NE-4000T

Quick Installation Guide

Second Edition, December 2006

MOXA Technologies Co., Ltd.

NE-4000T
Quick Installation Guide

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Introduction

Welcome to MOXA NE-4000T Embedded Network Enabler. This compact embedded device server not only lets you network enable your serial devices, but also comes equipped with built-in TCP/IP protocols for fast integration.

The following topics are covered in this chapter:

❑ **Overview**
❑ **Package Checklist**
❑ **Product Features**
❑ **Product Specifications**

Overview

NE-4000T Embedded Network Enabler measures only 44×31.48 mm, or less than half the size of a credit card. This means that NE-4000T can be embedded in most serial devices to convert the devices into 10M Ethernet-ready devices.

NE-4000T comes with a built-in TCP/IP stack for fast integration with your serial devices. Engineers no longer need to spend a lot of time on TCP/IP programming, but instead can focus on developing other software features, shortening the time to market of new products. The reliable TCP/IP communication firmware that comes with NE-4000T can be easily configured with a user-friendly Windows utility, web browser, or serial console. In addition, a Windows-based NECI (Network Enabler Configuration Interface) Library is available to help you develop your own Windows utilities.

An integration kit and a complete development kit containing a development board, documents, sample code, cables, and accessories are available for evaluation and development use.

Package Checklist

- 1 NE-4000T
- 1 NE-4000T-ST
- NE-4000T Document & Software CD
- NE-4000T Quick Installation Guide
- Universal Power Adaptor Set
- Null modem cable
- Product Warranty Booklet

NOTE: *Notify your sales representative if any of the above items is missing or damaged.*

Product Features

NE-4000T has the following features:

- Supports TTL Interface (up to 115.2 Kbps)
- Supports 10M Ethernet with built-in transformer
- Ready-to-use TCP/IP firmware for fast integration
- Compact size and dual-in-line pin headers for easy integration
- Low power consumption
- Easy configuration with web browser, serial console, or Windows utility
- Supports NECI Library for developing your own configuration utility
- Highly expandable with up to 8 GPIOs and modem control signals

Product Specifications

System

CPU	8-bit MCU
RAM	32 KB
Flash	64 KB

LAN

Ethernet	10 Mbps, pin headers
Protection	Built-in transformer with 1.5 KV magnetic isolation

Serial

Interface	TTL
Port Type	Pin header
Signals	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Serial Communication Parameters

Parity	None, Even, Odd
Data Bits	8
Stop Bits	1, 2
Flow Control	RTS/CTS, XON/XOFF
Transmission Speed	300 bps to 115.2 Kbps

Software Features

Protocols	ICMP, ARP, IP, TCP, UDP, DHCP, HTTP
Operating Mode	TCP Server
Utilities	Configurator utility for Windows 95/98/ME/NT/2000/XP
Configuration	Web Browser, Serial Console, or Windows Utility

Power Requirements

Power Input	5 VDC, ±5%
Power Consumption	65 mA @ 5 VDC (Max.)

Environment

Operating Temperature	0 to 70°C (32 to 158°F), 5 to 95%RH
Storage Temperature	-20 to 85°C (-4 to 185°F), 5 to 95%RH

Regulatory Approvals

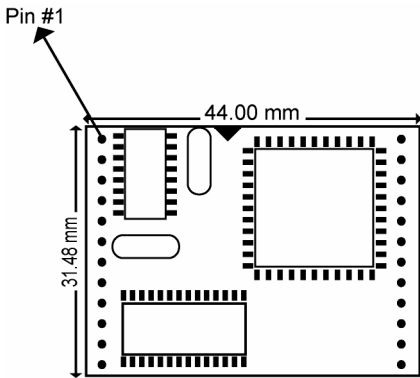|	
EMC	FCC Class B, CE Class B
WARRANTY	5 years

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Panel Layout and Pin Assignments

