V2403 Series Windows Software User's Manual

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V2403 Series Windows Software User's Manual

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Introduction

Thank you for purchasing a Moxa V2403 panel computer running the Windows 7 Embedded operating system. The Windows 7 Embedded OS provides a simple and familiar development environment for a variety of industrial applications.

- **Software Components**

Software Components

The following software components of the Windows Embedded Standard 7 OS come pre-installed on the V2403 computer.

Windows Embedded Standard 7

Core OS:

- 64-bit supported
- Remote Client
- Remote Procedure Call

Applications and Services Development:

- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:

- Internet Explorer 8
- IIS 7.0

File Systems and Data Storage:

- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:

- Common Diagnostic Tools
- Problem Reports and Solutions

Fonts: Western, Middle Eastern, South East Asian, and South Asian Fonts

Graphics and Multimedia:

- MPEG Layer-3 Audio Codecs (MP3)
- MPEG4 Decoders
- DirectX and Windows Device Experience

Management:

- Group Policy Management
- Windows Management Instrument (WMI)
- Windows Update

Networking:

- Extensible Authentication Protocol (EAP)
- Internet Authentication Service
- Telnet Server
- Bluetooth
- Domain Services
- Network Access Protection
- Network and Sharing Center
- Quality of Service
- Remote Access Service (RAS)
- Telephony API Client
- Windows Firewall
- Wireless Networking

Security:

- Credential Roaming Service
- Credentials and Certificate Management
- Windows Authorization Manager (AZMAN)
- Windows Security Center
- Active Directory Rights Management
- Security Base
- Encrypted File System (EFS)

Embedded Features:

- Enhanced Write Filter (EWF)
- File-Based Write Filter (FBWF)
- Registry Filter
- WSDAPI for .NET

Embedded Self-Health Diagnostic Software: Moxa Proactive Monitoring & Moxa Smart Recovery

2

System Initialization

In this chapter, we describe how to initialize the system settings on the V2403 embedded computer when booting up for the first time.

The following topic is covered in this chapter:

- **Overview**
- **Initializing User Settings**

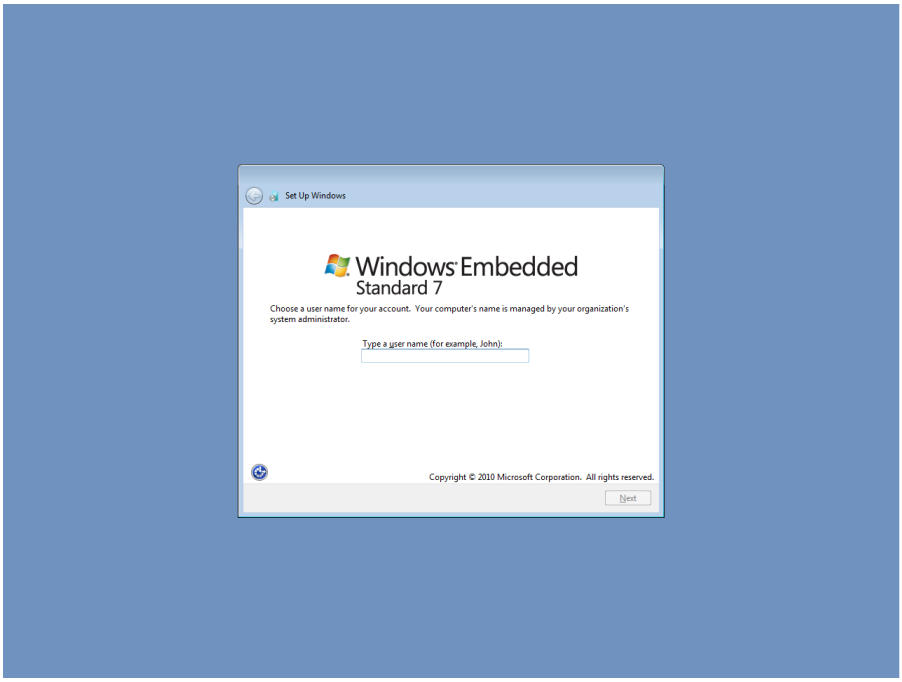
Overview

Similar to using a laptop computer for the first time, you need to specify a user name and create a user account to start using the V2403 embedded computer. Follow the procedure described in the next section.

NOTE If you perform a system recovery on the V2403 embedded computer, the system automatically resets to the factory defaults. You must initialize the user settings again.

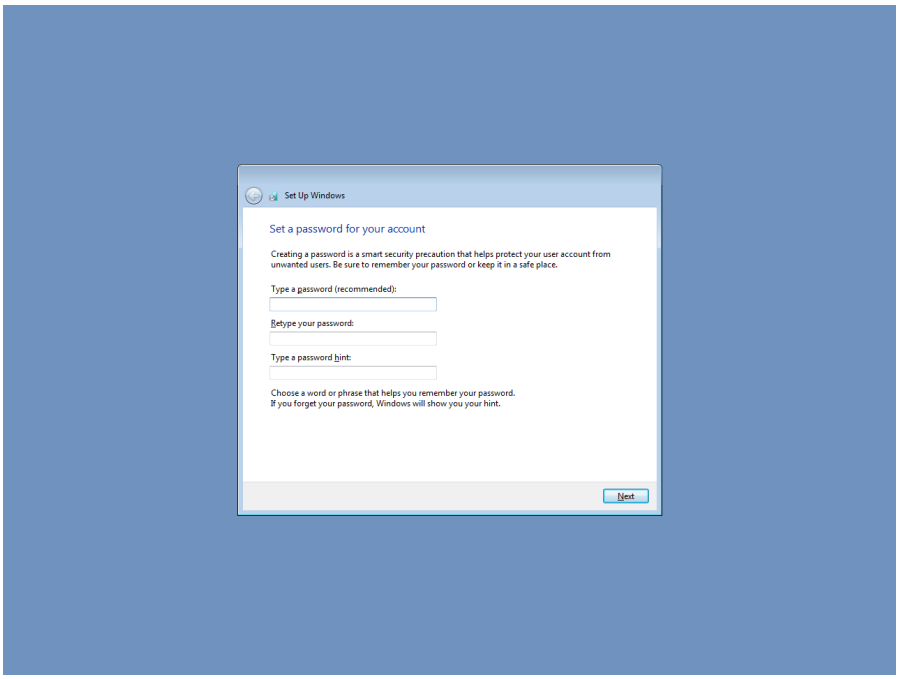
Initializing User Settings

1. When you turn on the embedded computer for the first time, enter a user name for the computer.

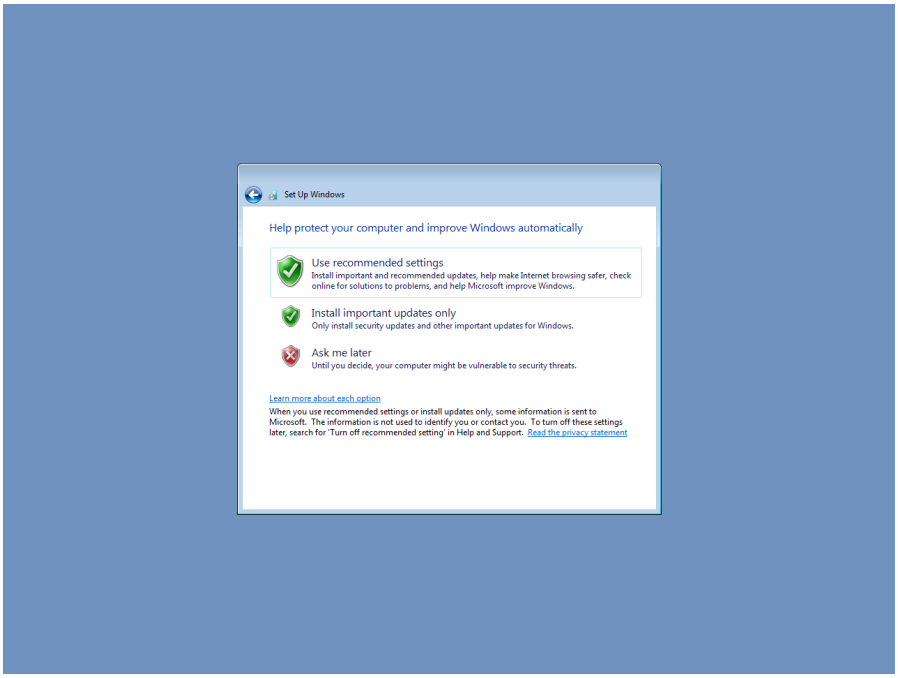


2. Type a password and retype the password to confirm.

   You may also type a password hint that you can refer to if you forget your password. If you do not want to set a password, leave all three fields blank. Click **Next** to continue.

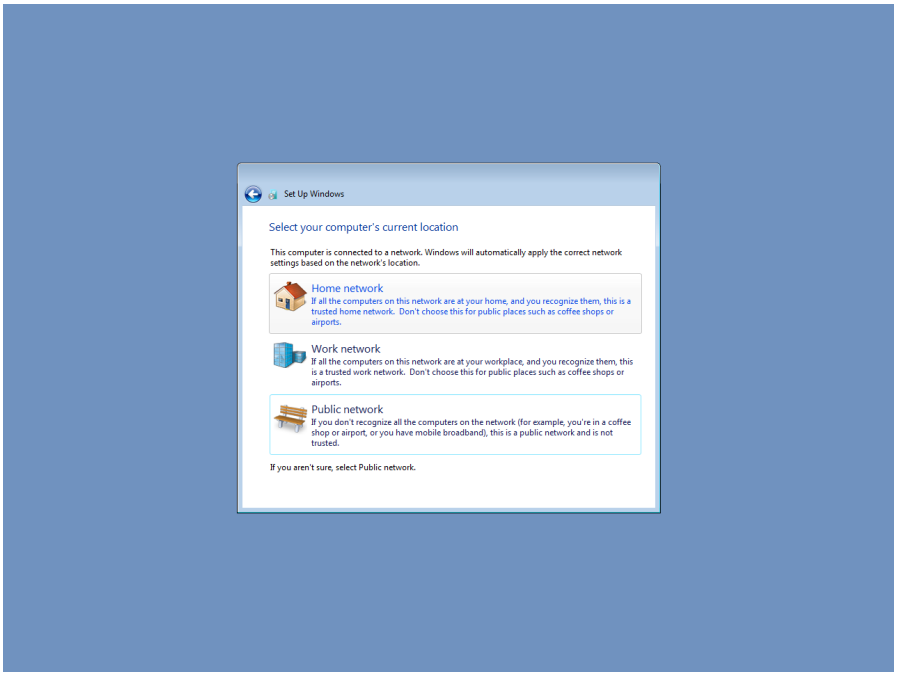


3. Select a Windows update option.



4. Select the computer's current location, and review the time and date settings.

   Windows automatically applies the appropriate network settings based on the type of network you select.



5. When the Windows desktop screen appears, you can start using your V2403 embedded computer.

3

Configuring the Serial Interface

This chapter describes how to configure the serial interface on the V2403 embedded computer.

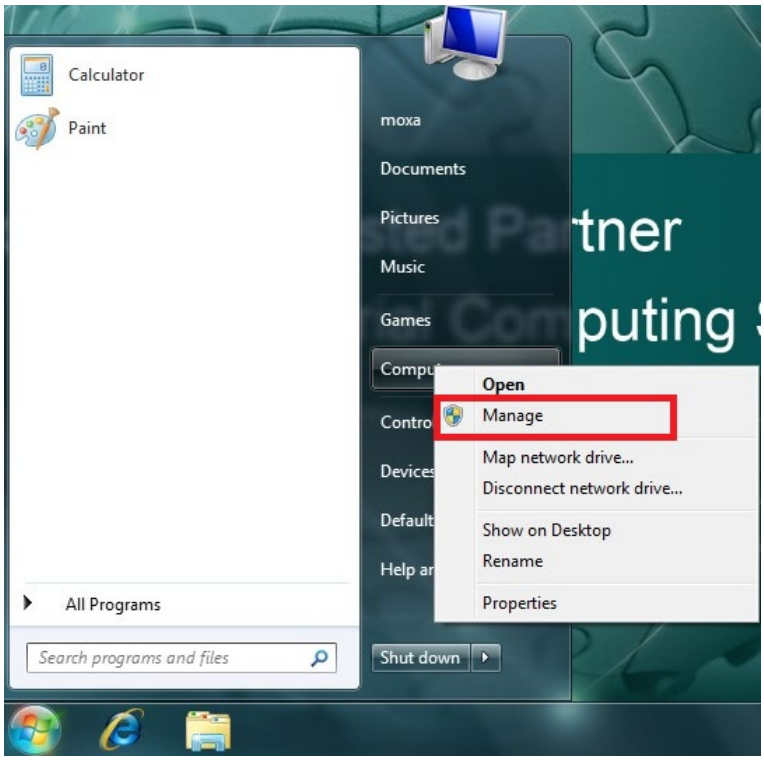
The following topics are covered in this chapter:

- **Configuring the Serial Interface Mode**
- **Changing a Beginning COM Number**

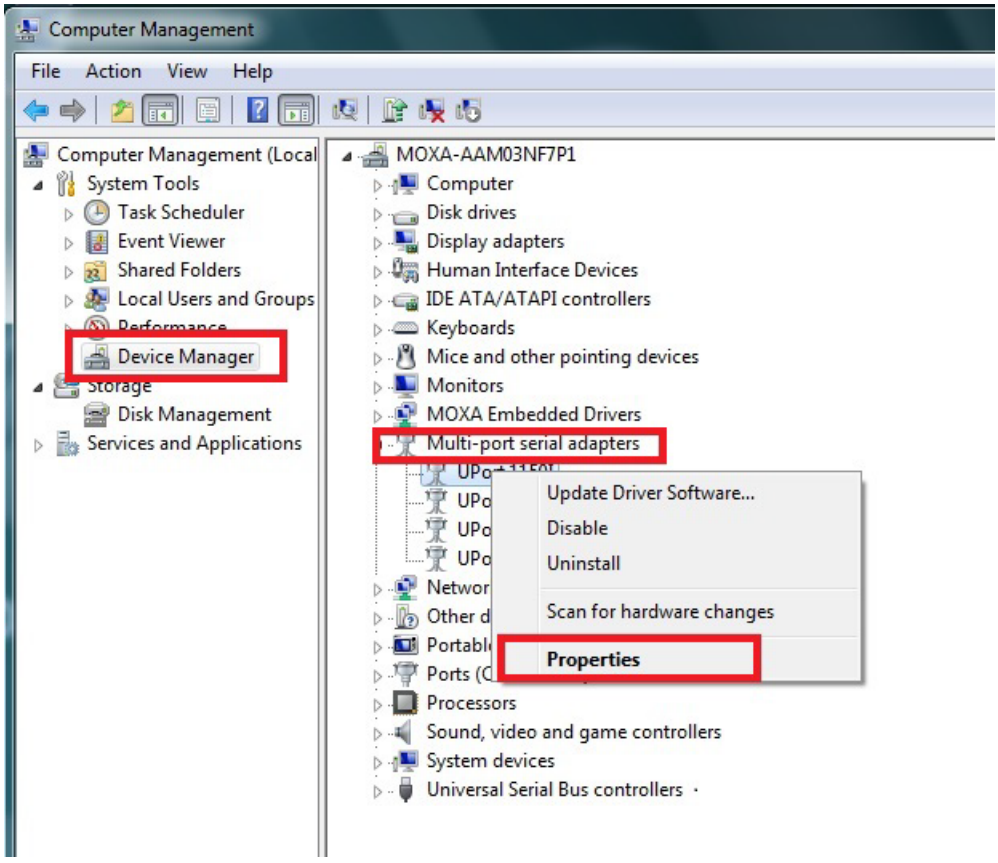
Configuring the Serial Interface Mode

Complete the following steps to configure the serial interface mode:

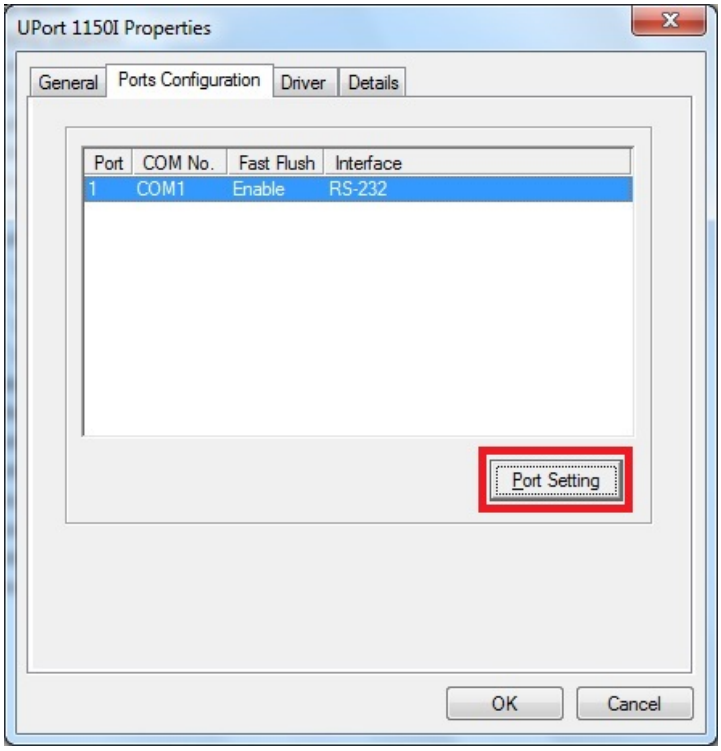
1. From the Start menu, right click **Computer → Manage**.



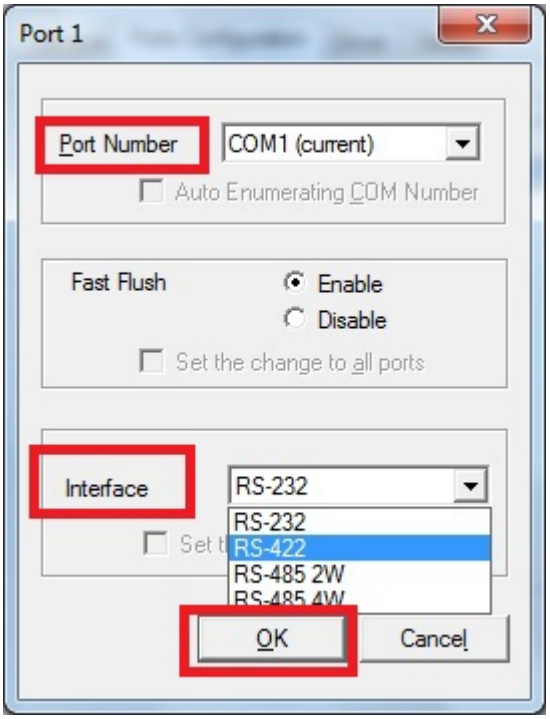
2. In Computer Management, select **Device Manager**, expand **Multi-port serial adapters**, right click the port for which you would like to set the mode, and then click **properties.**



3. Select the **Ports Configuration** folder, and then click **Port Setting**.



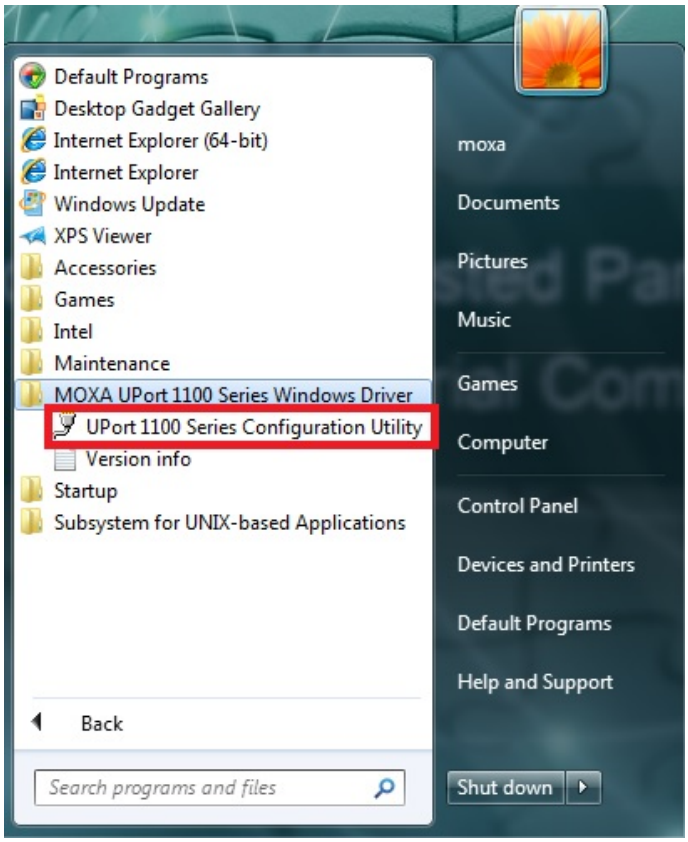
4. Check the Port number and select the mode you want to set. Click **OK** to complete the UART mode setting.



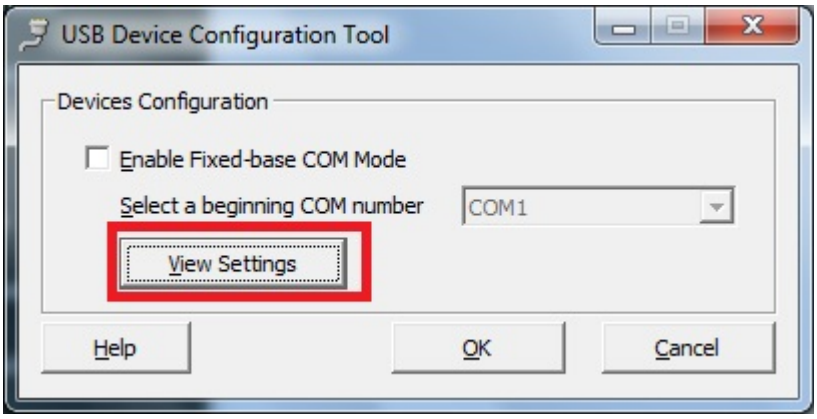
Changing a Beginning COM Number

Complete the following steps to change a beginning COM number:

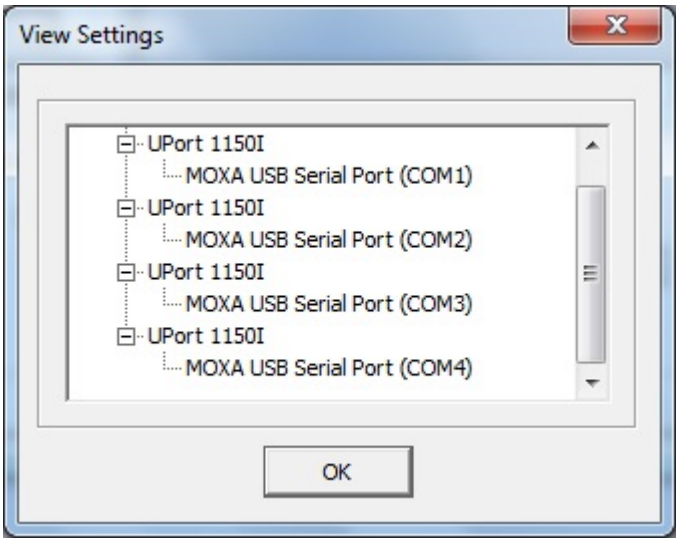
1. Open the **Start** menu, and then under **MOXA UPort 1100 Series Windows Driver** click **UPort 1100 Series Configuration Utility**.



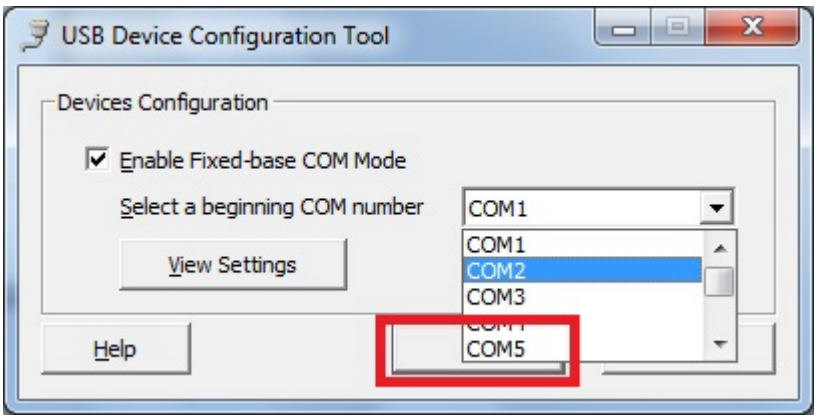
2. Click **View Settings**.



