

# DA-681A Series Windows Software User's Manual

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

**MOXA**®

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# DA-681A Series Windows Software User's Manual

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# Introduction

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Thank you for purchasing a Moxa DA-681A 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 DA-681A computer.

## **Windows Embedded Standard 7 (WS7E)**

### **Core OS:**

- 64-bit support
- Remote Client
- Remote Procedure Call

### **Applications and Services Development:**

- .Net Framework 3.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

### **Internet Services:**

- Internet Explorer 8.0
- IIS 7.0

### **File Systems and Data Store:**

- Windows Data Access Components
- Windows Backup and Restore

### **Diagnostics:**

- Common Diagnostic Tools
- Problem Reports and Solutions

**Fonts:** Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts

### **Graphics and Multimedia:**

- MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
- MPEG Layer-3 Audio Codecs(MP3)
- MPEG4 Decoder
- Windows Media Video VC-1 (WMV) Codecs
- DirectX and Windows Device Experience
- Windows Media Player 12

### **International:**

- IME Simplified Chinese Support
- IME Traditional Chinese Support
- IME Japanese Support
- IME Korean Support

### **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)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

**Embedded Self-Health Diagnostic Software:** SNMP-based remote scripting layer for monitoring, reporting, and control

## System Initialization

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In this chapter, we describe how to initialize the system settings on the DA-681A computer when booting up for the first time.

The following topics are covered in this chapter:

▣ **Overview**

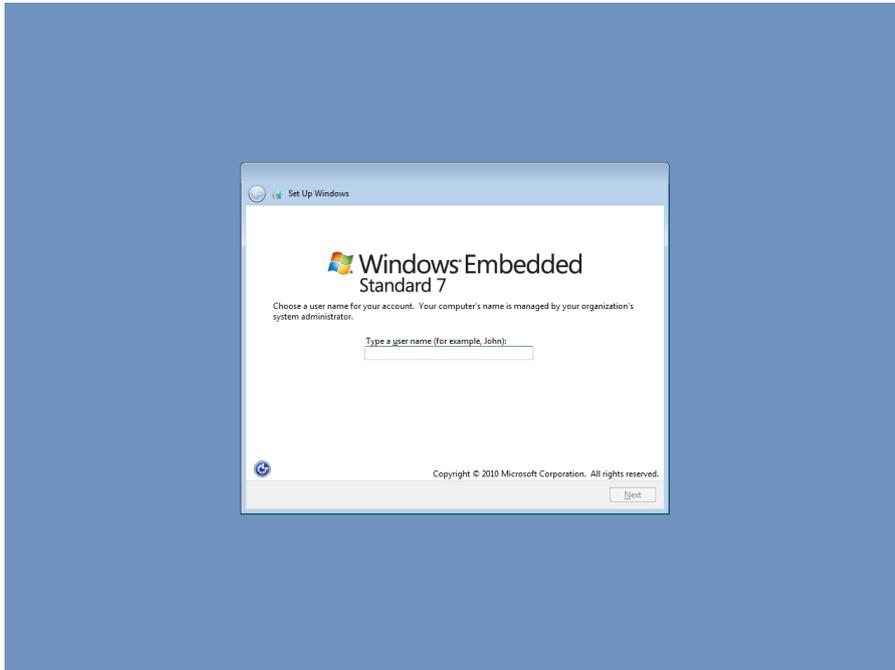
- Initializing User Settings

# Overview

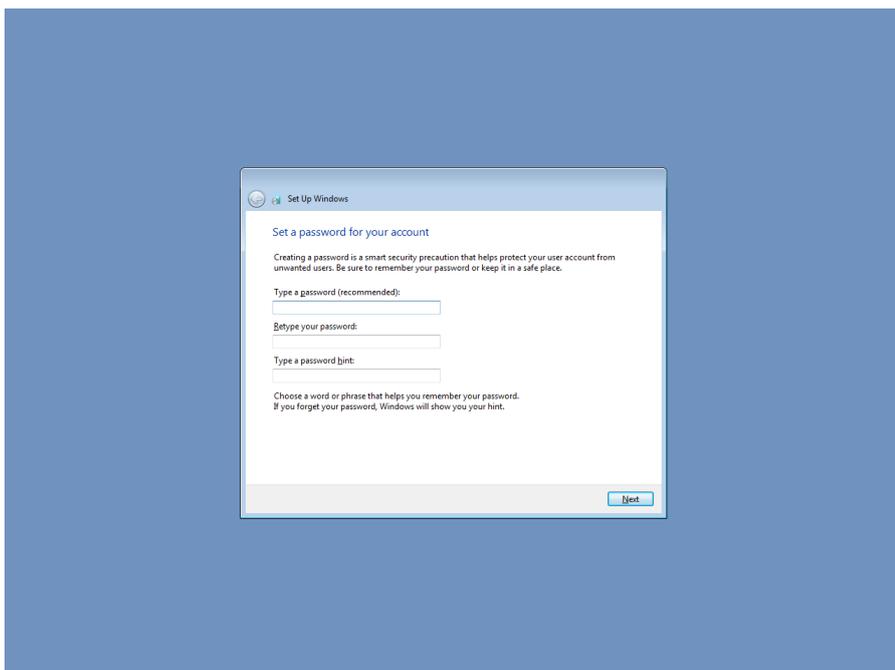
As with most laptop computers, you need to select a user name and create a user account to enable the embedded computer to work. Take the following steps to do this:

## Initializing User Settings

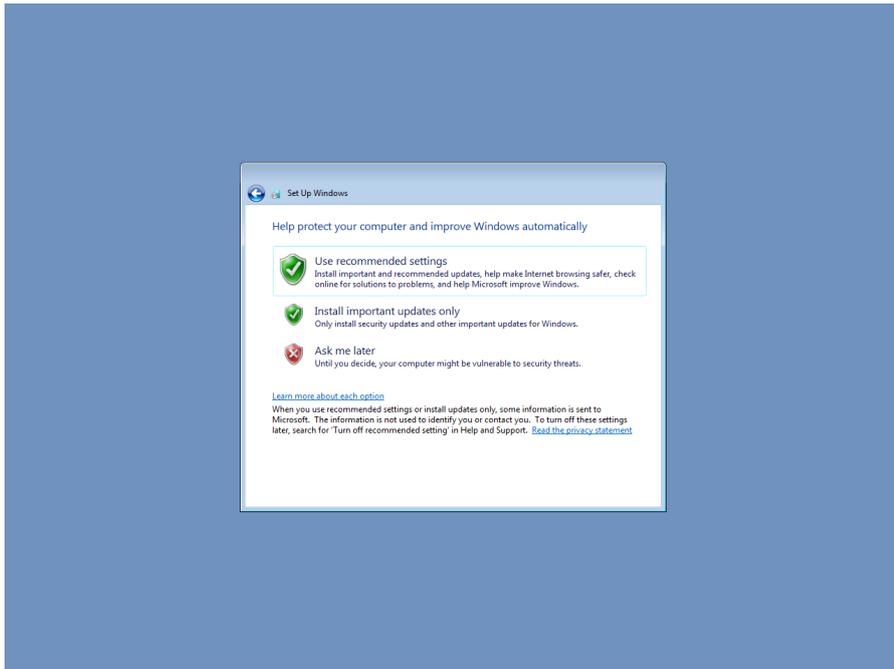
1. When you boot up the embedded computer for the first time, enter a user name for the computer.



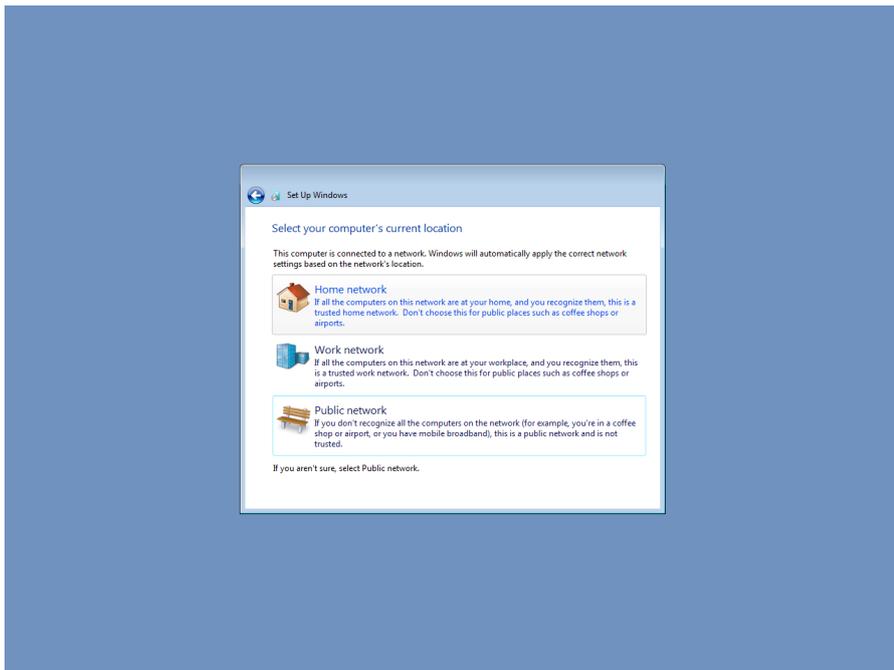
2. Type in a password, and then retype the password. You may also type a password hint that you can refer to if you forget your password. If you do not want to set a password, leave all three fields blank. Click **Next** to continue.



3. Select a windows update option.



4. Select the computer's current location. Windows will automatically apply the correct network settings based on the type of network you select.



5. At this point, you can start using your DA-681A embedded computer.



## Configuring the Serial Interface

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In this chapter, we describe how to configure the DA-681A's serial interface.

