

# WE-2100T Series User's Manual

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Moxa Technologies Co., Ltd.

Tel: +886-2-8919-1230

Fax: +886-2-8919-1231

Web: [www.moxa.com](http://www.moxa.com)

**MOXA Technical Support**

Worldwide: [support@moxa.com.tw](mailto:support@moxa.com.tw)

The Americas: [support@moxa.com](mailto:support@moxa.com)

# WE-2100T Series User's Manual

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Moxa's WE-2100T Serial-to-WLAN Embedded Network Enabler is compact sized embedded modules that let you wireless-network-enable your serial devices. WE-2100T module comes equipped with built-in TCP/IP and wireless security/authentication protocols for fast integration, saving you time and energy on programming.

The following topics are covered in this chapter:

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

## Overview

WE-2100T is very compact—around half the size of a credit card. With such a small size, these Embedded Network Enablers fit into almost any kind of serial device to make the serial device Wireless LAN ready. These products also come with a built-in TCP/IP stack for fast integration with your serial devices. This means that your engineers no longer need to spend a lot of time on TCP/IP programming and wireless know-how, but instead can focus on developing other major features, shortening your product's time to market. The reliable TCP/IP communication firmware that comes with WE-2100T can be configured easily with a user-friendly Windows utility, Web browser, serial console, or telnet 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 WE-2100T Series module (depending on which model you order)
- 1 WE-2100T-ST (the evaluation board )
- WE-2100T Series Documentation & Software CD
- 1 Power Adaptor
- 1 Power Cords
- 1 null modem cable
- 1 cross-over Ethernet cable
- Product Warranty Booklet
- Quick Installation Guide

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

## Product Features

WE-2100T Series products have the following features:

- Compliant to 802.11 a/b/g standards
- TTL to 10/100 Mbps auto-sensing Ethernet interface
- Compact size with ready-to-go design
- Ready-to-use TCP/IP firmware for fast integration
- TCP Server, TCP Client, UDP, Real COM, RFC2217 operation modes
- Serial command to configure via data port
- Easy configuration with Web browser, serial console, Windows utility, or telnet console
- 9 GPIOs for users' applications
- Software reset function

## Product Specifications

<b>WLAN</b>	
Spread Spectrum Technology	DSSS,CCK,OFDM
Standard Compliance	802.11 a/b/g
Tx Power	5.18~5.24GHz: 15dBm@6Mbps; 12dBm@54Mbps 5.745~5.805GHz:15dBm@6Mbps; 12dBm@54Mbps 2.412~2.483GHz:17dBm@6Mbps; 15dBm@54Mbps 2.412~2.472GHz:18dBm@1~11Mbps
Transmission Distance	Up to 100 meters (in open areas)
Security	AES, WEP 64/128-bit, WPA, WPA2, 802.11i
Network Modes	Infrastructure for 802.11 a/b/g Ad-Hoc for 802.11 b/g
Authentications	PEAP, EAP-TLS, EAP-TTLS, PEAP/MSCHAPv2, PEAP/TLS, PEAP/GTC, PEAP/MD5, EAP-TTLS/ EAP-MD5, EAP-TTLS/EAP-GTC, EAPTTLS, EAP-TTLS/EAP-MSCHAPv2, EAP-TTLS/EAP-TLS, EAP-TTLS/ MSCHAPv2, EAP-TTLS/MSCHAP
Security	AES, WEP 64/128-bit, WPA, WPA2, 802.11i
<b>LAN</b>	
Ethernet	10/100 Mbps
<b>Serial</b>	
Interface	TTL
Digital I/O	9
<b>Serial Communication Parameters</b>	
Parity	None, Even, Odd, Space, Mark
Data Bits	5, 6, 7, 8
Stop Bit	1, 1.5, 2
Flow Control	RTS/CTS, XON/XOFF, DTR/DSR
Transmission Speed	50 to 921.6K bps (standard baudrates), 250K and 500K bps (nonstandard baudrates)
<b>Software Features</b>	
Protocols	ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, SSH, HTTPS
Operating Mode	TCP Server, TCP Client, UDP, Real COM, RFC2217 mode
Utilities	Windows utility for Windows 98/ME/2000/XP/2003/Vista
COM Driver	Windows 95/ 98/ ME/ NT/ 2000/ XP/ 2003/ XP x64/ 2003 x64/ Vista Linux Real TTY driver, SCO Unix, SCO OpenServer 5, UnixWare 7, UnixWare 2.1.x, SVR4.2, QNX
Configuration	Web Browser, Serial Console, Telnet Console, or Windows Utility, Serial command
<b>Power Requirements</b>	
Power Input	3.3V $\pm$ 5% VDC
Power Consumption	950 mA @ 3.3 VDC (Max.)
<b>Environmental</b>	

Operating Temperature	0 to 55 °C (32 to 131 °F), 5 to 95% RH
Storage Temperature	-20 to 85 °C (-4 to 185 °F), 5 to 95% RH
<b>Regulatory Approvals</b>	
EMC	CE EN550022 Class A FCC Part 15, Subpart B, Class A Safety: EN60950, CUL, TUV
Wireless	CE ETSI EN 301 489-17 CE ETSI EN 301 489-1 FCC Part 15, Subpart B, Class A FCC Part 15 Subpart C and Subpart E
<b>Warranty</b>	5 years



## Panel Layout and Pin Assignments

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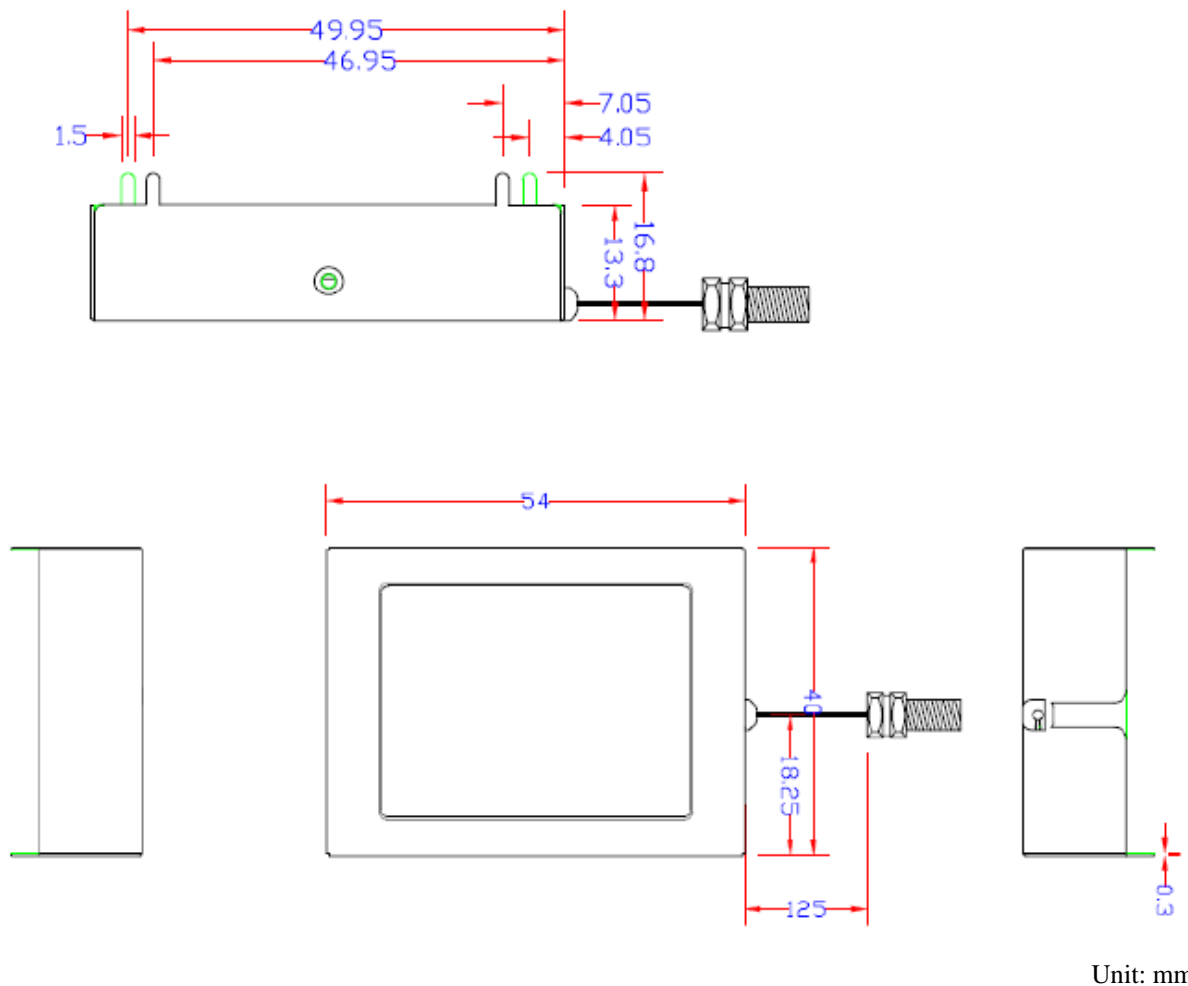
This chapter includes information about the panel layouts and pin assignments for WE-2100T. The layouts and reference circuit diagrams for the evaluation boards are also covered. The evaluation boards are used for evaluation and development of applications for WE-4100T.

The following topics are covered in this chapter:

- ❑ **Specification and dimension**
  - WE-2100T
  - WE-2100T-ST
- ❑ **Pin Assignments**
- ❑ **WE-2100T LED Indicators**

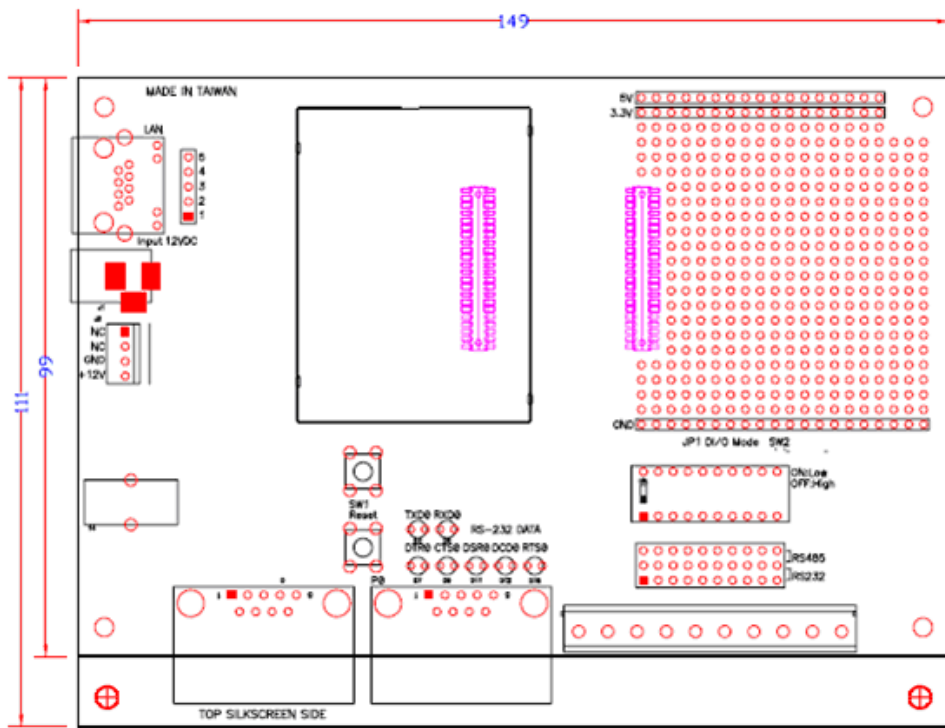
## Specification and dimension

WE-2100T



Unit: mm

WE-2100T-ST



Unit: mm

## Pin Assignments

Pin	Function	pin	Function	pin	function	pin	function
1	3.3V	12	Console_DSR	23	Data_RTS	34	SW_RESET
2	GND	13	PIO0	24	Data_RxD	35	Eth_Center_TAP
3	3.3V	14	Console_DCD	25	Data_DTR	36	HW_RESET
4	GND	15	PIO1	26	Data_CTS	37	Eth_Center_TAP
5	3.3V	16	PIO4(WLAN strength 1)	27	Ready_LED	38	Eth_100M_LED
6	GND	17	PIO2	28	Data_DSR	39	Eth_Rx+
7	Console_TxD	18	PIO5(WLAN strength 2)	29	Fault_LED	40	Eth_10M_LED
8	Console_RxD	19	PIO3	30	Data_DCD	41	Eth_Rx-
9	Console_RTS	20	PIO6(WLAN strength 3)	31	Eth_Tx+	42	Reserved
10	Console_CTS	21	Data_TxD	32	WLAN_Link_LED	43	PIO0(WLAN strength 0)
11	Console_DTR	22	PIO7(WLAN strength 4)	33	Eth_Tx-	44	Reserved

## WE-2100T LED Indicators

Type	Color	Status	Meaning
Ready	Off	Off	Power is off.
			WE-2100T is booting or rebooting.
			IP error condition occurs.
	Green	Steady On	WE-2100T is functioning normally.
		Blinking	WE-2100T is located by NEAdmin's Location function. SW Reset is hold within 5 seconds.
Fault	Off	Off	Power is off.
			WE-2100T is functioning normally.
	Red	Steady On	WE-2100T is booting or rebooting.
Blinking		IP conflict, DHCP or BOOTP server did not respond properly.	
WLAN	Off	Off	WE-2100T was booted with Ethernet cable plugged.
	Green	Steady On	Wireless LAN is activated. (WE-2100T was booted with Ethernet cable unplugged.)
WLAN Strength	Off	Off	JP3 is opened.
	Green/Off	Steady On/Off	JP3 is shorted; five LEDs represent WLAN signal strength of 20%~100%, in 20% scale.
Ethernet	Off	Off	Ethernet cable is unplugged.
	Orange	Steady On	10M Ethernet connected.
	Green	Steady On	100M Ethernet connected.
Serial TXD	Off	Off	No data is transmitted from WE-2100T.
	Green	On	Data is transmitted from WE-2100T.
Serial RXD	Off	Off	No data is transmitted to WE-2100T.
	Yellow	On	Data is transmitted to WE-2100T.
DO0~DO8	Off	Off	GPIO is input
			JP2 DO is opened.
			GPIO mode is output, and state is high.
Green	Steady On	JP2 DO is shorted, GPIO mode is output, and state is low.	

This chapter includes information about installing WE-2100T.

The following topics are covered in this chapter:

- ❑ **Wiring Requirements**
- ❑ **Attaching WE-2100T to the Evaluation Board**
- ❑ **Circuit Pad for External Connection**
- ❑ **Connecting the Power**
- ❑ **Connecting to the Network**
- ❑ **Connecting to a Serial Device**
- ❑ **DI/O Settings**
  - Digital Output LED Circuit Design

## Wiring Requirements

This section describes some important safety precautions that you should pay attention to before proceeding with any installation.

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**ATTENTION****Safety First!**

Be sure to disconnect the power cord before installing and/or wiring your evaluation boards for the WE-2100T module.

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**Wiring Caution!****ATTENTION**

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.

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**ATTENTION****Temperature Caution!**

Please take care when handling the evaluation boards. When plugged in, the evaluation boards' internal components generate heat, and consequently the board may feel hot to the touch.

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You should also pay attention to the following points:

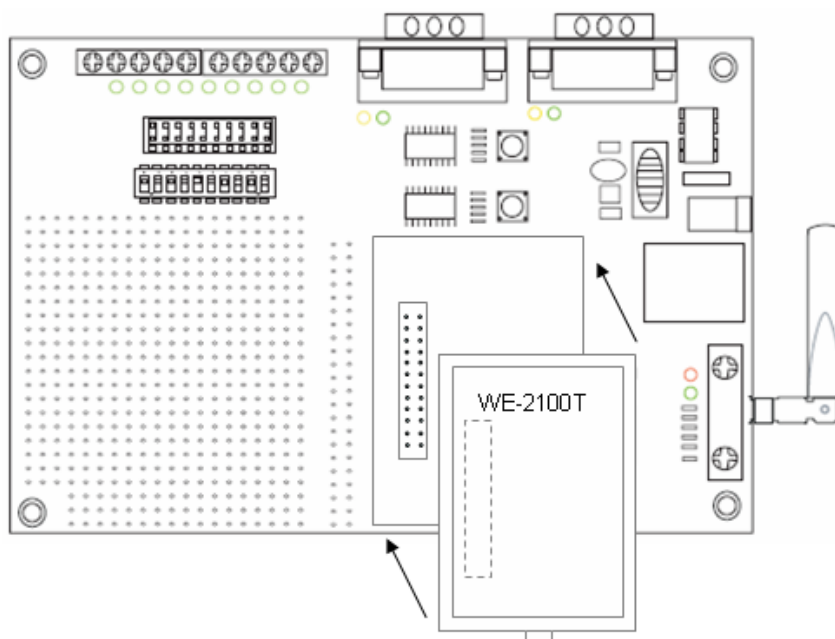
- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

**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.

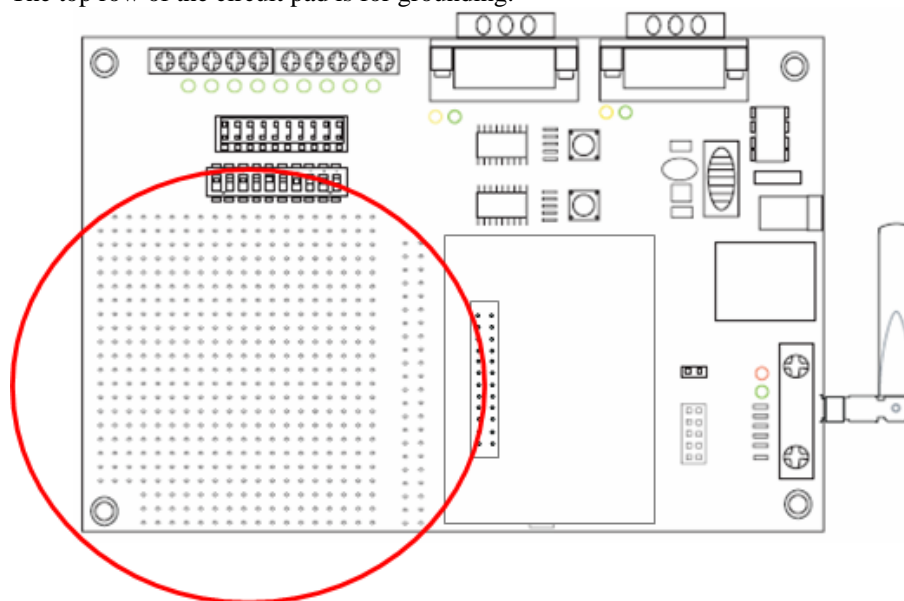
## Attaching WE-2100T to the Evaluation Board

Before connecting your WE-2100T-ST to the power supply, network, and serial device, you first need to attach WE-2100T to the WE-2100T-ST evaluation board. In the center of the evaluation boards, there is a square with 2 rows of male pins on one of its sides. The WE-2100T board also has 2 rows of female sockets on its bottom. When attaching your WE-2100T to WE-2100T-ST, make sure the pins and the socket match with each other, as shown in the following figure.

