

IA260 WinCE User's Manual

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IA260 WinCE User's Manual

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Table of Contents

Chapter 1	Introduction	1-1
	Overview.....	1-2
	Model Descriptions and Package Checklist.....	1-2
	Product Features	1-3
	Software Specifications	1-3
	Application Development Environment.....	1-3
	Networking and Communications Capabilities	1-4
	Supported Servers and Daemons.....	1-4
	Firmware Build Versions	1-5
	Memory and File Systems	1-5
	Hive-based Registry (not RAM-based).....	1-5
	Inserting a CompactFlash Card.....	1-5
	Inserting a USB Mass Storage Device.....	1-6
	RS-232/422/485 Serial Ports.....	1-6
Chapter 2	Getting Started	2-1
	Powering on the IA260.....	2-2
	Resetting the IA260-CE Computer	2-2
	Rebooting the IA260-CE Computer	2-2
	Boot Loader	2-3
	Operating the IA260-CE Computer via Serial Console	2-3
	Changing the Network Settings	2-4
	Virtual Private Network (VPN).....	2-6
	Operating the IA260-CE Computer via Telnet.....	2-7
	User/Group Management.....	2-7
	Adjusting the Time Zone	2-8
	Adjusting the System Time	2-8
	Starting and Stopping Services	2-8
	Troubleshooting Network Connectivity.....	2-9
	Simple Network Management Protocol (SNMP).....	2-10
	SNMP Agent	2-10
	SNMP Manager.....	2-10
	Accessing Files through File Sharing	2-11
	Configuring the FIFO	2-14
Chapter 3	Management Tools.....	3-1
	System Information.....	3-2
	Serial Port Configuration	3-2
	Process (Thread) Monitoring/Control.....	3-3
	Services Monitoring/Control	3-3
	Display.....	3-4
	User/Group Management.....	3-5
	Auto Launch Configuration	3-6
	Web Server Configuration	3-6
Appendix A	Firmware Upgrade Procedure.....	A-1

Microsoft® Windows® CE 6.0 is an open, scalable, 32-bit operating system (OS) that allows you to build a wide range of innovative, small footprint devices. A typical Windows® CE-based device is designed for a specific use, and often runs disconnected from other computers, or distributed as a front-end to a centralized host. Examples include enterprise tools, such as industrial controllers, communications hubs, point-of-sale terminals, and display devices, such as HMI, advertisement appliances, and interactive panels.

Moxa's IA260 ready-to-run embedded computer provides Windows® developers with an excellent Windows® CE solution. Moxa's extensive experience in kernel development on embedded small footprint communication devices provides the intense technological skills required while porting the Windows® CE 6.0 kernel.

The following topics are covered in this chapter:

- Overview**
- Model Descriptions and Package Checklist**
- Product Features**
- Software Specifications**
 - Application Development Environment
 - Networking and Communications Capabilities
 - Supported Servers and Daemons
- Firmware Build Versions**
- Memory and File Systems**
- Hive-based Registry (not RAM-based)**
- Inserting a CompactFlash Card**
- Inserting a USB Mass Storage Device**
- RS-232/422/485 Serial Ports**

Overview

The IA260 embedded computers feature 4 RS-232/422/485 serial ports, dual Ethernet ports, 8 digital input channels, 8 digital output channels, VGA output, 2 USB hosts and a CompactFlash socket in a compact, industrial-strength aluminum rugged casing. The DIN-Rail vertical form factor makes the IA260 a cost effective solution for installation in small cabinets. This space-saving solution also makes wiring easy, and is the best front-end embedded controller for industrial applications.

Because of its VGA output capability, the IA260 can be used for protocol conversion or data acquisition for field site devices, and is also suitable for SCADA systems in industrial applications, such as manufacturing automation, production line process monitoring, and mining automation. It can serve as an operator interface terminal at a field site by connecting a VGA monitor and appropriate HMI software.

The IA260 comes with RS-232/422/485 ports, digital inputs and outputs, and dual LAN ports, making it an ideal communication platform for redundant network applications.

In addition to the standard model, the IA260 also comes in a wide temperature model. The IA260-T has an operating temperature range of -40 to 75°C, making it suitable for harsh industrial automation environments. The IA260's industrial design provides robust and reliable computing, and the RISC-based architecture allows the IA260 to operate without generating too much heat. The high communication performance and fan-less design make the IA260 ideal for industrial automation environments.

The IA260 embedded computer uses a Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. Unlike the X86 CPU, which uses a CISC design, the RISC design architecture and modern semiconductor technology provide the IA260 with a powerful computing engine and communication functions, but without generating a lot of heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software directly on the IA260.

The IA260 comes with the Windows CE 6.0 operating system pre-installed. WinCE 6.0 supports general Windows and .NET CF 2.0 environments. This means that programs developed with standard programming tools such as Embedded Visual C++ or Visual Studio 2005 in Windows PC environments can operate on the IA260 without too much porting effort.

Model Descriptions and Package Checklist

Two models of the IA260 are available:

IA260-CE

RISC-based embedded computer with VGA, 4 serial ports, dual LANs, DIO, CompactFlash, USB, WinCE 6.0

IA260-T-CE

RISC-based embedded computer with VGA, 4 serial ports, dual LANs, DIO, CompactFlash, USB, WinCE 6.0, wide operating temperature

Both models are shipped with the following items:

- 1 IA260 Embedded Computer
- Wall-Mounting Kit
- DIN-Rail Mounting Kit (attached to the product's casing)
- Quick Installation Guide
- Document & Software CD
- Ethernet Cable: RJ45 to RJ45 cross-over cable, 100 cm

- CBL-4PINDB9F-100: 4-pin header to DB9 female console port cable, 100 cm
- Universal Power Adaptor
- Product Warranty Statement

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

Product Features

- Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- 128 MB RAM on-board, 32 MB Flash Disk
- VGA interface for field site monitoring
- 4 RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet ports for network redundancy
- 8+8 DI/DO channels
- 12 to 48VDC power input design
- Supports CF socket and USB 2.0 Host
- Ready-to-Run WinCE 6.0 platform
- -40 to 75°C wide temperature model available

Software Specifications

IA260 WinCE ready-to-run embedded computers are network centric / head-less computers that are designed to be programmable for embedded communication applications. The software features of the IA260-CE are listed below:

Application Development Environment

To make the IA260-CE easy to program, its Windows® CE environment provides the following common, popular application development features that make programming as convenient and easy as in a PC environment.

- **C Libraries and Run-times**—Compared to the C libraries and run-times used on a desktop PC running Windows®, the C libraries and run-times on an IA260-CE are a subset of the WIN32 APIs. They support full ANSI C run time, standard input/output library, standard input/output ASCII library, and standard ASCII string functions. In addition, they support C++ compiler exception handling and Run-Time Type Information (RTTI) equivalent to desktop C++ compilers.
- **Component Services (COM and DCOM)**—The Common Object Model (COM) is an operating system-independent, object-oriented system for creating binary software components that can interact with other COM-based components in the same process space, in other processes, or on remote machines.
- **Microsoft® Foundation Classes (MFC)**—MFC is a comprehensive class library and complete object-oriented application framework designed to help build applications, COM components, and controls.
- **SOAP Toolkit**—SOAP is an XML-based protocol for object exchange and remote procedure calls. Microsoft® Windows® CE 6.0 provides functionality similar to the SOAP Toolkit version 2 on a desktop computer. The SOAP Toolkit provides a layer that allows COM objects to use SOAP as the transport protocol for remote procedure calls and to interact with Web services.
- **Microsoft® .NET Compact Framework 2.0 with service pack 2**—Offers a choice of languages, Microsoft® Visual Basic® and Microsoft® Visual C#, and eliminates the common problems faced with language interoperability.

- **XML**—Provides the Document Object Model (DOM) for XML-based functionality, supports XML Query Language (XQL) and XPATH, Extensible Style Sheet Language Transformations (XSLT) that enable you to transform one class of XML document into another, SAX2 support for event-based parsing of XML documents, including MSXML Writer, and parsing based on Simple API for XML (SAX) for resource-constrained target devices.
- **Winsock 2.2**—Provides enhanced capabilities over Winsock 1.1, including installable service providers for additional third-party protocols, as well as Media sense.

Networking and Communications Capabilities

For network-centric embedded application usage, the IA260-CE not only provides powerful communication hardware interfaces, including dual Ethernet and 3-in-1 serial ports, but also supports the networking and communications capabilities that are built into Windows® CE 6.0. The following features are supported:

- **Simple Network Management Protocol (SNMP)**—Monitors remote connections to the network.
- **Simple Network Time Protocol (SNTP) Client**—Provides support for synchronizing the device's system time with an SNTP server, and supports Daylight Savings Time.
- **Serial Communications**—In addition to the 16550 UART driver bound to a debug port and the console port, a special driver for 8 additional Moxa serial ports is also included.
- **Network Utilities (IpConfig, Ping, Route)**—Utilities for troubleshooting various network problems.
- **TCP/IP**—Includes IP, Address Resolution Protocol (ARP), Internet Control Message Protocol (ICMP), Internet Group Membership Protocol (IGMP), Transmission Control Protocol (TCP), User Datagram Protocol (UDP), name resolution and registration, and DHCP.

Supported Servers and Daemons

In addition to development and communication capabilities, the IA260-CE is also embedded with the following services and daemons. These common and easy-to-use application servers help users migrate the IA26X-CE embedded computer to industrial communication applications easily and conveniently.