The following topics are covered in this chapter:

- **Overview**
- **Configuring the Serial Interface Mode**

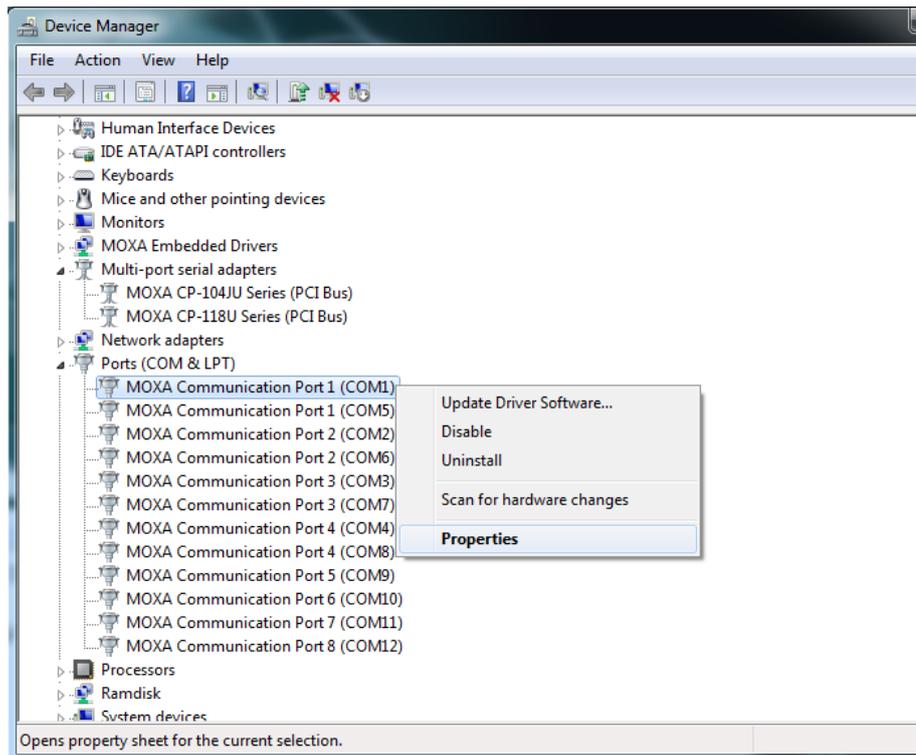
## Overview

The DA-681A supports the following serial modes: **RS-232**, **RS-485-2-wire**, and **RS-422/485-4-wire**. These modes can be configured as either COM1 or COM2.

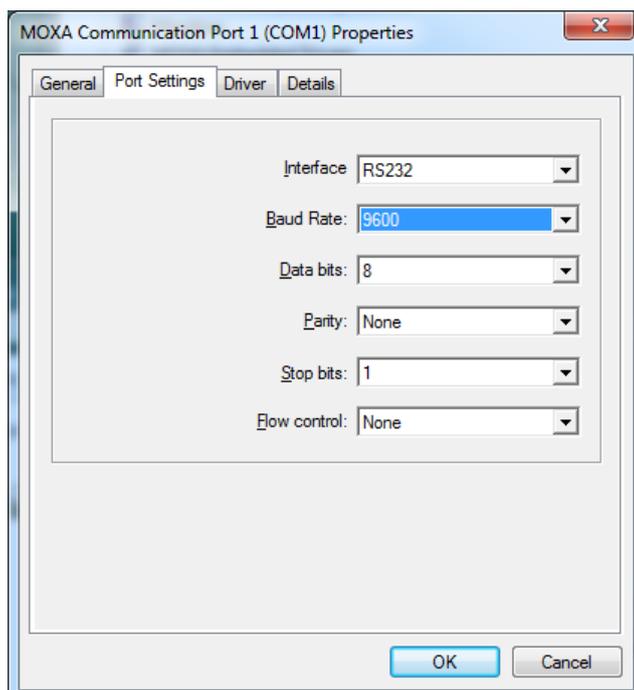
## Configuring the Serial Interface Mode

Take the following steps to configure the serial interface mode:

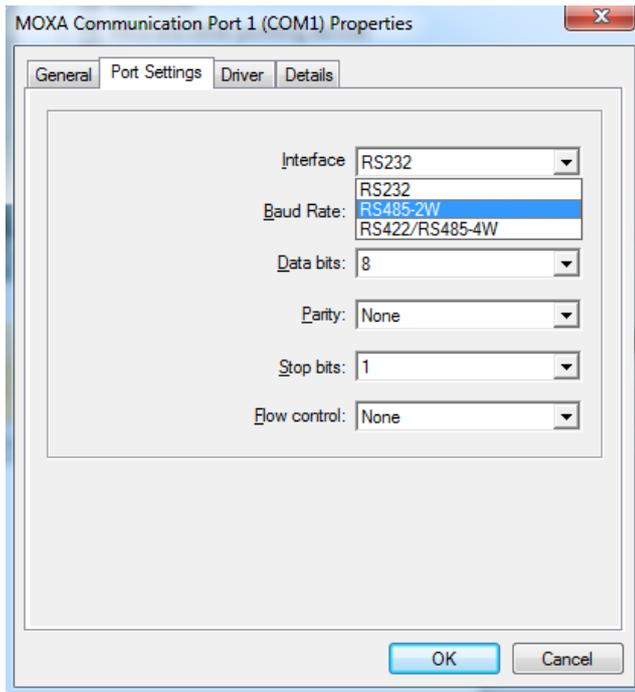
1. Right-click the port you would like to configure, and then select **Properties**.



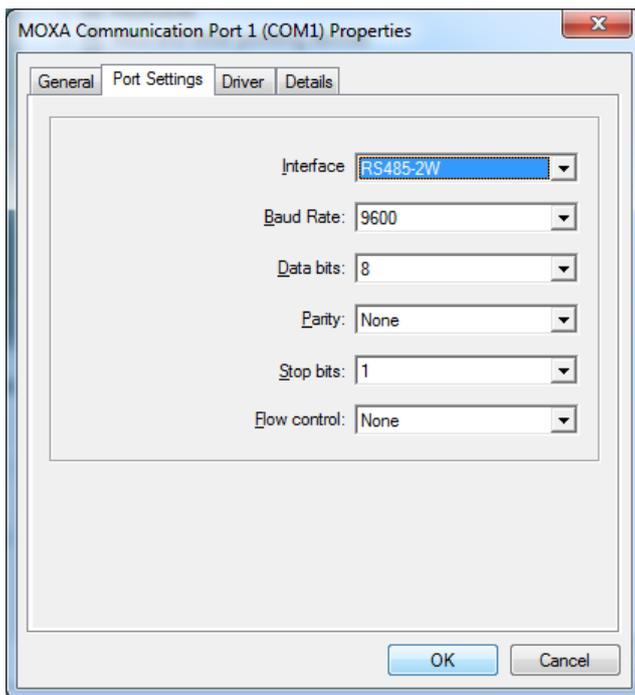
2. Select the **Port Settings** tab.



3. Select the serial mode you would like to use from the **Interface** dropdown box.



4. Check to make sure that the serial interface is correct.



# Enabling Embedded Filters

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In this chapter, we describe how to enable the DA-681A'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**

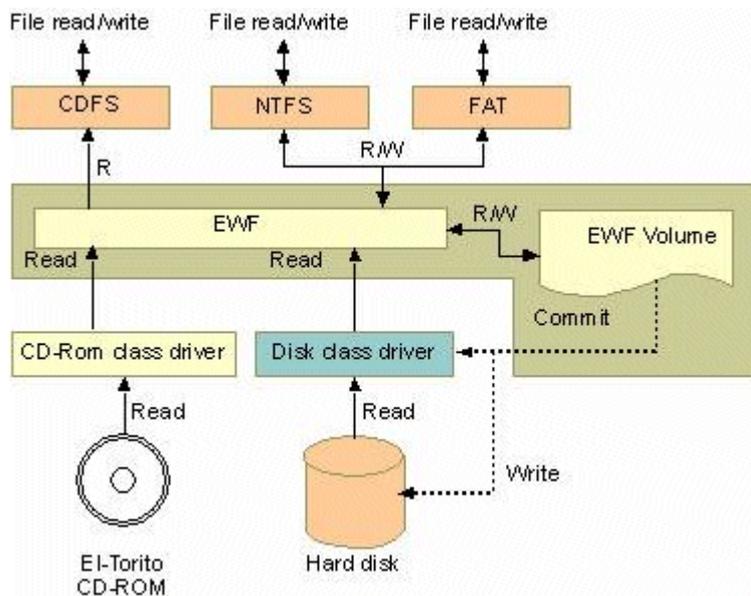
- Overview
- Configuring File-Based Write Filter
- Excluding Files from FBWF Protection
- Managing Temporary Files Cached in the Overlay

# Enhanced Write Filter

## Overview

Enhanced Write Filter (EWF) provides a means for protecting a volume from unauthorized writes by making the main OS drive a write-protected volume, effectively making the system a read-only system for most users. This gives much stronger protection against malicious computer code like trojans, worms, and viruses.

**Enhanced Write Filter (EWF)** allows Windows 7 users to protect all of the 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 operating system (OS) to boot from the hard disk, but protects the system by creating a virtual file system called an **overlay**. All writes to an EWF-protected volume (the **hard disk**, in Fig. 1) are only recorded on this virtual overlay (the **EWF Volume**, in Fig. 1), 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 desired, the 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. Refer to the following figure (from Microsoft) for an overview of the EWF structure.