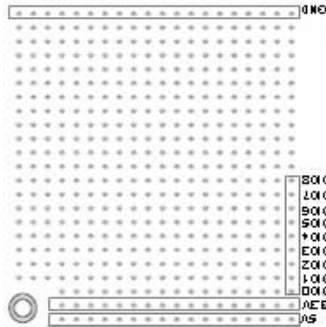


### Circuit Pad for External Connection

The circuit pad located on the left side of the evaluation boards is used to develop additional application circuits. The circuit pad is circled in red in the figure below. As shown in the second figure, the bottom row of the circuit pad is for connecting a 5V power supply, whereas the upper row is for connecting a 3.3V power supply. There are totally 9 digital I/O pins on the right side. The top row of the circuit pad is for grounding.







## Connecting the Power

Connect the 12 VDC power line with the evaluation boards' power jack.

## Connecting to the Network

In the development stage, you may want to configure the WE-2100T with Ethernet since the wireless LAN may not work before properly configured. If you are using WE-2100T, connect one end of the Ethernet cable to the WE-2100T-ST's RJ45 Ethernet port, and the other end of the cable to the Ethernet network. If the cable is properly connected, the RJ45 connector will indicate a valid connection to the Ethernet in the following ways:



The green indicator LED in the upper right corner blinks when the cable is properly connected to a 100 Mbps Ethernet network, and data is being transmitted.



The yellow indicator LED in the upper left corner blinks when the cable is properly connected to a 10 Mbps Ethernet network, and data is being transmitted.

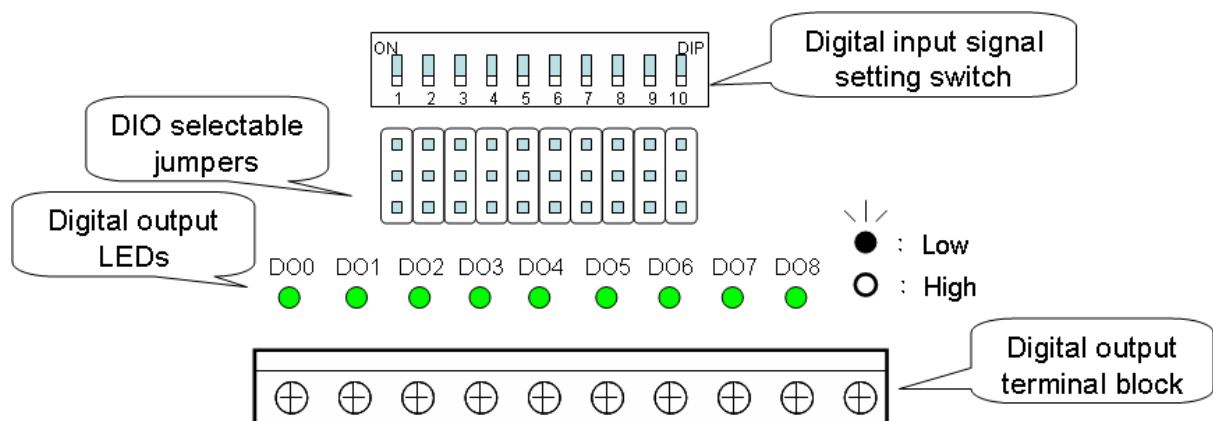
## Connecting to a Serial Device

Connect the serial data cable between the evaluation boards and the serial device. The "Console Port" or "P1" is used as serial console interface and the "Data Port" or "P2" is used as data interface.

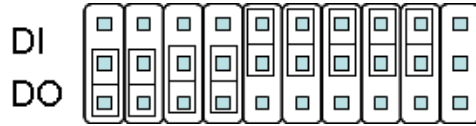
## D/I/O Settings

WE-2100T supports up to 9 digital I/Os. All 9 digital I/Os are GPIO (General Purpose I/O) that allow you to set to "digital output" or "digital input" mode by software. On the evaluation board, LEDs are used to simulate output loading whereas the DIP switch simulates an input device.

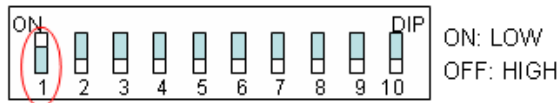
DIO mode for physical wiring is selected by the DIO mode jumper. For example, when the DIO mode of DIO1 is set to DI, the circuit of DIO1 on the WE-2100T is connected to Digital Input DIP switch, digit 1. When the firmware of the WE-2100T sets DIO1 to digital input mode, you can check the DIO1 status with the Windows utility or Web browser. When you change digit 1 of the switch, the changes appear on the Web browser.



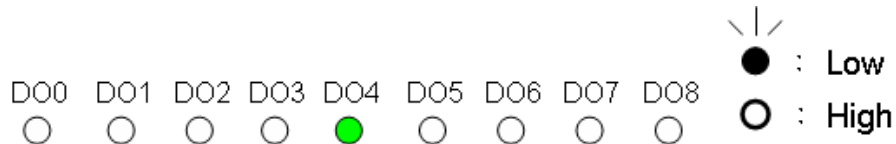
1. First, use the DIO selectable jumpers to set the D/O modes, as shown below.



2. After the DIO modes are set, use the Digital Input DIP Switches to configure the status for DI0 – DI3. You can either configure the status to “Low” or “High.” If you wish to configure DI0’s status to “Low” and the others to “High,” set DIP Switch 1 to the “ON” position and the others to the “OFF” position, as shown below.



3. DO4 – DO8’s status must be configured with the Web Console. If you configure DO4’s status to “Low” and the others to “High,” the DO4’s LED will show solid green, and the other LEDs will not light up. Refer to chapter 6 for more configuration details.



### Digital Output LED Circuit Design

The figure shown below is the digital output LED circuit design. The design is called “Sink.”



For developing your own applications, you need to be aware of the voltage limits shown below. The output electric circuit is 1 mA

		Min.	Max.	Unit	Conditions
Low-level Input Voltage	Maximum voltage when DI is set to “Low” status.	-----	0.3xVCC	V	
High-level Input Voltage	Minimum voltage when DI is set to “High” status.	0.7xVCC	-----	V	
Low-level Input Voltage	Maximum voltage when DO is set to “Low” status.	-----	0.4	V	
High-level Input Voltage	Minimum voltage when DO is set to “High” status	2.4	-----	V	

Digital Output’s output current carries only 1 mA.

## Choosing the Proper Operation Mode

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In this section, we describe the various WE-2100T operation modes. The options include an operation mode that uses a driver installed on the host computer, and operation modes that rely on TCP/IP socket programming concepts. After choosing the proper operating mode in this chapter, refer to subsequent chapters for detailed configuration parameter definitions.

- ❑ **Overview**
- ❑ **TCP Server Mode**
- ❑ **TCP Client Mode**
- ❑ **UDP Mode**
- ❑ **Real COM Mode**
- ❑ **RFC2217 Mode**

## Overview

WE-2100T Series Embedded Wireless Network Enablers act as a bridge to connect your serial devices to the wireless LAN. The built-in TCP/IP stack saves you a lot of time on programming networking protocols. One simple step allows you to choose the proper operating mode, and then use your computer to access, manage, and configure your serial device over the Internet from anywhere in the world.

Traditional SCADA and data collection systems rely on serial ports (RS-232/422/485) to collect data from various kinds of instruments. Since WE-2100T is equipped with the ability to convert between serial and Ethernet signals, your SCADA and data collection system will be able to access all devices connected to a standard TCP/IP network, regardless of whether the devices are used locally or at a remote site.

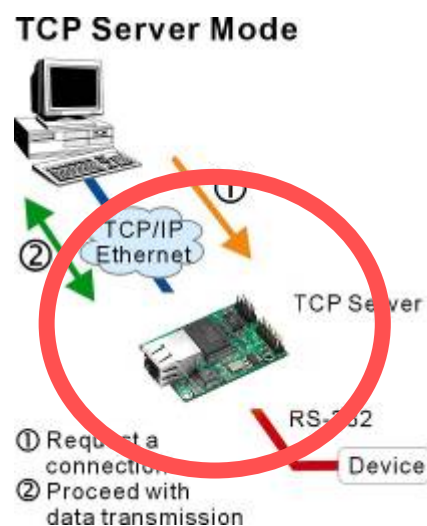
Three different socket modes—TCP Server, TCP Client, and UDP Server/Client—, one real COM and RFC-2217 modes are available. The main difference between the TCP and UDP protocols is that TCP guarantees delivery of data by requiring the recipient to send an acknowledgement to the sender. UDP does not require this type of verification, making it possible to offer speedier delivery. UDP also allows multicasting of data to groups of IP addresses.

## TCP Server Mode

In **TCP Server mode**, WE-2100T provides a unique IP:Port address on a TCP/IP network. WE-2100T wait passively to be contacted by the host computer, allowing the host computer to establish a connection with and get data from the serial device. This operation mode also supports up to 8 simultaneous connections, so that multiple hosts can collect data from the same serial device—at the same time.

As illustrated in the figure, data transmission proceeds as follows:

1. The host connects to the WE-2100T configured for TCP Server Mode.
2. Once the connection is established, data can be transmitted in both directions—from the host to the WE-2100, and from the WE-4100T to the host.



## TCP Client Mode

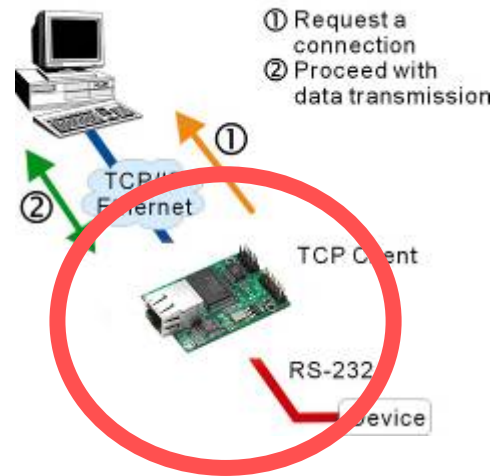
In **TCP Client mode**, WE-2100T can actively establish a TCP connection to a set of (max. 4) pre-defined host computer when serial data arrives.

After the data has been transferred, WE-2100T can automatically disconnect from the host computer by using the **TCP alive check time** or **Inactivity time** settings. Refer to the following chapters for more details.

As illustrated in the figure, data transmission proceeds as follows:

1. The WE-2100T running TCP Client Mode actively establishes a connection based on the conditions set in the firmware. You can let the WE-2100T connect to a remote host on start up, or connect later when data from serial device arrives.
2. Once the connection is established, data can be transmitted in both directions—from the host to the WE-2100T, and from the WE-2100T to the host.

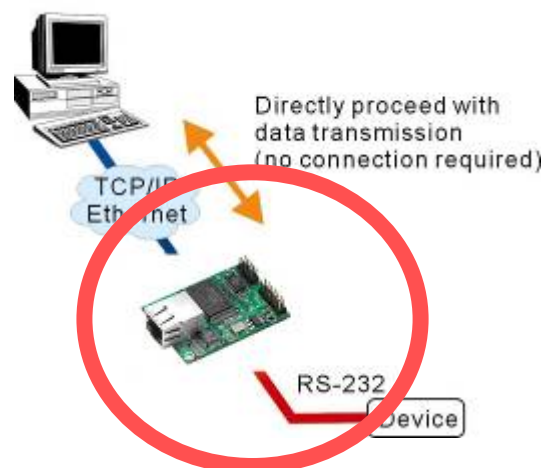
### TCP Client Mode



## UDP Mode

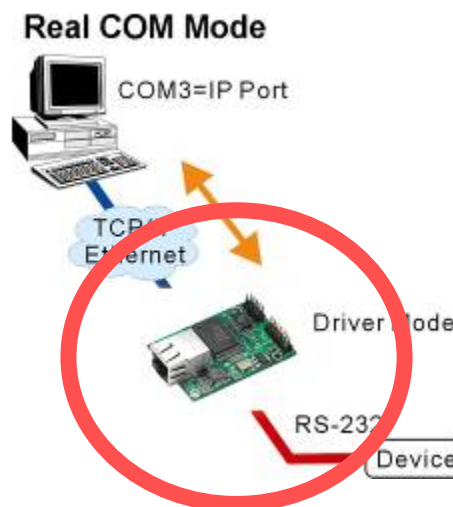
Compared to TCP communication, UDP is faster and more efficient. In UDP mode, you can multicast data from the serial device to multiple host computers, and the serial device can also receive data from multiple host computers, making this mode ideal for message display applications.

### UDP Mode



## Real COM Mode

WE-2100T comes equipped with COM drivers that work with Windows 95/98/ME/NT/2000/XP/Vista and UNIX-like systems. The driver establishes a transparent connection between host and serial device by mapping the IP:Port of the WE-2100T's serial port to a local COM port on the host computer.



### ATTENTION



The driver used for Real COM Mode comes with the Network Enabler Administrator which is installed automatically on your computer when you install the Network Enabler Administration Suite.

Real COM Mode allows users to continue using RS-232/422/485 serial communications software that was written for pure serial communications applications. The driver intercepts data sent to the host's COM port, packs it into a TCP/IP packet, and then redirects it through the host's Ethernet card or wireless interface. At the other end of the connection, the WE-2100T accept the WLAN frame, unpack the TCP/IP packet, and then transparently send it to the appropriate serial device attached to the WE-2100T's serial port.

### ATTENTION



Real COM Mode allows several hosts to have access control of the same WE-2100T. The Moxa driver that comes with your WE-2100T controls host access to attached serial devices by checking the host's IP address.

Modify the Accessible IP Setting table when a public IP address is required for your application.

## RFC2271 Mode

RFC-2217 mode is similar to Real COM mode. That is, a driver is used to establish a transparent connection between a host computer and a serial device by mapping the serial port on the WE-2100T to a local COM port on the host computer. RFC2217 defines general COM port control options based on the Telnet protocol. Third party drivers supporting RFC-2217 are widely available on the Internet and can be used to implement Virtual COM mapping to your WE-2100T serial port.

## Initial IP Address Configuration

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When setting up your WE-2100T module for the first time, the first thing you should do is configure the IP address. This chapter introduces the methods that can be used to configure the WE-2100T's IP address. For more details about network settings, see the *Network Settings* section from Chapter 6, *Web Console Configuration*.

This chapter includes the following sections:

- ❑ **Initializing WE-2100T's IP Address**
- ❑ **Factory Default IP Address**
- ❑ **Network Enabler Administration Suite** ← *recommended configuration method*
- ❑ **ARP**
- ❑ **Telnet Console**
- ❑ **Serial Console (19200, n, 8, 1)**

## Initializing WE-2100T's IP Address

1. Determine whether your WE-2100T will use a Static IP or Dynamic IP (either DHCP or BOOTP application).
2. *If WE-2100T is used in a Static IP environment*, you can use Network Enabler Administration Suite, ARP, Web Console, Telnet Console, or Serial Console to configure the new IP address.
3. *If WE-2100T is used in a Dynamic IP environment*, you can use Network Enabler Administration suite, Web Console, Telnet Console, or Serial Console to configure WE-2100T to get an IP address dynamically with DHCP, DHCP/BOOTP, or BOOTP.

**ATTENTION**

Consult your network administrator on how to reserve a fixed IP address (for your WE-2100T) in the MAC-IP mapping table when using a DHCP Server or BOOTP Server. In most applications, you should assign a fixed IP address to your WE-2100T module.

## Factory Default IP Address

WE-2100T is configured with the following default private IP address:

<b>Ethernet default IP address:</b>	192.168.126.254
<b>WLAN default IP address:</b>	192.168.127.254

(IP addresses of the form 192.168.xxx.xxx are referred to as private IP addresses, since it is not possible to directly access a device configured with a private IP address from a public network. For example, you would not be able to ping such a device from an outside Internet connection. WE-2100T applications that require sending data over a public network, such as the Internet, require setting up the server with a valid public IP address, which can be leased from a local ISP.)

## Network Enabler Administration Suite

Network Enabler Administration Suite consists of some useful utilities that are used to configure and manage your WE-2100T embedded module.

**See Chapter 7 for details on how to install Network Enabler Administration Suite, and how to use this suite of useful utilities to set up IP addresses and configure your WE-2100T embedded module.**

## ARP

You can use the ARP (Address Resolution Protocol) command to set up an IP address for your WE-2100T. The ARP command tells your computer to associate the WE-2100T's MAC address with the intended IP address. You must then use Telnet to access the WE-2100T, at which point the WE-2100T's IP address will be reconfigured.

**ATTENTION**

In order to use this setup method, both your computer and WE-2100T must be connected to the same LAN.

You may also use a cross-over Ethernet cable to connect the WE-2100T directly to your computer's Ethernet card.

Your WE-2100T must be configured with the factory default IP address—192.168.127.254—before executing the ARP command, as described below.

Take the following steps to use ARP to configure the IP address:

1. Obtain a valid IP address for your WE-2100T from your network administrator.
2. Obtain the WE-2100T's MAC address from the label on the module.
3. Execute the 'arp -s' command from your computer's MS-DOS prompt by typing:



```
arp -s 192.168.200.100 00-90-E8-xx-xx-xx
```

This is where 192.168.200.100 is the new IP address and 00-90-E8-xx-xx-xx is the MAC address for your WE-2100T. You will need to use both numbers, as described above in points 1 and 2.

- Next, execute a special Telnet command by typing:

```
telnet 192.168.200.100 6000
```

After issuing this command, a **Connect failed** message will appear, as shown here. After the WE-2100T module reboots, its IP address should be updated to the new address, and you can reconnect using Telnet, Web, or Administrator to check that the update was successful.

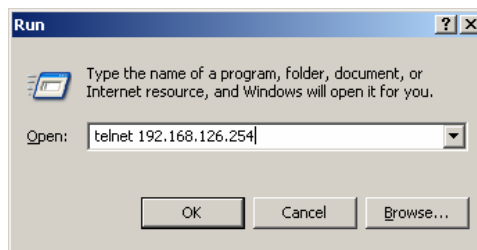


## Telnet Console

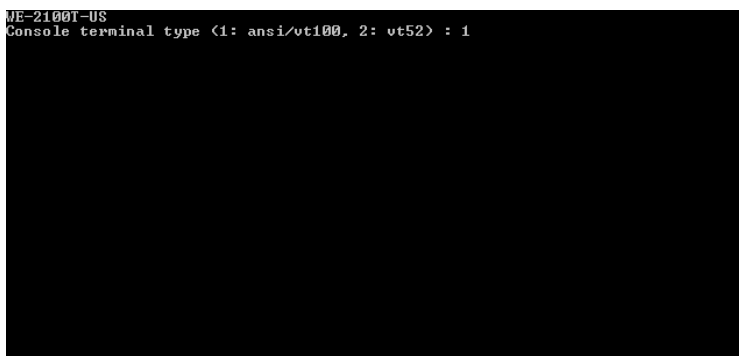
Depending on how your computer and network are configured, you may find it convenient to use network access to set up your WE-2100T module's IP address. This can be done using the Telnet program.