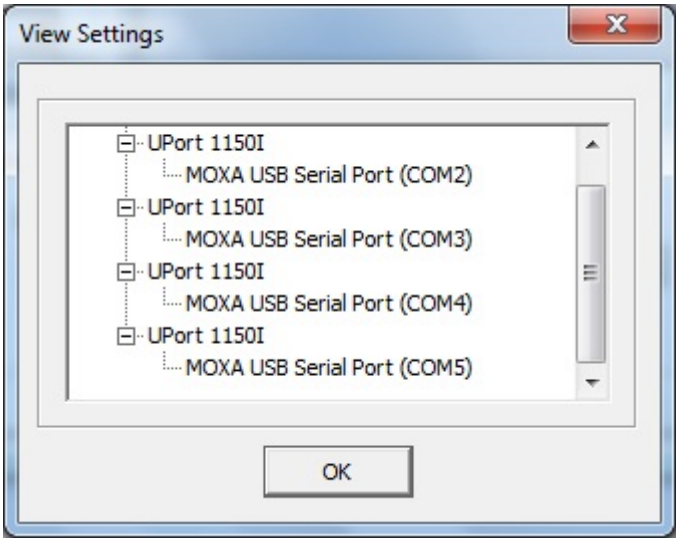
3. In **View Settings**, you can check which ports Windows is using for a **MOXA Serial port**; click **OK** to exit.



4. Select the **Enable Fixed-base COM Mode** checkbox, select a beginning COM number, and then click **OK** to complete the setting.



5. Click **View Settings** again to check that the beginning COM number was changed, and then click **OK** to exit.



4

Enabling Embedded Filters

In this chapter, we describe how to enable the V2403's embedded filters.

The following topics are covered in this chapter:

- **Enhanced Write Filter**
  - Overview
  - Enabling Enhanced Write Filter
  - Committing Data and/or Disabling EWF
- **File-Based Write Filter**
  - Configuring File-Based Write Filter
  - Excluding Files from FBWF Protection
  - Managing Temporary Files Cached in the Overlay

Enhanced Write Filter

Overview

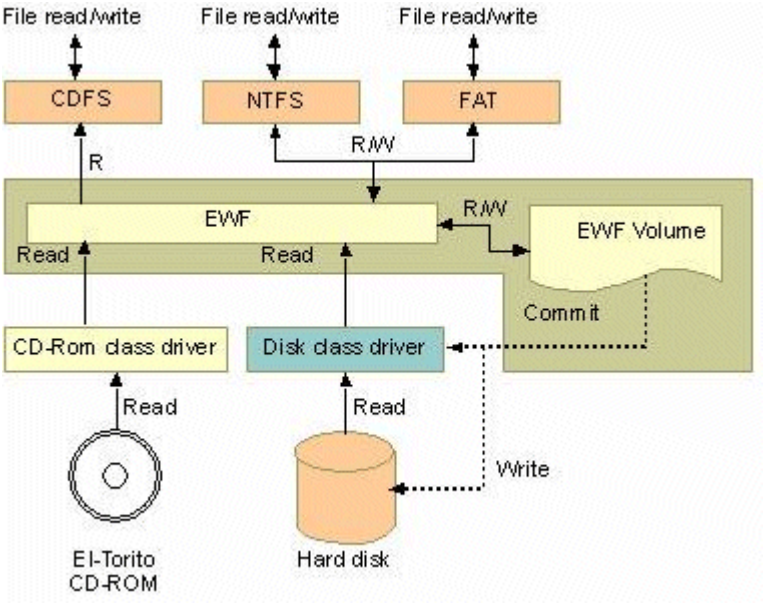
Enhanced Write Filter (EWF) enables you to protect a volume from unauthorized writes by making the main operating system (OS) drive a write-protected volume, effectively making the system a read-only system for most users. This provides much stronger protection against malicious computer attacks (such as trojans, worms, and viruses).

Enhanced Write Filter (EWF) allows Windows 7 users to protect data on their storage drive from permanent changes of any sort, at the lowest level of hardware protection available: the bit level. **EWF** allows the OS to boot from the hard disk, but protects the system by creating a virtual file system called an **overlay**. All writes to a EWF-protected volume (the **hard disk** in the following figure) are only recorded on this virtual overlay (the **EWF Volume** in the following figure), which is stored independently in random access memory (RAM).

Because EWF does not write data directly to the hard disk but instead only records system writes to this virtual RAM overlay, any data that is "written" during system operation will disappear upon the next re-boot. This approach allows the system to operate as if it is writeable when in reality all OS and user-space file systems are stored in a permanent, read-only state.

If required, data written to the overlay can be committed to the protected volume, but this requires additional setup and permissions that can only be granted by the administrator.

The following figure shows an overview of the EWF structure.



For more detailed information about EWF configuration and usage, refer to the following resources:

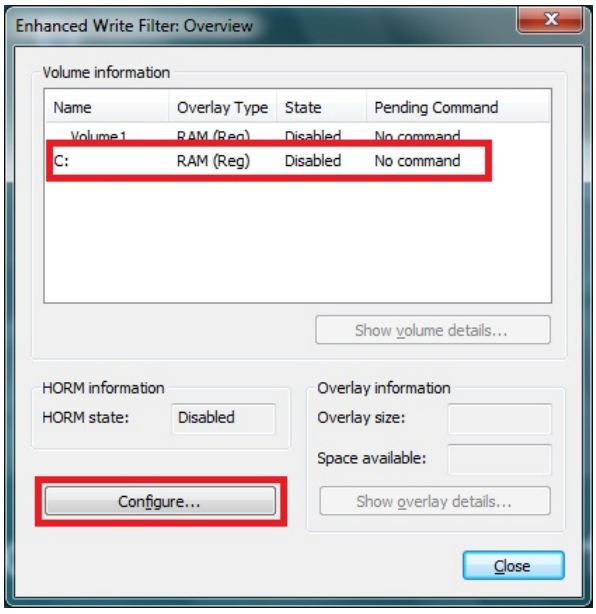
- Visit Microsoft's EWF Volume Configuration help pages.
- See Microsoft's EWF overview on the official Microsoft EWF help pages.
- See Microsoft's detailed description of EWF modes on the EWF help pages.
- See Microsoft's detailed description of the EWF API.
- For EWF commands, refer to the MSDN web site: http://msdn.microsoft.com/en-us/library/ms940853%28v=winembedded.5%29.aspx

Enabling Enhanced Write Filter

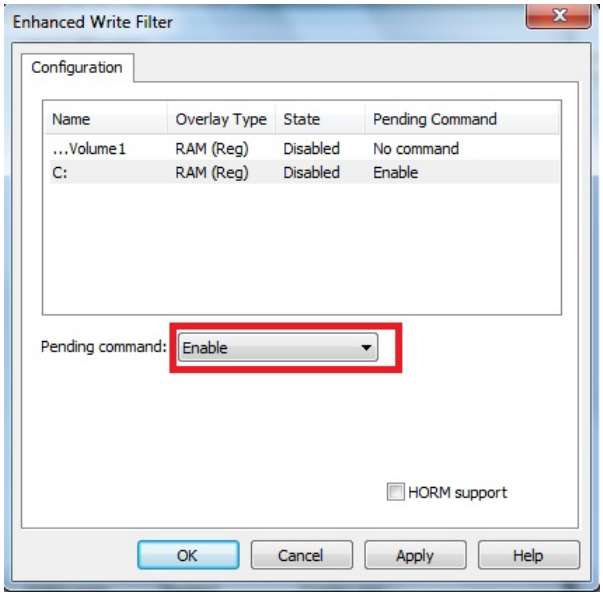
Follow these steps to enable Enhanced Write Filter:

1. To open EWF, double-click the padlock icon in the system tray.
   You may need to show hidden icons in the system tray.

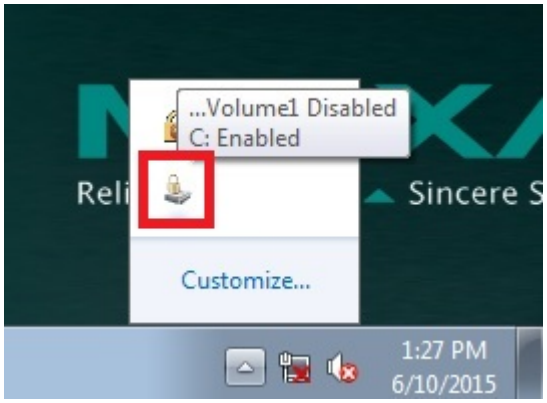
2. In the **Volume Information** area, select the partition you want to enable write-protection on and click **Configure...**.



3. The Configuration dialog box appears. Select **Enable** from the **Pending command** drop-down list and click **OK**.



4. Reboot the system.
5. Log into the system and verify that the padlock icon in the system tray indicates that the drive volume is locked with EWF.

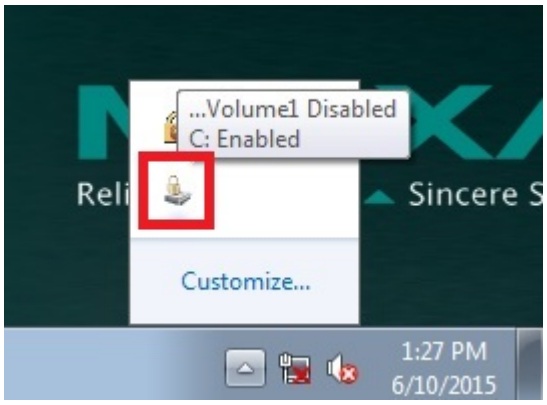


Committing Data and/or Disabling EWF

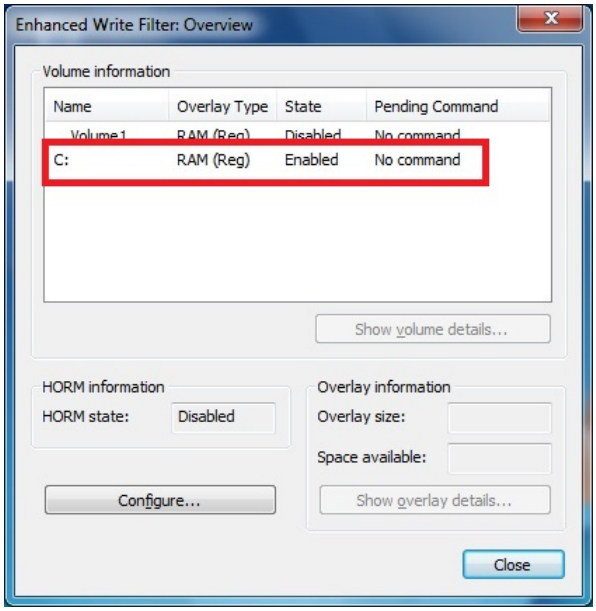
Perform the following steps to write (or commit) data to a EWF-enabled drive.

NOTE You must have administrator privileges to commit data to the drive.

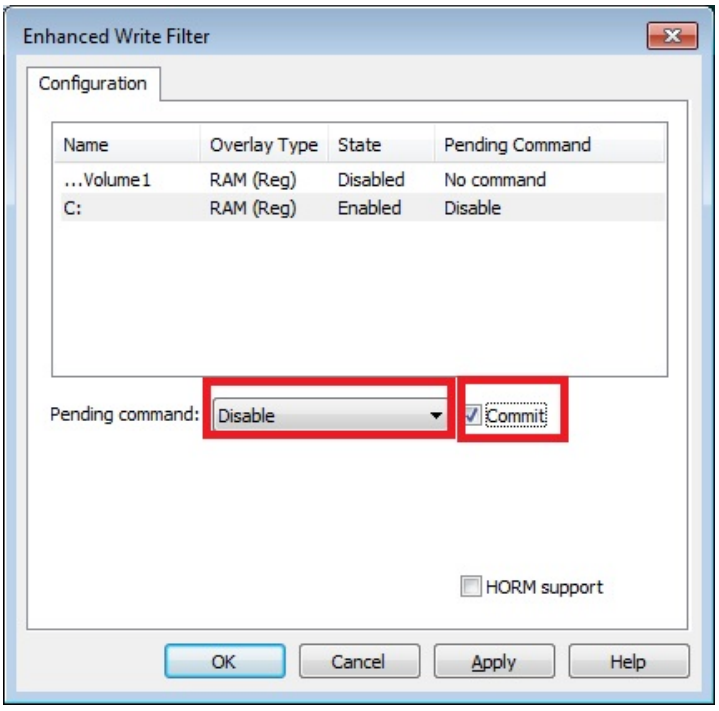
1. Double-click the padlocked drive in the system tray.
   You may need to show hidden icons in the system tray.



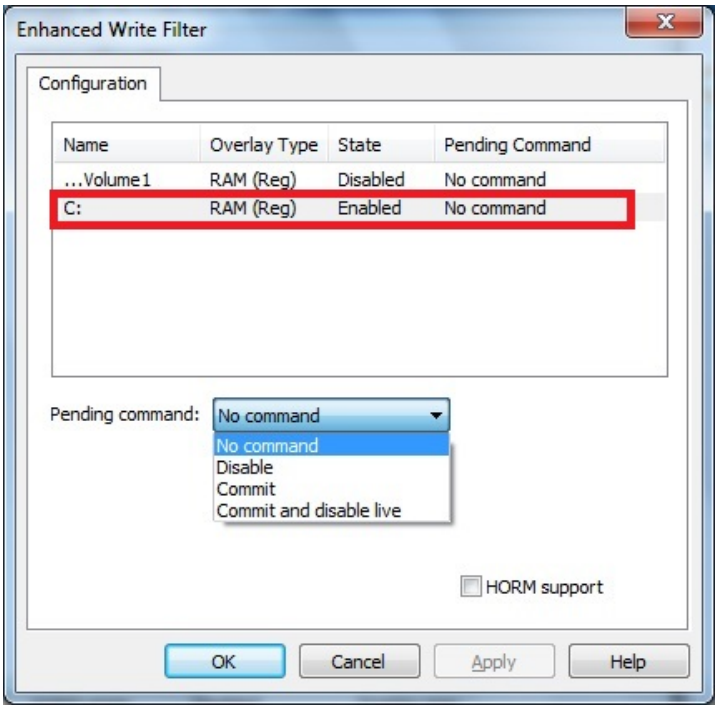
2. In the **Enhanced Write Filter: Overview** dialog box, select the drive you want to configure and click **Configure**.



3. In the Enhanced Write Filter Configuration screen, select a drive volume; then, select an option from the **Pending Command** drop-down list:
   - **No Command**
   - **Disable:** Disables EWF on the selected drive. Select the "commit" checkbox and reboot the system for the changes to take effect.
   - **Commit:** Writes all current system changes to the hard drive.



   - **Commit and Disable Live:** Writes all current data and changes to the system, and also turns off EWF on the selected drive (so that all future data and system changes will also be committed to the drive). The system does not automatically reboot if you select this option.



NOTE For detailed information, go to the Microsoft website at http://msdn.microsoft.com/en-us/library/ff794092(v=winembedded.60).aspx.

File-Based Write Filter

This section describes how to use the File-Based Writer Filter (FBWF). Note that when Enhanced Writer Filter is enabled, the File-Based Writer Filter function will not work.

According to Microsoft:

"File-Based Write Filter (FBWF) allows the Windows Embedded platform to maintain the appearance of read and write access on 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. Used in this context, an overlay is similar 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."

FBWF supports an advanced ESF feature, which allows users to specify which directory to write data to. The default directory is c:\temp. The advanced feature allows you can read/write data to disk without committing an action.

Configuring File-Based Write Filter

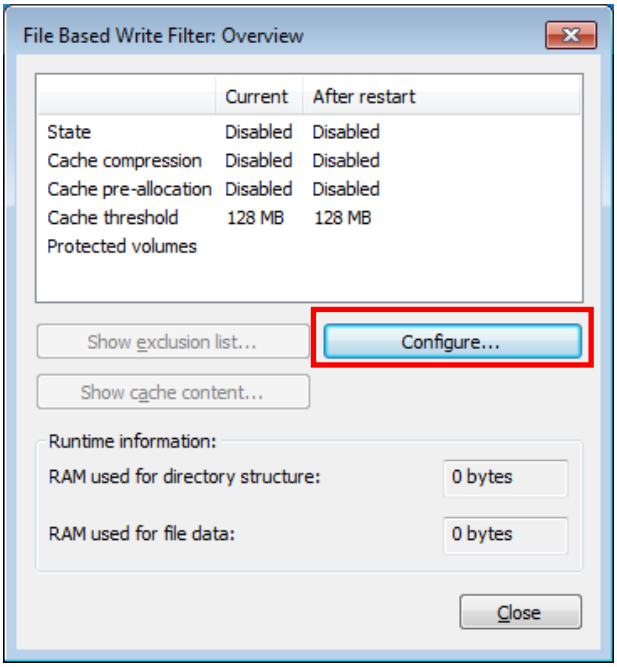
Complete the following steps to enable the File-Based Write Filter (FBWF) feature. Although you can enable FBWF and EWF on the same computer, FBWF does not protect a volume that is already protected by EWF. Similarly, EWF does not protect a volume that is already protected by FBWF.

NOTE Before using FBWF, make sure that you disable EWF.

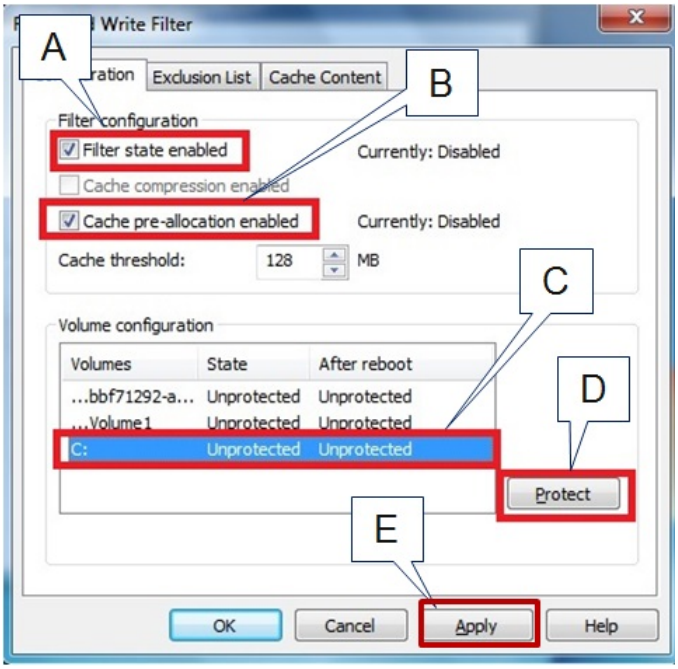
1. Double-click the padlock icon in the system tray.
   You may need to show hidden icons in the system tray.

NOTE When disabled, the EWF and FBWF icons in the system tray look the same. To verify that you have opened the correct writer filter program, check the screen title.

2. In the **File Based Writer Filter: Overview** screen, click **Configure**.

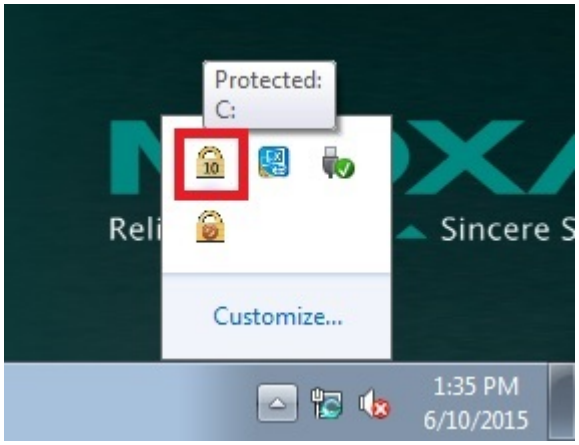


3. To enable FBWF protection on a storage drive, perform the following actions:
   a. Select **Filter state enabled** and **Cache pre-allocation enabled**.
   b. In the **Volume Configuration** area, select the storage drive you want to protect and click **Protect**.
   c. Click **Apply** or **OK**.



NOTE To minimize memory usage on the overlay cache, select **Cache compression enabled**. However, cache compression decreases performance when accessing protected volumes.
Select **Cache pre-allocation enable** to set the memory space available for the overlay cache when the system starts up, instead of adjusting it as needed.
You cannot enable cache pre-allocation and cache compression at the same time.
The **cache threshold** field sets the amount of memory that can be used by the write filter for the overlay cache. The default value and size limits for the overlay cache vary depending on the operating system.

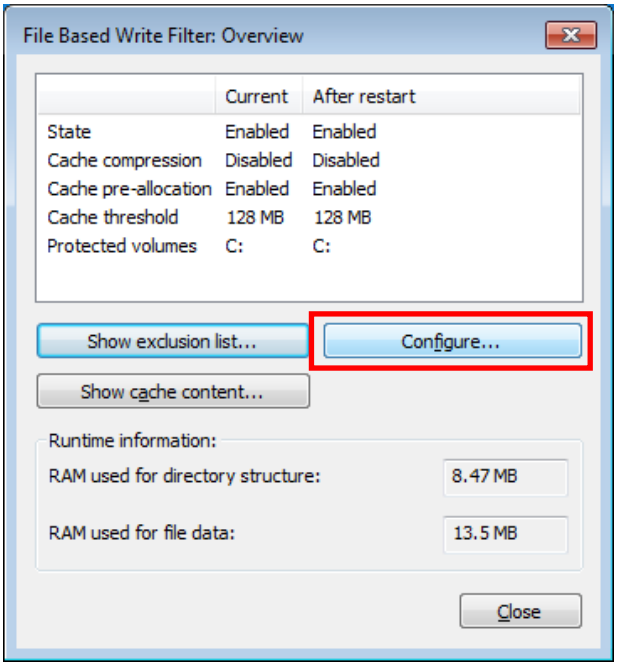
4. Reboot the system.
5. Log into the system and verify that the padlock icon in the system tray displays a number and indicates that FBWF is enabled on a drive. The following figure shows an example.



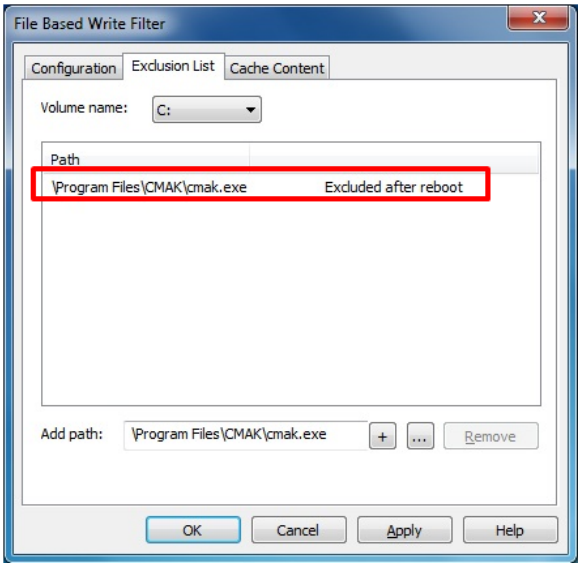
Excluding Files from FBWF Protection

1. Double-click the FBWF icon in the system tray.

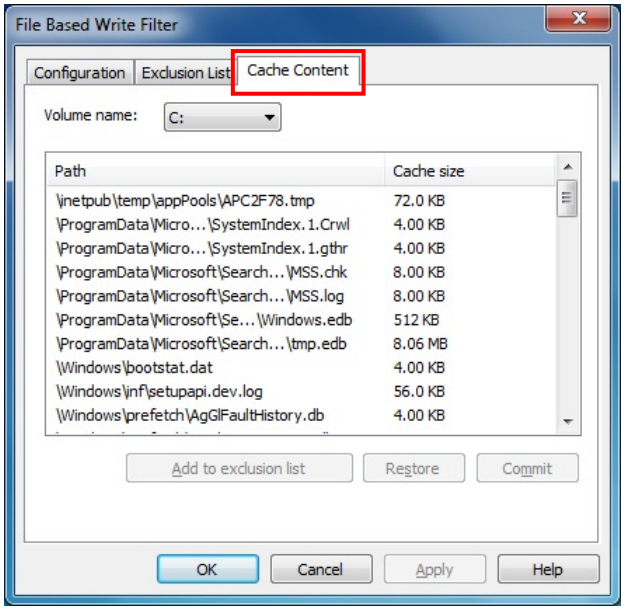
   You may need to show hidden icons in the system tray.
2. In the **File Based Write Filter:** Overview window, click **Configure**.



