NE Universal Module I/O Carrier User's Guide

Next Generation Embedded Solutions for Residential, Industrial and Demand Side Management

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Limited Warranty

Cyclonic Systems warrants this product to be free of defects in material and workmanship for a period of one year from date of purchase. During this warranty period Cyclonic Systems will repair or replace the defective unit in accordance with the following instructions:

1. Contact Cyclonic Systems to obtain a Return Material Authorization (RMA) number.

2. Clearly print the RMA number on the outside of the package bearing the product being returned. Include your return address and a telephone or email contact.

3. Send the package to the following address:

Repair Department
Cyclonic Systems, Inc.
PO Box 1310
Concord, NH 03301

Tel/Fax: 603-223-9687

Or, if email is your preferred method of communication:

internet@cyclonicsystems.com

This limited warranty does not cover damages resulting from lighting or other power surges, misuse, abuse, abnormal conditions of operation or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit. In no event shall Cyclonic Systems be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or anticipatory profits arising from the use or inability to use this product.

Repairs made after the expiration of the warranty period are subject to a flat rate repair charge and the cost of return shipping. Please contact Cyclonic Systems to arrange for any out of warranty repair service.

Kits and bare PCB fabrications are treated differently. You are assumed to possess the skill and knowledge to properly assemble the kit/fab. Please inspect all components and review any accompanying instructions provided. If instructions are unclear, please call or email for support or return the board or kit unassembled for a full refund. If you prefer, Cyclonic Systems will send you an assembled and tested board and bill you the price difference. You will be responsible for all shipping costs. In the event the kit/fab is partially assembled, no refund will be extended. Cyclonic Systems will, upon request, complete and test the kit/fab for a fixed or hourly rate set by Cyclonic Systems based on inspection of the received kit/fab. Cyclonic Systems reserves all rights to set the basis of repair/replacement.

This agreement and all rights of the respective parties shall be governed by the laws of the State of New Hampshire, United States of America.

Product Updates

To help our customers make the most of our products, we are continually making additional and updated resources available on the Cyclonic Systems web site. These include manuals, application notes, programming examples, and updated software and firmware.

Check in periodically at www.cyclonicsystems.com to see what's new!

When we are prioritizing work on these updated resources, feedback from customers (and prospective customers) is the number one priority. If you have questions, comments, or concerns about your Cyclonic Systems product, ***please let us know***.

FCC COMPLIANCE AND ADVISORY

This equipment is designed to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

CANADIAN DOC STATEMENT

DOC Class Compliance – This Class A digital apparatus is designed to comply with Canadian ICES-003.

Observation des normes – Class A – Cet appareil numérique de la classe A est çoncu se pour conformer à la norme NMB-003 du Canada.

Table of Contents

Introduction

The NE Universal Module I/O carrier board is used in conjunction with either a NE4000T or NE4100T Moxa Embedded Network Enabler module. When the carrier board used with either of these modules, the user can assemble an I/O controller subsystem capable of driving up to 4 outputs or receiving 4 inputs. I/O connectivity is accomplished via industry standard modules.

Features

- 10/100M Ethernet port.
- RS-232 Console/Debug (jumper selectable) port.
- 12-30 VDC power supply input via terminal block.
- Power, link and link speed indicator LEDs.
- I/O via terminal block. Selectable I/O via jumpers.
- Operating temp 0-70°C.
- 6.5" L x 3.5"W

Reference Documents

- NE-4100T User's Manual

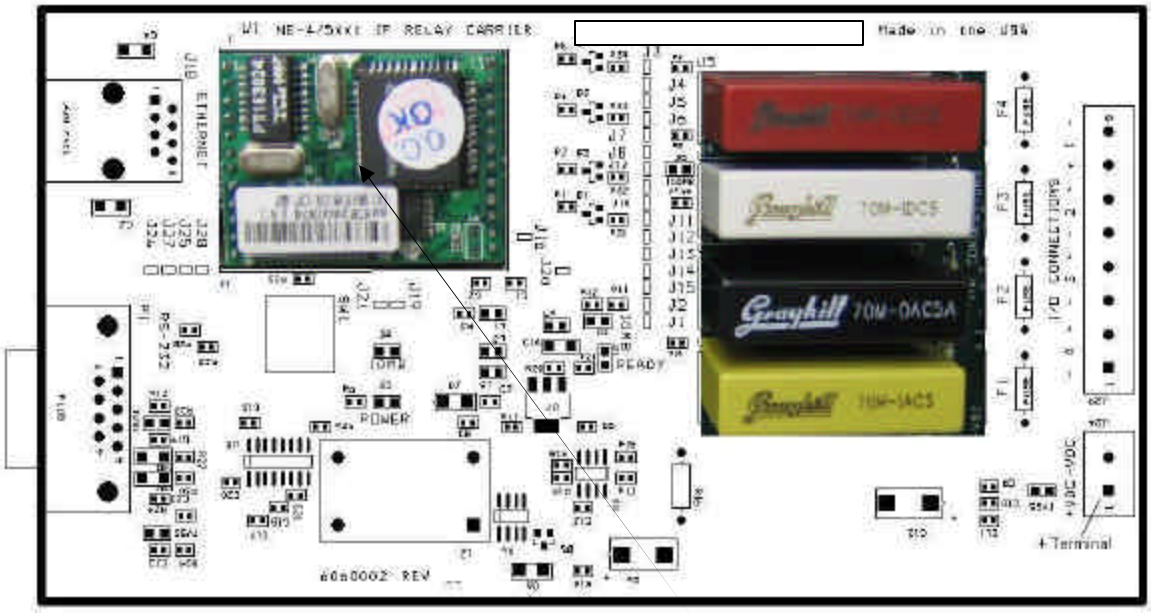
http://www.moxa.com/doc/manual/NE/4100/V7/NE-4100_Series_Users_Manual_v7.pdf

