V2401/2402 Series
WinXP Embedded User's Manual

First Edition, February 2010

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WinXP Embedded User's Manual

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Introduction

Thank you for purchasing the Moxa's V2401/2402 series of x86 ready-to-run embedded computers. This manual introduces the software configuration and management of V2401/2402 computers running the Windows Embedded Standard 2009 operating system. For hardware installation, connector interfaces, setup procedures, and upgrading the BIOS, please refer to the V2401/2402 Series Hardware User's Manual.

Microsoft Windows Embedded Standard 2009 is a specialized operating system consisting of componentized Windows XP Professional features that allows you to build a wide range of innovative, small footprint devices. Windows developers will find Moxa's V2401/2402 computer plus Windows Embedded Standard 2009 operating system to be the right solution for a wide range of applications.

In this chapter, we cover the following topics:

❑ **Overview**
❑ **Software Specifications**
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  ➢ Networking and Communication Capabilities
  ➢ Supporting Services and Daemons
❑ **How to Determine Firmware Build Versions**
❑ **Inserting a USB Mass Storage Device into the Computer**
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❑ **Inserting a SATA Hard disk into a** V2400 Computer
  ➢ Four RS-232/422/485 Serial Ports
  ➢ Digital Input/Output Channels
❑ **Eight RS-232 Serial Ports (V2401 only)**

Overview

The V2401 and V2402 come with four RS-232/422/485 serial ports, and the V2401 has an additional eight RS-232 ports, making them ideal for connecting a wide range of serial devices. The dual 10/100/1000 Mbps Ethernet ports offer a reliable solution for network redundancy, delivering continuous operations for data communication and management. As an added convenience, the V2401/2402 computers have four DIs, and four DOs for connecting digital input/output devices.

In addition, the CompactFlash and USB sockets provide the V2400 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

Pre-installed with Windows Embedded Standard 2009, the V2401/2402 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.

Software Specifications

The software features of the V2401/2402-XPE embedded computers are listed below:

Application Development Environment

The V2401/2402-XPE is fully compatible with the XP Professional Development Environment.

The V2401/2402-XPE's use of Windows Embedded Standard 2009 with SP3 provides the following common, popular application development features that make programming convenient and easy.

Every application that runs in Windows XP can be executed in the V2401/2402-XPE, so there is no migration cost.

Windows Embedded Standard 2009 is based on the same binary files as Windows XP Professional; Windows Embedded Standard 2009 enables you to rapidly develop reliable and full-featured connected devices.

- **Microsoft .Net Framework 3.5**—This component includes the common language runtime (CLR) and the .NET Framework class library.
- **Active Directory Service Interface (ADSI) Core**—Provides the basic functionality for ADSI. This component routes any requests to the corresponding provider according to the path it is provided.
- **Active Template Library (ATL)** —Supports ATL applications.
- **ASP.NET 2.0**—A unified Web application platform that provides the services necessary to build and deploy enterprise-class Web applications.
- **Certificate Request Client & Certificate Auto enrollment**—This component includes the common language runtime (CLR) and the .NET Framework class library.
- **COM Base**—Component Object Model (COM) includes a programming model and a set of application programming interfaces (APIs), and does not include a dedicated user interface.
- **Common Control Libraries**—(Side by Side) the component provides common user interface (UI) controls.
- **Common File Dialogs**—Support for common dialog boxes.
- **Direct3D**—The infrastructure for two-dimensional and three-dimensional graphics.
- **DirectPlay**—Provides a networking API that can enable any application to operate over both a peer-to-peer and client/server topology.

- **DirectShow**—Base filter graph and device enumeration support for all DirectShow applications. This component also provides most DirectShow filters.

- **Distributed Transaction Coordinator (MSDTC)** —A distributed transaction facility for Microsoft Windows systems, which uses transaction-processing technology. MSDTC exploits loosely coupled systems to provide scalable performance.

- **Enhanced Write Filter**—An upper filter in the storage device driver stack that redirects disk write operations to volatile (RAM) or non-volatile (disk) storage.

- **Event Log**—A dynamic-link library (DLL) that runs as part of Services.exe. This component stores and retrieves events that can be viewed in the event viewer.

- **Internet Explorer 7**—The Internet Explorer Web browser that allows customers to connect to the Internet or to an intranet (see properties via inetcpl.cpl).

- **Mapi32 Libraries**—The infrastructure for e-mail support.

- **Message Queuing (MSMQ) Core**—Message Queuing is a messaging infrastructure and a development tool for creating distributed messaging applications for Microsoft Windows operating systems; it provides guaranteed message delivery, efficient routing, increased security, support for sending messages within transactions, and priority-based messaging.

- **Microsoft Visual C++ Run Time Libraries**—The Microsoft C++ Runtime Library.

- **NTFS**—The NTFS File System driver (NT File System). Use NTFS instead of FAT for optimum file system security.

- **Power Management**—This component includes a dynamic-link library for power management features in the xpepm.dll file, and a command-line tool for using power management on a run-time image in the xpepm.exe file. **Note:** Instead of using this component, Shutdown.exe is the preferred method to shut down the system.

- **Registry Editor**—The Registry Editor (regedit.exe, regedt32.exe).

- **RPC**—Facilitates local remote procedure calls (RPCs) using the ncalrpc and ncacn_np protocol sequences, and provides support for dynamic endpoint resolution. The RPC name service provides remote procedure call (RPC) named services functionality, such as the RPC Locator. The RPC Named Service component exposes all RpcNs* RPC functions. The RPC server provides a variety of RPC and Component Object Model (COM) services, including RPC Endpoint Mapper, COM Service Control Manager (SCM) and COM Object Resolver.

- **Smart Card Cryptographic Service Providers**—Supports features such as smart card logon and improved e-mail security. Smart cards must be capable of certain RSA public key cryptographic operations. These functions are exposed by using CryptoAPI and, specifically, through a CSP. Typically, each type of smart card requires a CSP, which is provided by the card vendor.

- **USB 2.0**—The core drivers needed to communicate with an Enhanced Host Controller Interface (EHCI) that is compliant with USB .95 or 1.0.

- **Windows API—User**—Provides the user-mode component of the Windows operating system API.

- **Windows Media Player 11**—Playback functionality for digital media that includes videos, CDs, and DVDs for end users and developers.

- **Windows Script Engines**—A complete scripting environment for Windows, including command-line scripting, script languages, and the ability to host script engines within your applications.

- **WMI**—Bundles the features that combine to create the Windows Management Instrumentation (WMI) technologies.

Networking and Communication Capabilities

The V2401/2402-XPE embedded computers provide powerful hardware communication interfaces for network-centric embedded applications, including 2 Ethernet and 2 serial ports, and also support the networking and communications capabilities that are built into Windows Embedded Standard 2009 with SP3 OS. The following features are supported:

- **DHCP Client Service**—Registers and updates Internet Protocol (IP) addresses and Domain Name System (DNS) records for your target system.

- **IP Security Services**—This component provides IP Security (IPsec) services for all IP traffic.

- **Dial-Up Networking**—Provides the infrastructure necessary to implement a Remote Access Service (RAS) client.

- **Microsoft-Windows-HTTP**—Services that implement the functionality of the HTTP protocol on a server.

- **TCP/IP Networking**—Implements the core TCP/IP protocol stack, which includes the IPv4 version for the following protocols: Transmission Control Protocol (TCP), User Datagram Protocol (UDP), raw, Internet Control Message Protocol (ICMP), Internet Group Membership Protocol (IGMP), and Address Resolution Protocol (ARP). The component also includes Wshtcpip.dll, which is the Winsock provider for TCP/IP to enable socket-level communication over TCP/IP.

- **TAPI**—A Telephony API (TAPI) Telephony Service Provider (TSP).

- **Simple Network Management Protocol (SNMP)**—SNMP is an agent service that provides management systems with information about activities that occur at the Internet Protocol (IP) network layer. The SNMP agent monitors network traffic, and retrieves and updates local management information based on the requests from the SNMP manager. The agent also notifies registered managers with traps when significant events occur.

- **Time Service Core**—Synchronizes a workstation's clock with other computers using the Network Time Protocol (NTP) version 3. For increased accuracy, this component also incorporates algorithmic enhancements from NTP 4.

- **Windows Firewall/Internet Connection Sharing (ICS)**—Windows Firewall provides a barrier between your device and network connections to help reduce attacks by hackers, viruses, and worms across networks. Strongly recommended..

- **Wireless Zero Configuration**—Support for the Windows implementation of the IEEE 802.11 standard. This component performs automatic configuration and authentication for IEEE 802.11 wireless network adaptors.

- **Unimodem**—Provides the infrastructure necessary for applications to communicate with a modem.

Supporting Services and Daemons

In addition to development and communication capability, the V2401/2402-XPE embeds the services and daemons shown below. These common and easy-to-use application servers help users migrate industrial communication applications to the V2401/2402-XPE embedded computer very easily and conveniently.

- **COM+ Services**—The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

- **Computer Browser Service**—Computer browsing functionality exposed by Windows through Microsoft Networking. It allows a client machine to browse its network neighborhood for available computers, exposing file and print sharing services.

- **Disk Management Services**—Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes (both basic and dynamic). The component also monitors disk arrivals and removals and other changes in the storage subsystem.

- **IIS Web Server**—Allows you to create and manage Web sites.

- **Terminal Server**—Microsoft Terminal Server client application (mstsc.exe).

- **Remote Registry Service**—Enables remote users to modify registry settings on this computer.

- **Telnet Server**—Allows users to connect to Telnet servers from remote computers.

How to Determine Firmware Build Versions

Use the **mxver** command to obtain the firmware version of the V2401/2402-XPE embedded computer. This information is particularly important for identifying which features your embedded computer supports.

- Execute the **mxver.exe** command line utility.

   C:\> mxver
   Model Name: V2400-XPE
   **Build Date: 09110915**
   Version: V1.0

Inserting a USB Mass Storage Device into the Computer

Inserting a USB mass storage device will generate a new drive on the V2401/2402-XPE. The new drive should be visible in the File Explorer.
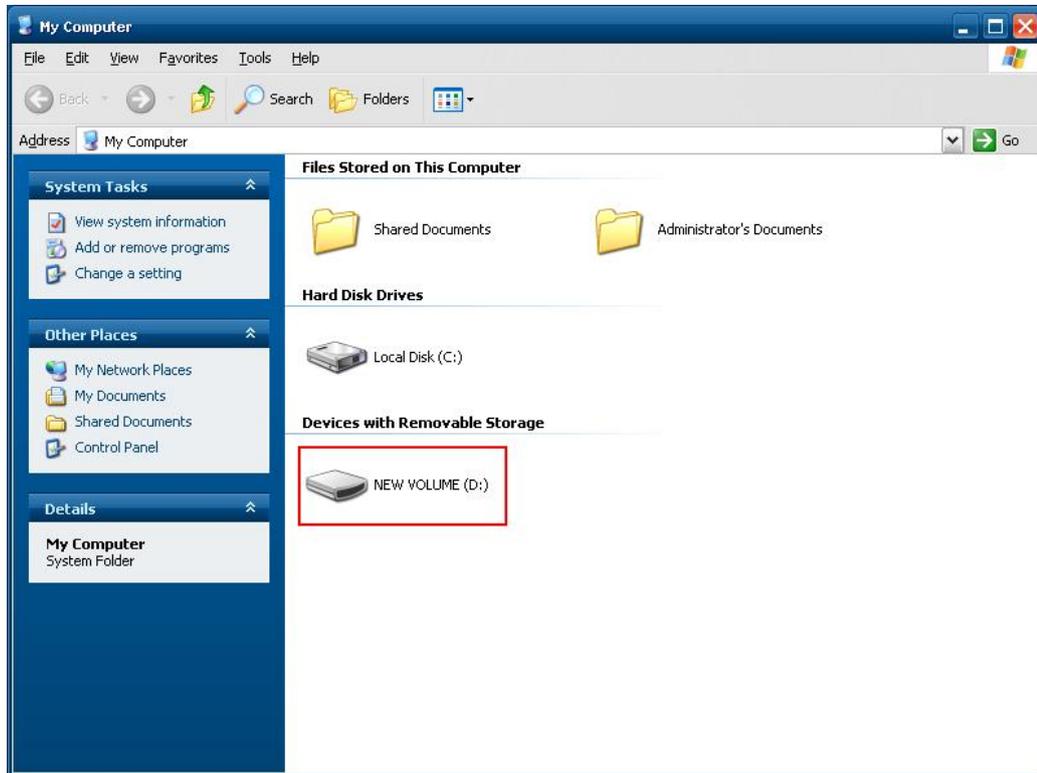
# Inserting an CF Card in the Computer

The V2401/2402-XPE computer is equipped with a CompactFlash slot for CompactFlash (CF) card storage expansion support. Please make sure to turn off the computer before inserting the CF card into the CF slot on the front panel.
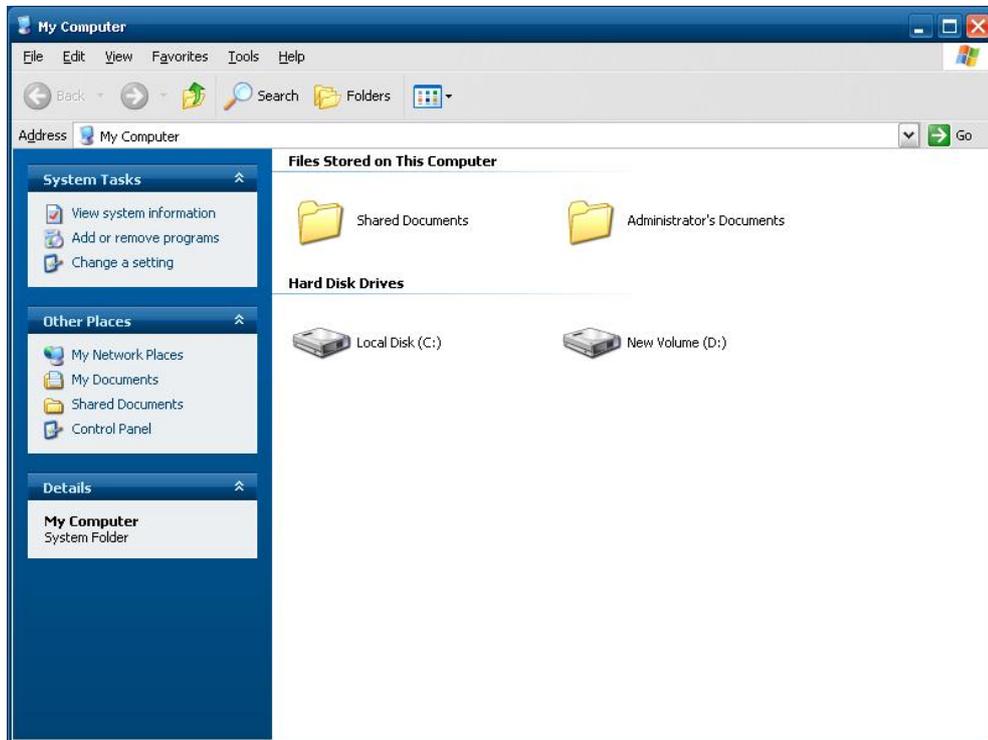
The V2401/2402-XPE does not support CF "Plug and Play" and "Hot Swap." Please make sure to turn off the computer before inserting a new CF cards.