For more detailed information about EWF configuration and usage, refer to any of 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>

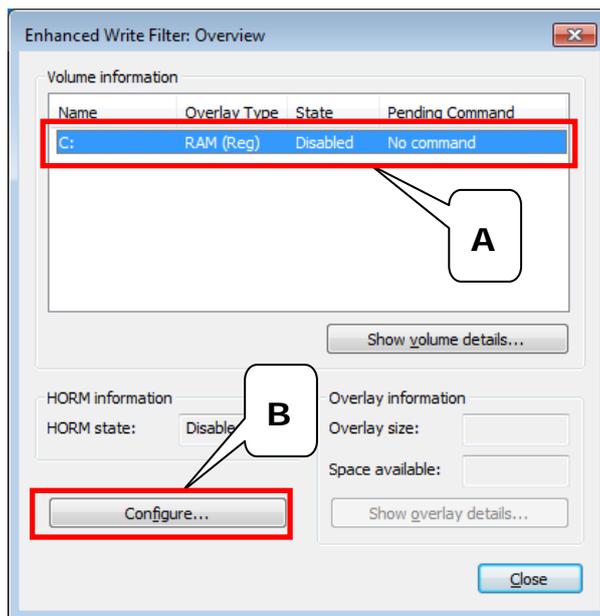
## Enabling Enhanced Write Filter

Follow these steps to enable Enhanced Write Filter:

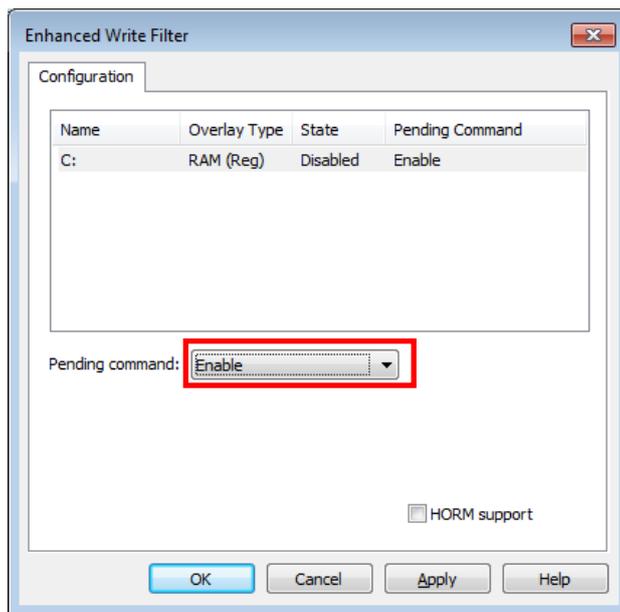
1. To open the EWF control dialog, open the system tray (located in the lower right corner of the desktop) and then right-click the padlock icon.



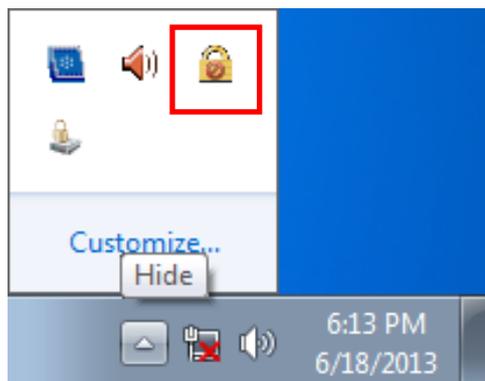
2. Select the volume you wish to enable write-protection on by selecting the partition (A) in the **Volume Information** dialog, and then pressing the **Configure** button (B) in the lower left section of the dialog.



3. After opening the configuration dialog, select **Enable** from the **Pending command** dropdown list and then click **OK**.



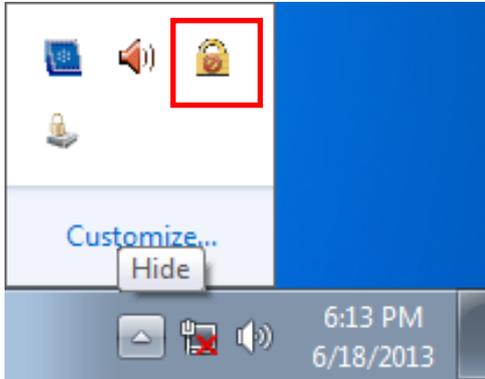
4. Reboot the system.
5. After logging in to the desktop environment, open the system tray (located in the lower right corner of the desktop) and check to verify that the padlock icon now shows that the drive volume is locked down with EWF.



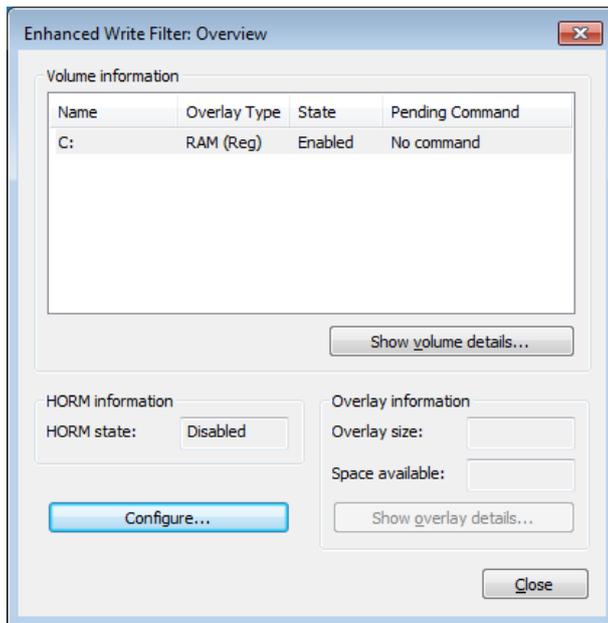
## Committing Data and/or Disabling EWF

When EWF is enabled on a drive, you will need to use a special process to write data to the hard drive. Writing data to the drive in this situation is called a **Commit**. Note that you must have administrator privileges to commit data to the drive.

1. Open the EWF control dialog by right-clicking on the padlocked drive in the system tray (located in the lower right corner of the desktop).



2. Once the EWF control dialog is open, select the drive you wish to operate on, and then click the **Configure** button in the lower left corner of the window to open the EWF **Configuration** page.



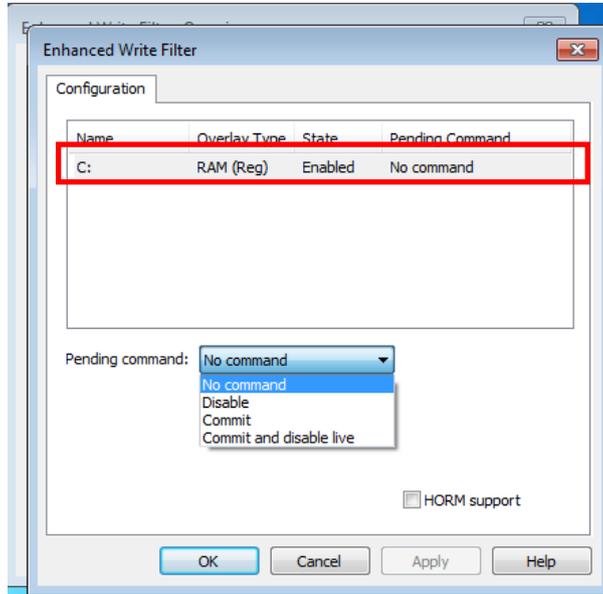
- Once the EWF control dialog is open, select the drive you wish to operate on from the upper window of the dialog, and then click on the Pending Command drop-down menu below. There are four choices:

**No Command**

**Disable:** Disables EWF on the selected drive. Be aware that the system will automatically reboot if you select this command.

**Commit:** Writes all current changes to the system data 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, as well). Selecting this option will NOT automatically reboot your system.



For more detailed descriptions of these commands, please refer to the Microsoft website shown below:

[http://msdn.microsoft.com/en-us/library/ff794092\(v=winembedded.60\).aspx](http://msdn.microsoft.com/en-us/library/ff794092(v=winembedded.60).aspx)

## File-Based Write Filter

### Overview

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.”

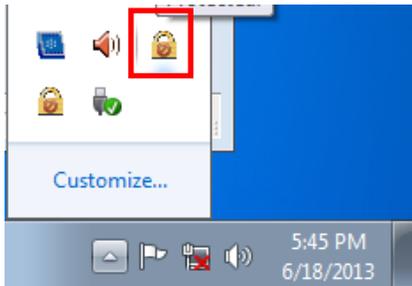
FBWF supports an advanced ESF feature, which allows users to specify which directory to write data to. The default directory is c:\temp. The advanced feature allows you can read/write data to disk without committing an action.

## Configuring File-Based Write Filter

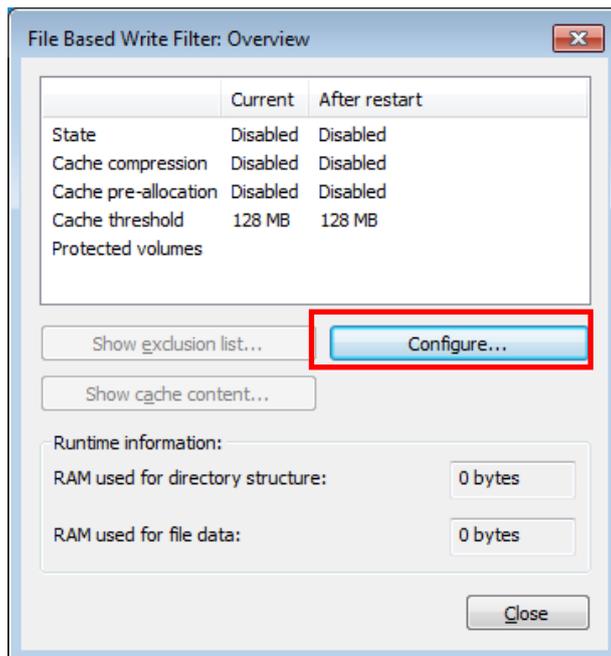
Take the following steps to enable the File-Based Write Filter (FBWF). Keep in mind that although FBWF and EWF may both be enabled on the same machine, FBWF cannot protect a volume also protected by EWF. Similarly, EWF cannot protect a volume also protected by FBWF.