- NE-4000T Series User's Manual

http://www.moxa.com/doc/manual/NE/4000/v3/NE-4000T_v3.pdf

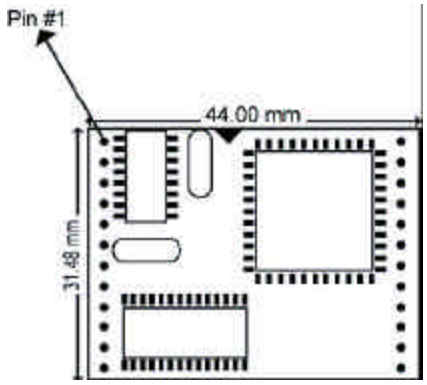
Quickstart Instructions

NE Embedded Enabler Module Configuration

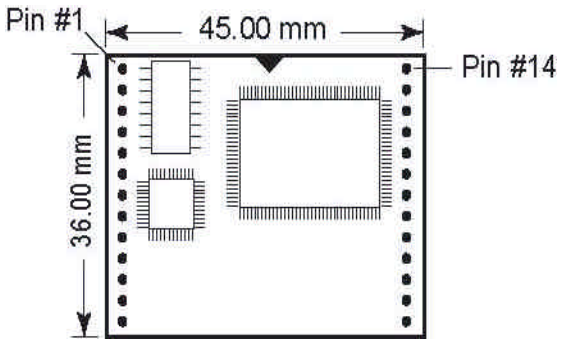


The NE Embedded Enabler module is installed at position **U1**. Observe the correct polarity when inserting the module into the board. The NE4000T is a 24 pin module. The NE4100T is a 26 pin module. Both modules are referenced from Pin 1, so the NE4000T will need to be shifted towards the top of the board. Align the white triangle on the module with that on the carrier board.

Module Profile (NE-4000T)



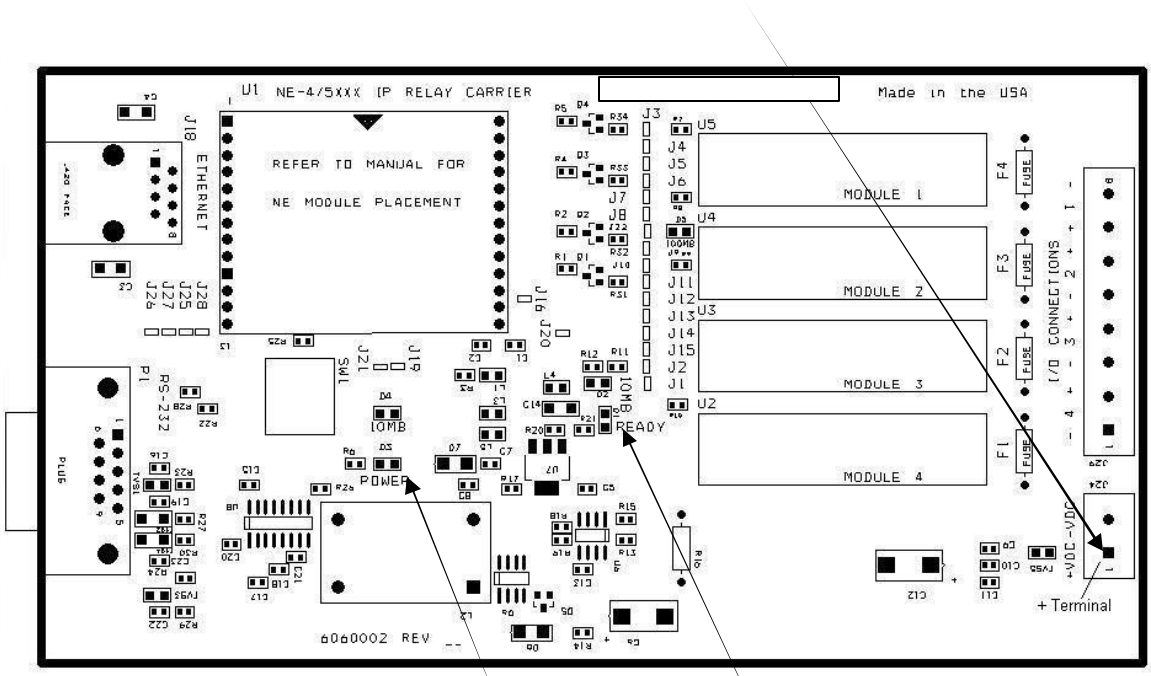
Module Profile (NE-4100T)



