed out |
| 2            | Get         | Instance Type                   | USINT     | 1 = I/O Message  |
| 3            | Get         | Transport Class Trigger         | USINT     | 0x82   |
| 4            | Get         | Produced Connection ID          | USINT     | 01111xxxxx<br>xxxxxx = Node Address                                    |
| 5            | Get         | Consumed Connection ID          | USINT     | 10xxxxxx101<br>xxxxxx = Node Address                                   |
| 6            | Get         | Initial Comm Characteristics    | USINT     | 0x01   |
| 7            | Get         | Produced Connection Size        | USINT     | 0 to 13  |
| 8            | Get         | Consumed Connection Size        | USINT     | 0 to 8   |
| 9            | Get/Set     | Expected Packet Rate            | USINT     | Timer Resolution of 8 msec.  |
| 12           | Get         | Watchdog Action                 | USINT     | 0 = Timed out  |
| 13           | Get         | Produced Connection Path length | USINT     | 9  |

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| Attribute ID | Access Rule | Name                            | Data Type | Value   |
|--------------|-------------|---------------------------------|-----------|---|
| 14           | Get         | Produced Connection Path        |           | [20][04][24][01]<br>[30][03][62hex] [hexstring] where<br>[hex string] is the input assembly<br>number in hex  |
| 15           | Get         | Consumed Connection Path Length | USINT     | 9   |
| 16           | Get         | Consumed Connection Path        |           | [20][04][24][02]<br>[30][03][62hex] [hexstring] where<br>[hex string] is the output assembly<br>number in hex |

**Common Services**

| Service Code | Implemented for: |          | Service Name         |
|--------------|------------------|----------|----------------------|
|              | Class            | Instance |                      |
| 0x05         | No               | Yes      | Reset                |
| 0x0E         | Yes              | Yes      | Get_Attribute_Single |
| 0x10         | No               | Yes      | Set_Attribute_Single |
| 0x47         | Yes              | No       | Get_Member           |

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**DISCRETE INPUT POINT OBJECT****Class Code 0X08 / Class Attributes**

| Attribute ID | Access Rule | Name                    | Data Type       | Value  |
|--------------|-------------|-------------------------|-----------------|--|
| 1            | Get         | Revision                | UNIT            | 2  |
| 2            | Get         | Max. Instances          | UNIT            | 8, 16, 24 or 32  |
| 176          | Get         | Class Name              | Short_String    |  |
| 180          | GetMember   | Class Attribute List    | Class Dependent | Specifies the encoding (Vol. 1 Appen. J of DeviceNet) of a single Class Attribute List.    |
| 186          | GetMember   | Instance Attribute List | Class Dependent | Specifies the encoding (Vol. 1 Appen. J of DeviceNet) of a single Instance Attribute List. |

Number of Instances: 8, 16, 24, or 32

**Instance Attributes**

| Attribute ID | Access Rule | Name  | Data Type | Value |
|--------------|-------------|-------|-----------|-------|
| 3            | Get         | Value | BOOL      |       |

**Common Services**

| Service Code | Implemented Class: |          | Service Name         |
|--------------|--------------------|----------|----------------------|
|              | for                | Instance |                      |
| 0x0E         | Yes                | Yes      | Get_Attribute_Single |
| 0x47         | Yes                | No       | Get_Member           |

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**DISCRETE OUTPUT POINT OBJECT****Class Code 0X09 / Class Attributes**

| Attribute ID | Access Rule | Name                       | Data Type          | Value  |
|--------------|-------------|----------------------------|--------------------|--|
| 1            | Get         | Revision                   | UNIT               | 1  |
| 2            | Get         | Max.<br>Instances          | UNIT               | 6, 12, 18, or 24   |
| 176          | Get         | Class Name                 | Short_String       |  |
| 180          | GetMember   | Class Attribute<br>List    | Class<br>Dependent | Specifies the encoding (Vol. 1<br>Appen. J of DeviceNet) of a single<br>Class Attribute List.    |
| 186          | GetMember   | Instance<br>Attribute List | Class<br>Dependent | Specifies the encoding (Vol. 1<br>Appen. J of DeviceNet) of a single<br>Instance Attribute List. |

Number of Instances: 6, 12, or 18, or 24.

