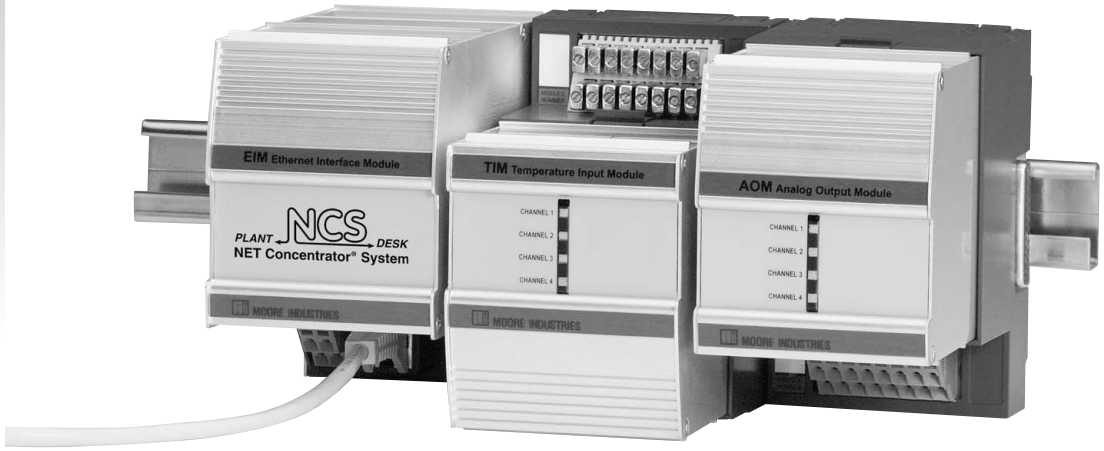
MOORE INDUSTRIES

July 2003
288-701-00 B

NET Concentrator® System with Ethernet Interface

NCS EIM



NCS EIM *NET Concentrator® System with Ethernet Interface*

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The NET Concentrator® System

This is the user's manual for the Moore Industries NET Concentrator® System (NCS), a modular family that provides a link between dispersed field-mounted process monitoring/control equipment and the control room. The NCS transports just a few, or hundreds, of process signals between the field or plant floor and your control room on a single communications network.

The NET Concentrator System is any combination of one Interface Module with one or more I/O modules. If there are multiple Interface Modules on one network, the individual Interface Modules are termed *stations*, while all the combined modules are called a *system*. If there is a single Interface Module on a network, it (and any attached I/O modules) is termed a *system*.

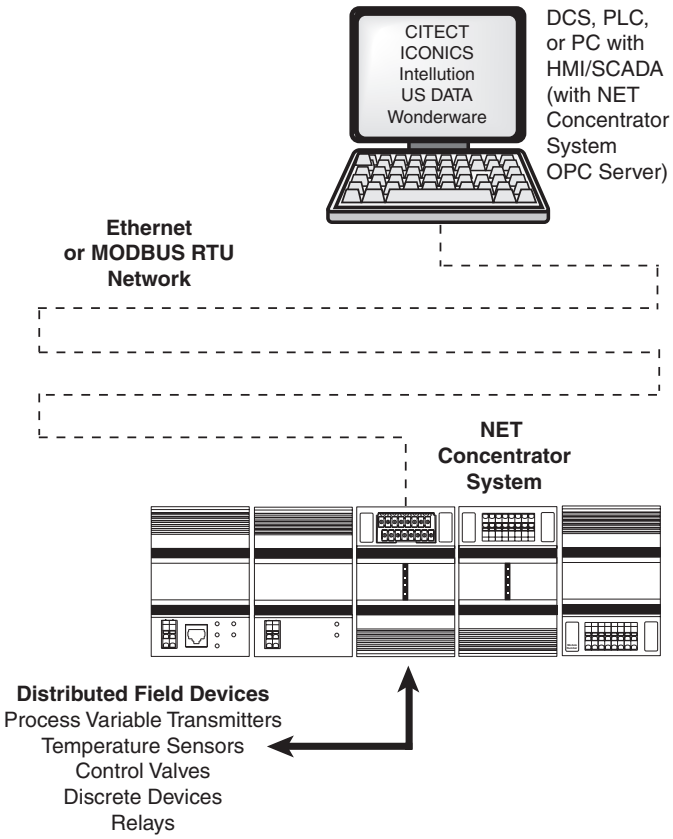
The Interface Module and one or more I/O modules connect together via DB-25 connectors integrated into the side(s) of each module. Any combination of input and output modules may be used within a NET Concentrator System network. Power for between two and four input/output modules, depending on module type, is supplied by the Interface Module. Up to eight additional units can be powered by adding a NET Concentrator System Power Module, or CPM.

About this Manual

Wherever you see a "***Note***", "***Caution***", or "***WARNING***" pay particular attention.

- A "***Note***" provides information to help you avoid minor inconveniences during calibration, installation, or operation of the NCS.
- A "***Caution***" provides information on steps to take in avoiding procedures and practices that could risk damage to the NCS or other equipment.
- A "***WARNING***" provides information on steps to take in avoiding procedures and practices that could pose safety risks to personnel.

Figure 1. *The NET Concentrator System Connects a Variety of Field Devices to Your Controller*



The EIM Ethernet Interface Module

The Ethernet Interface Module (EIM) continuously scans the process variables and fault status of the connected I/O modules, storing this real-time data for access by the control system. The EIM also provides power for one or two I/O modules.

Note:

The EIM Interface Module provides power for up to two Input and/or Output Modules.
If more than two I/O Modules will be connected to the Interface Module, a CPM Concentrator Power Module is required. The CPM may be installed at any position within a NCS station.
It works in conjunction with the Interface Module to power NCS stations of up to eight I/O Modules.

Figure 2. *NET Concentrator System stations consist of one EIM Interface Module combined with up to eight Input/Output Modules.*

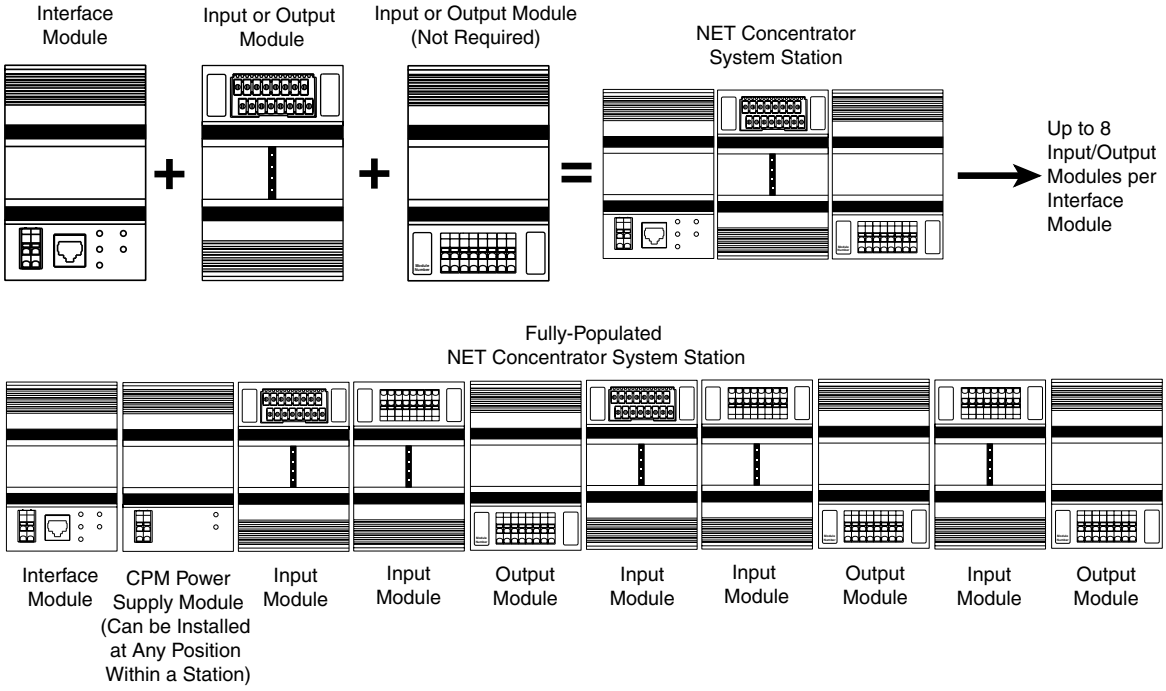
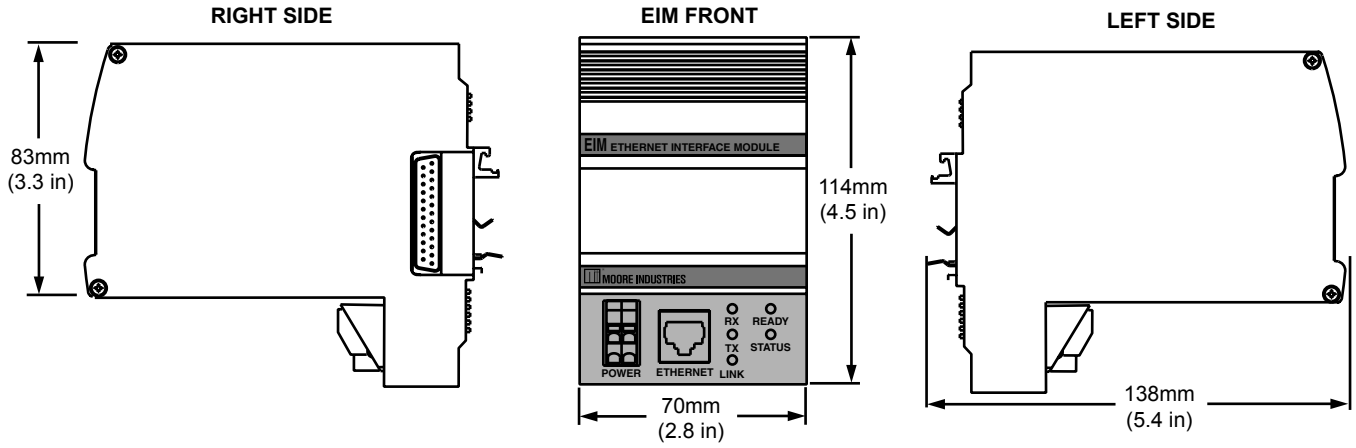


Figure 3. *EIM Dimensional Diagram*



Specifications

EIM Ethernet Interface Module

One Interface Module Required Per NET Concentrator System Station

Communications	**Ethernet Port:** 10/100Base-T supports speeds up to 100Mb/sec. **Ethernet Connection Type:** Standard RJ-45 **Protocol Type:** MODBUS/TCP
Performance	**Data Access Time:** Time to detect or effect a change in an I/O signal from a MODBUS master polling a NET Concentrator System station is the sum of 3 timing components: 1. Network Communication Time: Depends on network architecture and traffic. For a PC locally networked to an NCS station, this time is negligible 2. Scan Time: Time required by the EIM to scan real-time data in all I/O modules within an NCS station (see "Module Scan Time" specification for each I/O module type and add times for each I/O module in the NCS station) 3. Signal Response Time: Time to convert between physical I/O and digital signals (see specification for specific I/O type) **OPC Server:** Allows PC-based software packages to access data from the Ethernet Interface Module; Upon initiation, automatically polls the local intranet, and automatically identifies available I/O modules and individual channel tagnames **Isolation:** 500Vrms, continuous, and will withstand 1000Vrms dielectric strength test for one minute with no breakdown, between power input, Ethernet port, case and terminals of other attached NCS modules **Power Supply:** 20-30Vdc/3.5W maximum **Diagnostic Data:** Fault information provided on the following conditions: I/O channel error; RAM error; file system initialization error; missing system configuration file; missing or corrupted password file; bad clock battery; I/O communication port failure; failure to start an Ethernet service (TCP/IP, FTP, HTTP, NAC or MODBUS/TCP); data logger full; file system full
Status and Fault Indicators	**READY:** Green LED indicates the device has initialized and is running properly **STATUS:** Red/Green LED, normally green, turns red when fault diagnostic status conditions are detected **LINK:** Green LED indicates a network link is present **RX (Receive Status):** Green LED flashes as information is received **TX (Transmit Status):** Green LED flashes as information is transmitted
Data Logger	Records up to 32,000 time-stamped data points; minimum sample period, 1 second; maximum sample period, 24 hours; Real Time Clock (RTC) with non-volatile memory time-stamp data; measurement parameters are software configurable
Ambient Conditions	**Operating Range:** –40°C to +85°C (–40°F to +185°F) **Storage Range:** –40°C to +85°C (–40°F to +185°F) **Relative Humidity:** 0-95%, non-condensing **RFI/EMI Protection:** 20V/m @20-1000MHz, 1kHz AM when tested according to EN61000-4-3-1996
Weight	493 g (17.4 oz)

Specifications and information subject to change without notice.

Connecting the EIM to the Network

Connecting the EIM to the Ethernet network involves *Making the Connections* and *Configuring the EIM Web Server.* To access real-time data using Modbus commands instead of the web server, see *Appendix F: Modbus/TCP Support.*

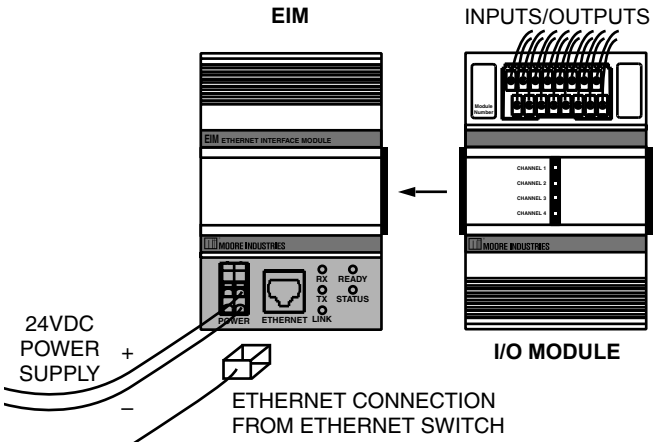
Mounting

The EIM is designed to snap easily onto 32mm, G-type (EN50035) or 35mm Top Hat (EN50022) DIN-rails. Snap the EIM onto the DIN-rail, then snap additional NCS modules onto the DIN-rail to the right of the EIM, and slide together until the DB25 connectors on the side of the EIM connect completely with the unit to its right.

Making the Connections

The EIM requires only three basic connections: power, communication, and input (see Table 1). Connect a 24Vdc power source, an Ethernet cable connected to your network, and I/O modules as shown in Figure 4.

Figure 4. *NET Concentrator System Connection Diagram*



To install the power supply into the terminals, insert a small, flathead screwdriver into the pry slot, open wire terminal and place wire.

Network Connection

Install the EIM onto your Ethernet process network using a CAT 5 cable with an RJ-45 connector to connect the EIM to an Ethernet switch or hub.

Note:

Hubs allow all network traffic through. This can overwhelm connected process instruments on a heavily utilized network. Switches allow only broadcasts and traffic directed to attached devices. It is recommended that switches be used in process networks, instead of hubs.

CE Conformity

Installation of any Moore Industries' product that carries the CE compliance marking (Commission Electrotechnique) must adhere to their respective installation guidelines in order to meet the requirements set forth in applicable EMC (Electromagnetic Compatibility) directive (EN61326). Consult the factory for additional information.

Recommended Ground Wiring Practices

Moore Industries recommends the following ground wiring practices:

Table 1. *Assembling the Necessary Equipment for NCS Hookup*

Device	Description
Ethernet Network Connection	10/100 Base-T UTP
Power Supply	24Vdc
Personal Computer	IBM or compatible PC with: 20Mb free hard disk space Microsoft Windows® 95, 98, 2000, ME, or NT and Internet Explorer 5.0+ with Javascript 1.1 or later. Available network connection (Windows 98, 2000, ME and NT may require additional RAM and hard disk space. See your Windows manual for details.)

• Any Moore Industries product in a metal case or housing should be grounded.

• The NCS individual module bases are mechani cally grounded when installed onto the DIN-rail. Be sure the DIN-rail is connected to a system safety earth ground before making any other con nections.

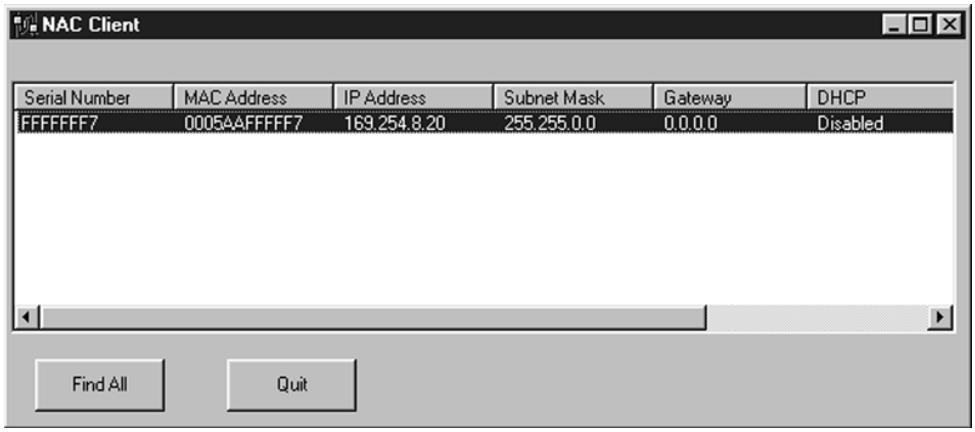
• With the exception of the Ethernet connection, which may use an unshielded, twisted pair, all input signals to, and output signals from, Moore Industries' products should be wired using a shielded, twisted pair technique. Shields are to be connected to an earth or safety ground at one end only.

• The maximum length of unshielded input and output signal wiring should be 2 inches.

Power Sourcing Parameters for General Locations, Intrinsically Safe, and Non-Incendive/Type N applications

In accordance with IEC 1010.1 Annex H (all models), the input terminals must be connected to and/or supplied from a certified energy limiting Class 2 or a Separate Extra Low Voltage (S.E.L.V.) power supply separated from all mains by double/reinforced insulation.

Figure 5. *NAC Client Software Screen*



Note:
If the EIM started using DHCP, the network address information displayed in the list box is how the server is currently configured. When you double click to open the "Edit" window, the network settings boxes are disabled. You cannot set the IP address, subnet mask, or gateway address manually if the server is using DHCP.

Configuring Network Settings

The EIM has a Web Server that is used for configuring the NET Concentrator System of products. To setup your NCS properly, you must configure your EIM for your local area network (LAN). Our Network Address Configuration (NAC) Client software will help you configure the EIM properly. Begin by installing the NAC Client software onto your PC.

Installing the NAC Client

To install the software, insert the EIM CD into the CD drive of a Windows equipped PC. Open the CD and run the *Moore NAC* program, then use the setup program to install the NAC Client. The setup program may require you to upgrade certain Windows components before it will install.

Fixed Network Settings or DHCP

To use the EIM on a given Ethernet network, three settings must be configured– IP address, gateway and subnet mask. The EIM comes with DHCP (dynamic host configuration protocol) enabled, allowing the network settings to be acquired automatically when the EIM is connected to a network with a DHCP server. If connected to a network without a DHCP server, fixed network settings must be configured in the EIM.