1. To open the FBWF overview window, open the system tray (located in the lower right corner of the desktop) and right-click on the padlock icon.

**NOTE** When disabled, the icons for EWF and FBWF are identical. After the dialog opens be sure to verify that you have opened the correct window.

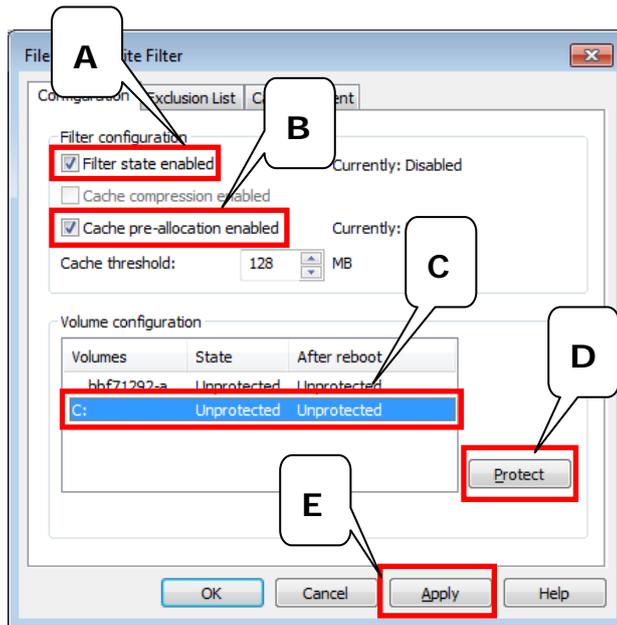


2. When the overview window opens, you will receive a quick report on the current FBWF configuration. The screenshot shows what it will look like before it is enabled. To continue with the setup, click the **Configure** button

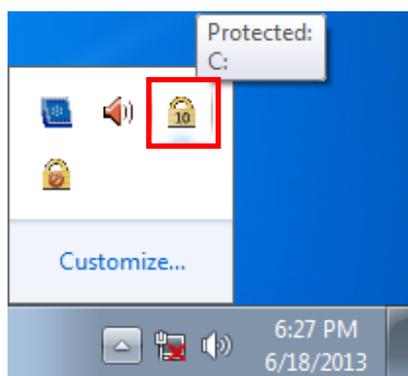


- The FBWF configuration window is considerably more complicated than the EWF setup. To enable FBWF protection on your main storage drive, you will need to enable the filter by ticking **Filter state enabled (A)** and **Cache pre-allocation enabled (B)**. Next, select the drive you want to protect from the **Volume Configuration** menu (C) and then click on the **Protect** button. Finally, click on **Apply (E)**, or **OK** to set the FBWF configuration.

**Cache compression** can be used on the overlay cache to minimize the amount of memory used. Cache compression decreases performance when accessing protected volumes, and cannot be used with pre-allocation. **Cache pre-allocation** sets the memory space available for the overlay cache when the system starts up, instead of adjusting it as needed. It cannot be used with cache compression. The **cache threshold** specifies 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 by operating system.

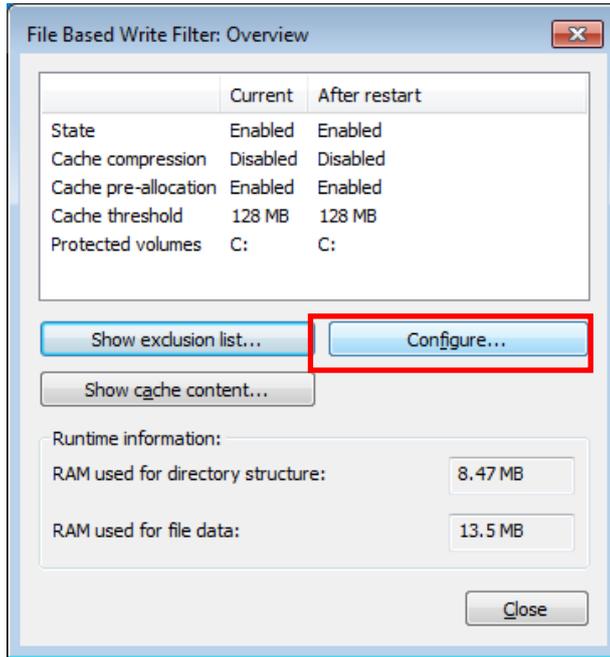


- Reboot the system.
- Once again, open the system tray (located in the lower right corner of the desktop) and verify that the padlock icon now shows that FBWF is enabled. The icon should have changed to a padlock displaying the number 10, as shown in the figure at right.

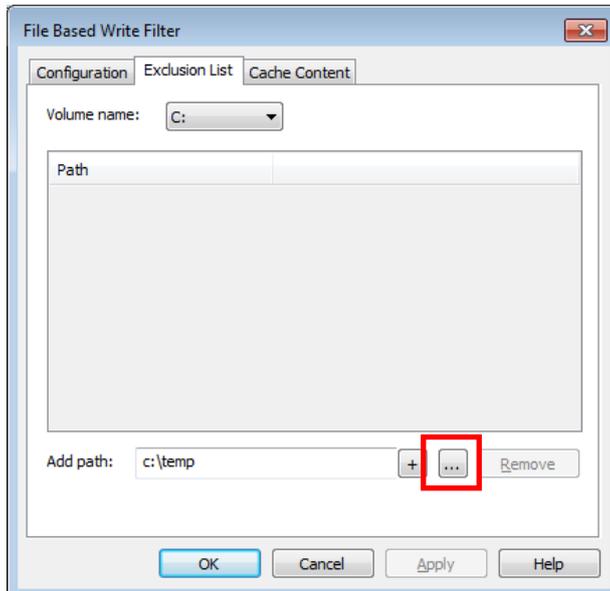


## Excluding Files from FBWF Protection

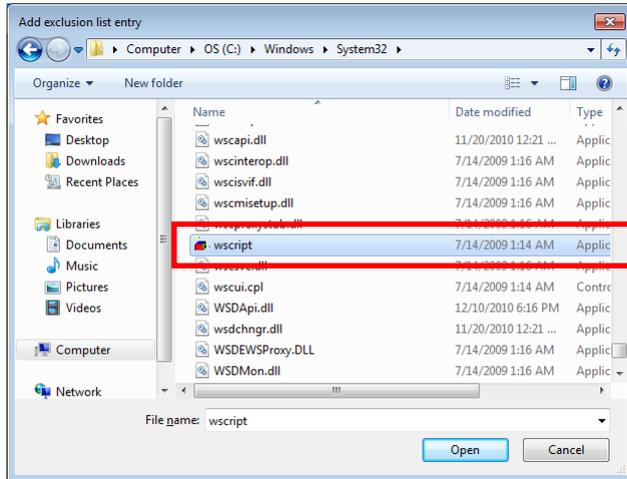
1. Click on the FBWF icon (in the desktop systray) to open the **Overview** dialog. Click on **Configure** to switch to the configuration interface.



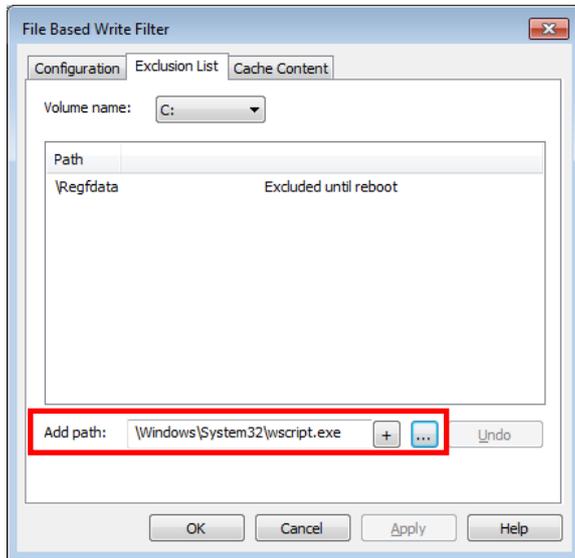
2. Click on the **Exclusion List** tab. Make sure the correct drive volume is shown in the dropdown menu labeled **Volume name**; if not, select the correct volume from the dropdown menu. Next, you must select the file path you wish to exclude from FBWF protection; doing so will allow the drive to write to the selected files and directories, so be careful. You may indicate an entire section of the file tree by selecting an entire file path, or you may select individual files. To select individual files, click on the **Browse** button (marked with ellipses, in the lower right corner, as shown below) to open a Windows Explorer interface.



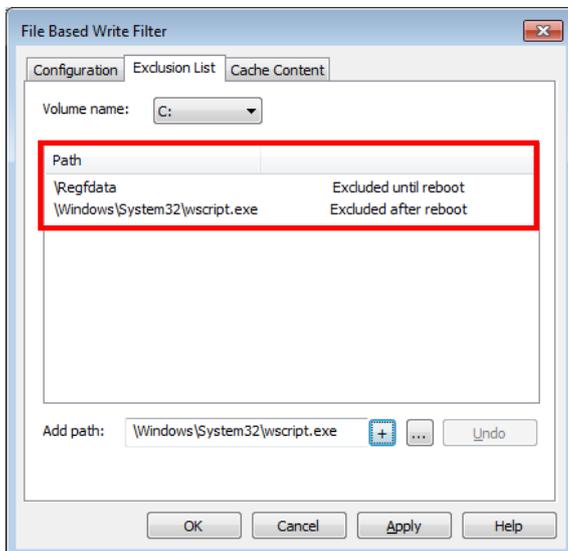
- Navigate to the file(s) you wish to exclude from FBWF protection, select the file, and then click **Open** to enter the path into the exclusion dialog. Windows Explorer will be closed, and you will be returned to the **Exclusion List** interface shown in step 2.