**Instance Attributes**

| Attribute ID | Access Rule | Name  | Data Type | Value |
|--------------|-------------|-------|-----------|-------|
| 3            | Get Set     | Value | BOOL      |       |

**Common Services**

| Service Code | Implemented for: |          | Service Name         |
|--------------|------------------|----------|----------------------|
|              | Class            | Instance |                      |
| 0x0E         | Yes              | Yes      | Get_Attribute_Single |
| 0x10         | No               | Yes      | Set_Attribute_Single |
| 0x47         | Yes              | No       | Get_Member           |

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**ANALOG INPUT POINT OBJECT****Class Code 0x0A / Class Attributes**

| Attribute ID | Access Rule | Name                    | Data Type       | Value  |
|--------------|-------------|-------------------------|-----------------|--|
| 1            | Get         | Revision                | USINT           | 1  |
| 2            | Get         | Max. Instances          | USINT           | 1  |
| 176          | Get         | Class Name              | Short_String    |  |
| 180          | Get Member  | Class Attribute List    | Class Dependent | Specifies the encoding (Vol. 1 Appen. J of DeviceNet) of a single Class Attribute List.    |
| 186          | Get Member  | Instance Attribute List | Class Dependent | Specifies the encoding (Vol. 1 Appen. J of DeviceNet) of a single Instance Attribute List. |

Number of Instances: 4.

**Analog Input Point / Instance Attributes**

| Attribute ID | Access Rule | Name                 | Data Type              | Attribute Description   | Semantics Of Values                          |
|--------------|-------------|----------------------|------------------------|---|--|
| 1            | Get         | Number of Attributes | USINT                  | Number of attributes Supported  |  |
| 2            | Get         | Attributes List      | Array of USINT         | List of attributes supported by this point  |  |
| 3            | Get         | Value                | Based upon attribute 8 | Analog input value. The data type defaults to INT but may be changed, based upon attribute 8. | 16 bit value (the upper four bits remain 0). |

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| Attribute ID | Access Rule | Name            | Data Type | Attribute Description   | Semantics Of Values  |
|--------------|-------------|-----------------|-----------|---|--|
| 4            | Get         | Status          | BOOL      | Point is operating without alarms or faults. This bit de-tects an open loop condition on a current input loop | 0 = Good<br>1 = Alarm State  |
| 7            | Get         | Input Range     | USINT     | Input range in which the point is operating   | 0 = -10v to 10v<br>1 = 0v to 5v<br>2 = 0v to 10v<br>3 = 4mA to 20mA<br>6 = -5v to 5v |
| 8            | Get         | Value Data Type | USINT     | Determines the data type value.   | 100 = 12 bit unsigned value<br>101 = 12 bit 2's complement value                     |

**Common Services**

| Service Code | Implemented for |          | Service Name         |
|--------------|-----------------|----------|----------------------|
|              | Class           | Instance |                      |
| 0x0E         | Yes             | Yes      | Get_Attribute_Single |
| 0x10         | No              | Yes      | Set_Attribute_Single |
| 0x47         | Yes             | No       | Get_Member           |

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**ANALOG OUTPUT POINT OBJECT****Class Code 0x0B / Class Attributes**

| Attribute ID | Access Rule | Name                    | Data Type       | Value  |
|--------------|-------------|-------------------------|-----------------|--|
| 1            | Get         | Revision                | USINT           | 1  |
| 2            | Get         | Max. Instances          | USINT           | 1  |
| 176          | Get         | Class Name              | Short_String    |  |
| 180          | Get Member  | Class Attribute List    | Class Dependent | Specifies the encoding (Vol. 1 Appen. J of DeviceNet) of a single Class Attribute List.    |
| 186          | Get Member  | Instance Attribute List | Class Dependent | Specifies the encoding (Vol. 1 Appen. J of DeviceNet) of a single Instance Attribute List. |

Number of Instances: 2.