Caution:
The use of DHCP introduces the possibility of change or loss of IP address, caused by DHCP server outages or configuration particulars, or by an untimely power outage to the EIM (i.e., coincident with DHCP lease expiration). Use of fixed network settings in the EIM avoids these potential problems.

To access the network settings of an EIM, run the NAC client on a PC connected to the same network as the EIM or, if no network is available, connect a cross-over cable between the Ethernet ports of the EIM and PC.

Start the NAC client by clicking on the icon in the "Start Menu". Once the program is running, click *Find All*. If more than one EIM is on the network, the NAC Client will list them all. Disconnect the network cable from the EIM in question, click *Find All* again and determine which EIM disappeared from the list.

To change the network settings for a station, double click on the station that you want to change. This will open a second window where you can view and change all network settings. Click *OK* when you are finished.

The station will change the settings and respond with a message indicating that the system will reboot in 10 seconds. If you receive an error, you may have not specified the correct username and password or have an incorrect setting in the network window. Note that the new settings do not appear in the NAC utility list window. To view the new network settings, click *Find All* in the NAC utility after the system is rebooted.

Connecting to the EIM Station
Once the EIM station is configured for your network, you can use a web browser to test the station. Open Internet Explorer and type the IP address of the station into the URL bar. Using the example from Figure 5, you would type *http:///169.254.8.20* .

This will bring up the *Login* page. Since the station is in *open* mode, simply click *Login*. When the station is in *closed* mode, you must supply an account name and password to access the web pages, and an administrator-level account is required to change network settings.

Note:
The EIM has a default security setup of Open; no password is required to access any and all levels of the software, simply click "Login".

You can also connect to the station using a FTP client tool. Simply open a FTP connection to the station using its IP address as the site address. The same username and passwords apply as for the web server. However, the default *guest* account does not have FTP access so only the *root* account (default password of *password*) can successfully connect using FTP.

EIM Web Server & Configuration Software

The EIM contains its own configuration program in the form of an embedded web server. Pages can be accessed using your Ethernet connection and an Internet browser. For directions, refer to *Connecting the EIM to the Network*. The Web Server contains these sections (as shown in Figure 6):

1. **Home Page**–This page is the NCS Interface Module Home Page. On it, you will find all the options you will need to configure your system.

2. **Process Status**–This screen continuously monitors and displays the activity of a selected I/O module, updating its display as frequently as every five seconds.

3. **I/O Modules**–This web page allows you to change the settings of the different modules attached to the Interface Module. For example, if you have a TIM attached, this screen will permit you to change the measurement type, input range, and other measurement parameters. Select the appropriate module and channel, adjust the parameters, then press *Commit* to transfer the configuration to the Interface Module.

4. **Interface Module**–The *Interface Module* page includes a number of selections that provide all the necessary options for setting the system parameters of the Interface Module.

   a. System Information–Lists the EIM server information, displays the amount of storage space left in the EIM, and allows you to reclaim (defragment) the lost space.
   b. System Time–Displays the current system (EIM) time in UTC, and allows you to update it to match the current workstation (computer) time.
   c. Modbus Floating Point Word Order–This determines how a Modbus system responds to the longer (32-digit) data strings. It will either read the first 16 digits, then the second 16 digits, or vice versa.
   d. Web Data Display–Allows you to adjust the rate at which the web server updates information and the precision (decimal place) it uses when displaying information.

5. **Data Logger**–The *Data Logger* screen allows you to manipulate the data log of the Interface Module. The Data Log records input information at a selected interval from a specified input channel. From the *Data Logger* page, you can surf to web pages where you can configure the data logger, view the data logger status, or view the data logger files.

   a. Configure Data Logger–This page allows you to configure which modules and channels are being logged, the frequency of the logging, and log file type and size. When the desired settings have been made, start the logger by pressing *Update*, then *Run*.
   b. View Logger Status–Lists the health and specifications (file name, current number of files, and status message) of the data logger.
   c. Data Log–Lists the current log and each recorded value.

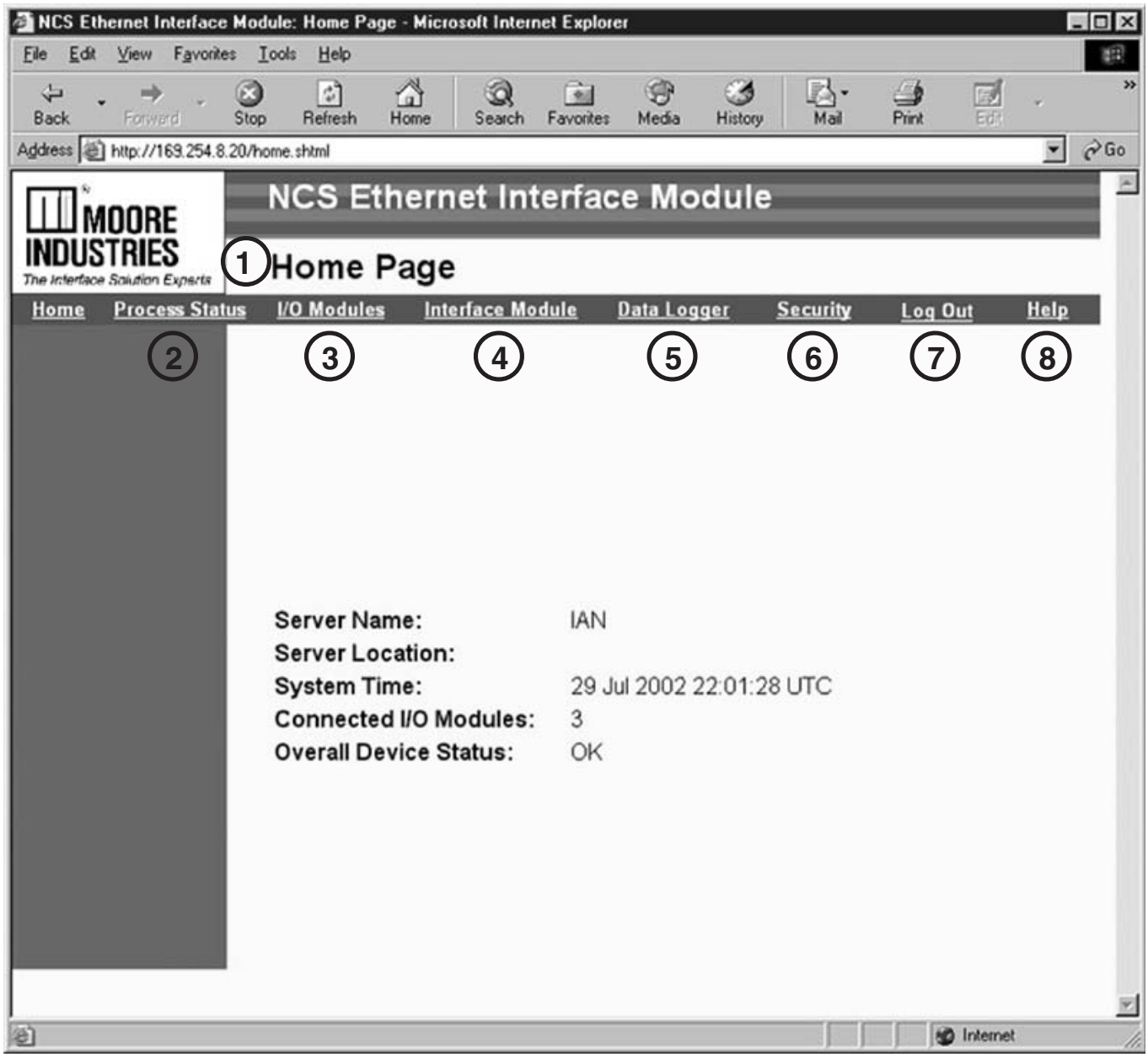
6. **Security**–The *Security* page includes a number of selections that provide all the necessary options for setting the security of the Interface Module. For more information on how to setup user accounts and change access privileges, see *Appendix E: NCS Security Overview*.

   a. User Accounts–Enables you to set the ability of each user to access various pages of the Net Concentrator program, modify passwords, and read or write using a FTP program.
   b. Change Password–The screen where users change their logon password.
   c. Security Mode–Changes the security from *open*, where passwords are unnecessary, to *closed*, where passwords are enforced.

7. **Logout**–Logging Out ends your session.

8. **Help**–Starts the HelpMap Navigation System.

Figure 6. *The EIM Web Server is used to set the parameters of each attached NCS module*



The TIM Temperature Input Module

The Temperature Input Module (TIM) of the NCS family isolates and conditions up to four temperature signals and relays temperature information from these inputs to the Interface Module.

Installing the TIM

Installation consists of physically mounting the unit, completing the input connections, and grounding the unit.

Mounting
The TIM is designed to snap easily onto 32mm, G-type (EN50035) or 35mm Top Hat (EN50022) DIN-rails. Snap the TIM onto the DIN-rail to the right of the NCS module, then slide it along the rail until the DB25 connectors on the side of the TIM connect completely with the unit to its left. See Figure 7 for illustration.

Recommended Ground Wiring Practices
Moore Industries recommends the following ground wiring practices:

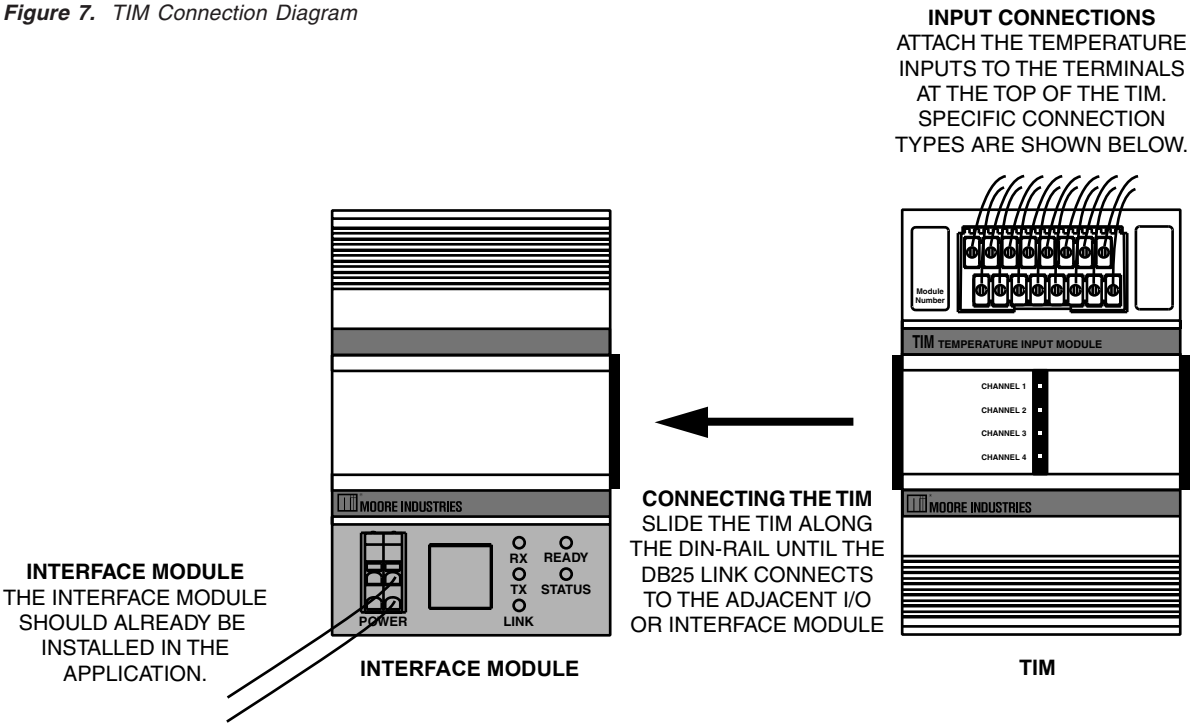
- Any Moore Industries product in a metal case or housing should be grounded.
- The NCS individual module bases are mechanically grounded when installed onto the DIN-rail. Be sure the DIN-rail is connected to a system safety earth ground before making any other connections.
- All input signals to, and output signals from, Moore Industries' products should be wired using a shielded, twisted pair technique. Shields are to be connected to an earth or safety ground near the unit itself.
- The maximum length of unshielded input and output signal wiring should be 2 inches.

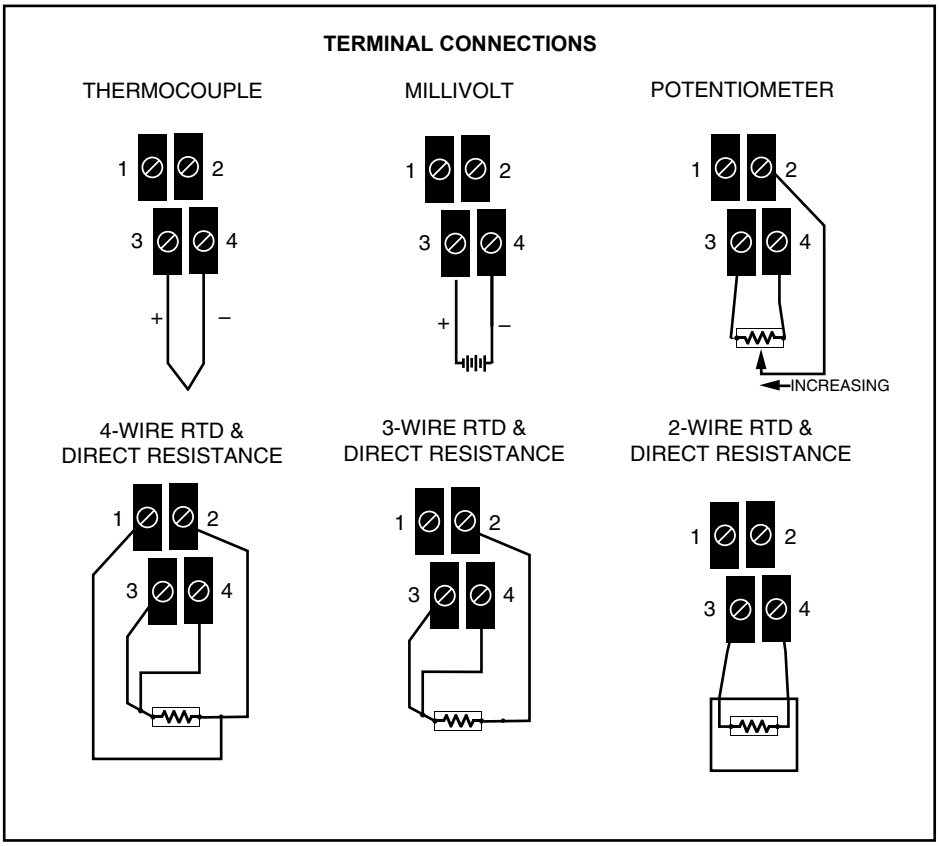
Input Connections
After mounting, you are ready to connect the inputs to the TIM. Since the TIM receives power from the connected Interface Module, only the temperature sensor inputs need to be connected. Figure 7 shows the connection diagrams for the TIM.

"Hot Swapable" I/O Modules
Should an Input/Output Module need to be replaced, simply program a new module, remove the old module from the mounting base and snap in the new one. For more specific instructions, see *Appendix H: Hot-Swapping a NET Concentrator Module*.

CE Conformity
Installation of any Moore Industries' product that carries the CE compliance marking (Commission Electro technique) must adhere to their respective installation guidelines in order to meet the requirements set forth in applicable EMC (Electromagnetic Compatibility) directive (EN61326). Consult the factory for additional information.

Figure 7. *TIM Connection Diagram*





Configuring the TIM

The TIM is configured using the web server contained within the connected Interface Module. To configure the TIM, you must first mount it to the Interface Module as described in *Installing the TIM*. To access real-time data using modbus commands instead of the web server, see *Appendix F: Modbus/TCP Support.*

After mounting, bring up the NCS configuration software by starting an Internet browser on a computer attached to the same network as the NCS, and typing *http://* followed by the IP address that the Moore Industries' NAC Client software lists for your Interface Module.

Once you have accessed the NCS configuration software, click on *I/O Module*, then *Configure Temperature Input Module.* This will display the screen shown in Figure 8. Configure the parameters listed on the screen, and when you are finished, press *Commit*. See below for a description of the different parts of the screen.

Current Channel
The TIM accepts four different temperature inputs, and uses a separate channel for each. Select the channel you wish to program.

Channel Not Used
Checking this box will cause the TIM and its associated Interface Module to ignore the selected channel, allowing you to use less than all four channels without receiving error messages.

Input Configuration
This programs the type of input that the TIM will receive. Different measurement types require different parameters to be programmed. When a measurement type is selected, other parameters may become red, indicating that these parameters must be programmed.

Input Ranging
Allows you to either input or capture the upper and lower ranges that you want to have measured.

Ambient Temperature
Checking this box causes the TIM to measure the temperature at the RJC sensor and causes the attached Interface Module to scan this value from the TIM. The temperature is stored in a modbus register titled *Ambient Temperature* and cannot be accessed through the web server. To access this register, refer to *Appendix F: Modbus/TCP Support.*

File Management
If you have a common configuration, it will be easier to create the configuration you want and save it to a file so that you can load it into your next NCS.

Broken Wire Detection
Checking this causes the TIM to perform continuous sensor diagnostics, monitoring the sensor and sending the output upscale or downscale during a failure.

