



# Cutler-Hammer

## DN65 DeviceNet I/O Module

Technical Data

Specifications  
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Configuration

Supersedes TD09F01ATE  
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## DN65 Specifications

The Cutler-Hammer DN65 I/O Module is a convenient and cost-effective DeviceNet Interface capable of providing discrete control and monitoring of motor starters, drives and other devices over a DeviceNet communications network. The DN65 is designed to provide the following benefits in both new and existing installations:

- Reduced field wiring.
- Greater operator efficiency.
- Ease in system startup and commissioning.

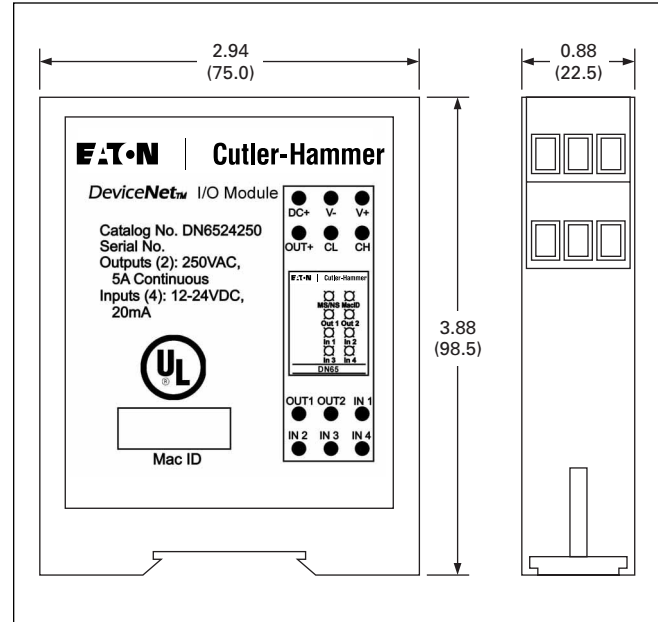
The DN65 DeviceNet I/O Module provides four (4) solid state 24V DC inputs and two (2) AC/DC rated relay outputs.

The DN65 DeviceNet I/O Module can be DIN rail mounted, or mounted directly to a back panel. Its compact size keeps required panel space to a minimum. The DN65's compact size, ease of wiring and DeviceNet communications capability makes the use of traditional discrete devices on DeviceNet cost-effective and simple.

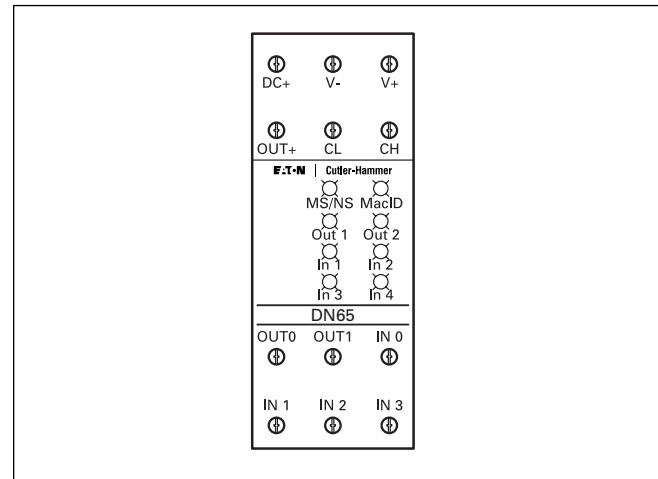
**Table 1. Specifications**

DeviceNet I/O Module Part Number	DN6524250
<b>Inputs</b>	
Type	Open Collector
Number	Four (4)
Voltage Range	12 – 24V DC (Network Powered)
Maximum Current	20 mA per Input
<b>Outputs</b>	
Type	Relay
Number	Two (2)
Voltage Range	10 – 30V DC, 24 – 240V AC
Current	5A Continuous, 10A Maximum
<b>DeviceNet</b>	
Voltage Range	12 – 24V DC
Current Consumption	79 mA Total (typical)
Data Rates	125, 250 and 500 kbps
<b>Environmental</b>	
Temperature Storage	-30° to 70°C (-22° to 158°F)
Operating	0° to 60°C (32° to 140°F)
Humidity	5 – 95% RH, Non-Condensing
Vibration	2G at 10 to 500 Hz
Shock	10G
<b>Physical</b>	
Dimensions	3.88-inch H x 2.94-inch W x .88-inch W
Weight	8 oz
Color	Light Gray
Case Material	Polycarbonate and ABS
Mounting	Din Rail or Back Panel Mount
Terminations	Captive Screws, Finger-safe
Indication	
MS/NS	Green/Red
MAC ID	Green/Red
Inputs (4)	Green
Outputs (2)	Green