- **Telnet Server**—A sample server that allows remote administration through a standard Telnet client.
- **FTP Server**—A sample server used for transferring files to and from remote computer systems over a network using TCP/IP.
- **File Server**—The file server functionality in Microsoft® Windows® CE enables clients to access files and other resources over the network.
- **Web Server (HTTPD)**—Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.
- **Dial-up Networking**—Consists of RAS client API and the Point to Point Protocol (PPP). RAS and PPP support Extensible Authentication Protocol (EAP) and RAS scripting.
- **Watchdog Service**—A CPU Hardware function for resetting the CPU in a user specified time interval. You must call a Moxa library function to trigger the reset action.

Firmware Build Versions

There are two ways to determine the version of your IA260-CE computer's firmware. You will need to know the firmware version to identify which features your IA260-CE supports.

- Examine the welcome message after you log on to the computer.
- Log on to the web-based management system (described in a later chapter) to view the system information.

Memory and File Systems

The SDRAM has 128 MB of memory space, of which 112 MB is allocated for the main memory in which the operating system and user applications run. The kernel image occupies the rest of the space.

The IA260-CE's internal file system controls access to the ROM, and also provides file storage in the object store, which is in the RAM. The ROM file system provides persistent storage for applications and the data used by the applications, even when the main power supply is lost. It integrates the read-only files that are stored in Flash ROM with the read/write files of both an application and a user. In the IA260-CE computer, a child directory named "NORFlash" under the root indicates the ROM storage of the flash memory is 12 MB.

The root directory is a 12 MB RAM file system. It can be used for storing temporary files for your applications. However, do not place persistent files or applications in the root directory, because they will be wiped out when the system is shut down. Instead, place them in the "NORFlash" directory.

The file systems for storage devices connected through the USB port and CompactFlash are placed in the root of the internal file system. If you intend to use these devices to port data between your PC and the IA260-CE computer, format them using the FAT file system on your PC.

Hive-based Registry (not RAM-based)

The registry for the IA260-CE is a hive-based registry instead of a RAM-based registry. The hive-based registry stores registry data in files, or hives, which can be kept on any file system. This removes the need for performing backup and restore on power off.

Inserting a CompactFlash Card

The IA260-CE is equipped with a CompactFlash slot of type II that supports cards of both types I and II. A mass storage card is considered to be a standard attachment to the computer. Thus, when an empty mass storage card is inserted into the slot, the computer automatically formats it to the FAT system. This process takes a few minutes to complete. When a mass storage card is inserted, the IA260-CE creates a directory named "HardDisk" under the root directory and the newly created directory serves as a link to the storage. The IA260-CE does not support PNP (plug and play) and hot swap for CompactFlash storage devices. Users must switch off the power and then insert the CompactFlash storage device in the slot. When the power is switched on again, the IA260-CE will detect the CompactFlash storage device. Be sure to shut off the power before removing the CompactFlash storage device.

Some CompactFlash storage disks are not compatible with the IA260-CE. You can try using other CompactFlash storage devices, or use "System Manager" to disable ultra DMA.

The following table describes the compatible CompactFlash storage devices that have been tested and found to be compatible with the IA260-CE.

Vendor	Device Name	Size
ScanDisk	Ultra II	1 GB
Transcend	Compact Flash 80X	512 MB
Apacer	Photo CIENO	2 GB
Unigen	Compact Flash card	128 MB

Inserting a USB Mass Storage Device

When an empty USB storage device is plugged into the USB slot on the IA260-CE's rear panel, the computer automatically formats device to the FAT system.

When the first USB mass storage device is plugged in, a directory named "USBDisk" is created in the internal file system under the root directory as a link to the storage device. The directory created for the second USB device is "USBDisk2."

RS-232/422/485 Serial Ports

The IA260-CE computer has 4 high performance serial ports named COM1:, COM2:, COM3:, and COM4: All of the ports are designed to provide reliable, high-speed, 3-in-1 (i.e., RS-232, RS-422, and RS-485) operation. Each of the ports supports baudrates up to 921600 bps.

2

Getting Started

In this chapter, we explain how to operate an IA26X-CE computer from a PC. The PC will be referred to as a development workstation and the IA26X-CE computer will be called the target computer.

We describe the steps needed for some operations, such as setting the system time, troubleshooting network connectivity, etc. Some of these operations can be done using system commands after gaining access to the computer, and others can be done with a web-based management system, as described in a later chapter.

The following topics are covered in this chapter:

- Powering on the IA260**
- Resetting the IA260-CE Computer**
- Rebooting the IA260-CE Computer**
- Boot Loader**
- Operating the IA260-CE Computer via Serial Console**
- Changing the Network Settings**
- Virtual Private Network (VPN)**
- Operating the IA260-CE Computer via Telnet**
- User/Group Management**
- Adjusting the Time Zone**
- Adjusting the System Time**
- Starting and Stopping Services**
- Troubleshooting Network Connectivity**
- Simple Network Management Protocol (SNMP)**
 - SNMP Agent
 - SNMP Manager
- Accessing Files through File Sharing**
- Configuring the FIFO**

Powering on the IA260

To boot up the system, connect the power source to the power input located on the computer's top panel. It takes about 5 seconds for the system to boot up. You will hear a clear "BEEP" sound when the boot up procedure is finished. Once the system is ready, the "Ready" LED will light up and stay on until you shut down the computer.

Resetting the IA260-CE Computer

Warm-Start: When powering on, push the "Reset" button briefly (for less than 1 second). The computer will reboot automatically.

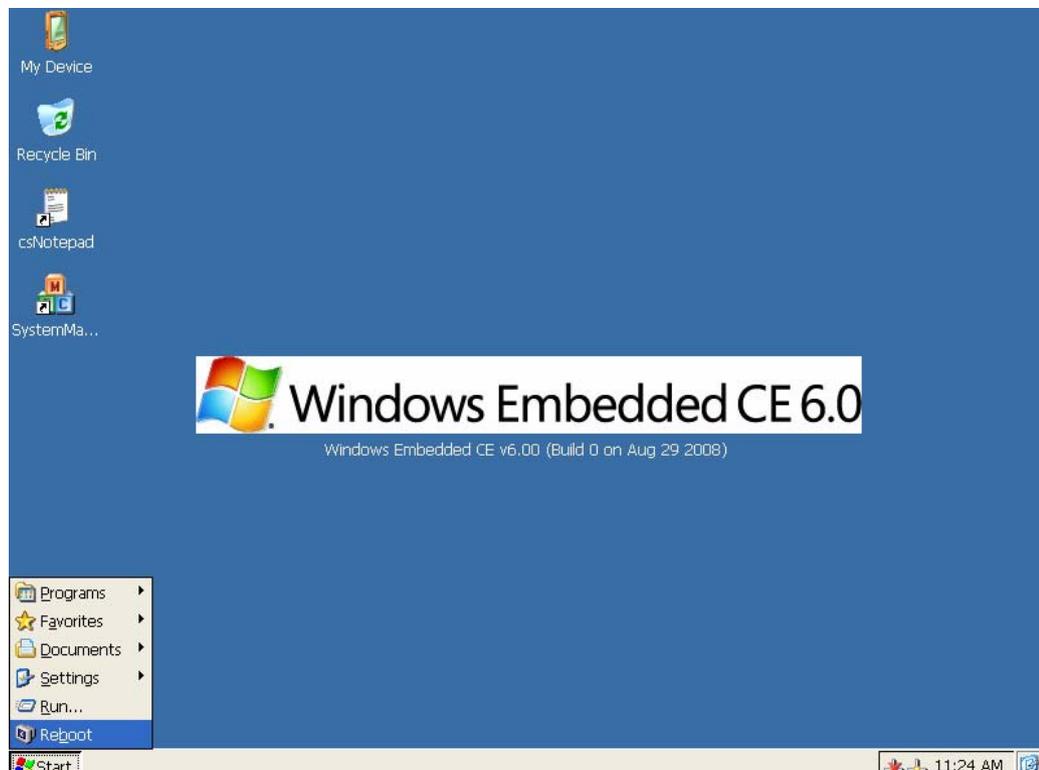
Cold-Start: Switch the power off and then on again. The computer will reboot automatically.

Reset to Factory Defaults (Configuration only): If the computer is not working properly and you would like to reset it to factory default settings, press and hold the "Reset" button for 5 seconds as the operating system is starting up. The buzzer sounds while the factory default settings are being loaded. After the factory default settings have finished loading, the computer will reboot automatically. Do not confuse this action with "Warm-Start."

Reset to Factory Defaults (Configuration and file system): If the computer will not start up, you **must** go to the Boot Loader and format the flash storage. Once the flash storage has been reformatted, restart the computer.

Rebooting the IA260-CE Computer

While the computer is powering on, click the "start" button and select "Reboot." The computer will reboot automatically.



Boot Loader

Three functions are provided to enhance the stability of the operating system.

- **Reset to default**—This function allows users to load the factory default into the IA260.
- **Format storage flash**—CE 6.0 is a FAT-based system. The system cannot work well when the FAT table is crashed. This function allows users to format the file system and reboot IA260.
- **Firmware upgrade**—The latest firmware can be downloaded from Moxa's website. See Appendix A for instructions on how to upgrade the firmware.

Use the following procedure to access the boot loader menu from the serial console:

Step 1: Power off the IA260-CE.

Step 2: Connect the serial console cable to your PC.