- You should now see the file or file path you selected for exclusion listed in the **Add Path** dialog, at the bottom of the **Exclusion List** tab. Click the add button (+) to add the path or file to the exclusion list.



- After adding a file or path to the exclusion list, you should see it listed in the **Path** window. If the file does not appear, then it has not yet been added.



6. Reboot the system for the changes to take effect.

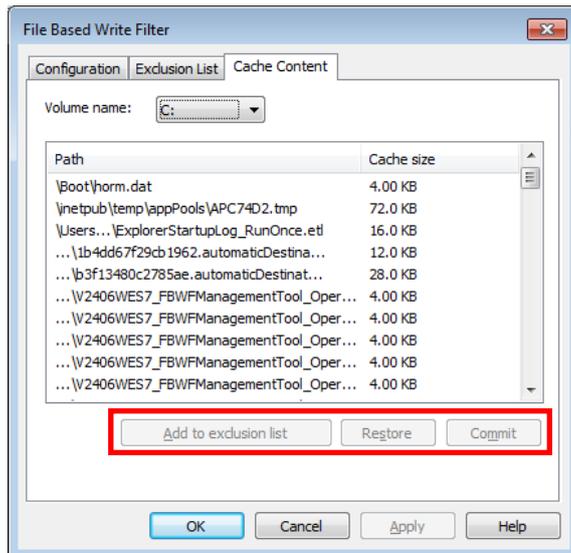
## Managing Temporary Files Cached in the Overlay

1. On the **Cached Content** tab, you will see all the files currently cached in the RAM overlay. Three commands are available:

**Commit** will save a file from the cache to permanent storage, deleting the file from the overlay and overwriting the original.

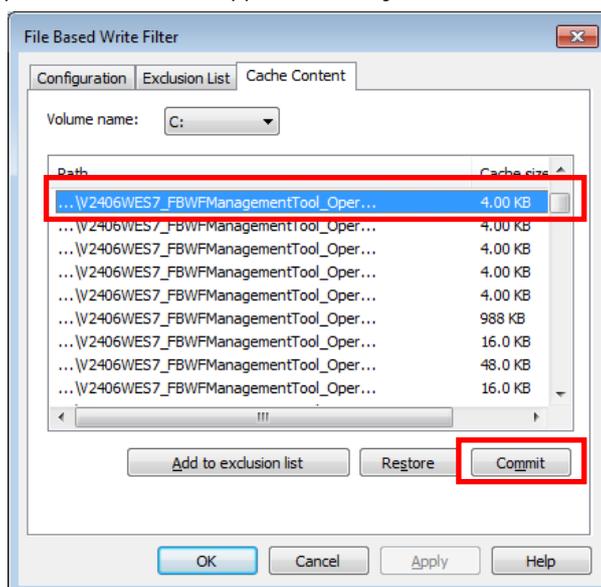
**Restore** will return the file to its original state, removing it from the overlay cache and discarding the changes that caused it to be added to the cache.

**Add to exclusion list** adds the file to the exclusion list after the next restart. Because this makes the file read-only, if it is executed on the wrong file it may render your system or particular applications inoperable.



2. 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, check the Microsoft help file that came with your computer, or check the following websites:

Go to Microsoft's [FBWF Installation and Configuration](#) help pages.

Go to Microsoft's [FBWF overview](#) on the official Microsoft FBWF help pages.

Go to Microsoft's detailed description of [FBWF features](#) on the FBWF help pages.

Go to Microsoft's detailed description of the [FBWF API](#).

# 5

## Examples

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In this chapter, we give examples illustrating how to use the DA-681A computer's various functions.

The following topics are covered in this chapter:

- ❑ **Setting a Serial Interface Mode**
- ❑ **LED Indicators**
- ❑ **Watchdog**

# Setting a Serial Interface Mode

This script allows you to select and query the communications standard used on a particular serial interface.

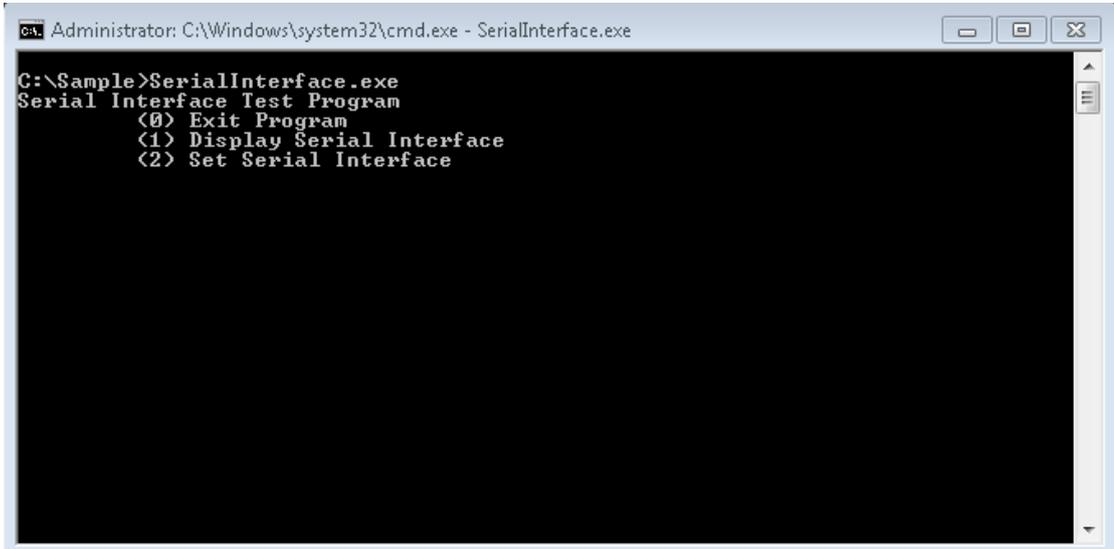
1. Copy the following files from the product software DVD.

**mxsp.dll:** \DVD\DA-681A-W7E V1.0\examples\lib\mxsp\

**mxGeneralIo.dll:** \DVD\DA-681A-W7E V1.0\examples\lib\MxGeneralIo\

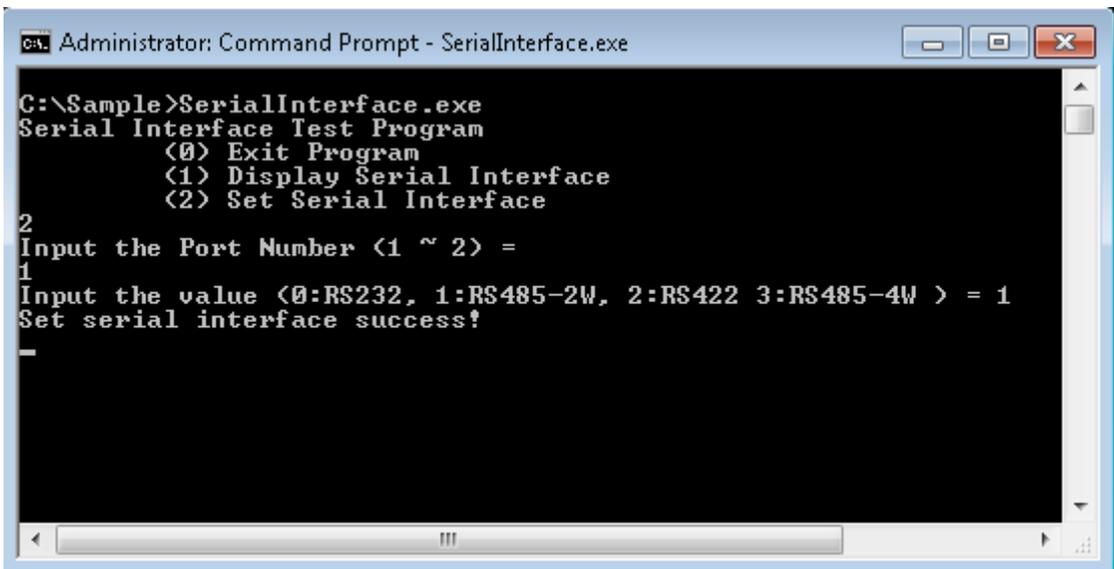
**SerialInterface.exe:** \DVD\DA-681A-W7E V1.0\examples\Release\

2. Execute **SerialInterface.exe**.



```
Administrator: C:\Windows\system32\cmd.exe - SerialInterface.exe
C:\Sample>SerialInterface.exe
Serial Interface Test Program
  <0> Exit Program
  <1> Display Serial Interface
  <2> Set Serial Interface
```

3. Type **2** to set the serial interface, and then follow the onscreen instructions.



```
Administrator: Command Prompt - SerialInterface.exe
C:\Sample>SerialInterface.exe
Serial Interface Test Program
  <0> Exit Program
  <1> Display Serial Interface
  <2> Set Serial Interface
2
Input the Port Number <1 ~ 2> =
1
Input the value <0:RS232, 1:RS485-2W, 2:RS422 3:RS485-4W > = 1
Set serial interface success!
```