Power Connections

⚠ CAUTION

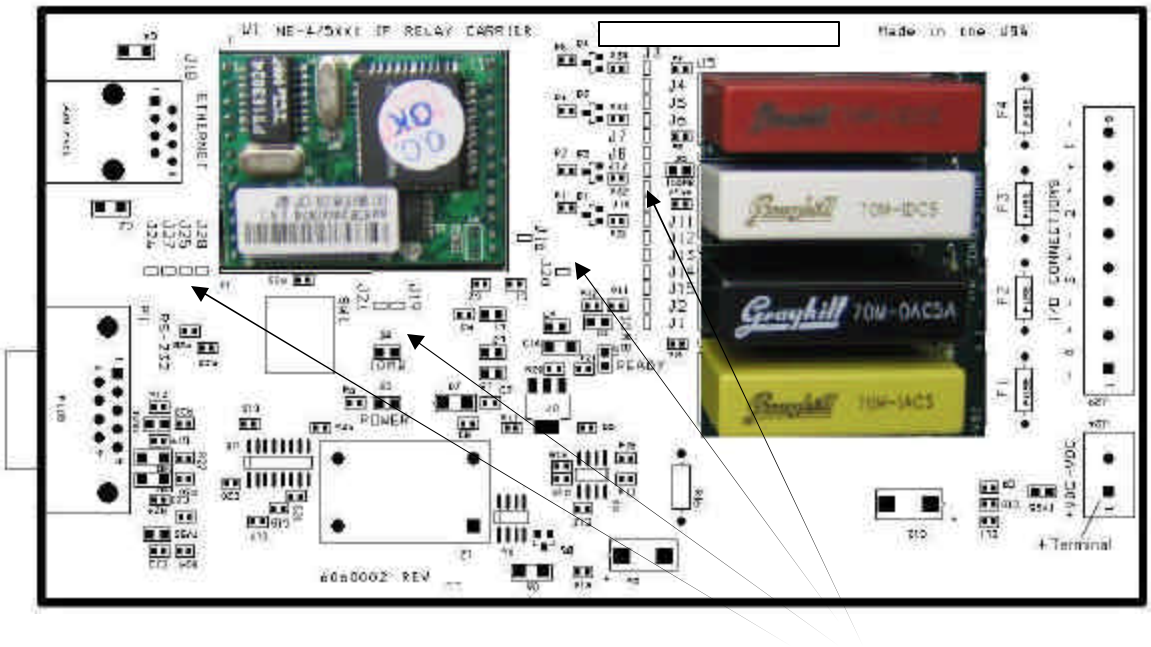
Observe the correct polarity markings when connecting power to the carrier board at J24. Pin 1 is the positive (+) connection



If the power is properly applied, the POWER led will illuminate GREEN.

After the module has initialized, the READY led will illuminate GREEN.