- From the Windows desktop, click on **Start** and then select **Run**.

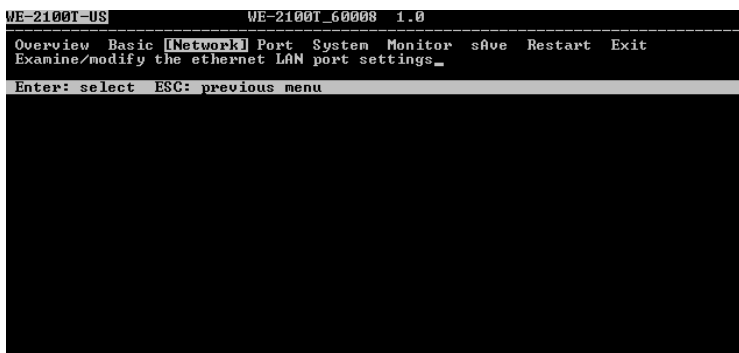
- Type `telnet 192.168.126.254` (use the correct IP address if different from the default) in the **Open** text input box, and then click **OK**.



- Type **Enter** to select **terminal type**.



- Press **N** to select **Network** and then press **Enter**.



5. Press **E** to select **Ethernet** or **W** to select **WLAN** and press **Enter**.

```
WE-2100T-US WE-2100T_60008 1.0 NETWORK MENU
-----
General Ethernet [WLAN] Profile Advanced Quit
Examine/modify wireless LAN settings
Enter: select ESC: previous menu
```

6. Use **Up/Down** key to move the cursor to the **IP address** field, and then modify it.

```
WE-2100T-US WE-2100T_60008 1.0
-----
General Ethernet [WLAN] Profile Advanced Quit
Examine/modify wireless LAN settings
ESC: back to menu Enter: select

IP configuration [Static]
IP address [192.168.32.156]
Netmask [255.255.0.0]
Gateway [ ]
```

7. Press **Esc** twice to quit the configuration page. When you see the configuration change warning, press **Y** to save to flash.

```
WE-2100T-US WE-2100T_60008 1.0 NETWORK MENU
-----
General Ethernet [WLAN] Profile Advanced Quit
Examine/modify wireless LAN settings
Enter: select ESC: previous menu

Warning !!!
You have modified the configuration without saving.
Would you save it now ?
'Y': yes 'N': no_
```

8. Press **R** to select **Restart** and then press **Enter**.

```
WE-2100T-US WE-2100T_60008 1.0 RESTART MENU
-----
Overview Basic Network Port System Monitor save [Restart] Exit
Restart the whole system or selected serial ports_
Enter: select ESC: previous menu
```

9. Press **S** to select **System** and then press **Enter**.

```
WE-2100T-US WE-2100T_60008 1.0 RESTART MENU
-----
[System] Port Quit
Restart the server
Enter: select ESC: previous menu
```

10. Press **Enter** to restart WE-2100T.

```
WE-2100T-US                               WE-2100T_60008  1.0
-----
[System] Port Quit
Restart the server
ESC: back to menu  Enter: select

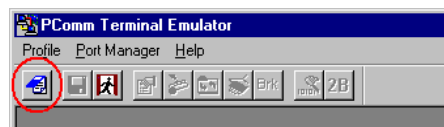
-----
Warning !!!
Restart system will disconnect all ports and clear all status value
Enter: continue  ESC: cancel
-----
```

## Serial Console (19200, n, 8, 1)

You may use the RS-232 console port to configure the IP address for WE-2100T Series modules. 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 installation procedure, although other similar utilities may also be used. (Please go to [www.moxa.com](http://www.moxa.com) to download the installation program for PComm Lite.)

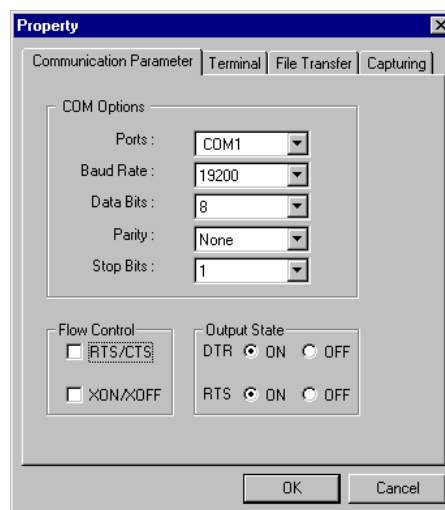
To begin with, use the serial cable to connect the WE-2100T module to your computer's serial port.

1. Connect the RS-232 Console (P1) port located on the evaluation board for WE-2100T directly to your computer's male RS-232 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.



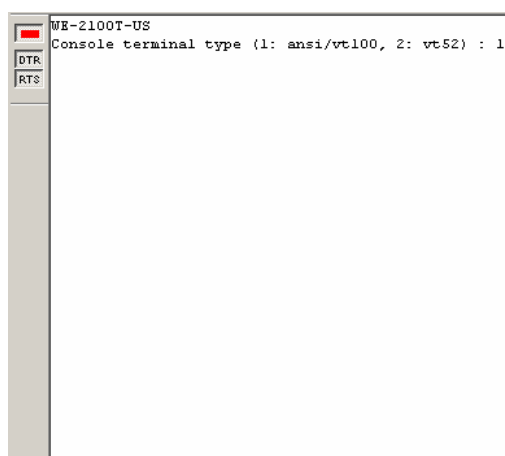
4. The **Property** window opens automatically. From the **Communication Parameter** page, select the appropriate COM port for the connection, **COM1** in this example, and **19200** for **Baud Rate**, **8** for **Data Bits**, **None** for **Parity**, and **1** for **Stop Bits**.
5. From the Property window's **Terminal** page, select **ANSI** or **VT100** for **Terminal Type** and then click **OK**.

If you select **Dumb Terminal** as the terminal type, the console functions may not work properly.



6. Type any character to switch automatically from data mode to console mode.

7. Start configuring the IP address. Refer to step 3, **Telnet Console**.

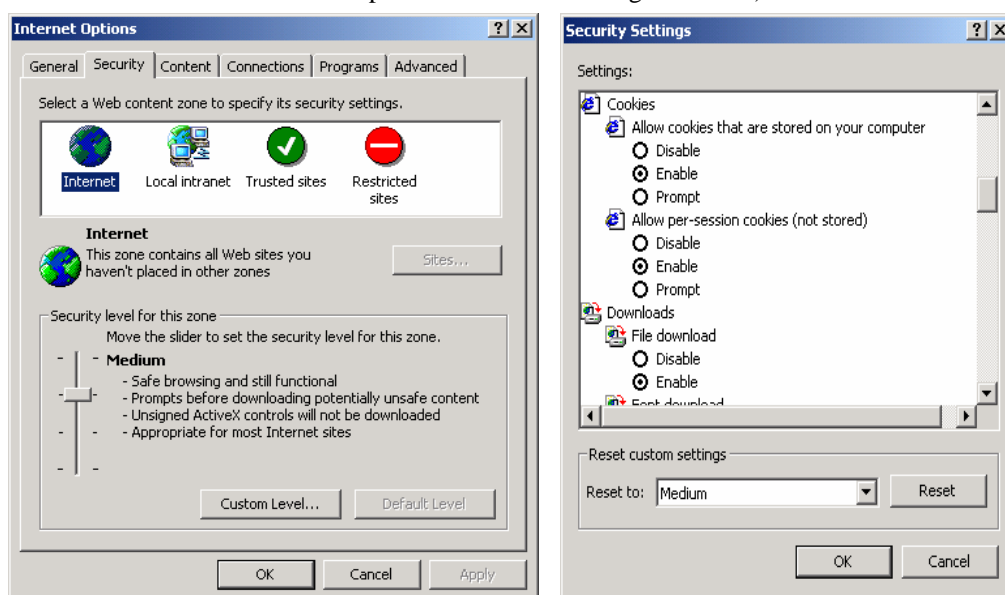


Description in this chapter is out of date! Please copy the chapter 5 of "NPort 6000 User's Manual" and let's modify it then. Thanks.

- TCP Client Mode
- UDP Mode
- ❑ **Accessible IP Settings**
- ❑ **Auto Warning Settings**
  - E-mail and SNMP Trap
  - Event Type
- ❑ **Digital IO**
  - DIO Monitor
- ❑ **Change Password**
- ❑ **Load Factory Defaults**
- ❑ **Save/Restart**

## Opening Your Browser

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 as shown in the figure below.)



2. Type 192.168.127.254 in the **Address** box (use the correct IP address if different from the default), and then press **Enter**.

### ATTENTION



If you use other web browsers, remember to enable the functions to “allow cookies that are stored on your computer” or “allow per-session cookies.”

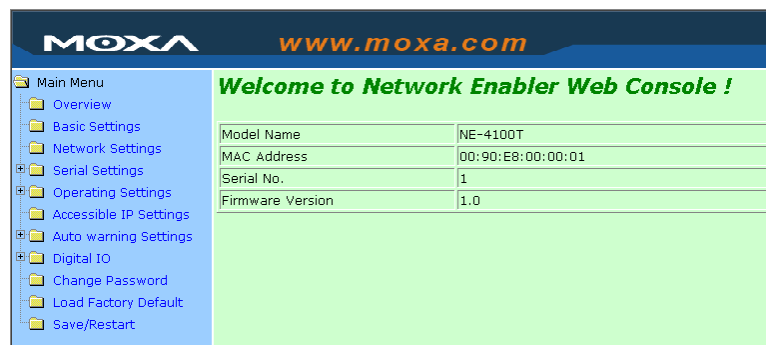
NE-4100 Series only uses cookies for “password” transmission.

### ATTENTION



Refer to Chapter 5, “Initial IP Address Configuration,” for IP configuration. The examples used in this chapter use the Factory Default IP Address (192.168.127.254).

3. The WE-2100T homepage will open. On this page, you can see a brief description of the Web Console's eleven function groups.



**ATTENTION**

If you can't remember the password, the **ONLY** way to configure the WE-2100T is to load factory defaults by using the Reset button located near the evaluation boards' DB9 male serial port.

Remember to use Network Enabler Administrator to export the configuration file when you have finished the configuration. After using the Reset button to load factory defaults, your configuration can be easily reloaded into WE-2100T by using the Network Enabler Administrator Import function. Refer to Chapter 7 for more details about using the Export and Import functions.

## Basic Settings

Click on the **Basic Settings** link on the left side of the screen to open the **Basic Settings** screen. Make necessary changes to the settings and click on **submit** to validate the modifications.

### Server name

Setting	Factory Default	Necessity
1 to 39 characters	NP[model name]_[Serial No.]	Optional

This option is useful for specifying the location or application of different WE-2100T.

### Time

WE-2100T has a built-in Real-Time Clock for time calibration functions. Functions such as Auto warning "Email" or "SNMP Trap" can add real-time information to the message.

**ATTENTION**

First time users should select the time zone first. The Console will display the "real time" according to the time zone compared to GMT.

If you would like to modify the real time clock, select "Local Time." The WE-2100T's firmware will modify the GMT time according to the Time Zone.

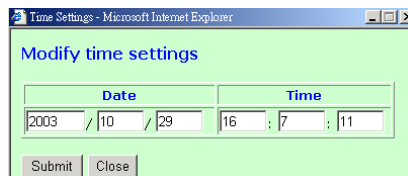
### Time zone

Setting	Factory Default	Necessity
User selectable time zone	GMT (Greenwich Mean Time)	Optional

*Local time*

Setting	Factory Default	Necessity
User adjustable time.	GMT (Greenwich Mean Time)	Optional

Click on the **Modify** button to open the **Modify time settings** window to input the correct local time.



*Time server*

Setting	Factory Default	Necessity
IP or Domain address (E.g., 192.168.1.1, time.stdtime.gov.tw, or time.nist.gov)	None	Optional

WE-2100T uses SNTP (RFC-1769) for auto time calibration.

Input the correct “Time Server” IP address or domain address. Once WE-2100T is configured with the correct Time Server address, WE-2100T will request time information from the “Time Server” every 10 minutes.

**Console**

The “Disable” option for Web Console and Telnet Console is included for security reasons. In some cases, you may want to Disable one or both of these Console utilities as an extra precaution to prevent unauthorized users from accessing your WE-2100T. The factory default for both Web Console and Telnet Console is **Enable**.

Setting	Factory Default	Necessity
Enable or Disable	Enable	Required

**ATTENTION**



If you disable both the “Web Console” and “Telnet Console,” you can still use the Serial Console to configure WE-2100T locally, or Network Enabler Administrator to configure WE-2100T either locally or remotely over the network.



## Network Settings

Click on the **Network Settings** link on the left side of the screen to open the **Networking Settings** screen. Make necessary changes to the settings and click on **Submit** to validate the modifications.

You must assign a valid IP address to WE-2100T before it will work in your network environment. Your network system administrator should provide you with an IP address and related settings for your network. The IP address must be unique within the network (otherwise, WE-2100T will not have a valid connection to the network). First time users can refer to Chapter 5, *Initial IP address Configuration*, for more information.

You can choose from four possible IP Configuration modes—**Static**, **DHCP**, **DHCP/BOOTP**, and **BOOTP**—located under the web console screen's IP configuration drop-down box.

Method	Function Definition
Static	User defined IP address, Netmask, Gateway.
DHCP	DHCP Server assigned IP address, Netmask, Gateway, DNS, and Time Server
DHCP/BOOTP	DHCP Server assigned IP address, Netmask, Gateway, DNS, and Time Server, or BOOTP Server assigned IP address
BOOTP	BOOTP Server assigned IP address

### IP Address

Setting	Factory Default	Necessity
E.g., 192.168.1.1 (IP addresses of the form $x.x.x.0$ and $x.x.x.255$ are invalid.)	192.168.127.254	Required

An IP address is a number assigned to a network device (such as a computer) as a permanent address on the network. Computers use the IP address to identify and talk to each other over the network. Choose a proper IP address which is unique and valid in your network environment.

*Netmask*

Setting	Factory Default	Necessity
E.g., 255.255.255.0	255.255.255.0	Required

A subnet mask represents all the network hosts at one geographic location, in one building, or on the same local area network. When a packet is sent out over the network, the WE-2100T module will use the subnet mask to check whether the desired TCP/IP host specified in the packet is on a local network segment. If the address is on the same network segment as the WE-2100T, a connection is established directly from the WE-2100T. Otherwise, the connection is established through the given default gateway.

*Gateway*

Setting	Factory Default	Necessity
E.g., 192.168.1.1	None	Optional

A gateway is a network gateway that acts as an entrance to another network. Usually, the computers that control traffic within the network or at the local Internet service provider are gateway nodes. WE-2100T needs to know the IP address of the default gateway computer in order to communicate with the hosts outside the local network environment. For correct gateway IP address information, consult the network administrator.

*IP configuration*

Setting	Factory Default	Necessity
Static	Static	Required
DHCP		
DHCP/BOOTP		
BOOTP		

**ATTENTION**

In Dynamic IP environments, the firmware will retry 3 times every 30 seconds until network settings are assigned by the DHCP or BOOTP server. The Timeout for each try increases from 1 second, to 3 seconds, to 5 seconds.

If the DHCP/BOOTP Server is unavailable, the firmware will use the default IP address, 192.168.127.254, Netmask, and Gateway for IP settings.

*DNS server 1 / DNS sever 2*

Setting	Factory Default	Necessity
E.g., 192.168.1.1 (IP addresses of the form <i>x.x.x.0</i> and <i>x.x.x.255</i> are invalid.)	None	Optional

When the user wants to visit a particular website, the computer asks a Domain Name System (DNS) server for the website's correct IP address, and the computer uses the response to connect to the web server. DNS is the way that Internet domain names are identified and translated into IP addresses. A domain name is an alphanumeric name, such as moxa.com, that it is usually easier to remember. A DNS server is a host that translates this kind of text-based domain name into the numeric IP address used to establish a TCP/IP connection.

In order to use WE-2100T's DNS feature, you need to set the IP address of the DNS server to be able to access the host with the domain name. WE-2100T provides **DNS server 1** and **DNS server 2** configuration items to configure the IP address of the DNS server. DNS server 2 is included for use when DNS sever 1 is unavailable.

NE-4100 plays the role of DNS client. WE-2100T functions that support domain name are **Time Sever IP Address**, **TCP Client-Destination IP Address**, **Mail Server**, **SNMP Trap IP Address**, and **IP Location Server**.

## SNMP Settings

### *Community name*

Setting	Factory Default	Necessity
1 to 39 characters (E.g., Support, 886-89191230 #300)	public	Optional

A community name is a plain-text password mechanism that is used to weakly authenticate queries to agents of managed network devices.

### *Contact*

Setting	Factory Default	Necessity
1 to 39 characters (E.g., Support, 886-89191230 #300)	None	Optional

The SNMP contact information usually includes an emergency contact name and telephone or pager number.

### *Location*

Setting	Factory Default	Necessity
1 to 39 characters (E.g., Floor 1, office 2)	None	Optional

Specify the location string for SNMP agents such as WE-2100T Series. This string is usually set to the street address where the WE-2100T is physically located.

## IP Address Report

When WE-2100T is used in a dynamic IP environment, users must spend more time with IP management tasks. For example, WE-2100T works as a server (TCP or UDP), and the host, which acts as a client, must know the IP address of the server. If the DHCP server assigns a new IP address to the server, the host must take care of what happens when the IP changes. WE-2100T helps out by periodically reporting their IP address to the IP location server, in case the dynamic IP has changed. The parameters shown below are used to configure the Auto IP report function. There are two ways to develop an "Auto IP report Server" to receive WE-2100T's Auto IP report.

1. Use Network Enabler Administrator's IP Address Report function.
2. Refer to Appendix C for the "Auto IP report protocol" to develop your own software.

### *Auto report to IP*

Setting	Factory Default	Necessity
E.g., 192.168.1.1 or URL (IP addresses of the form <i>x.x.x.0</i> and <i>x.x.x.255</i> are invalid.)	None	Optional

Reports generated by the Auto report function will be sent automatically to this IP address.

### *Auto report to TCP port*

Setting	Factory Default	Necessity
E.g., 4001	4002	Optional

### *Auto report period*

Setting	Factory Default	Necessity
Time interval (in seconds)	10	Optional

## Serial Settings

Click on the **Serial Settings** link on the left side of the screen to display serial settings. Make necessary changes to the settings and click on **submit** to validate the modifications.

### Port alias

Setting	Factory Default	Necessity
1 to 15 characters (E.g., PLC-No.1)	None	Optional

Port Alias is specially designed to allow easy identification of the serial devices which are connected to NE-4100 Series' serial port.

### Serial Parameters

#### ATTENTION



Check the serial communication parameters in your Serial Device's user's manual. You should set up WE-2100T's serial parameters with the same communication parameters used by your serial devices.

### Baud rate

Setting	Factory Default	Necessity
50 bps to 921.6 Kbps	115.2 Kbps	Required

WE-2100T supports a baud rate setting from 50 bps to 921.62 Kbps.

### Data bits

Setting	Factory Default	Necessity
5, 6, 7, 8	8	Required

When the user sets Data bits to 5 bits, the stop bits setting will automatically change to 1.5 bits.