This chapter includes information about NE-4000T's layout and pin assignments. The second section of the chapter discusses NE-4000T-ST, the evaluation board used for evaluation and development. The following topics are covered:
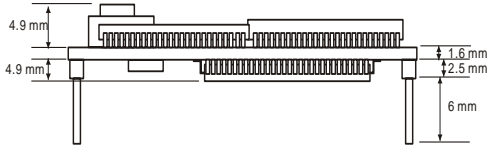
❑ **Panel Layout (NE-4000T)**
  ➢ Pin Assignments
  ➢ Block Diagram
❑ **Panel Layout (NE-4000T-ST)**
  ➢ Major Components
  ➢ Ethernet Port Pinouts
  ➢ Serial Port Pinouts
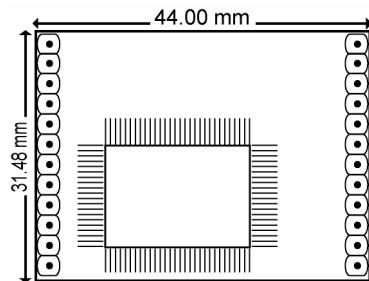 ➢ PIO Pin Headers
  ➢ LED Indicators

Panel Layout (NE-4000T)

Top panel of NE-4000T

Pin #1

44.00 mm

31.48 mm

Side panel of NE-4000T

4.9 mm

4.9 mm

1.6 mm
2.5 mm

6 mm

Back panel of NE-4000T

44.00 mm

31.48 mm

Pin Assignments

Pin	Signal	Pin	Signal
1	ETx+	13	PIO0
2	ETx-	14	PIO1
3	ERx+	15	PIO2
4	ERx-	16	PIO3
5	Link/Active LED	17	PIO4/ADDC
6	TXD	18	PIO5/DCD
7	RXD	19	PIO6/DSR
8	RTS	20	PIO7/DTR
9	CTS	21	Reserved
10	Reserved	22	Ready LED
11	GND	23	Reserved
12	GND	24	+5V

NOTE Ethernet Signals: ETx+, ETx-, ERx+, ERx-
Serial Signals: TXD, RXD, RTS, CTS, DCD, DSR, DTR
LED Names: Link/Active, Ready