Jumper selections



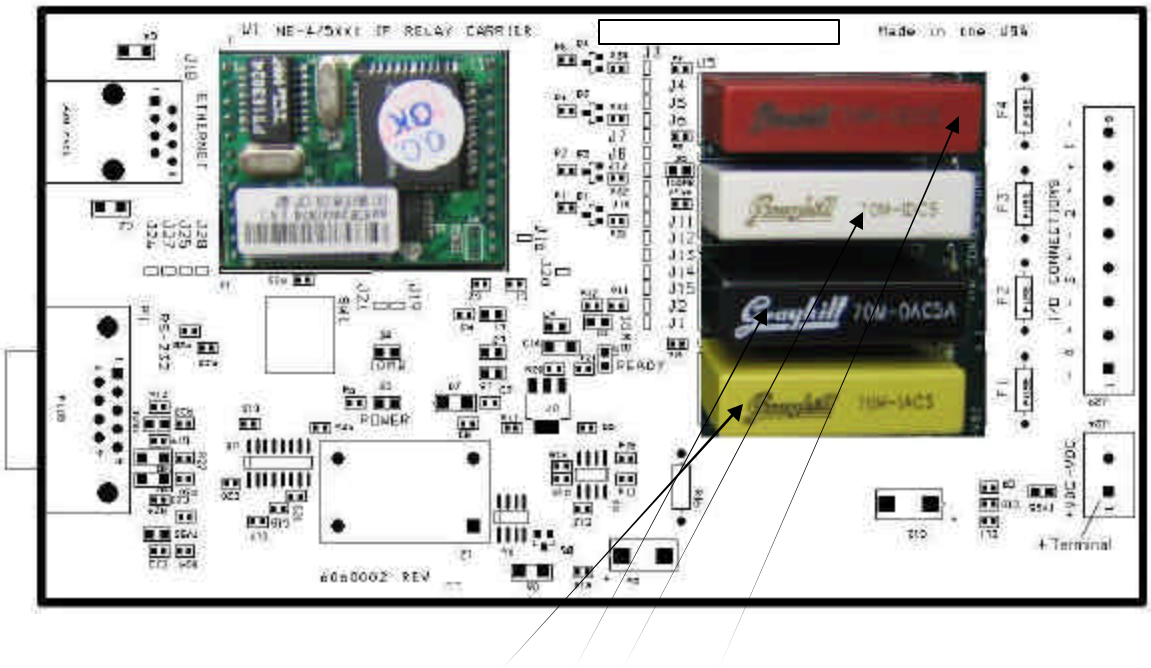
Jumpers must be inserted depending upon the installed NE module.

Table 1 outlines the proper jumper configurations for each respective module.

NE4000T	NE4100T	Description
	J15	Pin 22 GND
	J16	Pin 24 +5V
J19		Select 10MB LED
	J21	Select 10MB LED
	J22	Select 100MB LED
J25	J25	Serial I/O. Remove J26
J27	J27	Serial I/O. Remove J28
J26		Debug Console. Remove J25.
J28		Debug Console. Remove J27.
J20		Short to enter Serial Command Mode

Table 1 NE Module Jumper Table

I/O Module Configuration



I/O Modules are inserted into positions U2, U3, U4 and U5.

The following industry standard I/O modules are approved for use with the board:

- 70M-OAC5 – 120VAC output 3A max.
- 70M-OAC5A – 240VAC output 3A max.
- 70M-ODC5 – 60VDC output 3A max.
- 70M-IAC5 – 120VAC input 50mA load current.
- 70M-IDC5 – 5VDC input 50mA load current.
- 70M-ODCR – 5VDC input dry contact.

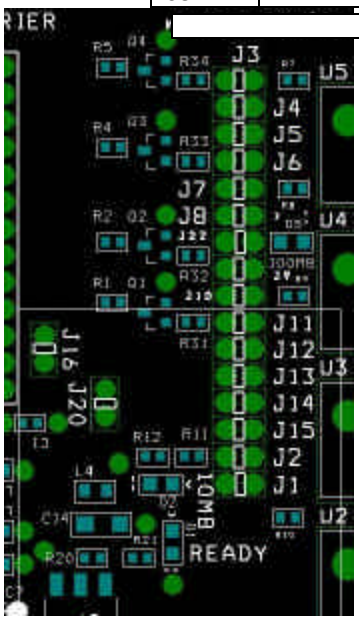
70 series (larger footprint) modules can be used but you are limited to 2 maximum at positions U3 and U5 or U2 and U4.

I/O Module Jumper Selections

Each I/O module requires specific configuration of jumpers for input or output.

Table 2 U5 Jumper Configuration

INPUT	OUTPUT	Description
J2	J2	+5V Install for both input and output modules
	J3	NE4000/NE4100 module configured as OUTPUT
J4		Module configured as INPUT for NE4100*
J5		Module configured as INPUT for NE4000



*** Remove when position is set up for output.**

Table 3 U4 Jumper Configuration

INPUT	OUTPUT	Description
J2	J2	+5V Install for both input and output modules
	J6	NE4000/NE4100 module configured as OUTPUT
J7		Module configured as INPUT for NE4100*
J8		Module configured as INPUT for NE4000