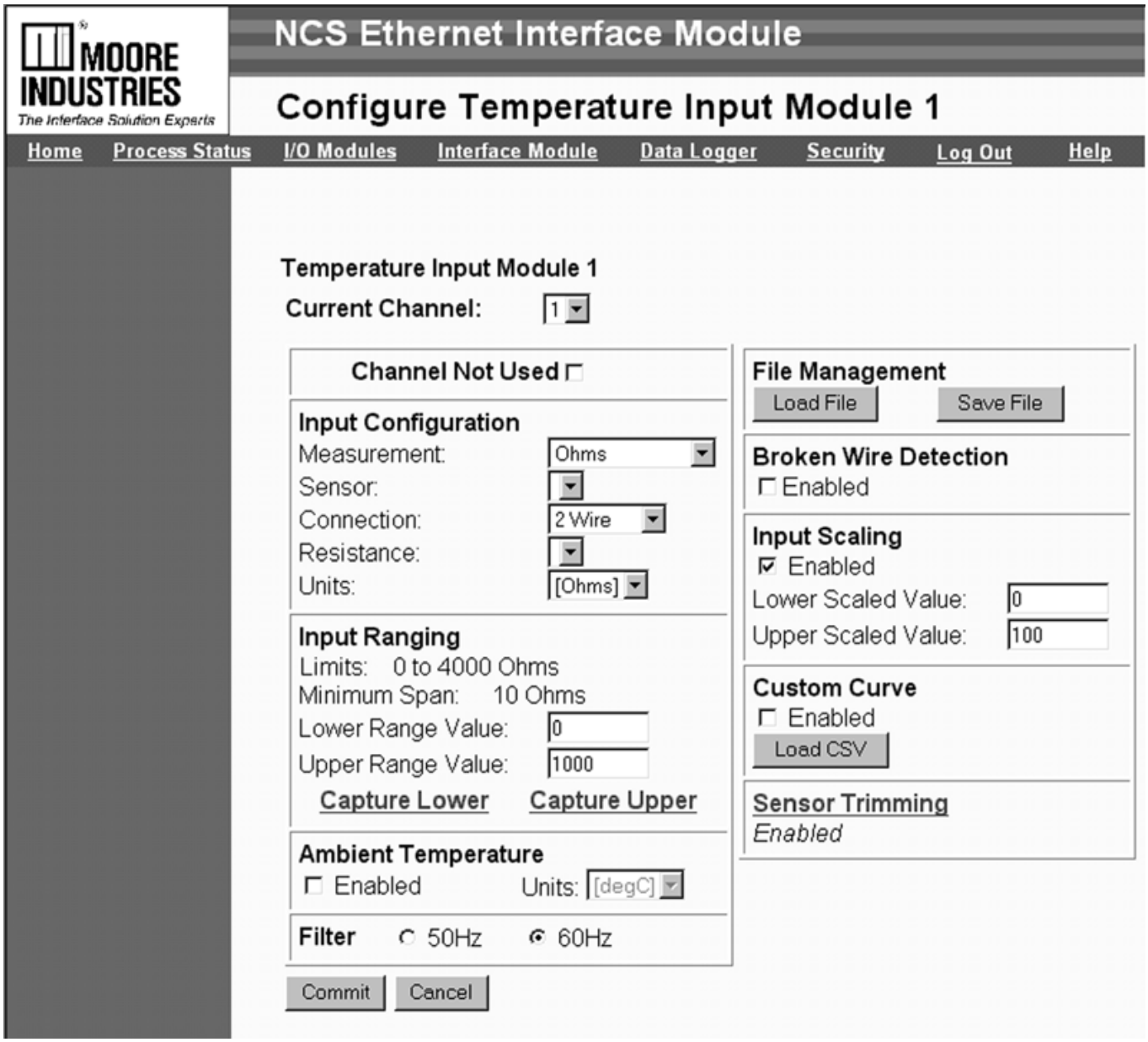
Input Scaling
Input Scaling allows you to take the input and convert it to a different range. For example, you take a channel with a 0-1000°C range and scale it to 0-100°C; now when the input is 734°C, it is relayed to the Interface Module as 73.4°C.

Custom Curve
The Custom Curve box allows you to setup a custom linearization table of up to 128 points that will tell the TIM what value to output when a certain input is received. This is accomplished by loading into memory a *comma-separated value* file (.csv) that was created in Excel® or a similar program. Refer to *Appendix G* for instructions on loading a custom curve file.

Sensor Trimming
The TIM can be trimmed with two data points within the selected zero and span measurement range. This allows a complete range to be monitored, while placing a measurement emphasis on the most critical segment of the process range.

Commit/Cancel Buttons
Click *Commit* when you are finished selecting parameters to save the settings to memory. *Cancel* ends your configuration.

Figure 8. *TIM Configuration Web Page*



Specifications

TIM Temperature Input Module (4 Channels)

(Up to Eight Per Interface Module)

Performance	**Input Ranges:** See Table 2 **Accuracy:** See Table 2 **Reference Junction Compensation Accuracy:** ±0.25°C **Input Resolution:** 20-bit **Stability (% of max. span):** RTD: 1-year, 0.013%; 3-year, 0.023%; 5-year, 0.029% Thermocouple: 1-year, 0.0084%; 3-year, 0.015%; 5-year, 0.019% **Isolation:** 500Vrms, continuous, from channel to channel, from each channel to case, and from each channel to terminals of other attached NCS modules; will withstand 1000Vrms dielectric strength test for one minute, with no breakdown, from each channel to case, and from each channel to terminals of other attached NCS modules **Scan Time:** The time required for the Interface Module to access process variable and status data from all four channels of the TIM is 16ms
Performance (continued)	**Response Time:** 150ms **Input Impedance (T/C):** 40Mohms, nominal **Maximum Input Overrange:** ±5Vdc peak, maximum **Excitation Current (RTD and Ohms):** 250 microamps nominal **Power Supply:** Power is supplied by the Interface Module, 1.5W maximum **Linearization Capability:** Custom curve tables can be configured with up to 128 points using Internet Explorer web pages or PC-based software **Input Filter:** Programmable for 50 or 60Hz noise rejection **Diagnostic Information:** Status data available when polling channels includes A/D saturated; input signal out of linearized range; broken RJC; broken sensor wire (#1, #2, #3, or #4); run-time failure; EEPROM failure; A/D converter fail
Status and Fault Indicators	One red/green LED per channel indicates proper channel operation (green) or that the channel is in a fault condition (red)
Ambient Conditions	**Operating Range:** –40°C to +85°C (–40°F to +185°F) **Storage Range:** –40°C to +85°C (–40°F to +185°F) **Ambient Temperature Effect:** See Table 1 **Effect on Reference Junction Compensation:** ±0.005°C/°C **Relative Humidity:** 0-95%, non-condensing **RFI/EMI Immunity:** 20V/m @20-1000MHz, 1kHz AM when tested according to ENC6100-4-3-1996; Effect on RTD/Ohms Input: 0.4°C/0.1Ohms, maximum; Effect on Thermocouple/Millivolt Input: 1.0°C/40uV, maximum **Common Mode Rejection:** 100dB@50/60Hz **Normal Mode Rejection:** 50dB typical@0.2V peak-to-peak, 50/60Hz
Weight	589 g (20.7 oz)

Specifications and information subject to change without notice.

Figure 9. *TIM Dimensions*

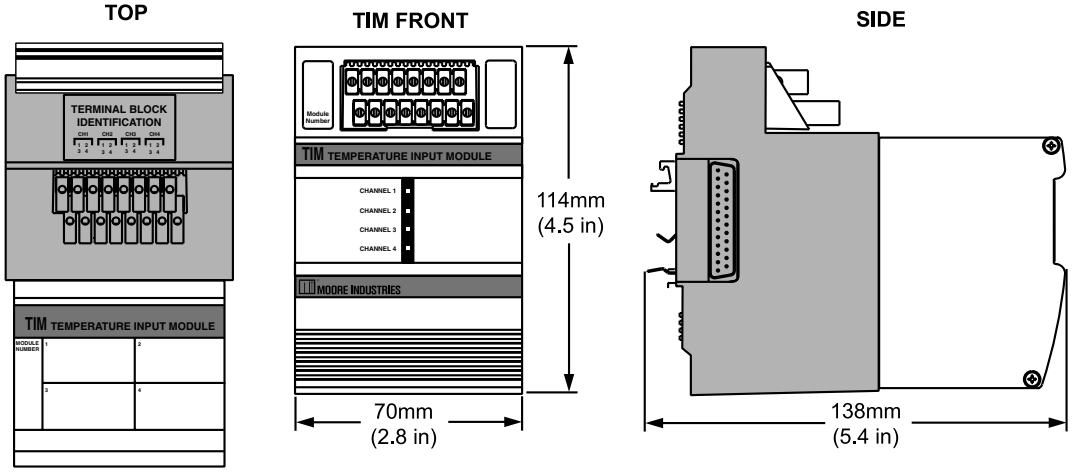


Table 2. *TIM Temperature Input Type and Accuracy Table.*

Input	Type	α	Ohms	Conformance Range	Minimum Span	Input Accuracy	Maximum Range	Ambient Temperature Accuracy/°C Change
RTD (2-, 3-, 4-Wire)	**Platinum**	0.003850	100	-200 to 850°C -328 to 1562°F	10°C (18°F)	±0.1°C (±0.18°F)	-240 to 960°C -400 to 1760°F	0.0035°C (0.0063°F)
			200					
			300					
			400					
			500					
			1000					
		0.003902	100	-100 to 650°C -148 to 1202°F			-150 to 720°C -238 to 1328°F	
			200					
			400					
			500					
			1000					
		0.003916	100	-200 to 510°C -328 to 950°F			-240 to 580°C -400 to 1076°F	
	Nickel	0.00672	120	-80 to 320°C -112 to 608°F		±0.14°C (±0.25°F)	-100 to 360°C -148 to 680°F	0.002°C (0.0036°F)
	Copper	0.00427	9.035	-50 to 250°C -58 to 482°F		±1.6°C (±2.88°F)	-65 to 280°C -85 to 536°F	0.0035°C (0.0063°F)
Ohms	**Direct Resistance**	n/a	0-4000ohms	0-4000ohms	10ohms	±0.4ohms	0-4095ohms	0.002ohms + 0.005% of reading
	Potentiometer		100-4000ohms	0-100%	10%	±0.1%	0-100%	
T/C	**J**	n/a	n/a	-180 to 760°C -292 to 1400°F	35°C (63°F)	±0.25°C (±0.45°F)	-210 to 770°C -346 to 1418°F	0.00016°C + 0.005% of reading
	K	n/a	n/a	-150 to 1370°C -238 to 2498°F	40°C (72°F)	±0.3°C (±0.54°F)	-270 to 1390°C -454 to 2534°F	0.0002°C + 0.005% of reading
	E	n/a	n/a	-170 to 1000°C -274 to 1832°F	35°C (63°F)	±0.25°C (±0.45°F)	-270 to 1013°C -454 to 1855.4°F	0.00026°C + 0.005% of reading
	T	n/a	n/a	-170 to 400°C -274 to 752°F	35°C (63°F)	±0.25°C (±0.45°F)	-270 to 407°C -454 to 764.6°F	0.0001°C + 0.005% of reading
	R	n/a	n/a	0 to 1760°C 32 to 3200°F	50°C (90°F)	±0.55°C (±0.99°F)	-50 to 1786°C -58 to 3246.8°F	0.00075°C + 0.005% of reading
	S	n/a	n/a	0 to 1760°C 32 to 3200°F	50°C (90°F)	±0.55°C (±0.99°F)	-50 to 1786°C -58 to 3246.8°F	0.00075°C + 0.005% of reading
	B	n/a	n/a	400 to 1820°C 752 to 3308°F	75°C (135°F)	±0.75°C (±1.35°F)	200 to 1836°C 392 to 3336.8°F	0.0038°C + 0.005% of reading
	N	n/a	n/a	-130 to 1300°C -202 to 2372°F	45°C (81°F)	±0.4°C (±0.72°F)	-270 to 1316°C -454 to 2400.8°F	0.0003°C + 0.005% of reading
	C	n/a	n/a	0 to 2300°C 32 to 4172°F	100°C (180°F)	±0.8°C (±1.44°F)	0 to 2338°C 32 to 4240.4°F	0.00043°C + 0.005% of reading
mV	**DC**	n/a	n/a	-50 to 1000mV	4 mV	15 microvolts	n/a	0.5 microvolts + 0.005%

The AIM Analog Input Module

The Analog Input Module (AIM) of the NCS family isolates and conditions four analog signals and relays input information to the Interface Module.

Installing the AIM

Installation consists of physically mounting the unit, completing the input connections, and grounding the unit.

Mounting
The AIM is designed to snap easily onto 32mm, G-type (EN50035) or 35mm Top Hat (EN50022) DIN-rails. Snap the AIM onto the DIN-rail to the right of the NCS unit, then slide it along the rail until the DB25 connectors on the side of the AIM connect completely with the unit to its left. See Figure 10 for illustration.

Recommended Ground Wiring Practices
Moore Industries recommends the following ground wiring practices:

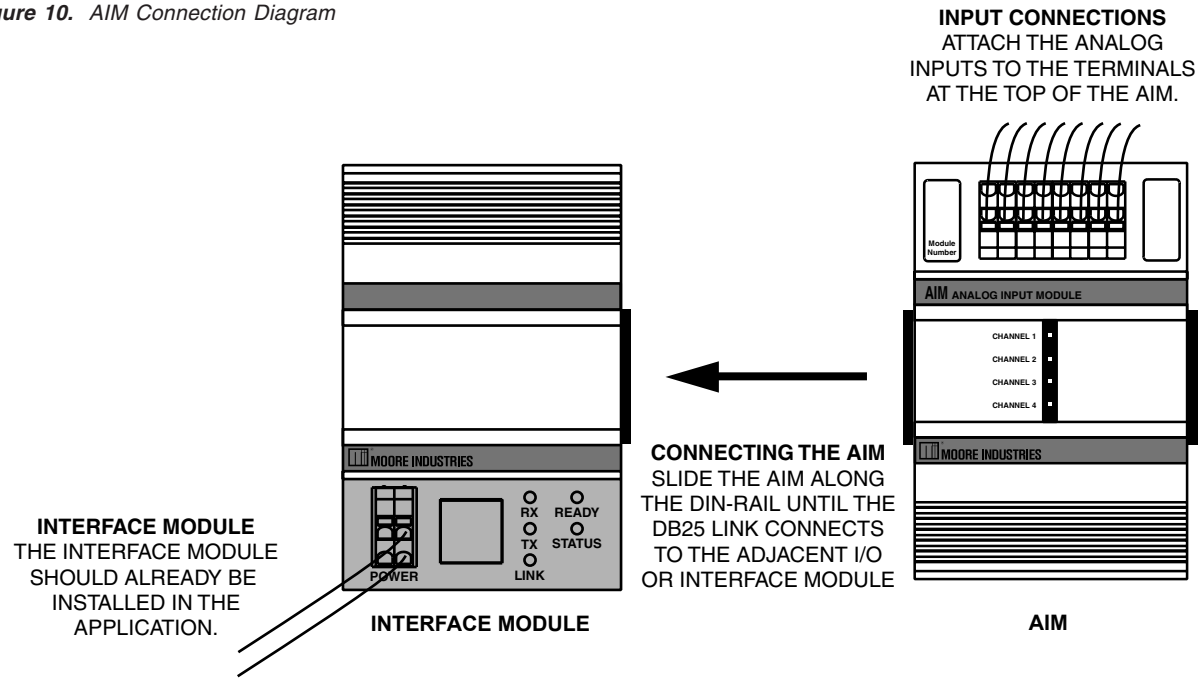
- Any Moore Industries product in a metal case or housing should be grounded.
- The NCS individual module bases are mechanically grounded when installed onto the DIN-rail. Be sure the DIN-rail is connected to a system safety earth ground before making any other connections.
- All input signals to, and output signals from, Moore Industries' products should be wired using a shielded, twisted pair technique. Shields are to be connected to an earth or safety ground near the unit itself.
- The maximum length of unshielded input and output signal wiring should be 2 inches.

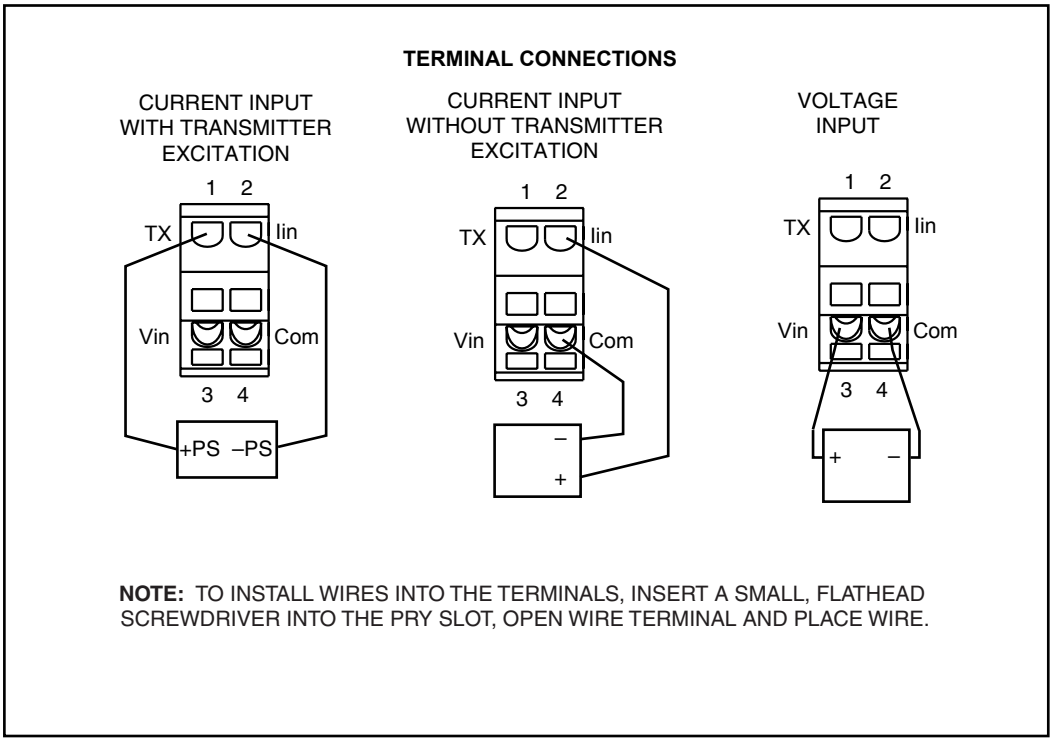
Input Connections
After mounting, it is time to connect the analog inputs to the AIM. Since the AIM receives power from the connected Interface Module, only the analog inputs need to be connected. Figure 10 shows the connection diagrams for an AIM.

"Hot Swapable" I/O Modules
Should an Input/Output Module need to be replaced, simply program a new module, remove the old module from the mounting base and snap in the new one. For more specific instructions, see *Appendix H: Hot-Swapping a NET Concentrator Module*.

CE Conformity
Installation of any Moore Industries' product that carries the CE compliance marking (Commission Electro technique) must adhere to their respective installation guidelines in order to meet the requirements set forth in applicable EMC (Electromagnetic Compatibility) directive (EN61326). Consult the factory for additional information.

Figure 10. *AIM Connection Diagram*





NOTE: TO INSTALL WIRES INTO THE TERMINALS, INSERT A SMALL, FLATHEAD SCREWDRIVER INTO THE PRY SLOT, OPEN WIRE TERMINAL AND PLACE WIRE.

Configuring the AIM

The AIM is configured using the web server contained within the Interface Module it is attached to. To configure the AIM, you must first mount it to the Interface Module as described in *Installing the AIM*. To access real-time data using modbus commands instead of the web server, see *Appendix F: Modbus/ TCP Support.*

After mounting, bring up the NCS configuration software by starting an Internet browser on a computer attached to the same network as the NCS, and typing "http://" followed by the IP address that the Moore Industries NAC Client software lists for your Interface Module.

Once you have accessed the NCS configuration software, click on *I/O Module*, then *Configure Analog Input Module.* This will display the screen shown in Figure 11. Configure the parameters listed on the screen, and when you are finished, press *Commit*. See below for a description of the different parts of the screen.

Current Channel
The AIM accepts four different analog inputs, and uses a separate channel for each. Select the channel you wish to program.

Channel Not Used
Checking this box will cause the AIM and its associated Interface Module to ignore the selected channel, allowing you to use less than all four channels without receiving error messages.

Input Type
This sets the type of input that the AIM will receive. Different measurement types require different parameters to be programmed. When a measurement type is selected, other parameters may become red, indicating that the red parameter must be programmed.

Input Ranging
Allows you to either input or capture the upper and lower ranges that you want to have measured.

Filter
The filter is designed to eliminate noise induced by the AC power. Set this to the Hz rating for the AC power of the country that the unit is located in.