## Dimensions



**Figure 1. Side and End View — Dimensions in Inches (mm)**



**Figure 2. Front View**

## Wiring Diagrams

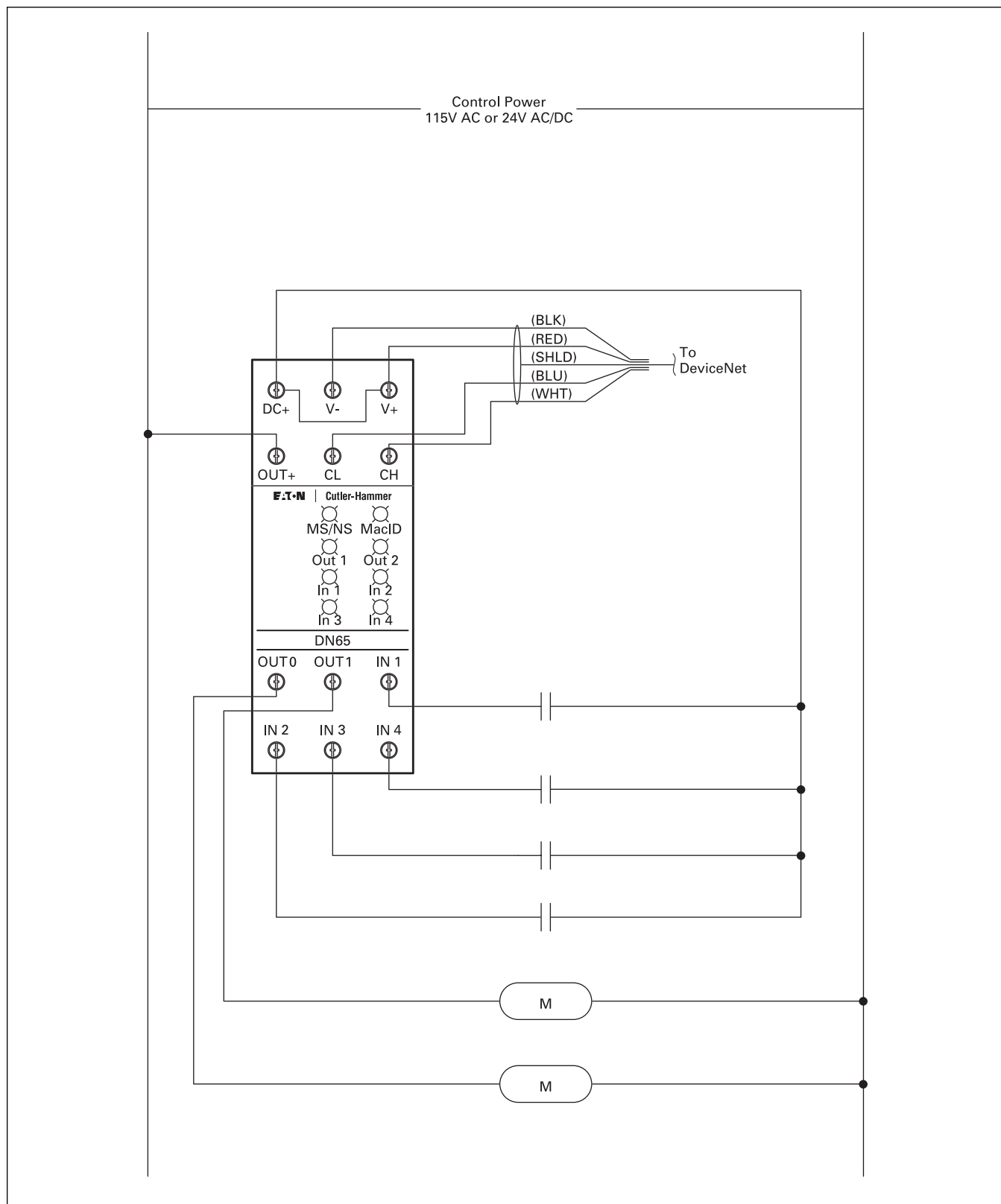
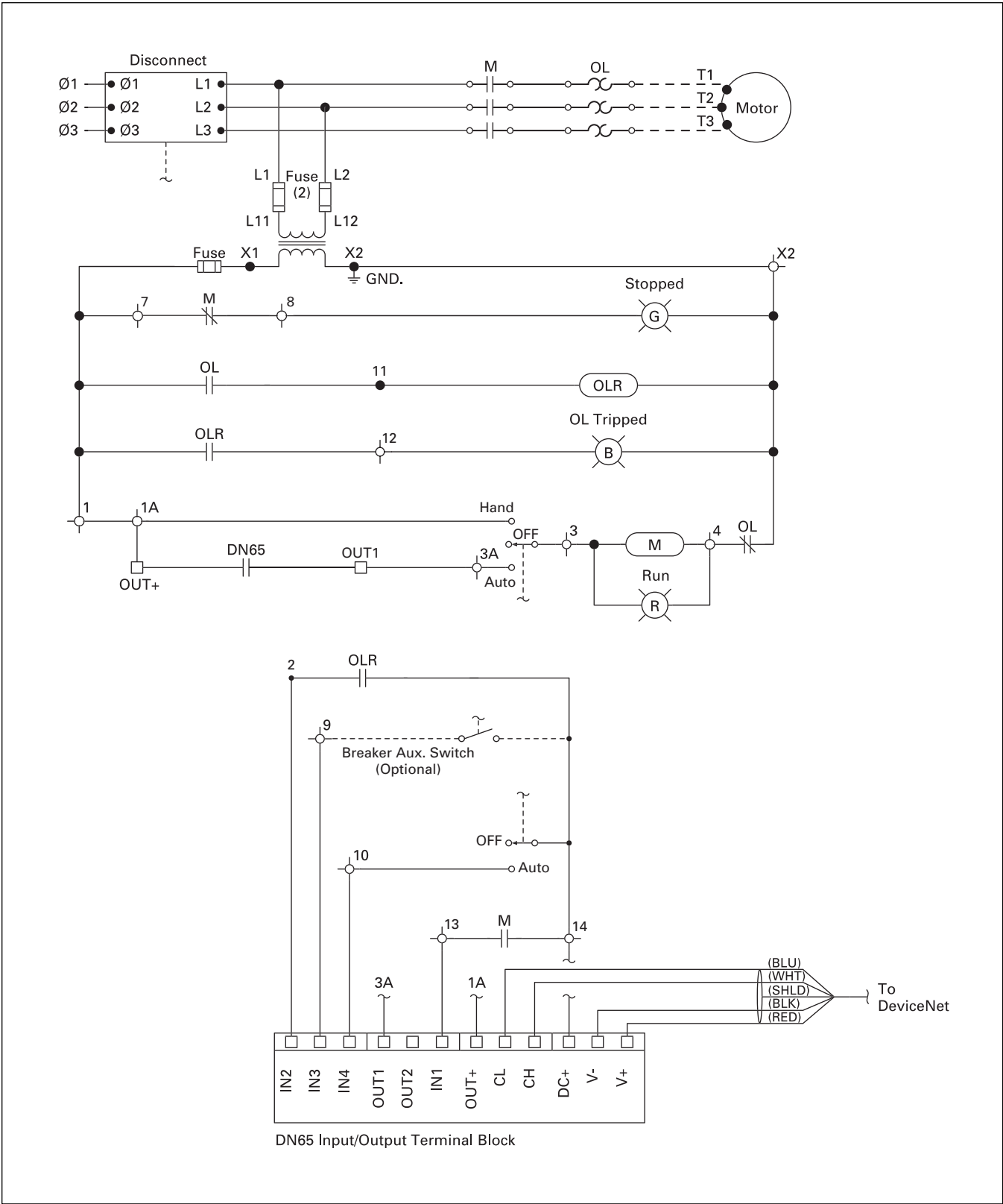