### Stop bits

Setting	Factory Default	Necessity
1, 2	1	Required

Stop bits will be set to 1.5 when Data bits is set to 5 bits.

### Parity

Setting	Factory Default	Necessity
None, Even, Odd, Space, Mark	None	Required

### Flow control

Setting	Factory Default	Necessity
None, RTS/CTS, DTR/DSR, XON/XOFF	RTS/CTS	Required

**FIFO**

Setting	Factory Default	Necessity
Enable, Disable	Enable	Required

WE-2100T's serial ports provide a 128-byte FIFO both in the Tx and Rx directions. Disable the FIFO setting when your serial device does not have a FIFO to prevent data loss during communication.

## Operating Settings

Click on the **Operating Settings** link on the left side of the screen to display operating settings. Make necessary changes to the settings and then click on **Submit** to validate the modifications.

### TCP Server Mode

**TCP alive check time**

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: TCP connection is not closed due to an idle TCP connection.

1 to 99 min: WE-2100T automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, WE-2100T starts listening for another host's TCP connection.

**Inactivity time**

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0 ms: TCP connection is not closed due to an idle serial line.

0-65535 ms: WE-2100T automatically closes the TCP connection if there is no serial data activity for the given time. After the connection is closed, NE-4100 starts listening for another host's TCP connection.

This parameter defines the maintenance status as Closed or Listen on the TCP connection. The connection is closed if there is no incoming or outgoing data through the serial port during the specific Inactivity time.

If the value of inactivity time is set to 0, the current TCP connection is maintained until there is a connection close request. Although inactivity time is disabled, the WE-2100T will check the connection status between the WE-2100T and remote host by sending "keep alive" packets periodically. If the remote host does not respond to the packet, it assumes that the connection was closed down unintentionally. WE-2100T will then force the existing TCP connection to close.

**ATTENTION**

The Inactivity time should at least be set larger than that of Force Transmit timeout. To prevent the unintended loss of data due a session getting disconnected, it is highly recommended that this value is set large enough so that the intended data transfer is completed.

**Max connection**

Setting	Factory Default	Necessity
1, 2, 3, 4	1	Required

**Max connection** is usually used when the user needs to receive data from different hosts simultaneously. The factory default only allows 1 connection at a time.

**Max. connection 1:**

WE-2100T only allows 1 host to open the TCP connection to the specific serial port.

**Max connection 2 to 4:**

Allows requests from between 2 and 4 host's TCP connection to open the specific WE-2100T serial port, at the same time. When multiple hosts establish a TCP connection to the specific serial port at the same time, WE-2100T will duplicate the serial data and transmit to all of the hosts. Ethernet data is sent on a first-in-first-out basis to the serial port when data comes into WE-2100T from the Ethernet interface.

**Delimiter 1**

Setting	Factory Default	Necessity
00 to FF	"0" for None	Optional

**Delimiter 2**

Setting	Factory Default	Necessity
00 to FF	"0" for None	Optional

Once the WE-2100T receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the WE-2100T's Ethernet port.

**ATTENTION**

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1K, the WE-2100T will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

**Force transmit**

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: Disable the force transmit timeout.

1 to 65535: Forces the WE-2100T's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.

This parameter defines the time interval during which WE-2100T fetches the serial data from its internal buffer. If data is being received through the serial port, the WE-2100T stores the data in its internal buffer. WE-2100T transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified as Force Transmit timeout.

Optimal force transmit timeout differs according to your application, but it must be at least as large as one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no for parity. In this case, the total number of bits required to send a character is 10 bits and the time required to transfer one character is

( 10 bits / 1200 bits/s ) \* 1000 = 8.3 ms.

Therefore, you should set Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If the user wants to send a series of characters in a packet, the serial device attached to the WE-2100T should send characters without time delay larger than the Force Transmit timeout between characters, and the total length of data must be smaller than or equal to the WE-2100T module's internal buffer size. WE-2100T's serial communication buffer size is 1 Kbyte per port.

#### Local TCP port

Setting	Factory Default	Necessity
1 to 65535	4001	Required

The TCP port that WE-2100T uses to listen to connections, and that other devices must use to contact WE-2100T. To avoid conflicts with well known TCP ports, the default is set to 4001.

#### Command port

Setting	Factory Default	Necessity
1 to 65535	966	Optional

The command port is a listen TCP port for IP-Serial Lib commands from the host. In order to prevent a TCP port conflict with other applications, the user can adjust the command port to another port if needed. The IP-Serial Lib will automatically check out the Command Port on WE-2100T so that the user does not need to configure the program.

## Real COM Mode

The screenshot shows the Moxa web console interface. The left sidebar contains a navigation menu with options like Main Menu, Overview, Basic Settings, Network Settings, Serial Settings, and Operating Settings. The main content area is titled 'Operating Settings' and shows configuration for 'Port=01'. The 'Operation mode' is set to 'Real COM Mode'. The 'TCP alive check time' is set to 7 minutes. The 'Max connection' is set to 1. Under 'Data Packing', 'Delimiter 1' is set to 'A' (Hex) and 'Enable' is checked. 'Delimiter 2' is set to '0' (Hex) and 'Enable' is unchecked. 'Force transmit' is set to 0 ms. There is a 'Submit' button at the bottom right.

#### TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: TCP connection is not closed due to an idle TCP connection.

1 to 99 min: WE-2100T automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, WE-2100T starts listening for another Real COM driver's connection from another host.

#### Max Connection

Setting	Factory Default	Necessity
1, 2, 3, 4	1	Required

**Max connection** is usually used when the user needs to receive data from different hosts simultaneously. The factory default only allows 1 connection at a same. When Max Connection is set to 1, the Real COM driver on the specific host has full control.

#### Max. connection 1:

Allows only 1 host's Real COM driver to open the specific WE-2100T serial port.

**Max connection 2 to 4:**

Allows 2 to 4 host's Real COM drivers to open the specific WE-2100T serial port, at the same time. When multiple hosts' Real COM drivers open the serial port at the same time, the COM driver only provides a pure data tunnel without control ability.

Application software that is based on the COM driver will receive a driver response of "success" when the software uses any of the Win32 API functions. The firmware will only send the data back to the driver on the host.

Data will be sent first-in-first-out when data comes into the WE-2100T from the Ethernet interface.

**ATTENTION**

When Max Connection is not 1, it also means that WE-2100T will be in "multi connection application." In the "multi connection application," when one of two to four hosts closes the COM port, WE-2100T will suspend receiving or sending serial data until the host successfully closes the COM port.

In multi connection applications, WE-2100T will use the serial communication parameters set in the console. If the host opens the COM with parameters different from WE-2100T's console setting, data communication may not work properly.

**Delimiter 1**

Setting	Factory Default	Necessity
00 to FF	"0" for None	Optional

**Delimiter 2**

Setting	Factory Default	Necessity
00 to FF	"0" for None	Optional

Once the WE-2100T receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the WE-2100T's Ethernet port.

**ATTENTION**

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1K, the WE-2100T will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

**Force Transmit**

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: Disable the force transmit timeout.

1 to 65535: Forces the WE-2100T's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.

This parameter defines the time interval during which WE-2100T fetches the serial data from its internal buffer. If data is incoming through the serial port, NE-4100 stores the data in the internal buffer. WE-2100T transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified under Force Transmit timeout.

Optimal force transmit timeout differs according to your application, but it must be at least larger than one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is

$$(10 \text{ bits} / 1200 \text{ bits/s}) * 1000 = 8.3 \text{ ms.}$$

Therefore, you should set Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If the user wants to send the series of characters in a packet, the serial device attached to the



WE-2100T should send characters without time delay larger than Force Transmit timeout between characters and the total length of data must be smaller than or equal to WE-2100T's internal buffer size. The serial communication buffer size of NE-4100 series is 1 Kbyte per port.

## TCP Client Mode

The screenshot shows the MOXA web console interface. On the left is a navigation menu with options like Overview, Basic Settings, Network Settings, Serial Settings, Operating Settings, and Accessible IP Settings. The main area is titled 'Operating Settings' and is for 'Port=01'. It includes sections for 'Data Packing' and 'TCP Client Mode'. Under 'Data Packing', there are fields for Delimiter 1 (A, Hex, Enable checked), Delimiter 2 (0, Hex, Enable unchecked), and Force transmit (0, 0-65535 ms). Under 'TCP Client Mode', there are fields for Destination IP address 1 through 4 (192.168.3.62, 4001), and TCP connect on (Startup selected, Any Character unselected). There is also a checkbox for 'Apply the above settings to all serial ports' and a 'Submit' button.

### TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: TCP connection is not closed due to an idle TCP connection.

1 to 99 min: WE-2100T automatically closes the TCP connection if there is no TCP activity for the given time.

### Inactivity time

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0 ms: TCP connection is not closed due to an idle serial line.

0-65535 ms: WE-2100T automatically closes the TCP connection, if there is no serial data activity for the given time.

This parameter defines the maintenance status as Closed or Listen on the TCP connection. The connection is closed if there is no incoming or outgoing data through the serial port during the specific Inactivity time.

If the value of inactivity time is set to 0, the current TCP connection is maintained until a connection close request is received. Although the inactivity time is disabled, the WE-2100T will check the connection status between the WE-2100T and remote host by sending "keep alive" packets periodically. If the remote host does not respond to the packets, it treats the connection as being down unintentionally. WE-2100T will then force the existing TCP connection to close.

**ATTENTION**



The Inactivity time should at least be set larger than that of the Force Transmit timeout. To prevent the unintended loss of data due to the session being disconnected, it is highly recommended that this value is set large enough so that the intended data transfer is completed.

**ATTENTION**

Inactivity time is ONLY active when "TCP connection on" is set to "Any character."

**Delimiter 1**

Setting	Factory Default	Necessity
00 to FF	"0" for None	Optional

**Delimiter 2**

Setting	Factory Default	Necessity
00 to FF	"0" for None	Optional

Once the WE-2100T receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the WE-2100T's Ethernet port.

**ATTENTION**

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1K, the WE-2100T will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

**Force transmit**

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: Disable the force transmit timeout.

1 to 65535: Forces the WE-2100T's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.

This parameter defines the interval during which WE-2100T fetches the serial data from its internal buffer. If there is incoming data through the serial port, WE-2100T stores data in the internal buffer. WE-2100T transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified as Force Transmit timeout.

Optimal force transmit timeout differs according to your application, but it must be at least as large as one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no for parity. In this case, the total number of bits required to send a character is 10 bits, and the time required to transfer one character is

$$(10 \text{ bits} / 1200 \text{ bits/s}) * 1000 = 8.3 \text{ ms.}$$

Therefore, you should set Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If the user wants to send a series of characters in a packet, the serial device attached to WE-2100T should send characters without time delay larger than Force Transmit timeout between characters and the total length of data must be smaller than or equal to NE-4100's internal buffer size. The serial communication buffer size of WE-2100T is 1 Kbyte per port.

**Destination IP address 1/2/3/4**

Setting	Factory Default	Necessity
IP address or domain name (e.g., 192.168.1.1)	None	Required

Allows WE-2100T to connect actively to the remote host whose address is set by this parameter.

**ATTENTION**

Up to 4 connections can be established between WE-2100T and hosts. The connection speed or throughput may be low if one of the four connections is slow. In this case, the other 3 connections will be delayed while waiting for the slowest connection to finish transmitting or receiving.

**ATTENTION**

The “Destination IP address” parameter can use both IP address and Domain address. For some applications, the user may need to send the data actively to the remote destination domain address.

**TCP connection on**

Setting	Factory Default	Necessity
Start up, Any Character	Start up	Optional

Start up: Attempts to establish a TCP connection as soon as the WE-2100T is powered on.

Any Character: Attempts to establish a TCP connection as soon as the WE-2100T starts receiving serial data.

## UDP Mode

**Delimiter 1**

Setting	Factory Default	Necessity
00 to FF	“0” for None	Optional

**Delimiter 2**

Setting	Factory Default	Necessity
00 to FF	“0” for None	Optional

Once the WE-2100T receives both delimiters through the serial port, it immediately packs all data currently in its buffer and sends it to the WE-2100T’s Ethernet port.

Note: Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer.

**ATTENTION**

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1K, the WE-2100T will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

***Force Transmit***

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: Disable the force transmit timeout.

1 to 65535: Forces the WE-2100T's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.

This parameter defines the interval during which WE-2100T fetches the serial data from its internal buffer. If there is incoming data through the serial port, WE-2100T stores the data in the internal buffer. WE-2100T transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified as Force Transmit timeout.

Optimal force transmit timeout differs according to your application, but it must be at least as large as one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no for parity. In this case, the total number of bits required to send a character is 10 bits and the time required to transfer one character is

$$(10 \text{ bits} / 1200 \text{ bits/s}) * 1000 = 8.3 \text{ ms.}$$

Therefore, you should set the Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If the user wants to send a series of characters in a packet, the serial device attached to WE-2100T should send characters without time delay larger than Force Transmit timeout between characters and the total length of data must be smaller than or equal to WE-2100T's internal buffer size. The serial communication buffer size of WE-2100T is 1 Kbyte per port.

***Destination IP address 1/2/3/4***

Setting	Factory Default	Necessity
IP address range E.g.,     Begin: 192.168.1.1 End:  192.168.1.10	None	Required

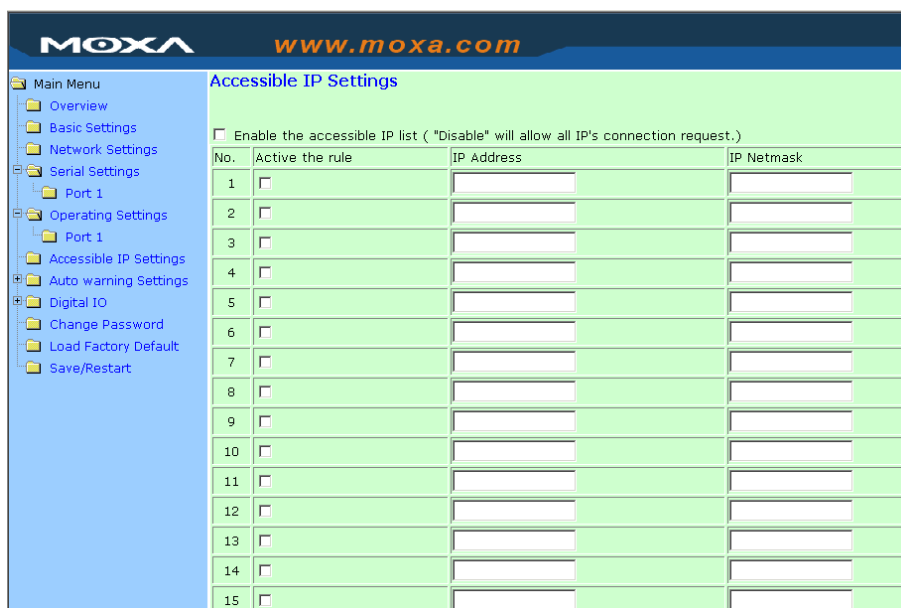
***Local Listen port***

Setting	Factory Default	Necessity
1 to 65535	4001	Required

The UDP port that WE-2100T listens to, and that other devices must use to contact WE-2100T. To avoid conflicts with well known UDP ports, the default is set to 4001.

## Accessible IP Settings

Click on the **Accessible IP Settings** link on the left side of the screen to display serial settings. Make necessary changes to the settings and click on **Submit** to validate the modifications.



WE-2100T has an IP address based filtering method to control access to the WE-2100T.

Accessible IP Settings allows you to add or remove “Legal” remote host IP addresses to prevent unauthorized access. Access to WE-2100T is controlled by IP address. That is, if a host’s IP address is in the accessible IP table, then the host will be allowed access to the WE-2100T. You can allow one of the following cases by setting the parameter.

- **Only one host with a specific IP address can access the WE-2100T**  
Enter “IP address/255.255.255.255” (e.g., “192.168.1.1/255.255.255.255”).
- **Hosts on a given subnet can access the WE-2100T**  
Enter “IP address/255.255.255.0” (e.g., “192.168.1.0/255.255.255.0”).
- **Any host can access the WE-2100T**  
Disable this function. Refer to the following table for more details about the configuration example.

Allowable Hosts	Input format
Any host	Disable
192.168.1.120	192.168.1.120 / 255.255.255.255
192.168.1.1 to 192.168.1.254	192.168.1.0 / 255.255.255.0
192.168.0.1 to 192.168.255.254	192.168.0.0 / 255.255.0.0
192.168.1.1 to 192.168.1.126	192.168.1.0 / 255.255.255.128
192.168.1.129 to 192.168.1.254	192.168.1.128 / 255.255.255.128

## Auto Warning Settings

Click on the **Auto Warning Settings** link on the left side of the screen to display serial settings. Make necessary changes to the settings and click on **Submit** to validate the modifications.

### E-mail and SNMP Trap

#### Mail server

##### *Mail server*

Setting	Factory Default	Necessity
IP or Domain Name	None	Optional

##### *User name*

Setting	Factory Default	Necessity
1 to 15 characters	None	Optional

##### *Password*

Setting	Factory Default	Necessity
1 to 15 characters	None	Optional

##### *From E-mail address*

Setting	Factory Default	Necessity
1 to 63 characters	NE_[Serial No.]@[WE-2100T Series Module Name]	Optional

##### *E-mail address 1/2/3/4*

Setting	Factory Default	Necessity
1 to 63 characters	None	Optional

#### ATTENTION



Consult your network administrator or ISP for the proper mail server settings. The Auto warning function may not work properly if not set up properly. WE-2100T SMTP AUTH supports LOGIN, PLAIN, CRAM-MD5 (RFC 2554).

#### SNMP trap server

##### *SNMP trap server IP or domain name*

Setting	Factory Default	Necessity
IP or Domain Name	None	Optional

## Event Type

Event Type		
Cold start	<input checked="" type="checkbox"/> Mail	<input checked="" type="checkbox"/> Trap
Warm start	<input checked="" type="checkbox"/> Mail	<input checked="" type="checkbox"/> Trap
Authentication failure	<input type="checkbox"/> Mail	<input checked="" type="checkbox"/> Trap
IP address changed	<input type="checkbox"/> Mail	
Password changed	<input type="checkbox"/> Mail	
<b>DCD changed</b>		
Port	<input type="checkbox"/> Mail	<input type="checkbox"/> Trap
Port 1	<input checked="" type="checkbox"/> Mail	<input checked="" type="checkbox"/> Trap
<b>DSR changed</b>		
Port	<input type="checkbox"/> Mail	<input type="checkbox"/> Trap
Port 1	<input checked="" type="checkbox"/> Mail	<input checked="" type="checkbox"/> Trap
<input type="button" value="Submit"/>		

### ***Cold start***

This refers to starting the system from power off (contrast this with warm start). When performing a cold start, WE-2100T will automatically issue an Auto warning message by e-mail, or send an SNMP trap after rebooting.