File Management
If you have a common configuration, it will be easier to create the configuration you want and save it to a file so that you can load it into your next NCS.

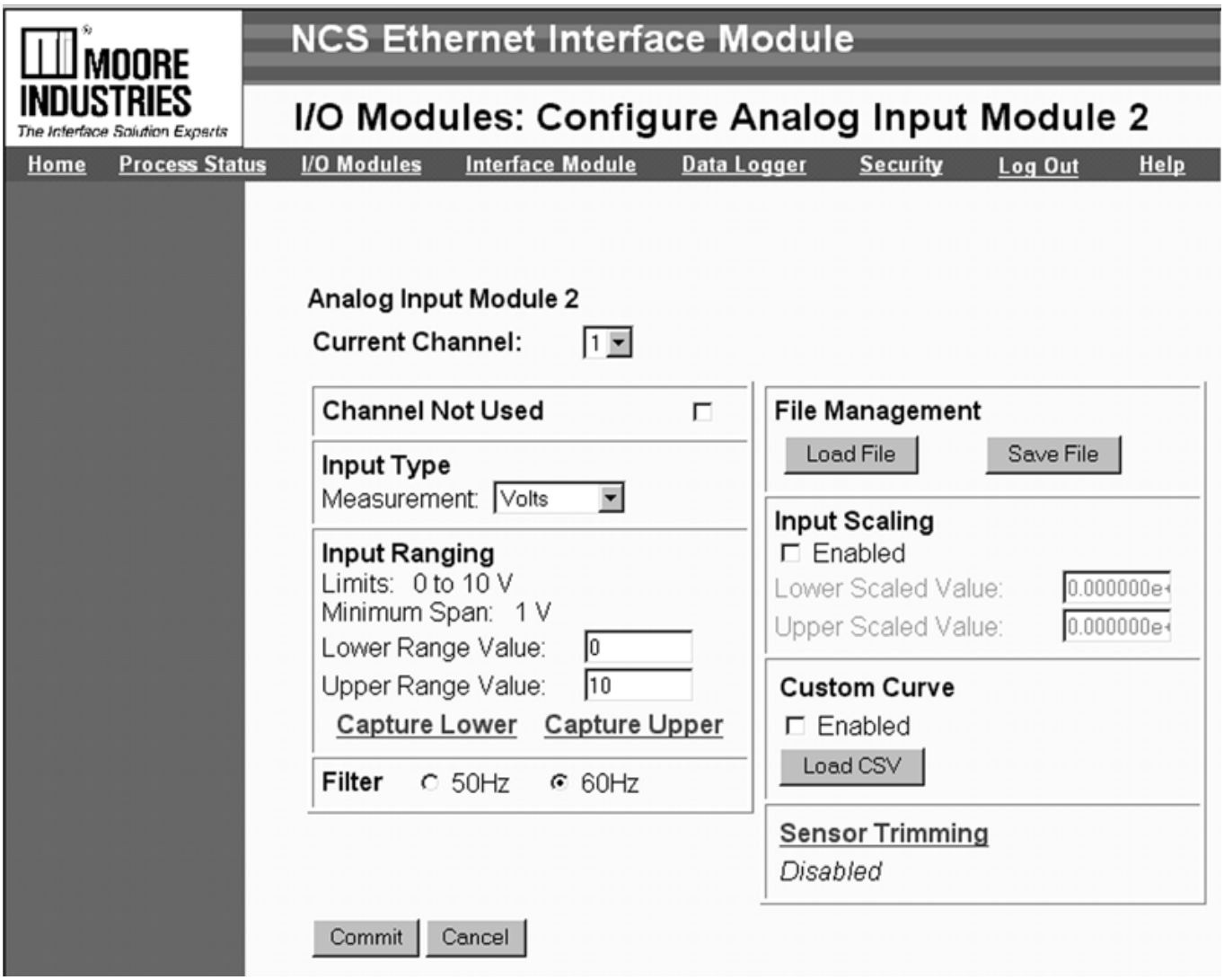
Input Scaling
Input Scaling allows you to take the input and convert it to a different range. For example, you take a channel with a 0-10V range and scale it to 0-100V; now when the input is 7.34V, it is relayed to the Interface Module as 73.4V.

Custom Curve
The Custom Curve box allows you to setup a custom linearization table of up to 128 points that will tell the AIM what value to output when a certain input is received. This is accomplished by loading into memory a *comma-separated value* file (.csv) that was created in Excel® or a similar program. Refer to *Appendix G* for instructions on loading a custom curve file.

Sensor Trimming
The AIM can be trimmed with two data points within the selected zero and span measurement range. This allows a complete range to be monitored, while placing a measurement emphasis on a specific segment of the range most critical to the process.

Commit/Cancel Buttons
Click *Commit* when you are finished selecting parameters to save the settings to memory. *Cancel* ends your configuration.

Figure 11. *AIM Configuration Web Page*



Specifications

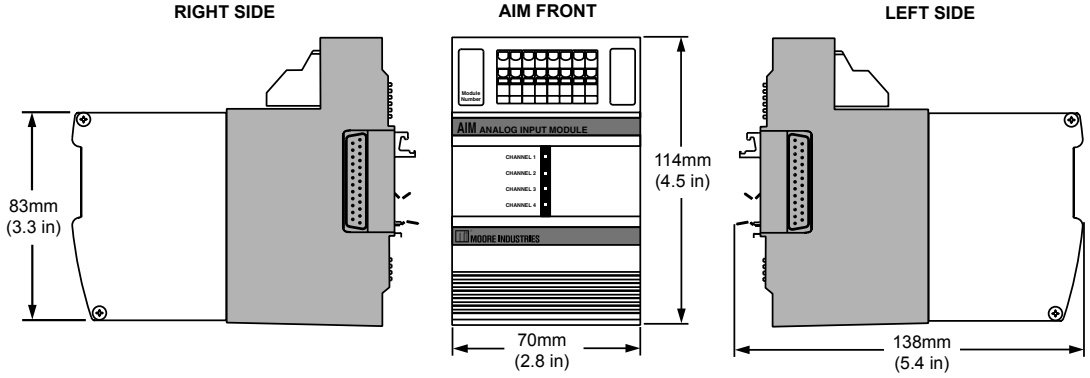
AIM Analog Input Module (4 Channels)

Up to Eight Per Interface Module

Performance	**Input Ranges:** Programmable for any range within: Current, 0-25mA (4mA minimum span) or Voltage, –10V to +10V (1V minimum span) **Accuracy:** ±0.01% of maximum span **Input Resolution:** 20-bit **Stability (% of max. span):** Current: 1-year, 0.047%; 3-year, 0.081%; 5-year, 0.11% Voltage: 1-year, 0.066%; 3-year, 0.11%; 5-year, 0.15% **Isolation:** 500Vrms, continuous, from channel to channel, from each channel to case, and from each channel to terminals of other attached NCS modules; will withstand 1000Vrms dielectric strength test for one minute, with no breakdown, from each channel to case, and from each channel to terminals of other attached NCS modules **Scan Time:** The time required for the Interface Module to access process variable and status data from all four channels of the AIM is 16ms
Performance (continued)	**Response Time:** 60ms **Input Impedance:** Current, 20ohms; Voltage, 1Mohm **Maximum Input Overrange:** Current, ±100mA; Voltage, ±30V **Power Supply:** Power is supplied by the Interface Module, 4W maximum **Input Filter:** User-Programmable for 50Hz or 60Hz noise rejection **Linearization Capability:** Custom curve tables can be configured with up to 128 points using Internet Explorer web pages or PC-based software **Transmitter Excitation:** 21V/24mA excitation for powering a 2-wire transmitter **Diagnostic Information:** Status data available when polling channels includes A/D saturated; input signal out of linearized range; EEPROM failure; A/D converter failure; and run-time failure
Status and Fault Indicators	One red/green LED per channel indicates proper channel operation (green) or that the channel is in a fault condition (red)
Ambient Conditions	**Operating Range:** –40°C to +85°C (–40°F to +185°F) **Storage Range:** –40°C to +85°C (–40°F to +185°F) **Ambient Temperature Effect:** 0.01% of maximum span/°C **Relative Humidity:** 0-95%, non-condensing **RFI/EMI Protection:** 20V/m @20-1000MHz, 1kHz AM when tested according to ENC61000-4-3-1996. **Common Mode Rejection:** 100dB@50/60Hz **Normal Mode Rejection:** Current, 60dB typical@10mA peak-to-peak; Voltage, 60dB typical@1V peak-to-peak, 50/60Hz
Weight	562 g (19.8 oz)

Specifications and information subject to change without notice.

Figure 12. *AIM Dimensions*



The AOM Analog Output Module

The Analog Output Module (AOM) accepts information from the NCS and outputs it as one of four independently configurable analog signals.

Installing the AOM

Installation consists of physically mounting the unit, completing the output connections, and grounding the unit.

Mounting
The AOM is designed to snap easily onto 32mm, G-type (EN50035) or 35mm Top Hat (EN50022) DIN-rails. Snap the AOM onto the DIN-rail to the right of the NCS unit, then slide it along the rail until the DB25 connectors on the side of the AOM connect completely with the unit to its left. See Figure 13 for illustration.

Recommended Ground Wiring Practices
Moore Industries recommends the following ground wiring practices:

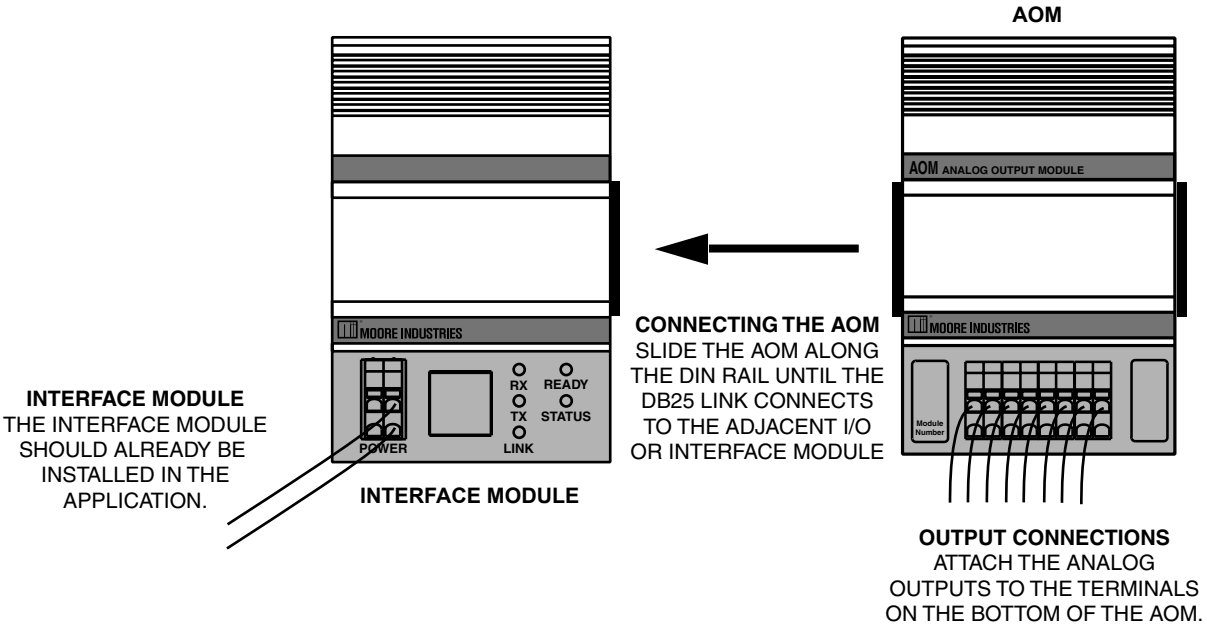
- Any Moore Industries product in a metal case or housing should be grounded.
- The NCS individual module bases are mechanically grounded when installed onto the DIN-rail. Be sure the DIN-rail is connected to a system safety earth ground before making any other connections.
- All input signals to, and output signals from, Moore Industries' products should be wired using a shielded, twisted pair technique. Shields are to be connected to an earth or safety ground at the unit itself.
- The maximum length of unshielded input and output signal wiring should be 2 inches.

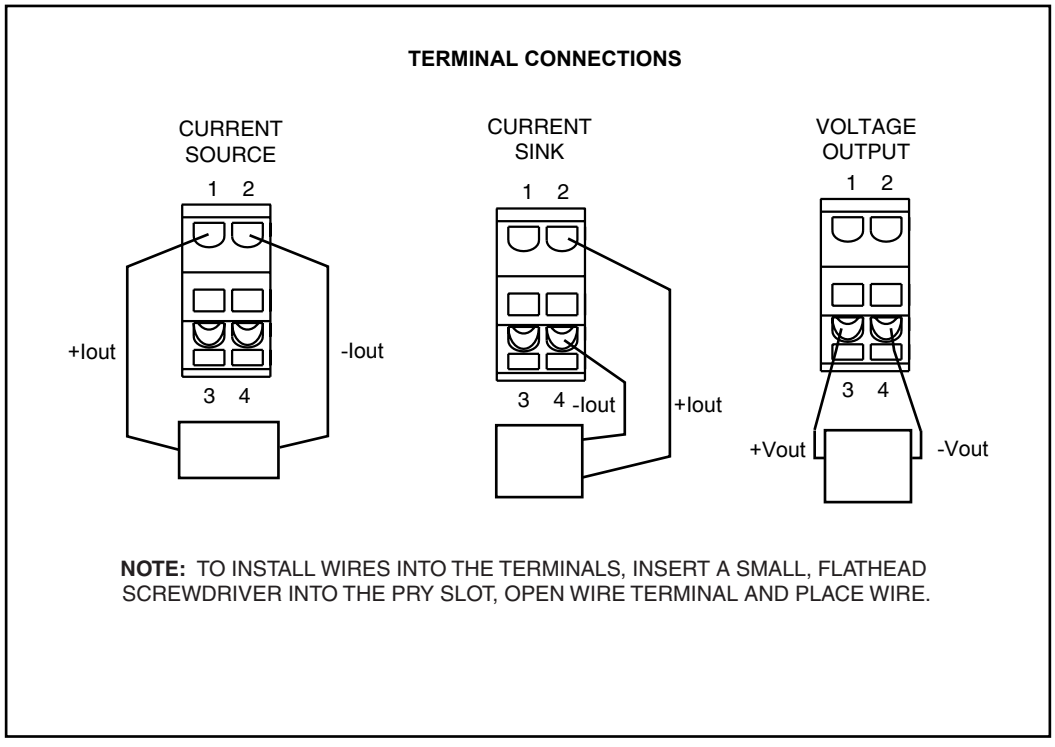
Input and Output Connections
After mounting, it is time to connect the analog outputs to the AOM. Since the AOM receives power from the connected Interface Module, only the analog outputs need to be connected. Figure 13 shows the connection diagrams for an AOM.

"Hot Swapable" I/O Modules
Should an Input/Output Module need to be replaced, simply program a new module, remove the old module from the mounting base and snap in the new one. For more specific instructions, see *Appendix H: Hot-Swapping a NET Concentrator Module*.

CE Conformity
Installation of any Moore Industries' product that carries the CE compliance marking (Commission Electro technique) must adhere to their respective installation guidelines in order to meet the requirements set forth in applicable EMC (Electromagnetic Compatibility) directive (EN61326). Consult the factory for additional information.

Figure 13. *AOM Connection Diagram*





Configuring the AOM

The AOM is configured using the web server contained within the Interface Module it is attached to. To configure the AOM, you must first mount it to the Interface Module as described in *Installing the AOM*. To access real-time data using modbus commands instead of a web server, see *Appendix F: Modbus/TCP Support.*

After mounting, bring up the NCS configuration software by starting an Internet browser on a computer attached to the same network as the NCS, and typing "http://" followed by the IP address that the Moore Industries NAC Client software lists for your Interface Module.

Once you have accessed the NCS configuration software, click on *I/O Module*, then *Configure Analog Output Module.* This will display the screen shown in Figure 14. Configure the parameters listed on the screen, and when you are finished, press *Commit*. See below for a description of the different parts of the screen.

Current Channel
The AOM comes standard with four channels, each independently configurable to handle current or voltage. Select the channel you wish to program.

Channel Not Used
Checking this box will cause the AOM and its associated Interface Module to ignore the selected channel, allowing you to use less than all four channels without receiving error messages.

Output Type
This programs the AOM to output either volt or mA. When an *Output Type* is selected, other parameters may become red, indicating that these parameters must be programmed.

Output Ranging
Allows you to input the upper and lower ranges that you want the AOM to output.

Output Damping
The Output Damping allows you to introduce a delay into the AOM's response to a change in input. The value of the output damping is the number of seconds that it will take for a display to make a 63% change in response to the change in input. A damping time of "0" will disable damping.

Output on Out-of-Range PV
These boxes allow you to enter the value that you want the AOM's output to default to when the monitored input goes out of range.

Loop Test
This function allows you test the other instruments on the loop by setting the AOM to output a specific value. After clicking *Loop Test*, use the arrows to select the desired value and press *Set Value* to begin.

File Management
If you have a common configuration, it will be easier to create the configuration you want and save it to a file so that you can load it into your next NCS.

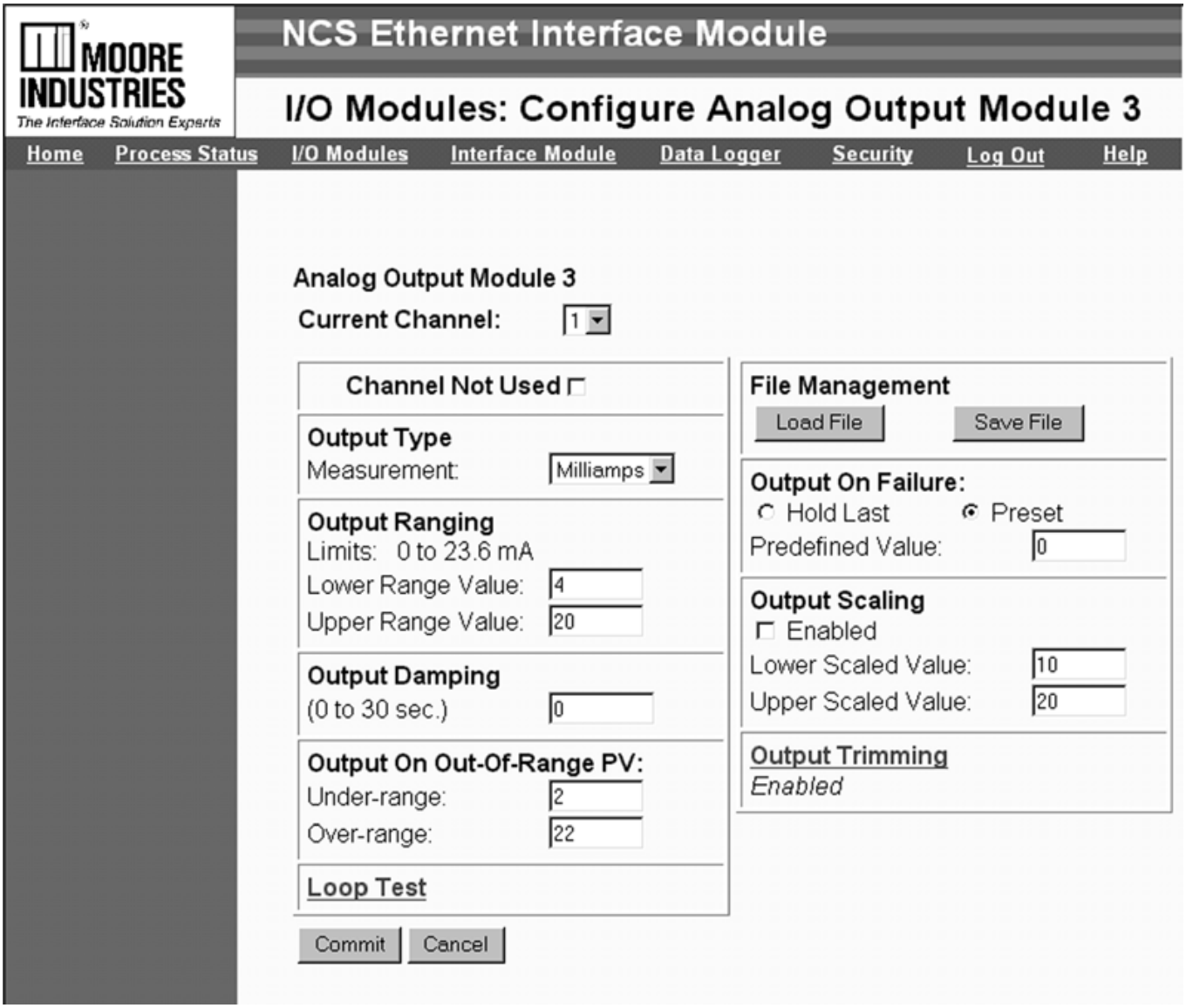
Output on Failure
This section tells the AOM what to do when the monitored input fails entirely. It will either maintain the last value (*Hold Last*), or jump to a predefined value that you input (*Preset Predefined Value*).