Figure 3. Wiring Diagram — General

Wiring Diagrams — Typical



## Status Indicators

**Combined Module Status (MS)/Network Status (NS) LED:** One bi-color (green/red) LED provides device and communication status. The combined Module Status (MS)/Network Status (NS) LED indicates whether or not the device has power and is operating properly.

**Table 2. Indicator Status**

For this State:	LED is to Indicate:	Meaning
Not Powered/Not On-line	Off	Device is not on-line. The device has not completed the Dup_MAC_ID test yet. The device may not be powered.
Device Operational AND On-line, Connected AND On-line, Connected	Green	The device is operating in a normal condition and the device is on-line with connections in the established state. DN65 is allocated to a master.
Device Operational AND On-line, Not Connected	Flashing Green	The device is operating in a normal condition and the device is on-line with no connections in the established state. The device has passed the Dup_MAC_ID test, is on-line, but has no established connections to other nodes. DN65 is NOT allocated to a master.
Minor Fault and/or Connection Time-out	Flashing Red	Recoverable fault and/or one or more I/O Connections are in the Timed-out state.
Critical Fault or Critical Link Failure	Red	Failed communication device. The device has detected an error that has rendered it incapable of communicating on the network (Duplicate MAC ID, or Bus-off).

## MAC ID Status Indicator

The Node Address MAC ID LED blinks the MAC ID of the unit while it is powered. The unit displays the tens digit with red blinks and the ones digit with green blinks. The unit plays the tens unit, then the ones, and finally delays about two seconds before repeating the sequence. An address of zero is not recommended. It will result in an "off" state for the MAC ID LED. The MAC ID LED will begin to flash the device address after the power-up initialization is completed (about 10 seconds).

## Configuration

The DN65 DeviceNet I/O Module can be configured using several software tools including Cutler-Hammer Netview, CH Studio and RS NetWorx (AB). For detailed instructions on configuring a DN65 using Netview, please consult publication DNMCS1.16.A. This document may be downloaded from the Cutler-Hammer Internet at: <http://www.cutler-hammer.com> by selecting Documents and Support > Browse > Current Products > Motor Control Centers > DeviceNet.

In order to configure the DN65 with CH Studio or RS NetWorx, an EDS file is required. The EDS file provides the configuration tools with the location, value and size of the device's configurable attributes. The EDS file for the DN65 may be downloaded from this link <http://www.cutler-hammer.com> by selecting Documents and Support > Solutions and Topics > Free Software Downloads. A Quick Start Guide for configuring the DN65 is included on **Page 6** of this document.

## Operation

The DN65 I/O Module is a general-purpose discrete I/O device functioning as a "Group 2 Only Server." In addition to explicit messaging, polled I/O is supported for the transfer of input and output information. Once a polled connection is established, the module expects a poll at least every 10 seconds, otherwise the module will time-out and take action as specified in the watchdog time-out action attribute. Changing the Expected Packet Rate (EPR) can alter the connection time-out for the polled connection.

**Table 3. Variables**

Bit	Name	Description
<b>Input</b>		
0	Input 0	State of Physical Input 0
1	Input 1	State of Physical Input 1
2	Input 2	State of Physical Input 2
3	Input 3	State of Physical Input 3
<b>Output</b>		
0	Output 0	Controls the State of Physical Output 0
1	Output 1	Controls the State of Physical Output 1

**Table 4. Device Parameters**

Object	Attribute	Description
ID Object — Class 1, Instance 1	1	Vendor ID
	2	Device Type
	3	Product Code
	4	Revision
	5	Status
	6	Serial Number
	7	Product Name
DeviceNet Object — Class 3, Instance 1	1	MAC ID (0-63)
	2	Baud Rate (0 = 125K, 1 = 250K, 2 = 500K)
	3	BOI
	4	Bus-off Counter
	5	Allocation Information
Connection Object — Class 5, Instance 1 and 2	1	State
	2	Instance Type
	3	Transport Class Trigger
	4	Produced Connection ID
	5	Consumed Connection ID
	6	Initial Communication Characteristics
	7	Produced Connection Size
	8	Consumed Connection Size
	9	Expected Packet Rate
	12	Watchdog Timeout Action
	13	Produced Connection Path Length
	14	Produced Connection Path
	15	Consumed Connection Path Length
	16	Consumed Connection Path

### Quick-Start Guide for the DN65 DeviceNet I/O Module Using Rockwell RSNetWorx Version 2.22 or Later

This Quick-Start Guide provides instructions for configuring a Cutler-Hammer DN65 DeviceNet I/O Module.

#### Firmware Version Notes

Firmware version 1.01 (or later) of DN65 is supported.

#### EDS Files

Electronic Data Sheets (EDS) files are available from the Cutler-Hammer Motor Control Center Intranet Site location at: [http://www.ch.etn.com/mcc\\_2/products/devicenet\\_mcc\\_techinfo\\_eds\\_files.html](http://www.ch.etn.com/mcc_2/products/devicenet_mcc_techinfo_eds_files.html) or the Cutler-Hammer Internet Site at <http://www.cutler-hammer.com> > Documents and Support > Solutions and Topics > Free Software Downloads.