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

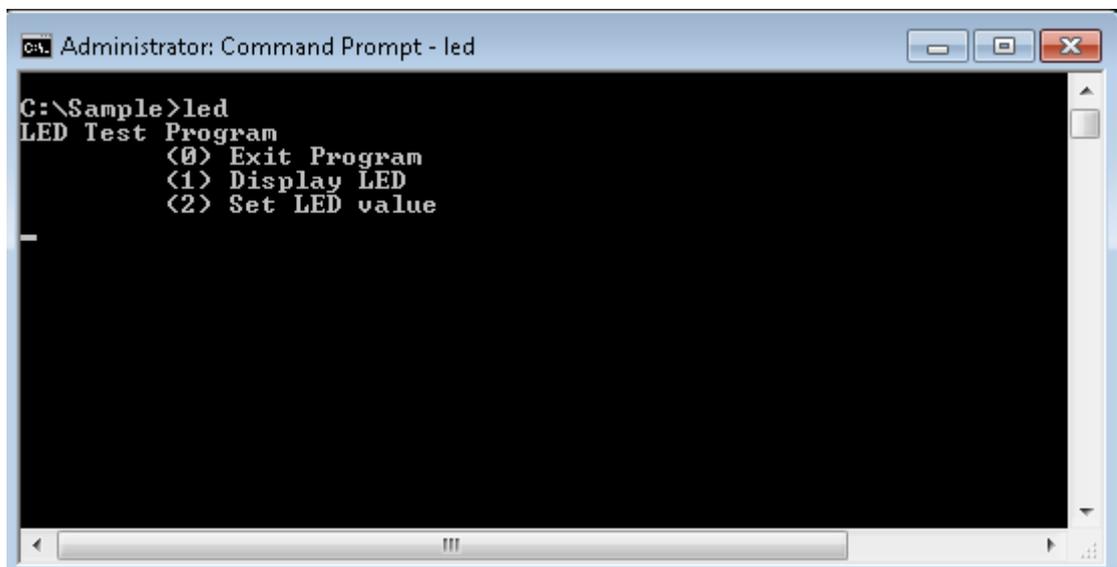


```
Administrator: Command Prompt - SerialInterface.exe
C:\Sample>SerialInterface.exe
Serial Interface Test Program
(0) Exit Program
(1) Display Serial Interface
(2) Set Serial Interface
1
COM1 = RS485-2W
COM2 = RS232
```

## LED Indicators

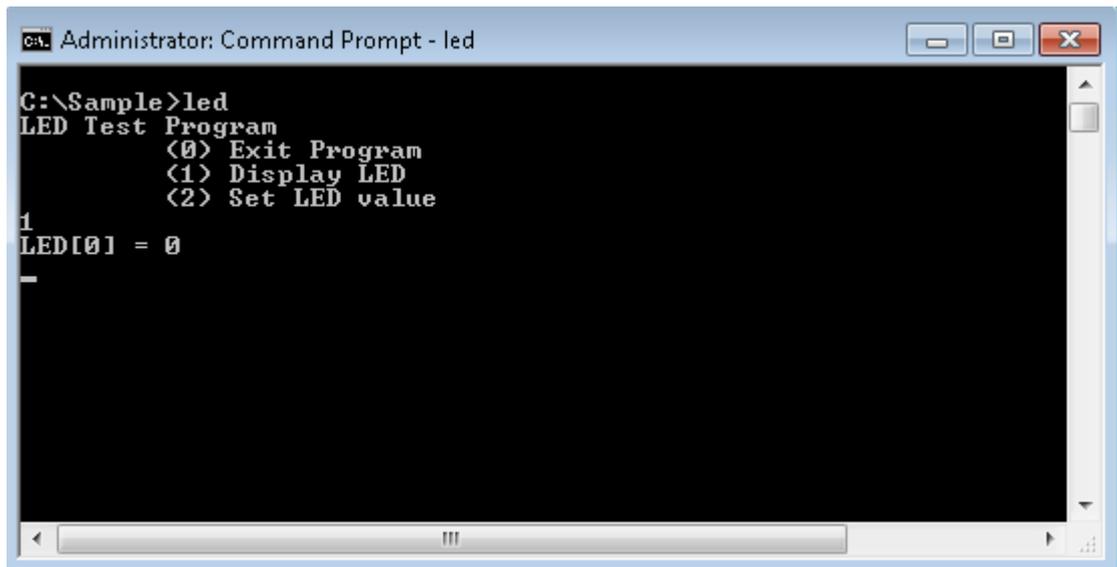
This script reports on and controls the LED state by switching it on or off.

1. Copy the following files from the product software DVD.  
**mxgpio.dll**: \DVD\DA-681A-W7E V1.0\examples\lib\mxgpio\  
**mxGeneralIo.dll**: \DVD\DA-681A-W7E V1.0\examples\lib\MxGeneralIo\  
**LED.exe**: \DVD\DA-681A-W7E V1.0\examples\Release\  
2. Execute **LED.exe**.



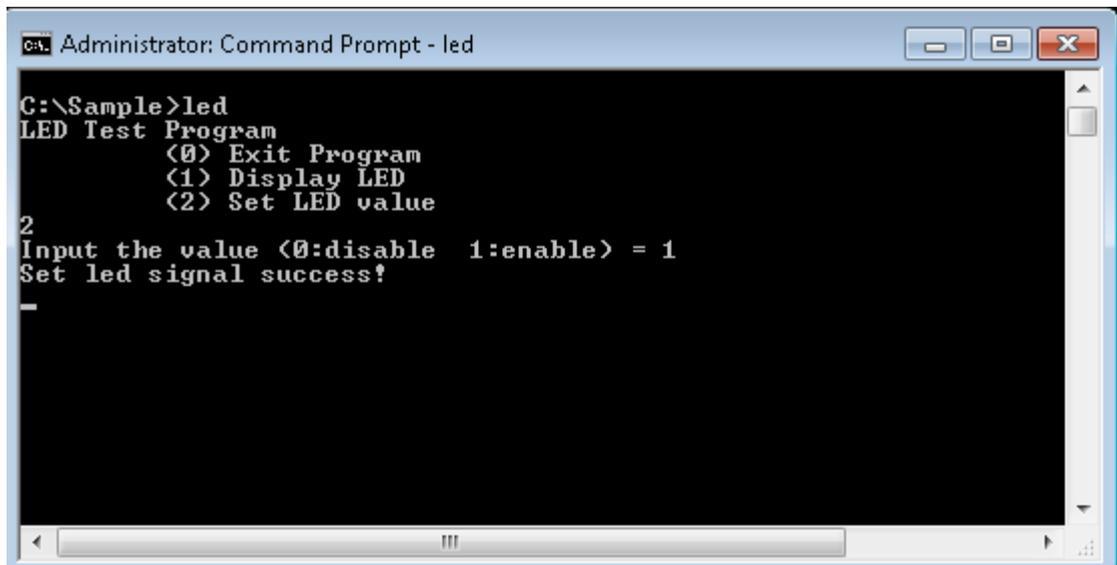
```
Administrator: Command Prompt - led
C:\Sample>led
LED Test Program
(0) Exit Program
(1) Display LED
(2) Set LED value
```

3. Type **1** to display the current LED value.



```
Administrator: Command Prompt - led
C:\Sample>led
LED Test Program
    (0) Exit Program
    (1) Display LED
    (2) Set LED value
1
LED[0] = 0
-
```

4. Type **2** to set the LED value, and then follow the onscreen instructions.



```
Administrator: Command Prompt - led
C:\Sample>led
LED Test Program
    (0) Exit Program
    (1) Display LED
    (2) Set LED value
2
Input the value (0:disable 1:enable) = 1
Set led signal success!
-
```

## Watchdog

This script reports on and controls the Watchdog state by switching it on or off.

1. Copy the following files from the product software DVD.
  - mxgpio.dll**: \DVD\DA-681A-W7E V1.0\examples\lib\mxgpio\
  - mxGeneralIo.dll**: \DVD\DA-681A-W7E V1.0\examples\lib\MxGeneralIo\
  - Watchdog.exe**: \DVD\DA-681A-W7E V1.0\examples\Release\
2. Execute **Watchdog.exe**.

# System Backup

---

In this chapter, we describe the system recovery process you should follow if your system becomes unstable.

The following topics are covered in this chapter:

- ❑ **Overview**
- ❑ **Setting Up the Recovery Environment**
- ❑ **Setting Up a Factory Default Recovery Image**
  - Step 1: Prepare the USB drive
  - Step 2: Setting the BIOS to Boot via USB
  - Step 3: How to Perform a System Recovery
  - Step 4: Reset the BIOS to its Original State
- ❑ **Creating a Custom System Image**

## Overview

In this section, we describe how to prepare your computer for recovery in the event of system instability. You can perform two types of system recovery, from one of two system images: a clean factory default image, or a user-generated image created from a fully configured, fully set up system.

Before you implement a system recovery, you should prepare the system environment in advance.

## Setting Up the Recovery Environment

To set up the recovery environment on a DA-681A computer, you will need an 8 GB (min.) USB drive and a copy of the recovery suite.