NOTE ADDC™ stands for Automatic Data Direction Control, which was developed by MOXA to simplify RS-485 software programming for transmitting and receiving data via a half-duplex RS-485 port.
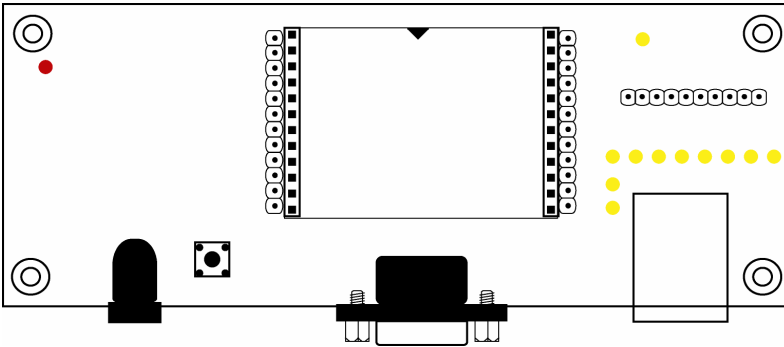
NOTE DCD, DSR, and DTR share pins 18 to 20 with PIO5, PIO6, and PIO7.
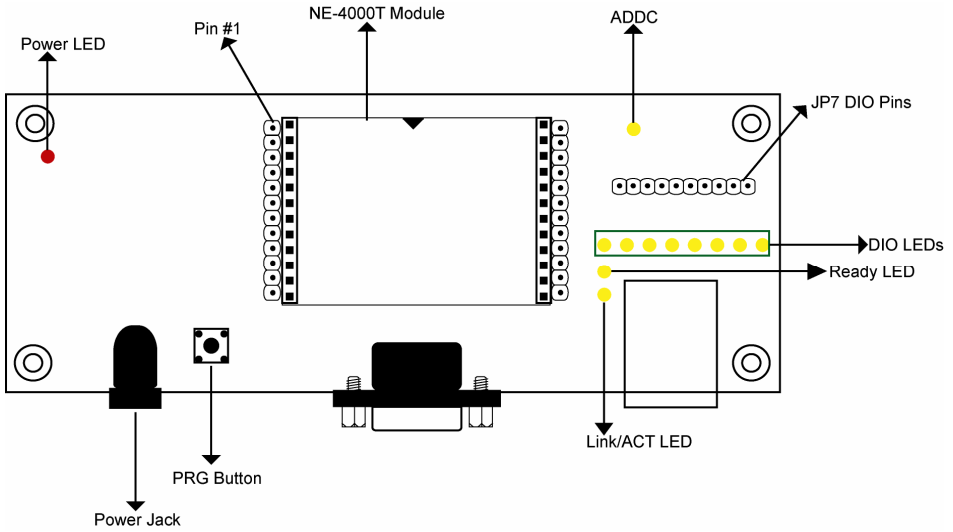
Block Diagram
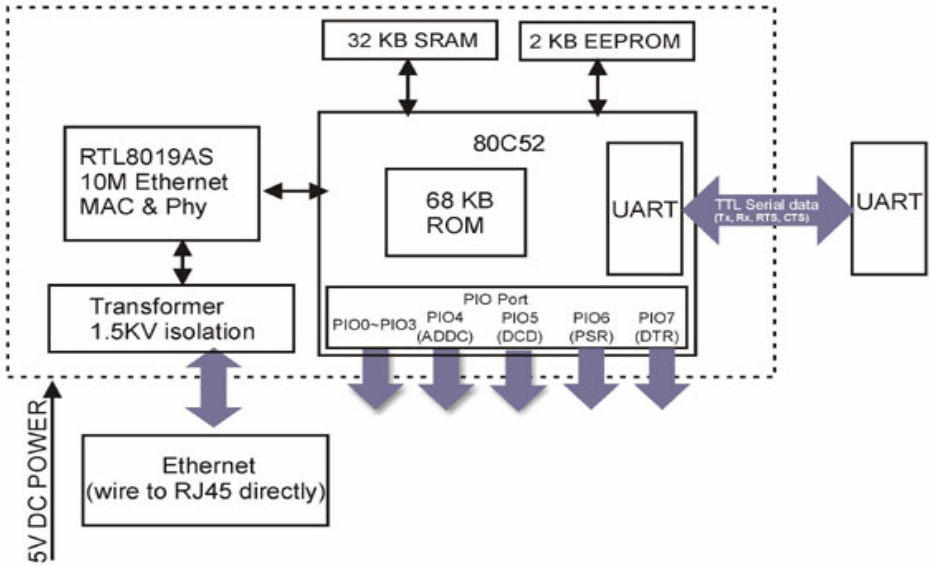
Panel Layout (NE-4000T-ST)

NE-4000T-ST is an evaluation and design board for use by engineers who will incorporate NE-4000T into their serial device. The size of this board is 130×50 mm, with a thickness of 1.6 mm.
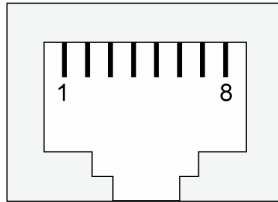
Major Components