3. Click the **Exclusion List** tab and configure the following fields:
   - **Volume name** – Select a drive volume from the drop-down list.
   - **Add path** – click the ellipsis (**...**) button to select a directory or file you want to exclude from FBWF protection; then click the **+** button. The system displays the selected directory or file in the **Path** table.



4. Click the **Cache Content** tab and click **Apply** and **OK**

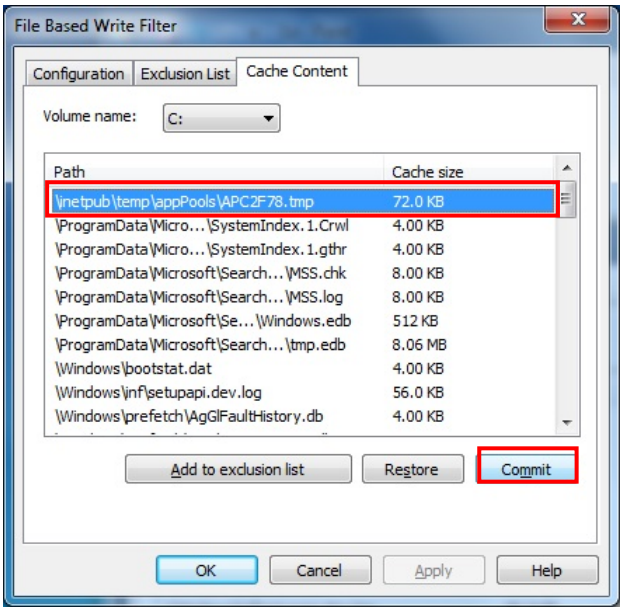


5. Reboot the system to make the changes take effect.

Managing Temporary Files Cached in the Overlay

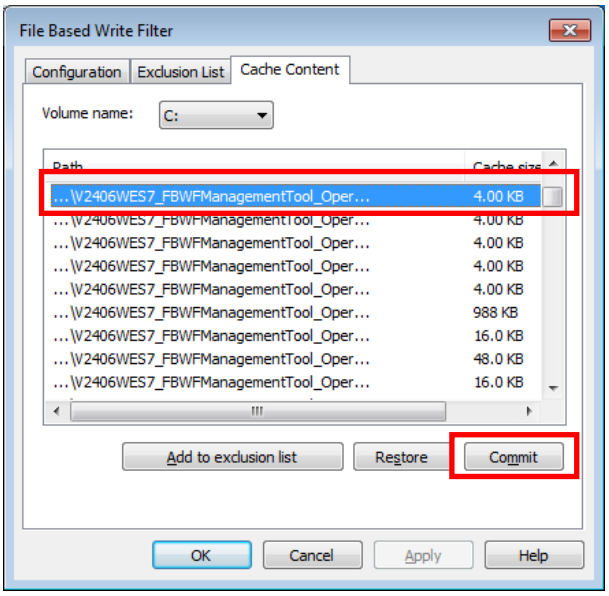
1. On the **Cached Content** tab, you will see all the files currently cached in the RAM overlay. Three commands are available:
   - **Commit**: Save a file from the cache to permanent storage, delete the file from the overlay, and overwrite the original file.
   - **Restore**: Return the file to its original state, remove the file from the overlay cache and discard the changes that added the file to the cache.

- **Add to exclusion list**: Adds the file to the exclusion list after the next restart. This will delete the file from the cached overlay and replace the current file in permanent storage with the modified cache file.



The most common usage of the Cache Content filter will likely be to permanently write content to the hard drive. To do this, select the file you wish to write to permanent memory and click on the **commit** button. This will delete the file from the cached overlay and replace the current file in permanent storage with the modified cache file.

Keep in mind that committing a configuration or application file will permanently alter the setup and/or performance of the application or system.



For more details about FBWF configuration and usage, refer to the Microsoft help file that came with your computer, or go to the following websites:

- Microsoft's FBWF Installation and Configuration help pages.
- Microsoft's FBWF overview on the official Microsoft FBWF help pages.
- Microsoft's detailed description of FBWF features on the FBWF help pages.
- Microsoft's detailed description of the FBWF API.

5

Examples

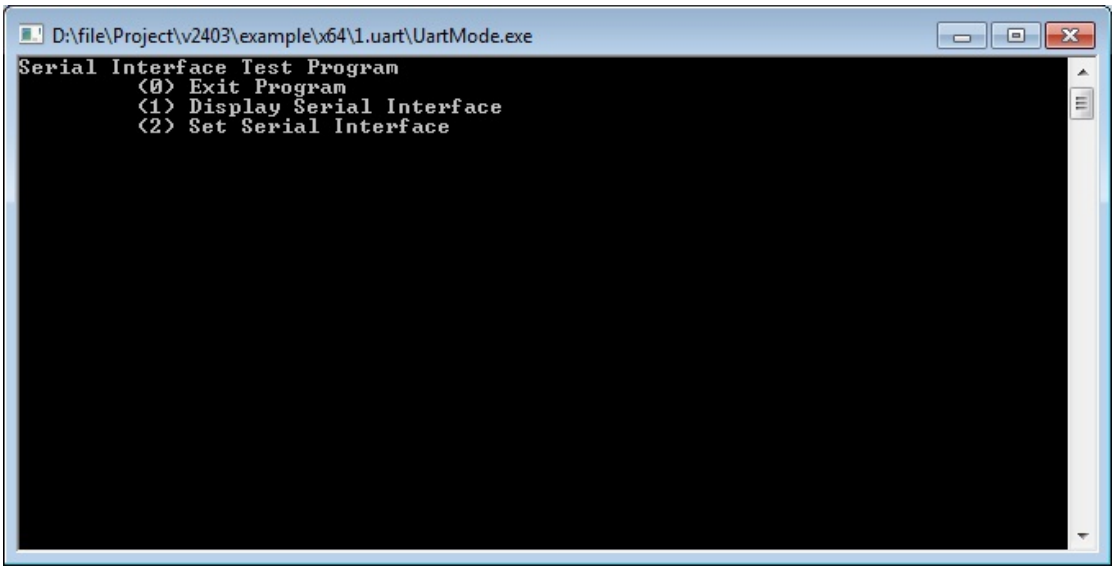
This chapter provides examples to illustrate how to use the V2403 computer for a variety of applications.

The following topics are covered in this chapter:

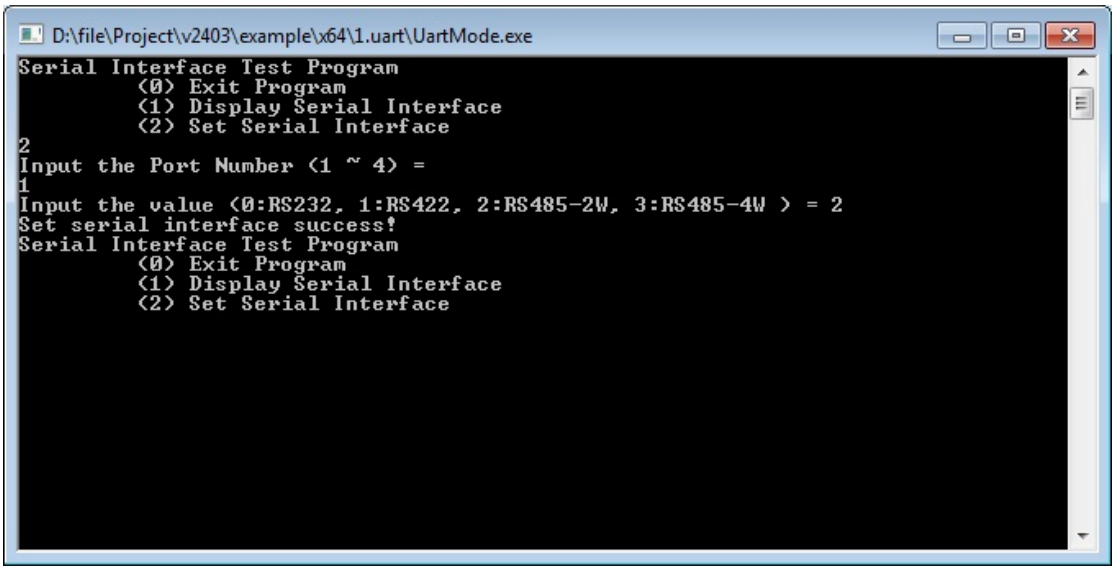
- **Serial Interface**
- **Digital Input/Output**
- **Watchdog**
- **Power Control**
- **Power Reset**

Serial Interface

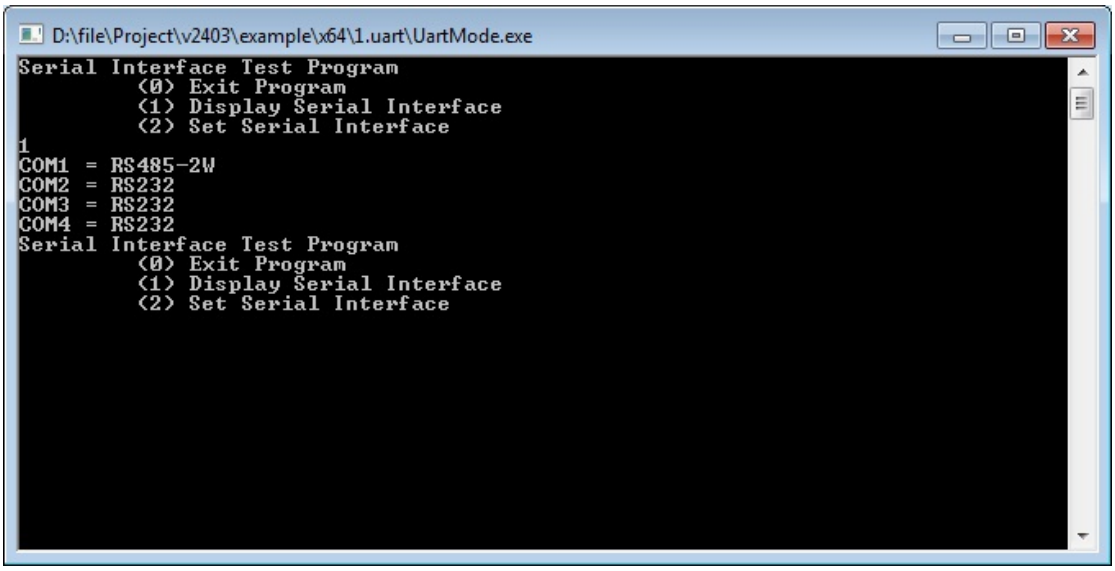
1. Copy the following files from the software CD/DVD to a folder on the V2403.
   - **mxsp.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\mxsp\x64\
   - **mxusapi.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\mxusapi \x64\
   - **UartMode.exe:** Examples\V2403-W7E_V1.0-Example\Release\x64\
2. Execute **UartMode.exe**.



3. Type **2** to set the serial interface, and then follow the on-screen instructions.

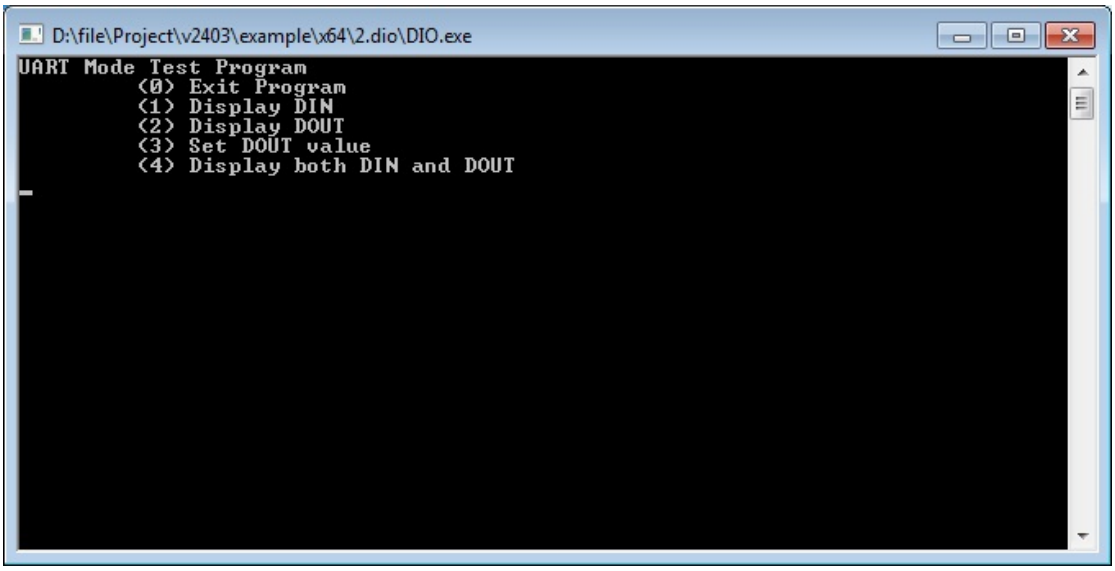


4. Type **1** to display the current serial interface settings.

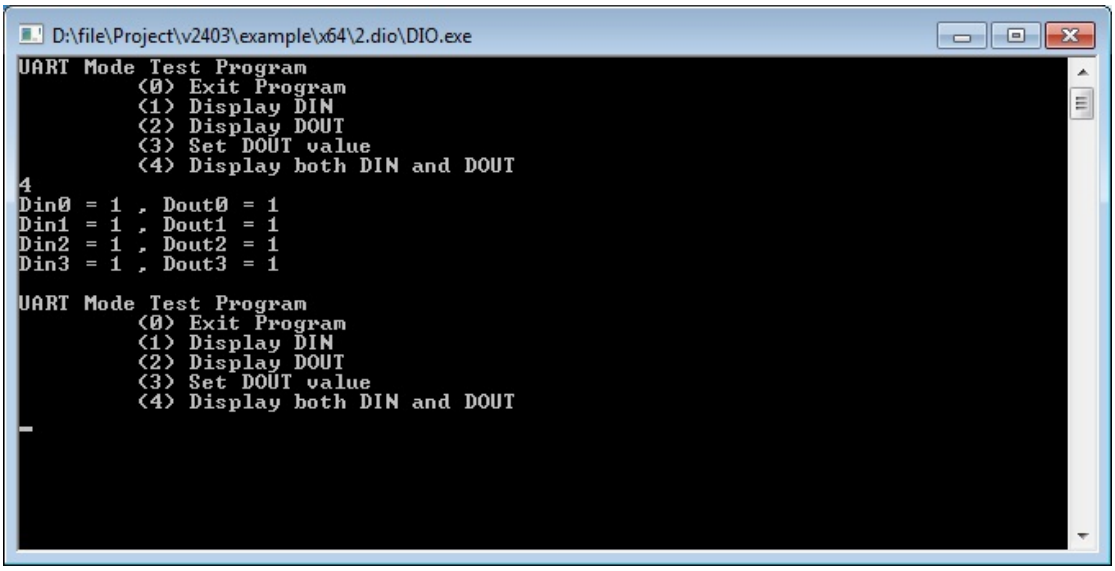


Digital Input/Output

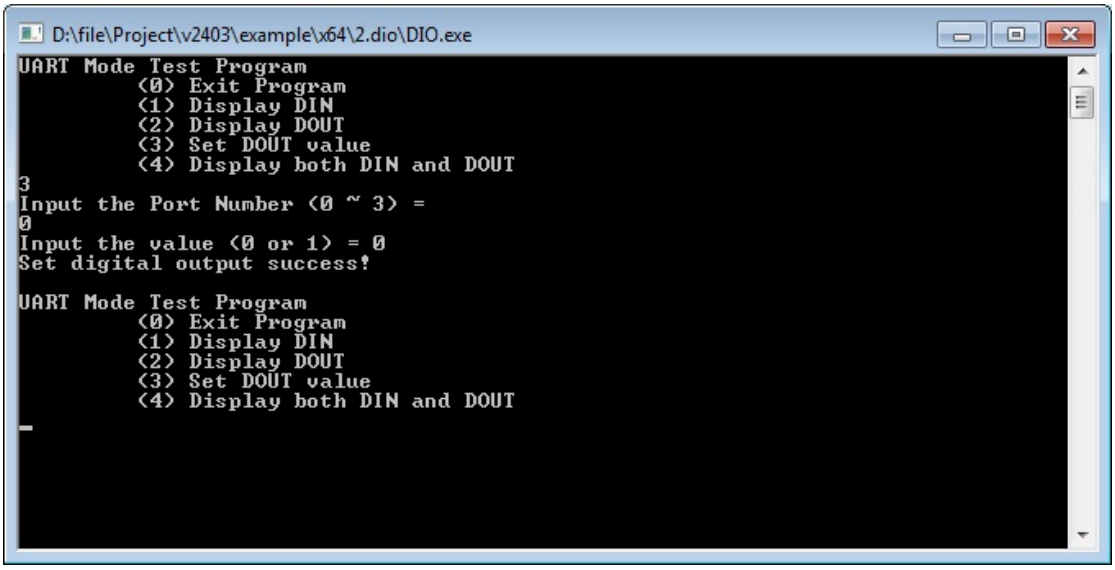
1. Copy the following files from the software CD/DVD to a folder on the V2403.
   - **mxdgio.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\mxdgio\x64\
   - **mxGeneralIo.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\MxGeneralIo\x64\
   - **DIO.exe:** Examples\V2403-W7E_V1.0-Example\Release\x64\
2. Execute **DIO.exe.**



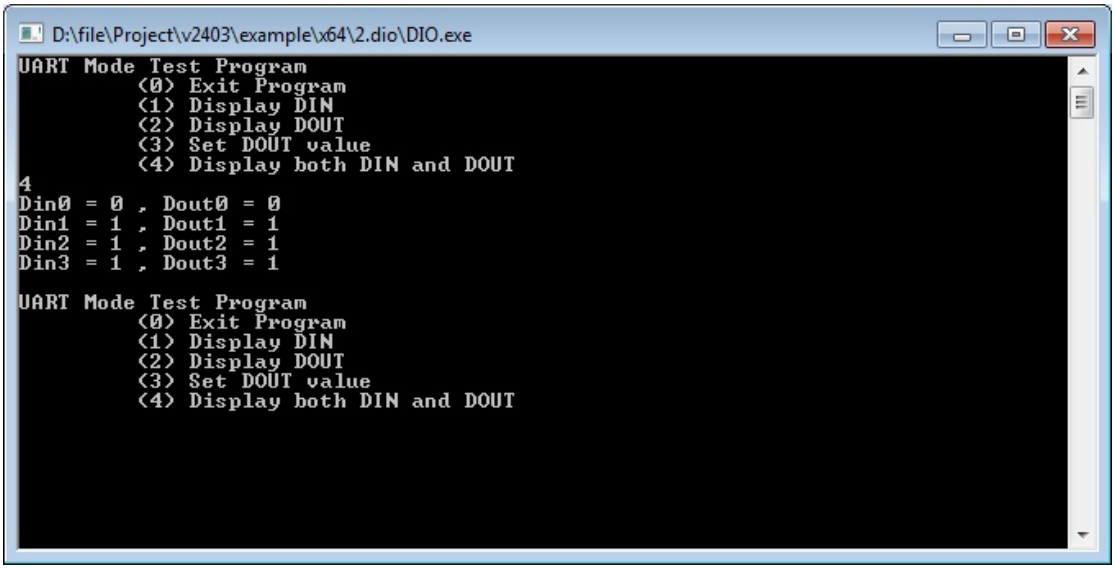
3. Type **4** to display the current DI and DO values.



4. Type **3** to set the DOUT port number, and then follow the on-screen instructions.

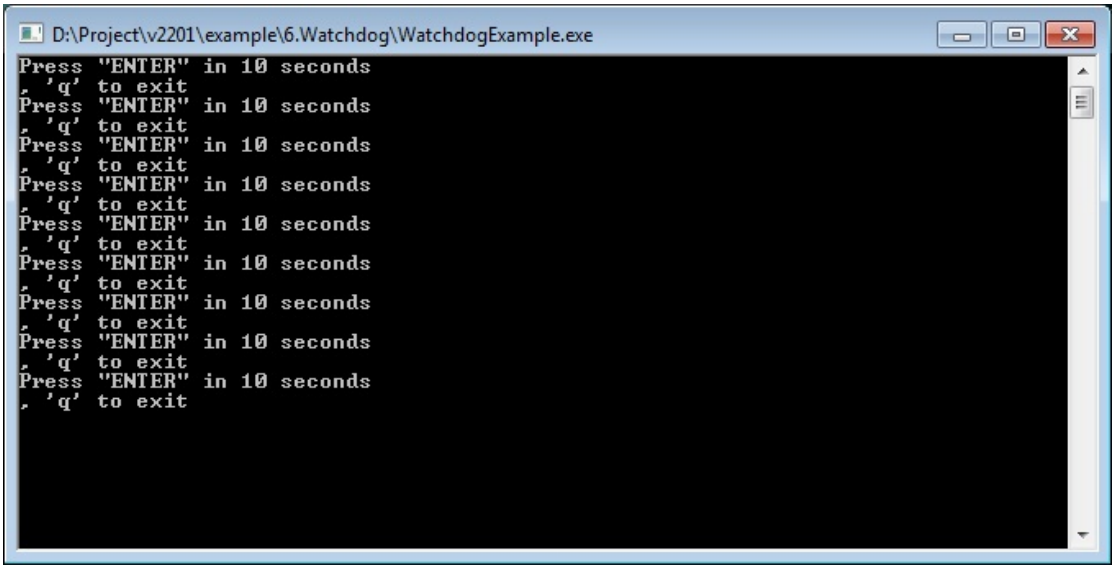


5. Type **4** to check if the port value was set correctly.



Watchdog

1. Copy the following files from the software CD/DVD to a folder on the V2403.
   - **mxdwg.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\mxdwg\x64\
   - **mxGeneralIo.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\MxGeneralIo\x64\
   - **Watchdog.exe:** Examples\V2403-W7E_V1.0-Example\Release\X64\
2. To prevent the system from rebooting, press [Enter] at least once every 10 seconds; otherwise, the system will reboot automatically.