### ***Warm start***

This refers to restarting the computer without turning the power off. It's the opposite of cold start. When performing a warm start, WE-2100T will automatically send an e-mail, or send an SNMP trap after rebooting.

### ***Authentication failure***

The user inputs a wrong password from the Console or Administrator. When authentication failure occurs, WE-2100T will immediately send an e-mail or send an SNMP trap.

### ***IP address changed***

The user has changed WE-2100T's IP address. When the IP address changes, WE-2100T will send an e-mail with the new IP address before WE-2100T reboots. If the WE-2100T fails to send mail to the mail server after 15 seconds, WE-2100T will reboot directly and abort the mail auto warning.

### ***Password changed***

The user has changed WE-2100T's password. When the password changes, WE-2100T will send an e-mail with the password change notice before WE-2100T reboots. If the WE-2100T fails to send mail to the mail server after 15 seconds, WE-2100T will reboot directly and abort the mail auto warning.

### ***DCD changed***

The DCD (Data Carrier Detect) signal has changed, also indicating that the modem connection status has changed. For example, a DCD change to high also means "Connected" between local modem and remote modem. If the DCD signal changes to low, it also means that the connection line is down.

When the DCD changes, WE-2100T will immediately send an e-mail or send an SNMP trap.

### ***DSR changed***

The DSR (Data Set Ready) signal has changed, also indicating that the data communication equipment's power is off. For example, a DSR change to high also means that the DCE is powered ON. If the DSR signal changes to low, it also means that the DCE is powered off.

When the DSR changes, WE-2100T will immediately send an e-mail or send an SNMP trap.

### ***Mail***

Setting	Factory Default	Necessity
Enable, Disable	Disable	Optional

This feature helps the administrator manage the WE-2100T. WE-2100T sends mail to pre-defined

mail boxes when the enabled events—such as Cold start, Warm start, Authentication failure, etc.—occur. To configure this feature, click on the event type box.

### Trap

Setting	Factory Default	Necessity
Enable, Disable	Disable	Optional

This feature helps the administrator manage the WE-2100T. WE-2100T sends SNMP Trap to a pre-defined SNMP Trap server when the enabled events—such as Cold start, Warm start, Authentication failure, etc.—occur. To configure this feature, you need to click on the event type box.

### ATTENTION



**DCD changed** and **DSR changed** events are only supported by those models that have these two signals.

## Digital IO

Click on the **Digital IO** link on the left side of the screen to open the **DIO Settings** window. There are 2 options for selecting DIO modes: **IN** and **OUT**. When you set the mode to **IN**, you will not be able to set the **Status** to **H** or **L**. You can only monitor the DIOs' status. But when you set the mode to **OUT**, you can configure the **Status** to **H** or **L**. Make necessary changes to the settings and click on **submit** to validate the modifications.


No.	Mode	Status
DIO 0	IN	R L C H
DIO 1	IN	R L C H
DIO 2	IN	R L C H
DIO 3	IN	R L C H
TCP Port	500	
BW Reset Function (Use DIO 1)	Disable	

Refer to Chapter 8 for information about the **SW Reset Function**.

## DIO Monitor

You can monitor the DIO status from the web page shown below. To do so, click on the **DIO Monitor** link on the left side of the screen to open the **DIO Monitor** window.





Digital IO		
No.	Mode	Status
0	IN	Low
1	OUT	Low
2	OUT	High
3	OUT	High

## Change Password

Click on the **Change Password** link on the left side of the screen to display the **Change Password** window. Make necessary changes to the settings and click on **Submit** to validate the modifications.



Input the “Old password” and “New password” to change the password. Leave the password boxes blank to erase the password. In this case, the WE-2100T will not have password protection.

### ATTENTION

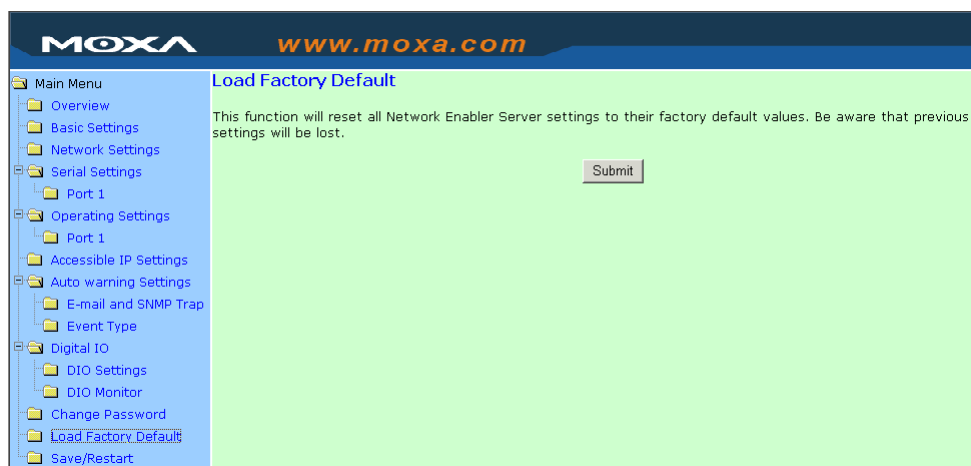


If you forget the password, the **ONLY** way to configure WE-2100T is by using the Reset button on the WE-2100T's evaluation boards to “Load Factory Defaults.”

Remember to export the configuration file using Network Enabler Administrator when you finish the configuration. By using the Import function of Network Enabler Administrator, your configuration can be re-loaded into WE-2100T after using “Load Factory Default.” Refer to Chapter 7 for more details about the Export and Import function.

## Load Factory Defaults

To load the factory default settings, click on the **Load Factory Default** link on the left side of the screen and then click on **Submit** to restore the factory default settings. Note that by doing so the modifications you made before will be lost.



## Save/Restart

Click on the **Save/Restart** link on the left side of the screen if you would like to restart the configuration. After all changes have been made and applied, click on **Submit** to exit the system.

**Pictures in this chapter  
may need re-captured.**

# 7

## Network Enabler Administrator

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In addition to using Web Console, Serial Console, and Telnet Console to configure WE-2100T, another useful configuration tool that can be used is Network Enabler Administrator. In this chapter, we will discuss how to use Network Enabler Administrator to configure your WE-2100T.

This chapter includes the following sections:

- ❑ **Overview**
- ❑ **Installing Network Enabler Administrator**
- ❑ **Starting the Configuration**
  - Broadcast Search
  - Unlock Password Protection
  - Configuring WE-2100T
  - Upgrading the Firmware
  - Export/Import
- ❑ **Monitor**
- ❑ **Port Monitor**
- ❑ **COM Mapping**
  - On-line COM Mapping
  - Off-line COM Mapping

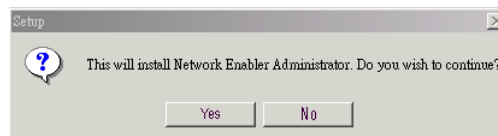
## Overview

We understand the importance of software as the foundation of your application, and with this in mind, we designed Network Enabler Administrator to let you easily install and configure your WE-2100T Series products over the network. Network Enabler Administrator provides five function groups that ease the installation process, allows off-line COM mapping, and provides monitoring and IP location server functions.

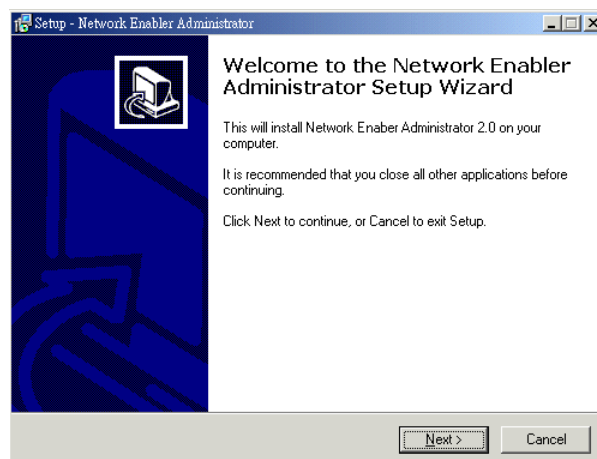
Network Enabler Administrator is an integrated software suite that bundles Network Enabler Administrator and the IP Serial Library, and provides everything you need to remotely manage, monitor, and modify your WE-2100T—hassle free.

## Installing Network Enabler Administrator

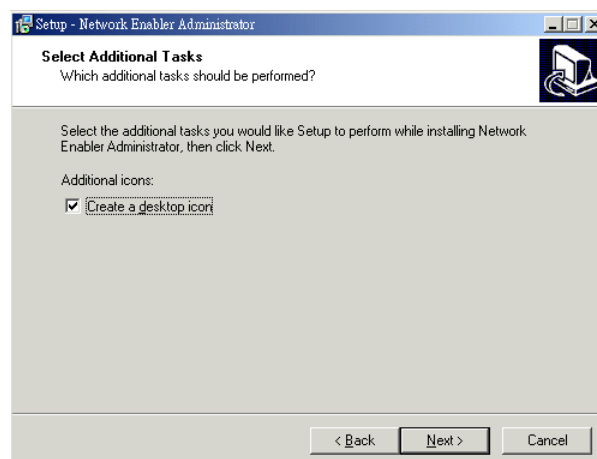
1. Once the Setup program starts running, click on **Yes** to proceed.



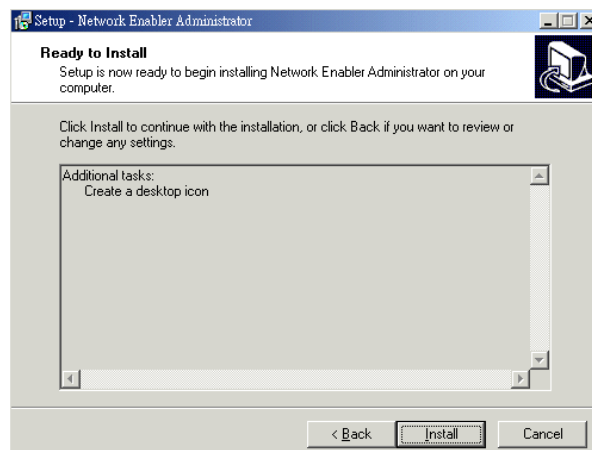
2. Click on **Next** when the **Welcome** window opens to proceed with the installation.



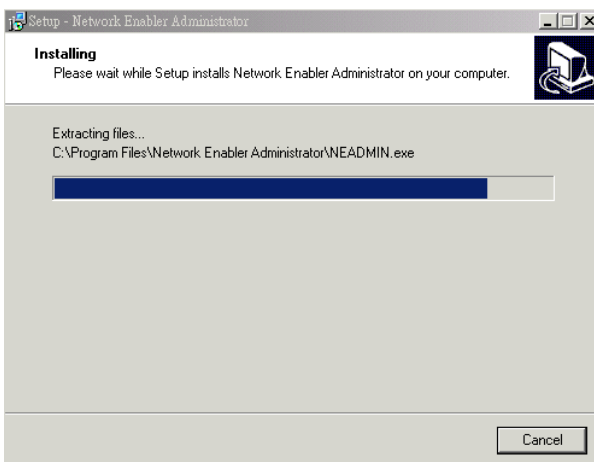
3. Click on **Next** when the **Select Additional Tasks** window opens to proceed with the installation.



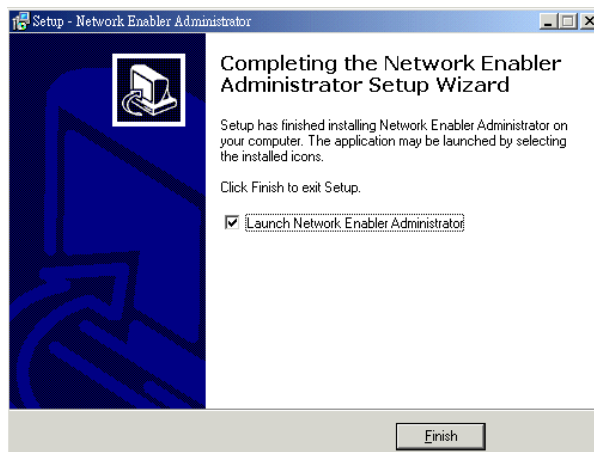
- Click on **Install** to install program files in the default directory.



- The **Installing** window reports the progress of the installation.



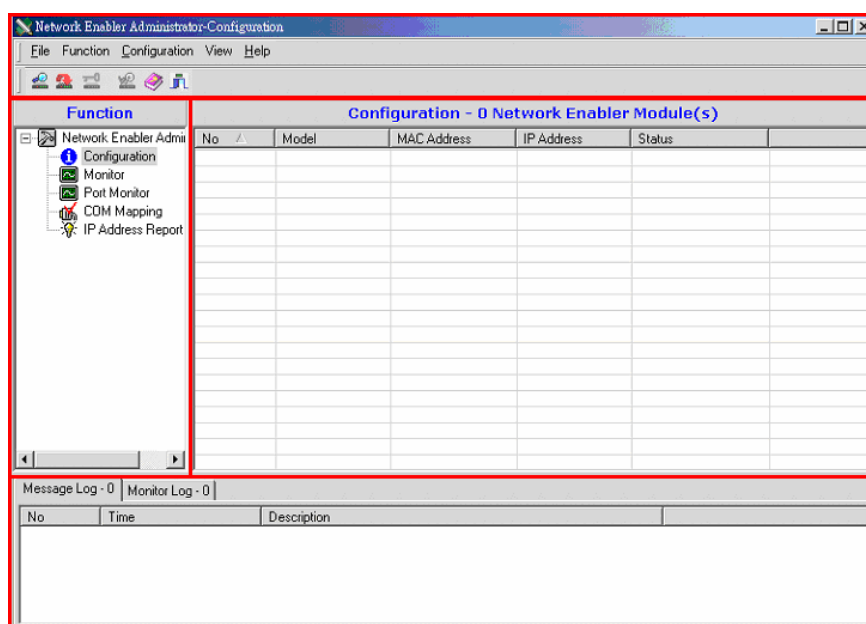
- Click on **Finish** to complete the installation of Network Enabler Administrator Suite.



## Starting the Configuration

The Network Enabler Administrator-Configuration window is divided into four parts.

- The top part is the function list and online help area. (Windows NT does not support this .chm file format.)
- The left part lists the five Administrator function groups.
- The right part gives the list of WE-2100Ts that can be selected to process user requirements.
- The bottom part is the Log area, which shows useful messages that record the user's processing history.

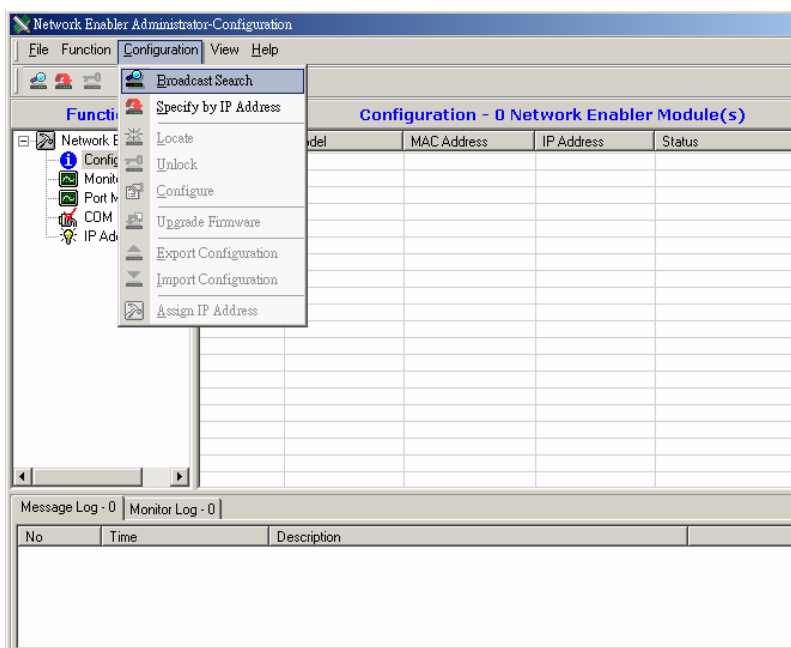


## Broadcast Search

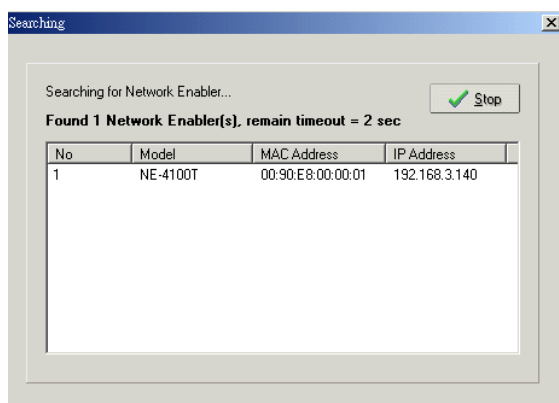
The **Broadcast Search** function is used to locate all WE-2100T modules that are connected to the same LAN as your computer. Since the Broadcast Search function searches by MAC address and not IP address, all WE-2100T modules connected to the LAN will be located, regardless of whether or not they are part of the same subnet as the host.

1. Click on the **Network Enabler Administrator** icon or click on **Start→Programs→Network Enabler Administrator→Network Enabler Administrator** to start the Network Enabler Administrator program.

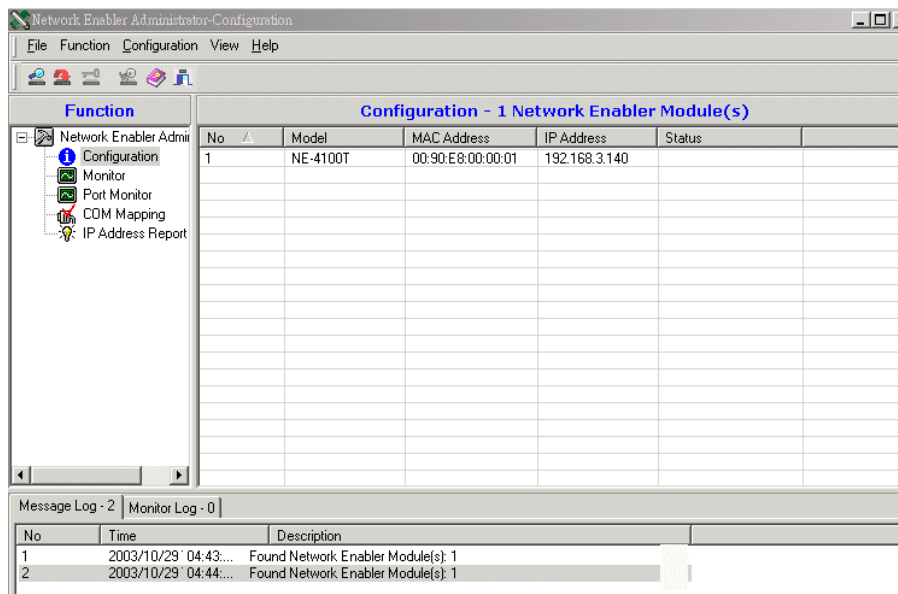
- Click on **Configuration** from the menu bar, and then select **Broadcast Search** from the drop-down menu.