Due to changes in ODVA specifications and enhancements to DeviceNet configuration software tools, it is recommended that **Cutler-Hammer Technical Support (1-800-809-2772)** be contacted for information about the latest EDS files. When inquiring about EDS files, have the following information ready:

- Which Cutler-Hammer motor starters are being used?
- Which DeviceNet interface is installed?
- Are reversing starters being used?
- Are reduced voltage (across-the-line) starters being used?
- Are Advantage Control Modules (ACMs) used on non-reversing starters?
- The Firmware Number or Rev. code letter for the DeviceNet I/O Module.
- NetView or RSNetWorx software revision number.

#### Equipment Setup:

1. Connect the DeviceNet trunk cable to the DeviceNet scanner interface being used.
2. Connect the DN65 DeviceNet I/O Module to the network using the DeviceNet terminals located on the top of the unit.  
**Note:** The DeviceNet cable shield is not terminated at the DN65.
3. Check that the 24V DC power supply disconnect switch is ON and that 24V DC is present on the DeviceNet network cable (V+ & V- at any location).

#### Network Setup:

1. Have functional RSNetWorx software and interface hardware as needed.
2. Install the Cutler-Hammer supplied EDS file using the EDS Wizard.
3. Once you have determined that you have the correct EDS file, click on **Tools, EDS Wizard**, next choose **Register an EDS File(s)**, next, **Choose File** to identify the location of the EDS file, locate the EDS file and double-click on it. Then, click **Next**.

A ✓ next to the EDS file path indicates that the EDS is valid.

Click **Next**. A new Vendor device listing under General Purpose I/O called "DN65 Discrete I/O Device" will be displayed.

Click **Next**, then **Finish**.

#### Connecting to the DN65 I/O Module

Once the EDS file is installed, the Hardware listing (left side of RSNetWorx window) will include a new device as shown:

1. To see if the starter is found correctly click on **Network, Online**. RSNetWorx will browse all possible MAC IDs for the network. The DN65 icon should show up in the Network View window.

**Troubleshooting Note:** If the icon does not appear in the top right window, and instead shows up in the bottom as not being registered on this computer then you probably have the wrong EDS file loaded for that particular version of DN65. To check the version, right click on the Globe icon for the node that isn't being recognized and select properties. You should then see a window with the revision number for the device.

Make a note of the revision number. To compare the hardware version to the EDS file version, go to the Hardware listing tree and select the Cutler-Hammer DN65 Discrete I/O Device. Right click to view the properties of the EDS file and compare that revision number with the installed hardware. If they do not match, download the correct EDS file from the Cutler-Hammer Internet Site.

Once the DN65 appears properly in the network window you can modify the appropriate parameters in the DN65.

#### Setting Properties

MAC ID and possibly Baud Rate are the only two parameters that typically need to be modified.

1. Double-click on the DN65 icon to open the Properties Window. Upload the parameters. Select **Device Parameters**. As shown in the window to the right, all of the configuration parameters will be listed. Some will be "locked" (read-only). Others allow you to modify the parameter as needed. Typical parameters that need to be configured are:

- a. MAC ID
- b. Baud Rate

**Note:** The MAC ID, or node address, must be a unique number between "0" and "63." It is recommended that address "63" be reserved for new (or replacement) devices being added to the network. Also, a good practice for motor control center applications is to leave a few network addresses available for expansion. The host control platform network scanner also consumes one MAC ID address.

2. Use the following steps to configure the DN65 DeviceNet I/O Module for operation.
  - a. **MAC ID:** With the Parameters window displayed as shown above, click on the MAC ID field under the "Current Value" column. Right click and select **Edit**. Enter in the new network address number. Click on **Apply** and then **Download to Device**. In the Network window, delete the DN65 node referencing the old MAC ID. Perform a Single Pass Browse to locate the new MAC ID.
  - b. **Baud Rate:** The factory default is 125Kb/s. This is suitable for most applications. Increasing the Baud Rate will limit the overall distance allowed for the network trunk cable. If the network is to operate at a higher Baud Rate, click on the **Baud Rate** field under the "Current Value" column. Right click and select **Edit**. Select the new Baud Rate (250 or 500). Click on **Apply** and then **Download to Device**.