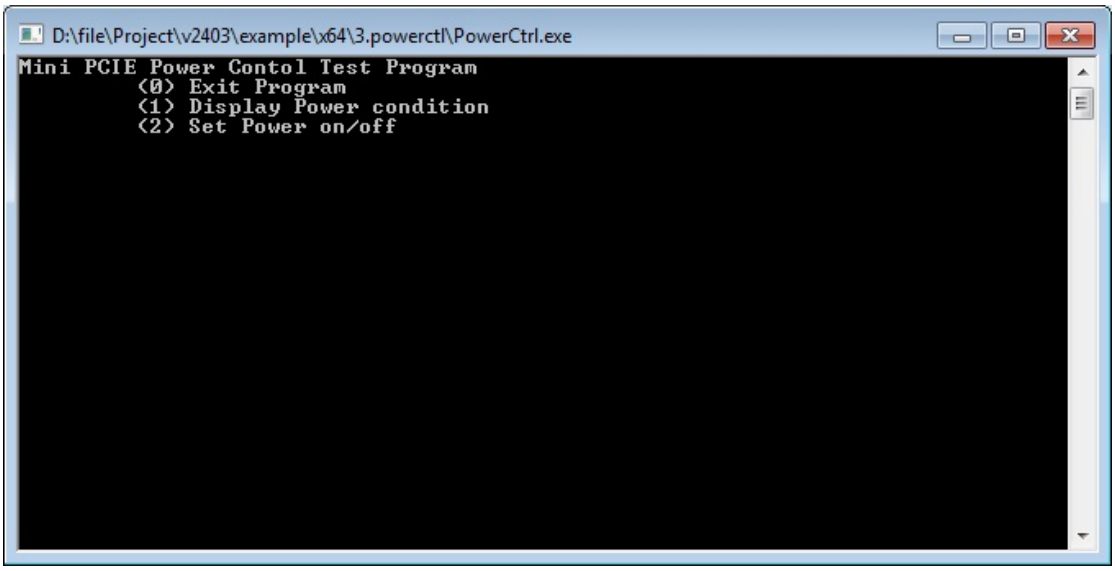


3. To stop the watchdog, press **q** to exit the program

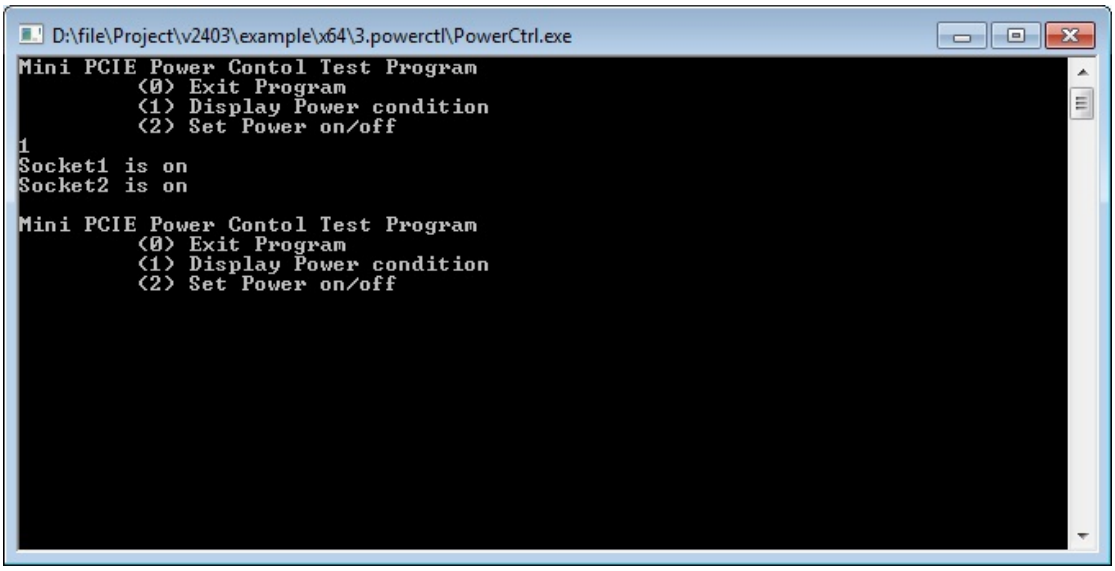
Power Control

In this section, we illustrate how to use the test utility to control power through the mini-PCIE interface.

1. Copy the following files from the product software DVD.
   - **mxgpio.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\mxgpio\x64\
   - **mxGeneralIo.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\MxGeneralIo\x64\
   - **PowerCtrl.exe:** Examples\V2403-W7E_V1.0-Example\Release\x64\
2. Execute **PowerCtrl.exe**.



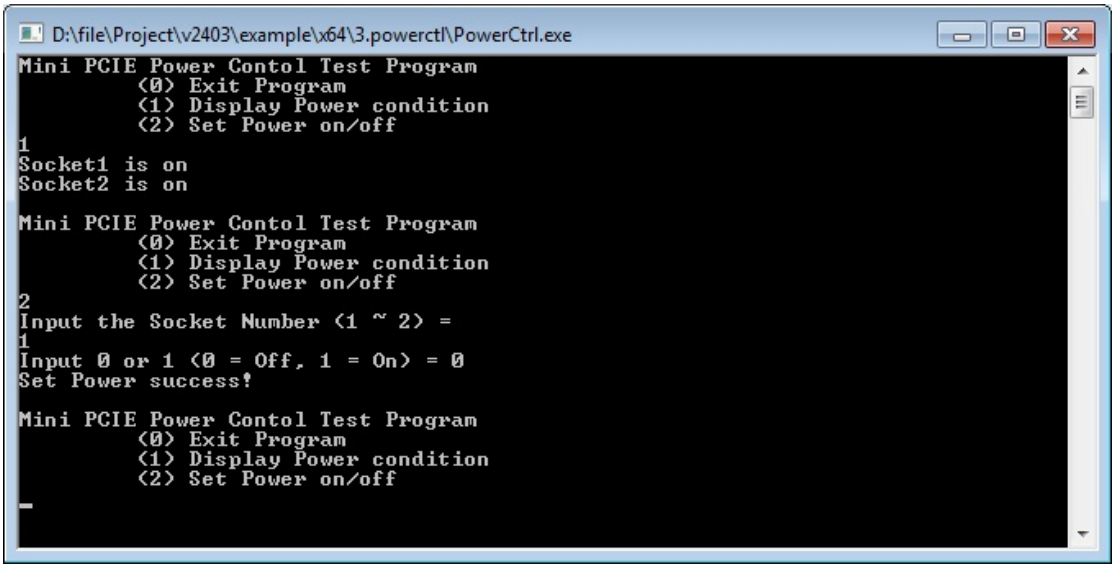
3. Type **1** to display the current power status.



4. Type **2** and follow the on-screen instructions to set the power value.

   When you set the power value to 0, the power turns off.

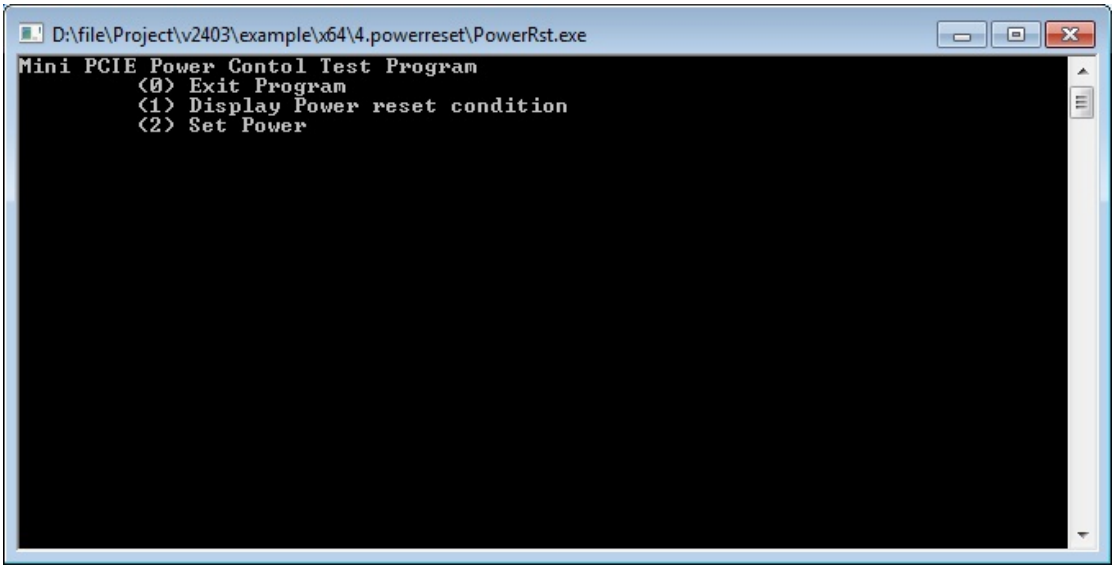
   When you set the power value to 1, the power turns on.



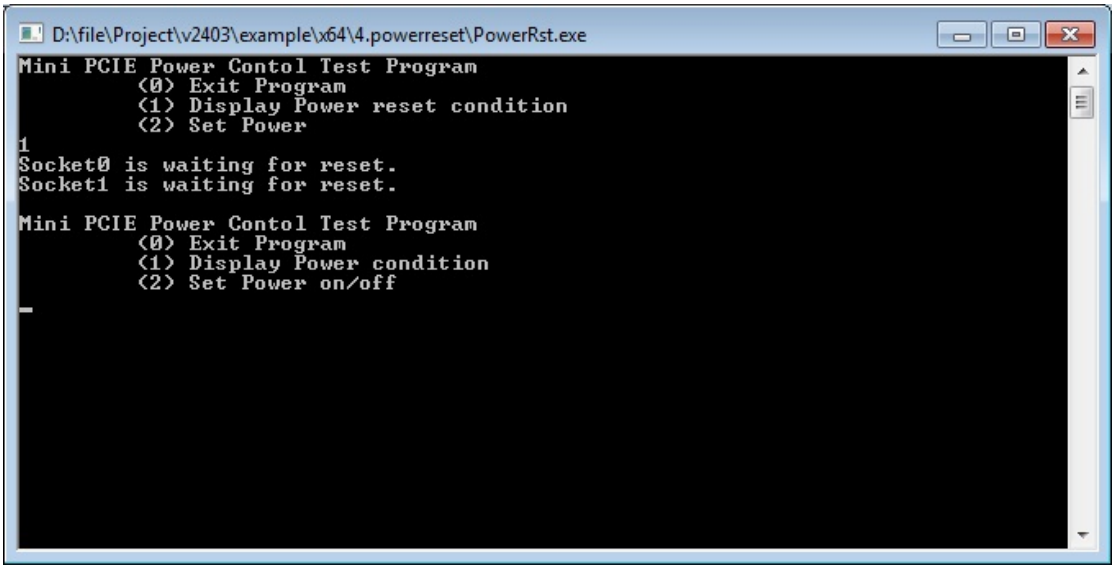
Power Reset

In this section, we illustrate how to use the test utility to reset the power through the mini-PCIE interface.

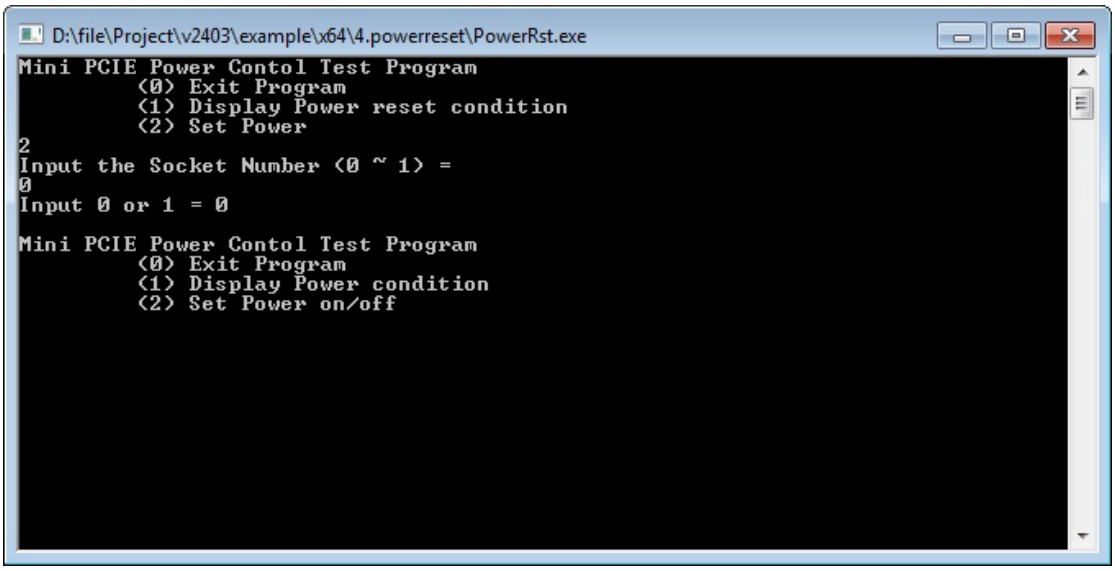
1. Copy the following files from the product software DVD.
   - **mxgpio.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\mxgpio\x64\
   - **mxGeneralIo.dll:** Examples\V2403-W7E_V1.0-Example\3.lib\MxGeneralIo\x64\
   - **PowerRst.exe:** Examples\V2403-W7E_V1.0-Example\Release\x64\
2. Execute **PowerRst.exe**.



3. Type **1** to display the current power reset status



4. Type **2** and follow the on-screen instructions to set the reset pin.



6

Module Card

In this chapter we discuss installation and usage of the software utility.

The following topics are covered in this chapter:

- **Overview**
- **Installing the Cellular Module Driver for the MC-9090, MC-7304, MC-7354**
- **Installing the Cellular Module Dial Utility**
- **Cellular Module Configuration**
- **Installing the WPEA-252NI's WiFi Module Driver**
- **WiFi Module Configuration**
- **Choosing the Gateway when WiFi and Cellular are Connected at the Same Time**

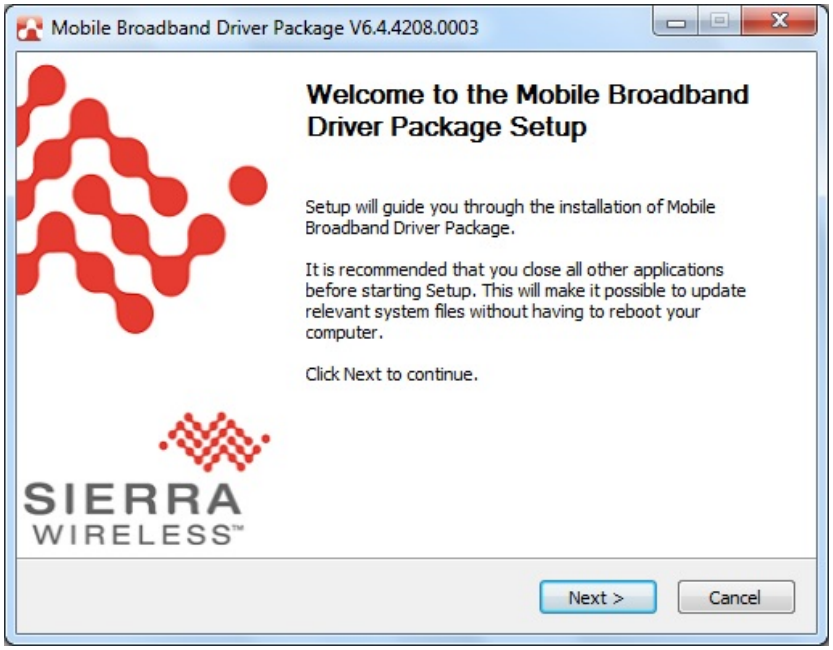
Overview

Moxa provides MC-9090, MC-7304, and MC-7354 cellular modules, and WPEA-252NI WiFi modules, all of which are pre-tested with the V2403.

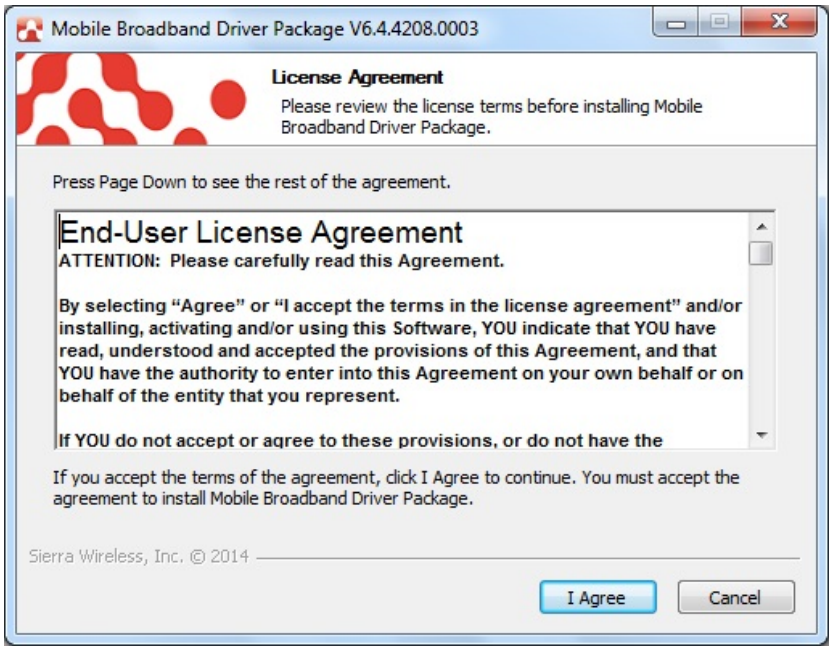
The files that are needed are located in the folder named after the corresponding module, in the \driver\V2403-W7E_V1.0_Expansion_Module\x64\Modules folder

Installing the Cellular Module Driver for the MC-9090, MC-7304, MC-7354

1. Run **driver\V2403-W7E_V1.0_Expansion_Module\x64\Modules\MC-9090\Build4208.exe** to begin the installation and click **Next**.

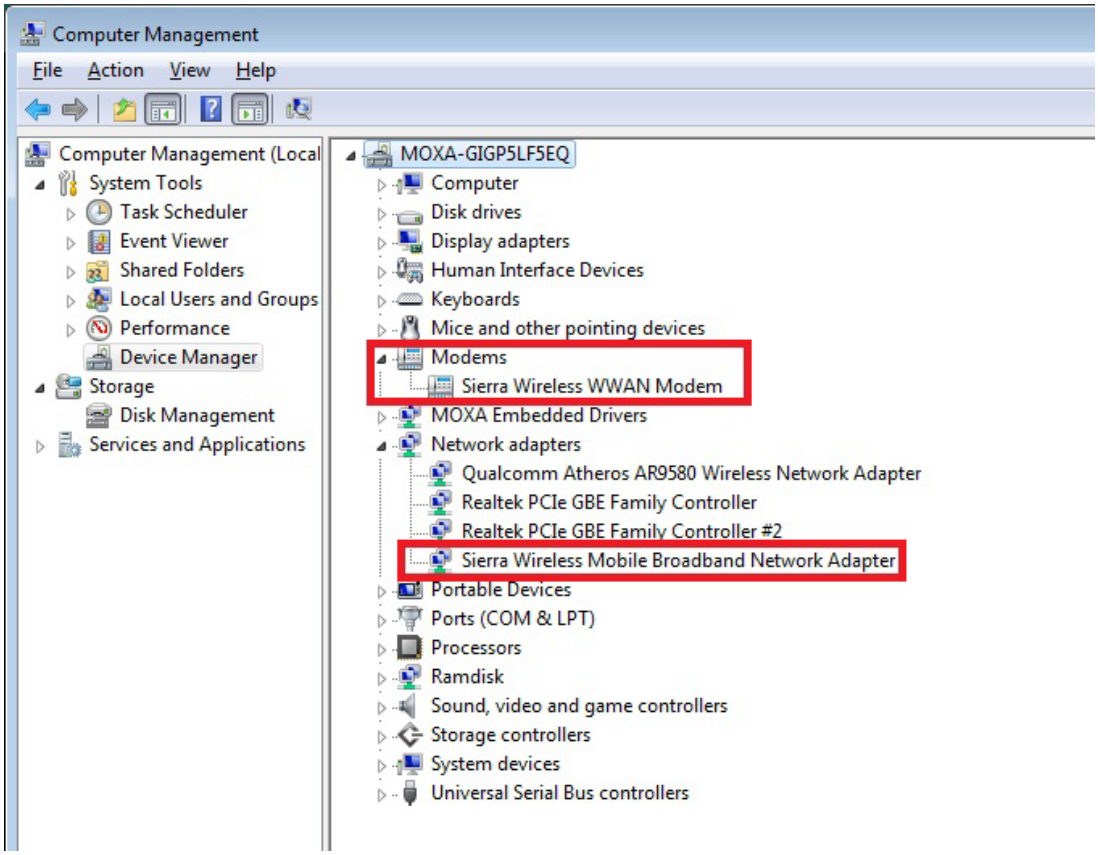


2. Click **I Agree** to accept the license.



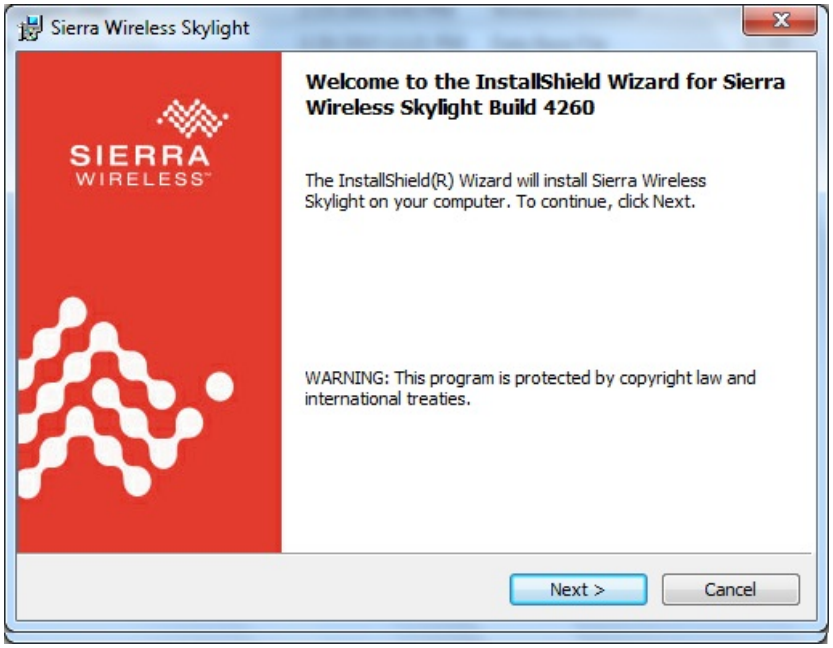
3. Click **Finish** to complete the installation.

4. The system should locate the new hardware and install the driver automatically. Check the **Windows Device Manager** to verify.

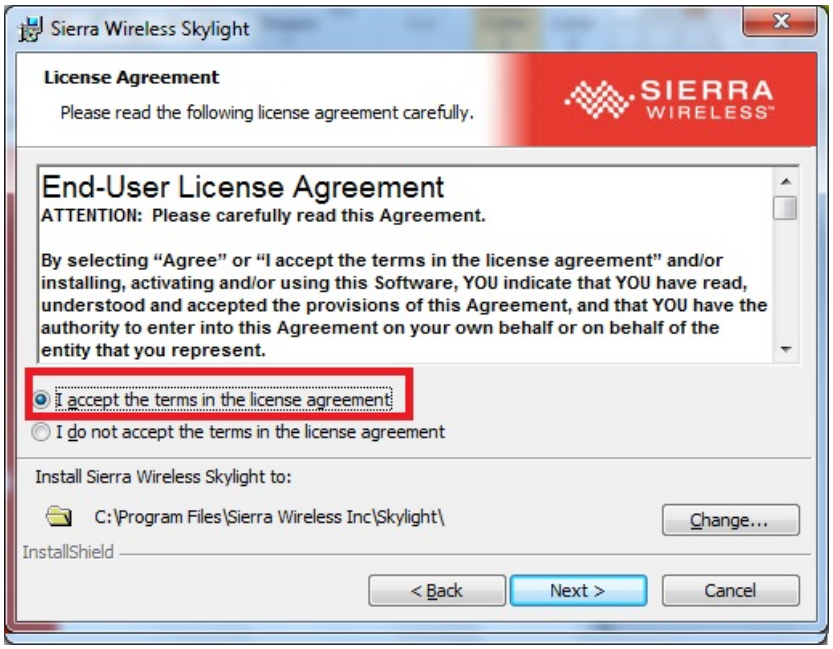


Installing the Cellular Module Dial Utility

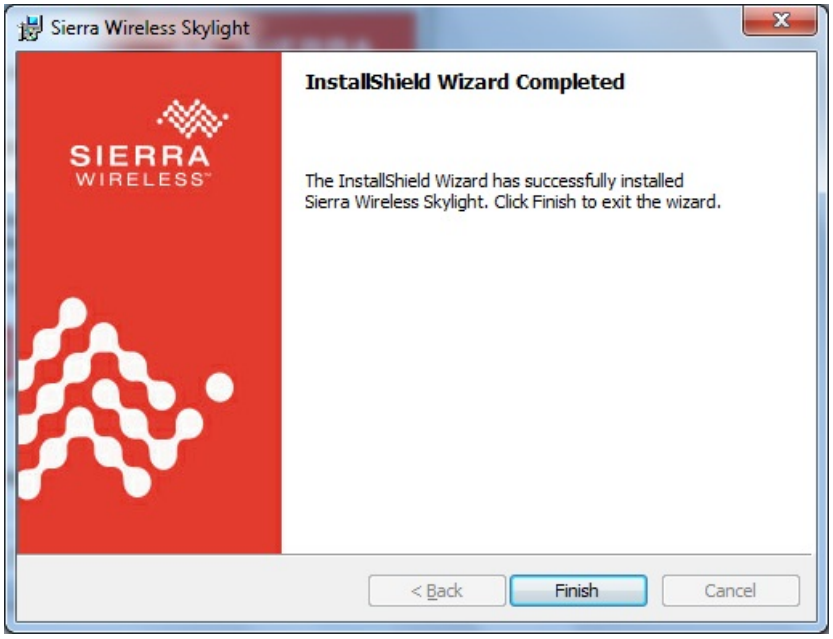
1. Run **driver\V2403-W7E_V1.0_Expansion_Module\x64\Modules\MC-9090\Skylight64_Generic.msi** to begin the installation and then click **Next**.