Step 3: Go to [Start] → [Programs] → [Accessories] → [Communication] → [Terminal] to create a new terminal. Use these settings: Baudrate = 115200, Hardware Flow Control = None, Data bits = 8, Parity = None, Stop bits = 1, Terminal = VT100.

Step 4: Activate this terminal window on your PC.

Step 5: Hold down the "DEL" key.

Step 6: Power on the IA260-CE.

Operating the IA260-CE Computer via Serial Console

The serial console port gives users a convenient way of connecting the development workstation to the console utility of the target computer. This method is particularly useful when using the target computer for the first time.

After connecting the serial cable, return to the development workstation and start a terminal program (e.g., HyperTerminal). Use the following console port settings.

Baud rate	115200 bps
Parity	None
Data bits	8
Stop bits	1
Flow Control	None
Terminal	VT100

Next enter the login name and password. The default values are both **admin**.

Login: admin

Password: admin

Changing the Network Settings

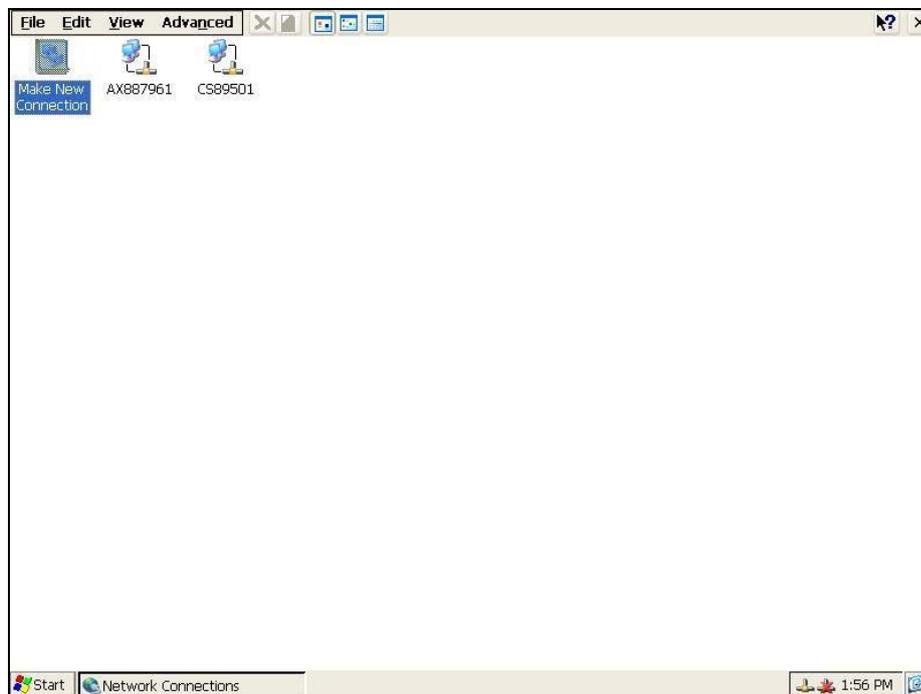
The IA260-CE computer comes with two network interfaces. The default IP addresses and netmasks of the network interfaces are as follows:

	Default IP Address	Netmask
LAN 1	192.168.3.127	255.255.255.0
LAN 2	192.168.4.127	255.255.255.0

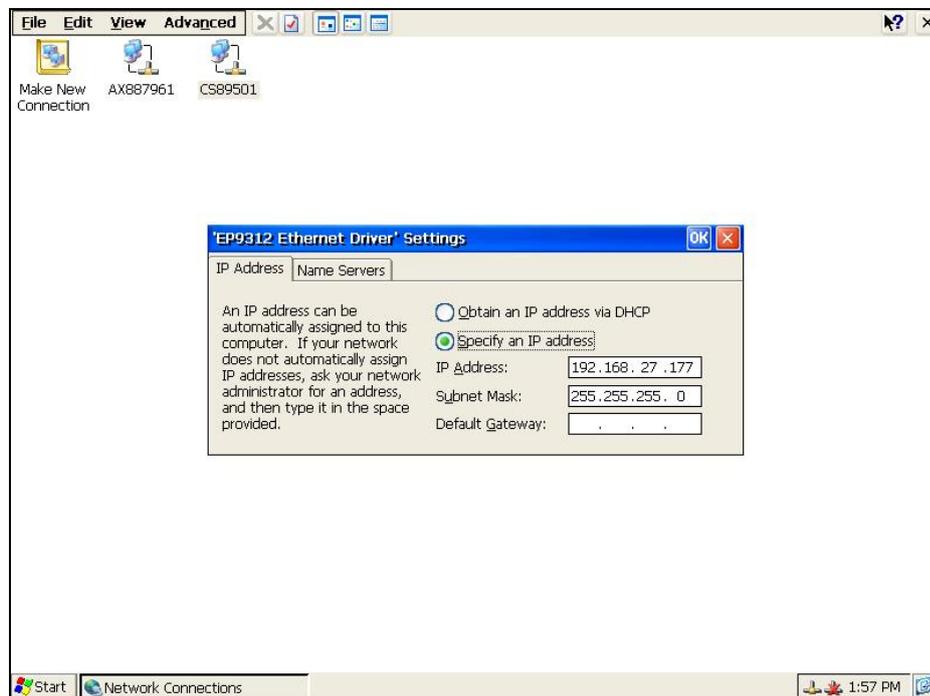
There are two methods to change the network settings of the IA260: Use the network settings function of the OS, or use the Serial Console connection.

Use the following procedure to change your network settings.

1. Go to [Start] → [Settings] → [Network and Dial-Up Connections].



- Right click the LAN icon and the click **Property**.



- Click **OK**.

Another method to change the network setting is via Serial Console. Refer to “Operating the IA260-CE Computer via Serial Console”, and connect the IA260. Type **netconfig -h** to get help on this utility.

```

COM7,115200,None,8,1,ANSI

[IA260CE] \>netconfig -h
netconfig V1.0
Usage: netconfig -n <AdapterName | Alias> [-EnableDHCP] [-i <IP address>] [-m <
e.g.: netconfig -n IXP425ETHNPE1 -i 192.168.10.101 -g 192.168.10.254
      : netconfig -n CS89501 -i 192.168.12.101 -m 255.255.0.0
      : netconfig -n PCI\RTL81391 -EnableDHCP

Alias:
      LAN1=CS89501
      LAN2=AX887961
[IA260CE] \>
State:OPEN
CTS DSR RI BCO
  
```

To illustrate how to match the settings to your application, let's assume that your development workstation has a LAN port at 192.168.1.5, and the Domain Name Server (DNS) is at 192.168.2.6. In this case, you should issue the following command:

```
\> netconfig -n LAN1 -i 192.168.1.5 -m 255.255.255.0 -g 192.168.1.254 -d 192.168.2.6
```

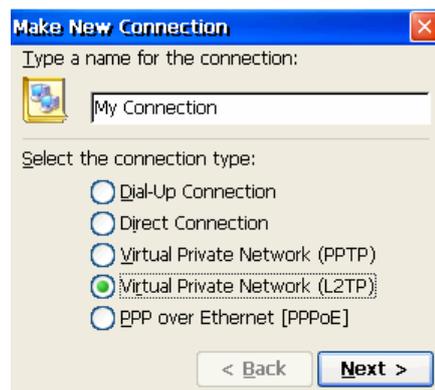
Use netconfig command without parameters to view the new settings:

```
\> netconfig
LAN1 Interface Configuration:
IP Address: 192.168.1.5
SubNet Mask: 255.255.255.0
Gateway: 192.168.1.254
DNS: 192.168.2.6
LAN2 Interface Configuration:
IP Address: 192.168.4.127
SubNet Mask: 255.255.255.0
Gateway:
DNS:
```

Virtual Private Network (VPN)

Windows Embedded CE supports Virtual Private Networks (VPNs). The VPN support in Windows Embedded CE includes Layer Two Tunneling Protocol (L2TP), IP Security Protocol (IPSec), and Point-to-Point Tunneling Protocol (PPTP). L2TP/IPSec enables enhanced security for Virtual Private Network (VPN) client connections from Windows Embedded CE-based devices to corporate servers. PPTP is a Network protocol that adds a security infrastructure for the transfer of data from a remote client to a private enterprise server, which creates a VPN by using TCP/IP-based data networks.

Currently, this function is supported only by the IA260-CE. For VPN questions concerning the IA261-CE and IA262-CE, please contact Moxa's Technical Support team.



Operating the IA260-CE Computer via Telnet

Before operating your IA260-CE computer using a Telnet client, we suggest that you change the network settings of the computer (see an earlier section) so that at least one of the two network ports is on the same LAN as your development workstation.

Use a cross-over Ethernet cable to connect your development workstation directly to the target computer, or a straight-through Ethernet cable to connect the computer to a LAN hub or switch. Next, use the Telnet client on your development workstation to connect to the Telnet console utility of the target computer. Once a connection is established, type the login name and password as requested to log on to the computer.

After logging in via the console port or a Telnet client, several busybox commands are available to operate the computer. Use **HELP** to display all of the commands, or type **HELP [command name]** to display extended help for the selected command. Some of the commands, such as **DATE** and **TIME** are very useful for managing the computer's the system time. Other commands, such as **DIR** and **MKDIR** are good utilities for file management. For example, to inspect the file structure of the root directory, simply type **DIR**.

```
\> dir /b
NORFlash
My Documents
Program Files
Temp
Windows
```

User/Group Management

User Group—You should assign specific services, such as ftp and Telnet, to defined user groups so that these services are accessible only by the users within the permissible user group. Three user groups, namely **ftpd**, **telnetd**, and **httpd**, are created by default for your convenience.