Inserting a SATA Hard disk into a V2400 Computer

Before inserting a SATA hard disk, make sure that the computer is powered off. Insert a SATA Hard disk device will create a new disk in the V2401/2402-XPE. You should see it in the File Explorer.
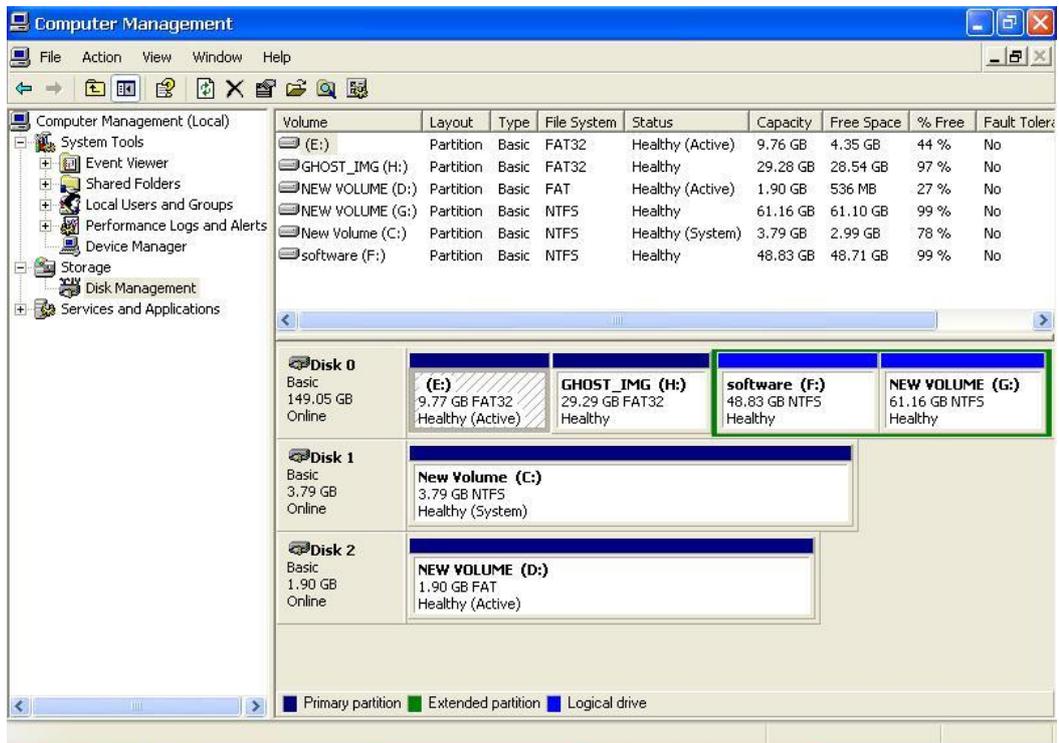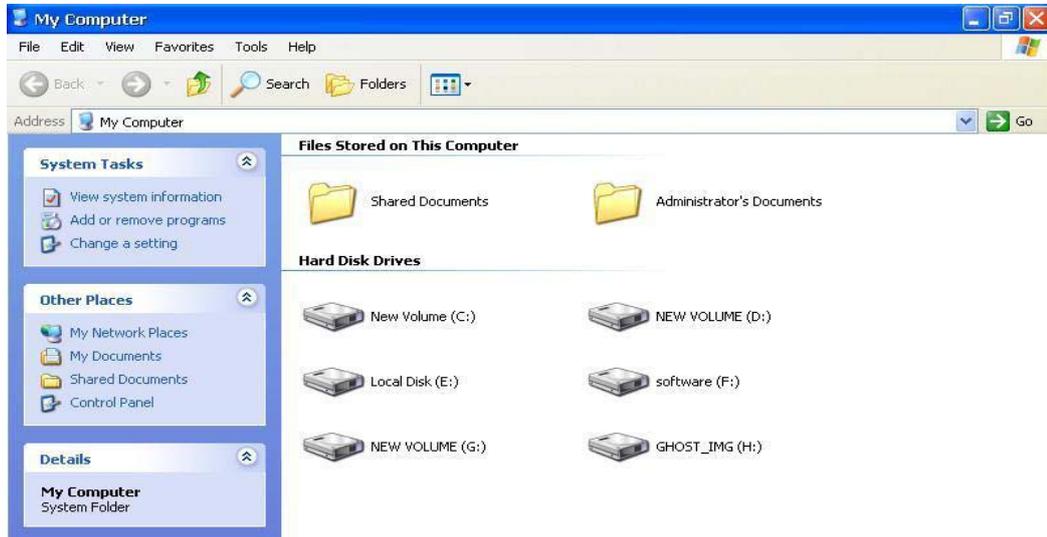
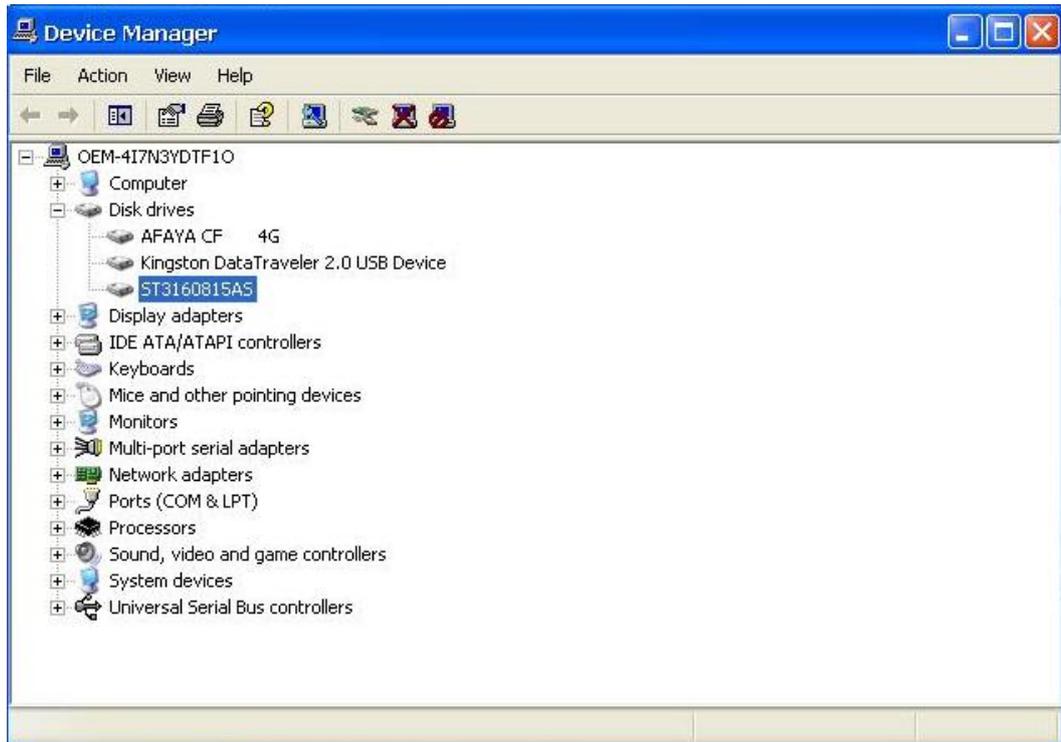**NOTE: The V2401/2402 embedded computer supplies only 5V DC power for 2.5 inch SATA hard disks. If you want to use a 3.5 inch hard disk, you will need to use external power supply for your SATA hard disk.**

Four RS-232/422/485 Serial Ports

The serial ports of the V2401/2402-XPE computer from button to top are named "COM1" to "COM4" COM1 to COM4 are RS-232/422/485 serial ports. Each of these ports supports baudrate settings of up to 921.6 Kbps.

Digital Input/Output Channels

The V2401/2402 series provides four digital input and four digital output channels for controlling digital signals. You can set the operation mode by programming; the example "DIO" can be found under **\examples\C++** of the Software DVD.

The code snippet is as follows:

```
/*

  index[n]: 0   ; BIT 0
        1   ; BIT 1
        2   ; BIT 2
        3   ; BIT 3
          ....
  data[n]: 0  ; Digital LOW
         1  ; Digital HIGH
```

```
*/

unsigned int   hDIO;
unsigned int port_no;
int data;
int    intDout,intDin;
int    nDout=0;
int port=0,mode=0;
int n=0;

WCHAR sin,smode;
printf("UART Mode Test Program\n");
printf("\t (0) Exit Program\n");
printf("\t (1) Display DIN\n");
printf("\t (2) Display DOUT\n");
printf("\t (3) Set DOUT value\n");
        printf("\t (4) Display both DIN and DOUT\n");

sin=getwchar();
n=_wtoi(&sin);

do
{
    switch (n)
    {
        // if char == '1', display the digital input
        case 1:
            //Open dio
            hDIO=mxdio_open();

            for(int i=0;i<=3;i++)
            {
                //Get digital input
                port_no=i;
                intDin=mxdio_get_din(hDIO,port_no);
                printf("Din%d = %d\n",port_no,intDin);
            }

            //Close DIO
```

```
            mxdio_close(hDIO);
             break;


        // if char == '2', display the digital output
        case 2:
            //Open dio
            hDIO=mxdio_open();

            for(int i=0;i<=3;i++)
            {
                //Get digital input
                port_no=i;
                intDin=mxdio_get_dout(hDIO,port_no);
                printf("Dout%d = %d\n",port_no,intDin);
            }

            //Close DIO
             mxdio_close(hDIO);
            break;
        // if char == '3', Set the digital output
        case 3:

            //Get Port Number
            getwchar();
            printf("Input the Port Number (0 ~ 3) = \n");
            smode=getwchar();
            port_no=_wtoi(&smode);

            //Get Value
             getwchar();
             printf("Input the value (0 or 1) = ");
            smode=getwchar();
            data=_wtoi(&smode);

            //Open DIO
            hDIO=mxdio_open();
            //Set DOUT
            nDout=mxdio_set_dout(hDIO,port_no, data);
            if(!nDout)
```

1-11

```
                {
                    printf("Set digital output fail!\n");
                }
                else
                {
                    printf("Set digital output success!\n");
                }

                //Close DIO
                mxdio_close(hDIO);
                 break;

        case 4:
                // if char == '4', Get both digital input and digital output
                //Open dio
                hDIO=mxdio_open();

                for(int i=0;i<=3;i++)
                {
                    //Get digital input
                    port_no=i;
                    intDin=mxdio_get_din(hDIO,port_no);
                    intDout=mxdio_get_dout(hDIO,port_no);
                    printf("Din%d = %d, Dout%d =
    %d\n",port_no,intDin,port_no,intDout);
                }

                //Close DIO
                 mxdio_close(hDIO);
                break;

        }
        getwchar();
          sin = getwchar();
        n = _wtoi(&sin);
    } while (n != 0);
```

Eight RS-232 Serial Ports (V2401 only)

The V2401 also offers eight RS-232 serial ports by connecting with a 68-pin VHDC cable. These eight serial devices will be named "COM5" to "COM12"

Follow the steps below to set the operation mode of each COM port:

A. Go to the **Control Panel → Ports (COM & LPT)** and select the COM port (ex. MOXA Port 0 (COM1)).

B. Right-click the COM port and click **Properties**.

C. At the **Port Settings** tab, select the interface you wish to use.
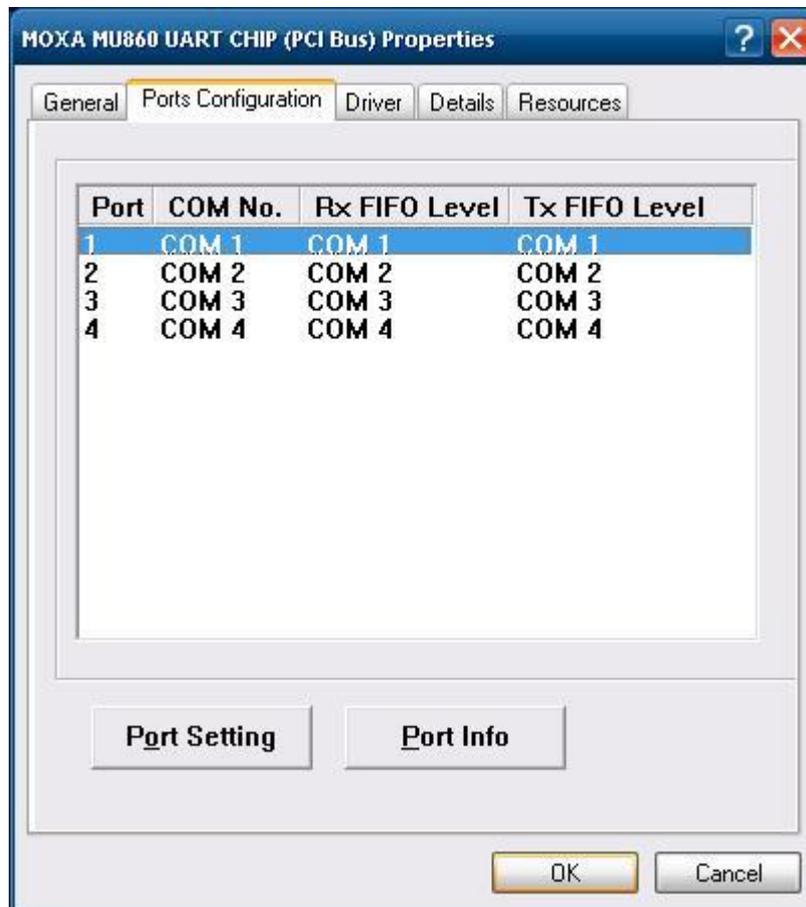
D. Click **OK** to apply these settings.
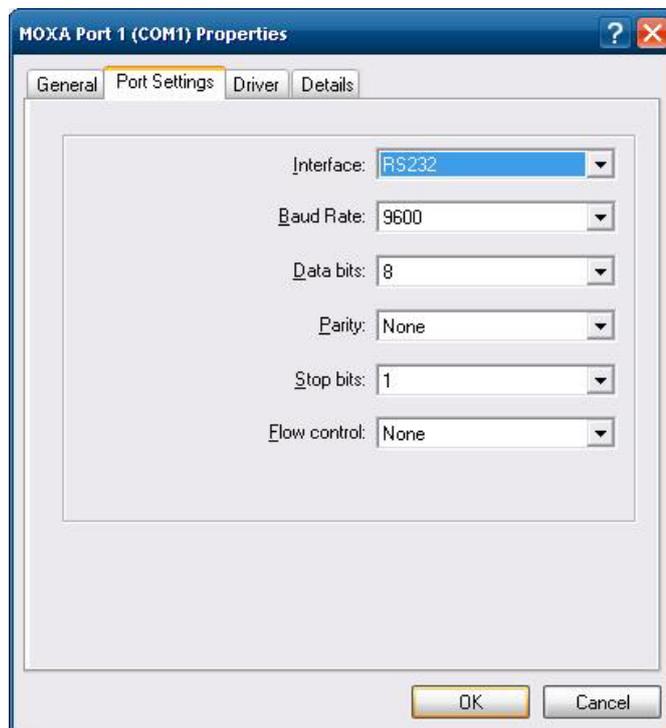
In some situations, you may want to change the port name to accommodate your program. Follow the steps below to change the name of the ports:

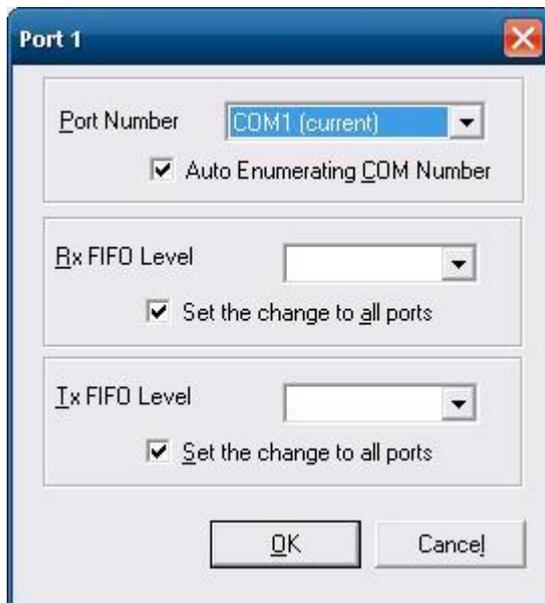A. Go to the Control **Panel → Multi-port serial adapters** and select the adapter.

B. Right-click the adapter and click **Properties**.
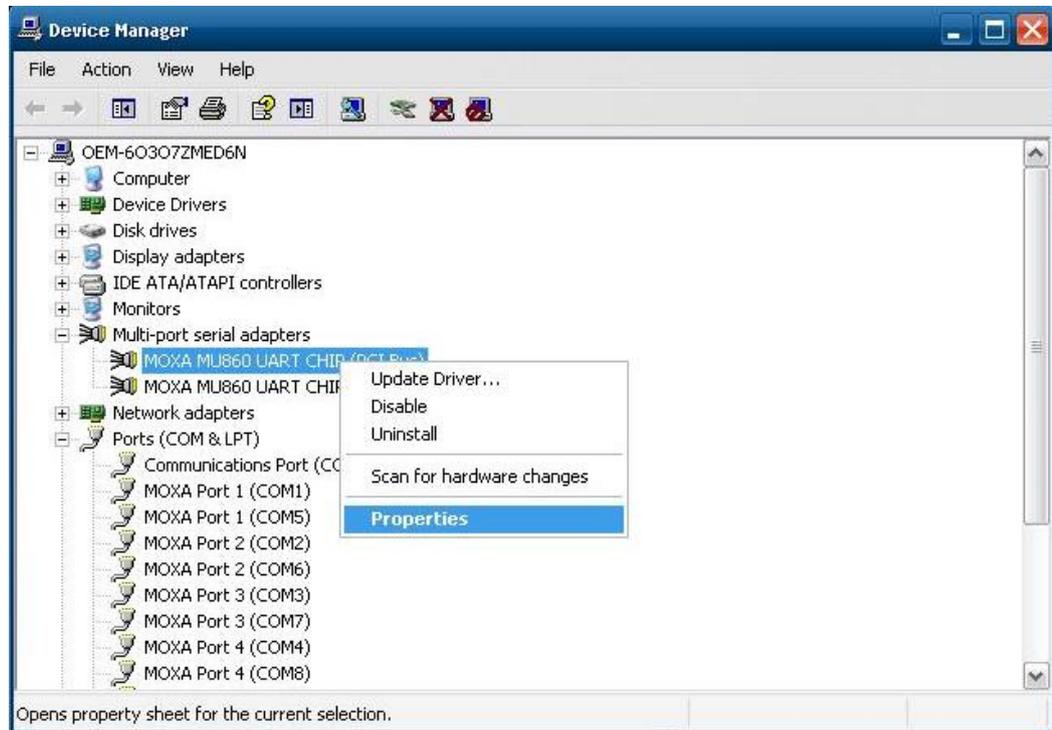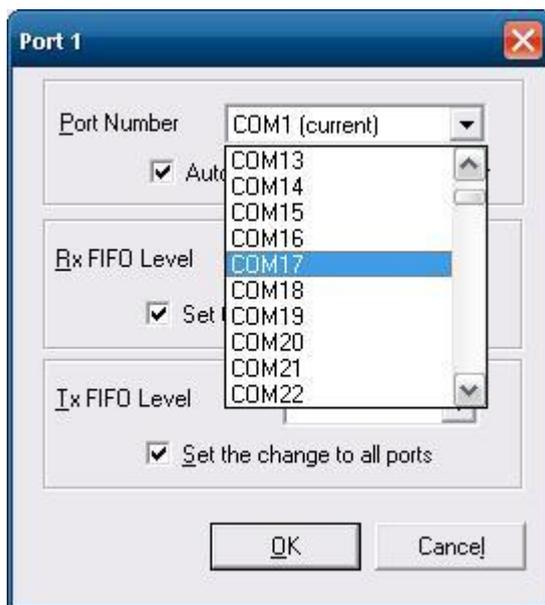
C. At the Port Configuration tab, select the port you want to change its name and then click **[Port Setting]**.