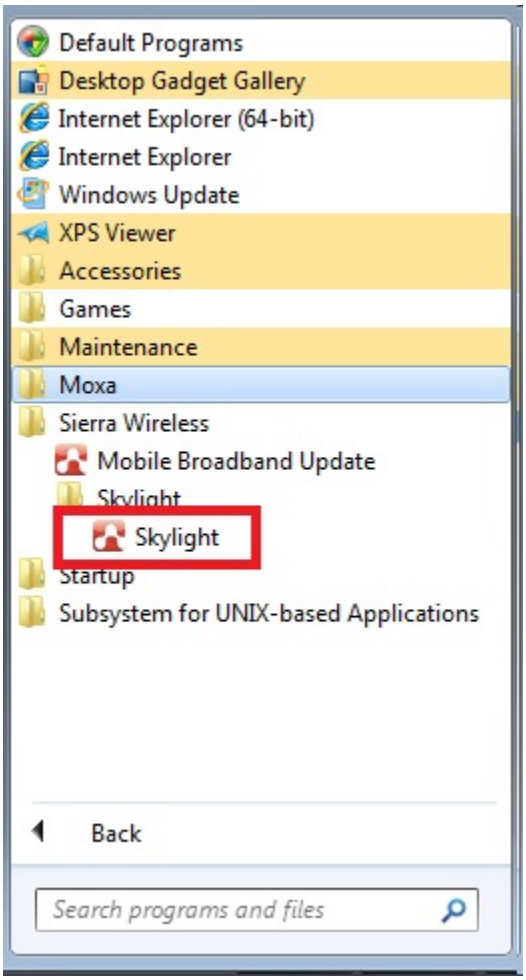
2. Check **I accept the terms in the license agreement** and click **Next**.



3. Click **Finish** to complete the installation.



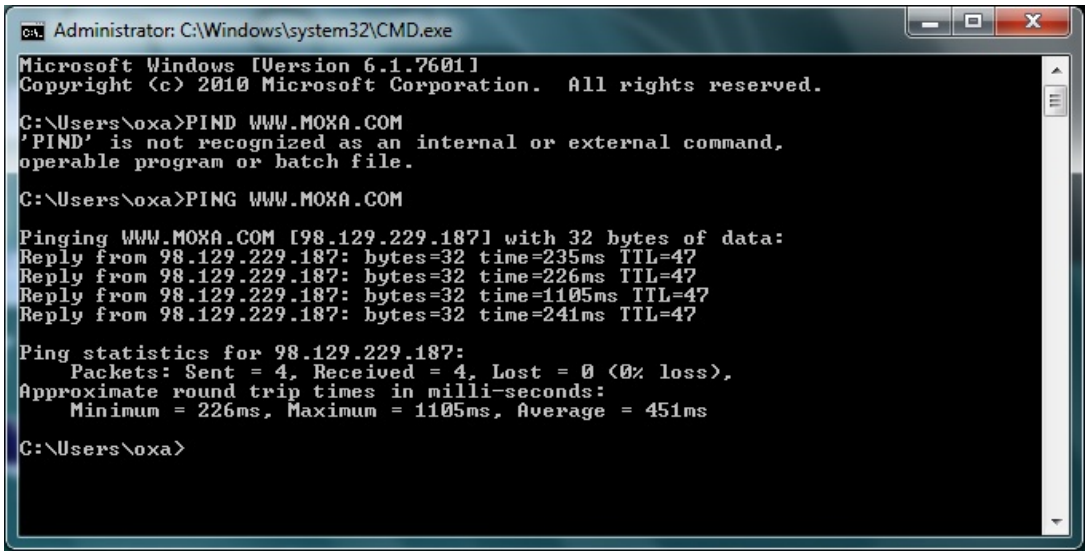
4. The system should locate the new hardware and install the driver automatically. Check the **Skylight** from **Sierra Wireless**.



Cellular Module Configuration

1. After installing cellular module driver and utility, if you want to establish a cellular connection, start **Skylight** and click **Connect**.

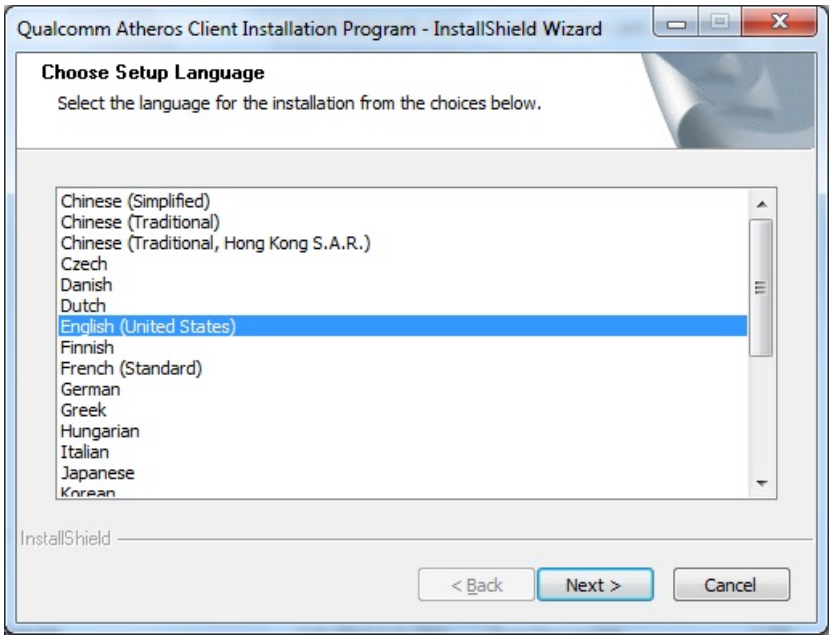
2. You can verify the cellular connection by pinging the interface once the connection is established.



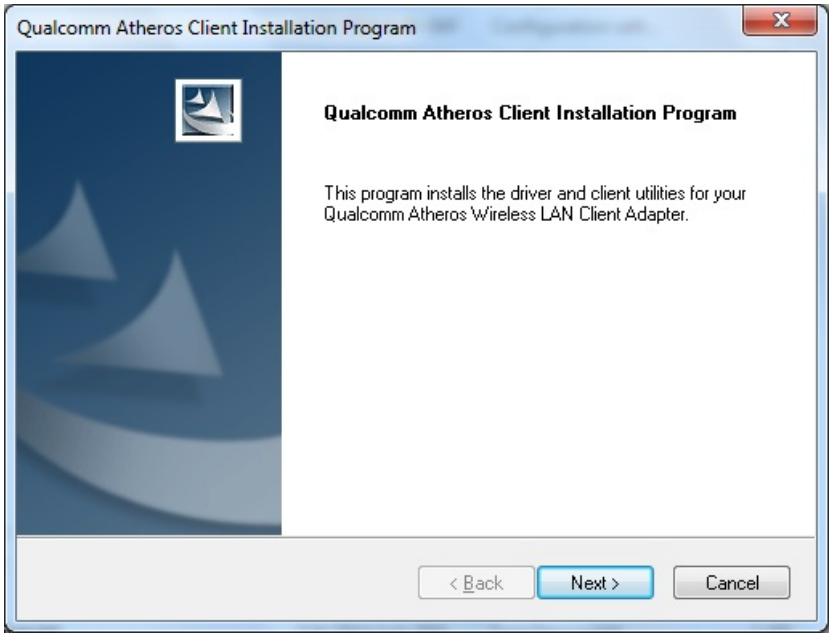
3. If you want to interrupt the cellular connection, click **Disconnect**.

Installing the WPEA-252NI's WiFi Module Driver

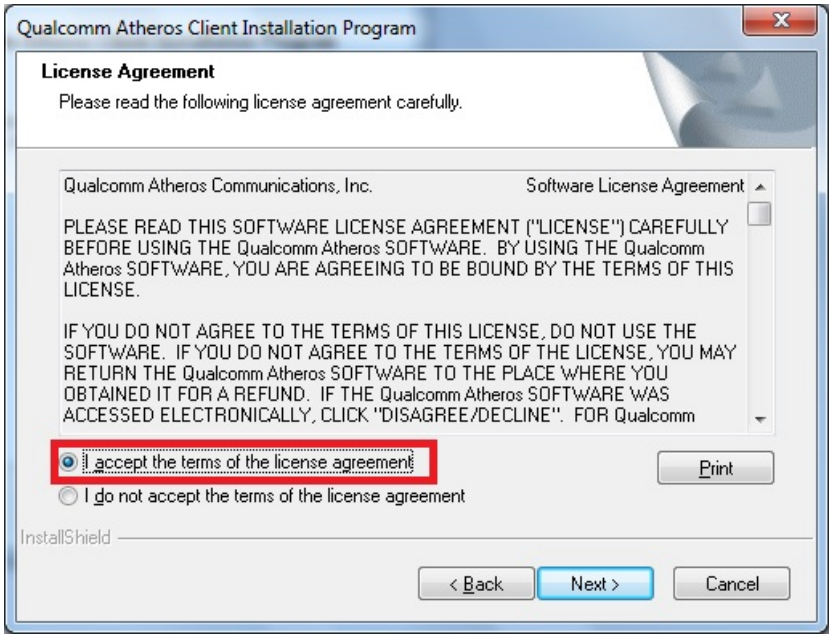
1. Run **driver\V2403-W7E_V1.0_Expansion_Module\x64\Modules\WPEA-252NI\Install_CD\setup.exe** located in the **Install_CD** folder to begin the installation.
2. Select language and then click **Next**.



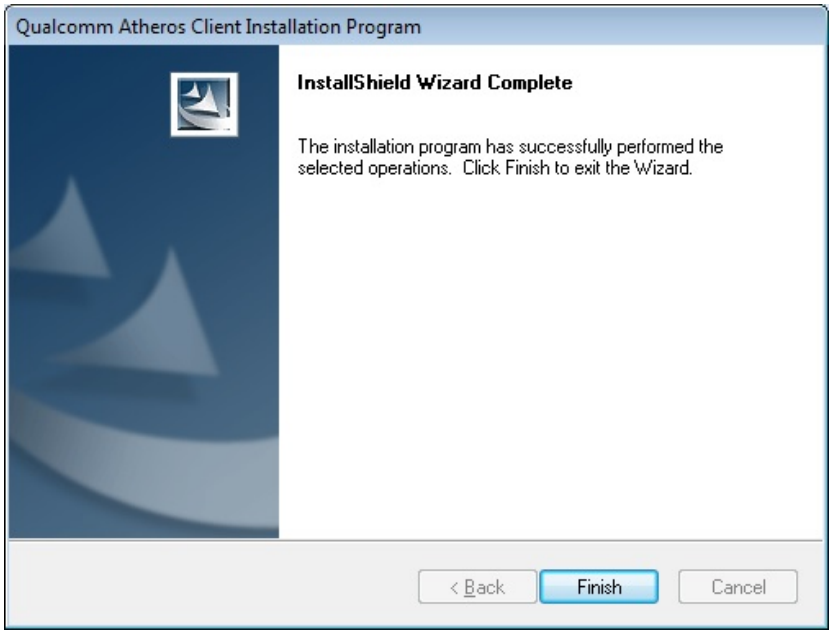
3. Click **Next**.



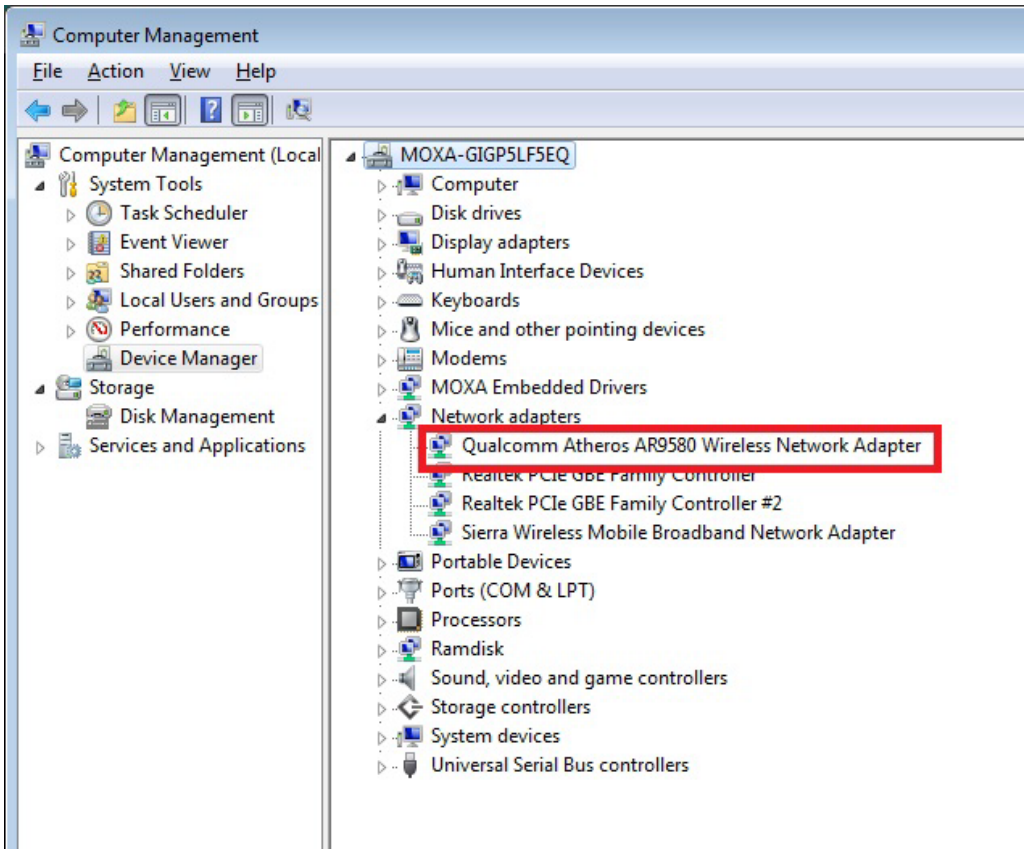
4. Select **I accept the terms of the license agreement** and then click **Next**.



5. Click **Finish** to complete installation.

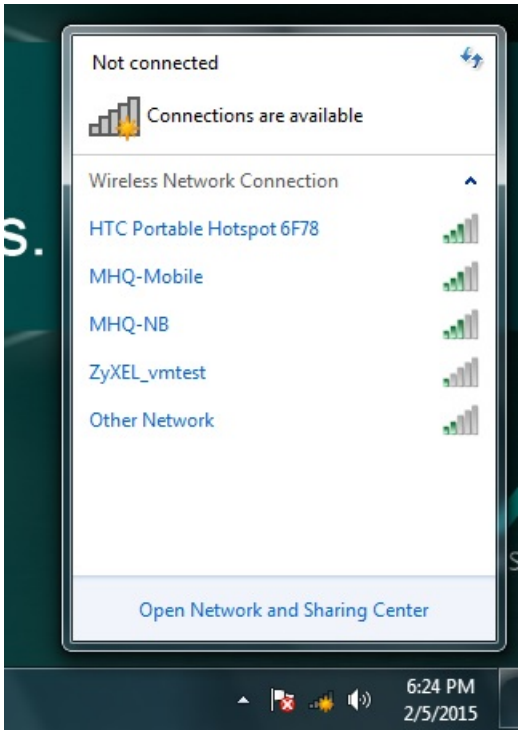


6. The system should locate the new hardware and install the driver automatically. Check the **Windows Device Manager** to verify.



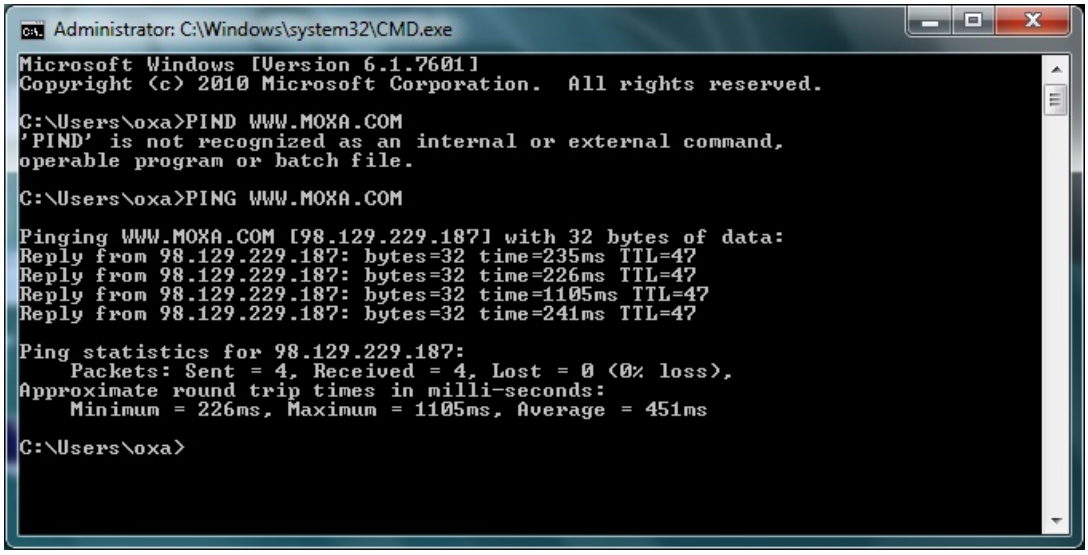
WiFi Module Configuration

1. After installing the WiFi module driver, select the wireless network connection from the taskbar.



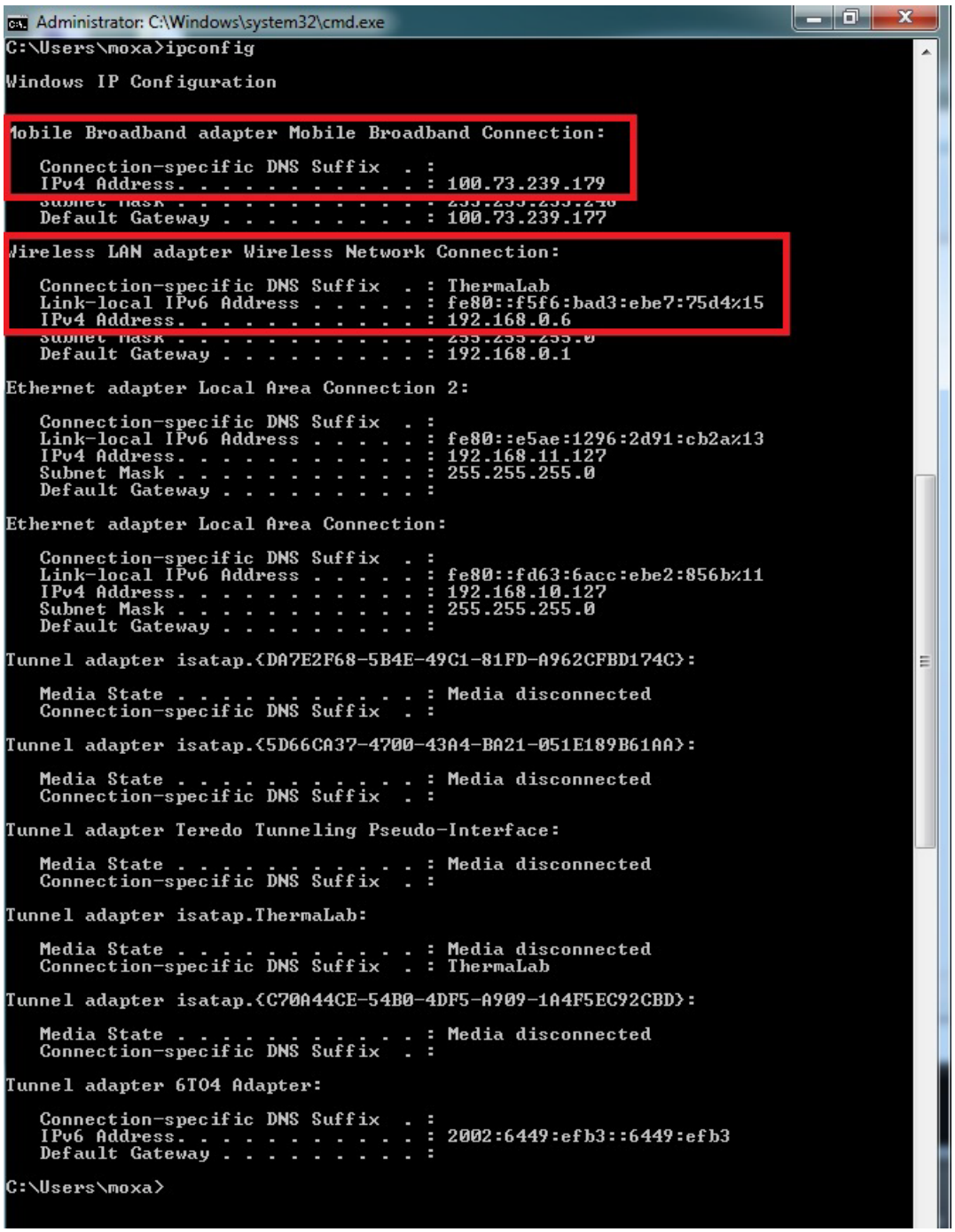
2. Enter the password and then click **OK** to connect to the network.

3. You can verify the cellular connection by pinging the interface once the connection is established.

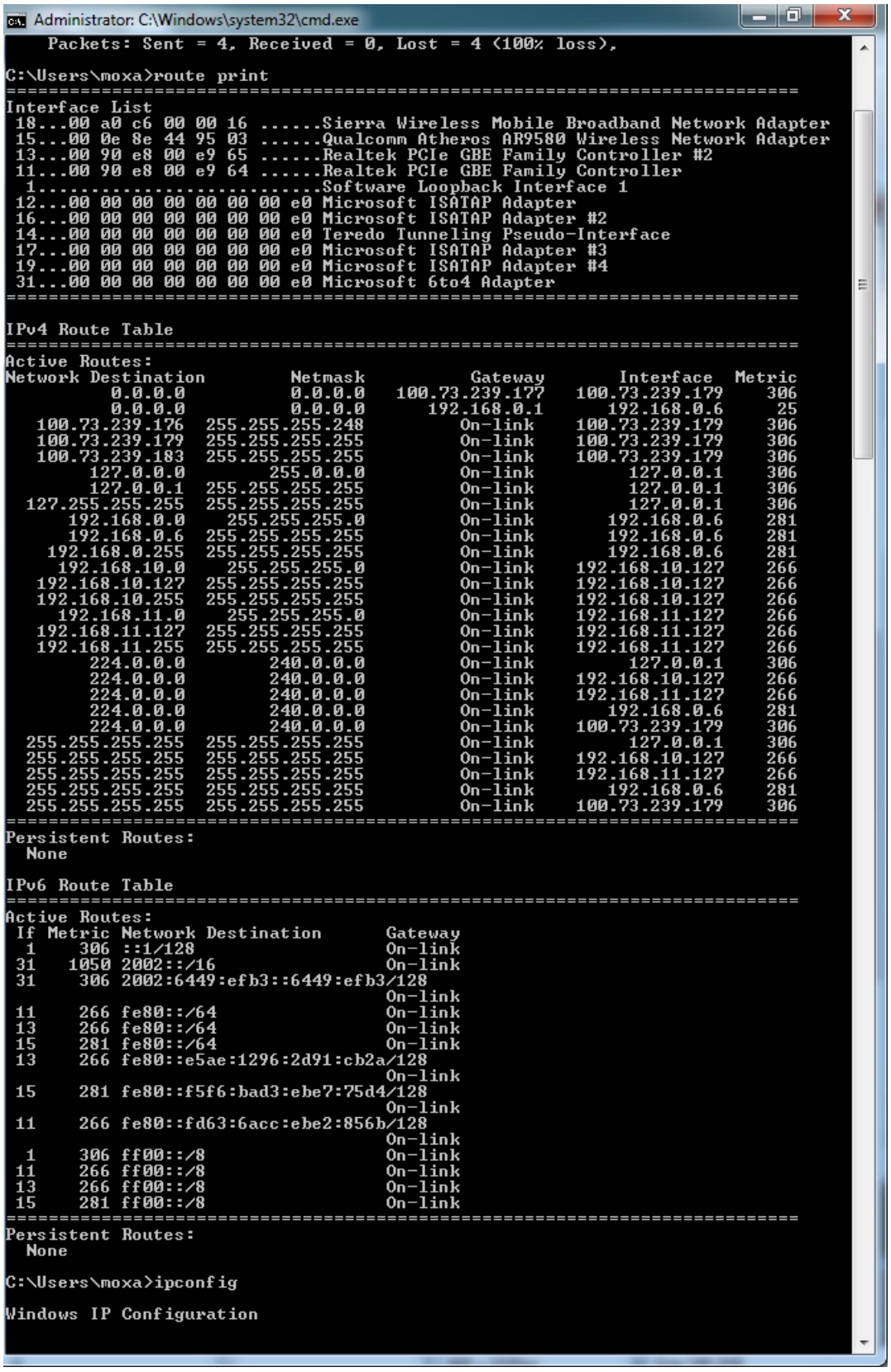


Choosing the Gateway when WiFi and Cellular are Connected at the Same Time

1. Open the **Start Menu** and type **cmd** in the Start Menu search box.
2. Click cmd from the search results, which should appear directly under Programs.
3. When the Command Prompt window opens, type **ipconfig** into the command prompt window. You can then get the IP address of the WiFi connection and cellular connection. In this case, the IP address of the WiFi connection is **192.168.0.6**, and the IP address of the cellular connection is **100.73.239.179**.