Adding a Group—Use the command **useradd -g <groupName>** to create a user group.

```
\> useradd -g yyyy
group yyyy has been added.
```

Deleting a Group—To remove a group, use the command **userdel -g <groupName>**.

```
\> userdel -g yyyy
group yyyy has been removed.
```

Adding a User—Use the command **useradd <newUserID>** to add a user for accessing the system. The user's password, by default, is the same as the user name.

```
\> useradd xxxx
user xxxx has been added.
```

In addition, you can permit this user to access a particular service by typing **-g** followed by the user group name of the service, i.e., **useradd -g <groupName> <newUserID>**. For example,

```
\> useradd -g telnetd xxxx
user xxxx is existent
group telnetd is existent
user xxxx has been added to group yyyy
```

Deleting a User—Use the command **userdel <userID>** to delete a user from the system. User "admin" CANNOT be deleted.

```
\> userdel xxxx
user xxxx has been deleted
```

You can also just remove a user from a user group by using the command *userdel -g <groupName> <newUserID>*. For example,

```
\> userdel -g yyyy xxxx
user xxxx has been removed from group yyyy
```

Changing the Password—Please use “System Manager” to change the Password.

Adjusting the Time Zone

Windows CE 6.0 supports Time Zone. You can use [Control Panel]→[Date/Time] to adjunct your current Time Zone. It also supports **Daylight Date** and **Daylight Time**.

Adjusting the System Time

Setting the System Time Manually—Use the *date* and *time* commands to query the current system date and time or to set a new system date and time.

```
\> date
The current date is: Tuesday, November 22, 2005
Enter the new date (mm-dd-[yy]yy): 12-23-05
```

```
\> date /T
Wednesday, November 23, 2005
```

```
\> time
The current time is: 5:27:17 PM
Enter the new time (hh:mm:ss): 16:02:00
```

```
\> time /T
4:02:04 PM
```

The Date/Time setting is saved to IA26X-CE RTC so that the date and time will not change when the system reboots.

Starting and Stopping Services

After booting up, the IA260-CE computer runs several services continuously to serve requests from users or other programs. Notable services include telnet (“TEL0:”), console (“CON0:”), world wide web HTTP (“HTP0:”), file transfer FTP (“FTP0:”), and others. You will seldom need to use these services. However, note that you can start or stop a service with its associated name by using the “services” command. For example,

Start the FTP service by typing:

```
\> services start FTP0:
```

Stop the FTP service by typing

```
\> services stop FTP0:
```

The default services for the IA260-CE are listed as below:

TEL0: Telnet Service

FTP0: FTP Service

CON0: Console Service

Troubleshooting Network Connectivity

The ipconfig tool prints the TCP/IP-related configuration data of a host, including the IP addresses, gateway, and DNS servers.

```
\> ipconfig /all
Windows IP configuration
Ethernet adapter Local Area Connection:
IP Address: 192.168.4.127
Subnet Mask: 255.255.255.0
Adapter Name: IXP425ETHNPE2
Description: IXP425ETHNPE2
Adapter Index: 2
Address: 80 86 33 33 34 12
DHCP Enabled: NO
Ethernet adapter Local Area Connection:
IP Address: 192.168.14.202
Subnet Mask: 255.255.248.0
Default Gateway: 192.168.15.254
Adapter Name: IXP425ETHNPE1
Description: IXP425ETHNPE1
Adapter Index: 3
Address: 78 56 34 91 cc dd
DHCP Enabled: NO
```

```
Host name: IA261
Domain Name:
DNS Servers: 192.168.1.6
NODETYPE: 8
Routing Enabled: NO
Proxy Enabled: NO
```

Use the ping command to troubleshoot network connectivity, reachability, and name resolution. The command verifies IP-level connectivity to another TCP/IP computer by sending Internet Control Message Protocol (ICMP) Echo Request messages. The corresponding return Echo Reply messages are displayed, along with round-trip times. For more information, type ping without parameters.

```
\> ping www.moxa.com
Pinging Host www.moxa.com [192.168.1.16]
Reply from 192.168.1.16: Echo size=32 time<1ms TTL=126
Reply from 192.168.1.16: Echo size=32 time<1ms TTL=126
Reply from 192.168.1.16: Echo size=32 time<1ms TTL=126
```

The **route** utility allows you to view or modify network routing tables. Type this command without parameters to view a list of functions.

```
\> route
```

To view current routing items in the tables, type

```
\> route PRINT
```

To add a routing item on network interface 1, type

```
\> route ADD 192.168.0.0 MASK 255.255.0.0 192.168.15.254 IF 2
```

To delete a routing item, type

```
\> route DELETE 192.168.0.0
```

Simple Network Management Protocol (SNMP)

SNMP is the Internet Standard protocol for network management, and is part of the TCP/IP protocol suite. SNMP was developed to monitor and manage networks. It uses a distributed architecture that consists of agents and managers:

SNMP Agent

The SNMP agent is an SNMP application that monitors network traffic and responds to queries from SNMP manager applications. The agent also notifies the manager by sending a trap when significant events occur.

SNMP Manager

An SNMP manager is an SNMP application that generates queries to SNMP-agent applications and receives traps from SNMP-agent applications.

The IA260-CE computer installs an SNMP agent to serve as an SNMP device. You should install the SNMP manager on the workstation computer (for example, a Linux system) that monitors the network. After installing the nodes, you need to configure the SNMP manager and agent.

To check SNMP agent capabilities on a target IA260-CE (e.g, network IP at 192.168.3.127) computer, log on to the workstation computer that the SNMP manager resides on and then type:

```
\> snmpwalk -v 2c -c public 192.168.3.127 system
SNMPv2-MIB::sysDescr.0 Microsoft Windows CE Version 6.0 (Build 1400)
SNMPv2-MIB::sysObjectID.0 SNMPv2-SMI::enterprises.8691.13.7420
SNMPv2-MIB::sysUptime.0 1282929
SNMPv2-MIB::sysContact.0 Your System Contact Here
SNMPv2-MIB::sysName.0 WindowsCE
```

You will see a series of messages from the SNMP agent on the IA260-CE computer. From there, you can monitor and manage the computer.

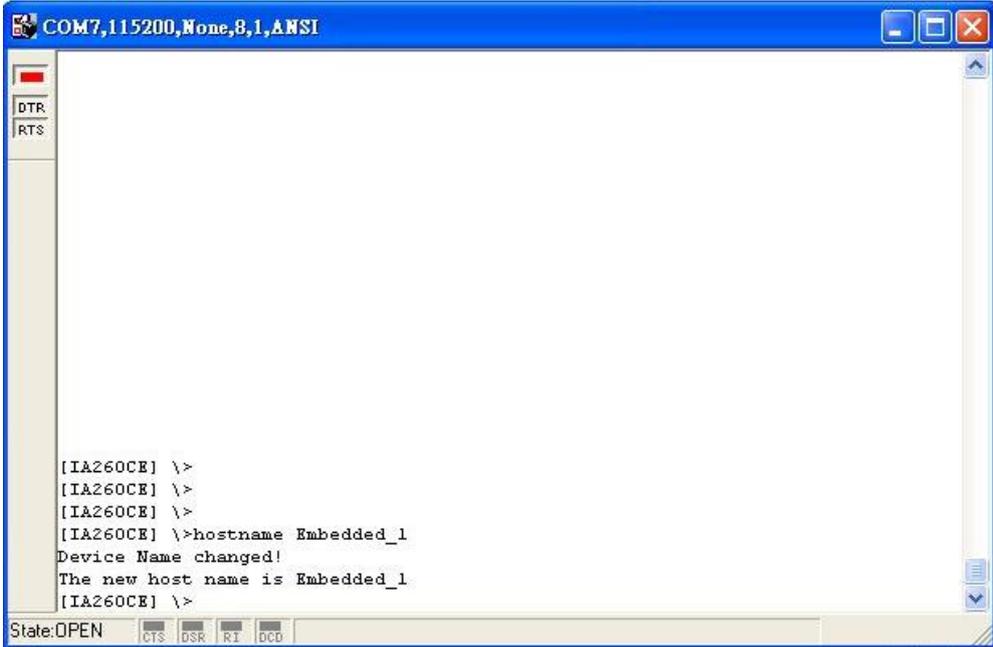
Accessing Files through File Sharing

The IA260-CE offers file sharing function so that remote computer can access the IA260-CE to read the files. Follow the next steps to enable file sharing.

1. To enable file sharing function, you need to rename the hostname of the IA260-CE to avoid hostname collision on the network.