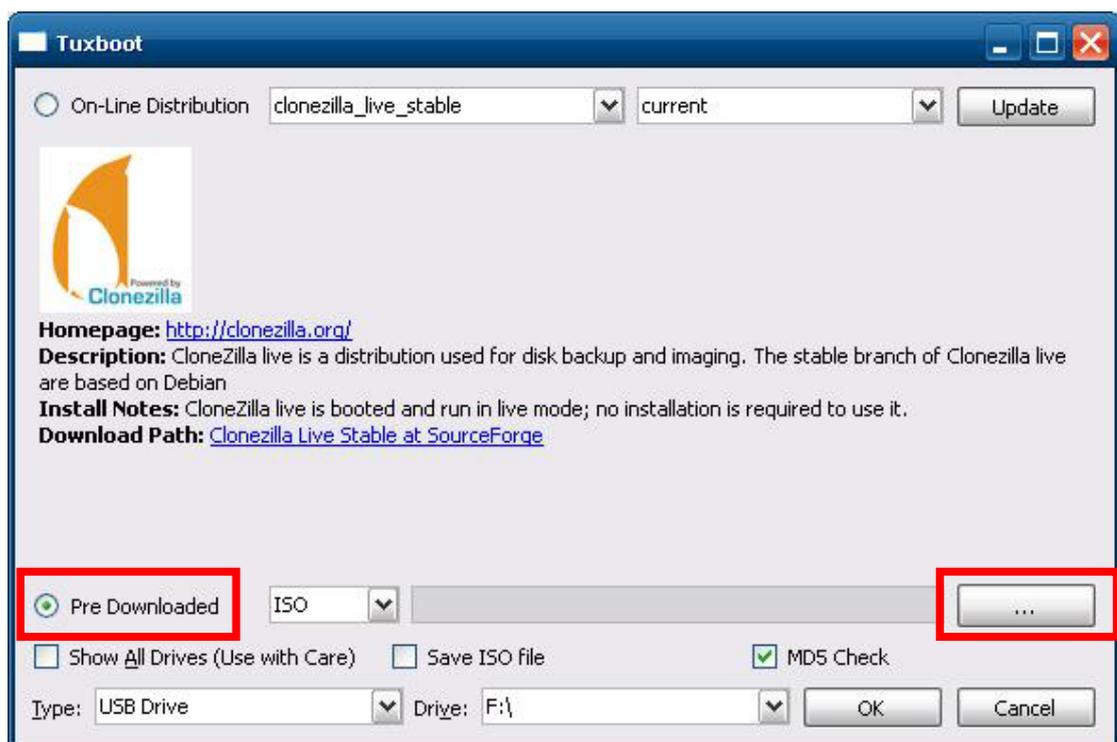
For the recovery procedure itself, you will only need a DA-681A computer and a USB drive. The following procedure describes the basic process of setting up the system recovery environment.

1. First, the recovery programs and system image file will be copied over to the USB drive, and the drive will be set up as a live-drive system, with an ISO image of the boot environment.
2. The system will be re-booted, and the BIOS will be manually configured to boot the recovery system from the USB port.
3. An image of the current software system will then be created on the USB drive. The recovery environment will use this image when restoring the system.
4. The system will be re-booted again, and the BIOS returned to its original state.

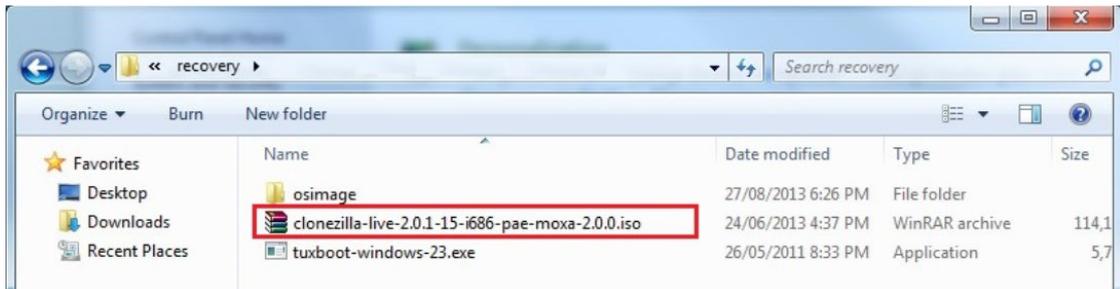
## Setting Up a Factory Default Recovery Image

### Step 1: Prepare the USB drive

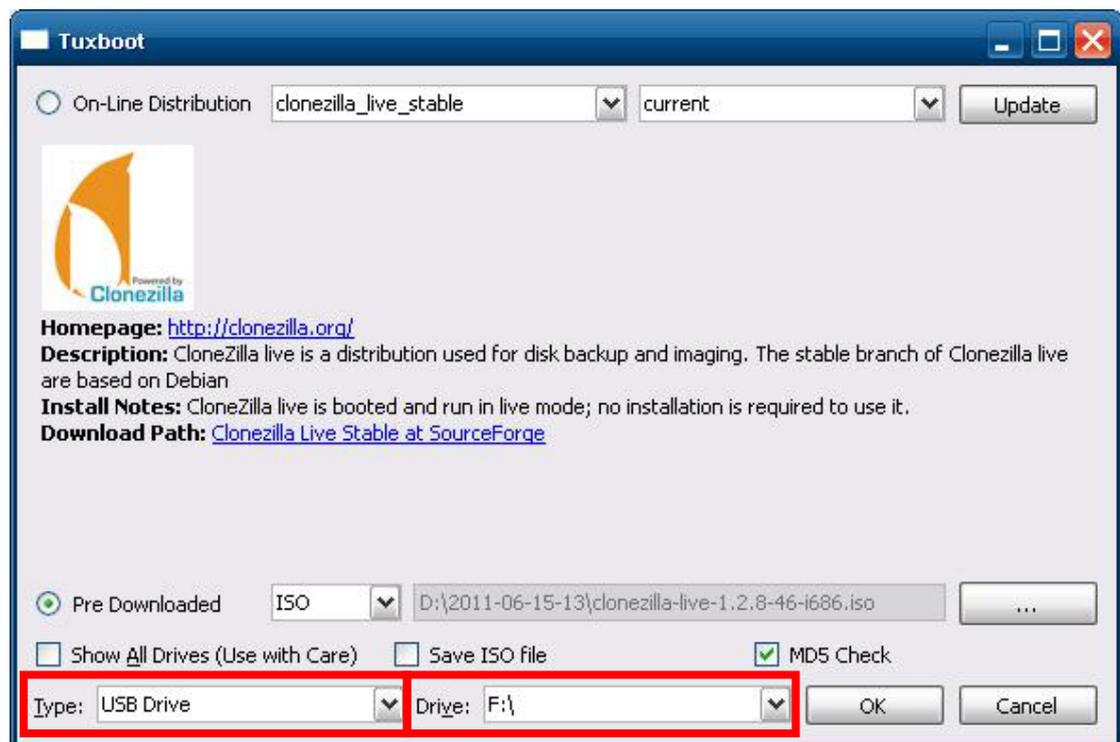
1. Load the software DVD that came with your DA-681A computer and execute **tuxboot-windows-23.exe** from the software **DVD\recovery\DA-681A-W7E\_Recovery** folder. Select **Pre-Downloaded**, and click the button marked with an ellipsis (...) to browse the file system and find the location of the boot environment's ISO image.



- Navigate to `\recovery\` on the software DVD and select the boot environment's ISO image.



- Select **USB Drive** from the **Type** dropdown box (lower left-hand corner), and then select the drive letter that corresponds to the USB drive from the **Drive** dropdown box. Click **OK** to copy the boot environment and bootloader to your USB drive.



- Click **Exit**; the boot environment and bootloader will be copied to your USB drive.

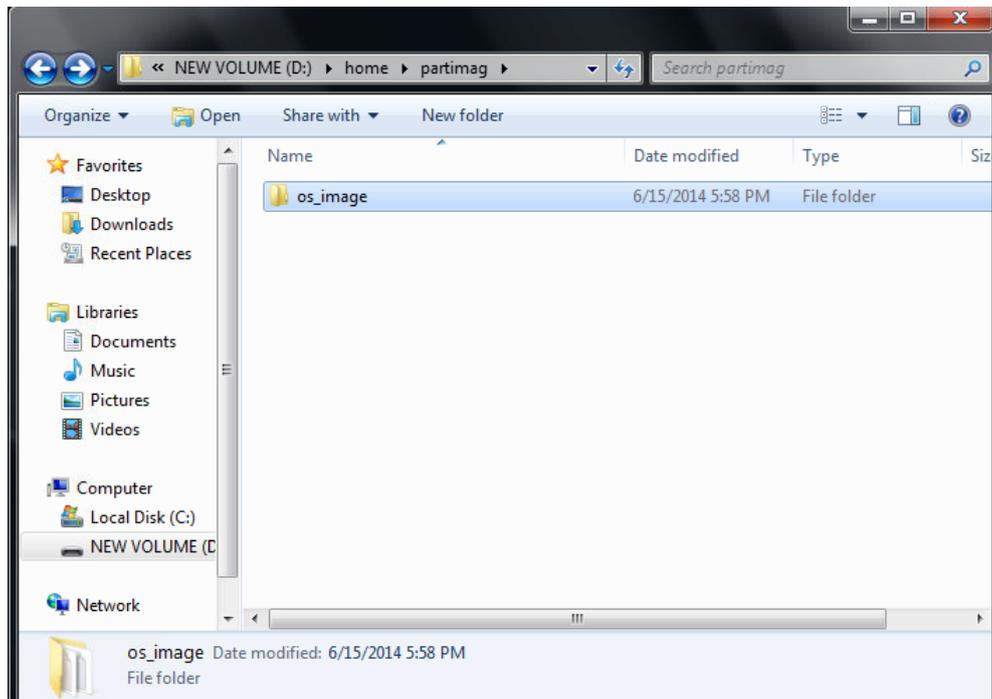


- When finished, click **OK**. Note that because of the file system naming conventions used, for any given computer only a single recovery image may be used on any given USB drive.
- From the desktop, manually copy the directory containing the base OS from the software DVD over to the USB drive. That is, copy

#:\<SoftwareDVD>\recovery\DA-681A-W7E\_Recovery\Clonezilla\os\_image to the partition image directory, F:\home\partimag\, on the USB drive.

However, if you would like to recover from your own system image, you first need to perform a system image backup. Refer to the section below, **Creating a Custom System Image**, for details.

At this point, **Step 1** has been completed, and you should proceed to the next section, **Step 2: Setting the BIOS to Boot via USB**.