Output Scaling
Output Scaling allows you to take the monitored variable and convert it to a different range before you output it.

Output Trimming
The AOM can be trimmed with two data points within the selected zero and span output range. This allows a complete range to be output, while placing an emphasis on a specific segment of the range most critical to the process.

Commit/Cancel Buttons
Click *Commit* when you are finished selecting parameters to save the settings to memory. *Cancel* ends your configuration.

Figure 14. *AOM Configuration Web Page*



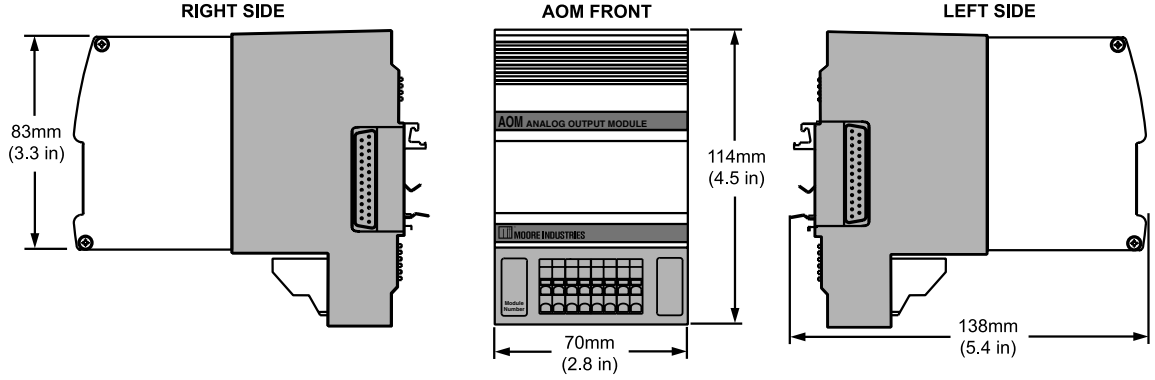
Specifications

AOM Analog Output Module (4 Channels)
Up to Eight per Interface Module

Performance	**Output Ranges:** Programmable for any range within: Current (sink or source), 0-20mA or Voltage, 0-10V **Accuracy:** ±0.015% of maximum span **Output Resolution:** 18-bit **Stability (% of max. span):** Current: 1-year, 0.012%; 3-year, 0.020%; 5-year, 0.026% Voltage: 1-year, 0.066%; 3-year, 0.11%; 5-year, 0.15% **Isolation:** 500Vrms, continuous, from channel to channel, from each channel to case, and from each channel to terminals of other attached NCS modules; will withstand 1000Vrms dielectric strength test for one minute, with no breakdown, from each channel to case, and from each channel to terminals of other attached NCS modules **Scan Time:** The time required for the Interface Module to access process variable and status data from all four channels of the AOM is 16ms **Response Time:** 50ms to 90% of final value on a step input
Performance (continued)	**Output Damping:** Increases response time by adjusting filter time constant from 0-30 seconds **Ripple:** Current, 10mV peak-to-peak measured across a 250ohm load resistor; Voltage, 50mV peak-to-peak maximum **Load Capability:** Current, 0-1000ohms (source), 42V maximum (sink) 1500ohms; Voltage, 0-50mA (2000ohms minimum load) **Output Limiting:** Current output is guaranteed up to 21.6mA (or 10% of full scale above the programmed full value) and limits at 23.6mA; Voltage output accuracy is guaranteed up to 10.5V (or 5% of full scale above the programmed full value) and limits at 11.0V **Load Effect (current outputs):** 0.01% of span from 0 to maximum load resistance on current output **Output Failure Mode:** Outputs are programmable to either hold last value or go to a pre-defined value on error
Performance (continued)	upon lost communication with the Interface Module or upon receiving invalid primary variable data **Power Supply:** Power is supplied by the Interface Module, 4W maximum **Diagnostic Information:** Status data available when polling channels includes ROM failure; RAM failure; EEPROM; open current output; EEPROM checksum error
Status and Fault Indicators	One red/green LED per channel indicates proper channel operation (green) or that the channel is in a fault condition (red)
Ambient Conditions	**Operating Range:** –40°C to +85°C (–40°F to +185°F) **Storage Range:** –40°C to +85°C (–40°F to +185°F) **Ambient Temperature Effect:** 0.01% of maximum span/°C **Relative Humidity:** 0-95%, non-condensing **RFI/EMI Protection:** 20V/m@20-1000MHz, 1kHz AM when tested according to ENC61000-4-3-1996
Weight	765 g (27 oz)

Specifications and information subject to change without notice.

Figure 15. *AOM Dimensions*



The CPM NET Concentrator System Power Module

Normally, an Interface Module can only power two I/O modules; the CPM provides additional power, allowing up to eight I/O modules of any type to be attached to one Interface Module.

Installing the CPM

Installation consists of physically mounting the unit, making the power connections, and grounding the unit.

Mounting

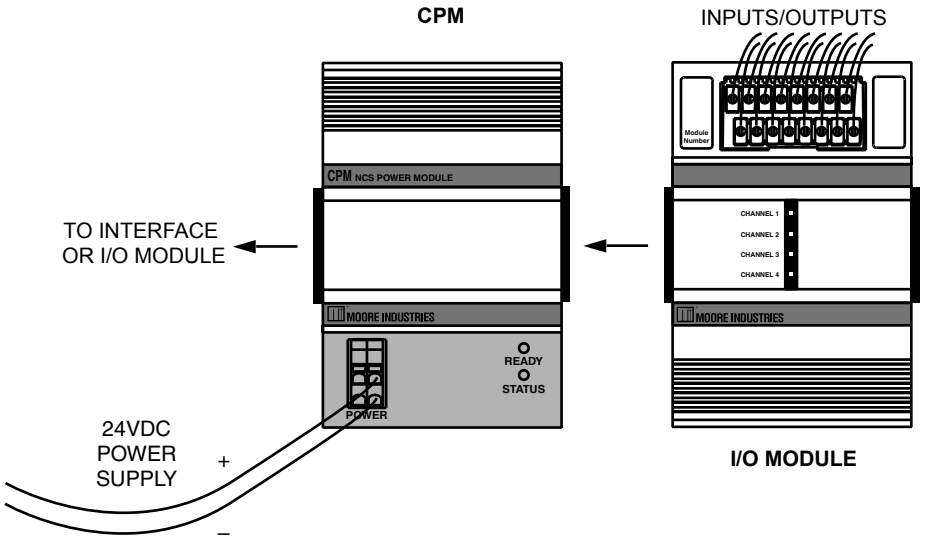
The CPM is designed to snap easily onto 32mm, G-type (EN50035) or 35mm Top Hat (EN50022) DIN-rails. Snap the CPM onto the DIN-rail to the right of any module within the NCS station, then slide it along the rail until the DB25 connectors on the side of the CPM connect completely with the unit to its left. The CPM can be installed at any position within a NET Concentrator System.

Recommended Ground Wiring Practices

Moore Industries recommends the following ground wiring practices:

- Any Moore Industries product in a metal case or housing should be grounded.
- The NCS individual module bases are mechanically grounded when installed onto the DIN-rail. Be sure the DIN-rail is connected to a system safety earth ground before making any other connections.
- The maximum length of unshielded input and output signal wiring should be 2 inches.

Figure 16. *CPM Connection Diagram*



Specifications

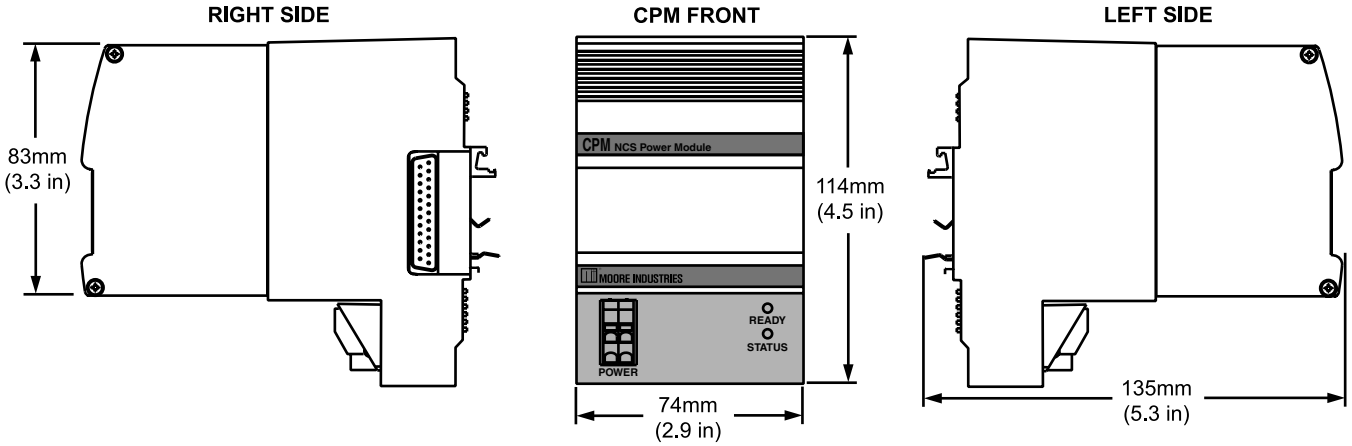
CPM Power Supply Module

One Required Per NET Concentrator System Station if There Are More Than Two Input/Output Modules

Performance	**Inputs (Power):** 20-30Vdc **Output (Power):** Provides power to up to eight NCS I/O modules **Isolation:** 500 Vrms, continuous, and will withstand 1000Vrms dielectric strength test for 1 minute with no breakdown, between power input, each Modbus port, case and terminals of other attached NCS modules **Startup Time:** 10ms **Power Consumption:** 40W maximum	**Status and Fault Indicators**	**Power LED:** A green LED turns on to indicate that power is being supplied to the power terminals. **Status LED:** A green LED turns on to indicate that power is available at the CPM module's output	**Ambient Conditions (continued)**	**Relative Humidity:** 0-95%, non-condensing **RFI/EMI Protection:** 20V/m@20-1000MHz, 1kHz AM when tested according to ENC61000-4-3-1996
		Ambient Conditions	**Operating Range:** –40°C to +85°C (–40°F to +185°F) **Storage Range:** –40°C to +85°C (–40°F to +185°F)	**Weight**	585 g (20.7 oz)

Specifications and information subject to change without notice.

Figure 17. *CPM Dimensions*



Note:

The EIM Interface Module provides power for up to two Input and/or Output Modules.
If more than two I/O Modules will be connected to the Interface Module, a CPM Concentrator Power Module is required. The CPM may be installed at any position within a NCS station.
It works in conjunction with the Interface Module to power NCS stations of up to eight I/O Modules.

Power Connections

After mounting, it is time to power the CPM. Attach 20-30Vdc power as shown in Figure 16.

Power Sourcing Parameters for General Locations, Intrinsically Safe, and Non-Incendive/Type N applications

In accordance with IEC 1010.1 Annex H (all models), the input terminals must be connected to and/or supplied from a certified energy limiting Class 2 or a Separate Extra Low Voltage (S.E.L.V.) power supply separated from all mains by double/reinforced insulation.

CE Conformity

Installation of any Moore Industries' product that carries the CE compliance marking (Commission Electro technique) must adhere to their respective installation guidelines in order to meet the requirements set forth in applicable EMC (Electromagnetic Compatibility) directive (EN61326). Consult the factory for additional information.

The DIM Discrete Input Module

The Discrete Input Module (DIM) of the NCS family isolates and conditions up to eight discrete signals, and relays input information to the Interface Module. The DIM is available for three different discrete input channel types: contact closure, high range voltage, or low range voltage. See the NCS Data Sheet for more information on module types and options.

Installing the DIM

Installation consists of physically mounting the unit, completing the input connections, and grounding the unit.

Mounting
The DIM is designed to snap easily onto 32mm, G-type (EN50035) or 35mm Top Hat (EN50022) DIN-rails. Snap the DIM onto the DIN-rail to the right of the NCS unit, then slide it along the rail until the DB25 connectors on the side of the DIM connect completely with the unit to its left. See Figure 18 for illustration.

Recommended Ground Wiring Practices
Moore Industries recommends the following ground wiring practices:

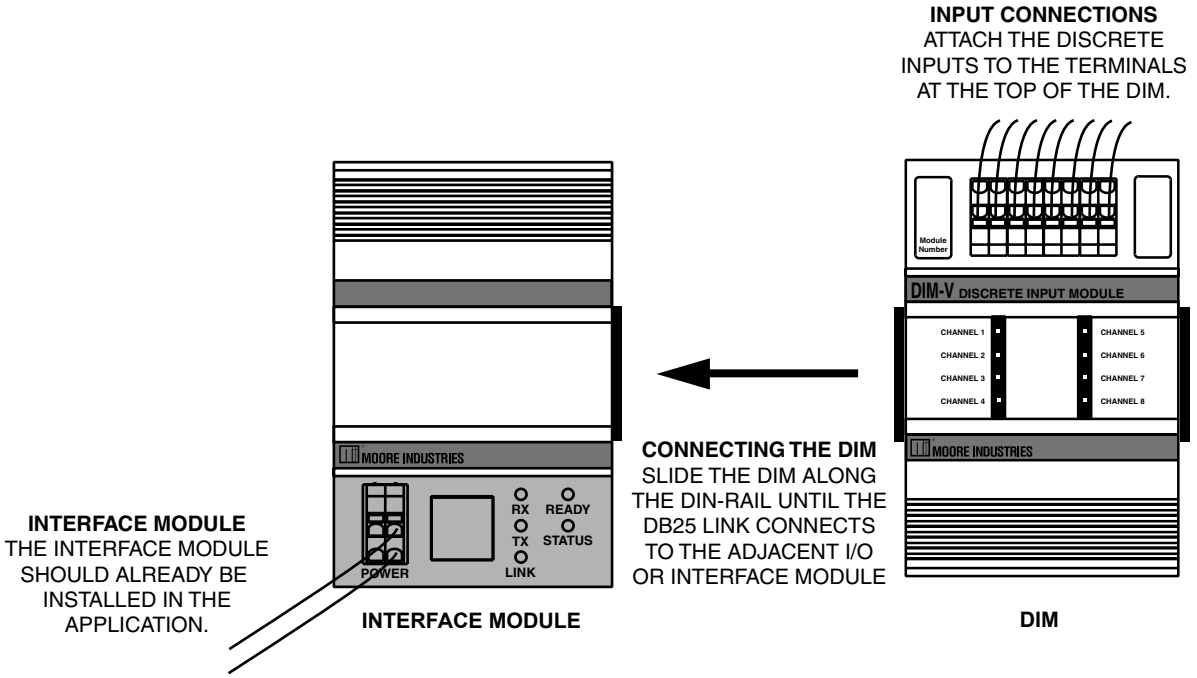
- Any Moore Industries product in a metal case or housing should be grounded.
- The NCS individual module bases are mechanically grounded when installed onto the DIN-rail. Be sure the DIN-rail is connected to a system safety earth ground before making any other connections.
- All input signals to, and output signals from, Moore Industries' products should be wired using a shielded, twisted pair technique. Shields are to be connected to an earth or safety ground near the unit itself.
- The maximum length of unshielded input and output signal wiring should be 2 inches.

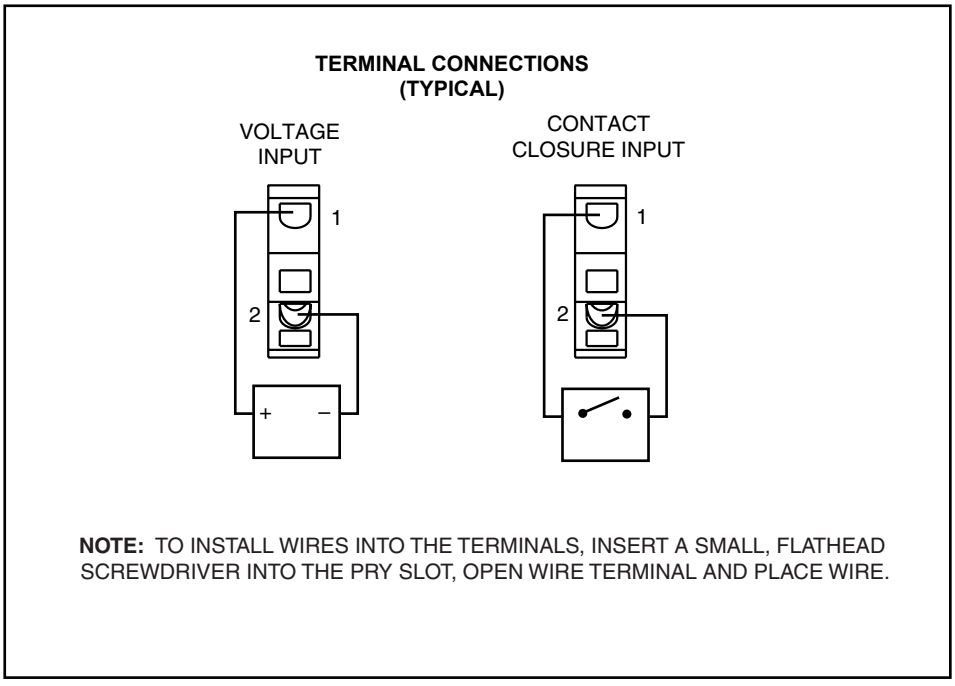
Input Connections
After mounting, it is time to connect the discrete inputs to the DIM. Since the DIM receives power from the connected Interface Module, only the discrete inputs need to be connected. Figure 18 shows the connection diagrams for the DIM.