D.   Uncheck "**Auto Enumerating COM Number**" if you want to change the port name separately.
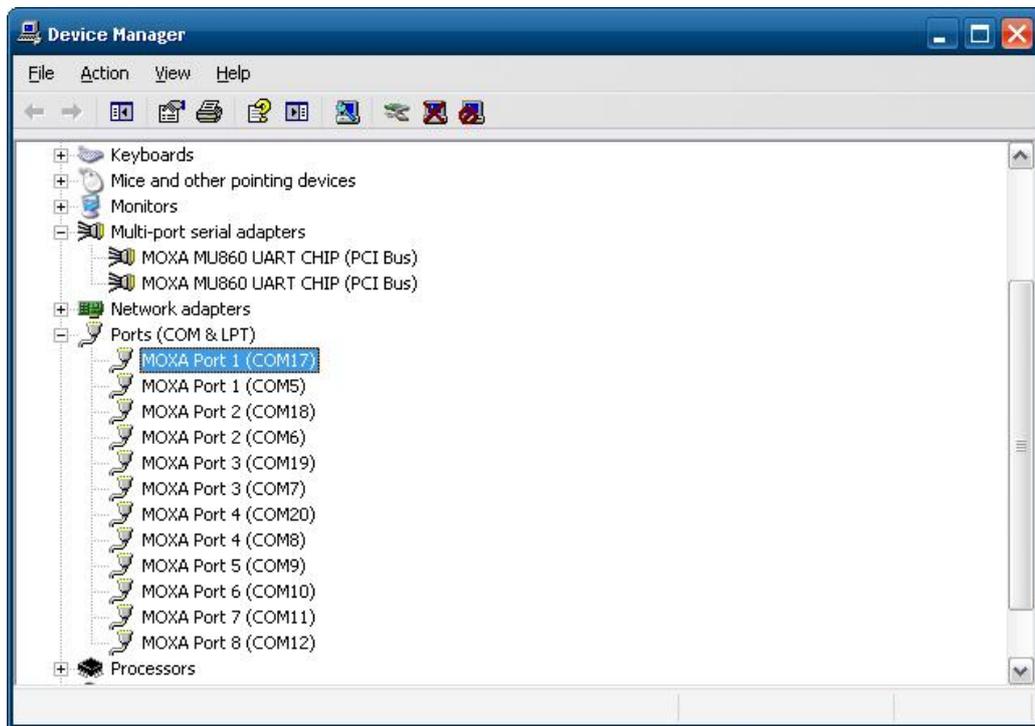

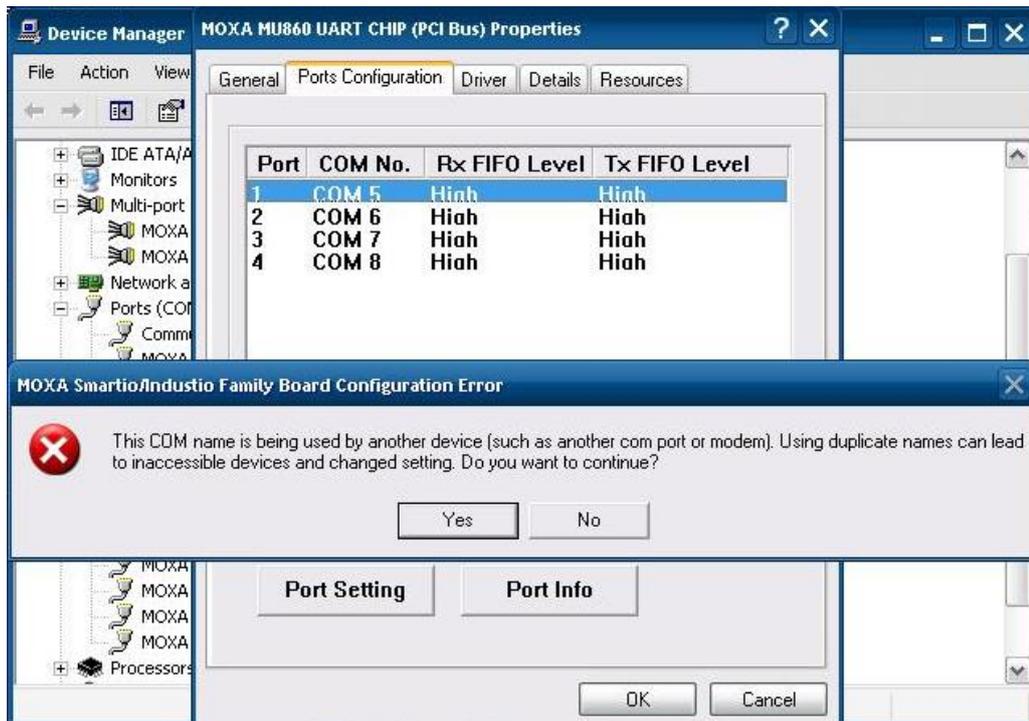E.   Select the port name you want to change, and then press **[OK].**

F. Make sure the port names are correct, and then click **[OK]** to apply these settins.
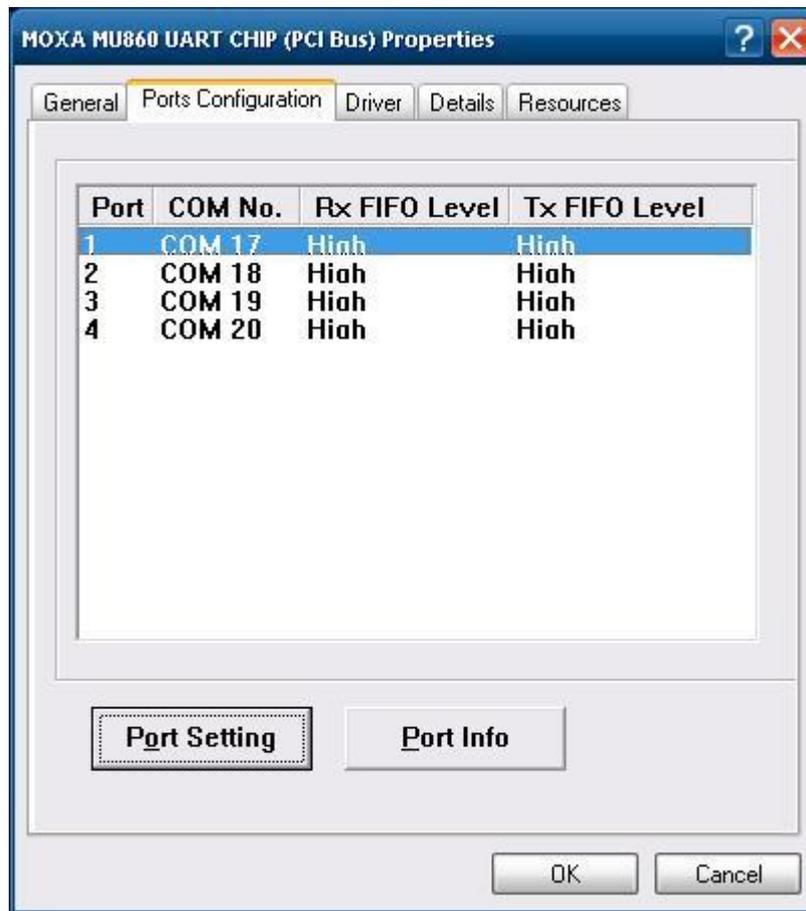
G.   Now, you can see that the port names have been changed under Ports (COM & LPT).

NOTE: Make sure each port name is unique, or the duplicate names will lead to inaccessible devices.

Also, you can set the operation mode by programming; the example "UartMode" can be found in **\examples\C++** of the Software DVD.

The code snippet is as follows:

```
int port=0,mode=0;
int n=0;

WCHAR sin;
WCHAR wcs_port[3],wcs_mode[3];
printf("UART Mode Test Program\n");
printf("\t (0) Exit Program\n");
printf("\t (1) Display UART Mode\n");
printf("\t (2) Set UART Mode\n");

sin=getwchar();
n=_wtoi(&sin);


do
{
    switch (n)
    {
        // if char == '1', display the UART Mode
        case 1:
                printf("Input the Port Number (1~4) = \n");
                wscanf(L"%s",wcs_port);
                port=_wtoi(wcs_port);
                mode=uart_getmode(port);
                if(mode==(-1))
                {
```

```
                    printf("Invalid value!!\n");
                    break;
                }

                printf("COM%d=%s\n",port,mode_array[mode]);

            break;
        // if char == '2', Set the UART Mode
        case 2:

                //Get Port Number
                printf("Input the Port Number (1~4) = \n");
                wscanf(L"%s",wcs_port);
                port=_wtoi(wcs_port);

                //Get Mode Value
            printf("Input the Mode value (0 ~ 3) = ");
                wscanf(L"%s",wcs_mode);
                mode=_wtoi(wcs_mode);

                //Set UART Mode
                if(uart_setmode(port,mode)==-1)
                {
                    printf("Invalid value!!\n");
                    printf("Set UART Mode Fail!!\n");
                }
                else
                {
                    printf("COM%d=%s\n",port,mode_array[mode]);
                }
            break;
    }
     getwchar();
    sin = getwchar();
    n = _wtoi(&sin);
} while (n != 0);

return 0;
```

2

Software Configuration

In this chapter, we explain how to operate a V2401/2402-XPE computer directly or from a PC. Instructions are given on how to adjust the system time, troubleshoot network connectivity, and manage other functions. Some of these operations can be done with system commands after gaining access to the computer, and others can be done from the "Control Panel," which is described in a later chapter.

In this chapter, we cover the following topics:

- ❑ **Starting Your V2401/2402-XPE Computer**
- ❑ **Resetting Your V2401/2402-XPE Computer**
- ❑ **Changing the LVDS Settings**
- ❑ **Changing the Network Settings**
- ❑ **Operating Your V2401/2402-XPE Computer with a Telnet Client**
- ❑ **Adjusting the System Time**
- ❑ **Starting and Stopping Services**
- ❑ **Simple Network Management Protocol (SNMP)**
- ❑ **Remote Desktop (RDP)**
- ❑ **Serial Ports**
- ❑ **Enhanced Write Filter**
- ❑ **File Based Write Filter**

Starting Your V2401/2402-XPE Computer

Connect the CRT monitor or LCD monitor to the target computer, and then power it up by connecting it to the power adaptor. It takes about 30 to 40 seconds for the system to boot up. Once the system is ready, the Desktop will appear on your monitor.
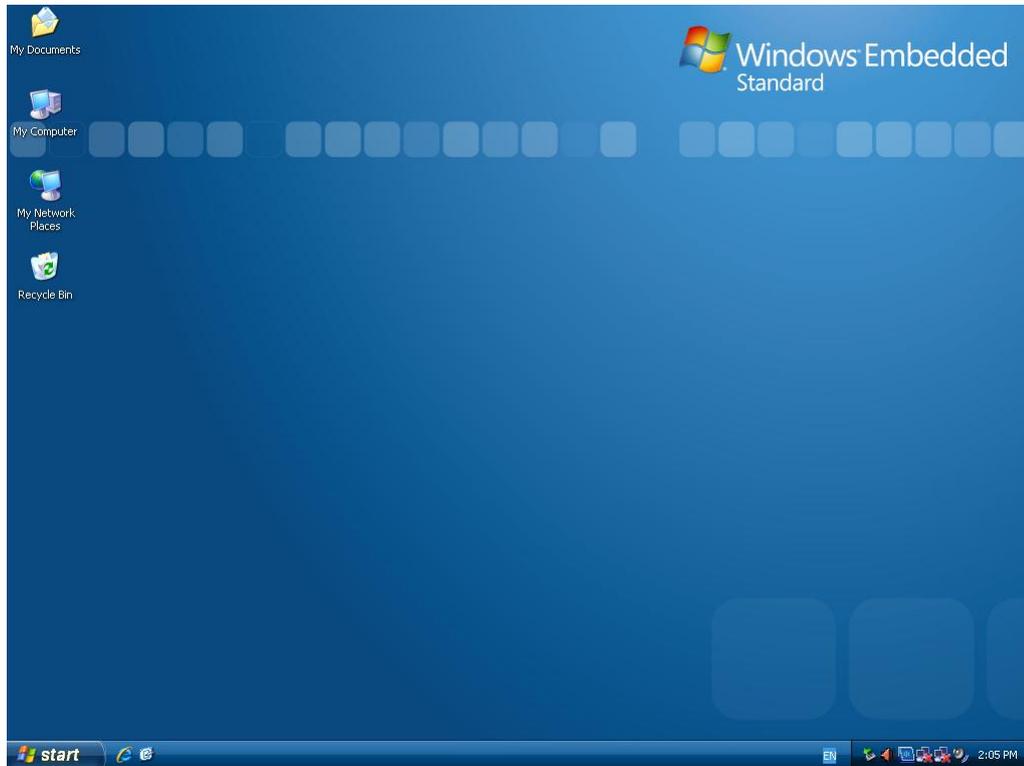

Resetting Your V2401/2402-XPE Computer

- **Reset Button**
  A **Reset** button is located on the front panel of V2401/2402-XPE. Press the reset button to shut down your computer, just as you would do with a standard PC.

- **Software Shutdown / Reboot**
 Click **Start → Turn Off Computer** to reboot or shutdown the V2401/2402-XPE computer.

Changing the LVDS Settings

The V2401/2402-XPE computer comes with an LVDS connector, allowing users to connect an LVDS display. Before you connect your LVDS panel to the embedded computer, be sure the display settings match your LVDS panel. Use the following steps to adjust LVDS settings.

1. Select **[Advanced]** tab in the BIOS Menu.

2. Select **[Advanced Chipset Features]** and then select the **[LCD Panel Type]** and **[Panel Data Format]** compatible with your LVDS panel.

3. Double-click the display icon at the bottom right of the screen

4. Select **Graphics Properties**. (Ex. Intel(R) Dual Display Clone mode for both CRT and LVDS output)
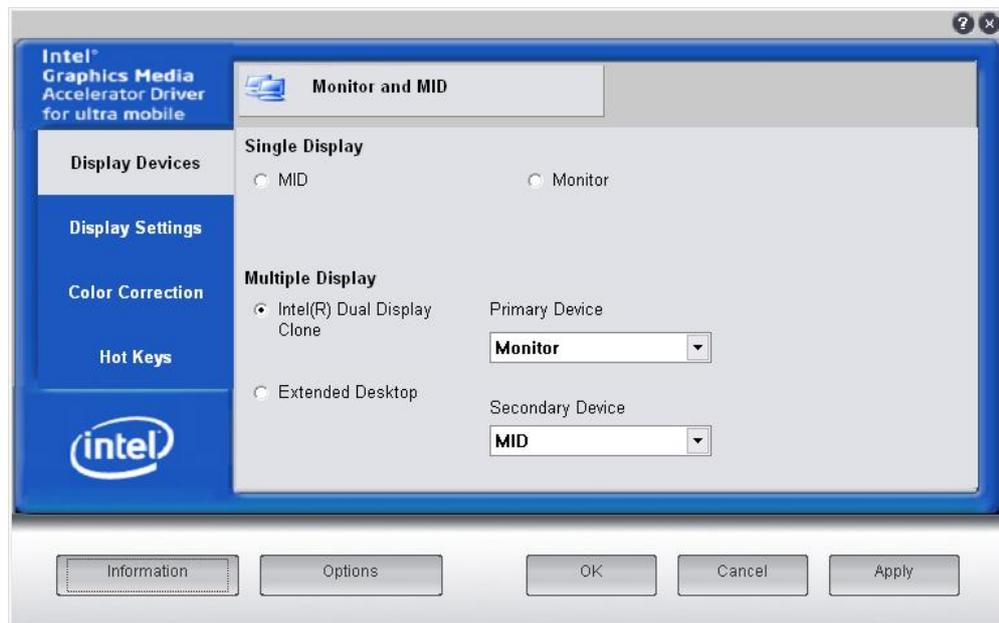
5. Select the **Color Quality** (32 bit or 18 bit), **Screen Resolution**, and **Refresh Rate** compatible with your LVDS display. You may also select the **Enable Rotation** checkbox if you need rotation functions.
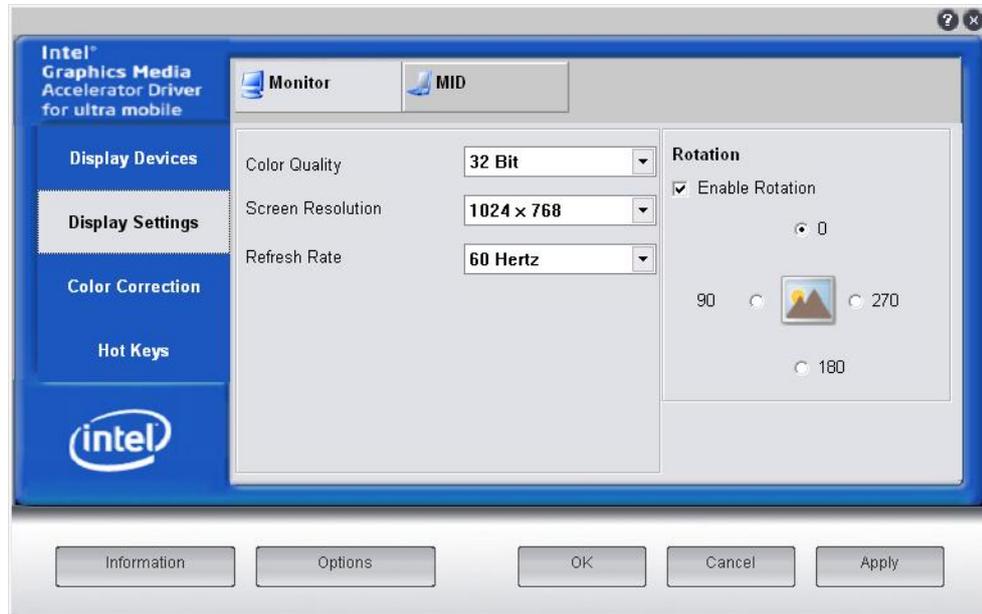
6. You can also use hot keys to change your display settings. When finished, click **Apply** and then **OK**.
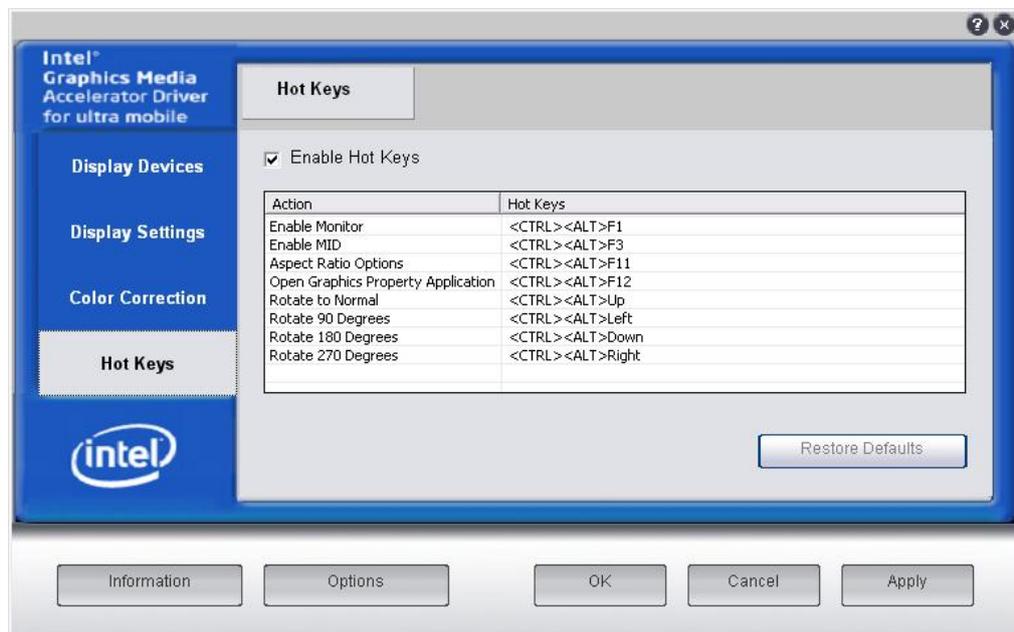
Changing the Network Settings