In the Serial Console screen, enter the following command:

```
\>hostname Embedded_1
```

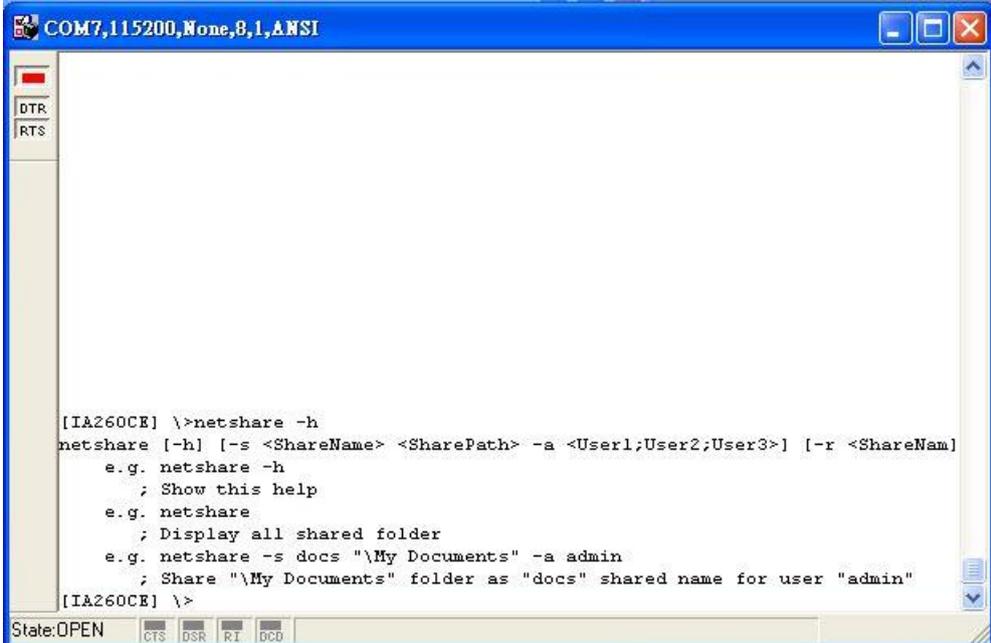
A screenshot of a serial console window titled "COM7,115200,None,8,1,ANSI". The window shows a command prompt interface with the following text:

```
[IA260CE] \>  
[IA260CE] \>  
[IA260CE] \>  
[IA260CE] \>hostname Embedded_1  
Device Name changed!  
The new host name is Embedded_1  
[IA260CE] \>
```

The window also features a status bar at the bottom with "State:OPEN" and several control buttons (CTS, DSR, RI, DCD).

Now you have successfully changed the hostname to Embedded_1. You may use other hostname as you wish.

- Configure the files you would like to share in the IA260-CE. Use `\>netshare -h` to configure the parameters. See the following figure.



```
[IA260CE] \>netshare -h
netshare [-h] [-s <ShareName> <SharePath> -a <User1;User2;User3>] [-r <ShareNam
e.g. netshare -h
; Show this help
e.g. netshare
; Display all shared folder
e.g. netshare -s docs "\My Documents" -a admin
; Share "\My Documents" folder as "docs" shared name for user "admin"
[IA260CE] \>
```

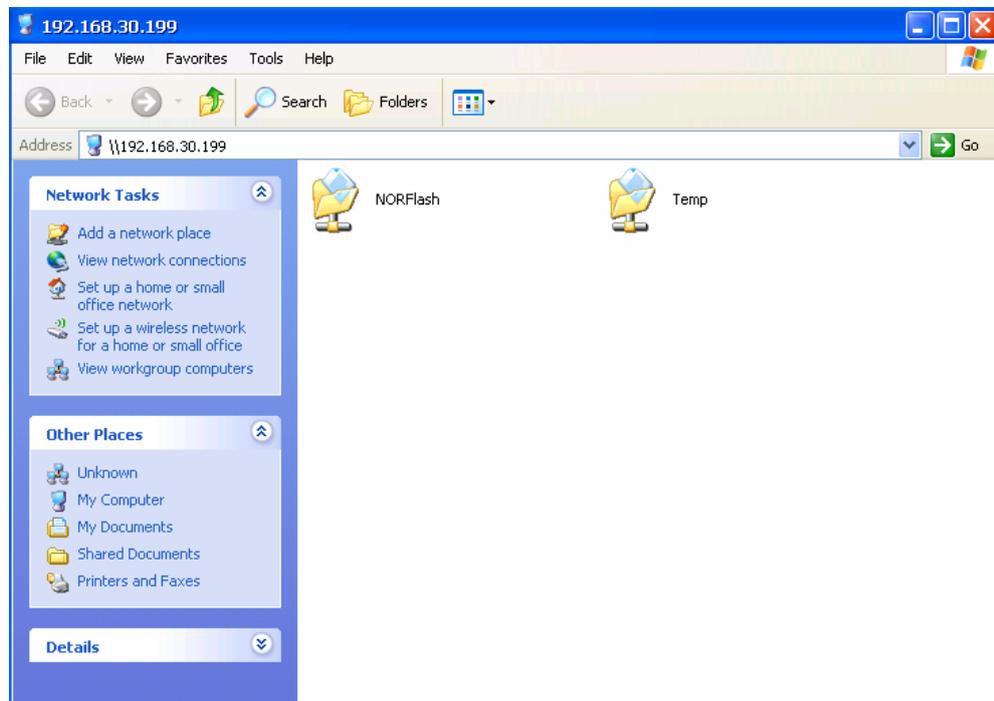
- When finished, you may access the IA260-CE from the remote computer.

To use the function, click **Start** → **Run** and then input the device IP (e.g., \\192.168.30.199). The following login window will appear.



Enter Username and Password to access the IA260-CE.

4. When you have successfully logged in the IA260-CE, you can view the files in the sharing folders of the IA260-CE.

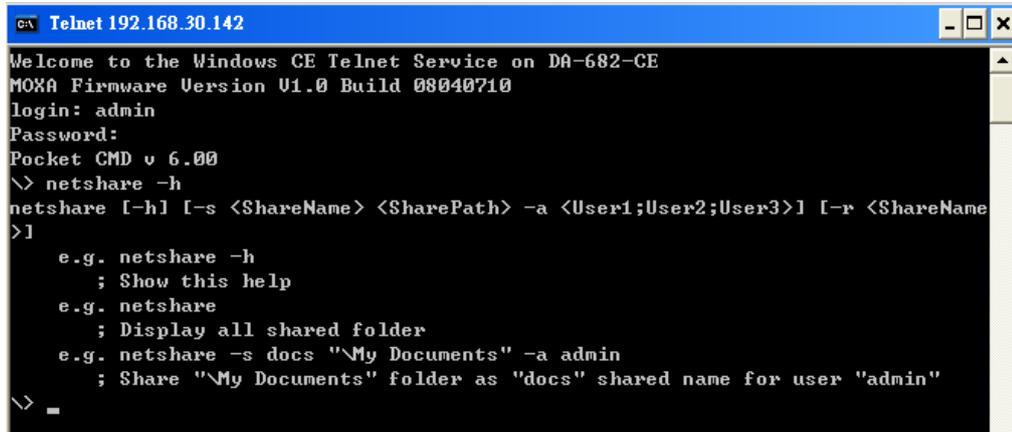


A file server function is available for transferring files to the IA-260-CE efficiently. To use the function, click **Start** → **Run** and then input the device IP (e.g., \\192.168.100.1). The following login window will appear.



After logging in, you can view the sharing files on the remote computer.

From any command window (telnet or console), type the “netshare -h” command to display the following command syntax:

A screenshot of a Telnet window titled "Telnet 192.168.30.142". The window shows a Windows CE Telnet service prompt. The user has logged in as 'admin' and is at the 'Pocket CMD v 6.00' prompt. They have entered the command 'netshare -h', which displays the following help text:

```
netshare [-h] [-s <ShareName> <SharePath> -a <User1;User2;User3>] [-r <ShareName>]
>]
    e.g. netshare -h
        ; Show this help
    e.g. netshare
        ; Display all shared folder
    e.g. netshare -s docs "\\My Documents" -a admin
        ; Share "\\My Documents" folder as "docs" shared name for user "admin"
>
```

Configuring the FIFO

You can enable or disable the FIFO with the utility's “setfifo” command. For example, type “setfifo COM1: 0” to disable the FIFO of COM1, or type “setfifo COM1: 1” to enable the FIFO of COM1. Note that you can check the FIFO status by typing “setfifo”.

```
\>setfifo COM1: 0
Set FIFO success
> setfifo
COM1: FIFO = Disabled
COM2: FIFO = Enabled
COM3: FIFO = Enabled
COM4: FIFO = Enabled
```

The IA260-CE ready-to-run embedded computers are network-centric platforms designed to serve as front-ends for data acquisition and industrial control applications. Due to the distributed characteristics of the devices that these computers control, they are often located in remote locations separate from the system administrator. Managing this kind of remote computer requires handling configuration, file management, and process (thread) monitoring/control over the network.

The IA260-CE computer comes with a pre-installed management system to assist administrators. Before using the system, make sure that a CRT or LCD monitor is connected to your IA260-CE embedded computer, and then double-click the desktop icon [System Manager].

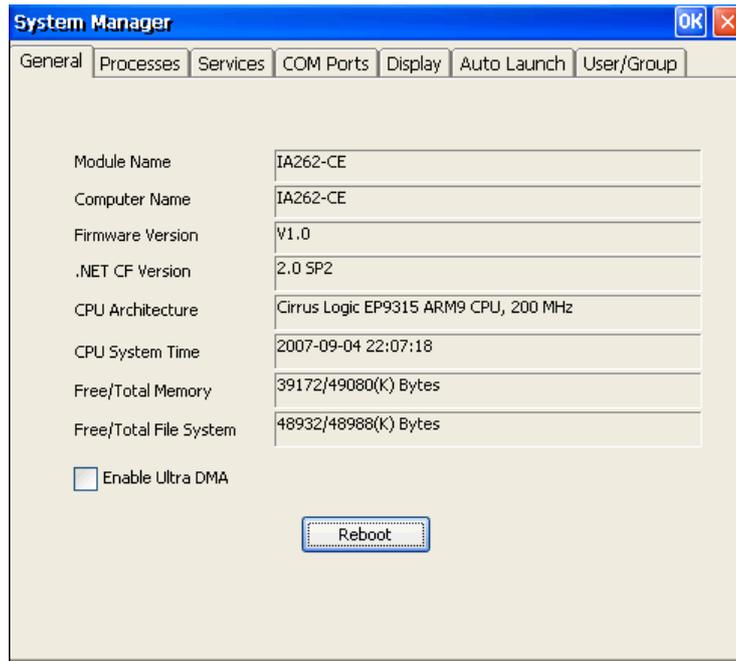
The following topics are covered in this chapter:

- System Information**
- Serial Port Configuration**
- Process (Thread) Monitoring/Control**
- Services Monitoring/Control**
- Display**
- User/Group Management**
- Auto Launch Configuration**
- Web Server Configuration**

System Information

The first page displays the system information of the IA260-CE computer, including the firmware version of the computer, .Net CF version, the system time, and system resources, including main memory and file system usage.