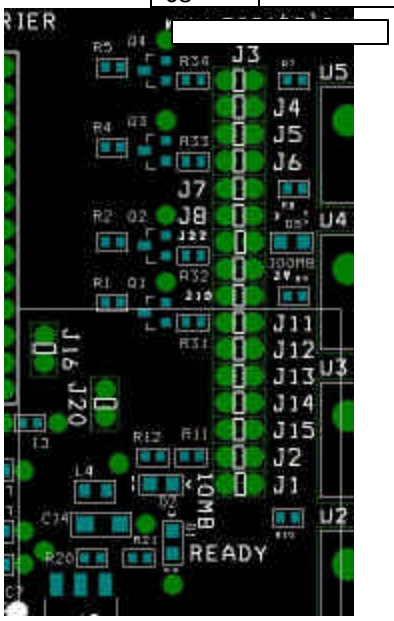


Table 4 U3 Jumper Configuration

INPUT	OUTPUT	Description
J2	J2	+5V Install for both input and output modules
	J9	I/O module configured as OUTPUT
J10		Module configured as INPUT for NE4100*
J11		Module configured as INPUT for NE4000

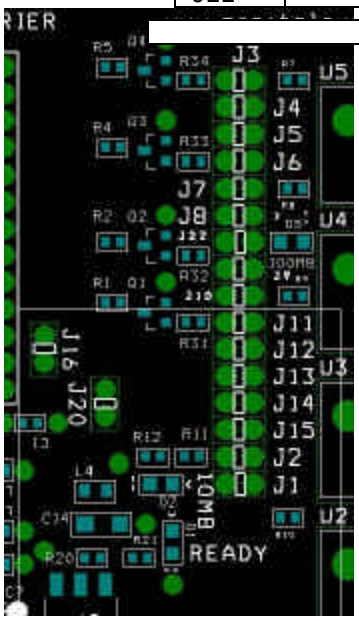
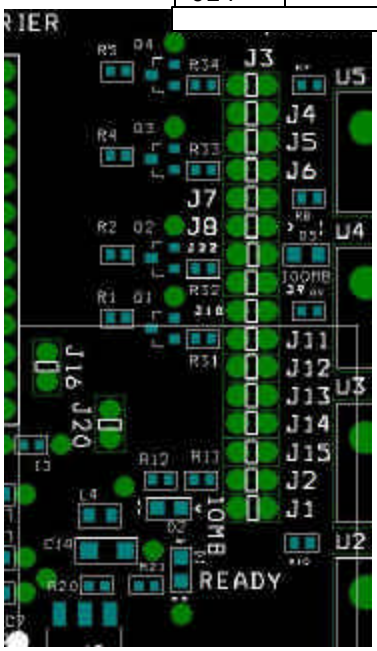
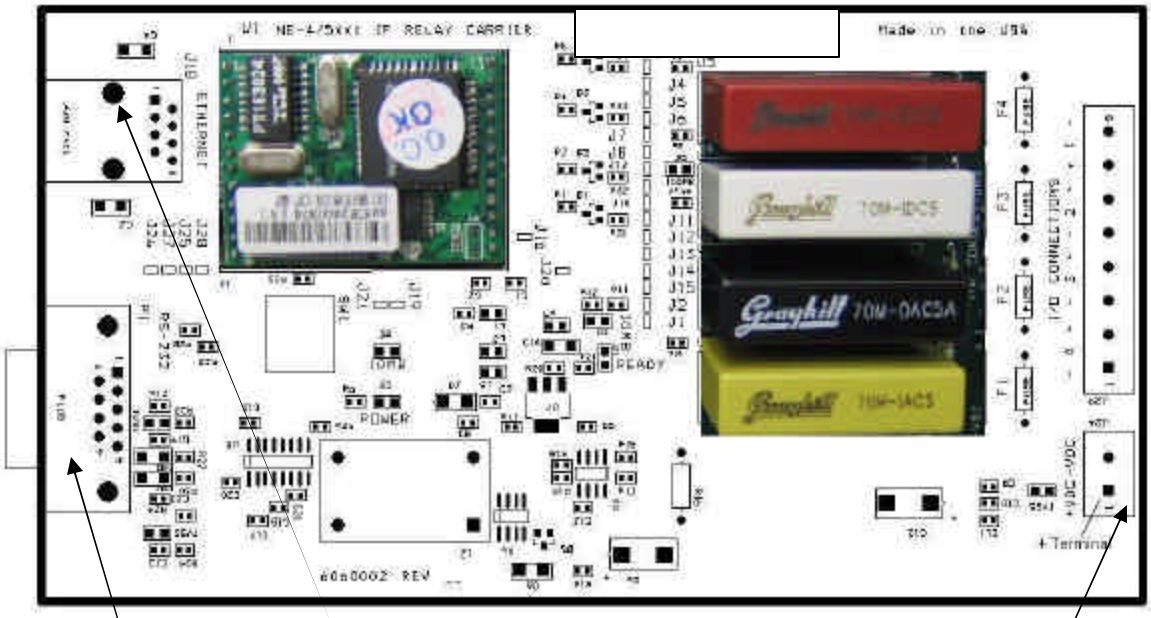