The V2401/2402-XPE computer comes with two network interfaces. Both of the default IP addresses are DHCP. Choose **Start → Control panel → Network Connections** to enter the network settings page. Select the connection and choose **Properties** on the pop-up menu by right-clicking. You can specify the IP address manually or by DHCP. In addition, you can disable or enable either one or both connections with the pop-up menu.
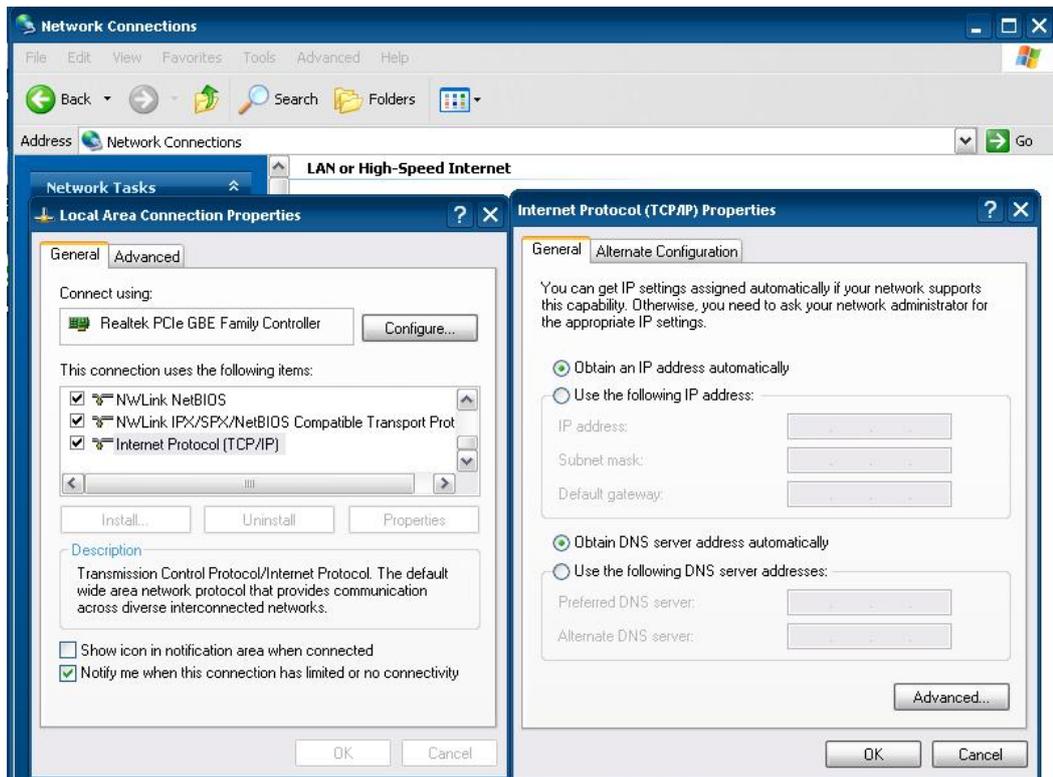
# Operating Your V2401/2402-XPE Computer with a Telnet Client

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

After logging in through the Telnet client, a list of commands will be available for operating 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 these commands, such as *DATE* and *TIME*, are very useful for managing the computer's 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, type *DIR.*

NOTE: The default user id is "administrator" and the default password is not set; you need to create a new password for this account to use this telnet client.

NOTE: There is a connection limitation on using Telnet clients. You are only allowed to create connections with two Telnet clients at the same time.
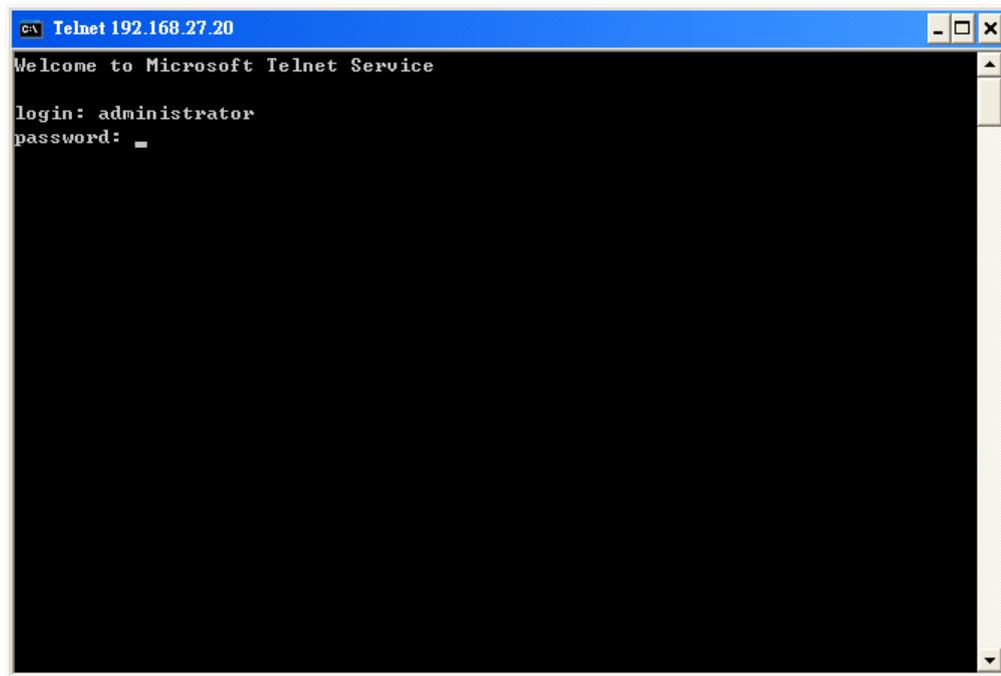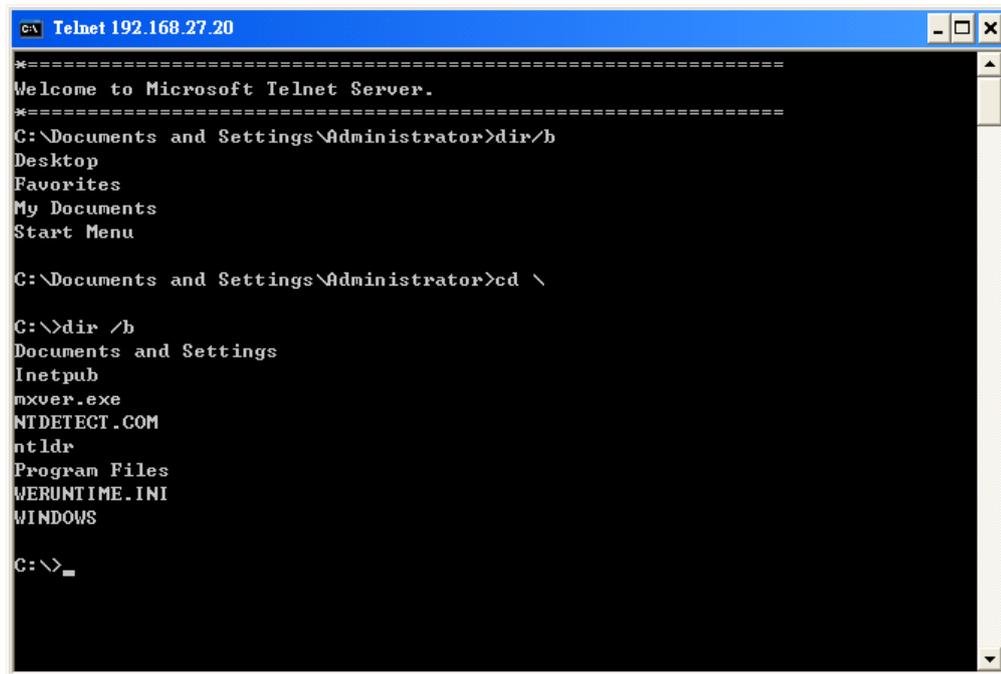
```
Telnet 192.168.27.20

*===============================================================
Welcome to Microsoft Telnet Server.
*===============================================================
C:\Documents and Settings\Administrator>dir/b
Desktop
Favorites
My Documents
Start Menu

C:\Documents and Settings\Administrator>cd \

C:\>dir /b
Documents and Settings
Inetpub
mxver.exe
NTDETECT.COM
ntldr
Program Files
WERUNTIME.INI
WINDOWS

C:\>_
```

Adjusting the System Time

- **Setting the System Time Manually:** Use the **date/time** command line utility to query the current system date/time or set a new system date/time.
- **Date/Time Control panel:** Go to the **Control Panel** and double click the **Date and Time** icon.
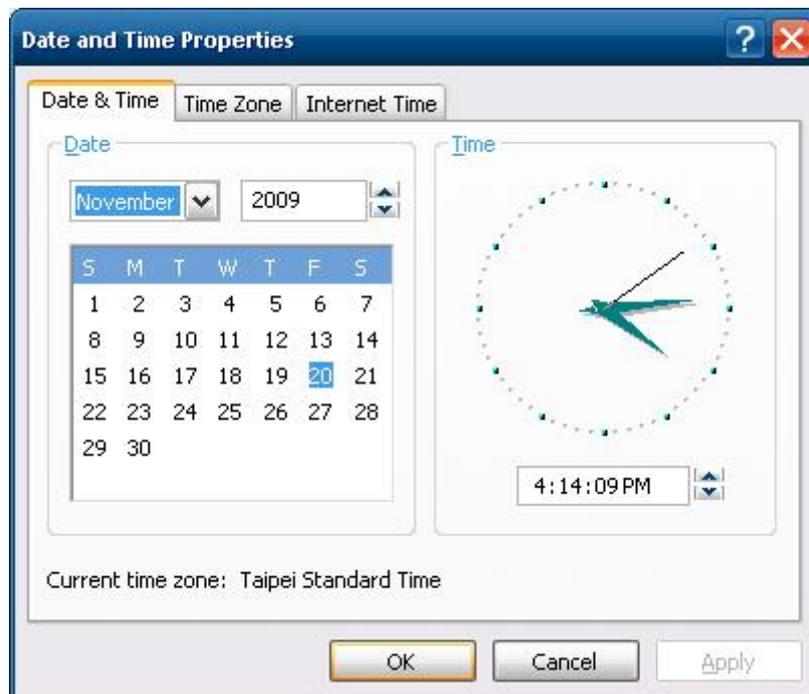
- **SNTP:** In the Date and Time Properties window, you can see the NTP server setting.
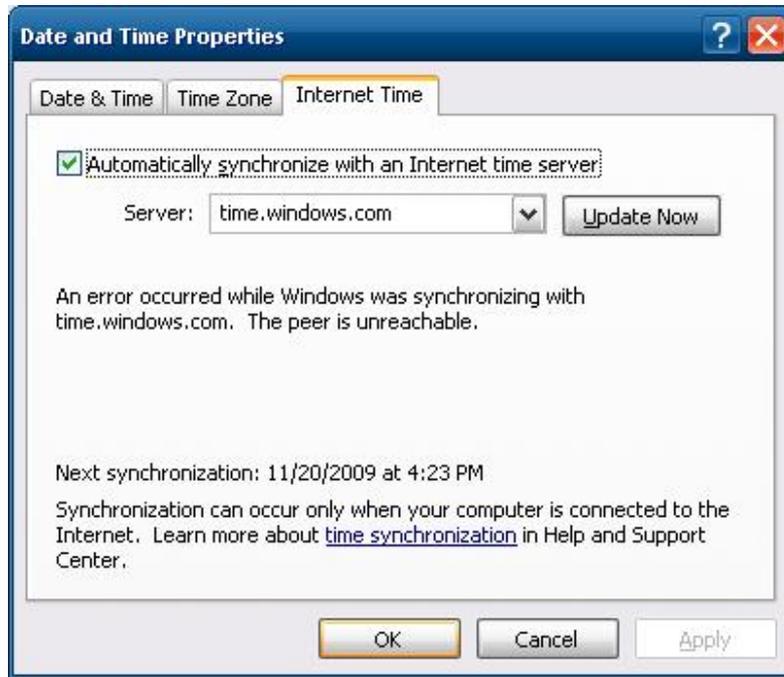
Starting and Stopping Services

Select **Start → Control Panel → Administrative Tools** and double click **Services**. Select and right-click on the service name, and then choose to stop or start.

Simple Network Management Protocol (SNMP)

To check SNMP agent capabilities on a target V2401/2402-XPE (e.g., suppose the network IP is 192.168.3.127) computer, log on to the workstation computer on which the SNMP manager resides and then type:
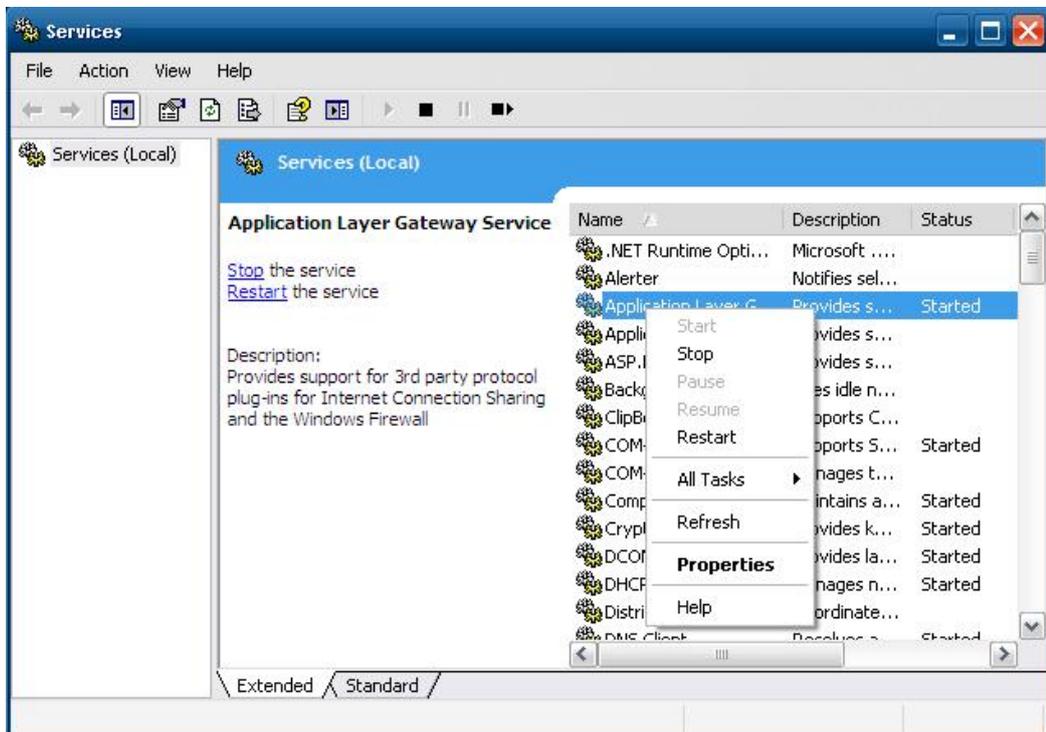
\> snmpwalk -v 2c -c public 192.168.3.127 system

You will see a series of messages from the SNMP agent on the V2401/2402-XPE computer that allow you to monitor and manage the computer.

Remote Desktop (RDP)

You can connect to the target V2401/2402-XPE computer remotely by using **Remote Desktop**. Right-click **My Computer** on your desktop, and select **Properties**. Click the **Remote** tab for further configuration.

Make sure that the **Allow users to connect remotely to this computer** checkbox is selected. Next, click **Select Remote Users**, and add the users allowed to connect to your desktop. When finished, click **OK**.

Serial Ports

V2401/2402-XPE embedded computers have 4 serial ports on the back panel. These ports are designed to provide reliable, high-speed, 3-in-1 (RS-232, RS-422, and RS-485) operation. Each of the ports supports baudrates up to 115,200 bps.

The command line utility "SetInterface.exe" is for users to view and set the current operation mode.