- A **Searching** window will open, showing that the program is searching for WE-2100Ts connected to this network.



- After the search is finished, all WE-2100Ts that were found will be shown in the right panel of the **Configuration** window. If you locate more than one module connected to this network, refer to the **MAC** address on the module(s) to determine which modules are the ones you wish to configure.



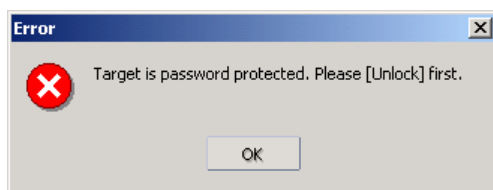
**ATTENTION**



Before modifying an WE-2100T's configuration, use **Broadcast Search** or **Specify by IP Address** to locate the WE-2100T.

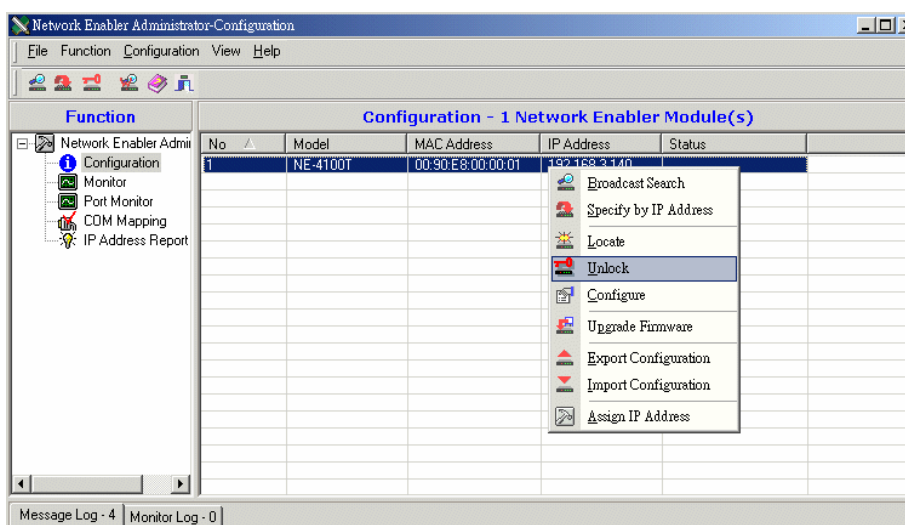
### Unlock Password Protection

If the WE-2100T is password protected, then you will not be able to use the right click or double click method to open the configuration page. Before you can make any modifications to the WE-2100T configuration, you need to unlock the WE-2100T.





1. Select the WE-2100T that you would like to unlock. Right click the mouse and then select **Unlock** from the drop down list.



2. After inputting the correct password, the following window will open.



The meanings of the six states are as follows (note that the term Fixed is borrowed from the standard fixed IP address networking terminology):

#### ***Lock***

The WE-2100T is password protected, “Broadcast Search” was used to locate it, and the password has not yet been entered from within the current Administrator session.

#### ***Unlock***

The WE-2100T is password protected, “Broadcast Search” was used to locate it, and the password has been entered from within the current Administrator session. Henceforth during this Administrator session, activating various utilities for this WE-2100T will not require re-entering the password.

#### ***Blank***

The WE-2100T is not password protected, and “Broadcast Search” was used to locate it.

#### ***Fixed***

The WE-2100T is not password protected, and “Search by IP address” was used to locate it.

#### ***Lock Fixed***

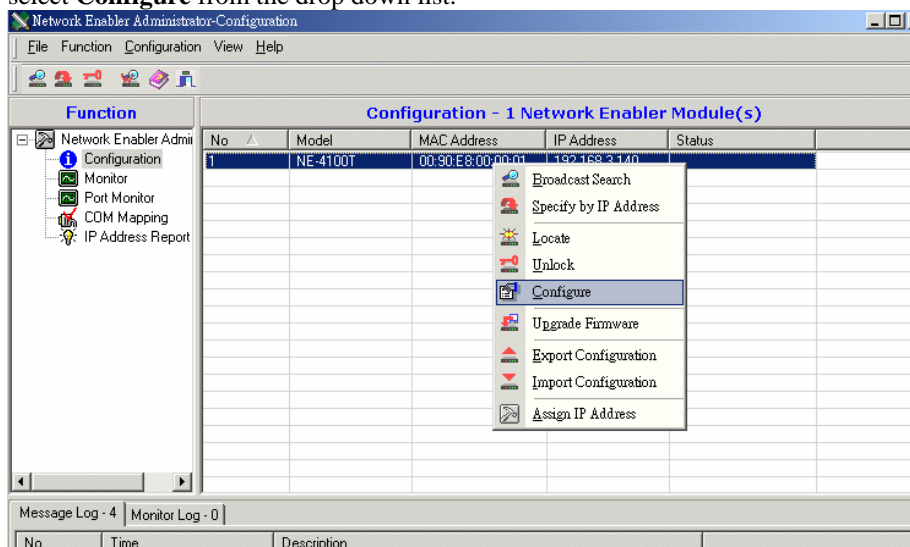
The WE-2100T is password protected, “Specify by IP address” was used to locate it, and the password has not yet been entered from within the current Administrator session.

#### ***Unlock Fixed***

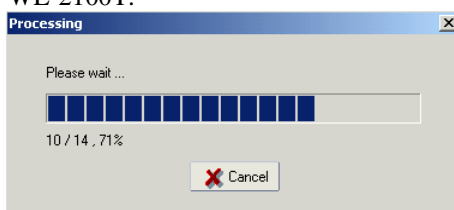
The WE-2100T is password protected, “Specify IP Address” was used to locate it, and the password has been entered from within the current Administrator session. Henceforth during this Administrator session, activating various utilities for this WE-2100T will not require re-entering the password.

## Configuring WE-2100T

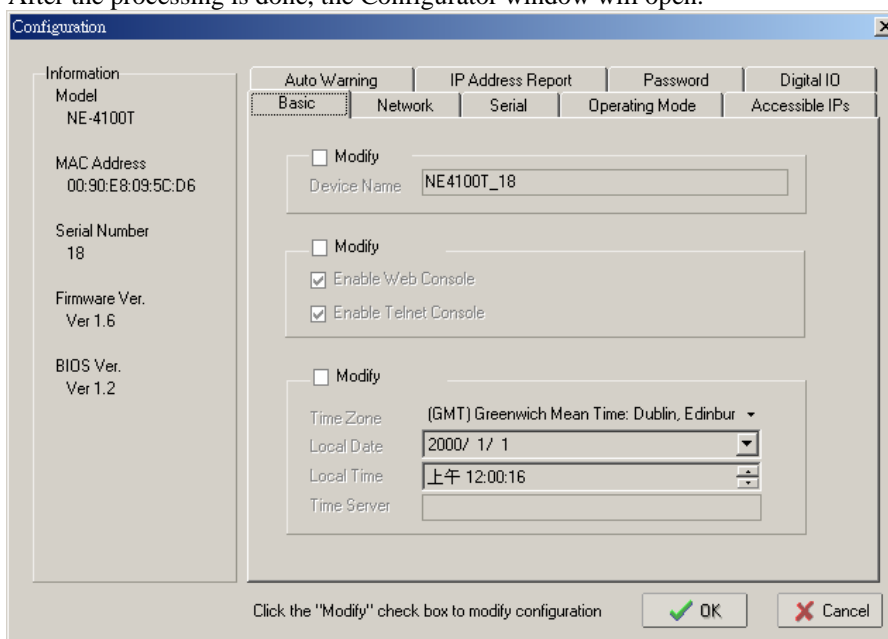
1. Select the WE-2100T module you wish to configure, click the right mouse button, and then select **Configure** from the drop down list.



2. The next window to open shows that Configurator is processing the configuration of that WE-2100T.



3. After the processing is done, the Configurator window will open.



The Configurator window has nine tabs—**Basic**, **Network**, **Serial**, **Operating Mode**, **Accessible IPs**, **Auto Warning**, **IP Address Report**, **Password**, and **Digital IO**—that allow the user to view and modify basic parameters related to the WE-2100T operation. Refer to Chapter 6 for each parameter's function definition. To modify the configuration, you must first click in the **Modify** box to activate the parameter setting box.

**ATTENTION**

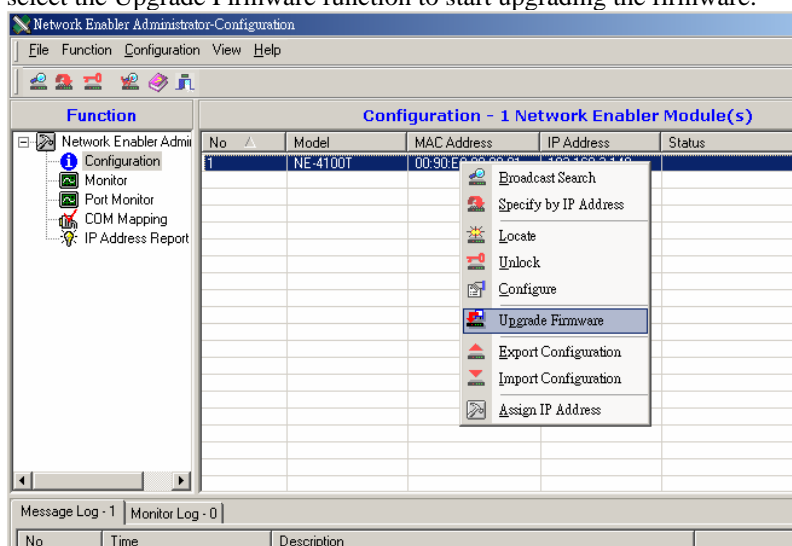
You can simultaneously modify the configurations of multiple WE-2100Ts that are of the same model.



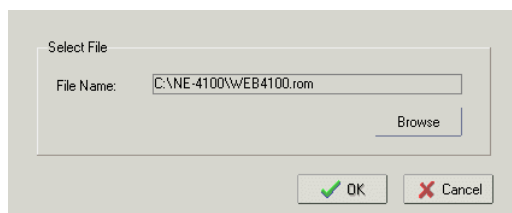
To select multiple WE-2100Ts, hold down the Ctrl key when selecting additional WE-2100Ts, or hold down the Shift key to select a group of WE-2100Ts.

### Upgrading the Firmware

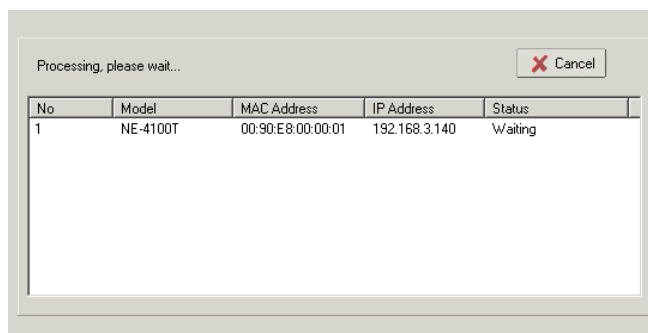
1. Input the password to Unlock the WE-2100T, and then right click on a specific module and select the Upgrade Firmware function to start upgrading the firmware.



2. Select the correct ROM file to be downloaded to the WE-2100T. Visit Moxa's website at [www.moxa.com](http://www.moxa.com) for the latest firmware release.



3. Wait patiently while the Upgrade Firmware action is being processed.



**ATTENTION**

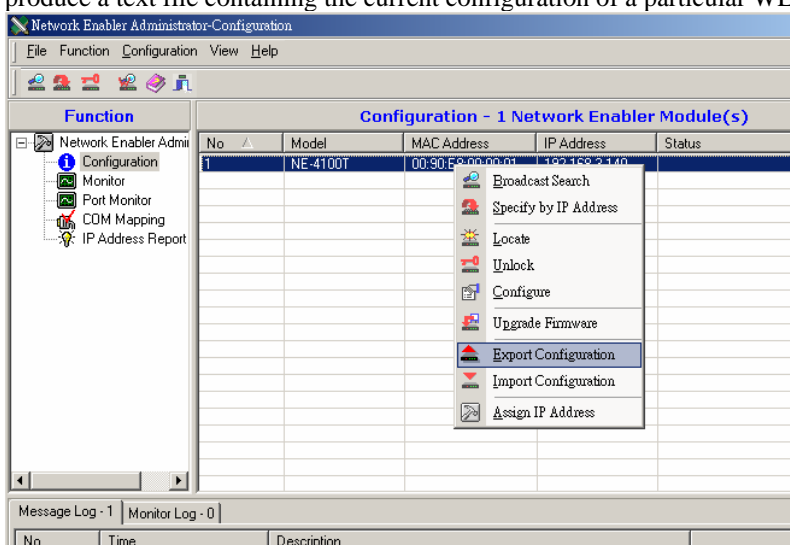
You can simultaneously upgrade the firmware of multiple WE-2100Ts that are of the same model.



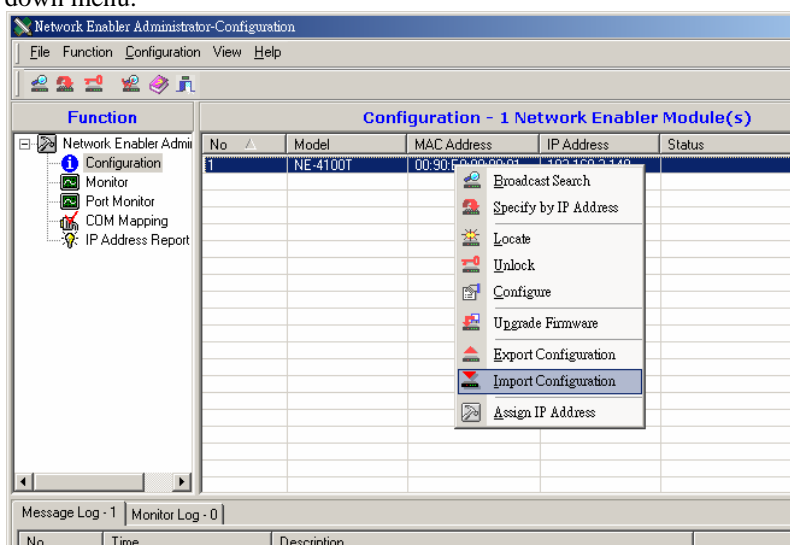
To select multiple WE-2100Ts, hold down the Ctrl key when selecting an additional WE-2100T, or hold down the Shift key to select a block of WE-2100Ts.

## Export/Import

1. Right click on a specific WE-2100T and select the Export function to start exporting the configuration file. The Export Configuration function is a handy tool that can be used to produce a text file containing the current configuration of a particular WE-2100T.



2. The Import Configuration function is used to import an WE-2100T configuration from a file into one or more of the same model of WE-2100T. To import a configuration, first select the target modules, click on the right mouse, and select **Import Configuration** from the drop down menu.



### ATTENTION



You can simultaneously import the same configuration file into multiple WE-2100Ts that are of the same model.

To select multiple WE-2100Ts, hold down the Ctrl key when selecting an additional WE-2100T, or hold down the Shift key to select a block of WE-2100Ts.

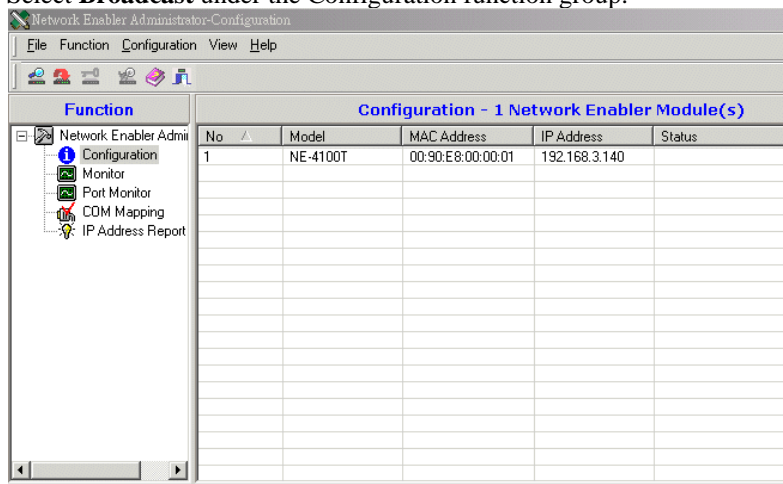
## Monitor

Two methods can be used to activate the Monitor function.

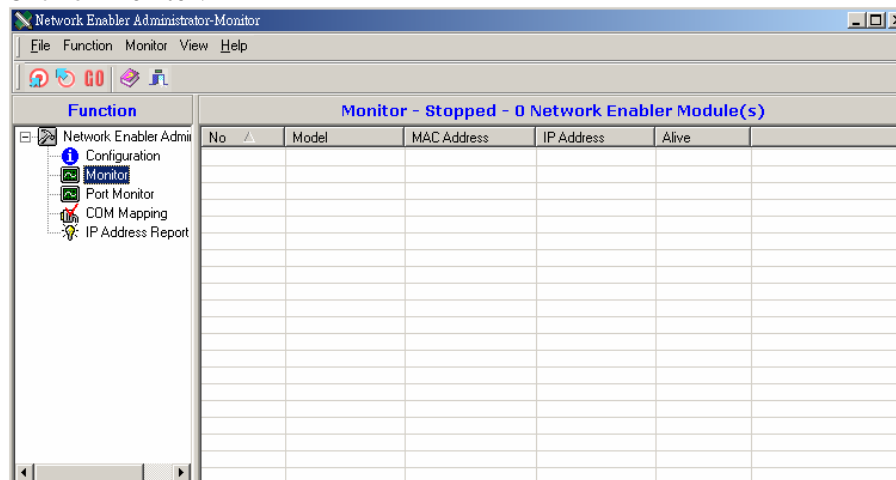
1. First use **Broadcast Search** under the Configuration Function group, and then click on **Monitor** → **Add Target** → **Select From List**.
2. First click on **Monitor**, and then **Add Target** → **Rescan**.

To use the Monitor function, follow the steps described below.

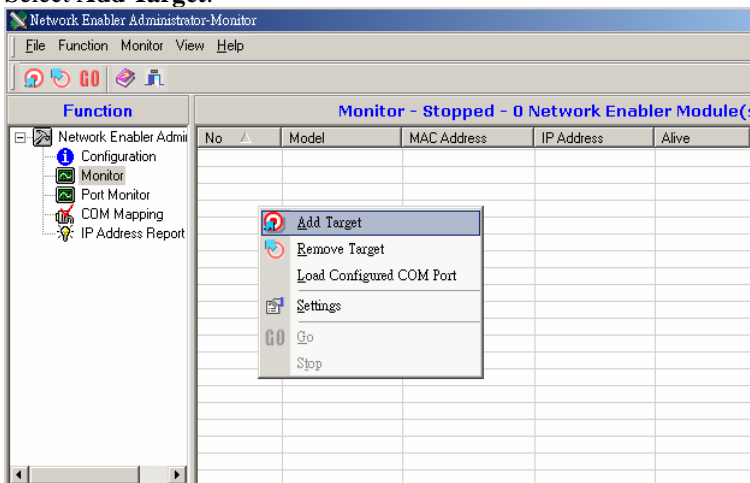
1. Select **Broadcast** under the Configuration function group.