**Analog Output Point Instance Attributes**

| Attribute ID | Access Rule | Name                 | Data Type              | Attribute Description  | Semantics Of Values |
|--------------|-------------|----------------------|------------------------|--|---------------------|
| 1            | Get         | Number of Attributes | USINT                  | Number of attributes Supported   |                     |
| 2            | Get         | Attributes List      | Array of USINT         | List of attributes supported by this point   |                     |
| 3            | Get Set     | Value                | Based upon attribute 8 | Analog output value. The data type defaults to INT but may be changed, based upon attribute 8. |                     |

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| Attribute ID | Access Rule | Name            | Data Type                     | Attribute Description   | Semantics Of Values  |
|--------------|-------------|-----------------|-------------------------------|---|--|
| 4            | Get         | Status          | BOOL                          | Point is operating without alarms or faults. This bit detects an open loop condition on a current input loop. | 0=Good<br>1=Alarm State  |
| 7            | Get         | Output Range    | USINT                         | Output in which the point is operating  | 0=4mA to 20mA<br>1=0v to 10v<br>3=-10v to 10v<br>4=0v to 5v<br>5=-5v to 5v |
| 8            | Get         | Value Data Type | USINT                         | Determines the data type of value   | 100-12 bit unsigned value<br>101=12 bit 2's complement value               |
| 9            | Set         | Fault State     | USINT                         | Output value to go to on error of fault   | 0=Hold last state<br>1=Low state<br>2=High State                           |
| 11           | Set<br>Get  | Fault Value     | INT or based upon Attribute 8 | User Specified Value. User defined outputs go to in fault mode if Fault State = 3.                            |  |

**Common Services**

| Service Code | Implemented for: |          | Service Name         |
|--------------|------------------|----------|----------------------|
|              | Class            | Instance |                      |
| 0x0E         | Yes              | Yes      | Get_Attribute_Single |
| 0x10         | No               | Yes      | Set_Attribute_Single |
| 0x47         | Yes              | No       | Get_Member           |

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## APPENDIX B

### EXTERNAL DEVICE WIRING

This section describes the recommended wiring for external

devices, such as sensors and actuators, when used with the analog input expander modules



#### NOTE

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TO MAINTAIN THE BEST RELIABILITY FROM THE EXPANDER MODULES, LINE NOISE SHOULD BE AVOIDED.

#### Cable Placement

Do not place expansion module cables near, or tie in with the main circuit line, high voltage line, or load lines from the PLC and the external devices like inverters, drives or motor starters.

Expander module cables should be more than 10 cm. Away from main circuit lines.

Expansion cables should be more than 1 meter away from sources of noise (such as transformers, contactors, motors and electric welding equipment).

Cables should be located as close as possible to ground level.

Avoid extending cables using terminal block interfaces or similar equipment.

**Cable Length**

Cables should be kept as short as possible to maintain the best electrical noise immunity. The recommended maximum length for voltage input devices is 1.5m. Longer lengths may result in signal degradation.

Cable length for current input devices is not as restricted. Analog signals from these devices are less sensitive to electrical noise interference.

**Cable Type**

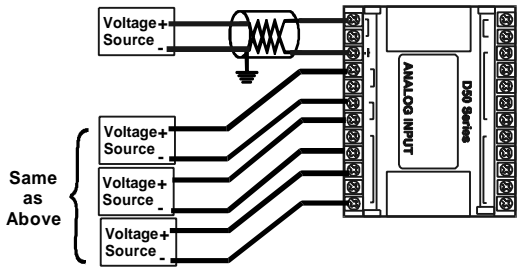
The expander module requires a twisted pair, shielded cable for transmission to the expander module. The shielding of the cable must cover the twisted pair wire completely.

Connect each output cable shield to a properly grounded common bus. Ground the shield at only one end of the cable.

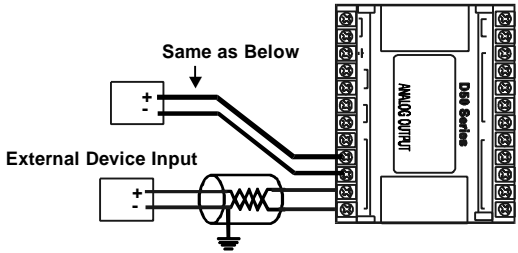
**CAUTION**

TAPE ANY EXPOSED WIRE TO INSULATE IT FROM ELECTRICAL OR PERSONNEL CONTACT.