Enhanced Write Filter

The "Enhanced Write Filter" protects the contents of a volume on the target media volume by redirecting all writes to another storage location called on overlay. Use the following steps to enable the Enhanced Write Filter.

1. Type **EWFMGR C:** to check if the state of the Enhanced Write Filter is **Disabled**.

2. To enable the filter, type **EWFMGR C: -enable**.

3. Reboot the system to activate the change.

4. Delete a file on your protected volume and reboot the system; the file you just deleted will appear.
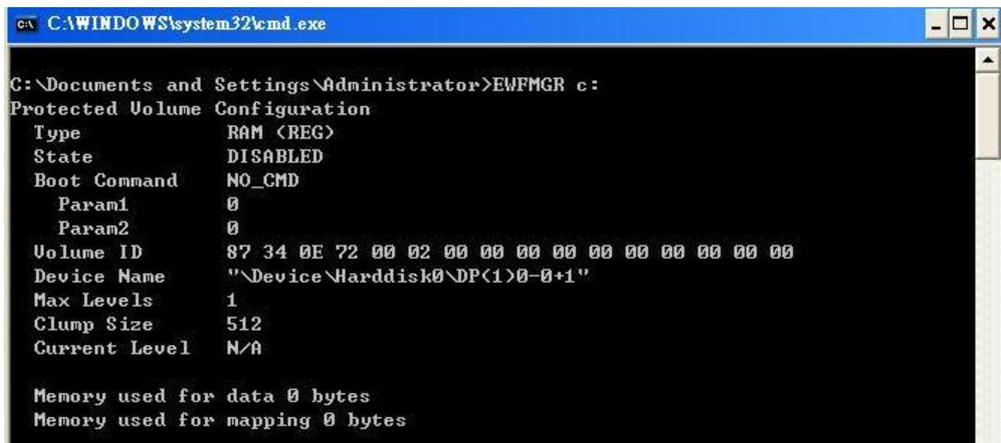
File Based Write Filter

File-Based Write Filter (FBWF) allows Windows Embedded Standard 2009 to maintain the appearance of read and write access to write sensitive or read only storage. FBWF makes read and write access transparent to applications.

Writing to storage media may be undesirable or impossible in embedded devices. FBWF redirects all writes targeted for protected volumes to a RAM cache called an overlay. In this context, an overlay can be likened to a transparency overlay on an overhead projector. Any change made to the overlay affects the picture as seen in the aggregate, but if the overlay is removed, the underlying picture remains unchanged.

Follow the steps below to enable FBWF:

1. In the command prompt, type **fbwfmgr /displayconfig** to check the current FBWF status. The status defaults to **disabled**.

```
C:\>fbwfmgr /displayconfig
File-based write filter configuration for the current session:
    Filter state: disabled.

File-based write filter configuration for the next session:
    Filter state: disabled.
C:\>
```

2. Type **fbwfmgr /enable** to enable FBWF. Reboot the system for the changes to come into effect.

```
C:\>fbwfmgr /enable
File-based write filter will be enabled on the next reboot.

C:\>
```

3. When the system has rebooted, type **fbwfmgr /displayconfig** in the command prompt again to confirm thatthe status has been changed to **enabled**. The default folder for FBWF will be **\temp**. Type **fbwfmgr /help** for more detailed information.

```
C:\> fbwfmgr /displayconfig
File-based write filter configuration for the current session:
    filter state: enabled.
    overlay cache data compression state: disabled.
    overlay cache threshold: 64 MB.
    overlay cache pre-allocation: disabled.
    size display: actual mode.
    protected volume list:
        \Device\HarddiskVolume3
    write through list of each protected volume:
        \Device\HarddiskVolume3:
            \temp

File-based write filter configuration for the next session:
    filter state: enabled.
    overlay cache data compression state: disabled.
    overlay cache threshold: 64 MB.
    overlay cache pre-allocation: disabled.
    size display: actual mode.
    protected volume list:
        \Device\HarddiskVolume3
    write through list of each protected volume:
        \Device\HarddiskVolume3:
            \temp

C:\
```

4. You may copy a file (in this example, we will use TestFile.txt) to C:\temp and to C:\, and then reboot the system.
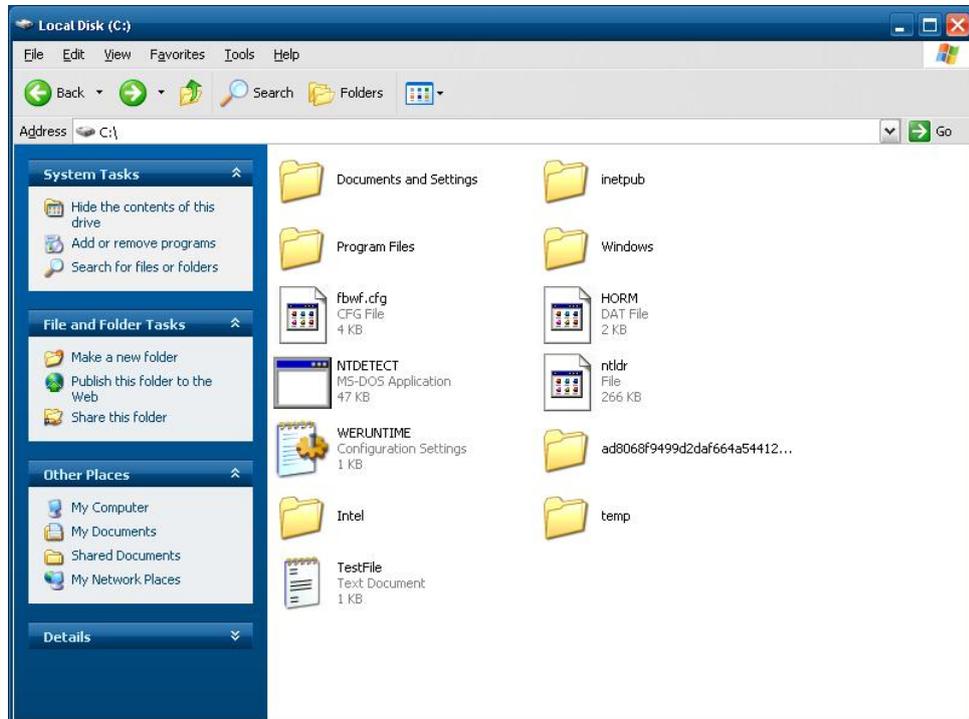
5. After rebooting the system, you should see that the file in C:\ has disappeared and that the file in C:\temp remains.

3
Management Tools

The V2401/2402-XPE ready-to-run embedded computers are shipped with the Windows Embedded Standard 2009 operating system already installed. This network-centric platform is designed to serve as a front-end for data acquisition and industrial control applications. A set of Windows XP management tools are installed on the V2401/2402-XPE computer to resolve management issues.

In this chapter, we cover the following topics:

❑ **Computer Management**
❑ **Component Services**
❑ **Event Viewer**
❑ **Internet Information Services (Web/FTP)**
❑ **ODBC Data Source Administrator**
❑ **Performance Monitor**
❑ **Services**

Computer Management

[Control Panel] → [Administrative Tools] → Computer Management.

You can use the tools for a variety of tasks, such as disk partition, disk mount/dismount, and create/remove users.

You can also check services in the Computer Management window.
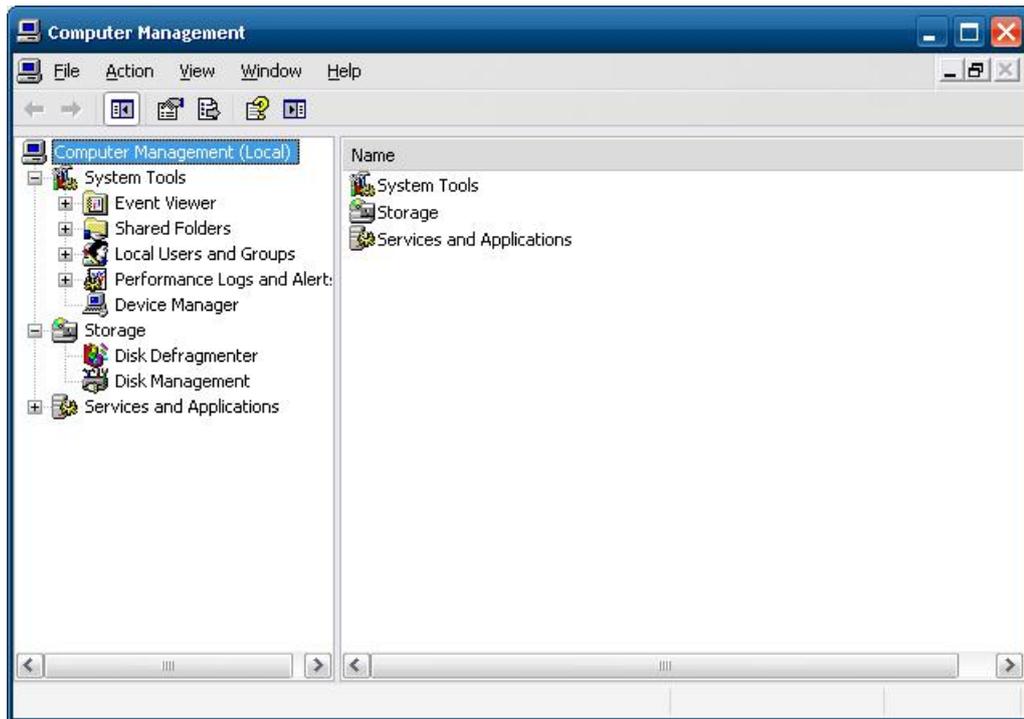
Component Services

[Control Panel] → [Administrative Tools] → Component Services.

You can install/view/remove COM components with this tool.
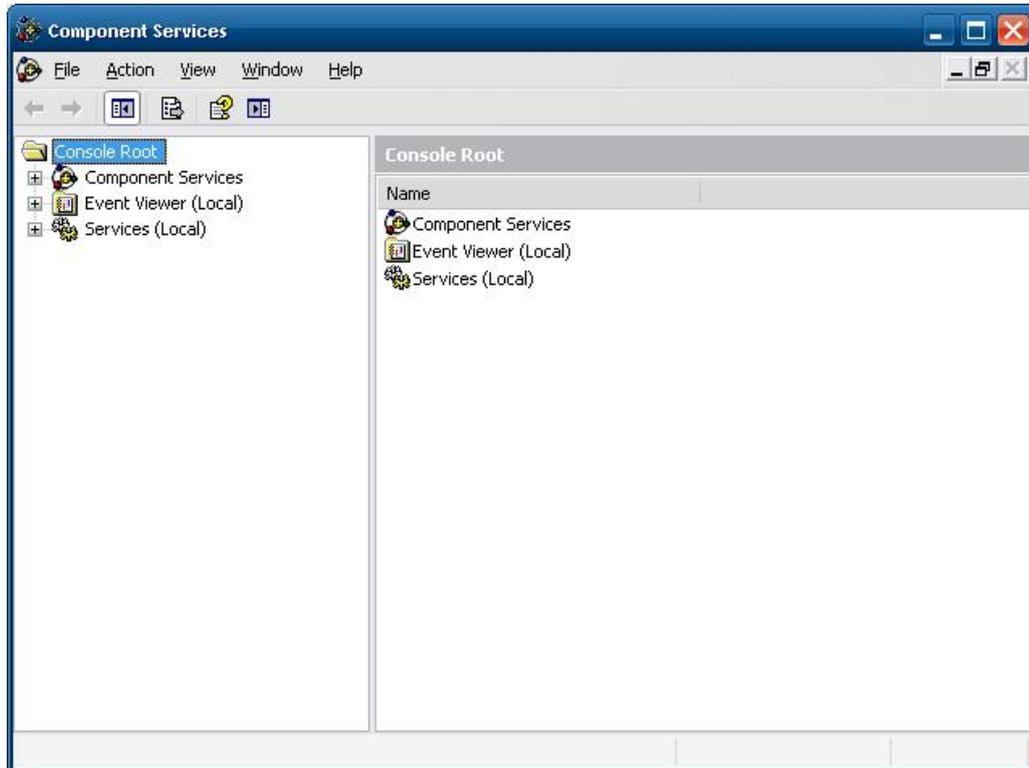
Event Viewer

[Control Panel] → [Administrative Tools] → Event Viewer.

Every V2401/2402-XPE event, including system, applications, and security events are logged in this event database.
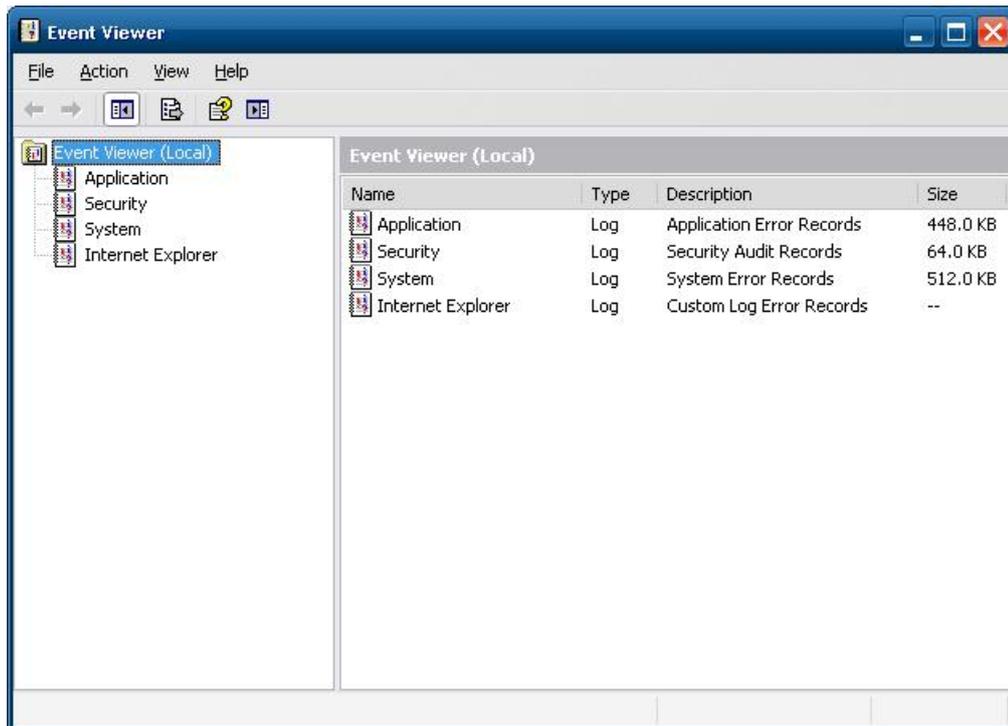
Internet Information Services (Web/FTP)

[Control Panel] → [Administrative Tools] → Internet Information Services.

If you need to set up Web or FTP, you must use this tool for configuration purposes, and you can also start/stop HTTP/FTP services.
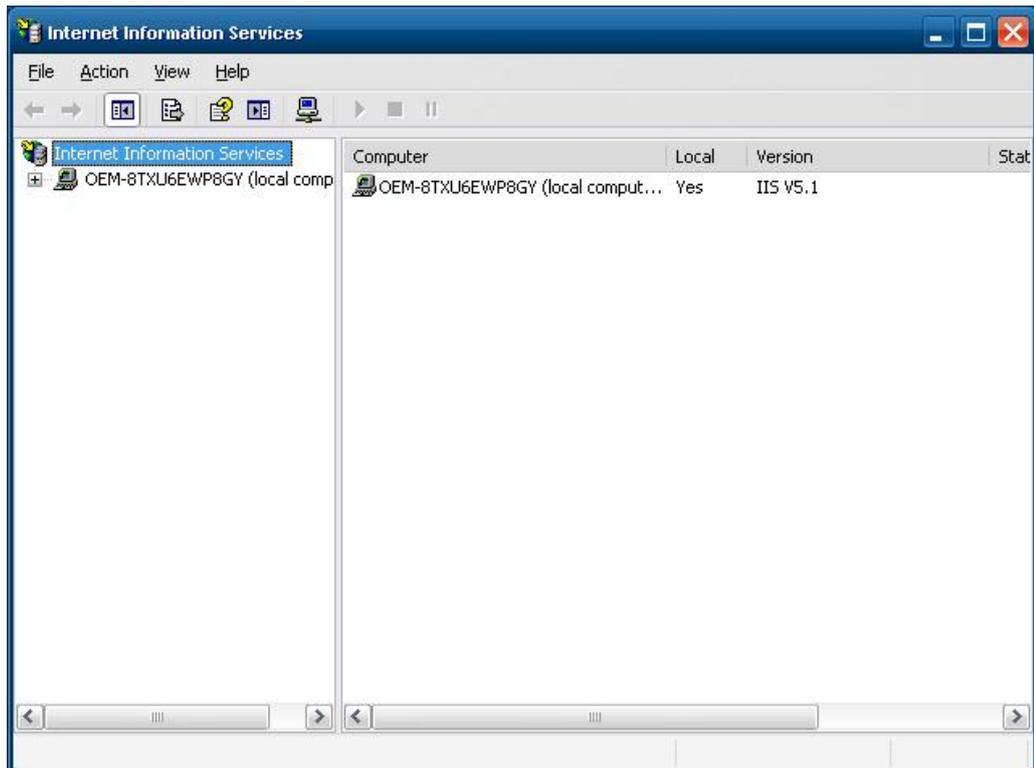
A default web page is located in the directory **c:\Inetpub**. Use this default page to test your web server.

Follow the steps shown below to create the virtual directory.