Table 5 U2 Jumper Configuration

INPUT	OUTPUT	Description
J2	J2	+5V Install for both input and output modules
	J12	I/O module configured as OUTPUT
J13		Module configured as INPUT for NE4100*
J14		Module configured as INPUT for NE4000



Connector Pinouts



RJ45 Ethernet connector J18

Signal	Pin
TX+	1
TX-	2
RX+	3
No Connect	4
No Connect	5
RX-	6
No Connect	7
No Connect	8

DB-9 Male DTE Serial Connector P1

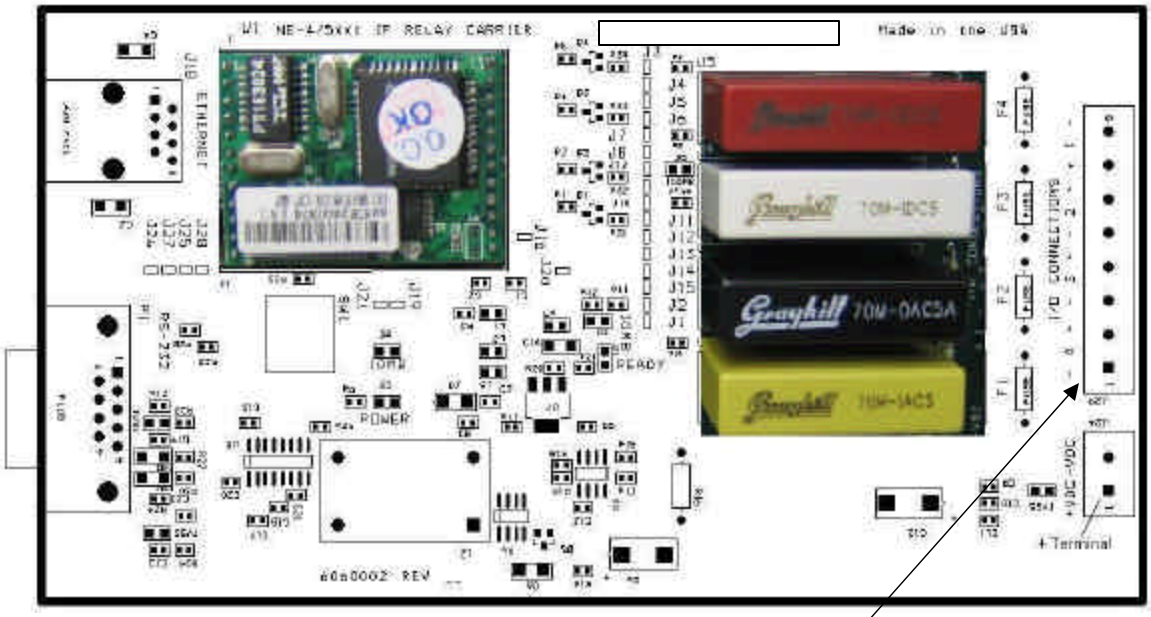
Signal	Pin
No Connect	1
RXD Input	2
TXD Output	3
No Connect	4
Signal Common	5
No Connect	6
RTS Output	7
CTS Input	8
No Connect	9

Power Connector J24

Signal	Pin
+VDC	1
-VDC (GND)	2

I/O Connector J10

Connect the load devices to J29 according to the chart:



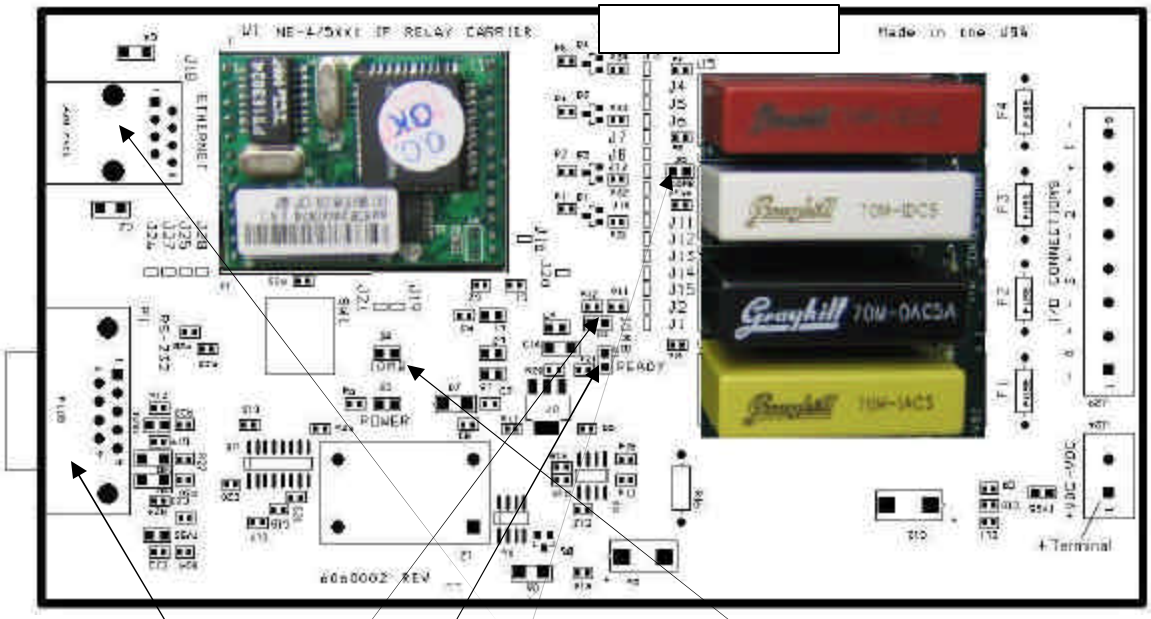
Signal	Pin
+ LOAD 1	1
- LOAD 1	2
+ LOAD 2	3
- LOAD 2	4
+ LOAD 3	5
- LOAD 3	6
+ LOAD 4	7
- LOAD 4	8

Connecting to the Network

The Ethernet cable will vary depending upon how the carrier is connected to a peer device on the network:

- If connected back to back with another computer and the network adapter on the computer supports auto MDX, either a straight through or crossover cable can be used. Otherwise, you must use a crossover cable.

- If connected to a HUB or router, then a straight through cable may be used.



Connect one end of the Ethernet Cable to J18 and the other end of the cable to the peer device. If the cable is properly connected, the carrier board will indicate a valid connection to the Ethernet in the following ways:

- The Link LED (D1) maintains a solid green color when connected to a 10 Mbps Ethernet network if the NE4000T module is installed. If the NE4100T module is installed, D4 will indicate a 10 Mbps connection. D5 will indicate a 100 Mbps connection when an NE4100T module is installed.

The READY LED (D2) will flash when Ethernet packets are being transmitted or received.

Connecting to a Serial Device

Connect the serial data cable between P1 and the serial device. The cable configuration will be dependent on the peer serial device the carrier board will connect to.

Network Configuration of the network module

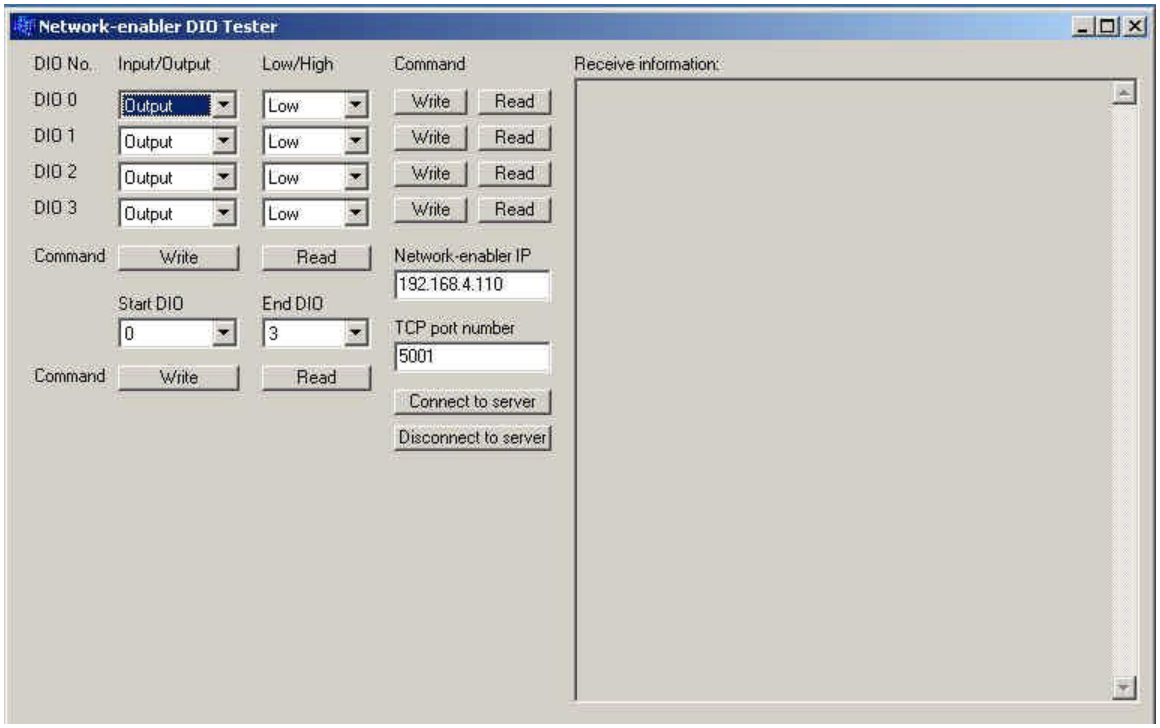
Both the NE4000T and NE4100T modules require specific configuration before they can be placed in service on the network. Consult the module specific user's guide for specific configuration instructions. These user's guides can be found in the Reference Documents section of this guide.