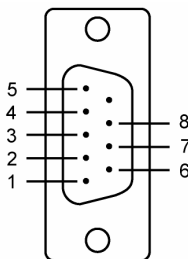
Ethernet Port Pinouts

RJ45 Port

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

Serial Port Pinouts

Male DB9 Connector

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

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PIO Pin Headers

Pin	Signal
1	VCC
2	PIO0
3	PIO1
4	PIO2
5	PIO3
6	PIO4
7	PIO5
8	PIO6
9	PIO7
10	GND

VCC
PIO0
PIO1
PIO2
PIO3
PIO4
PIO5
PIO6
PIO7
GND

LED Indicators

LED Name	LED Color	LED Function	
Power	red	Indicates the power is on.	
Ready	green	Steady on:	Power is on and NE-4000T-ST is functioning normally.
		Blinking:	NE-4000T-ST has been located by NE-4000T-ST Administrator's Location function.
	off	Power is off, or power error condition exists.	
Link	green	10 Mbps Ethernet connection.	
	off	Ethernet cable is disconnected, or has a short.	
PIO0	green	Indicates that PIO is in "low" (0) status.	
PIO1	green	Indicates that PIO is in "low" (0) status.	
PIO2	green	Indicates that PIO is in "low" (0) status.	
PIO3	green	Indicates that PIO is in "low" (0) status.	
PIO4	green	Indicates that PIO is in "low" (0) status.	
PIO5	green	Indicates that PIO is in "low" (0) status.	
PIO6	green	Indicates that PIO is in "low" (0) status.	
PIO7	green	Indicates that PIO is in "low" (0) status.	

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Getting Started

This chapter includes information about installing NE-4000T. The following topics are covered:

- ❑ **Wiring Requirements**
- ❑ **Plugging NE-4000T into NE-4000T-ST**
- ❑ **Connecting the Power**
- ❑ **Connecting to the Network**
- ❑ **Connecting to a Serial Device**
- ❑ **Operating Mode**

Wiring Requirements

This section describes some points that need your attention before proceeding with the installation.

⚠️ **ATTENTION**

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your NE-4000T-ST.

Wiring Caution!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Temperature Caution!

Please take care when handling NE-4000T-ST. When plugged in, NE-4000T-ST's internal components generate heat, and consequently the board may feel hot to the touch.

You should also heed the following points:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

  NOTE: Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.

- Keep input wiring and output wiring separate.

- Where necessary, it is strongly advised that you label wiring to all devices in the system.

Plugging NE-4000T into NE-4000T-ST

Before you connect your NE-4000T-ST to the power supply, network, or a serial device, you first need to plug NE-4000T into NE-4000T-ST. In the center of NE-4000T-ST, there is a square with one white inverted triangle (shown as black in the figure) on one of its sides, and 2 rows of female sockets on the other two sides. The NE-4000T board also has a white inverted triangle on one of its sides. When plugging your NE-4000T into the NE-4000T-ST board, make sure these 2 white inverted triangles are facing the same direction, as shown in the figure.
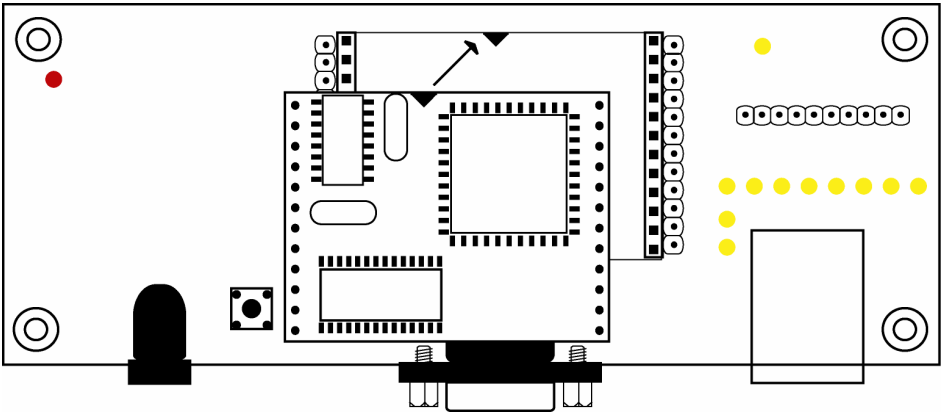
Connecting the Power

Connect the 12-30 VDC power line with NE-4000T-ST's terminal block. If the power is properly supplied, the "Power" LED will show a solid red color until the system is ready, at which time the "Ready" LED will show a green color.