1. Create a virtual directory by selecting **Default Web Site → New → Virtual Directory.**
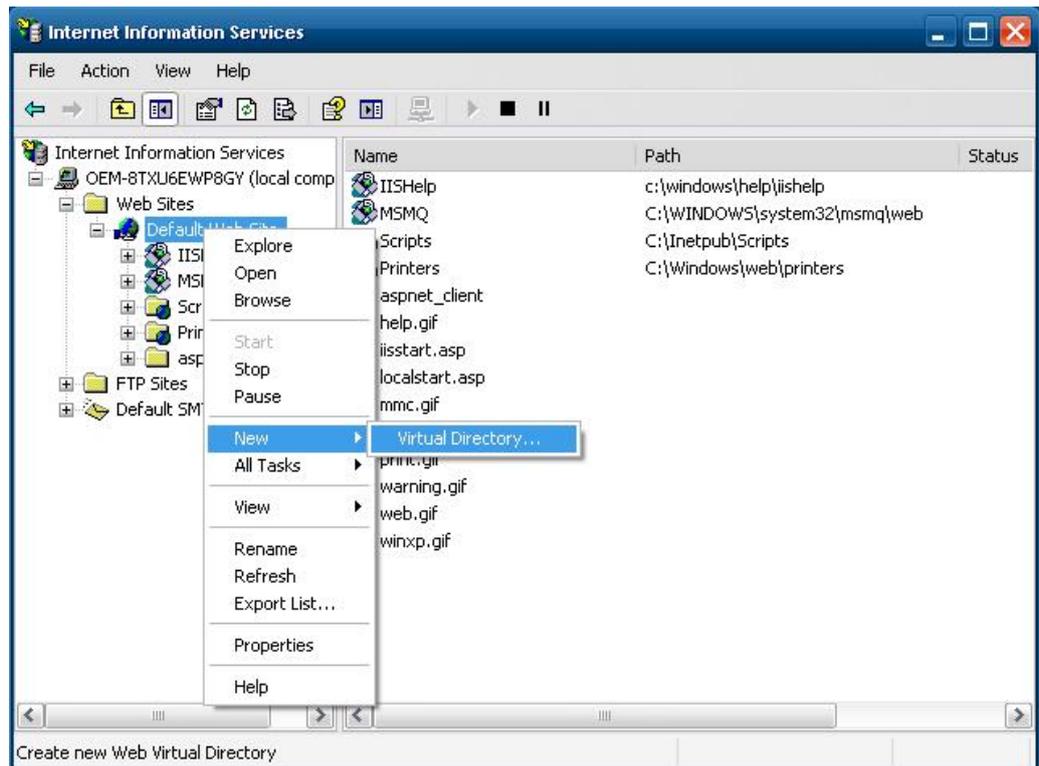
2. Follow the virtual directory creation wizard and complete the steps to create the virtual directory **c:\Inetpub**.
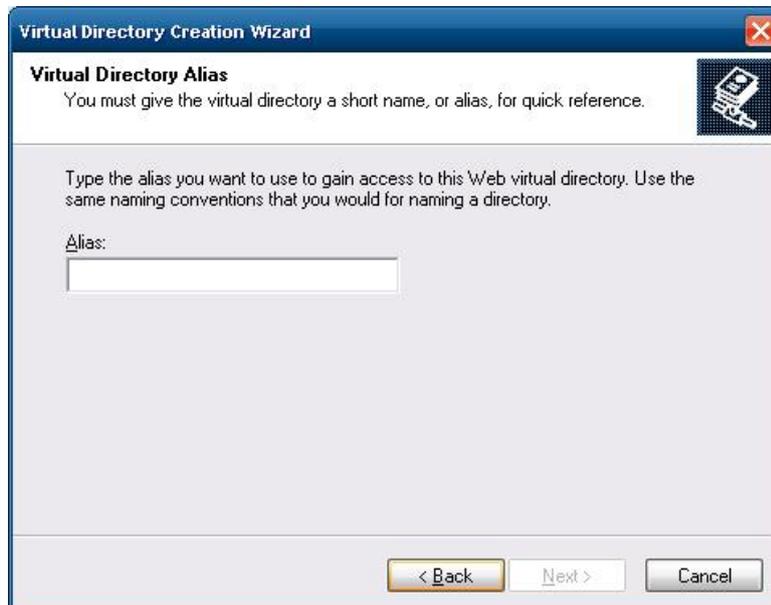
Type the alias into the text box. Click **Next** to continue.
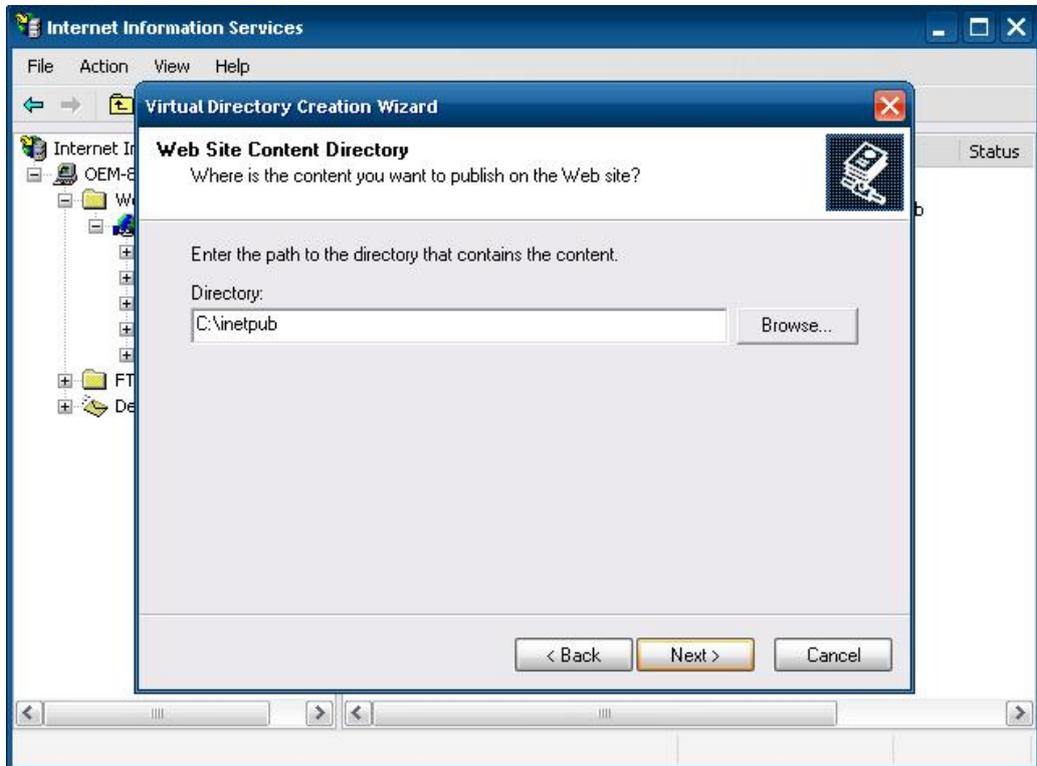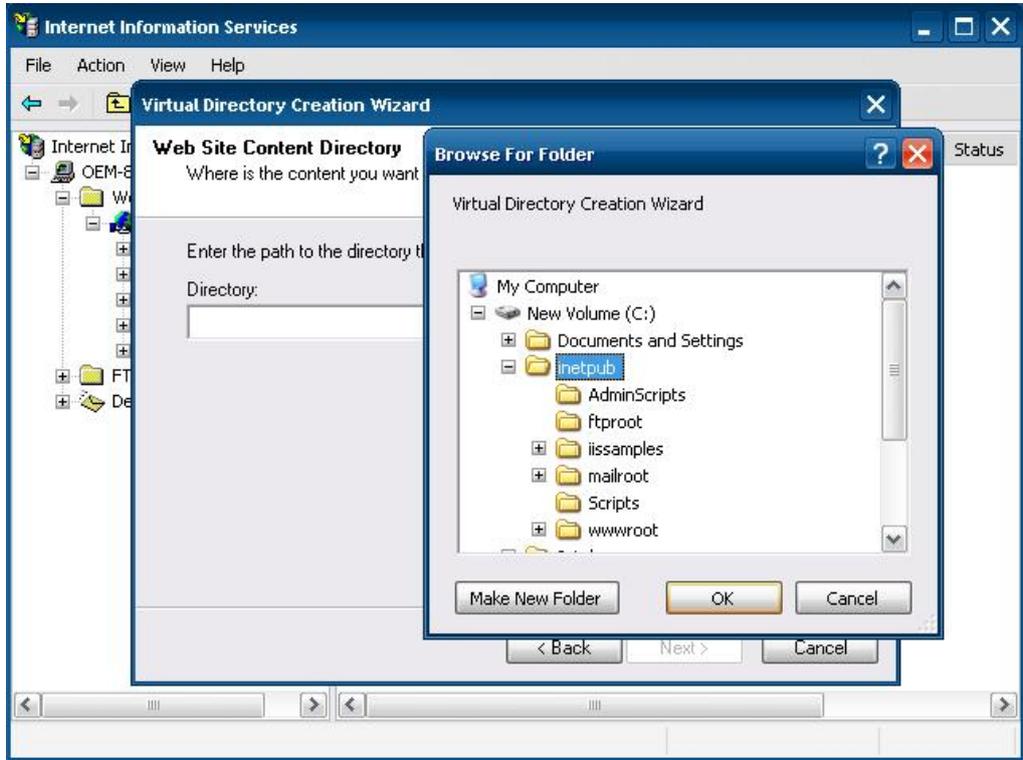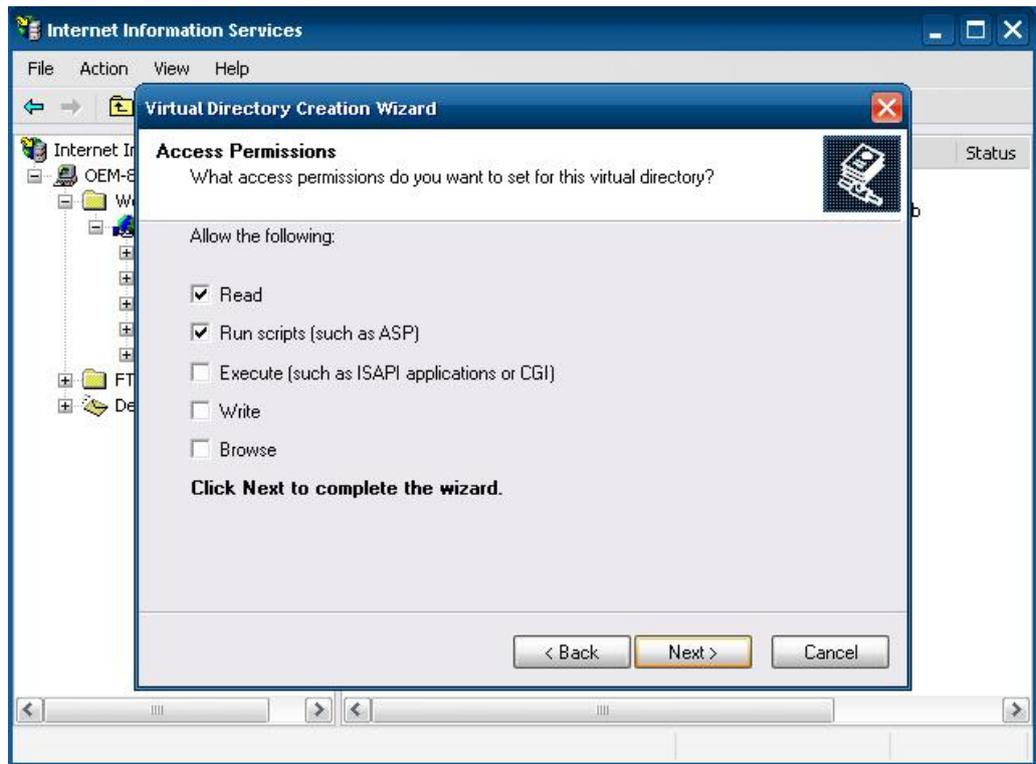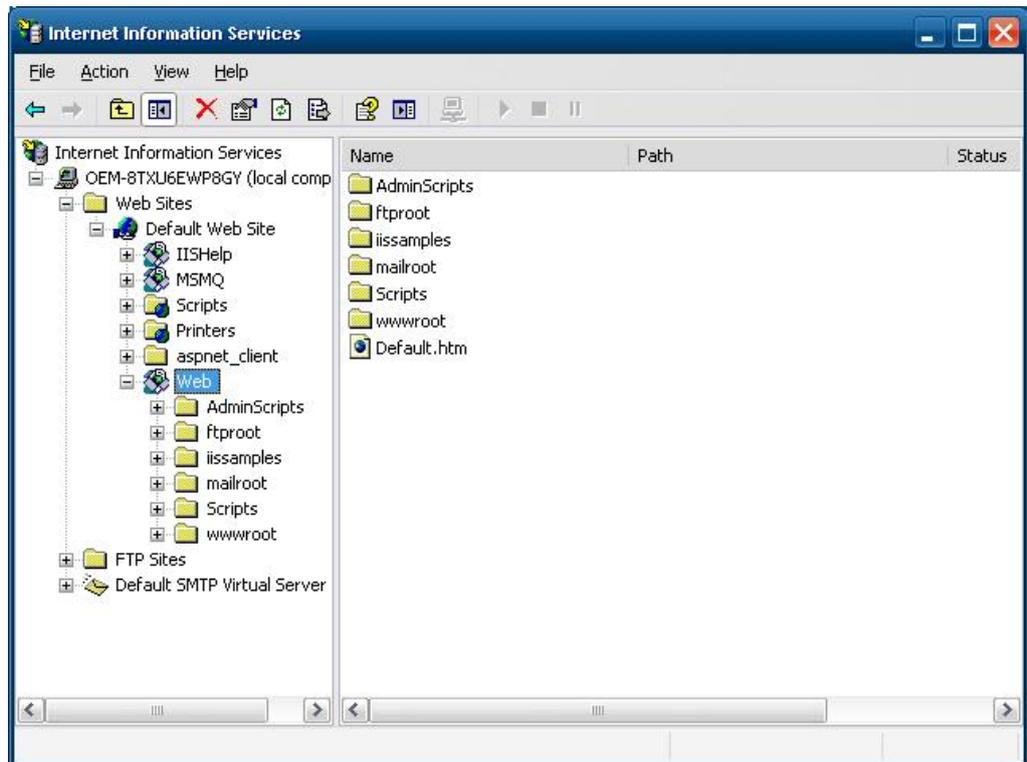
3. When you complete the steps, the virtual directory **WEB** will appear under **Default WEB Site**.

4. On your desktop, type **[IP Address]/WEB/Default.htm**
(e.g., 192.168.1.127/WEB/Default.htm). The following message will appear. The steps are indicated in the following sequence of diagrams.

If you need to use the FTP server, you must create the default password for your account and turn on the write permission on your home directory located in **c:\intepub\ftproot**. Select **FTP Sites → Default FTP Site → Properties → Home Directory**, and checkmark the **Write** checkbox. You should now be able to transmit files through the ftp server.
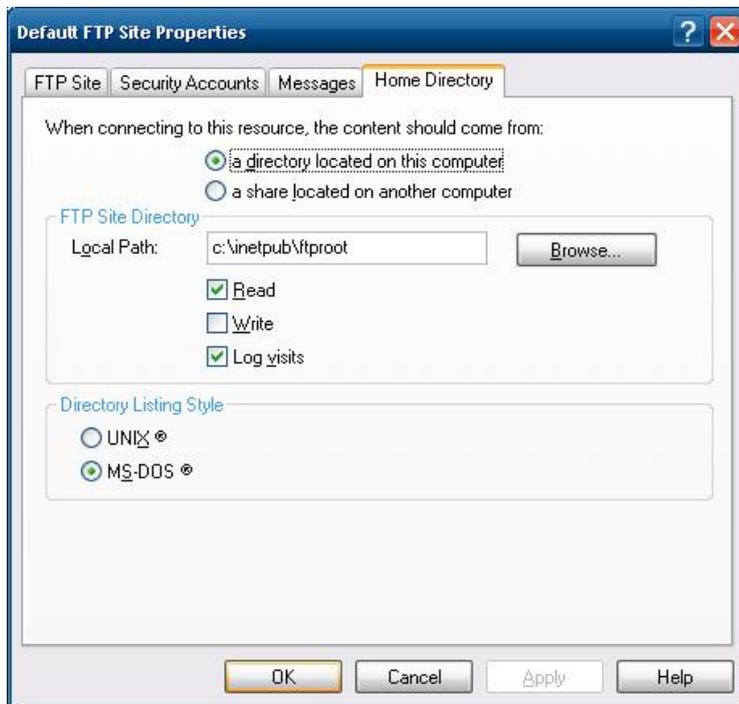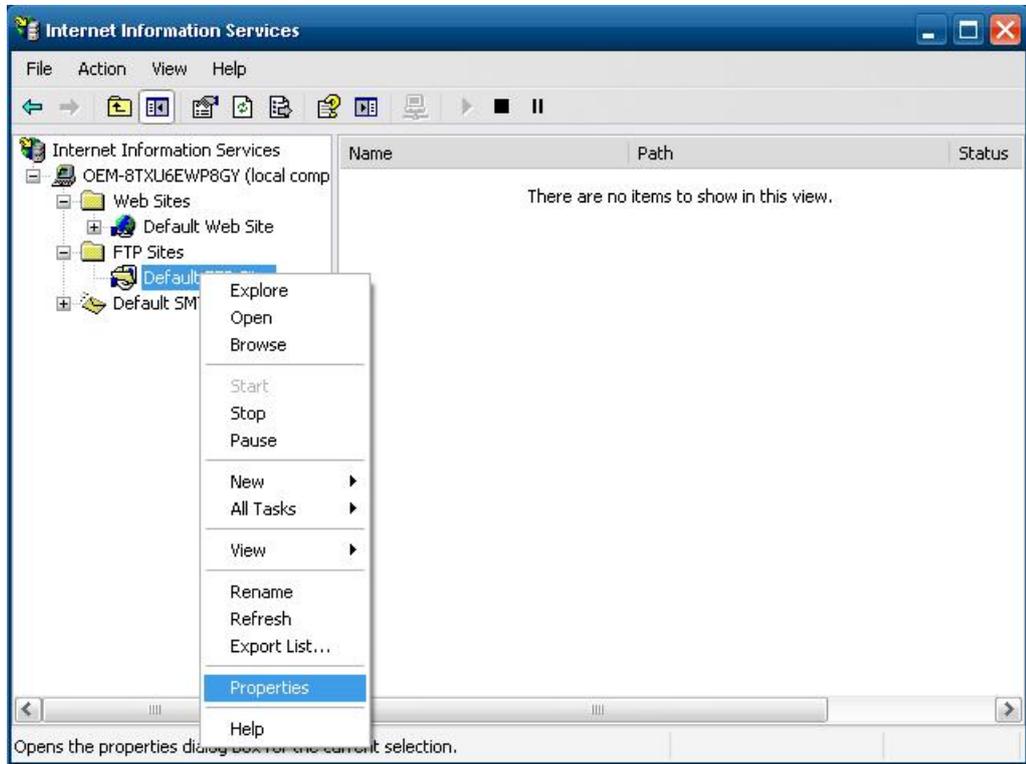
ODBC Data Source Administrator