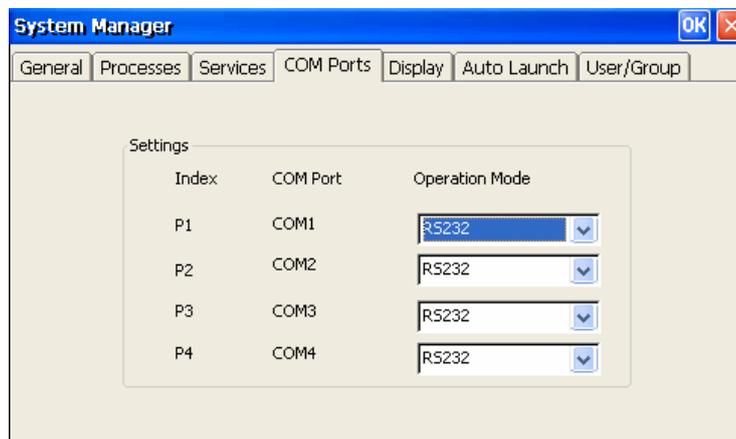
On the **General** tab, click the **Enable Ultra DMA** check box to enable or disable Ultra DMA for the CF card. If the system cannot detect some CF cards, then you should uncheck this box. After changing this setting, you will need to reboot the system for the new setting to take effect.



Serial Port Configuration

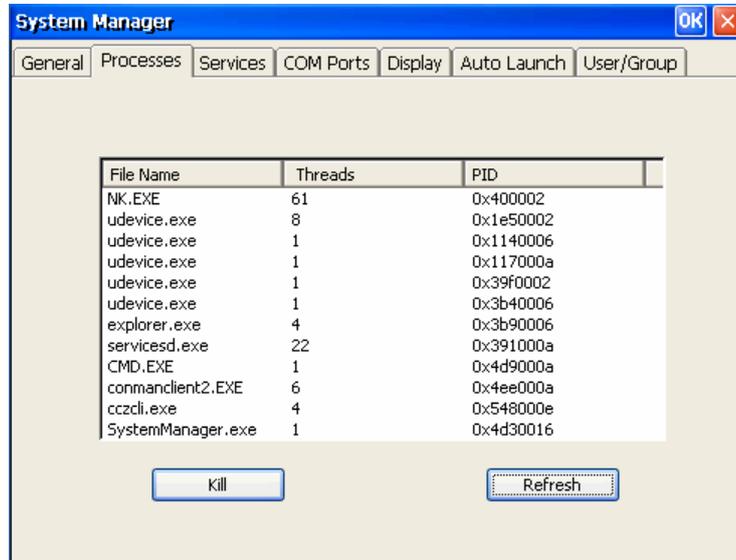
The IA260-CE has 4 high-performance serial ports. When the system starts, specify the default operation mode (RS-232, RS-422, or RS-485). The factory default mode is RS-232.

Click the **COM Ports** tab to see the status of the 4 ports.



Process (Thread) Monitoring/Control

While running, the IA260-CE computer manages up to 32,000 applications. To view processes that are currently running, click the **Processes** tab. To kill a process, click the **kill** button next to the process name.



Services Monitoring/Control

Some services, such as FTP, Telnet and HTTP, run in the background to provide service for user requests.

Click the appropriate check box to enable or disable operation of a particular service.

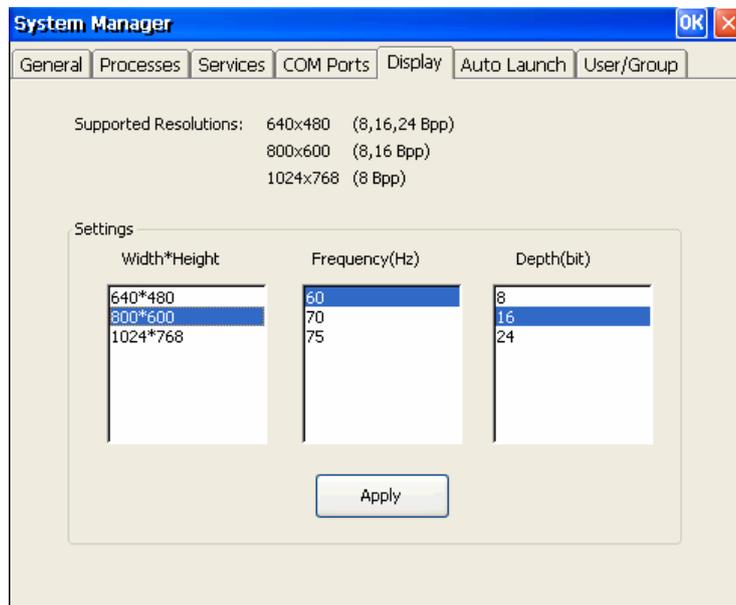


You can also use SNTP to adjust the time automatically. To do this, check mark the **Enable** check box under SNTP, and then click **Save Settings**.

To maintain normal operation of the computer, some listed services cannot be stopped. Such services do not have a check box next to them.

Display

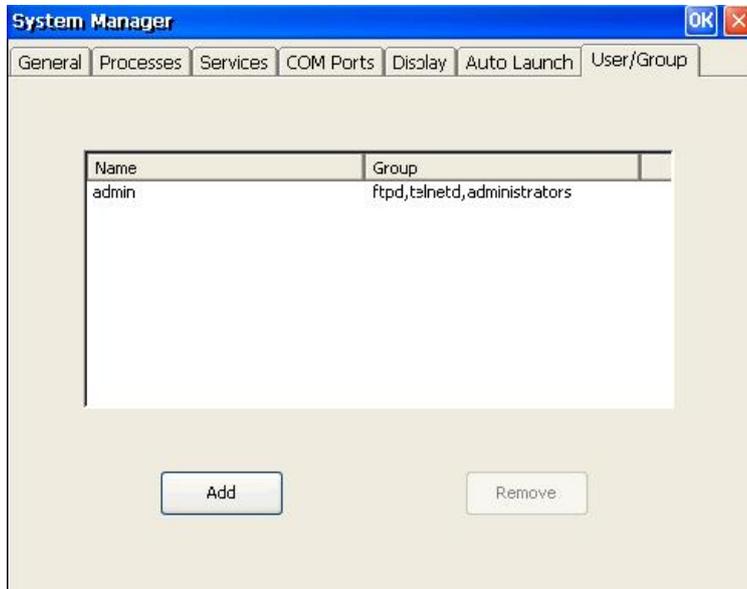
The IA260-CE's VGA output uses a DB15 female CRT connector to display the Windows CE desktop on an LCD monitor or a CRT monitor. The default settings, which are shown on the **Display** tab, are **800*600** for Width*Height, **60** (in Hz) for Frequency, and **16** (bits) for Depth. For general use, adjust the settings to match the specifications of your LCD or CRT. Click **Apply** to save the setting.



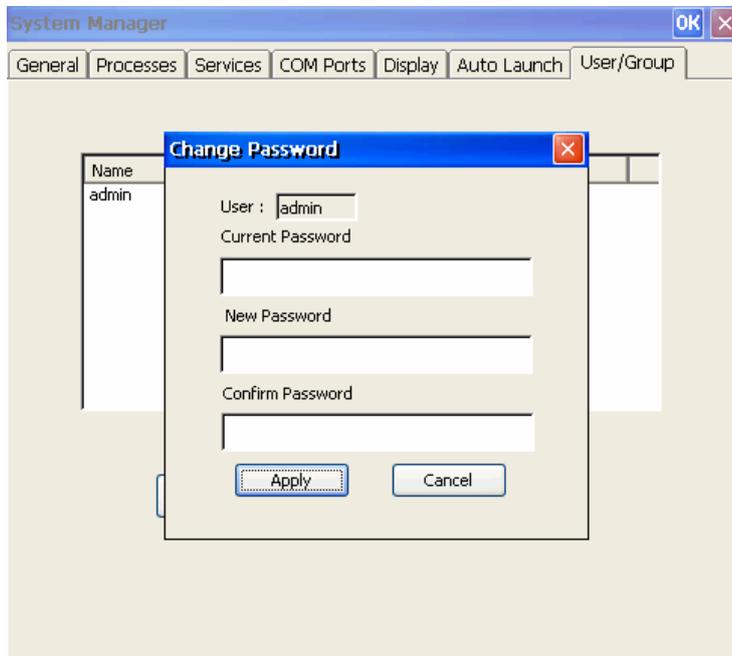
Note: You must reboot your IA260-CE for new settings to take effect.