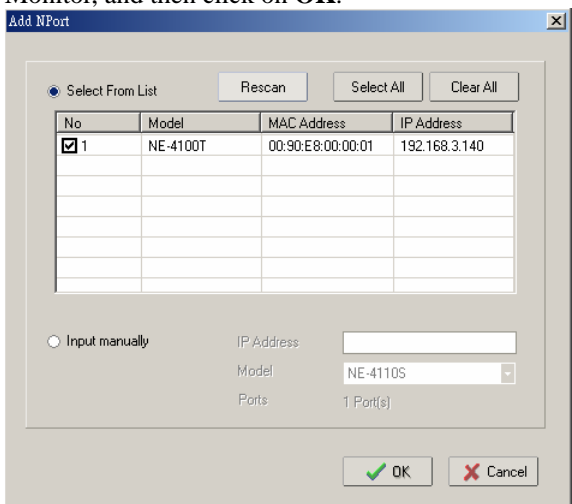
2. Click on **Monitor**.



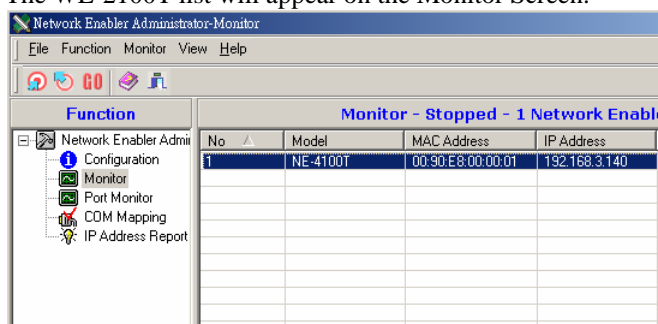
3. Select **Add Target**.



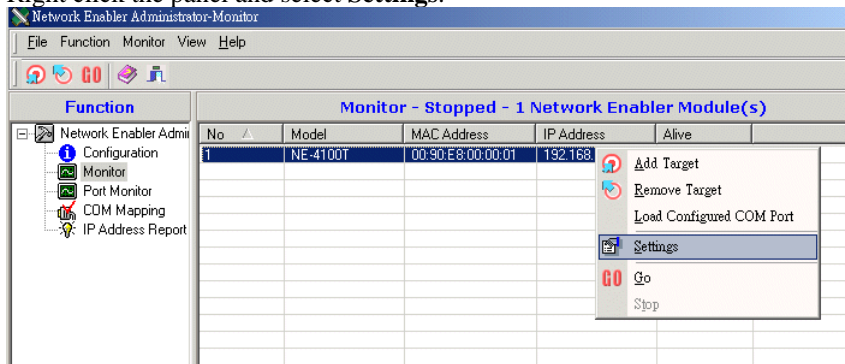
4. When you select add target, you will see an WE-2100T list that looks the same as when using **Configuration → Broadcast Search**. Checkmark the WE-2100T modules you would like to Monitor, and then click on **OK**.



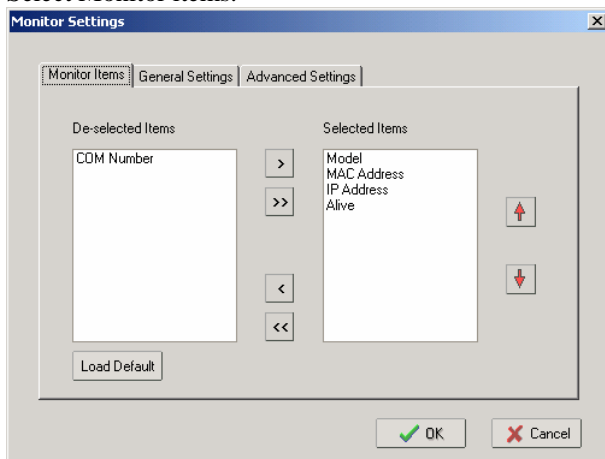
5. The WE-2100T list will appear on the Monitor Screen.



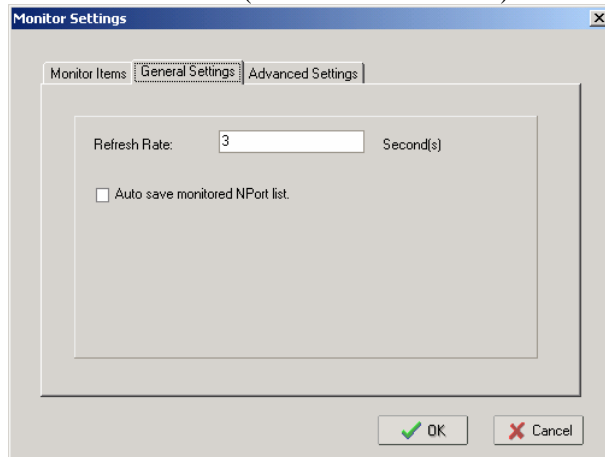
- Right click the panel and select **Settings**.



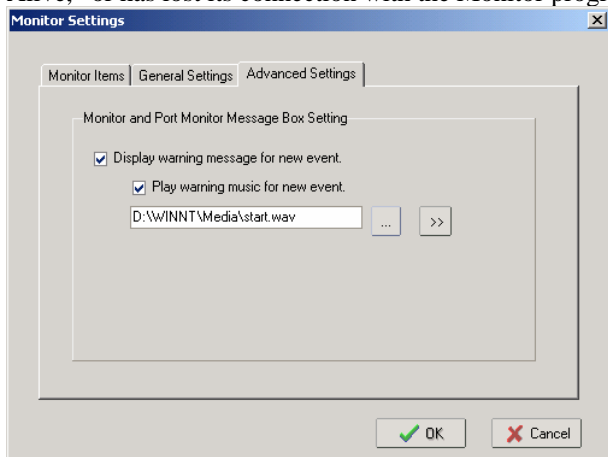
- Select Monitor items.



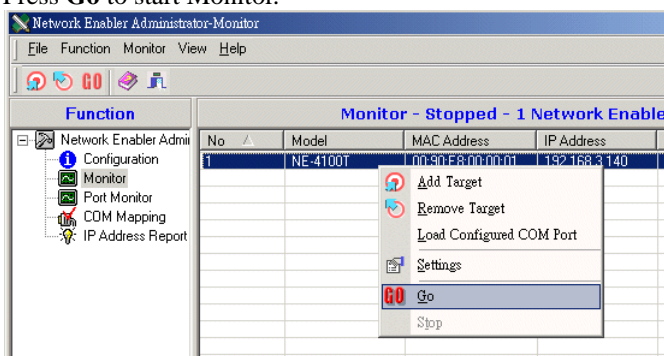
- Select a Refresh Rate (the default is 3 seconds).



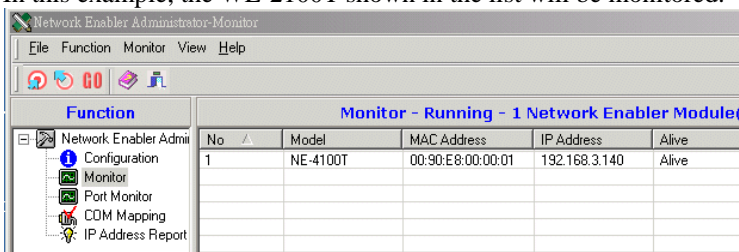
9. Select **Display warning message** or **Play the warning music** in WAV format when a new event occurs. New event means one of the WE-2100Ts in the monitor is “Alive” or “Not Alive,” or has lost its connection with the Monitor program.



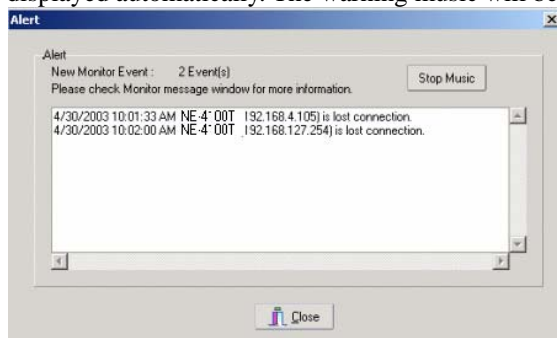
10. Press **Go** to start Monitor.



11. In this example, the WE-2100T shown in the list will be monitored.

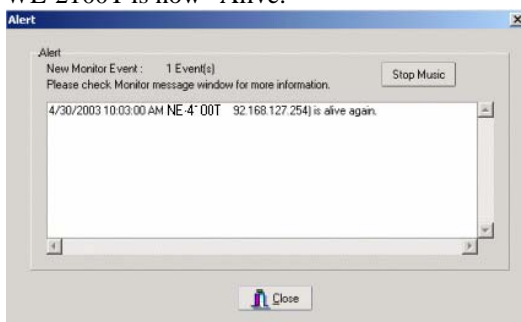


12. When one of the WE-2100Ts loses connection with the Monitor program, a warning will be displayed automatically. The warning music will be played at the same time.



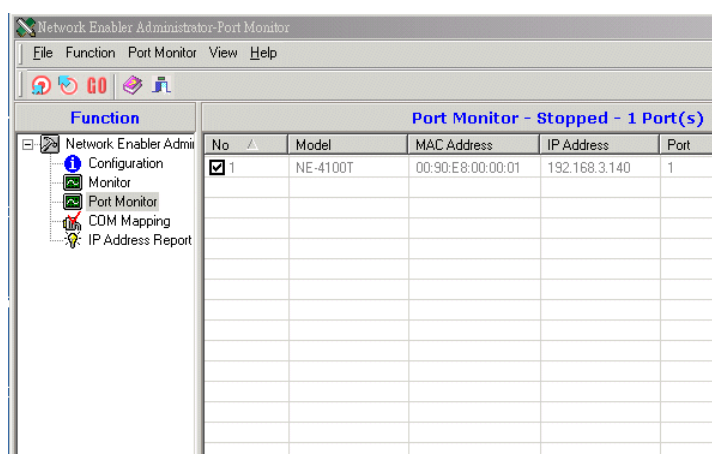


- If the WE-2100T gets reconnected, a warning will be displayed to remind the user that the WE-2100T is now "Alive."

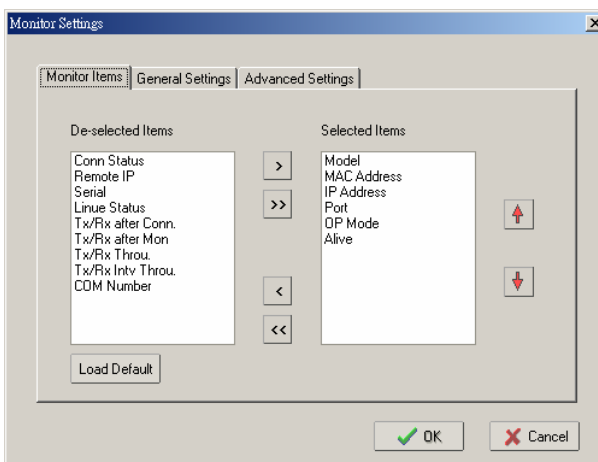


## Port Monitor

The process is the same as in the previous "Monitor" section. The only difference is that you can select more items under Port Monitor than under port status.



Select the Monitor Items.



## COM Mapping

Network Enabler Administrator Suite comes with Windows 95/98/ME/NT/2000/XP/Vista Real COM drivers. After you install Network Enabler Administrator Suite, there are two ways to set up the WE-2100T's serial port as your host's remote COM port.

The first way is **On-line COM Mapping**. On-line COM Mapping will check to make sure the WE-2100T is connected correctly to the network and then install the driver on the host computer.

The second way is **Off-line COM Installation**, with does not require connecting the WE-2100T to the network first. Off-line COM Mapping can decrease the system integrator's effort by solving different field problems. With off-line installation, users can process the host software installation and then install the WE-2100T to different fields.

Use the following procedure to map COM ports:

1. On-line COM Mapping:

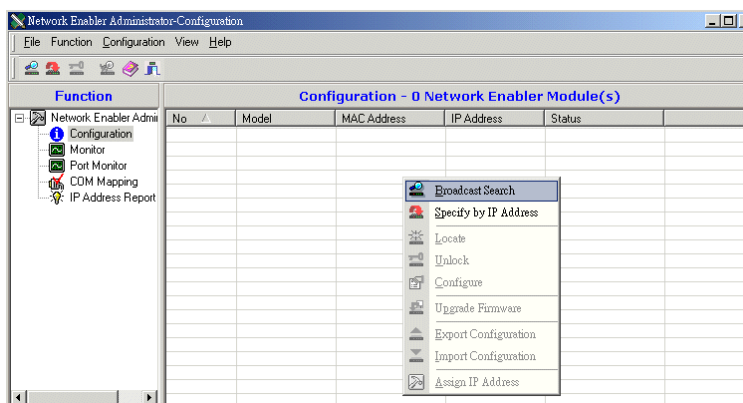
Connect WE-2100T to the network → Set WE-2100T to the proper IP address → Map COMs to your host → Apply Change.

2. Off-line COM Mapping:

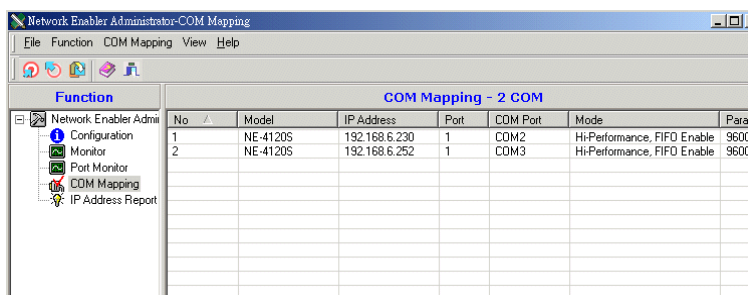
Map COMs to your host → Apply Change → Connect WE-2100T to the network → Configure WE-2100T's IP address.

### On-line COM Mapping

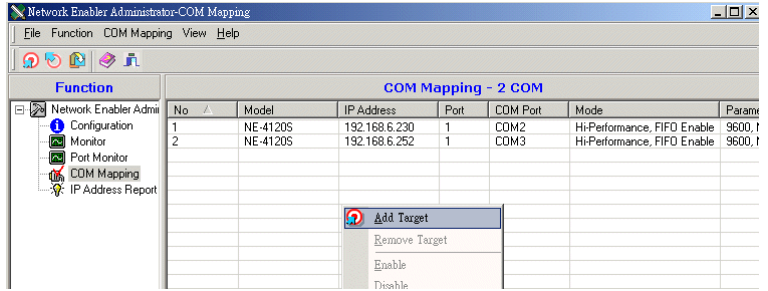
1. Broadcast Search for WE-2100Ts on the network.



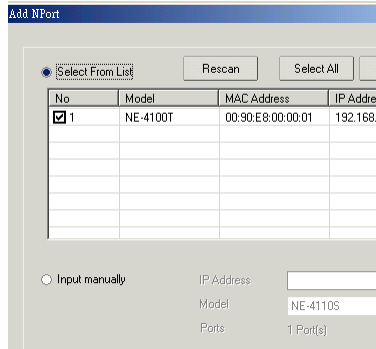
2. Select the COM Mapping function group.



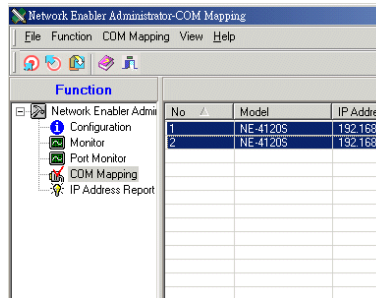
3. Add the target that you would like to map COM ports to.



4. The WE-2100T list that appears is based on the Broadcast Search. Select the WE-2100T that you would like to map COM ports to.

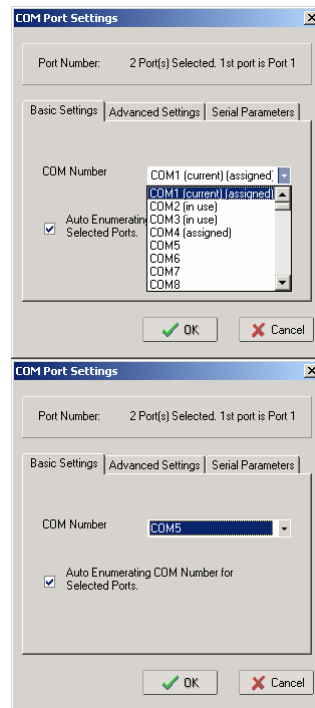


5. Select **COM Setting** to modify COM No., default setting, etc.



6. Select the COM No. Those “in use,” “assigned” COM ports will also be indicated in this window.

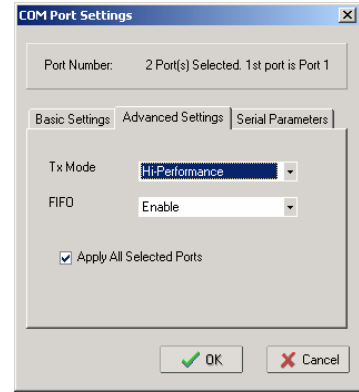
If you select multiple serial ports or multiple WE-2100Ts, remember to check the “Auto Enumerating” function to use the COM No. you select as the first COM No.



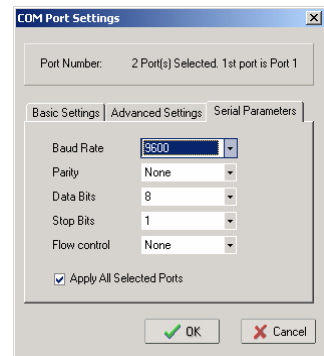
7. **Hi-performance** mode is the default for Tx mode. If the driver completes sending data from the host to the WE-2100T, the driver will respond to the program with "Tx Empty."

Under **Classical mode**, the driver will not notify the user's program that a Tx has completed until all Tx data has been sent out from the WE-2100T; this mode will case lower throughput. If you want to ensure that all data is sent out before further processing, classical mode is recommended.

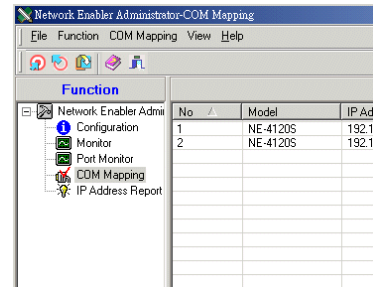
Enable/Disable Tx/Rx FIFO. If disabled, WE-2100T will send one byte each time the Tx FIFO becomes empty, and an Rx interrupt will be generated for each incoming byte. This will cause a faster response and lower throughput. If you want to use XON/XOFF flow control, we recommend setting FIFO to Disable.



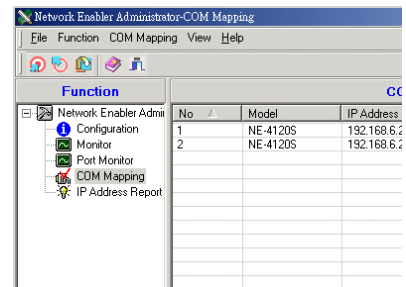
8. The Serial Parameter settings shown here are the default settings when the WE-2100T is powered on. The program can define the serial parameter after the program opens the port via Win32API with the specific serial parameters.