[Control Panel] → [Administrative Tools] → Data Sources (ODBC)

This database source configuration tool is for users to add, delete, or set up the data source, and then display information about the installed ODBS drivers. You can create a new data source or trace the calls to ODBC functions.
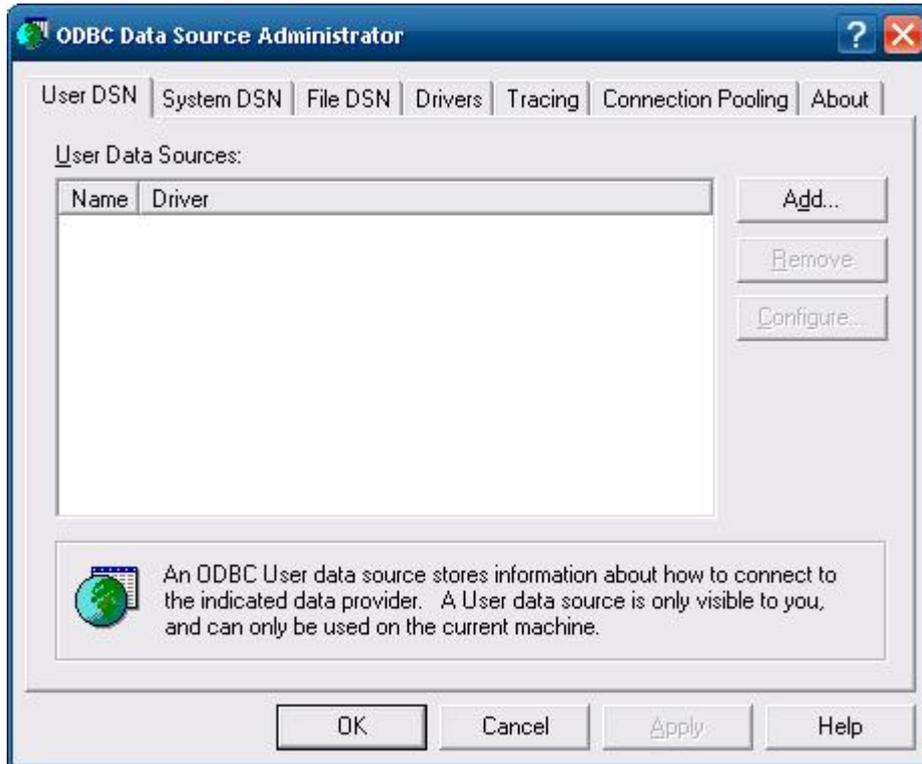
Performance Monitor

[Control Panel] → [Administrative Tools] → Performance. You can use this tool to monitor system and network resources.
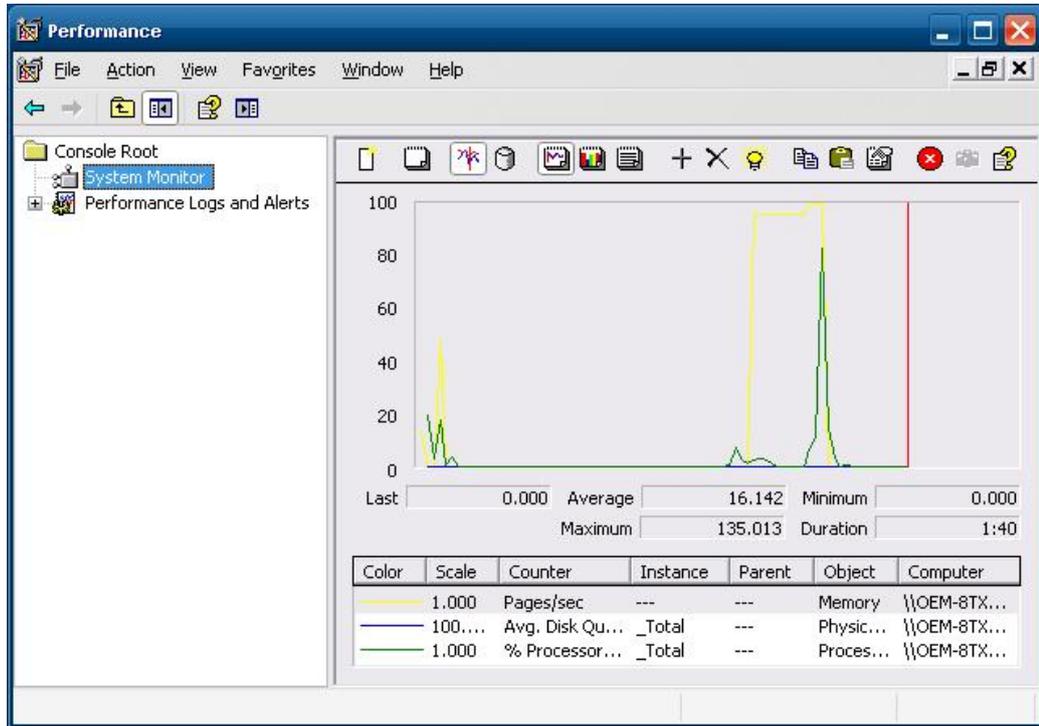
Services

[Control Panel] → **[Administrative Tools]** → **Services**

You can use this utility to start/stop/restart services.

(e.g. If you do not need telnet service you can stop it and set the "startup option" to "manual".)
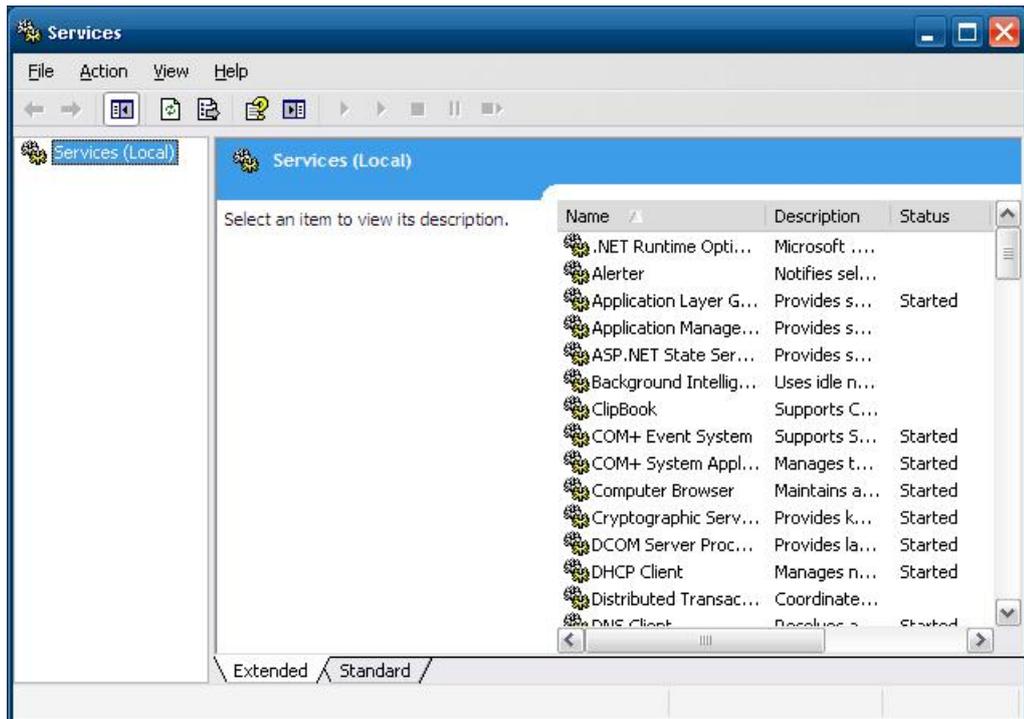
4

System Recovery

The V2401/2402-XPE ready-to-run embedded computers are a Windows Embedded Standard 2009 platform. This chapter describes the recovery process in the event of system instability.

The following topics are covered in this chapter:

❑ **Recovery Environment**
❑ **Recovery Procedure**

Recovery Environment

The environment includes a V2401/2402-XPE embedded computer and a bootable USB disk with the recovery programs and system image file.

Hardware

The hardware used includes a PC, a V2401/2402-XPE computer and a USB disk with the recovery programs. **(Note: The USB disk should be at least 2GB.).**
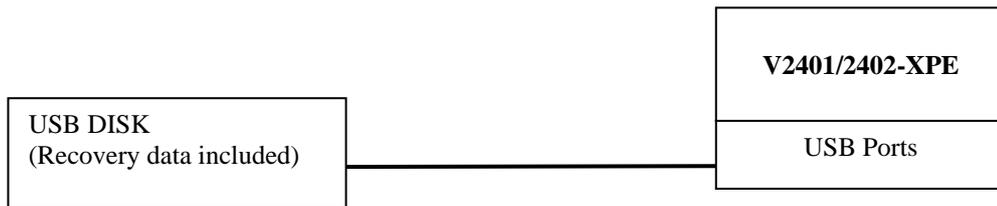
Recovery Procedure

Step 1: Install XPE Disk Recovery

Insert the software CD (in your package) into your computer and find **XPeRecovery.msi** in the **recovery** folder. Double-click **XPeRecovery.msi** to start the setup process and click **Next**.

Click **Browse** and select the folder you wish to install to and then click **Next**.
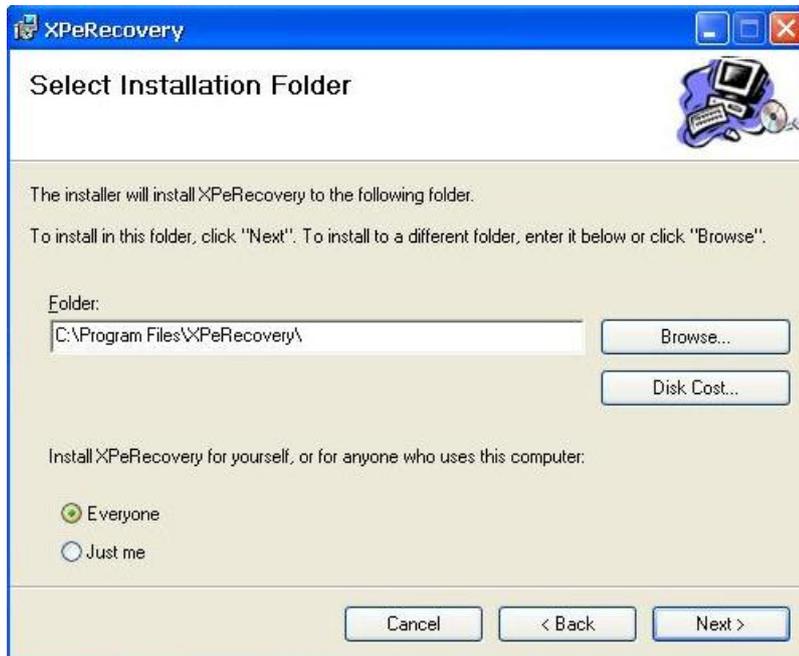
Click **Next** to start the installation.
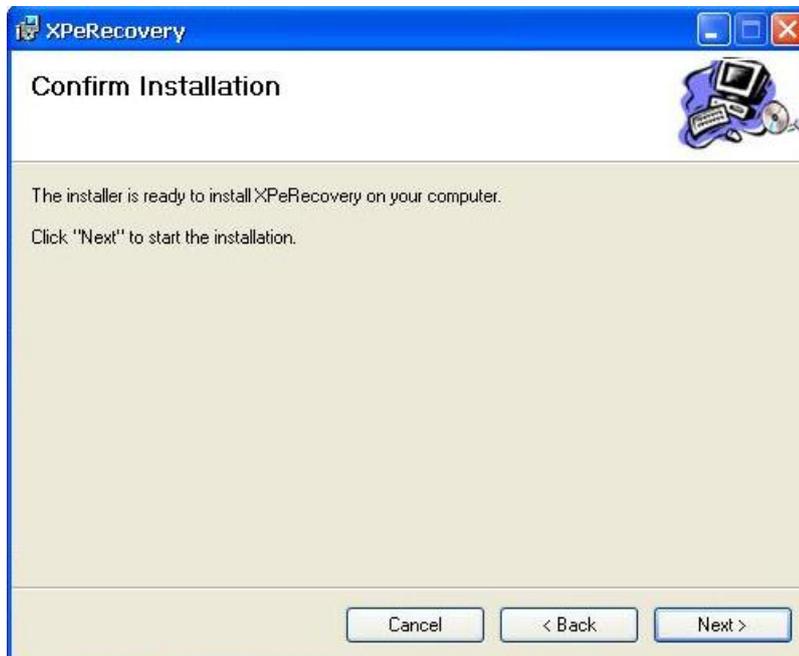
Click **Close** to finish.
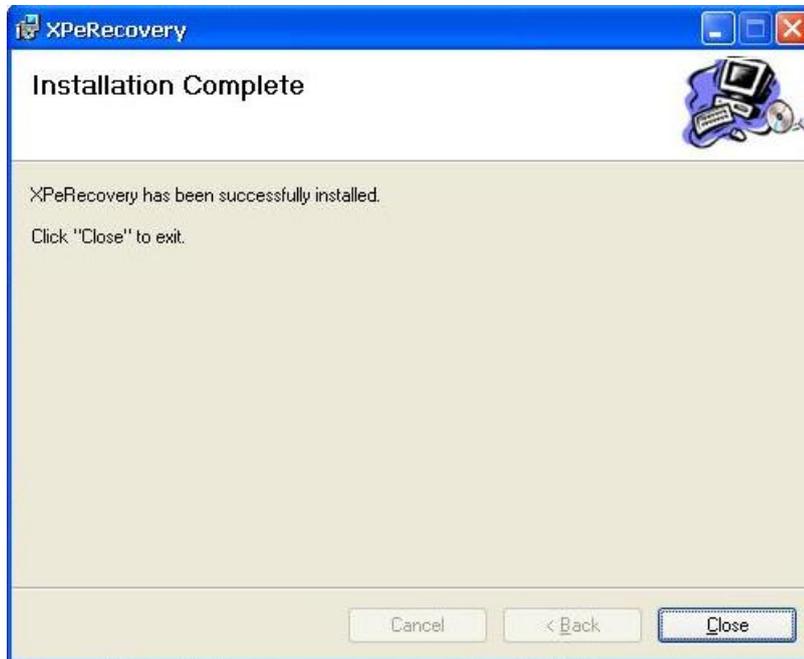
Step 2: Extract Recovery Image from PC to USB disk