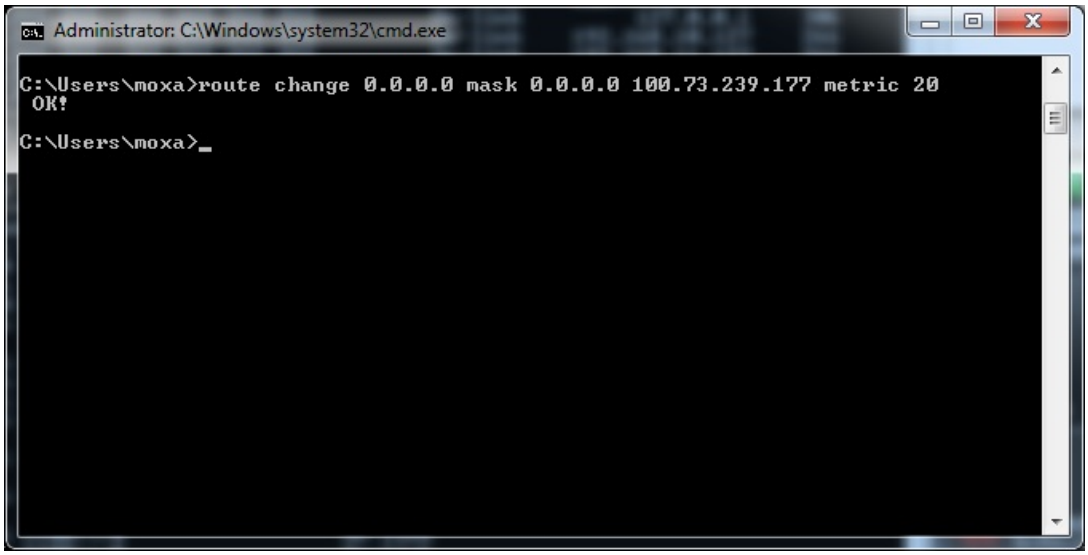


4. Windows 7 will choose the lowest Metric value for the connection interface if several routes are available for the same network destination and netmask. In this case, WiFi interface is the connection interface.



```
Administrator: C:\Windows\system32\cmd.exe
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\moxa>route print
===========================================================================
Interface List
 18...00 a0 c6 00 00 16 ......Sierra Wireless Mobile Broadband Network Adapter
 15...00 0e 8e 44 95 03 ......Qualcomm Atheros AR9580 Wireless Network Adapter
 13...00 90 e8 00 e9 65 ......Realtek PCIe GBE Family Controller #2
 11...00 90 e8 00 e9 64 ......Realtek PCIe GBE Family Controller
  1...........................Software Loopback Interface 1
 12...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter
 16...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #2
 14...00 00 00 00 00 00 00 e0 Teredo Tunneling Pseudo-Interface
 17...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #3
 19...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #4
 31...00 00 00 00 00 00 00 e0 Microsoft 6to4 Adapter
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0   100.73.239.177   100.73.239.179     306
          0.0.0.0          0.0.0.0      192.168.0.1      192.168.0.6      25
    100.73.239.176  255.255.255.248         On-link    100.73.239.179     306
    100.73.239.179  255.255.255.255         On-link    100.73.239.179     306
    100.73.239.183  255.255.255.255         On-link    100.73.239.179     306
        127.0.0.0        255.0.0.0         On-link         127.0.0.1     306
        127.0.0.1  255.255.255.255         On-link         127.0.0.1     306
  127.255.255.255  255.255.255.255         On-link         127.0.0.1     306
      192.168.0.0    255.255.255.0         On-link       192.168.0.6     281
      192.168.0.6  255.255.255.255         On-link       192.168.0.6     281
    192.168.0.255  255.255.255.255         On-link       192.168.0.6     281
     192.168.10.0    255.255.255.0         On-link    192.168.10.127     266
   192.168.10.127  255.255.255.255         On-link    192.168.10.127     266
   192.168.10.255  255.255.255.255         On-link    192.168.10.127     266
     192.168.11.0    255.255.255.0         On-link    192.168.11.127     266
   192.168.11.127  255.255.255.255         On-link    192.168.11.127     266
   192.168.11.255  255.255.255.255         On-link    192.168.11.127     266
        224.0.0.0        240.0.0.0         On-link         127.0.0.1     306
        224.0.0.0        240.0.0.0         On-link    192.168.10.127     266
        224.0.0.0        240.0.0.0         On-link    192.168.11.127     266
        224.0.0.0        240.0.0.0         On-link       192.168.0.6     281
        224.0.0.0        240.0.0.0         On-link    100.73.239.179     306
  255.255.255.255  255.255.255.255         On-link         127.0.0.1     306
  255.255.255.255  255.255.255.255         On-link    192.168.10.127     266
  255.255.255.255  255.255.255.255         On-link    192.168.11.127     266
  255.255.255.255  255.255.255.255         On-link       192.168.0.6     281
  255.255.255.255  255.255.255.255         On-link    100.73.239.179     306
===========================================================================
Persistent Routes:
  None

IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
  1    306 ::1/128                  On-link
 31   1050 2002::/16                On-link
 31    306 2002:6449:efb3::6449:efb3/128
                                    On-link
 11    266 fe80::/64                On-link
 13    266 fe80::/64                On-link
 15    281 fe80::/64                On-link
 13    266 fe80::e5ae:1296:2d91:cb2a/128
                                    On-link
 15    281 fe80::f5f6:bad3:ebe7:75d4/128
                                    On-link
 11    266 fe80::fd63:6acc:ebe2:856b/128
                                    On-link
  1    306 ff00::/8                 On-link
 11    266 ff00::/8                 On-link
 13    266 ff00::/8                 On-link
 15    281 ff00::/8                 On-link
===========================================================================
Persistent Routes:
  None

C:\Users\moxa>ipconfig

Windows IP Configuration
```

5. Now, if you want to change to using cellular for the connection interface, just reduce the metric value of the cellular interface; this value must be lower than the WiFi's metric value.



7

System Recovery

This chapter describes the system recovery process that you can perform if the system is not functioning properly.

The following topics are covered in this chapter:

- **Overview**
- **Setting Up the Recovery Environment**
- **Recovery Procedure**
- **Saving the System Image to a USB Device**

Overview

This section describes how to prepare your computer for recovery in the event the system becomes unstable. You can perform a system recovery using one of the following system images:

- A clean factory default image.
- A user-generated image created from a fully configured, fully set up system.

Before you perform a system recovery, set up the system environment.

Setting Up the Recovery Environment

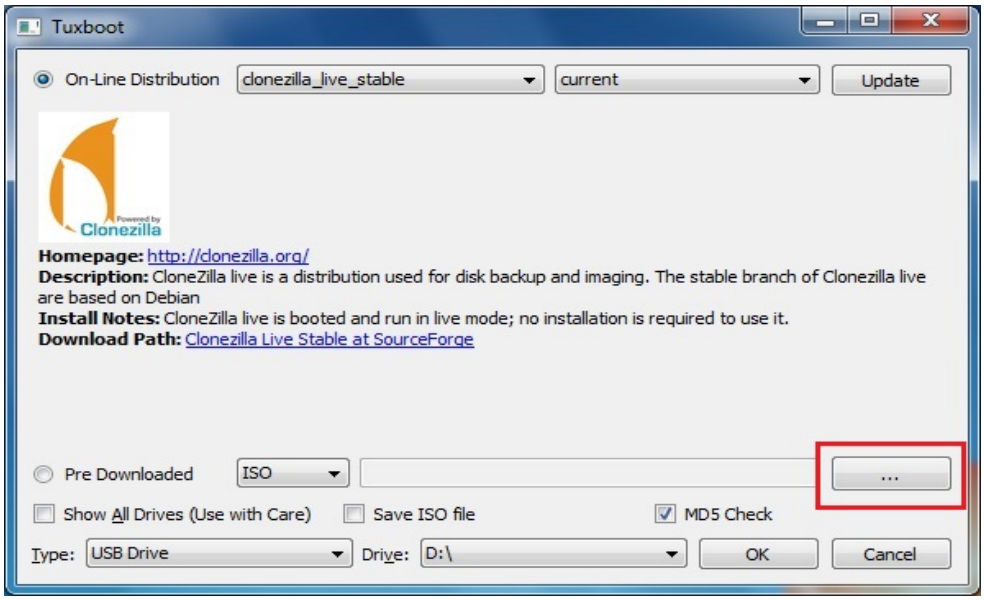
To set up the recovery environment on a V2403 computer, you will need a USB drive that has at least 4 GB of memory, and a copy of the recovery programs and system image file. To set up the recovery environment, do the following:

1. Copy the recovery programs and system image file on to the USB drive and set up the drive as a live-drive system with an ISO image of the boot environment.
2. Reboot the system and configure the BIOS to boot the recovery system from the USB port.
3. An image of the current software system will be created on the USB drive. The recovery environment will use this image when restoring the system.
4. Reboot the system again and configure the BIOS to its original state.

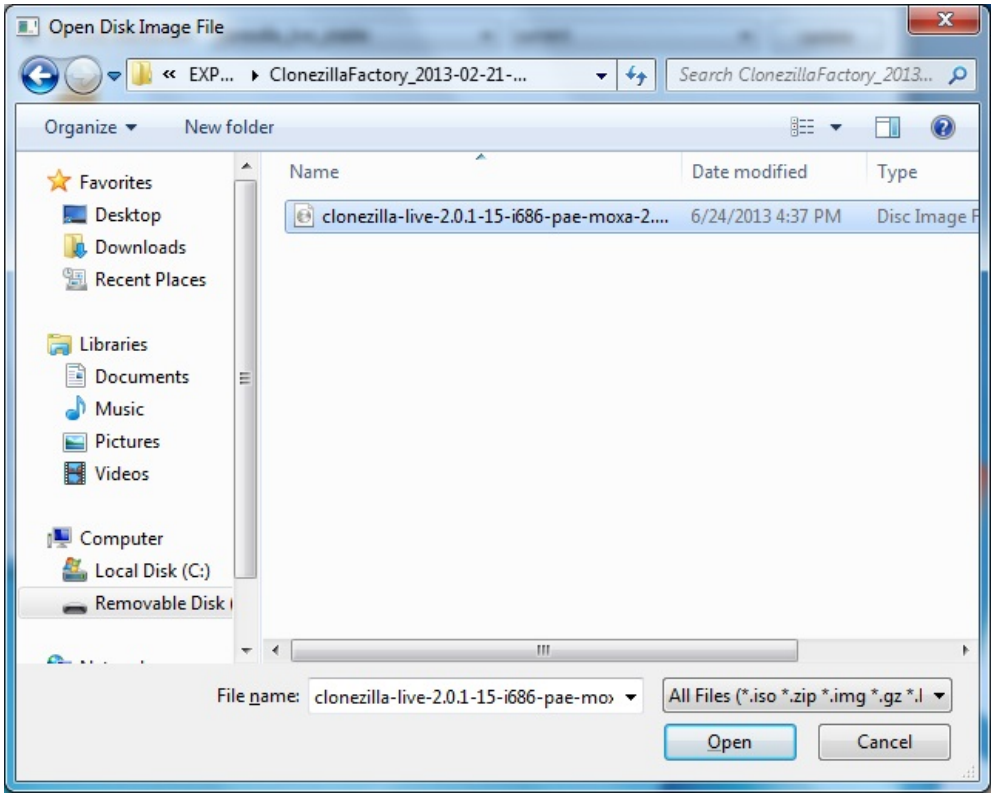
Recovery Procedure

Step 1: Prepare your USB drive

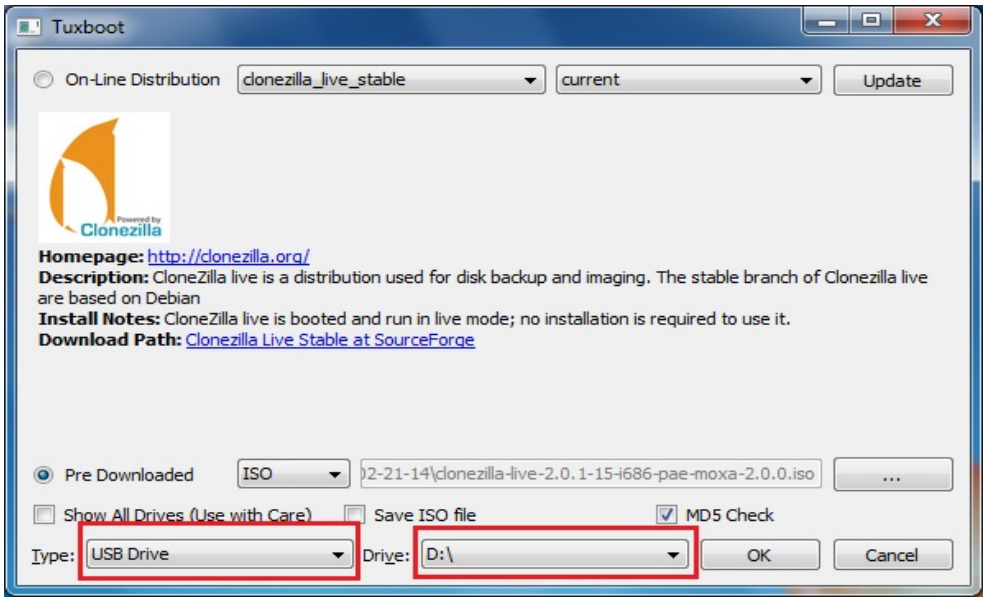
1. Execute **tuxboot-windows-23.exe** from the **<Software DVD>\Recovery** folder on the Software DVD, select **Pre Download**, and then click "**...**"



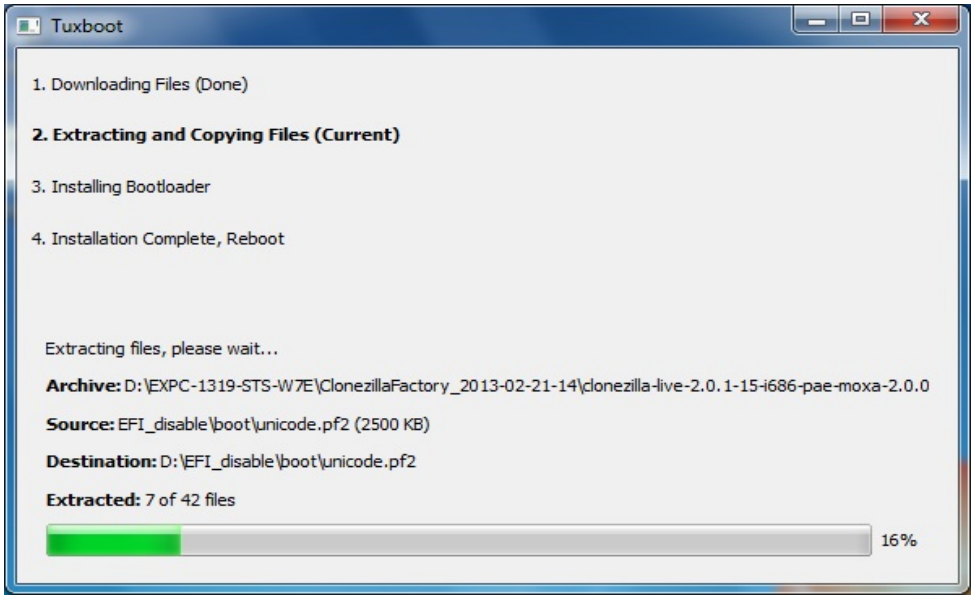
2. Select the ISO file in the directory **<Software DVD>\Recovery**



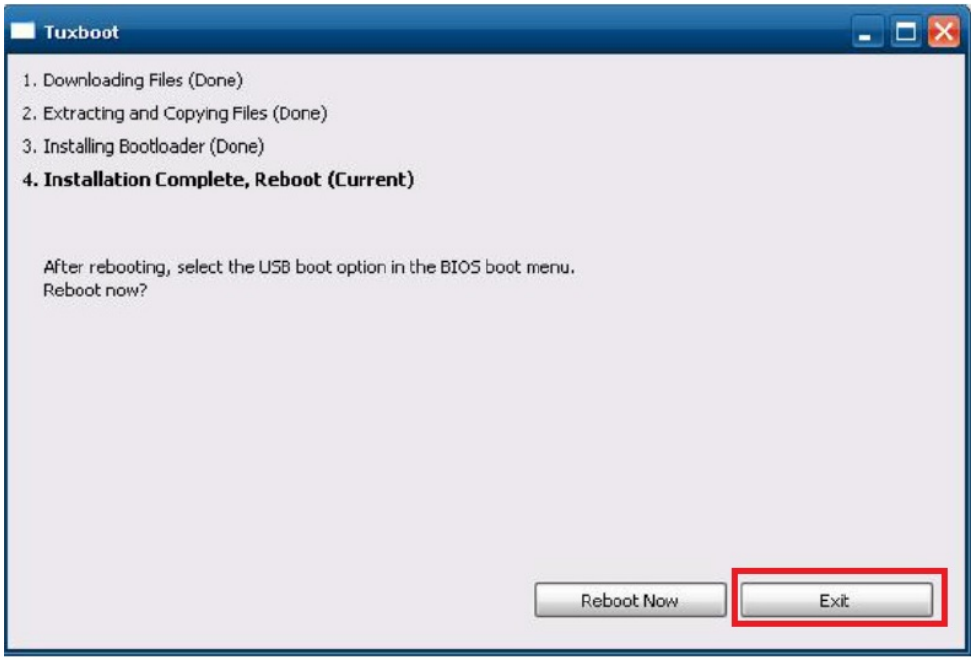
3. Select **USB Drive** type, select a **Drive**, and then click **OK** to continue.



4. The boot files will be copied to your USB drive.



5. When finished, click **Exit** to stop the program.

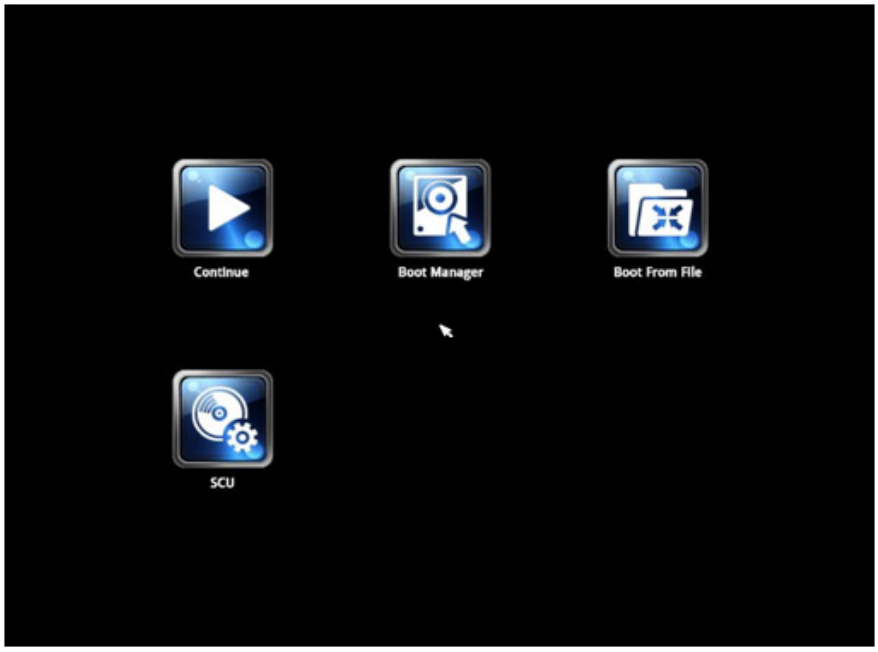


6. Manually copy the **os_image** directory from the **<Software DVD>\Recovery** folder on the Software DVD to **\home\partimag** on the USB drive.

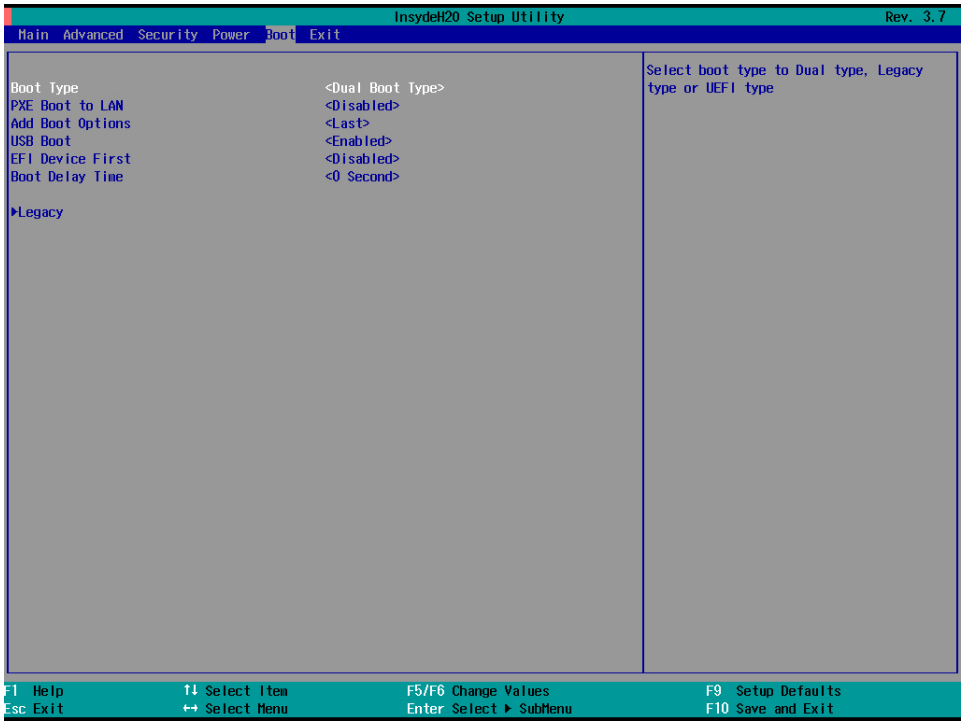
Step 2: Change the BIOS Settings

You will need to change the BIOS settings to boot from the USB disk.