"Hot Swapable" I/O Modules
Should an Input/Output Module need to be replaced, simply program a new module, remove the old module from the mounting base and snap in the new one. For more specific instructions, see *Appendix H: Hot-Swapping a NET Concentrator Module*.

CE Conformity
Installation of any Moore Industries' product that carries the CE compliance marking (Commission Electro technique) must adhere to their respective installation guidelines in order to meet the requirements set forth in applicable EMC (Electromagnetic Compatibility) directive (EN61326). Consult the factory for additional information.

Figure 18. *DIM Connection Diagram*





NOTE: TO INSTALL WIRES INTO THE TERMINALS, INSERT A SMALL, FLATHEAD SCREWDRIVER INTO THE PRY SLOT, OPEN WIRE TERMINAL AND PLACE WIRE.

Configuring the DIM

The DIM is configured using the web server contained within the Interface Module it is attached to. To configure the DIM, you must first mount it to the Interface Module as described in *Installing the DIM*. To access real-time data using modbus commands instead of the web server, see *Appendix F: Modbus/ TCP Support.*

After mounting, bring up the NCS configuration software by starting an Internet browser on a computer attached to the same network as the NCS, and typing "http://" followed by the IP address that the Moore Industries NAC Client software lists for your Interface Module.

Once you have accessed the NCS configuration software, click on *I/O Module*, then *Configure Discrete Input Module.* This will display the screen shown in Figure 19. Please note that only the Contact Closure DIM units will display the *Contact Debounce* portion of the screen.

Configure the parameters listed on the screen, and when you are finished, press *Commit*. See below for a description of the different parts of the screen.

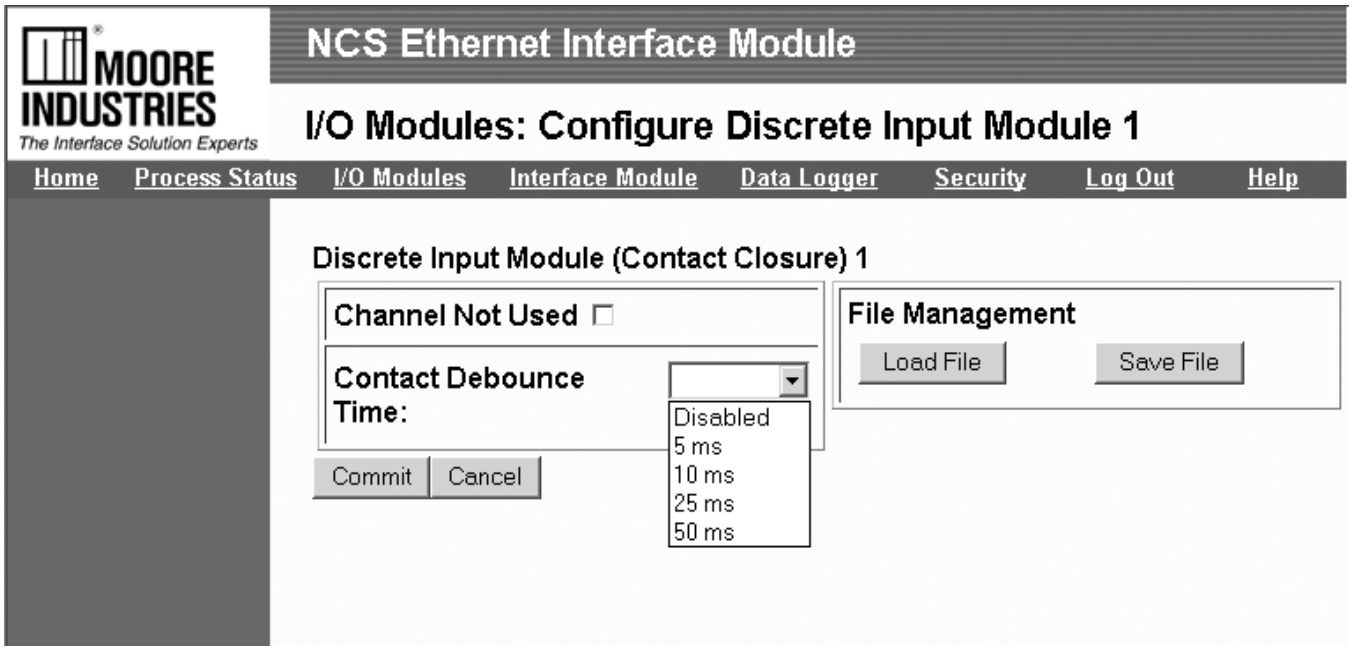
Channel Not Used
Checking this box will cause the Interface Module to ignore the DIM.

Contact Debounce
When some contacts open or close, there can be a short period of oscillation resulting from the mechanical contacts. The *Contact Debounce* setting causes the NCS to ignore false signals caused by these oscillations. This setting is only available with contact closure DIM modules.

File Management
If you have a common configuration, it will be easier to create the configuration you want and save it to a file so that you can load it into your next DIM.

Commit/Cancel Buttons
Click *Commit* when you are finished selecting parameters to save the settings to memory. *Cancel* ends your configuration.

Figure 19. *DIM Configuration Web Page*



Specifications

DIM Discrete Contact Closure Input Module (8 Channels)

Up to Eight Per Interface Module

Performance

Input Ratings: 24V/3.7mA, internally powered
Input Logic Threshold: 8V low-going; 16V high-going
Input Logic: Closed contact input yields logic 1
Isolation: 500Vrms, continuous, from channel to channel, from each channel to case, and from each channel to terminals of other attached NCS modules; will withstand 1000Vrms dielectric strength test for one minute, with no breakdown, from each channel to case,

Performance (continued)

and from each channel to terminals of other attached NCS modules
Scan Time: 4ms
Response Time: <12ms with contact debounce disabled
Power Supply: Power is supplied by the Interface Module, 3W maximum
Diagnostic Information: Status data available when polling channels, includes: ROM failure; RAM failure; EEPROM checksum error

LED Indicators

One red/green LED per channel indicates input state, with red indicating open contact input

Ambient Conditions

Operating Range: –40°C to +85°C (–40°F to +185°F)
Storage Range: –40°C to +85°C (–40°F to +185°F)
Relative Humidity: 0-95%, non-condensing
RFI/EMI Protection: 20V/m @20-1000MHz, 1kHz AM when tested according to IEC1000-4-3-1995

Weight 493 g (17.4 oz)

DIM Discrete Voltage Input Module (8 Channels)

Up to Eight Per Interface Module

Performance

Input Ratings: Low Range, 30Vac/Vdc; High Range: 120/240Vac/Vdc
Input Logic Threshold: Low Range: <9Vac or DC guaranteed low, >15Vac or DC guaranteed high; High Range: <55Vac guaranteed low, >90Vac guaranteed high
Input Logic: Input above threshold yields logic 1; Input below threshold yields logic 0
Input Impedance: Each input draws <4mA when on
Isolation: 500Vrms, continuous, from channel to channel, from each channel to case, and from each channel to terminals of other

Performance (continued)

attached NCS modules; will withstand 1000Vrms dielectric strength test for one minute, with no breakdown, from each channel to case, and from each channel to terminals of other attached NCS modules
Scan Time: 4ms
Response Time: <30ms
Maximum Input Overrange: Up to 260Vac/Vdc
Power Supply: Power is supplied by the Interface Module, 1W maximum
Diagnostic Information: Status data available when polling channels, includes: ROM failure; RAM failure; EEPROM checksum error

LED Indicators

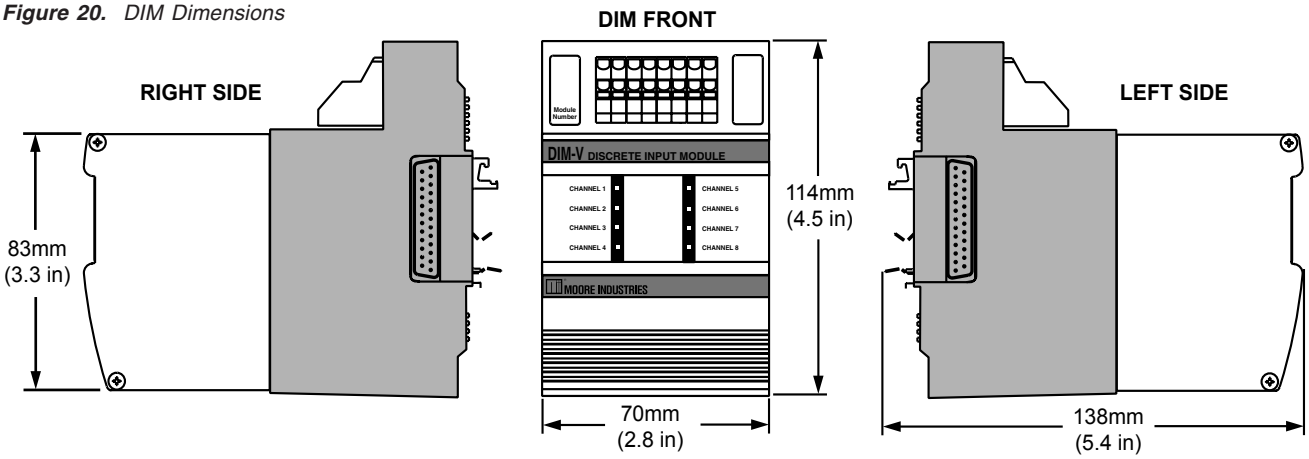
One red/green LED per channel indicates input state, with red indicating input below threshold

Ambient Conditions

Operating Range: –40°C to +85°C (–40°F to +185°F)
Storage Range: –40°C to +85°C (–40°F to +185°F)
Relative Humidity: 0-95%, non-condensing
RFI/EMI Protection: 20V/m @20-1000MHz, 1kHz AM when tested according to IEC1000-4-3-1995

Weight 536 g (18.8 oz)

Figure 20. *DIM Dimensions*



The ROM Relay Output Module

The Relay Output Module (ROM) accepts information from the NCS and outputs it to either four or eight independently configurable relay signals.

Installing the ROM

Installation consists of physically mounting the unit, completing the output connections, and grounding the unit.

Mounting
The ROM is designed to snap easily onto 32mm, G-type (EN50035) or 35mm Top Hat (EN50022) DIN-rails. Snap the ROM onto the DIN-rail to the right of the NCS unit, then slide it along the rail until the DB25 connectors on the side of the ROM connect completely with the unit to its left. See Figure 21 for illustration.

Recommended Ground Wiring Practices
Moore Industries recommends the following ground wiring practices:

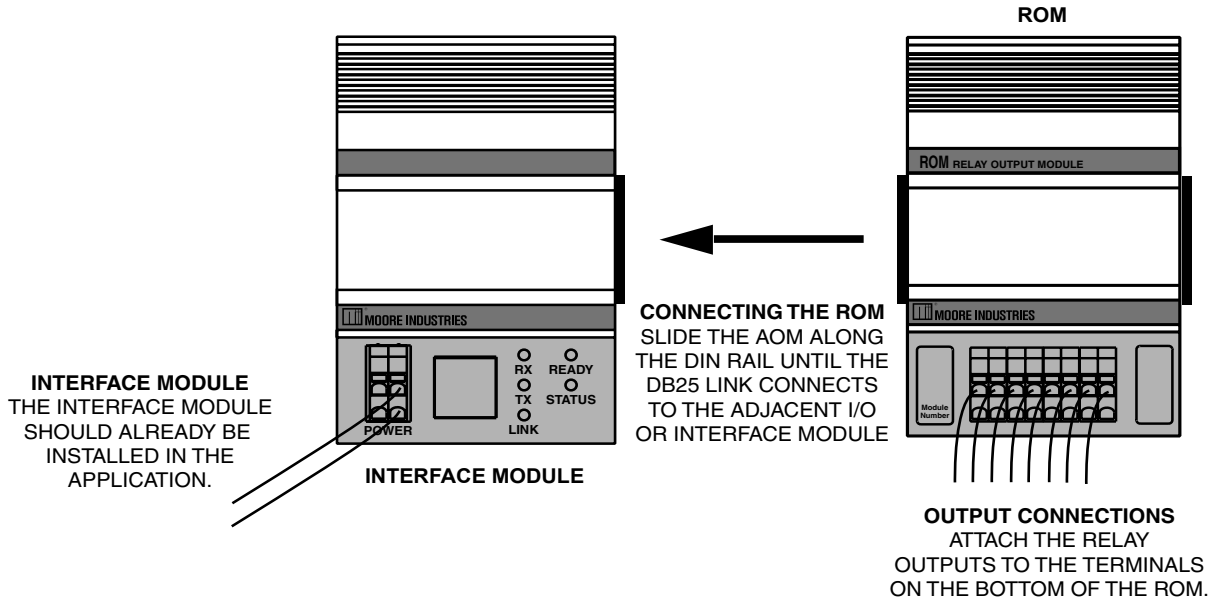
- Any Moore Industries product in a metal case or housing should be grounded.
- The NCS individual module bases are mechanically grounded when installed onto the DIN-rail. Be sure the DIN-rail is connected to a system safety earth ground before making any other connections.
- All input signals to, and output signals from, Moore Industries' products should be wired using a shielded, twisted pair technique. Shields are to be connected to an earth or safety ground near the unit itself.
- The maximum length of unshielded input and output signal wiring should be 2 inches.

Input Connections
After mounting, it is time to connect the relay outputs to the ROM. Since the ROM receives power from the connected Interface Module, only the relay outputs need to be connected. Figure 21 shows the connection diagrams for a ROM.

"Hot Swapable" I/O Modules
Should an Input/Output Module need to be replaced, simply program a new module, remove the old module from the mounting base and snap in the new one. For more specific instructions, see *Appendix H: Hot-Swapping a NET Concentrator Module*.

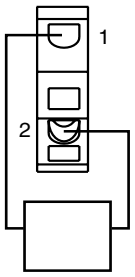
CE Conformity
Installation of any Moore Industries' product that carries the CE compliance marking (Commission Electro technique) must adhere to their respective installation guidelines in order to meet the requirements set forth in applicable EMC (Electromagnetic Compatibility) directive (EN61326). Consult the factory for additional information.

Figure 21. *ROM Connection Diagram*



TERMINAL CONNECTIONS

RELAY OUTPUT



NOTE: TO INSTALL WIRES INTO THE TERMINALS, INSERT A SMALL, FLATHEAD SCREWDRIVER INTO THE PRY SLOT, OPEN WIRE TERMINAL AND PLACE WIRE.

Configuring the ROM

The ROM is configured using the web server contained within the Interface Module it is attached to. To configure the ROM, you must first mount it to the Interface Module as described in *Installing the ROM*. To access real-time data using Modbus commands instead of a web server, see *Appendix F: Modbus/TCP Support.*

After mounting, bring up the NCS configuration software by starting an Internet browser on a computer attached to the same network as the NCS, and typing "http://" followed by the IP address that the Moore Industries NAC Client software lists for your Interface Module.

Once you have accessed the NCS configuration software, click on *I/O Module*, then *Configure Relay Output Module.* This will display the screen shown in Figure 22.

Configure the parameters listed on the screen, and when you are finished, press *Commit*. See below for a description of the different parts of the screen.

Channel Not Used
Checking this box will cause the Interface Module to ignore the ROM.

Outputs on Power-up
Checking a box configures the corresponding relay to be on (energized) upon power up.

When energized, LEDs are:
Allows you to input the color (red or green) of the LED when the relay is energized.

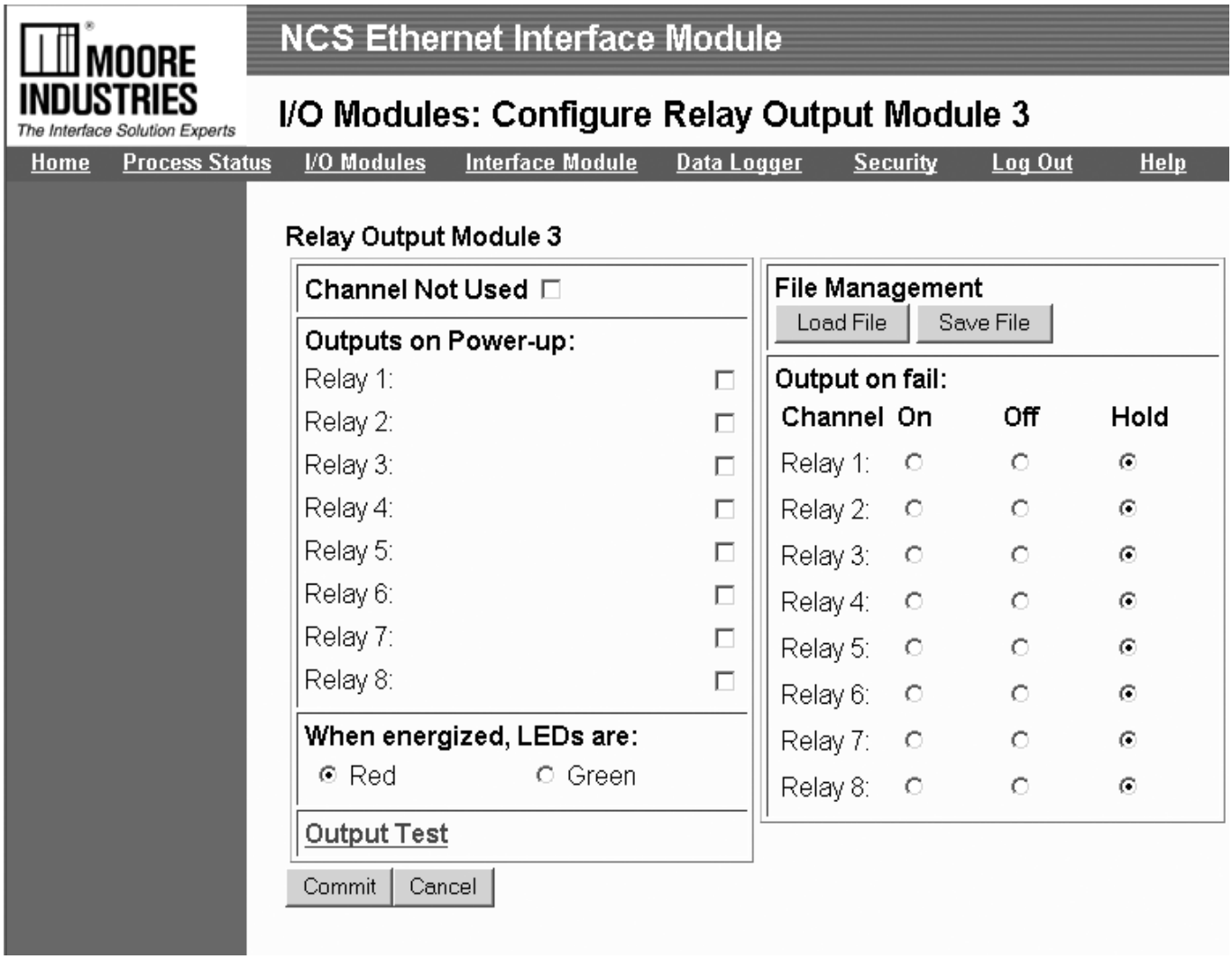
Output Test
This function allows you to change the state of each relay. After clicking *Output Test*, use the check boxes to select the desired relay and press *Update Output* . A checked box energizes the corresponding relay.