After the installation is complete, you will see the **XPeRecovery** shortcut on your desktop. You can start the USB disk recovery utility by opening this shortcut. Double-click the shortcut then click **OPEN** to select the image file. This file is located on the software CD in the **recovery** folder, and the filename is **V2400_V1.0_Build_yymmddhh.wim**. You may also copy this file to your PC. In the following example, we have already copied the image file to the D drive of the PC.
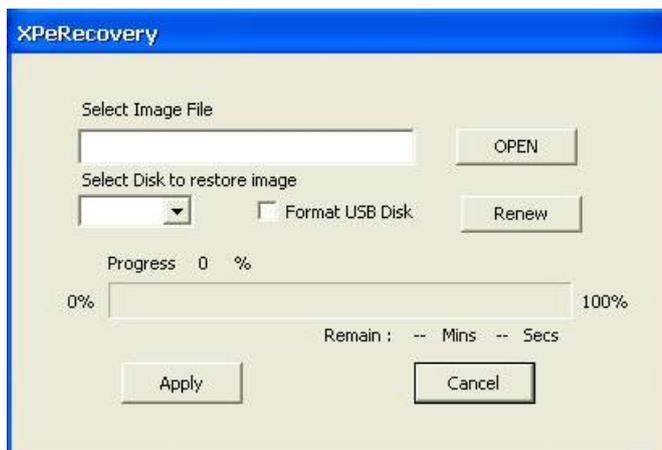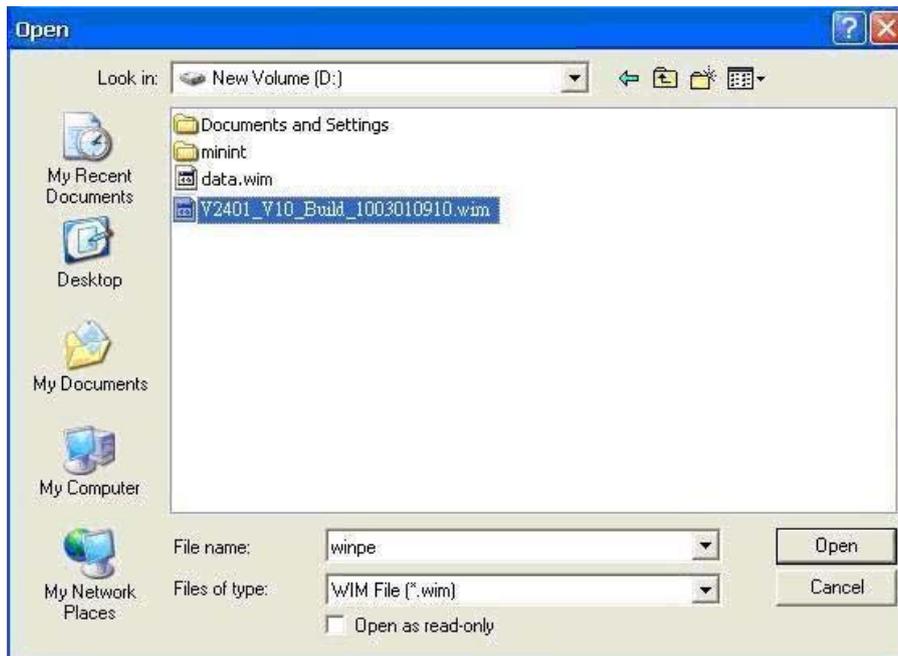
Click the drop-down list and select your USB disk drive letter (in this example, it is the E drive), and check **Format USB Disk**.
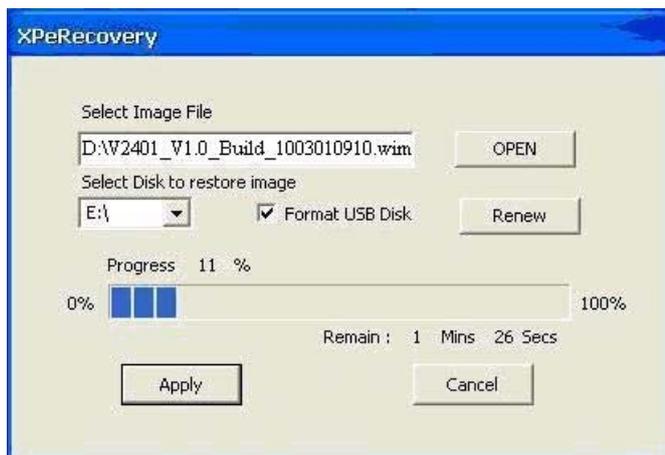
Click **Apply** to start the process; the utility will display the progress and time remaining
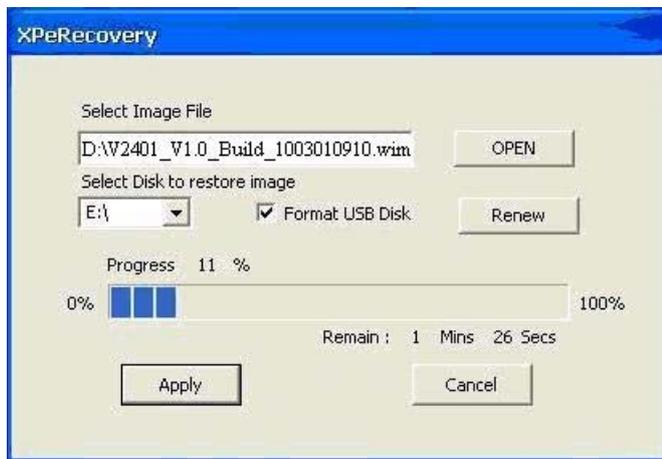
This message will appear when the process is complete. Click **OK**.
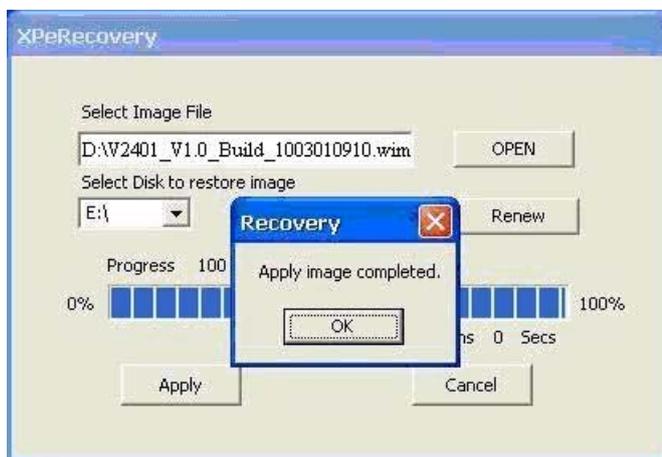
Step 3: Change the BIOS Settings

On the V2401/2402-XPE computer, you need to change the BIOS settings to boot from USB disk. Turn on the computer and press **DEL** to enter the BIOS setup menu. Select **Hard Disk Boot Priority** and press **Enter**.

```
          Phoenix - AwardBIOS CMOS Setup Utility
   Main  Advanced  Peripherals  Power  HW Monitor  Defaults  Exit

 ▶ Hard Disk Boot Priority                            │      Item Help
   First Boot Device         [CDROM]                  │
   Second Boot Device        [Hard Disk]              │ Menu Level    ▶
   Third Boot Device         [Removable]              │
   Boot Other Device         [Enabled]                │ Select Hard Disk Boot
                                                       │ Device Priority
 ▶ Advanced BIOS Features                              │
 ▶ Advanced Chipset Features                           │
 ▶ PnP/PCI Configurations                              │



 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
 F5:Previous Values         F6:Default Settings        F7:Turbo Settings
```

Select USB disk and then press "+" to make it the first boot device. **Warning: Incorrect boot disk priority will lead to recovery failure**.

```
          Phoenix - AwardBIOS CMOS Setup Utility
        Advanced

        Hard Disk Boot Priority                       │     Item Help

   1. USB-HDD0  :   SD/MMC Card Reader                 │ Menu Level    ▶
   2. Ch0 M.    :   AFAYA MDM 1G                        │
   3. Ch0 S.    :   AFAYA CF 256M                       │ Use <↑> or <↓> to
   4. Bootable Add-in Cards                             │ select a device , then
                                                        │ press <+> to move it
                                                        │ up , or <-> to move it
                                                        │ down the list. Press
                                                        │ <ESC> to exit this
                                                        │ menu.



 ↑↓:Move      PU/PD/+/-:Change Priority     F10:Save       ESC:Exit
    F5:Previous Values     F6:System Defaults     F7:Turbo  Defaults
```
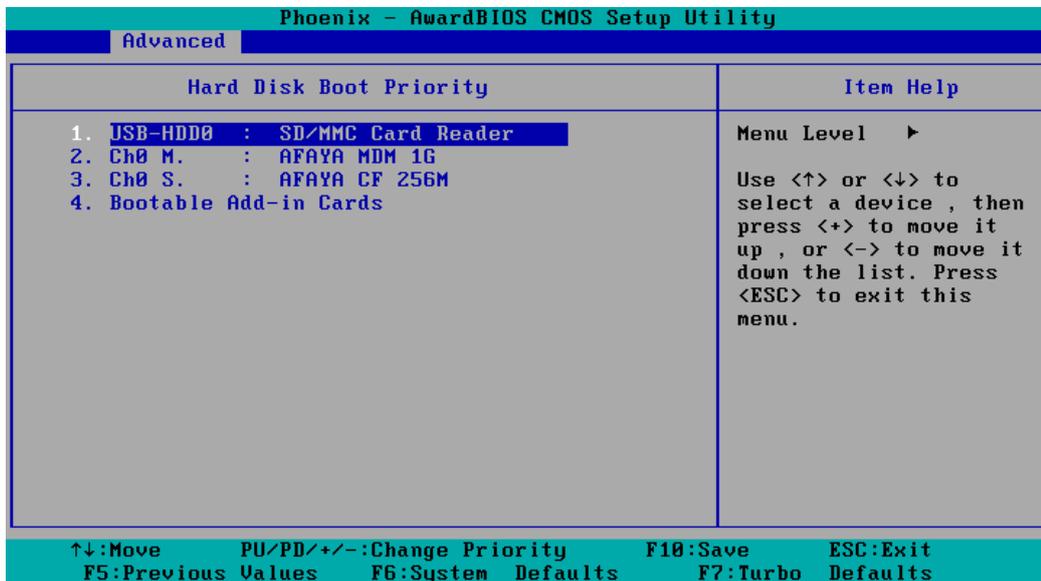
Press **F10** and then press **Enter** to save and leave the BIOS setup.

⚠ **ATTENTION**

Please note that some USB disks will be regarded as the **Removable Device**. If it happens, see the following steps.

a. Select **Removable Device Priority**.

```
               Phoenix - AwardBIOS CMOS Setup Utility
   Main  Advanced  Peripherals  Power  HW Monitor  Defaults  Exit

 ▶ Removable Device Priority                          Item Help
 ▶ Hard Disk Boot Priority
   First Boot Device        [CDROM]           Menu Level    ▶
   Second Boot Device       [Hard Disk]
   Third Boot Device        [Removable]       Select Removable Boot
   Boot Other Device        [Enabled]         Device Priority

 ▶ Advanced BIOS Features
 ▶ Advanced Chipset Features
 ▶ PnP/PCI Configurations




 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
 F5:Previous Values       F6:Default Settings        F7:Turbo Settings
```

b. Make sure that the USB disk has been detected. Press **Esc** to exit.

```
               Phoenix - AwardBIOS CMOS Setup Utility
       Advanced

      Removable Device Priority                      Item Help

  1. USB-ZIP0  :  Afaya Flash Disk            Menu Level    ▶

                                              Use <↑> or <↓> to
                                              select a device , then
                                              press <+> to move it
                                              up , or <-> to move it
                                              down the list. Press
                                              <ESC> to exit this
                                              menu.




 ↑↓:Move       PU/PD/+/-:Change Priority    F10:Save       ESC:Exit
     F5:Previous Values    F6:System Defaults     F7:Turbo Defaults
```
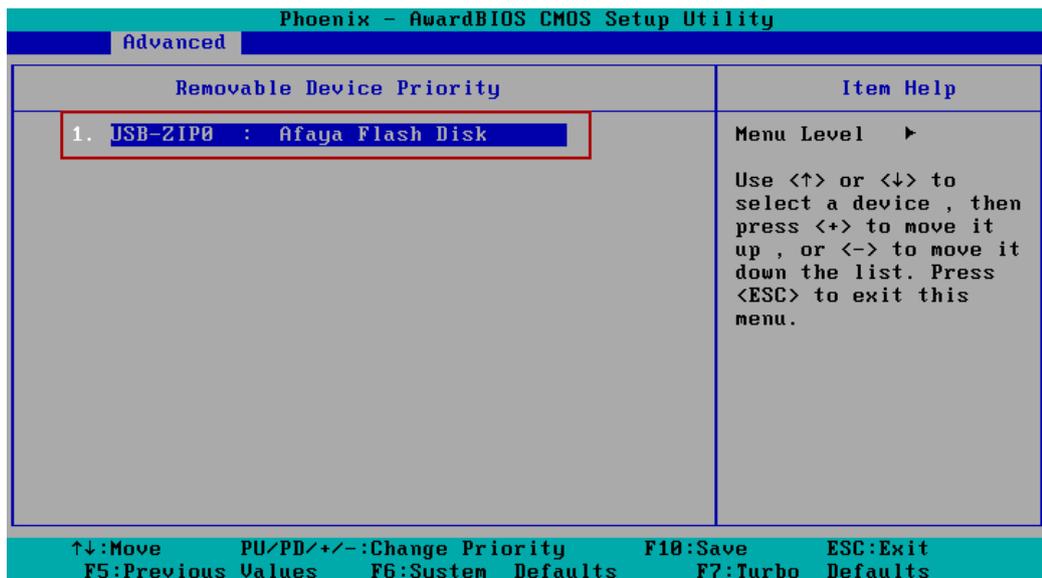
c. Make sure that the **First Boot Device is Removable**. If not, select **First Boot Device**, press **Enter** and select it from the list.

```
                    Phoenix - AwardBIOS CMOS Setup Utility
      Main  Advanced  Peripherals  Power  HW Monitor  Defaults  Exit
   ┌──────────────────────────────────────────┬─────────────────────┐
   │  ▶ Removable Device Priority              │      Item Help      │
   │  ▶ Hard Disk Boot Priority                │                     │
   │    First Boot Device        [Removable]   │  Menu Level    ▶    │
   │    Second Boot Device       [Hard Disk]   │                     │
   │    Third Boot Device        [Removable]   │  Select Your Boot   │
   │    Boot Other Device        [Enabled]     │  Device Priority.   │
   │                                           │  Please set         │
   │  ▶ Advanced BIOS Features                 │  'Peripherals →     │
   │  ▶ Advanced Chipset Features              │   Onboard Device →  │
   │  ▶ PnP/PCI Configurations                 │   Onboard LAN Boot ROM' │
   │                                           │  to enable when you │
   │                                           │  would like to boot │
   │                                           │  from onboard Lan.  │
   │                                           │                     │
   ├──────────────────────────────────────────┴─────────────────────┤
   │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
   │ F5:Previous Values         F6:Default Settings    F7:Turbo Settings │
   └──────────────────────────────────────────────────────────────────┘
```

d.   Select **Exit → Save & Exit Setup** and then press **Enter**.

e.   Choose **Y** to save to the CMOS and then exit.

Step 4: Reboot the Computer and Start Recovery

Insert the USB disk on any USB port of the V2401/2402-XPE, and then reboot the computer. The system will boot from the USB disk and the Windows Pre-installation Environment and the recovery utility will appear. Click **Recover** to start system recovery.

Click **OK** when the recovery process is complete and system will reboot.

Step 5: Change the BIOS Setting to Boot from Original Disk.

Now, you need to change the boot priority so that it can boot from the original disk. As the system reboots, press **DEL** to enter BIOS setup menu. Select **Hard Disk Boot Priority** and press **Enter**. Make sure that the hard disk has first boot priority.

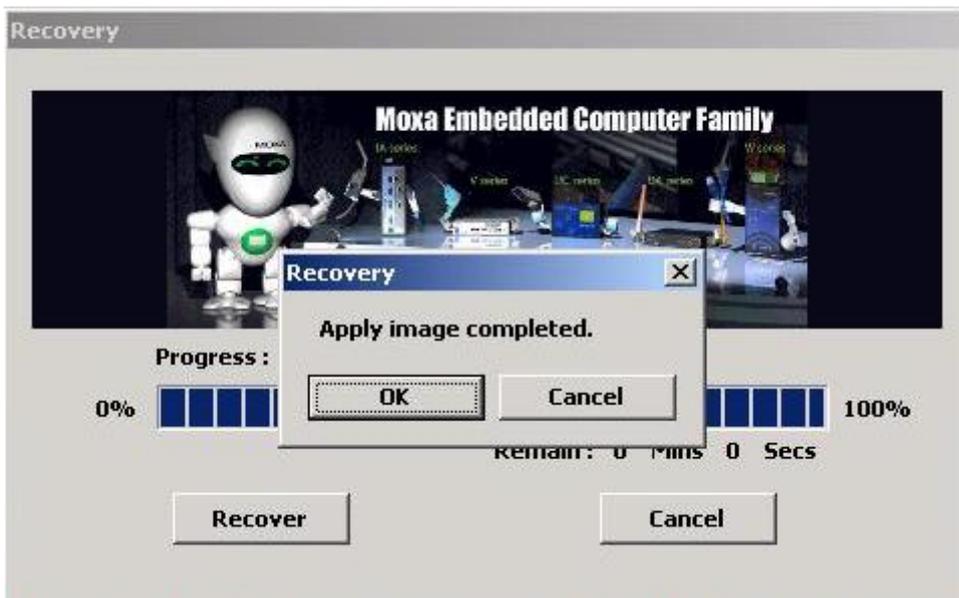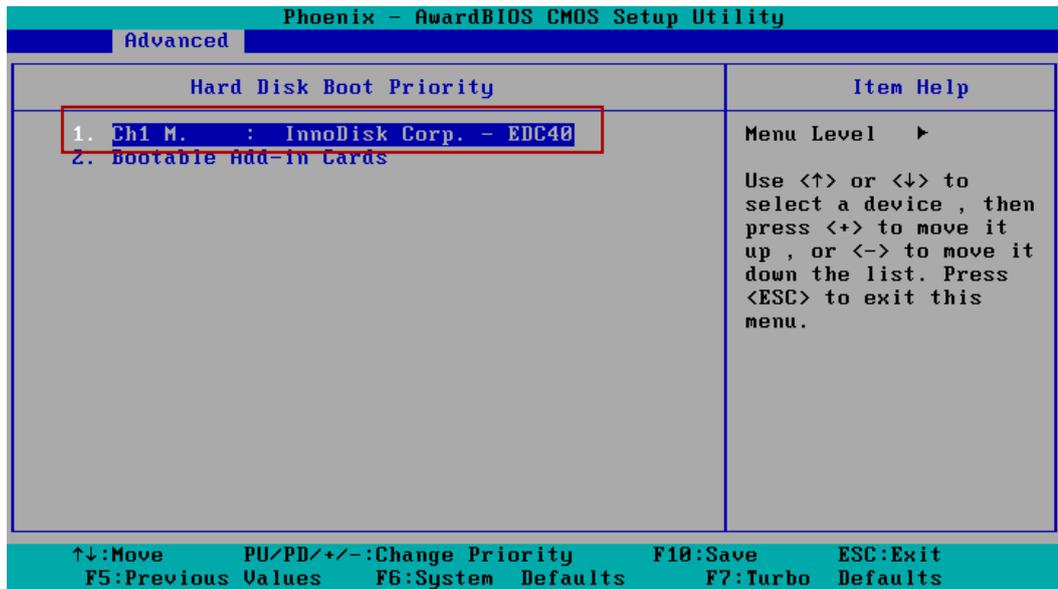Press **F10** and then press **Enter** to save and leave the BIOS settings.

Step 6: Reboot the Computer.

Remove the USB disk from the USB port before restarting and rebooting the V2401/2402-XPE. You need to wait for about ten to fifteen minutes while the system recovers. **DO NOT power off or shut down the computer** during this time or the IIS service will be terminated. When the operating system has successfully launched, you need to restart your computer so that the new settings can be activated.