User/Group Management

Use the **Add** button on the **User/Group** tab to assign specific services (such as ftp and telnet) to individual users and user groups. Use the **Remove** button to remove users.

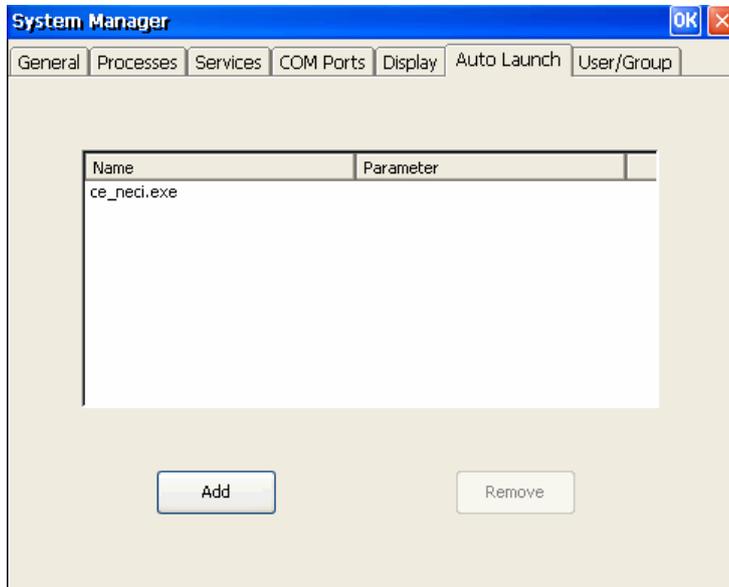


Use the **Change Password** utility to change the password.



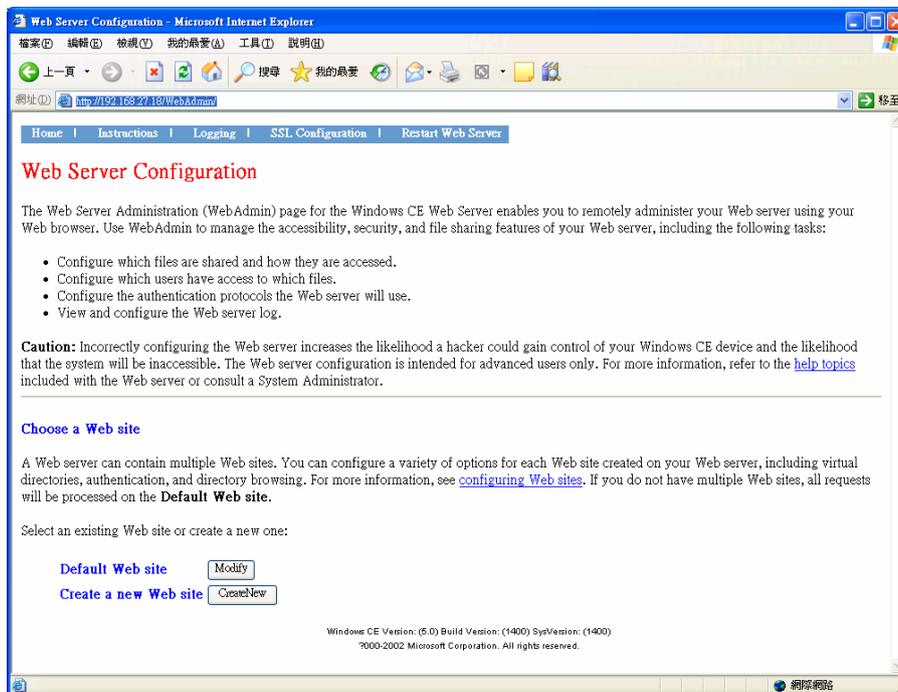
Auto Launch Configuration

Use the **Auto Launch** tab to specify which programs will execute automatically on boot up. Click the **Add** button to add programs to the list, and then restart the IA260-CE.

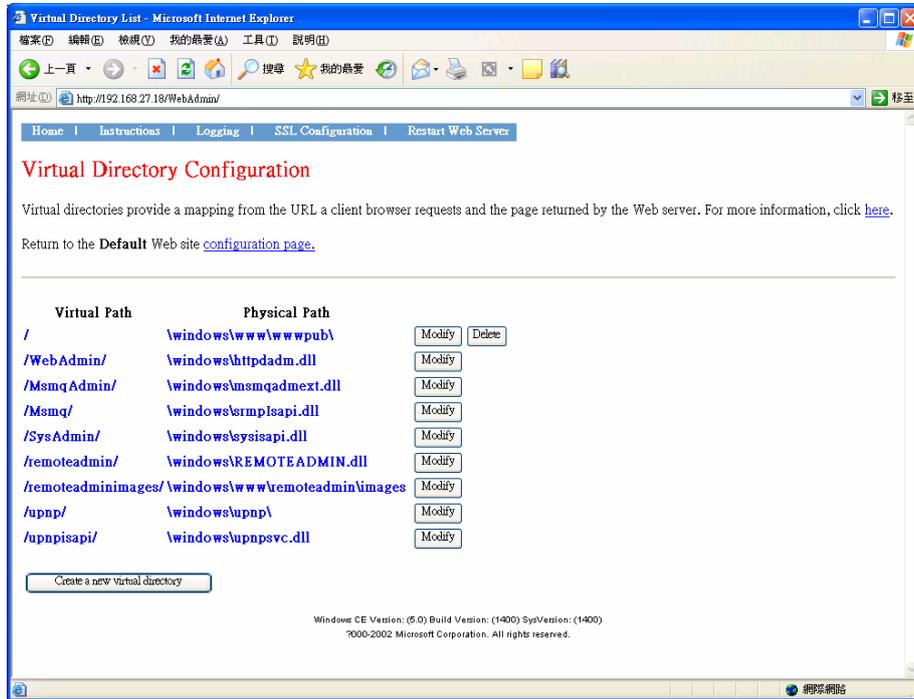


Web Server Configuration

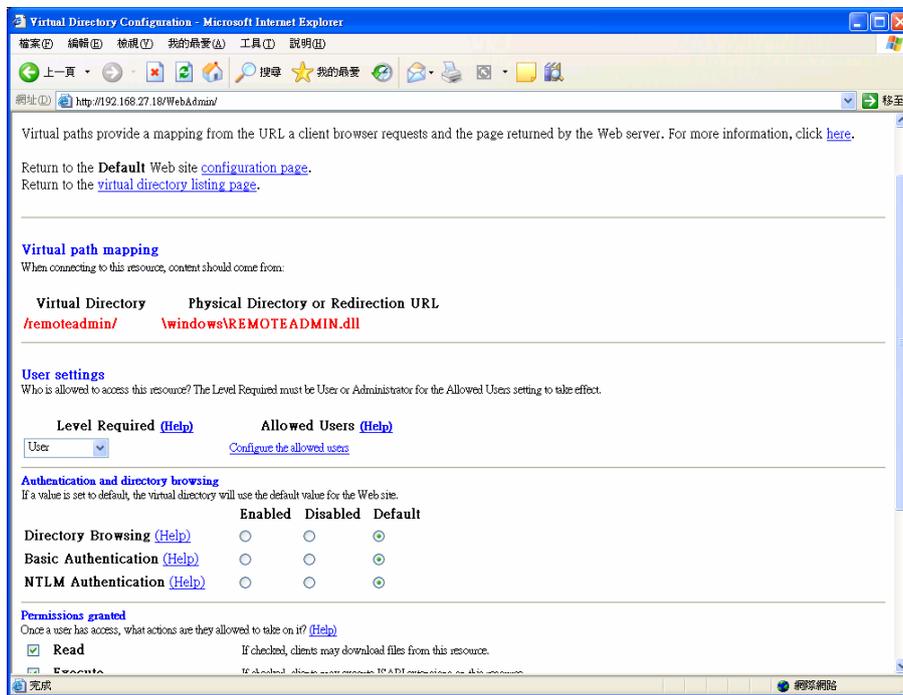
You will need to use a Windows 2000 or Windows XP machine for web administration. Open Internet Explorer and then type the URL <http://192.168.3.127/WebAdmin> (replace the IP with your IA260-CE's network IP address) to link to the **Web Server Configuration** page.



You can now create a new web site or create a virtual web path for your web application.



You can also change the authentication for each web virtual directory.