File Management
If you have a common configuration, it will be easier to create the configuration you want and save it to a file so that you can load it into your next ROM.

Output on Fail
This section tells the ROM what to do if communication with the Interface Module fails. It will either maintain the last value (*Hold Last*), or turn the relay to a predetermined energized or de-energized state (*On/Off*).

Commit/Cancel Buttons
Click *Commit* when you are finished selecting parameters to save the settings to memory. *Cancel* ends your configuration.

Figure 22. *ROM Configuration Web Page*



Specifications

ROM Relay Output Module (4 or 8 Channels)
Up to Eight Per Interface Module

Performance

Mechanical Output Ratings: 4-Channel Model: SPDT relay, 1 form C, rated 2A@250Vac, 50/60Hz, non-inductive, or 2A@30Vdc
8-Channel Model: SPST relay, 1 form A or B, rated 2A@250Vac, 50/60Hz, non-inductive, or 2A@30Vdc
Output Logic: Logic 1 yields energized relay
Output Failure Mode: Outputs are programmable to either hold last value, or go energized or de-energized upon lost communication with the Interface Module
Scan Time: 4ms
Isolation: 500Vrms, continuous, from channel to channel, from each channel to case, and from each channel to terminals of other attached NCS modules; will withstand 1000Vrms dielectric strength test for one minute, with no breakdown, from each channel to case, and from each channel to terminals of other attached NCS modules
Response Time: <10ms
Power Supply: Power is supplied by the Interface Module, 3W maximum
Diagnostic Information: Status data available when polling channels, includes: ROM failure; RAM failure; EEPROM checksum error

LED Indicators

One red/green LED per channel indicates relay state and can be programmed for desired sense

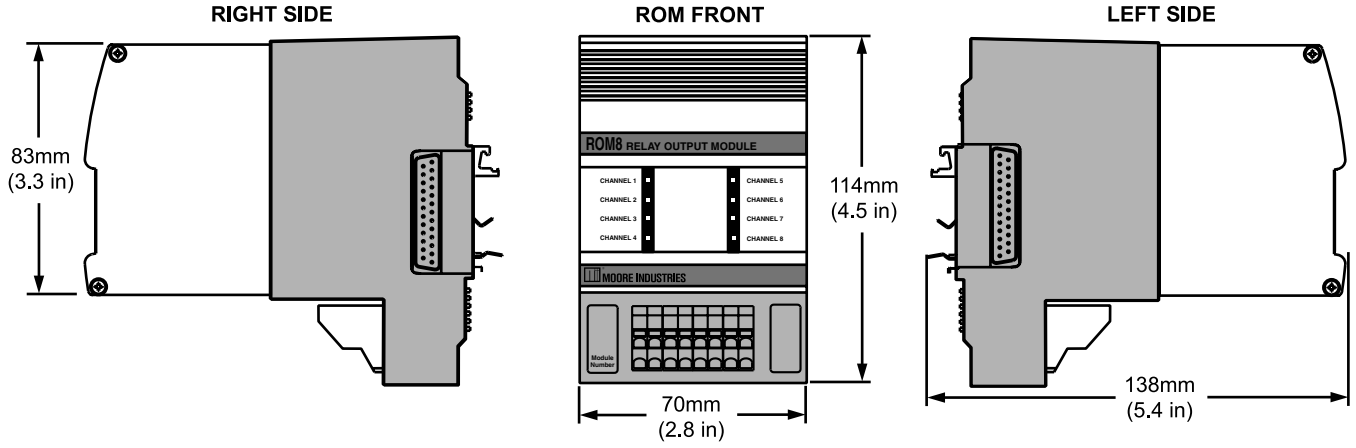
Ambient Conditions

Operating Range: –40°C to +85°C (–40°F to +185°F)
Storage Range: –40°C to +85°C (–40°F to +185°F)
Relative Humidity: 0-95%, non-condensing
RFI/EMI Protection: 20V/m @20-1000MHz, 1kHz AM when tested according to IEC1000-4-3-1995

Weight

493 g (17.4 oz)

Figure 23. *ROM Dimensions*



Appendix A: Configuring the Data Logger

The Data Logger records process variable data at a selected interval from specified I/O channels. From the Data Logger menu item you can access web pages where you can configure the data logger, view status, or data logger files.

NCS stations using EIM Interface Modules are capable of storing 32,000 points of time-stamped data. A station can be configured to store data from one, or all, of its input channels. Sampling rate is user-selectable for any period between once per second, to once every 24 hours. Follow the directions below to complete the data logger configuration.

Note:
Before configuring the data logger, ensure that you logon with the appropriate security rights. For information on security rights, see Appendix E.

1. From the Home Page of the NCS, select the "Configure Data Logger" option from the Data Logger menu.

2. In the *Channel Selection* area, choose the channels that you want to log. If you want to log more than one channel, hold the *Control* key down while selecting the multiple channels. Alternatively, you can use the *Shift* key to select a group of contiguous channels.

3. Next, specify the *Sample Rate* at which you want to log the selected channels.

4. In the *Maximum Records Per Channel* area, enter the number of records per channel you would like to log. If you are logging two channels and you entered a value of 25, your data log file will contain a total of 50 records.

5. Now select how you would like the data logger to react if power is lost to the NCS. On power recovery, the data logging can be re-started or discontinued.

6. After reviewing your configuration, click the "Update" button to download the setup details of the NCS.

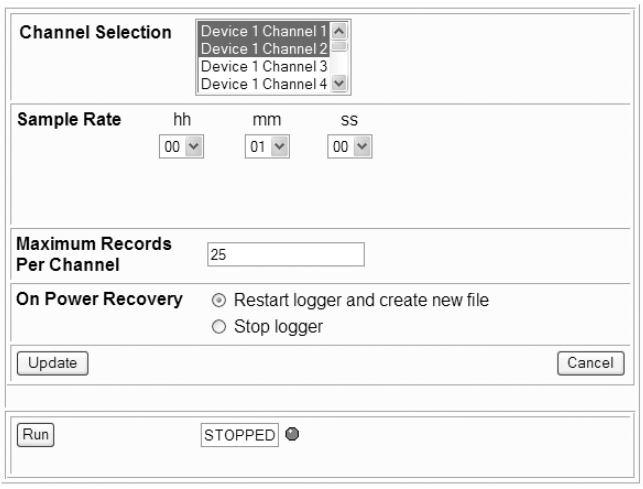
7. Finally, click the "Run" button to start the data logger.

You can now view the recorded data on the "View Data Logger" option from the *Data Logger* menu. When the *Maximum Records Per Channel* value has been reached the data logger will stop running. You can now download the data log *.txt file via FTP. To see instructions for downloading these files, refer to the *Using a Spreadsheet Program to Edit a Data Logger* section on the following page.

Note:
Files cannot be downloaded or accessed while the data logger is writing to them.

The "View Logger Status" hyperlink lists the health and specifications (file name, current number of files, and status message) of the data logger.

Figure A-1. *Configure Data Logger Screen*



Using a Spreadsheet Program to Edit a Data Logger File

The Interface Module's *Data Logger* function saves data in text format into its non-volatile memory. These text files can then be viewed inside the NET Concentrator Configuration Program, but what if you want to edit the file in a spreadsheet or word processing program?

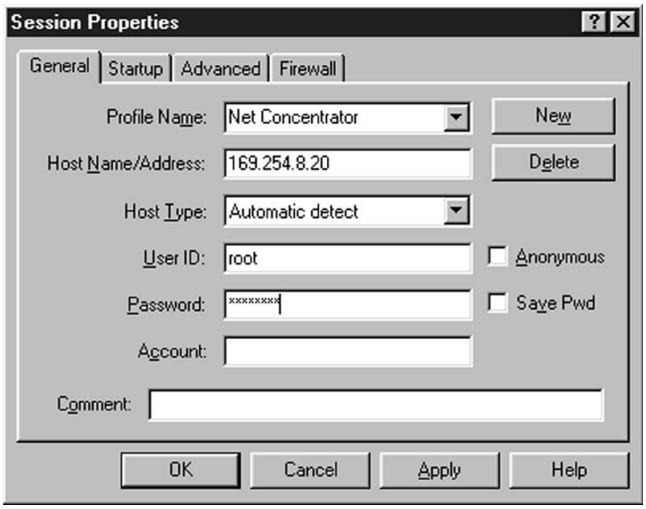
Moving, editing, or saving the *Data Logger* file to a PC requires a FTP program. If you don't already have a FTP program, you can download a number of FTP programs from the Internet. For an example, we will use WS_FTP®, a popular file transfer utility. Follow the steps below to transfer your *Data Logger* file.

1. Verify that the Interface Module is attached to the network and is operational. You will need to know the IP address of the Interface Module. For installation instructions, please consult the appropriate pages of this manual.

2. Run the FTP program that you normally use. The following instructions assume that you are using WS_FTP.

3. Enter the IP address of the Interface Module in the *Host Name/Address* box, as shown in Figure A-2 (The IP address can be found by contacting your network administrator or by running the NAC Client software included with the Interface Module.)

Figure A-2. *WS_FTP Property Screen*



Enter account name in the *UserId* box that has FTP permissions, such as the *Root* account. Enter the appropriate password in the *Password* box. Leave the *Account* box blank.

Make sure the *Passive Mode* box is selected. Leave the *Local Folder* and *Comment* boxes blank. Click on *Connect* to complete the connection.

4. When the server is connected, double click on the *Log* directory displayed in the Remote Site browser window.

5. Set the transfer mode to Auto by clicking in the *Auto* Checkbox.

6. Locate the data logs in the *Log* directory browser. Select a file by clicking on it, then click on the send arrow→. This will transfer the files from the Interface Module to the PC.

7. Close the connection when you are finished.

8. You can now open the log file with Microsoft® Excel.

Note:
Windows® 2000/XP versions of Internet Explorer support FTP.

Appendix B: Upgrading the Interface Module Firmware

As more options become available for the Interface Module, you may want to upgrade its Firmware. Follow the directions below to do this.

Table A-1. *Necessary Equipment for Firmware Upgrade*

Device	Description
FTP Communication Software	WS_FTP or similar FTP client
Installed Server	See installation instructions
Firmware Upgrade File	(Eimserver Vx.yy.dlb)
Administrator-Level Username & Password	Default username is *Root* and password is *Password*

1. Verify that the Interface Module is attached to the network and is operational. You will need to know the IP address of the server to upgrade the firmware. For installation instructions, please consult the appropriate pages of this manual.

2. Run the FTP client that you normally use. The following instructions assume that you are using WS_FTP.

3. Enter the IP address of the Interface Module into the *Host Name* box. Enter an administrator-level account name in the *UserId* box. Enter the appropriate password for the account in the *Password* box. Leave the *Account* box blank. Make sure the *Passive Mode* box is selected. Leave the *Local Folder* and *Comment* boxes blank. Click on *Connect* to complete the connection.

4. When the server is connected, enter */update* in the *Remote Site* box. This will change to the */update* directory on the EIM.

Note:
"/update" is a hidden directory. It does not normally appear in the root directory listing.
No files will appear in the remote directory browser for the "/update" directory.

5. Set the transfer type to binary by clicking on the *Binary* checkbox.

6. In the local directory listing browser, locate the upgrade file. Interface Module server upgrade files are typically named "*imserver Vx.yy.dlb" where "*" is the type of Interface Module and "x.yy" is the version number of the firmware upgrade.

7. Click on the firmware upgrade file to highlight it and then click on the send arrow →. This will start the file transfer to the server. When the file transfer is complete, you must close the FTP connection to start the firmware upgrade.

   To close the connection, click on the *Close* button or exit the utility using the *Exit* button. There is no need to worry about accidentally transferring the wrong file. The server does an internal check of the received file and will not perform the upgrade unless the file is a valid server firmware upgrade.

8. When the firmware upgrade starts, the server's *Ready* LED will blink on and off once per second. If you transferred the wrong file, transferred the file in ASCII mode, or the upgrade file has an error, the server will not perform the upgrade. Verify that you sent the proper file by checking *Application Software Version* and try again.

CAUTION:
During the upgrade process, do not remove or disturb the power to the Interface Module server. Removing the power during the upgrade will corrupt the Interface Module's memory and the server will not boot.

9. The server will not respond to web page or FTP accesses during the upgrade process. Attempting to access the server during the upgrade will not disrupt the process. If an error occurs during the upgrade, the status LED will blink red and green to indicate that a fatal error occurred while programming the Flash. In this case, use the information on the back of this manual to contact Moore Industries for further instructions.

10. When the upgrade is complete, the server will automatically reboot in 10 seconds. Once the server reboots, you can check the firmware version of the server using the *Server Information* web page available in the Interface Module core configuration screen. The firmware version should match the version code of the file loaded in step 6.

Appendix C: Upgrading the Interface Module Web Pages

As more options become available for the Interface Module, you may want to upgrade the Web Server. Follow the directions below to do this.

1. Verify that the Interface Module is attached to the network and is operational. You will need to know the IP address of the server. For installation instructions, please consult *Connecting the EIM to the Network*.

Table A-2. *Necessary Equipment for EIM Server Upgrade*

Device	Description
FTP Communication Software	WS_FTP or similar FTP client
Installed EIM Server	See *Connecting the EIM*
MII Web Page Files	Contact MII for more information
EIM Administrator-Level Username & Password	Default username is *Root* and password is *Password*

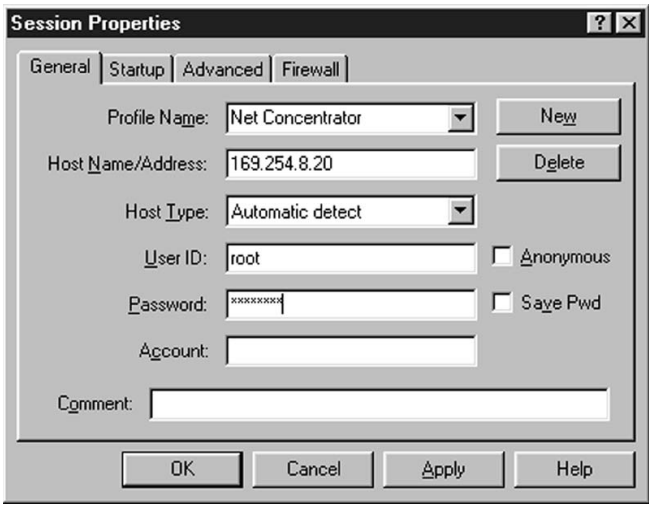
2. Run the FTP program that you normally use. In the following example, we will be using *WS_FTP*.

3. Enter the IP address of the Interface Module in the *Host Name* box. The IP address can be found by contacting your network administrator or by running the NAC Client software included with the Interface Module. Enter an administrator-level account name in the *User Id* box (See Figure A-3 for illustration). Enter the appropriate password in the *Password* box. Leave the *Account* box blank.

   Click on the *Startup* tab, and make sure the *Local Folder* and *Comment* boxes are blank. Click on the *Advanced* tab, and make sure the *Passive Transfer* or *Passive Mode* box is selected. Click on *Connect* to complete the connection.

4. When the server is connected, double click on the *www* directory displayed in the *Remote Site* browser window.

Figure A-3. *WS_FTP Session Property Screen*



5. To simplify the FTP process, set the file extension types in the *Options* menu. This will allow WS_FTP to automatically control the transfer of files in Binary or ASCII mode as necessary. To view the file extensions, click on the *View* menu and then on *Options*. Then click on the *Extensions* tab. Add the following file types for ASCII transfer: .css, .html, .shtml, .ini, .txt. All other files can be transferred in binary. Accept the changes by clicking on *OK*.

6. Set the transfer mode to Auto by clicking the *Auto* checkbox.

7. Locate the web page file (with a file extension of *.DFS*) in the *Local Site* directory browser. Select the file by clicking on it. Then click on the send arrow→. This will transfer the file from the PC to the Interface Module. You may want to set/check the time of the Interface Module so that the web pages are stored on the server with the correct time. Select *Yes* if WS_FTP asks if you want to replace files.

8. Close the connection when you are finished. You have successfully upgraded the Interface Module's web pages.

Appendix D: Resetting the Interface Module Passwords

The Password function is a valuable security tool, but can be troublesome when the password is lost, forgotten, or erroneously set. If you cannot access the Interface Module's web server because of a missing password, there are two options.

First, try to log on using the default administrator username of *root* with the password of *password*. This may have already been replaced by your current administrator password. If that is the case, you will need to reset the passwords using the following steps.

Note:
All previously setup user accounts will be deleted when you reset the passwords.

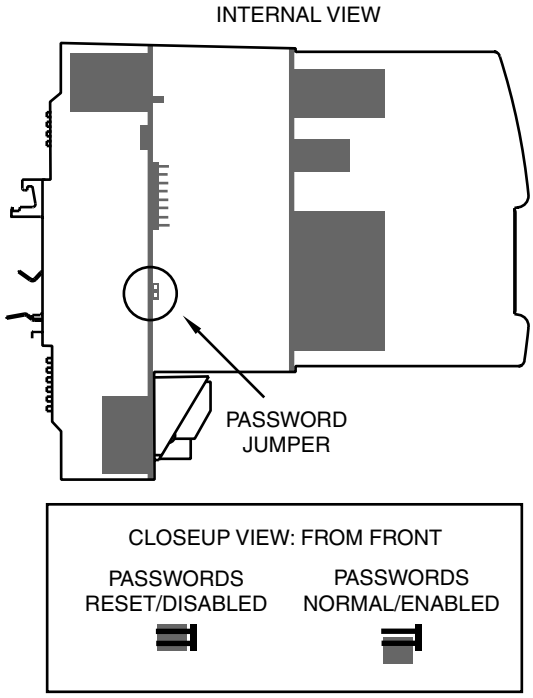
1. Power down the Interface Module by removing the power cables from it.

2. Remove the left side panel from the Interface Module by removing the six side panel screws.

3. Place the password jumper on both pins as illustrated in Figure A-4 under the *Passwords Reset/Disabled* illustration, and power up the Interface Module.

4. Power down the Interface Module and remove the password jumper, placing it back on the jumper as shown in the *Passwords Normal/Enabled* illustration. Replace the side panel, and power up the module. It is now ready for use.

Figure A-4. *Password Jumper Location*



5. Start the Web Server, and use the administrative account with a username of *root* and a password of *password*, to access the system and make any necessary changes. A guest account with the username of *guest* and a password of *password* is also available for use.

Appendix E:
NCS Security Overview

The Security page of the NCS web server allows an administrator to determine which users are allowed access to which portions of the NCS configuration software. There are three different user types; each user type has different security restrictions.

Administrator
The administrator is allowed read and write access to all pages.

Power User
The power user can read and write all pages except the security pages. (Although he is allowed to change his own password on the security page.)