Connecting to the Network

Connect one end of the Ethernet Cable to NE-4000T-ST's Ethernet port and the other end of the cable to the Ethernet network. If the cable is properly connected, NE-4000T-ST will indicate a valid connection to the Ethernet in the following ways:

• The Link LED maintains a solid green color when connected to a 10 Mbps Ethernet network.

• The Link LED will flash when Ethernet packets are being transmitted or received.

Connecting to a Serial Device

Use a serial data cable to connect NE-4000T-ST with the serial device.

Operating Mode

NE-4000T uses TCP Server mode to establish the Serial-to-Ethernet connection. NE-4000T provides a unique IP:Port address on a TCP/IP network. NE-4000T waits passively to be contacted by the host computer, allowing the host computer to establish a connection with and get data from the serial device. Data transmission proceeds as illustrated in the following figure:

1. The host requests a connection from the NE-4000T (configured for TCP Server Mode).

2. Once the connection is established, data can be transmitted in both directions—from the host to the NE-4000T, and from the NE-4000T to the host.
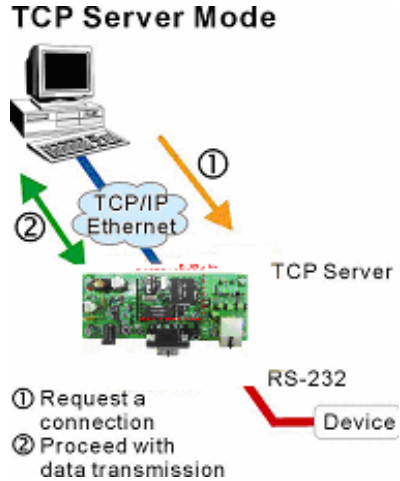
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How to Configure NE-4000T

After installing the hardware, the next task required is to configure NE-4000T's settings. There are 3 configuration methods: Network Enabler Utility, Web Console, and Serial Console. In this chapter, we will discuss how to use Network Enabler Utility to configure your NE-4000T. This chapter includes the following sections:

❑ **Utility**
❑ **Web Console**
❑ **Serial Console**

Utility

To install the Network Enabler Utility, insert the CD-ROM into your computer's CD tray and select "Utility installation." Refer to the online user's manual for detailed installation instructions.

Web console

1. Open your browser with the cookie function enabled. (To enable your browser for cookies, right click on your desktop Internet Explorer icon, select Properties, click on the Security tab, and then select the three Enable options.)

2. Type 192.168.127.254 in the **Address** input box (use the correct IP address if different from the default), and then press **Enter**. A screen will open, displaying detailed information about NE-4000T.
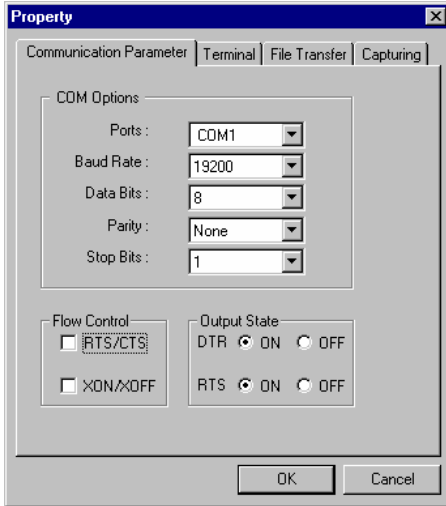
Serial Console

You may use the RS-232 console port to set up NE-4000T's IP address. We suggest using MOXA PComm Terminal Emulator, which is available free of charge as part of the MOXA PComm Lite program suite, to carry out the configuration procedure. (You may download the PComm Lite installation program from the MOXA website ate www.moxa.com. Select "Software Downloads" under the "Support & Service" menu, and then choose "PComm Lite" from the "Select a Product" list.)