A

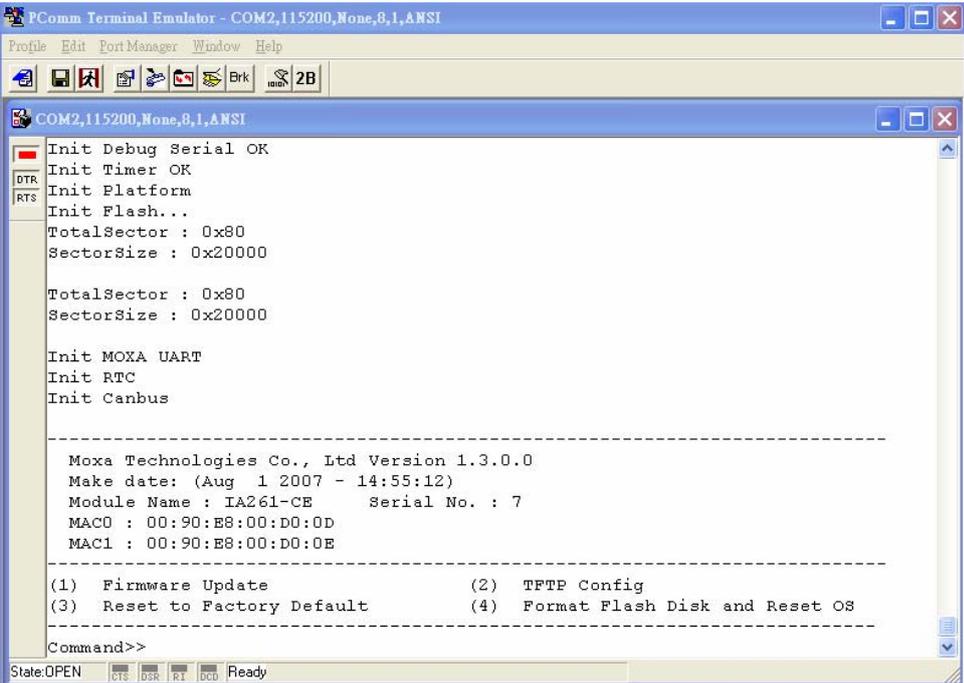
Firmware Upgrade Procedure

To upgrade the IA260-CE firmware, you must download the firmware upgrade installation file located on the software CD. The latest firmware version can be downloaded from the Moxa Download Center at http://www.moxa.com/support/resource_category.aspx

Use the following steps to upgrade the firmware. Before you start, make sure your PC has the TFTP server software installed correctly.

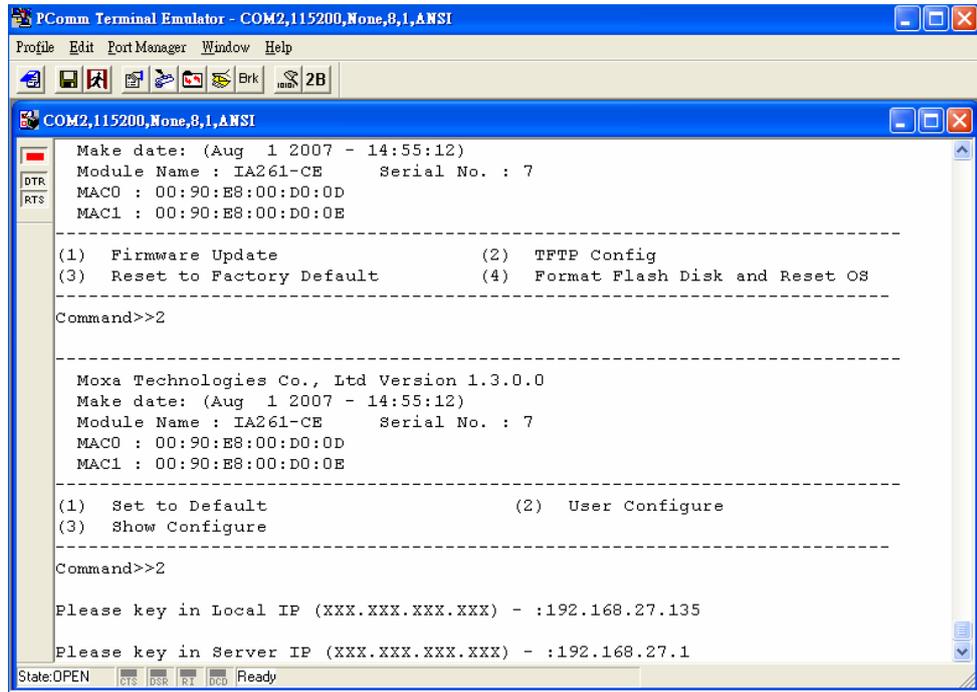
1. Locate the firmware file (e.g., IA260CE_V1.0_07091112.hfm).
2. Go to the Boot Loader menu first (see chapter 2 section 4 for instructions).

Select option **(2) TFTP Config**.

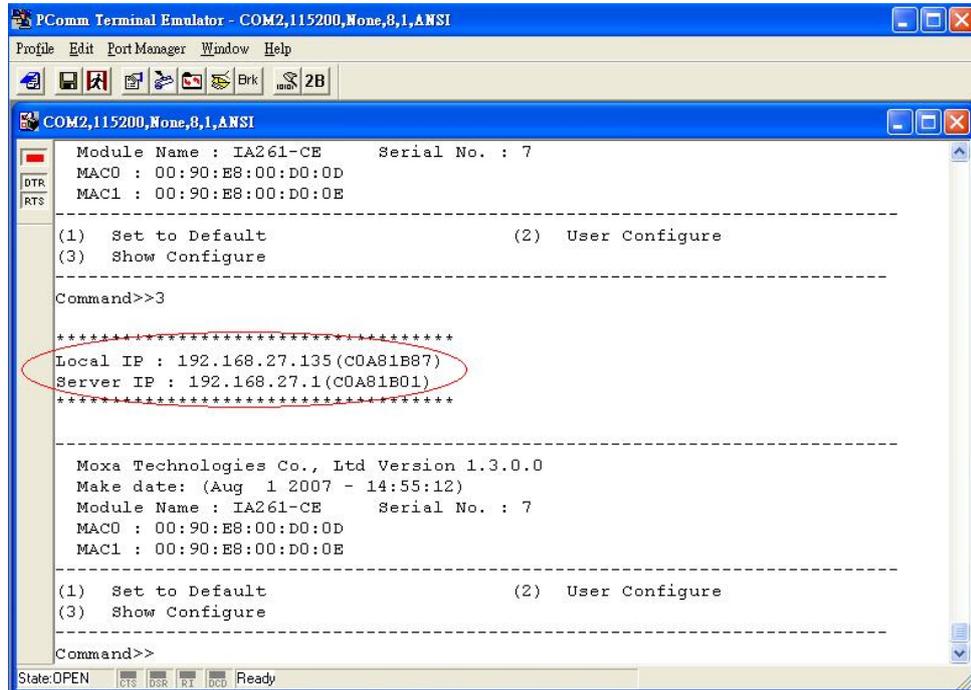


```
PComm Terminal Emulator - COM2,115200,None,8,1,ANSI
Profile Edit Port Manager Window Help
COM2,115200,None,8,1,ANSI
Init Debug Serial OK
Init Timer OK
Init Platform
Init Flash...
TotalSector : 0x80
SectorSize : 0x20000
TotalSector : 0x80
SectorSize : 0x20000
Init MOXA UART
Init RTC
Init Canbus
-----
Moxa Technologies Co., Ltd Version 1.3.0.0
Make date: (Aug 1 2007 - 14:55:12)
Module Name : IA261-CE Serial No. : 7
MAC0 : 00:90:E8:00:D0:0D
MAC1 : 00:90:E8:00:D0:0E
-----
(1) Firmware Update (2) TFTP Config
(3) Reset to Factory Default (4) Format Flash Disk and Reset OS
-----
Command>>
```

Select option **(2) User Configure** and then input the local IP address for the IA260-CE and server IP address (i.e., the TFTP host IP Address)

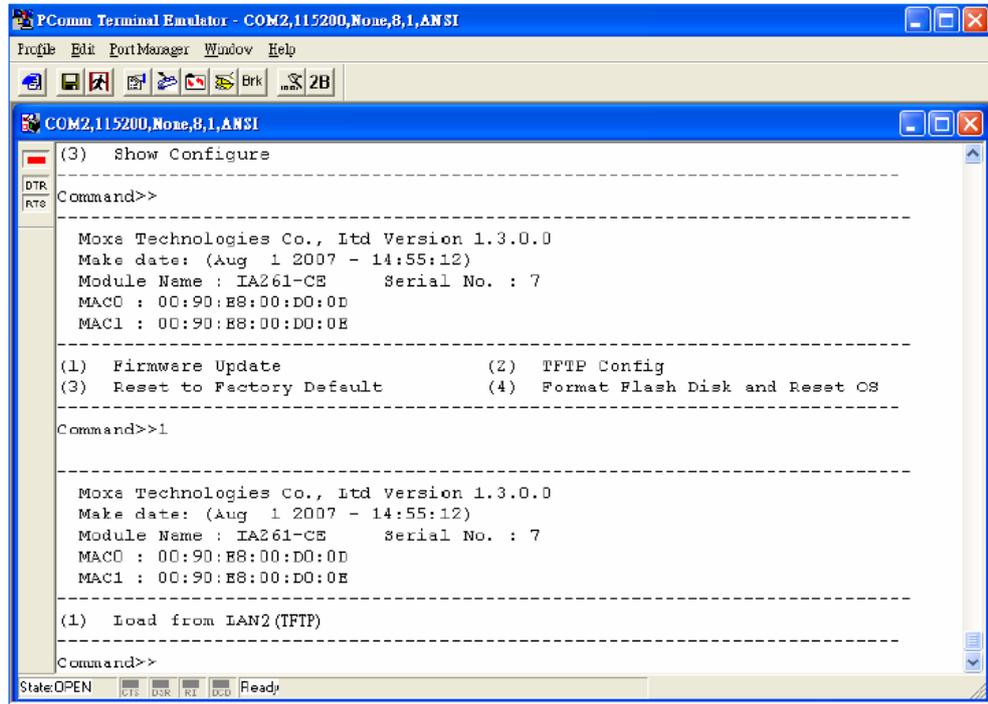


Select (3) Show Configure to check the local IP and server IP.



After confirming the IP configuration, press ESC to return to the main menu.

3. Select (1) Firmware Update.



Select (1) **Load from LAN2** and then input the firmware file name (e.g., IA260CE_V1.0_0704210.hfm) and press **Enter**.