Guest
A guest has no write privileges, but can read any pages except the security pages. The guest also cannot access ftp or change his or her password.

Changing the Security Settings

To add or edit user accounts, the Interface Module must be in closed security mode and you must log in with an administrative password. The default security mode is open, so first click on *Security*, then *Security Mode* and set it to closed. Finally, log out.

Log on using an administrative account. The default administrator account is *administrator* with a password of *password*. When the NCS Home Page is displayed, click on *Security*, then any of the options you wish to change. Log out when you are finished.

Appendix F: Modbus/TCP Support

Each NCS Interface Module is designed to be accessed using either a supplied OPC server or Modbus communication. Directions for connecting to the OPC server can be found in the installation section for your Interface Module. The section below supplies all of the information necessary to reference the Modbus register map and program a generic Modbus/TCP OPC server, or other Modbus/TCP master.

Modbus/TCP is supported according to the document, *Open Modbus/TCP Specification*, release 1.0, 29March1999, Schneider Electric. The Modbus registers allow access to process variable data and status information. See Table A-3 for a complete list of available Modbus Registers.

Reading Primary Variables
Process variables are read using Modbus function code 3 or 4. Each 32-bit floating-point process variable will be mapped to two Modbus registers; the lower numbered Modbus register will hold the least-significant-word (LSW), and the higher numbered Modbus register will hold the most-significant-word (MSW) of the 32-bit value. For Modbus clients that support swapped floating point, the NCS demo provides a setting to change the default word order using the *Modbus Properties* page of the web server.

Reading Device Status
Diagnostic data is read using Modbus function codes 1 to 4. Each 16-bit status register will be one Modbus integer register, accessible using function codes 3 or 4. When using function codes 1 or 2, the 16 status register bits are mapped to 16 consecutive cells, with the status register's least-significant-bit in the lowest addressed cell.

Communicating with NET Concentrator Modules
At startup, the Interface Module will perform an initialization sequence to detect all connected NCS I/O modules. If it recognizes the connected device, it will mark the module as active in preparation for data scanning.

After detecting connected NCS modules, the Interface Module will begin continuous polling for the current process variable and status of each module. The returned data is stored locally by the inteface module for access by the web server or the Modbus/TCP server. Interface modules continuously poll all connected I/O modules.

Table A-3. *Modbus Register Definitions*

	Register Reference	Number of Modbus Registers	Function Code	Data Type
Primary Variable	1 + 8(M – 1) + 2(C – 1)	2	3, 4, 6, or 16	Float
Ambient Temperature	201 + 8(M – 1) + 2(C – 1)			
Interface Module Status Register	2000	1	3 or 4	Integer
Interface Module Status Flags	2000 + B	1	1 or 2	Discrete
Base Fail Register	2001	1	3 or 4	Integer
Module Fail Register	2002	1	3 or 4	Integer
Base Fail Flags	2015 + M	1	1 or 2	Discrete
Module Fail Flags	2031 + M	1	1 or 2	Discrete
Channel Status Register	2002 + 4(M – 1) + C	1	3 or 4	Integer
Channel Status Flags	2048 + 64(M – 1) + 16(C – 1) + B	1	1 or 2	Discrete
Discrete Primary Variable	8(M – 1) + C	1	1-6, 15 or 16*	Discrete
Discrete Module Status Register	2003 + 4(M – 1)	1	3 or 4	Integer
Discrete Module Status Flags	2048 + 64(M – 1) + B	1	1 or 2	Discrete

In Register Reference:
M represents module position (1-8);
C represents channel number (1-4);
B represents bit position (0-15) within the Interface Module's register.

*When using function codes 3, 4, 6, or 16, one discrete primary variable is delivered per Modbus register, with a non-zero integer value representing logic 1.

NET Concentrator Module Status

The I/O status register obtained during data scanning is used to create a 16-bit status word. The status word can be read using Modbus/TCP as described earlier. The status register bits are defined in Table A-4. An error is indicated by a set bit or any combination of set bits.

Table A-4. *Interface Module Status Register*

Bit Position	Description
15 14 13 12 11	Reserved Reserved Reserved Reserved Reserved
10	The data logger file is full.
9	The data logger could not be initialized.
8	Indicates a failure to start one or more of the TCP/IP, FTP, HTTP, NAC, or Modbus/TCP services.
7	Indicates a failure in the serial port driver.
6	Missing or corrupted password file. This bit indicates that the EEC has created a new, default password file.
5	Bad clock battery. Replace the clock battery or the clock module.
4	Missing system configuration file.
3	New file system. Indicates that the EEC has formatted the file system. Normally, this is only performed once at the initial system startup. However, an automatic format can occur if the file system becomes corrupted.
2	File system initialization error. Indicates that the EEC cannot determine the state of the file system. Depending on the type of error, the EEC may attempt to automatically format the file system.
1	RAM test failed. This bit is set when a read/write error occurs during the power-on RAM test.
0	Slave device error. Typically used to indicate an error in any attached I/O devices.

Table A-5. *TIM Channel Status Register/Bit Positions*

Bit Position	Description
11	Run-time Failure
10	EEPROM Failure
9	A/D Converter Failure
8	Broken RJC
7	Broken Wire #4
6	Broken Wire #3
5	Broken Wire #2
4	Broken Wire #1
3	Analog Input A/D Saturated
2	Input Signal out of Linearized Range
1	Channel not Used
0	I/O Channel Fail

Table A-6. *AOM Channel Status Register/Bit Positions*

Bit Position	Description
9	PV is too large
8	PV is too small
7	PV is invalid floating-point value
6	Low current error
5	Front-end reset occurred
4	FLASH failure
3	SRAM failure
2	EEPROM failure
1	Channel not used
0	I/O channel failure

Table A-7. *AIM Channel Status Register/Bit Positions*

Bit Position	Description
11	Run-time Failure
10	EEPROM Failure
9	A/D Converter Failure
3	Analog Input #1 A/D Saturated or Analog Input #2 A/D Saturated
2	Input signal of RTD/TC linearization table range or Input/Trimmed value out of custom table range
1	Channel not used
0	I/O channel failure

Table A-8. *ROM and DIM Channel Status Registers/Bit Positions*

Bit Position	Description
6	LED Port Error
5	Front-end reset occurred
4	FLASH failure
3	SRAM failure
2	EEPROM failure
1	Channel not used
0	I/O channel failure

Appendix G: Loading a Custom Curve File

There are two ways in which a custom curve can be loaded into the EIM for use with the TIM or AIM configuration pages. In order to create a Comma Separated Value (.csv) file, you will need either Microsoft Excel® or other similar spreadsheet program, (refer to Figure A-5) or a text editor (refer to Figure A-6).

1. In Microsoft Excel®, open a new sheet. Using column A as your X data, and column B as your Y data observe the following scheme:

Column A: The X data must be a monotonically increasing sequence (i.e, each value must be greater than the previous value in the sequence).

Column B: The Y data may be any sequence. You may enter up to 128 X,Y pairs. All numbers must be real, signed numbers, up to 6 digits long (7 digits and higher must be translated to exponential notation) or 6 plus one decimal point. Exponent notation (in the form of 1e+010, rather than 10e9) may also be used, but it will be translated to the full value (i.e. 10e9 = 10000000000) and thus must not represent a number higher than Xe37. Numbers represented as Xe38 and above will produce errors.

After entering your values, simply save as a .csv file.

2. Observing the same rules, you can also use a text editor to create your .csv file in the following manner:

The file must be saved with a .csv extention. The .csv file is then transferred to the EIM "cfg" directory via FTP.

To configure the TIM or AIM with the custom curve, perform the following:

1. From the configuration page for the channel requiring the custom curve, click "Load .csv".

2. The "Load Custom Curve" window will appear. Select the file you created from the list and click "Load".

3. The "Load Custom Curve" window will disappear. Check the "Enabled" box in the Custom Curve section of the configuration page and click "Commit".

Figure A-5. *Comma Separated Value file (Microsoft Excel® Spreadsheet)*

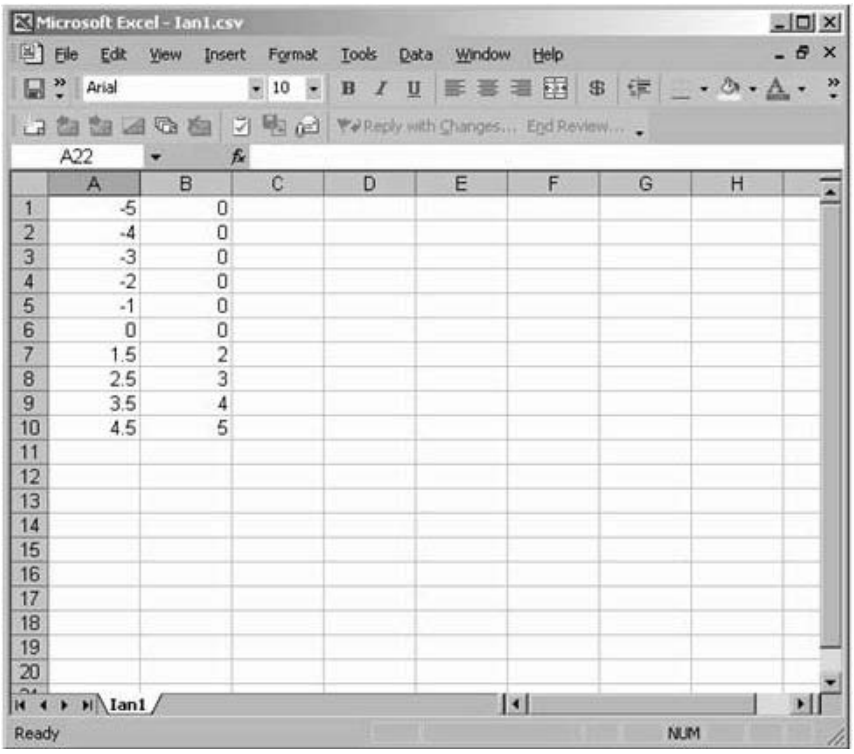
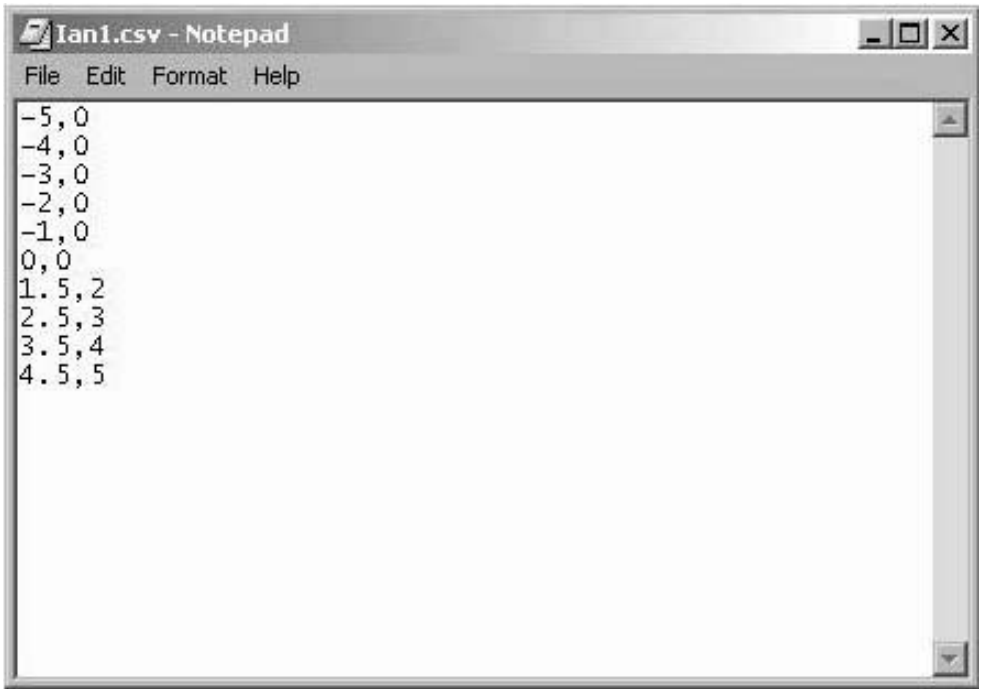


Figure A-6. *Comma Separated Value file (text editor)*



Appendix H: Hot-Swapping a NET Concentrator® Module

Should an Input/Output Module need to be replaced, you do not need to power down the NET Concentrator System. Instead, simply remove the old module from the terminal base, and snap in the new one.

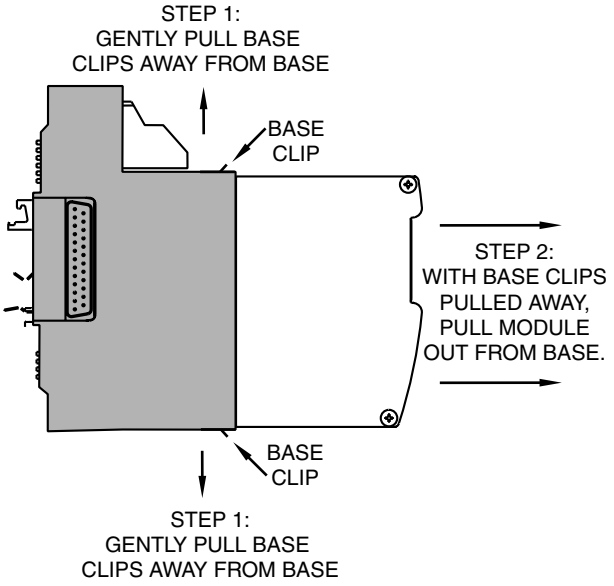
Programming a New Module

The NCS uses the configuration present in the new module. If the new module has the same configuration as the one being replaced, nothing else needs to be done. If not, the new module must be programmed using the directions in the configuration section of the manual that applies to the module being installed.

Removing the Old Module

Begin by taking two small flathead screwdrivers and insert each under a different base clip, as shown in Figure A-7. With the base clips pulled away, pull the module out from the base.

Figure A-7. *Removing the Old NCS Module*

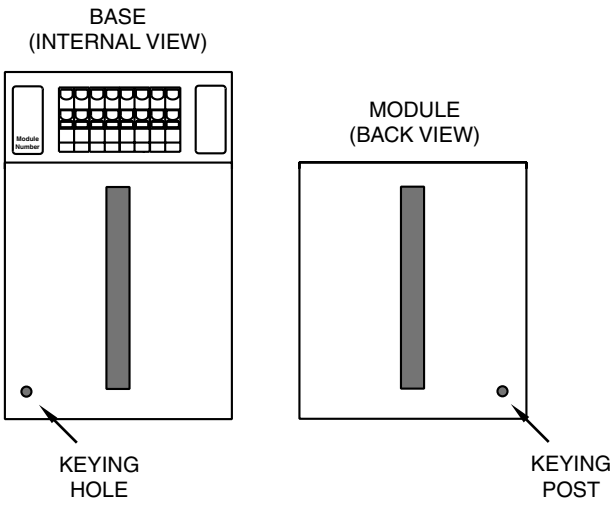


Snapping in the New Module

Check to see that the keying post (shown in Figure A-8) will line up properly with the keying hole in the bottom of the module. If it does not, rotate the module 180°. If it still does not line up, the module is of the wrong I/O type. The new module must be of the same type as the previous module.

Slip the new module into the base that the old one was removed from. Push firmly into position. The lights on the face of the input/output module should glow as the unit powers up. Your new NCS module is now in service!

Figure A-8. *Snapping in the New NCS Module*



Note:

A new NCS module will only work with an identical type of base. For example, you cannot place an AIM module into a base that previously held a TIM; the new module must replace an identical older module.

Customer Service

If service assistance is ever required for one of the NET Concentrator Modules in your application, refer to the back cover of this manual for the telephone numbers to Moore Industries STAR Center customer service department.

If possible, make a note of the model number of the offending module before calling. For fastest assistance, try to gather information on the unit(s) serial number and the job and purchase order number under which it was shipped.

CE Declaration of Conformity CE

EMC Directive 89/336/EEC

- **Manufacturer's Name:** Moore Industries-International, Inc.
- **Manufacturer's Address:** 16650 Schoenborn Street
  North Hills, CA 91343-6196
  USA

Declares that the product(s):

- **Product Name:** AIM, AOM, CPM, DIM, EIM, ROM, TIM

- **Model Number(s):**

MODEL /	INPUT /	OUTPUT /	POWER /	OPTIONS /	HOUSING
AIM	*	*	*	*	*
AOM	*	*	*	*	*
CPM	*	*	*	*	*
DIM	*	*	*	*	*
EIM	*	*	*	*	*
ROM	*	*	*	*	*
TIM	*	*	*	*	*

* Indicates any input, output, power, option and housing as listed on the product data sheet

- **Conforms to the following EMC specifications:**
  EN 61326-1, 1998, Electromagnetic Compliance (EMC) requirements for electrical equipment for control use

- **Supplementary Information:**
  None

13 June 2003
Date

Fred Adt
Quality Assurance Director

Robert Stockham
Moore Industries-Europe General Mgr.

European Contact: Your Local Moore Industries Sales and Service Office

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RETURN PROCEDURES

To return equipment to Moore Industries for repair, follow these four steps:

1. Call Moore Industries and request a Returned Material Authorization (RMA) number.

   ## Warranty Repair –

   If you are unsure if your unit is still under warranty, we can use the unit's serial number to verify the warranty status for you over the phone. Be sure to include the RMA number on all documentation.

   ## Non-Warranty Repair –

   If your unit is out of warranty, be prepared to give us a Purchase Order number when you call. In most cases, we will be able to quote you the repair costs at that time. The repair price you are quoted will be a "Not To Exceed" price, which means that the actual repair costs may be less than the quote. Be sure to include the RMA number on all documentation.

2. Provide us with the following documentation:
   a) A note listing the symptoms that indicate the unit needs repair
   b) Complete shipping information for return of the equipment after repair
   c) The name and phone number of the person to contact if questions arise at the factory

3. Use sufficient packing material and carefully pack the equipment in a sturdy shipping container.

4. Ship the equipment to the Moore Industries location nearest you.

The returned equipment will be inspected and tested at the factory. A Moore Industries representative will contact the person designated on your documentation if more information is needed. The repaired equipment, or its replacement, will be returned to you in accordance with the shipping instructions furnished in your documentation.

The Interface Solution Experts • **www.miinet.com**

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MOORE INDUSTRIES

User's Manual Errata

NCS[EIM] NET Concentrator®
System with Ethernet Interface

July 2003

This document describes the known errata for the NCS Ethernet Interface Module (EIM). It may be superseded without notice by a more recent revision.

The affected units are as follows:

Model Number: EIM/COM/SM/20-30DC [DIN]
Firmware Version: 2.23
Release Date: June 2003

Loss of Communications with DHCP and High Traffic

The EIM may stop responding to network requests when DHCP is enabled and under non-specific high traffic conditions, requiring a power cycle to "wake-up".

Present Remedy

Disable DHCP in the EIM and use fixed network settings: fixed IP address, gateway and subnet mask. (See the "Configuring Network Settings" section in the NCS[EIM] User's Manual).

Future Correction

To be fixed upon next major firmware revision.

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