Before you start to configure the NE-4000T via serial console, turn off NE-4000T-ST's power and connect the serial cable from NE-4000T-ST to your computer's serial port.

1. Use a serial cable to connect NE-4000T-ST's serial port (the DB9 Male connector) directly to your computer's serial port.

2. From the Windows desktop, click on **Start → Programs → PComm Lite → Terminal Emulator**.

3. When the **PComm Terminal Emulator** window opens, first click on the **Port Manager** menu item and select **Open**, or simply click on the **Open** icon.
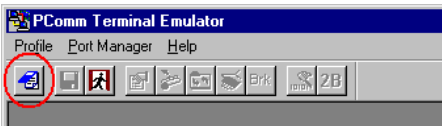
4.   The **Property** window opens automatically. From the **Communication Parameter** page, select the appropriate COM port for the connection, **COM1** in this example, and **19200** for **Baud Rate**, **8** for **Data Bits**, **None** for **Parity**, and **1** for **Stop Bits**.
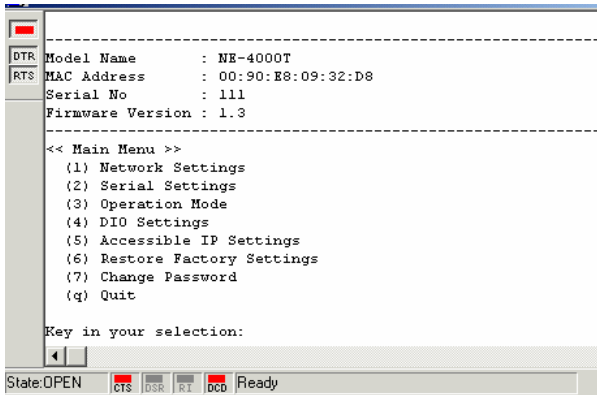

5.   From the **Property** window's **Terminal** page, select **ANSI** and then click on **OK**.
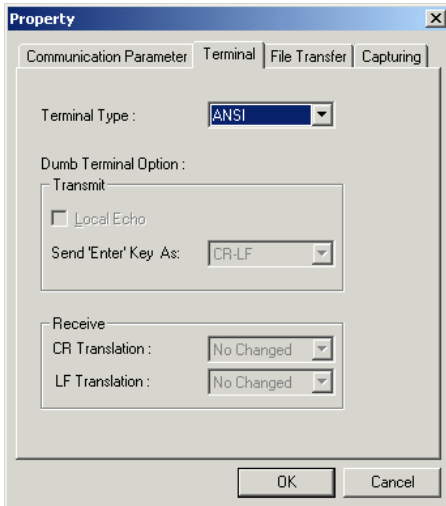
6. Power on NE-4000T-ST and press "0" continuously until the serial console screen opens.

```
┌───┐ ┌──────────────────────────────────────────────────────
│ ▬ │ │------------------------------------------------------
├───┤ │Model Name      : NE-4000T
│DTR│ │MAC Address     : 00:90:E8:09:32:D8
│RTS│ │Serial No       : 111
      │Firmware Version : 1.3
      │------------------------------------------------------
      │<< Main Menu >>
      │   (1) Network Settings
      │   (2) Serial Settings
      │   (3) Operation Mode
      │   (4) DIO Settings
      │   (5) Accessible IP Settings
      │   (6) Restore Factory Settings
      │   (7) Change Password
      │   (q) Quit
      │
      │Key in your selection:
      │ ◄
State:OPEN   [CTS][DSR][RI][DCD] Ready
```

Please refer the online user's manual for more detailed configuration information.

A
Certification

This product complies with Chinese RoHS (Restriction of Hazardous Substances) regulations for Electronic Information Products.