Using the Test Utilities

A stand alone test utility is available for each specific NE module to exercise the I/O ports. These utilities can also be used to control the outputs and read the inputs from installed I/O modules.

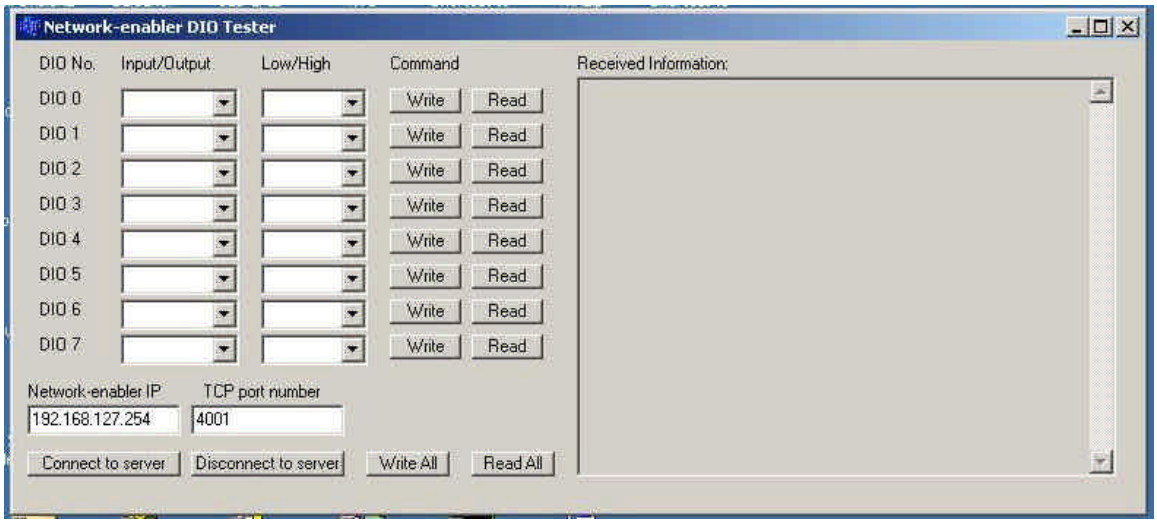
? **tdio.exe – Standalone test utility for the NE4100T module.**

http://web4.moxa.com/support/download.asp#2_DIOTester.zip



? **tdio4000t – Standalone test utility for the NE4000T module.**

http://web4.moxa.com/support/download.asp#2_DIO4000T.zip



Specifications (module dependent)

LAN	1 10/100 Mbps auto sensing RJ45
Serial	1 RS-232 Female DB-9
Signals	RS-232: TxD, RxD, RTS, CTS and Signal Common
Speed	50BPS – 115.2 KBPS
Parity	None, Even, Odd
Data bits	5, 6, 7, 8
Stop bits	1, 1.5, 2
Flow Control	NONE, XON/XOFF, RTS/CTS
Operation Modes	TCP Server, TCP Client, UDP, Real COM (Win98/NT/2000/XP)
Management	HTTP (Port 80), Windows Administration Utility, Telnet console, serial console, NECI library.
Power requirements	DC 12V to 30V,
Operating temp.	0 - 70°C
Operating Humidity	5 - 95%RH
Storage Temp.	-20 - 85°C
Surge protection	+/-15KV ESD protection for serial port
Magnetic isolation	1.5KV Ethernet
Fuse Part Number	Wickman 27513500001 or equivalent
Mechanical	Length 6.5 inches (16.5 cm) Width 3.5 inches (8.9 cm) Height 1 inch (25 cm) Weight 1 lb (.45 kg)

Designed to meet the following Certification Requirements, Regulatory Approvals and Standards

Safety:	UL 60950 third edition, CSA C22.2 No. 60-950-00,CB Scheme
Emissions/Immunity:	FCC Part 15 Class A, Canadian DOC Class A
	EU EN61000-4-2, 3, 5, 6