The Network configuration master being used must also be changed to match the new Baud Rate.

### 3. Map the DN65 I/O Data to the Host Scanner Module:

A DeviceNet scanner is a device that manages input and output data for the processor. The scanner receives input data from I/O devices, organizes the information into scanner data tables, and sends the input data to the processor when the processor requests it. In addition, it sends output data, which it receives from the processor, to the I/O devices.

- Open the Scanner module's Properties window by right-clicking on the Scanner icon.  
Select the Scanlist Tab to view the available slave devices on the network.  
**Suggestion:** Remove the "Automap on Add" feature to allow changes to the mapping location.
- Click on the DN65 device and add it to the Scanlist by clicking on the > arrow.
- Next, choose **Edit I/O Parameters** to tell RSNetWorx how many bytes of data to expect. Select **Polled**, and **Rx Size** to be 1 byte and **Tx Size** to be 1 byte. These are the default settings.
- Next, select the **Input Tab**.  
Choose the Memory location and Start Word for the Input data.  
Click on the desired DN65 Node and select **AutoMap**.
- Repeat the process for the Output data by selecting the **Output Tab**, then specifying the Memory location and the Start Word.
- Click on **Apply** to save your configuration.

**Note:** ControlLogix and SLC/PLC5 have different memory options. This example is based on the 1756-DNB memory location.

Now the input data (information transmitted from the starter) and output data (commands from logic to the starter) are mapped to the Scanner's I/O table.

In this example (based on the 1756-DNB scanner), input data will be located as follows:

**Table 5. Input Data**

1:I.Data[1]	Bit 0	State of Input 1
1:I.Data[1]	Bit 1	State of Input 2
1:I.Data[1]	Bit 2	State of Input 3
1:I.Data[1]	Bit 3	State of Input 4
1:I.Data[1]	Bit 4	unused
1:I.Data[1]	Bit 5	unused
1:I.Data[1]	Bit 6	unused
1:I.Data[1]	Bit 7	unused

Output data will be located as follows:

**Table 6. Output Data**

1:O.Data[1]	Bit 0	Control of Output 1
1:O.Data[1]	Bit 1	Control of Output 2
1:O.Data[1]	Bit 2	unused
1:O.Data[1]	Bit 3	unused
1:O.Data[1]	Bit 4	unused
1:O.Data[1]	Bit 5	unused
1:O.Data[1]	Bit 6	unused
1:O.Data[1]	Bit 7	unused

You have now successfully commissioned a DN65 DeviceNet I/O Module. Depending on the PLC/PC platform you are using for control, you may need to create ladder logic elements to move the DeviceNet data from the scanner to the PLC/PC memory.

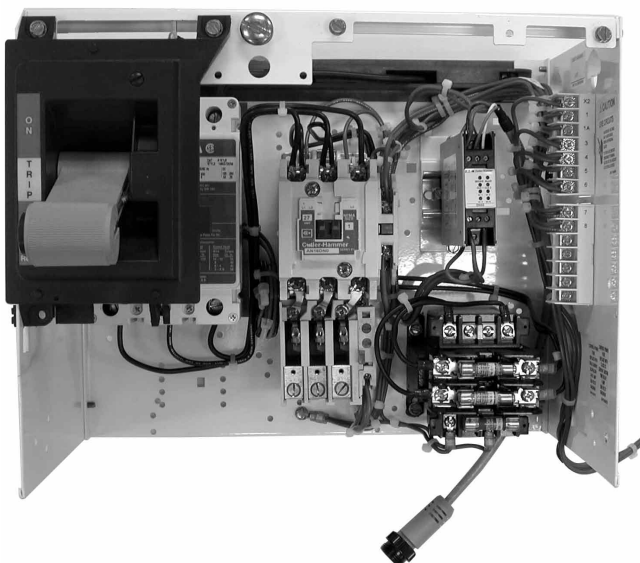
For any questions regarding the hardware, software, or procedures mentioned in this document, please contact **Cutler-Hammer Technical Support at 1 (800) 809-2772**.

## DN65 Applications

The DN65 is ideally suited for a wide variety of applications requiring discrete device control. Compact size and ease of wiring make the DN65 an excellent choice for Motor Control Center and Enclosed Control Starter Units. Typical control functions include start/stop, auxiliary contact status, overload status and breaker status.



*Full Voltage Non-Reversing Enclosed Starter*



*Full Voltage Non-Reversing MCC Starter Unit*

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