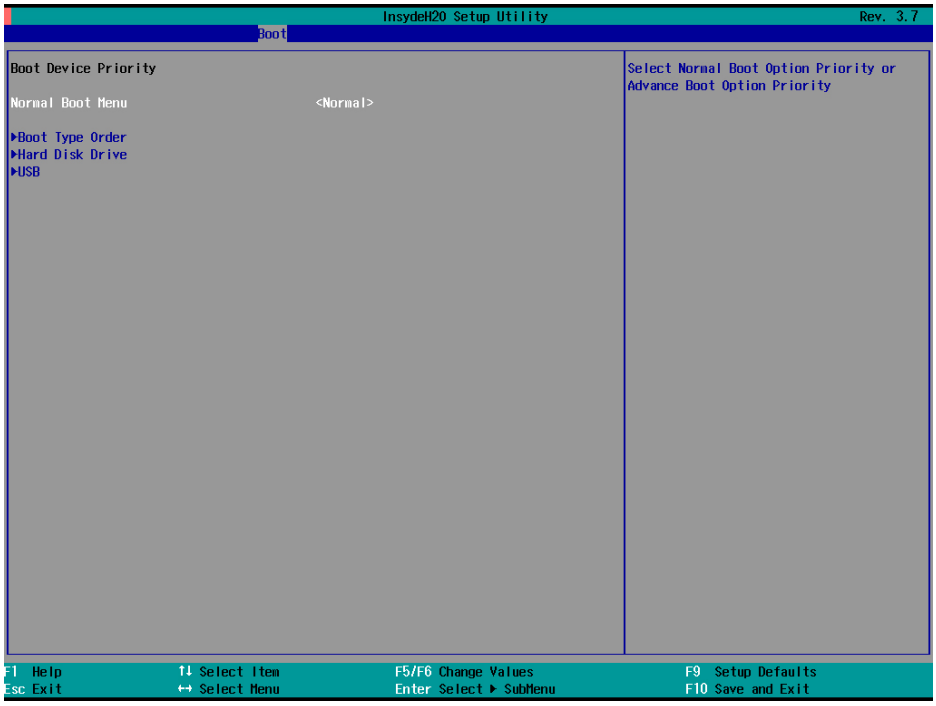
1. Turn on the computer and press **F2.** Select **SCU** in the following screen.



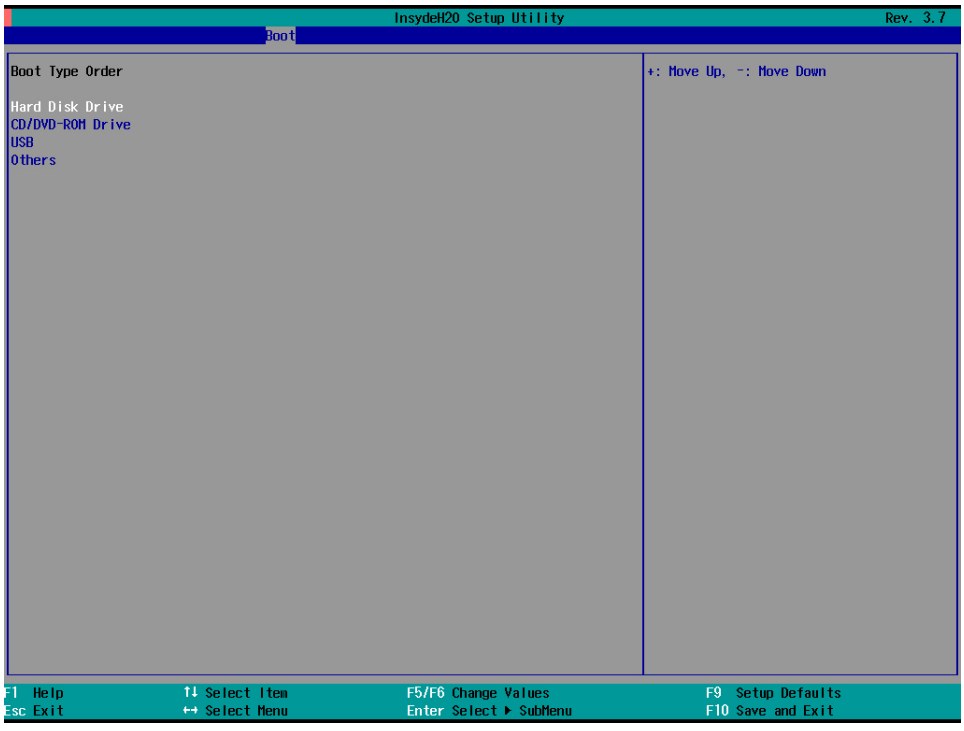
2. Select **Boot** and then select **Legacy**. Press **Enter** to continue.



3. Select **Boot Type Order**.



4. Select USB disk and then press "+" to move it to the first boot device position.
   Warning: An incorrect boot priority will lead to recovery failure.

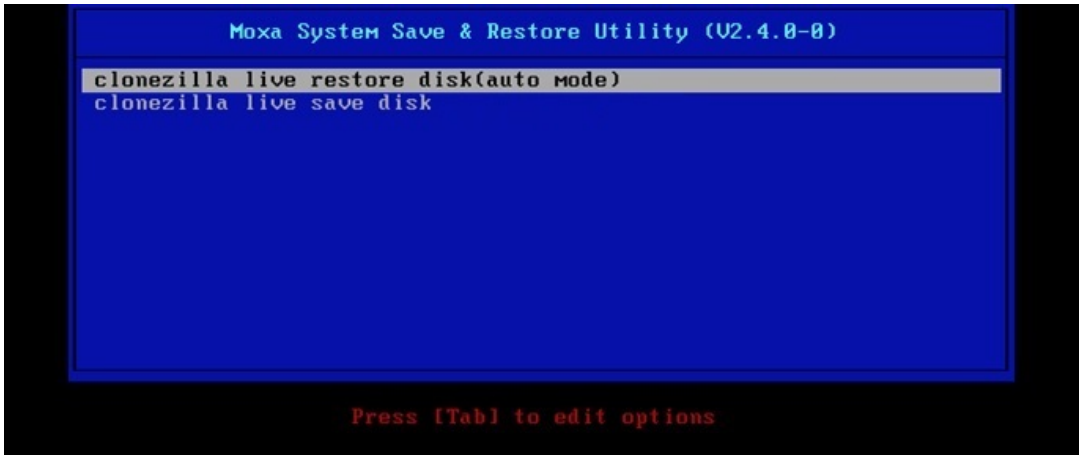


5. Press **F10** and then press **Enter** to save and exit the BIOS setup.

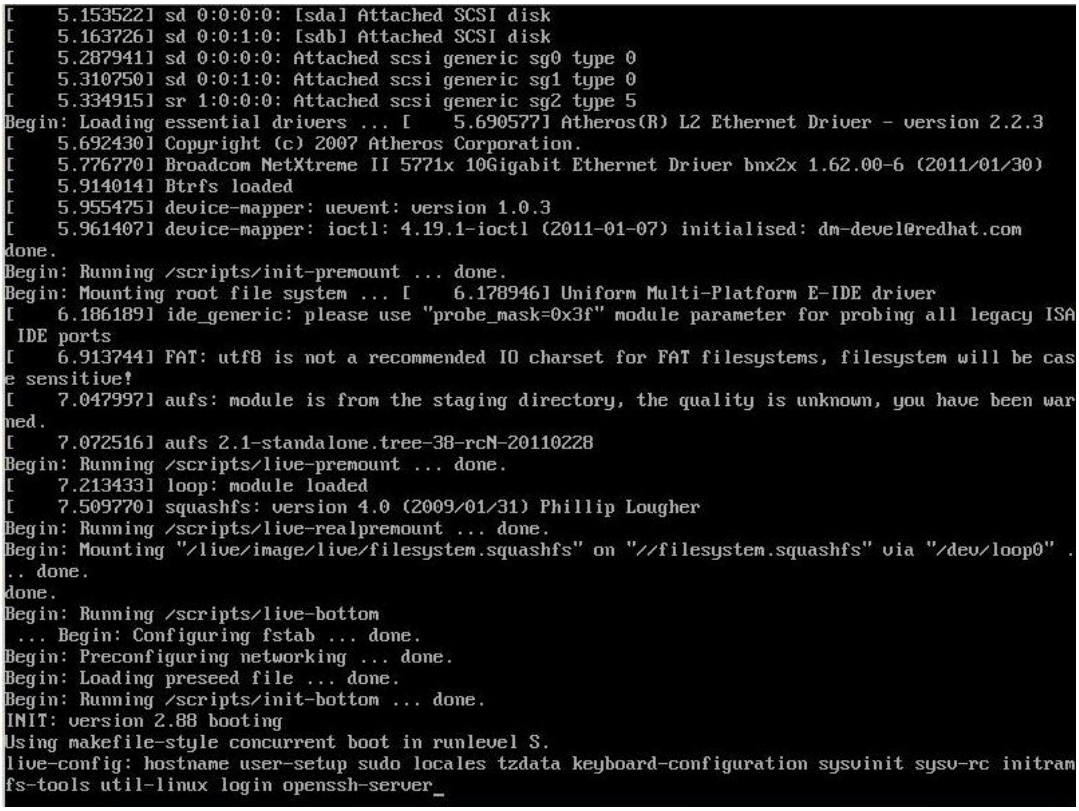
Step 3: Restore the system from the USB drive

Connect the USB disk to any of the V2403's USB ports and then reboot the computer. The system will boot from the USB disk and the Pre-installation Environment and the recovery utility will appear.

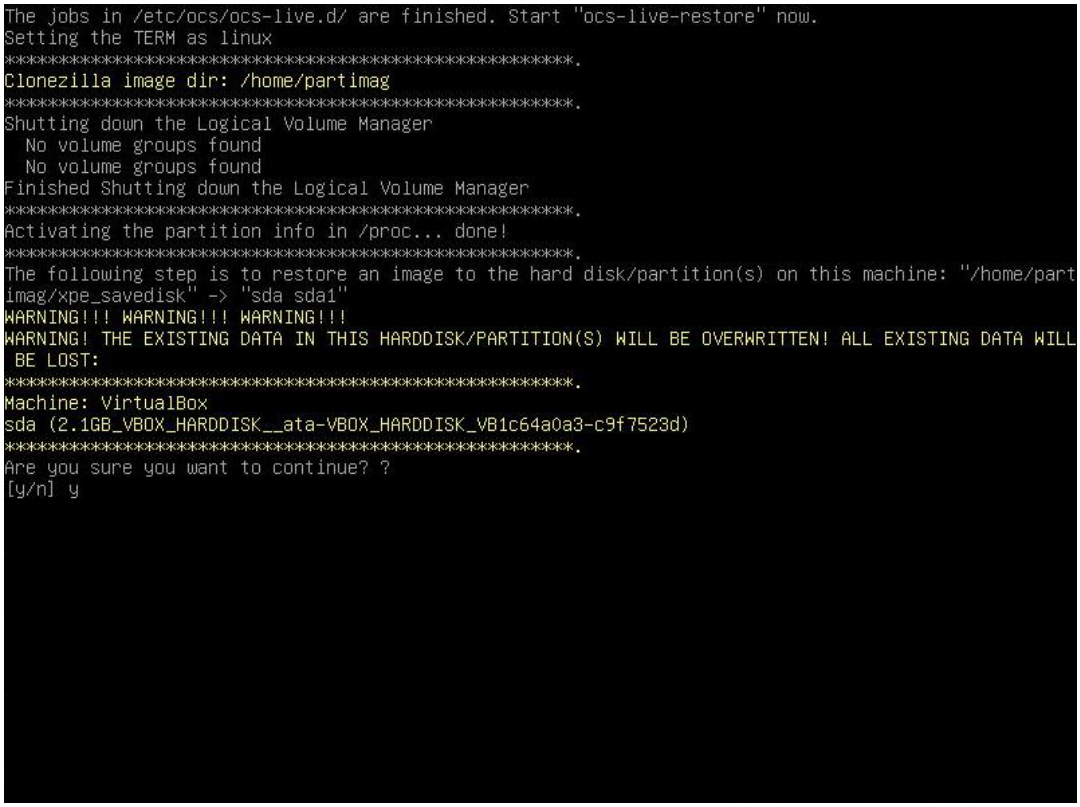
1. Select **clonezilla live restore disk(auto Mode)** option if you want Clonezilla to help you recover the MBR and decompress the image automatically.



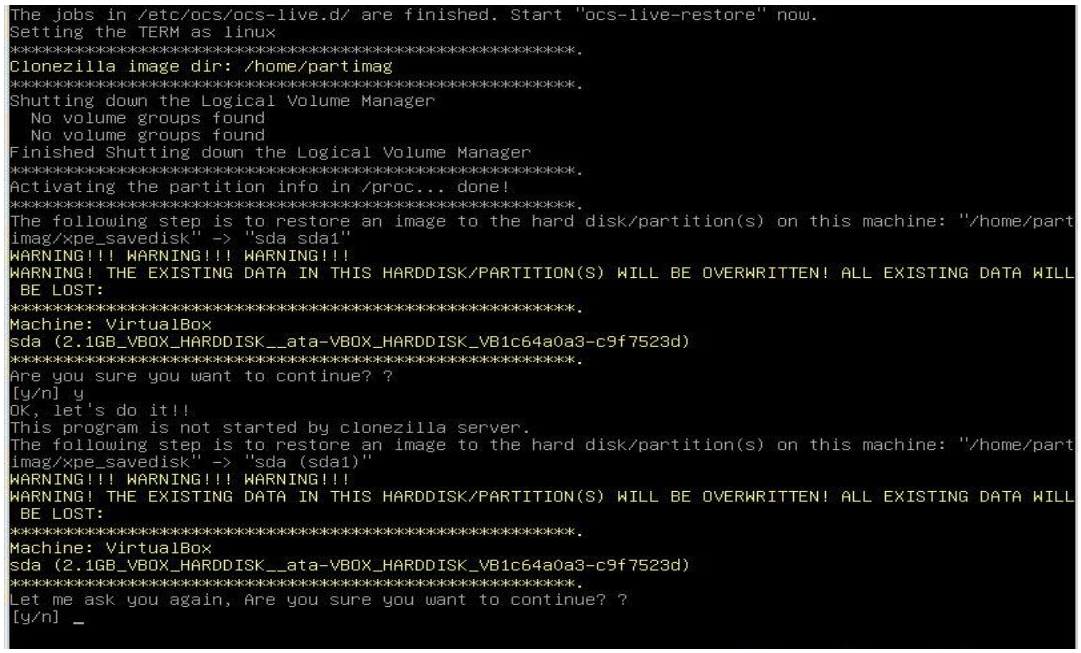
2. Wait for the USB drive boot process to finish.



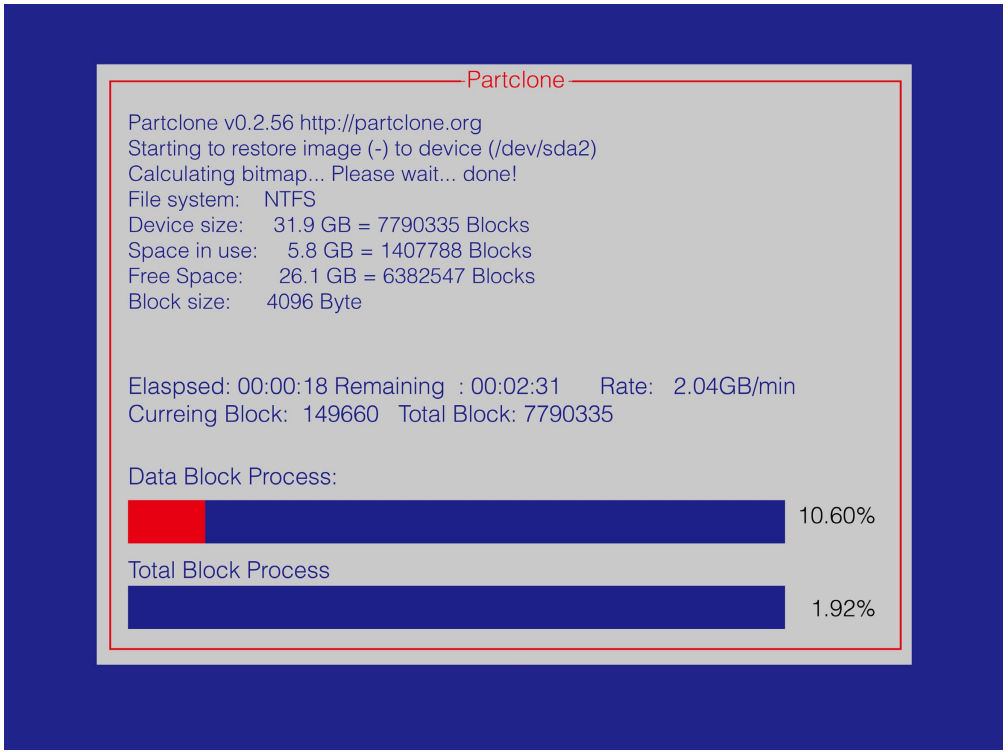
3. Enter **y** to continue the restore process.



4. Enter **y** to confirm again.

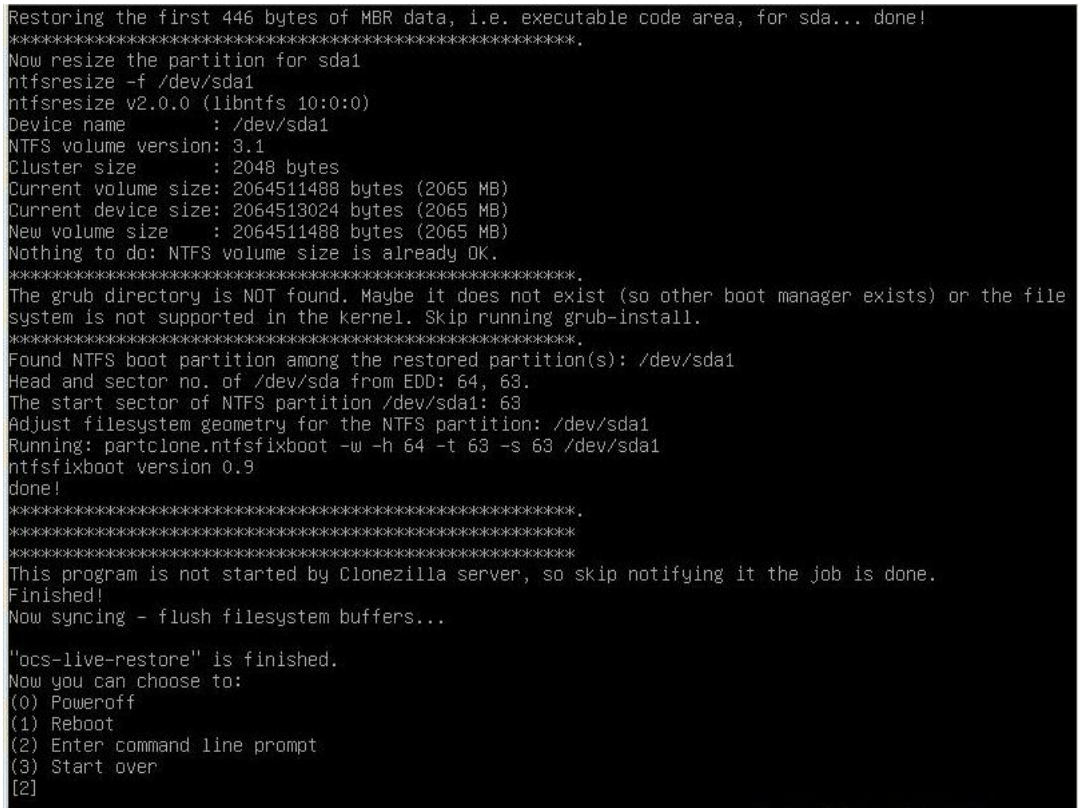


5. Wait for the process to finish.



NOTE You can press any key or use **CTRL+C** to cancel the recovery process and exit Clonezilla.

6. Select **(0) Poweroff** to power off the computer.

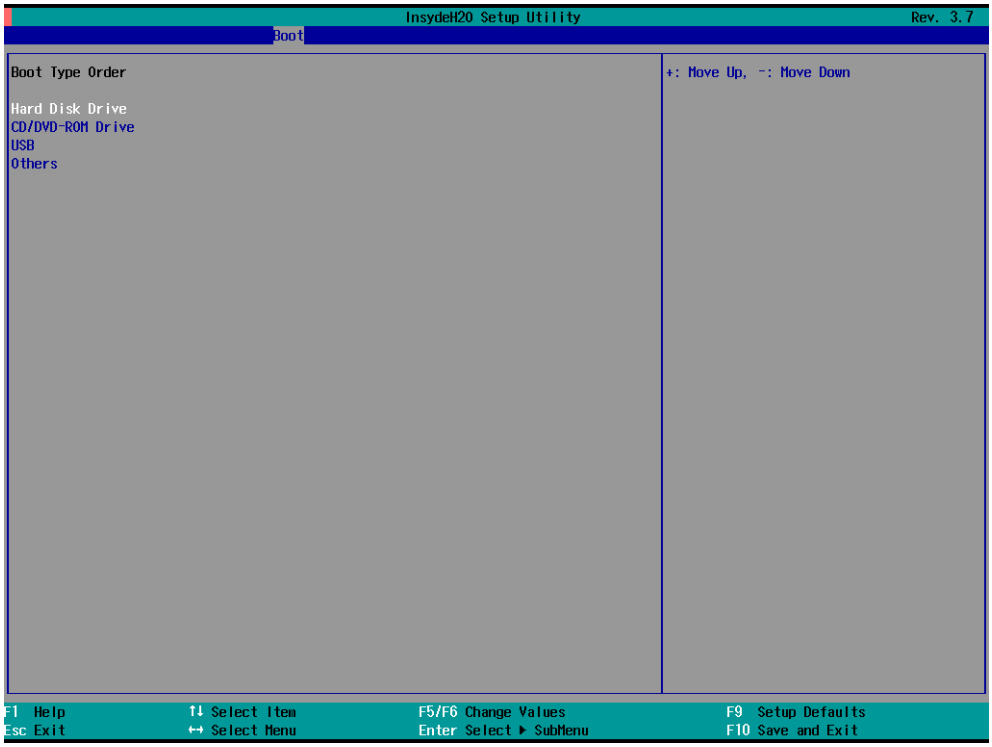


7. Remove the USB drive after the computer has been powered off.

Step 4: Change the BIOS Settings to Boot from the Original Disk

Now you will need to change the boot priority so that it can boot from the original disk. As the system reboots, press **F2** to enter the BIOS setup menu.

1. Select **Hard Disk Drive** and then press + to move to the first boot device position, and then press **Enter**. Make sure the hard disk has first boot priority.



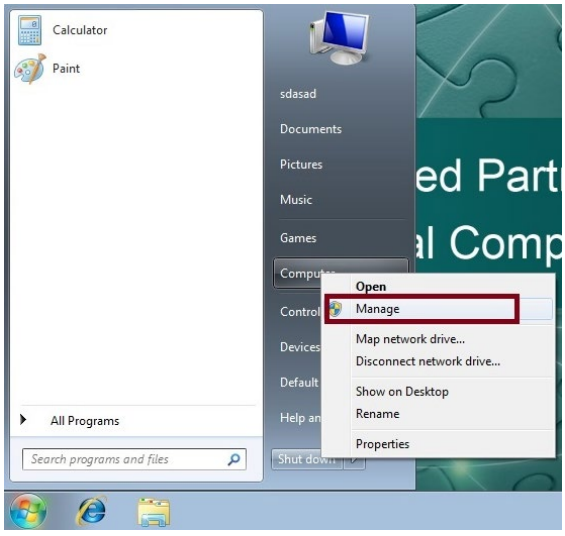
2. Press **F10** and then press **Enter** to save and exit BIOS settings.