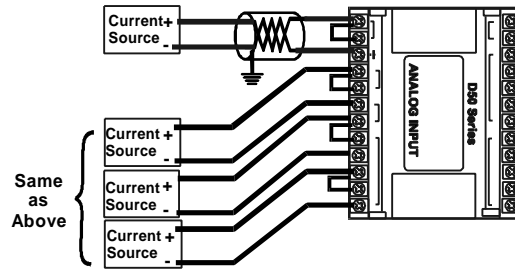
Voltage Input Terminal Wiring



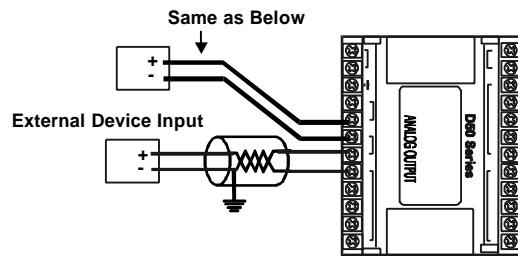
Voltage Output Terminal Wiring



### Current Input Terminal Wiring



### Current Output Terminal Wiring



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**INPUT EXPANDER MODULE CONFIGURATION**

Each voltage module can be configured for two voltage ranges. Jumper placement determines which voltage range is active. Jumper caps are included, and mounted on the factory default positions.

On the Current Input model D50AIM420V, a DIP switch is set by the factory.

If you are experiencing difficulty, be sure that SW 2 is set to the ON position. SW 1 is reserved, and set to the ON position as well. Jumpers are used on the outside terminals between V and I in the current mode.

| Analog Input Module | Voltage Range        | JP 1           | JP 2             | JP 3             |                    |
|---------------------|----------------------|----------------|------------------|------------------|--------------------|
| D50AIM405V          | 0 – 5V<br>-5 – 5 V   | Open<br>Jumper | Jumper<br>Jumper | Open<br>Open     | Factory<br>Default |
| D50AIM410V          | 0 – 10V<br>-10 – 10V | Open<br>Jumper | Open<br>Openr    | Jumper<br>Jumper | Factory<br>Default |
| D50AIM420V          | 4 – 20 mA            | Open           | Jumper           | Open             | Factory Default    |

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**OUTPUT EXPANDER MODULE CONFIGURATION**

Voltage modules can be configured for two voltage ranges. Jumper placement determines which voltage range is active and DIP switches are set to activate a voltage range.

Jumper caps are included and mounted on the factory default positions.

| Jumper Settings |      |       | D50AOM205V |        | D50AOM210V |          | D50AOM220V |
|-----------------|------|-------|------------|--------|------------|----------|------------|
| Position        |      |       | 0 –5V      | -5 –5V | 0 –10V     | -10 –10V | 4 –20mA    |
| CH 0            | JP 1 | 1 - 2 | Jumper     | Open   | Open       | Open     | Open       |
|                 |      | 3 - 4 | Open       | Open   | Jumper     | Open     | Jumper     |
|                 |      | 5 –6  | Open       | Jumper | Open       | Jumper   | Open       |
|                 | JP 3 | 1 –2  | Jumper     | Jumper | Jumper     | Open     | Jumper     |
|                 |      | 3 –4  | Open       | Open   | Open       | Jumper   | Open       |
| CH 1            | JP 2 | 1 - 2 | Jumper     | Open   | Open       | Open     | Open       |
|                 |      | 3 - 4 | Open       | Open   | Jumper     | Open     | Jumper     |
|                 |      | 5 –6  | Open       | Jumper | Open       | Jumper   | Open       |
|                 | JP 4 | 1 –2  | Jumper     | Jumper | Jumper     | Open     | Jumper     |
|                 |      | 3 –4  | Open       | Open   | Open       | Jumper   | Open       |
| Dip Switch      |      | SW 4  | OFF        | OFF    | OFF        | OFF      | OFF        |
|                 |      | SW 3  | OFF        | OFF    | OFF        | OFF      | ON         |
|                 |      | SW 2  | OFF        | ON     | OFF        | ON       | OFF        |
|                 |      | SW 1  | OFF        | OFF    | ON         | ON       | OFF        |

**Note** To operate the analog output expansion module in bipolar mode, remove Jumper JP7. For unipolar operation, install Jumper JP7.

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*NOTES*

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