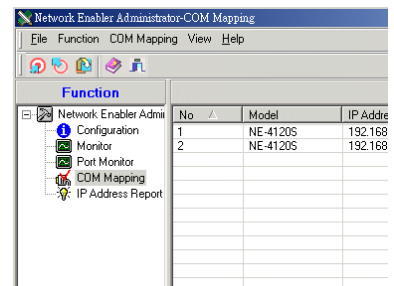
9. After setting the COM Mapping, remember to select **Apply Change** to save the information in the host system registry. The host computer will not be able to use the COM port until after selecting Apply Change.



10. Select **Discard Change** to tell Administrator to NOT save the COM Mapping information to the host.

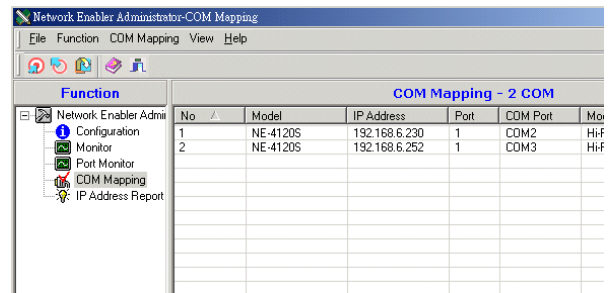
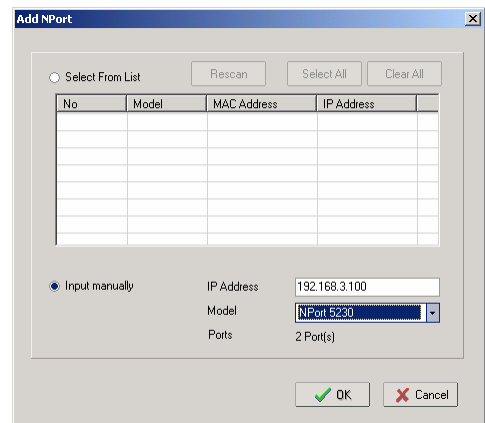


11. To save the configuration to a text file, select **Export COM Mapping**. You will then be able to import this configuration file to another host and use the same COM Mapping settings in the other host.

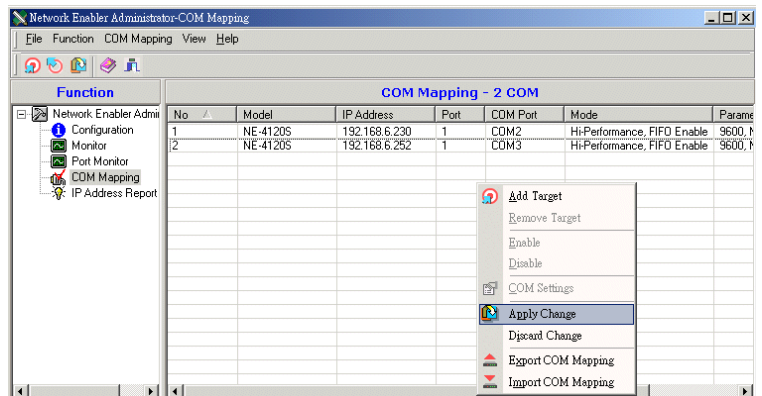


## Off-line COM Mapping

1. Add a target by inputting the IP address and selecting the Model Name without physically connecting the WE-2100T to the network.



2. Apply change.



Same as NE with some additional commands. Could you help to copy from NE users' manual and we will add the additional part on it directly?

# A

## Well Known Port Numbers

---

This appendix is included for your reference. Listed below are Well Known Port Numbers that may cause network problems if you configure WE-2100T for the same port. Refer to RFC 1700 for Well Know Port Numbers or refer to the following introduction from IANA.

The port numbers are divided into three ranges: the Well Known Ports, the Registered Ports, and the Dynamic and/or Private Ports.

The Well Known Ports are those from 0 through 1023.

The Registered Ports are those from 1024 through 49151.

The Dynamic and/or Private Ports are those from 49152 through 65535.

The Well Known Ports are assigned by IANA, and on most systems, can only be used by system processes or by programs executed by privileged users. The following table shows famous port numbers among the well-known port numbers. For more details, please visit the IANA website at <http://www.iana.org/assignments/port-numbers>.

<b>TCP Socket</b>	<b>Application Service</b>
0	reserved
1	TCP Port Service Multiplexor
2	Management Utility
7	Echo
9	Discard
11	Active Users (systat)
13	Daytime
15	Netstat
20	FTP data port
21	FTP CONTROL port
23	Telnet
25	SMTP (Simple Mail Transfer Protocol)
37	Time (Time Server)
42	Host name server (names server)
43	Whois (nickname)
49	(Login Host Protocol) (Login)
53	Domain Name Server (domain)
79	Finger protocol (Finger)

<b>TCP Socket</b>	<b>Application Service</b>
80	World Wide Web HTTP
119	Network news Transfer Protocol (NNTP)
123	Network Time Protocol
213	IPX
160 – 223	Reserved for future use

<b>UDP Socket</b>	<b>Application Service</b>
0	reserved
2	Management Utility
7	Echo
9	Discard
11	Active Users (systat)
13	Daytime
35	Any private printer server
39	Resource Location Protocol
42	Host name server (names server)
43	Whois (nickname)
49	(Login Host Protocol) (Login)
53	Domain Name Server (domain)
69	Trivial Transfer Protocol (TFTP)
70	Gopher Protocol
79	Finger Protocol
80	World Wide Web HTTP
107	Remote Telnet Service
111	Sun Remote Procedure Call (Sunrpc)
119	Network news Transfer Protocol (NNTP)
123	Network Time protocol (ntp)
161	SNMP (Simple Network Management Protocol)
162	SNMP Traps
213	IPX (Used for IP Tunneling)



# B

## NECI Library

---

NECI (Network Enabler Configuration Interface) is a set of APIs that run in the Windows 95/98/ME/NT/2000/XP/Vista system to search, locate, and configure the WE-2100T over the network. The WE-2100T library can be found in the folder `.\NECI_LIB\` on the CD enclosed with WE-2100T. For more information, refer to **NECI.chm** in that directory, and examples located in `.\NECI_LIB\VC\ConsoleExample`.

In this appendix, we give the reference DIO commands used to access the Digital I/O status of the Network Enabler from an Ethernet network. The Digital I/O status can be accessed by a specific TCP port (default 5001) on the Network Enabler.

**Command Packet Format:**

Length (Bytes)	<b>4</b>	<b>1 – 255</b>
Format	<b>*Header</b>	<b>Data</b>

Send the Command packet to the Network Enabler. “Data” field is command specific.

**ACK Packet Format:**

Length (Bytes)	<b>4</b>	<b>1 -255</b>
Format	<b>*Header</b>	<b>Data</b>

The Network Enabler returns by ACK packet. You can get the Digital I/O status and input/output operation mode by checking the “Data” field of the packet.

**\*Header Format:**

Length (Bytes)	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Format	<b>Command</b>	<b>Version (must be 2)</b>	<b>Command Status</b>	<b>Length (for data)</b>

Check the “Command Status” to get the result after sending the Command packet.

**Command:** This field defines the command code. For example, 1(hex) represents “read single D I/O.” For more information, please refer to following content.

**Command Status:** This field returns the status of the command.

- 0 – OK
- 1 – Command error; may be unknown
- 2 – Version error; not supported by this version
- 3 – Length error; the length member does not match the attached data
- 4 – Operation error; you cannot set the DIO mode to input mode, and set the DO status at the same time
- 5 – “Packet too short” error
- 6 – DIO number error; might not support request DIO number
- 0xFF – other unknown error

**Data Structure Definition:**

*C code example:*

```
//define DIO Header format
typedef struct _DIO_Header_Struct {
    char  command;
    char  version;    /* This specification is version 2 */
    char  status;
    char  length;
} DIOHeaderStruct, *pDIOHeaderStruct;
```

```
//define DIO Packet format
//Used for Command and ACK packet
typedef struct _DIO_Packet_Struct {
    DIOHeaderStruct header;
    char data[255];
} DIOPacketStruct, *pDIOPacketStruct;
```

## Command Code Usage

### 1. Reading Single DIO

Parameters:

Command code: 1(hex)  
 Version: 2(hex)  
 Command Status: doesn't matter  
 Length of data: 1(hex), represents one byte.  
 data[0]: Fill in the number of the DIO you wish to access. The DIO number starts from 0(hex).

Return:

Command Status: Check the Command Status code on the previous page.  
 Length of data: 3(hex). Must be 3 bytes of return code in this mode.  
 data[0]: The number of the DIO you wish to access.  
 data[1]: DIO mode(hex), 0 for IN, 1 for OUT  
 data[2]: DIO status(hex), 0 for LOW, 1 for HIGH

*C code example:*

```
BOOL ReadSingleDIO(int port, int *mode, int *status)
{
    DIOPacketStruct packet;

    packet.header.command = 1;    // read single DIO command
    packet.header.version = 2;    // DIO protocol version
    packet.header.length = 1;     // data length
    packet.data[0] = (char)port;   // Number of the DIO
    send(SocketFd, (char *)&packet, sizeof(DIOHeaderStruct)+1, 0); //Send TCP Packet
    // Process the returned data here.
    return TRUE;
}
```

### 2. Writing a Single DIO

Parameters:

Command code: 2(hex)  
 Version: 2(hex)  
 Command Status: doesn't matter  
 Length of data: 3(hex); represents three bytes.  
 data[0]: The number of the DIO you wish to access.  
 data[1]: DIO mode(hex), 0 for IN, 1 for OUT  
 data[2]: DIO status(hex), 0 for LOW, 1 for HIGH

Return:

Command Status: Check the Command Status code on the previous page.  
 Length of data: 3(hex). Must be 3 bytes of return code in this mode.  
 data[0]: The number of the DIO you wish to access.  
 data[1]: DIO mode(hex), 0 for IN, 1 for OUT  
 data[2]: DIO status(hex), 0 for LOW, 1 for HIGH

*C code example:*

```
void WriteSingleDIO(int port, int mode, int status)
{
    DIOPacketStruct packet;

    packet.header.command = 2;    // write single DIO command
    packet.header.version = 2;    // DIO protocol version
    packet.header.length = 3;    // data length
    packet.data[0] = (char)port;    // number of the DIO
    packet.data[1] = (char)mode;    // DIO mode
    packet.data[2] = (char)status;    // DIO status;
    send(SocketFd, (char *)&packet, sizeof(DIOHeaderStruct)+3, 0); //Send TCP packet
    //Process the returned data here
}

```

### 3. Reading Multiple DIOs

Parameter:

Command code: 5(hex)  
 Version: 2(hex)  
 Command status: doesn't matter  
 Length of data: 2(hex); represents two bytes.  
 data[0]: Number of the DIO you wish to access first.  
 data[1]: The last number of the DIO you wish to access.

Return:

Command Status : Check the Command Status code on the previous page.  
 Length of data: (end-start+1)\*2  
 data[0]: mode of start DIO  
 data[1]: status of start DIO  
 data[2]: mode of (start+1) DIO  
 data[3]: status of (start+1) DIO  
 ....  
 data[(end-start)\*2]: mode of end DIO  
 data[(end-start)\*2+1]: status of end DIO

*C code example:*

```
BOOL ReadMultipleDIO(int start, int end, int *mode, int *status)
{
    DIOPacketStruct packet;

    packet.header.command = 5;    // Read Multiple DIO Commands
    packet.header.version = 2;    // DIO protocol command version
    packet.header.length = 2;    // data length
    packet.data[0] = start;    // start of the DIO number
    packet.data[1] = end;    // end of the DIO number
    send(SocketFd, (char *)&packet, sizeof(DIOHeaderStruct)+2, 0); //Send TCP packet
    //Process the returned data here
    return TRUE;
}

```

#### 4. Writing Multiple DIOs

##### Parameters:

Command code: 6(hex)  
 Version: 2(hex)  
 Command status: doesn't matter  
 Length of data:  $(\text{end}-\text{start}+1)*2 + 2$   
 data[0]: Number of the DIO you wish to access first.  
 data[1]: The last number of the DIO you wish to access  
 data[2]: mode of start DIO  
 data[3]: status of start DIO  
 data[4]: mode of (start+1) DIO  
 data[5]: status of (start+1) DIO  
 ....  
 data[(end-start)\*2+2]: mode of end DIO  
 data[(end-start)\*2+3]: status of end DIO

##### Return:

Command Status: Check the Command Status code on the previous page.  
 Length of data :  $(\text{end}-\text{start}+1)*2$   
 data[0]: mode of start DIO  
 data[1]: status of start DIO  
 data[2]: mode of (start+1) DIO  
 data[3]: status of (start+1) DIO  
 ....  
 data[(end-start)\*2]: mode of end DIO  
 data[(end-start)\*2+1]: status of end DIO

##### C code example:

```

void WriteMultipleDIO(int start, int end, int* mode, int* status)
{
    DIOPacketStruct packet;

    packet.header.command = 6;           // Write Multiple DIO Command Codes
    packet.header.version = 2;          // DIO protocol version
    packet.header.length = (end-start+1)*2+2; // data length
    packet.data[0] = start;              // start DIO number
    packet.data[1] = end;                // end DIO number
    int i, len;
    for ( i=0; i<(end-start+1);i++ ) {
        packet.data[i+2] = mode[i];
        packet.data[i+3] = status[i];
    }
    send(SocketFd, )(char*)&packet,( end-start+1)*2+2+sizeof(DIOHeaderStruct), 0); //Send TCP
    packet
    //Process the returned data here
}
  
```

Note: A utility that can be used to test the DIO access commands can be found on the CD-ROM.

# D

## SNMP Agent with MIB II & RS-232 Like Group

---

WE-2100T has a built-in SNMP (Simple Network Management Protocol) agent software. It supports SNMP Trap, RFC1317 RS-232 like group and RFC 1213 MIB-II. The following table lists the standard MIB-II groups, as well as the variable implementations for WE-2100T.

### **RFC1213 MIB-II supported SNMP variables:**

<b>System MIB</b>	<b>Interfaces MIB</b>	<b>IP MIB</b>	<b>ICMP MIB</b>
SysDescr	ifNumber	ipForwarding	IcmpInMsgs
SysObjectID	ifIndex	ipDefaultTTL	IcmpInErrors
SysUpTime	ifDescr	ipInreceives	IcmpInDestUnreachs
SysContact	ifType	ipInHdrErrors	IcmpInTimeExcds
SysName	ifMtu	ipInAddrErrors	IcmpInParmProbs
SysLocation	ifSpeed	ipForwDatagrams	IcmpInSrcQuenchs
SysServices	ifPhysAddress	ipInUnknownProtos	IcmpInRedirects
	ifAdminStatus	ipInDiscards	IcmpInEchos
	ifOperStatus	ipInDelivers	IcmpInEchoReps
	ifLastChange	ipOutRequests	IcmpInTimestamps
	ifInOctets	ipOutDiscards	IcmpTimestampReps
	ifInUcastPkts	ipOutNoRoutes	IcmpInAddrMasks
	ifInNUcastPkts	ipReasmTimeout	IcmpOutMsgs
	ifInDiscards	ipReasmReqds	IcmpOutErrors
	ifInErrors	ipReasmOKs	IcmpOutDestUnreachs

System MIB	Interfaces MIB	IP MIB	ICMP MIB
SysServices	ifInUnknownProtos	ipReasmFails	IcmpOutTimeExcds
	ifOutOctets	ipFragOKs	IcmpOutParmProbs
	ifOutUcastPkts	ipFragFails	IcmpOutSrcQuenchs
	ifOutNUcastPkts	ipFragCreates	IcmpOutRedirects
	ifOutDiscards	ipAdEntAddr	IcmpOutEchos
	ifOutErrors	ipAdEntIfIndex	IcmpOutEchoReps
	ifOutQLen	ipAdEntNetMask	IcmpOutTimestamps
	ifSpecific	ipAdEntBcastAddr	IcmpOutTimestampReps
		ipAdEntReasmMaxSize	IcmpOutAddrMasks
		IpNetToMediaIfIndex	IcmpOutAddrMaskReps
		IpNetToMediaPhysAddress	
		IpNetToMediaNetAddress	
		IpNetToMediaType	
		IpRoutingDiscards	

UDP MIB	TCP MIB	SNMP MIB
UdpInDatagrams	tcpRtoAlgorithm	snmpInPkts
UdpNoPorts	tcpRtoMin	snmpOutPkts
UdpInErrors	tcpRtoMax	snmpInBadVersions
UdpOutDatagrams	tcpMaxConn	snmpInBadCommunityNames
UdpLocalAddress	tcpActiveOpens	snmpInASNParseErrs
UdpLocalPort	tcpPassiveOpens	snmpInTooBigs
	tcpAttempFails	snmpInNoSuchNames
<b>Address Translation MIB</b>	tcpEstabResets	snmpInBadValues
AtIfIndex	tcpCurrEstab	snmpInReadOnlys
AtPhysAddress	tcpInSegs	snmpInGenErrs
AtNetAddress	tcpOutSegs	snmpInTotalReqVars

# E

## Service Information

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This appendix shows you how to contact Moxa for information about this and other products, and how to report problems.

In this appendix, we cover the following topics.

- ❑ **MOXA Internet Services**
- ❑ **Problem Report Form**
- ❑ **Product Return Procedure**



## MOXA Internet Services

Customer satisfaction is our number one concern, and to ensure that customers receive the full benefit of our products, Moxa Internet Services has been set up to provide technical support, driver updates, product information, and user's manual updates.

The following services are provided

E-mail for technical support..... [support@moxa.com.tw](mailto:support@moxa.com.tw)

World Wide Web (WWW) Site for product information:

..... <http://www.moxa.com>

# Problem Report Form

## MOXA WE-2100T

<b>Customer name:</b>	
<b>Company:</b>	
<b>Tel:</b>	<b>Fax:</b>
<b>Email:</b>	<b>Date:</b>

- Moxa Product:**  WE-2100T     WE-2100T-ST
- Serial Number:** \_\_\_\_\_

**Problem Description:** Please describe the symptoms of the problem as clearly as possible, including any error messages you see. A clearly written description of the problem will allow us to reproduce the symptoms, and expedite the repair of your product.

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## Product Return Procedure

For product repair, exchange, or refund, the customer must:

- ◆ Provide evidence of original purchase.
- ◆ Obtain a Product Return Agreement (PRA) from the sales representative or dealer.
- ◆ Fill out the Problem Report Form (PRF). Include as much detail as possible for a shorter product repair time.
- ◆ Carefully pack the product in an anti-static package, and send it, pre-paid, to the dealer. The PRA should be visible on the outside of the package, and include a description of the problem, along with the return address and telephone number of a technical contact.

## **FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### **CAUTION:**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

### **FCC RF Radiation Exposure Statement**

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This equipment must not be co-located or operating in conjunction with any other antenna or transmitter.