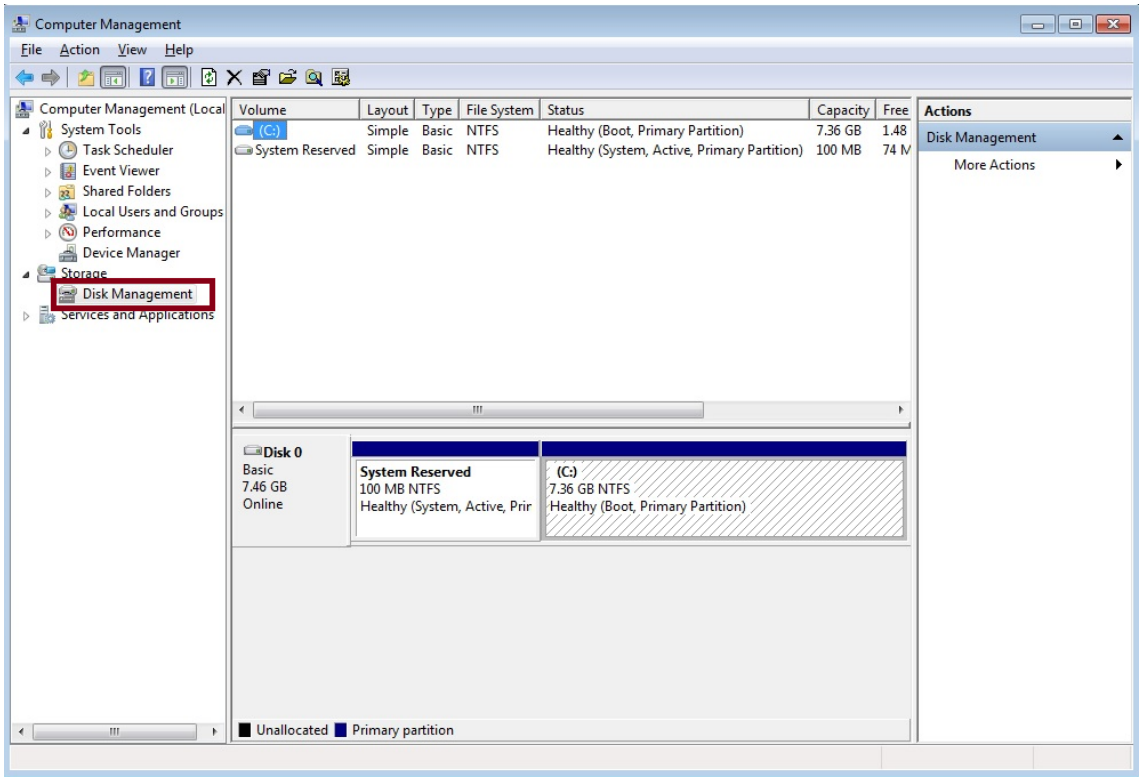
Saving the System Image to a USB Device

You can also save the current system image to a USB device for system recovery in case the system crashes. Before saving the system image to the USB device, we suggest removing all files under **\home\partimag** on the USB device. Compress the file system on your system before saving the system image to the USB device to ensure smooth completion of the task.

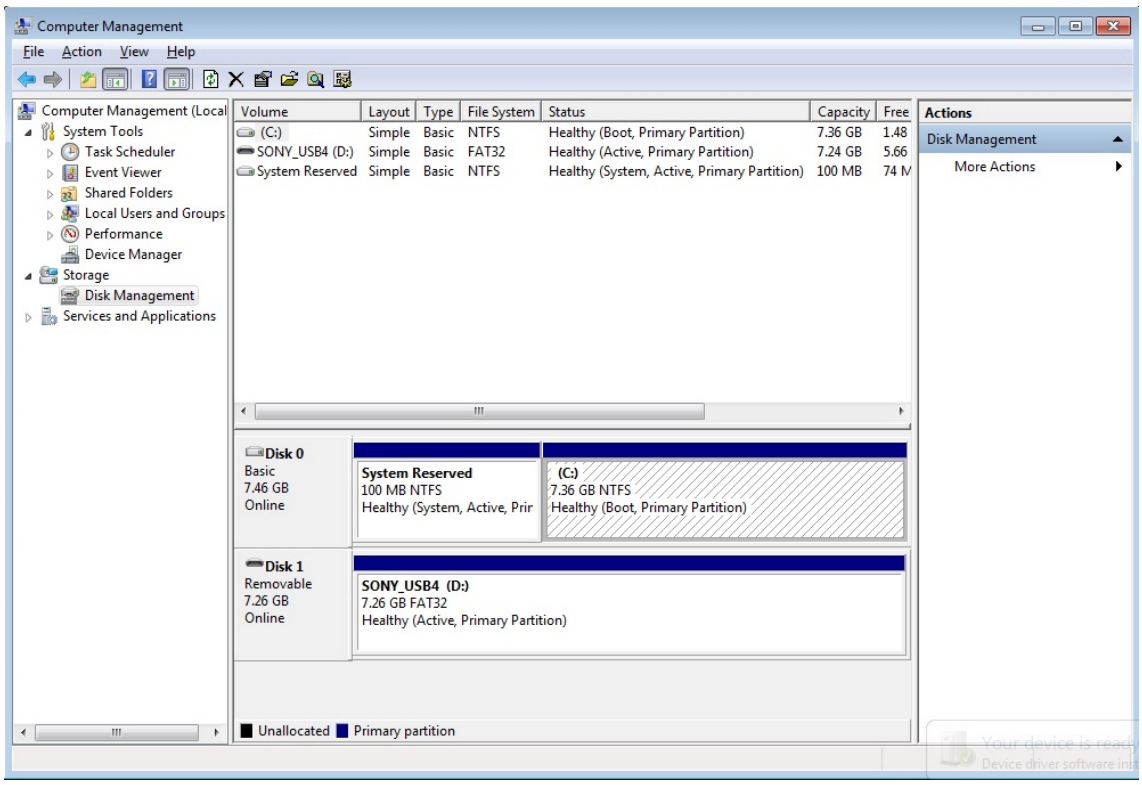
Compressing the File System on Windows Embedded 7

1. In the **start menu**, right click on **Computer** and select **Manage**. Click on **Disk Management** in the left panel.



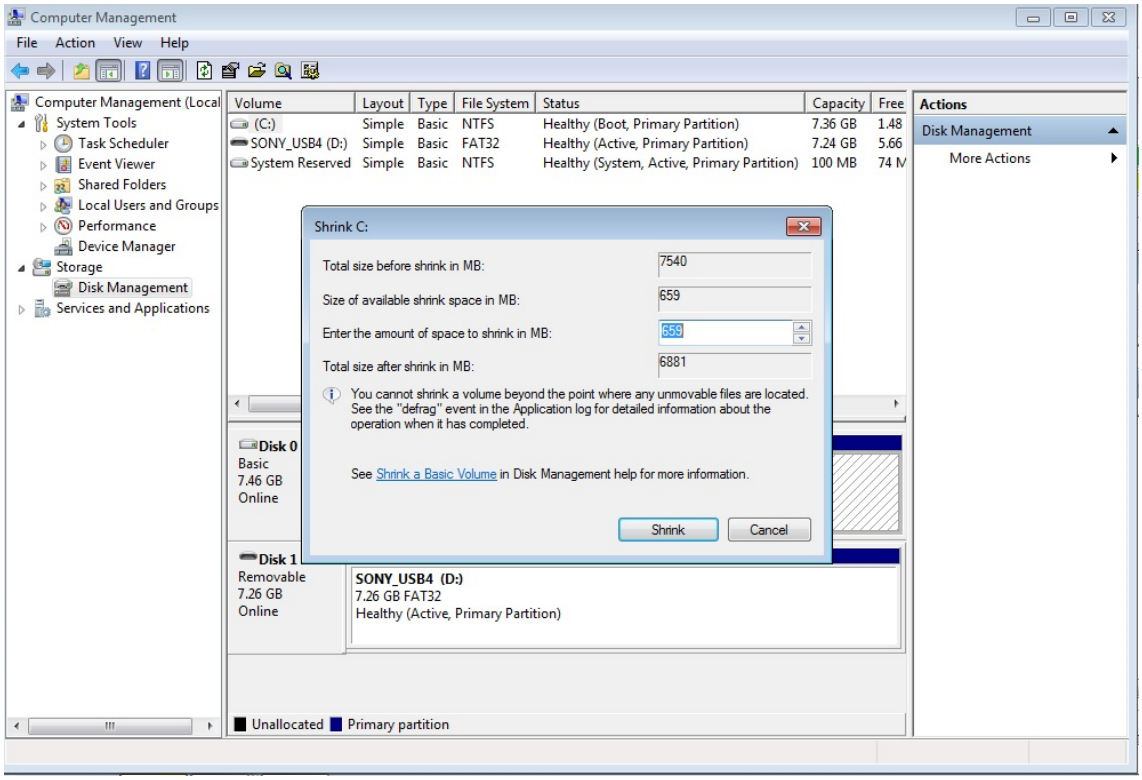


2. Insert the USB device that you want to save the system image to, in the USB port of the system. Click on **Disk Management** to view the size of the file system in **Disk 0** (sum of "**System Reserved**" and "**C:**").

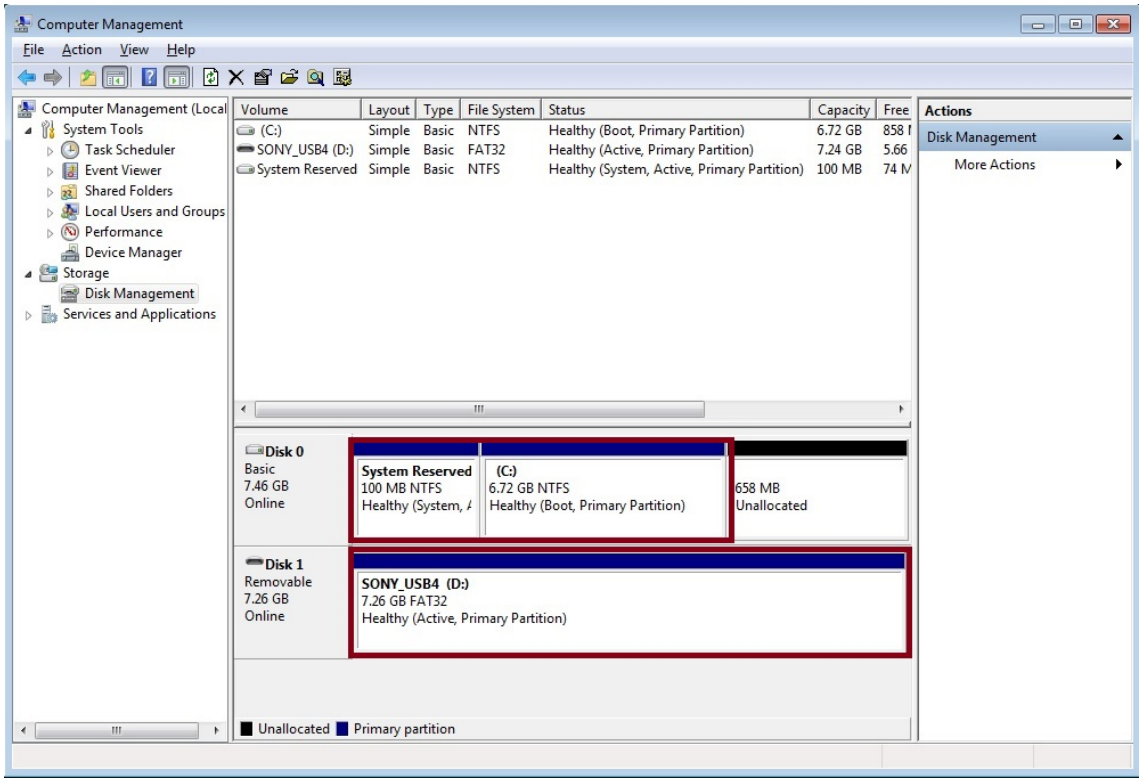


3. Right click on **(C:)** and select **Shrink Volume.**

4. Specify a value in **Enter the amount of space to shrink in MB** and click **Shrink**.
   The **Total size after shrink in MB** must to be smaller than the size of the USB disk.

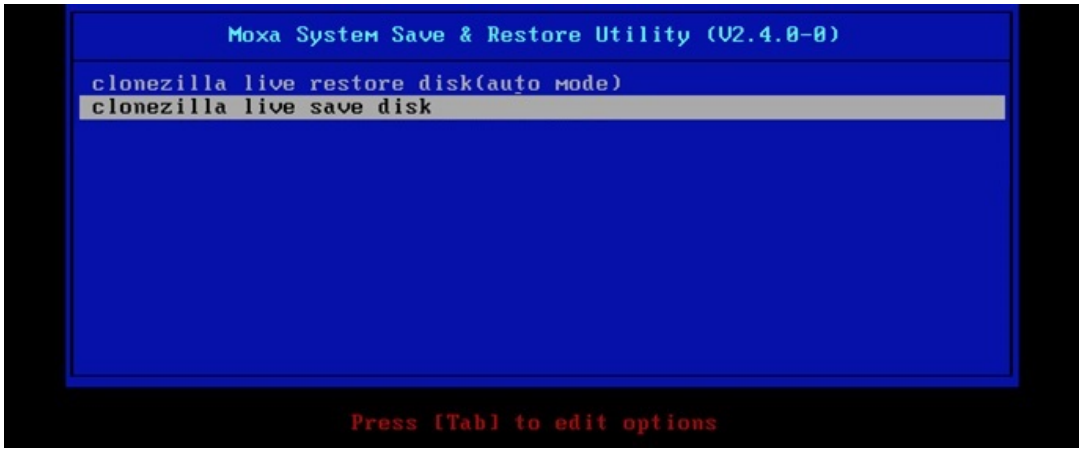


5. Make sure that the **Total size after shrink in MB** is smaller than the size of USB disk.

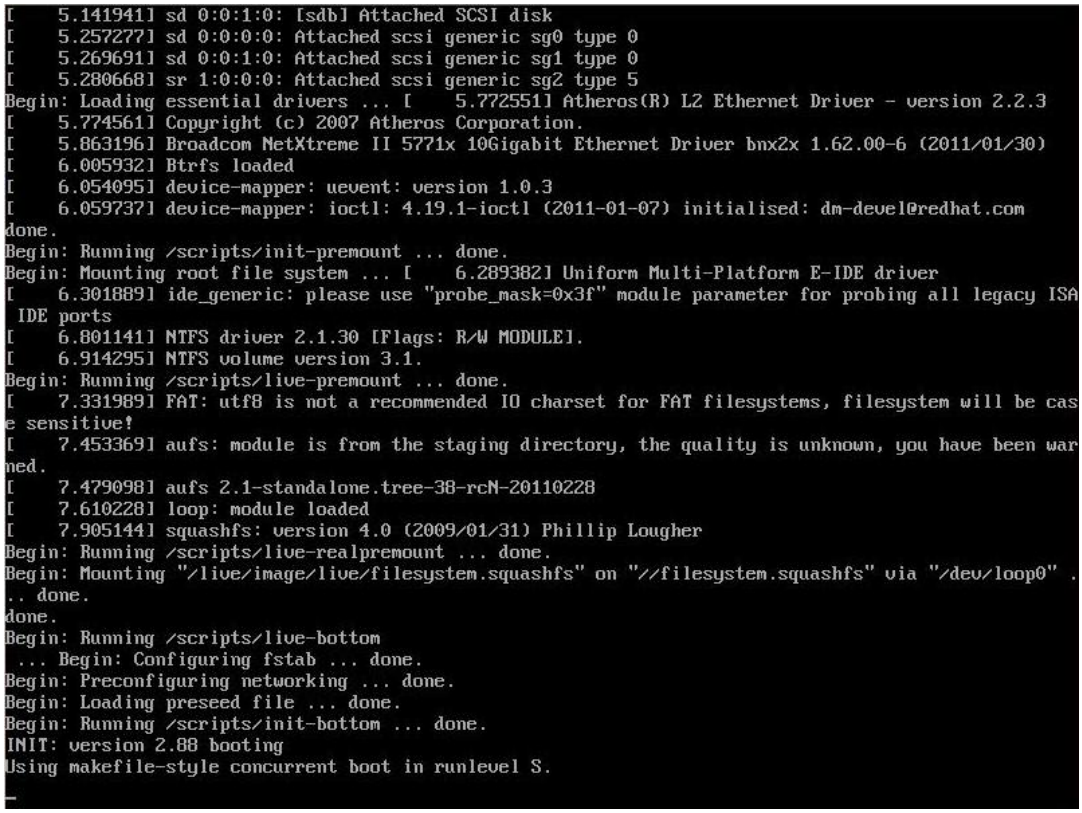


Now reboot the system and change the boot order in the BIOS setting (refer to the "Boot Setting" section of the Hardware Manual) to set the USB device as the first boot priority. Do the following to complete saving the system image to the USB device:

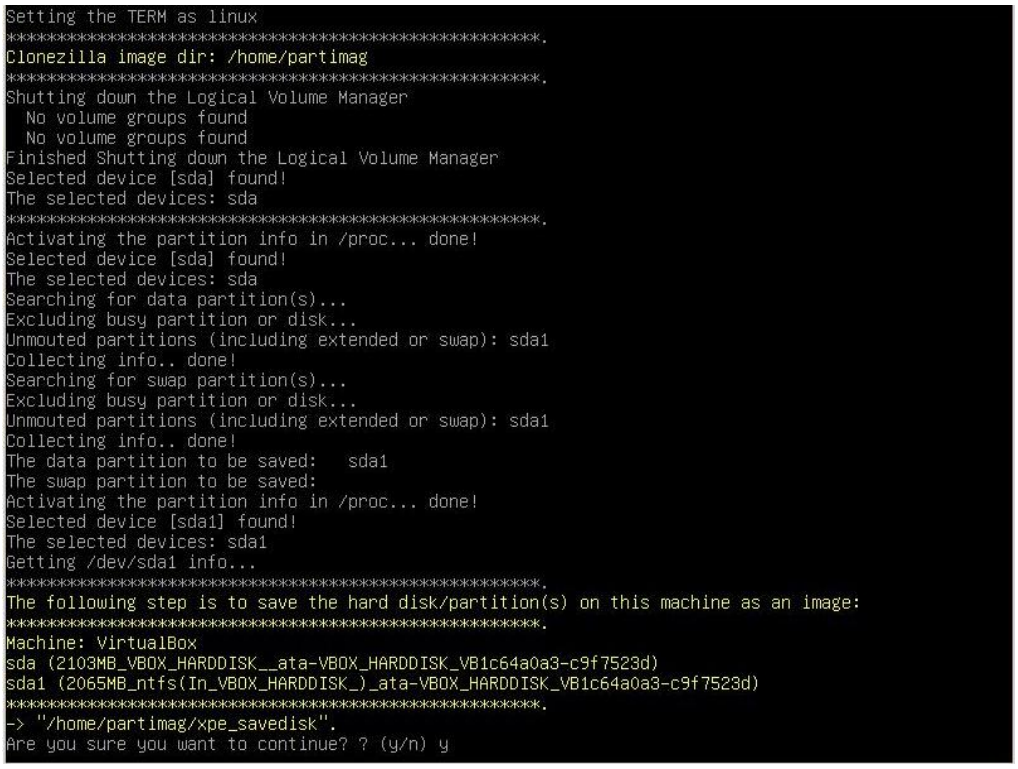
1. Select **clonezilla live save disk**.



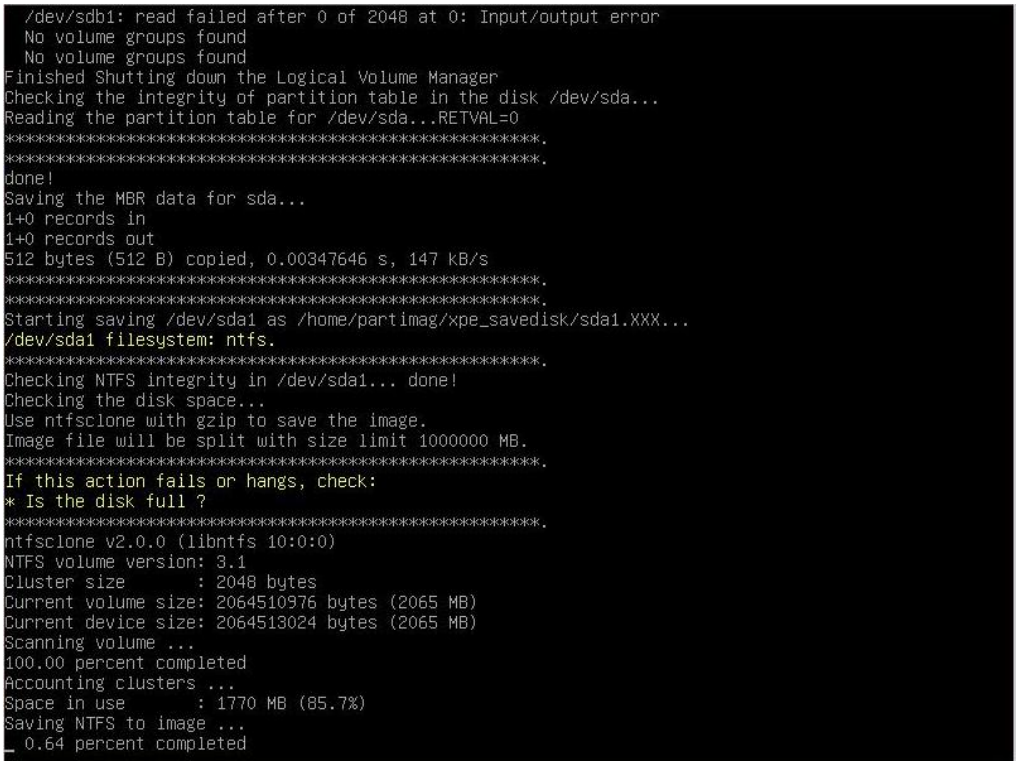
2. Wait for the USB drive boot process to finish.



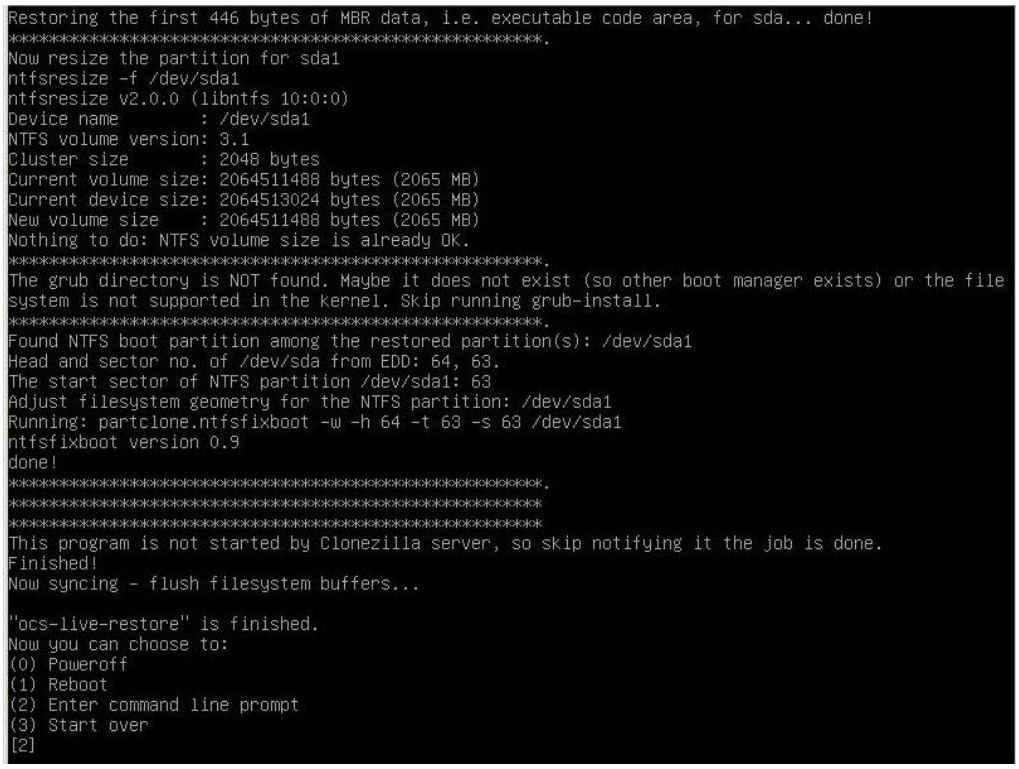
3. Enter **y** to continue.



4. Wait for the process to finish.



5. Select **(0) Poweroff** so that the computer will power off when the process is finished.



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Proactive Monitoring

The V2403 series supports the “Moxa Proactive Monitoring” utility. See the “Moxa Proactive Monitoring Windows Software User’s Manual” for details. The manual can be found on the product CD/DVD or downloaded from Moxa’s website. Note that the V2403 does not support hardware relay.