## Step 2: Setting the BIOS to Boot via USB

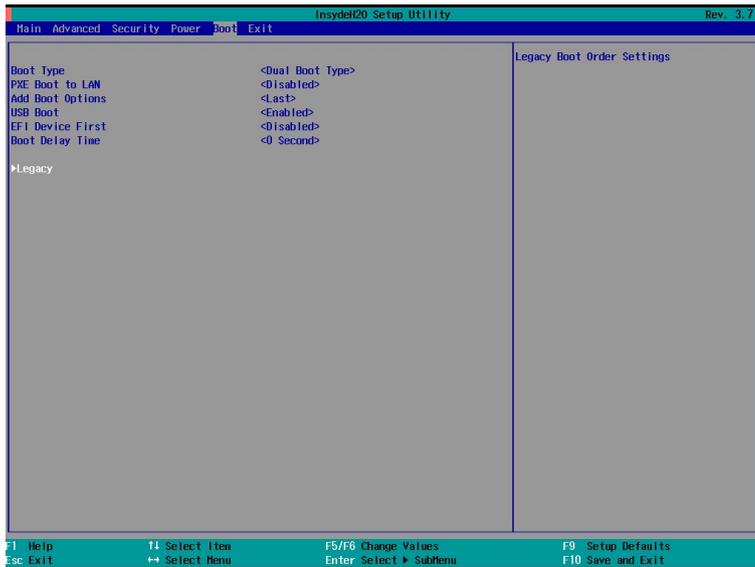
In this step, you will reset the BIOS so that the system boots directly from the USB. This must be done before the rest of the system recovery environment can be configured.

- Reboot the system, and, during the POST process, press **F2 until you hear a long beep**. Click **SCU** to enter the BIOS setup menu.



- Use the left/right arrow keys to navigate to the **Boot** menu, and then press **Enter**.

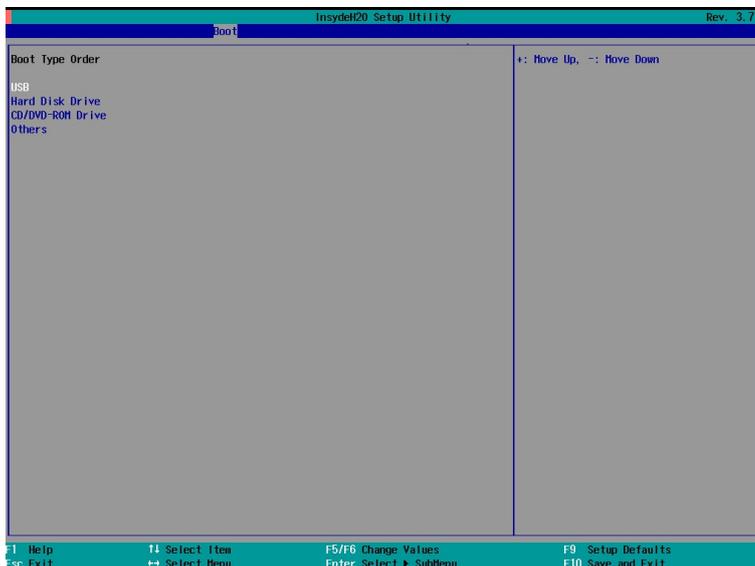
- 3. Use the up/down arrow keys to navigate to the **Legacy** link, and then press **Enter**.



- 4. Use the up/down arrow keys to navigate to the **Boot Type Order** link, and then press **Enter**.



- 5. Use the up/down arrow keys to navigate to the **USB** link, and then use the plus/minus (+/-) keys to move "USB" to the first boot priority position.

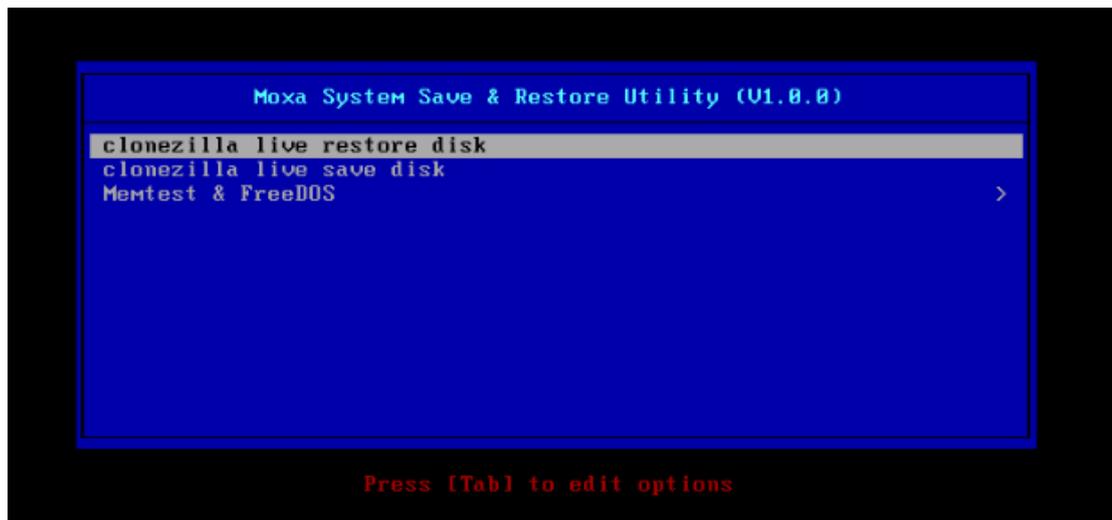


## Step 3: How to Perform a System Recovery

In this step, we provide instructions on how to perform a system recovery. We include this as step 3 of the installation so administrators can first perform a test run before deploying the system to the field.

To begin the system recovery, you will first need to have prepared the BIOS as described in the previous section **Step 2: Setting the BIOS to Boot via USB**, just above. After preparing the BIOS, connect the USB recovery drive to any of the DA-681A's USB ports and then reboot the computer. If you have successfully prepared the USB and BIOS, the computer will boot into the Clonezilla boot loader, from the USB.

1. Select **clonezilla live restore disk** to boot into the system restoration environment.



2. Wait until the boot process is finished.

```
[ 5.153522] sd 0:0:0:0: [sda] Attached SCSI disk
[ 5.163726] sd 0:0:1:0: [sdb] Attached SCSI disk
[ 5.287941] sd 0:0:0:0: Attached scsi generic sg0 type 0
[ 5.310750] sd 0:0:1:0: Attached scsi generic sg1 type 0
[ 5.334915] sr 1:0:0:0: Attached scsi generic sg2 type 5
Begin: Loading essential drivers ... [ 5.690577] Atheros(R) L2 Ethernet Driver - version 2.2.3
[ 5.692430] Copyright (c) 2007 Atheros Corporation.
[ 5.776770] Broadcom NetXtreme II 5771x 10Gigabit Ethernet Driver bnx2x 1.62.00-6 (2011/01/30)
[ 5.914014] Btrfs loaded
[ 5.955475] device-mapper: uevent: version 1.0.3
[ 5.961407] device-mapper: ioctl: 4.19.1-ioctl (2011-01-07) initialised: dm-devel@redhat.com
done.
Begin: Running /scripts/init-premount ... done.
Begin: Mounting root file system ... [ 6.178946] Uniform Multi-Platform E-IDE driver
[ 6.186189] ide_generic: please use "probe_mask=0x3f" module parameter for probing all legacy ISA
IDE ports
[ 6.913744] FAT: utf8 is not a recommended IO charset for FAT filesystems, filesystem will be cas
e sensitive!
[ 7.047997] aufs: module is from the staging directory, the quality is unknown, you have been war
ned.
[ 7.072516] aufs 2.1-standalone.tree-38-rcN-20110228
Begin: Running /scripts/live-premount ... done.
[ 7.213433] loop: module loaded
[ 7.509770] squashfs: version 4.0 (2009/01/31) Phillip Lougher
Begin: Running /scripts/live-realpremount ... done.
Begin: Mounting "/live/image/live/filesystem.squashfs" on "//filesystem.squashfs" via "/dev/loop0" .
.. done.
done.
Begin: Running /scripts/live-bottom
... Begin: Configuring fstab ... done.
Begin: Preconfiguring networking ... done.
Begin: Loading preseed file ... done.
Begin: Running /scripts/init-bottom ... done.
INIT: version 2.88 booting
Using makefile-style concurrent boot in runlevel S.
live-config: hostname user-setup sudo locales tzdata keyboard-configuration sysvinit sysv-rc initram
fs-tools util-linux login openssh-server_
```

- At this point, the system will remind you that you are about to overwrite your entire operating system with a new drive image, and ask you if you want to continue. When prompted, enter **Y** (case insensitive) from the keyboard to start the system restoration process. Any other letter or **Ctrl-C** will cancel the recovery process and exit Clonezilla.

```

The jobs in /etc/ocs/ocs-live.d/ are finished. Start "ocs-live-restore" now.
Setting the TERM as linux
*****
Clonezilla image dir: /home/partimag
*****
Shutting down the Logical Volume Manager
  No volume groups found
  No volume groups found
Finished Shutting down the Logical Volume Manager
*****
Activating the partition info in /proc... done!
*****
The following step is to restore an image to the hard disk/partition(s) on this machine: "/home/part
imag/xpe_savedisk" -> "sda sda1"
WARNING!!! WARNING!!! WARNING!!!
WARNING! THE EXISTING DATA IN THIS HARDDISK/PARTITION(S) WILL BE OVERWRITTEN! ALL EXISTING DATA WILL
BE LOST:
*****
Machine: VirtualBox
sda (2.1GB_VBOX_HARDDISK__ata-VBOX_HARDDISK_VB1c64a0a3-c9f7523d)
*****
Are you sure you want to continue? ?
[y/n] y

```

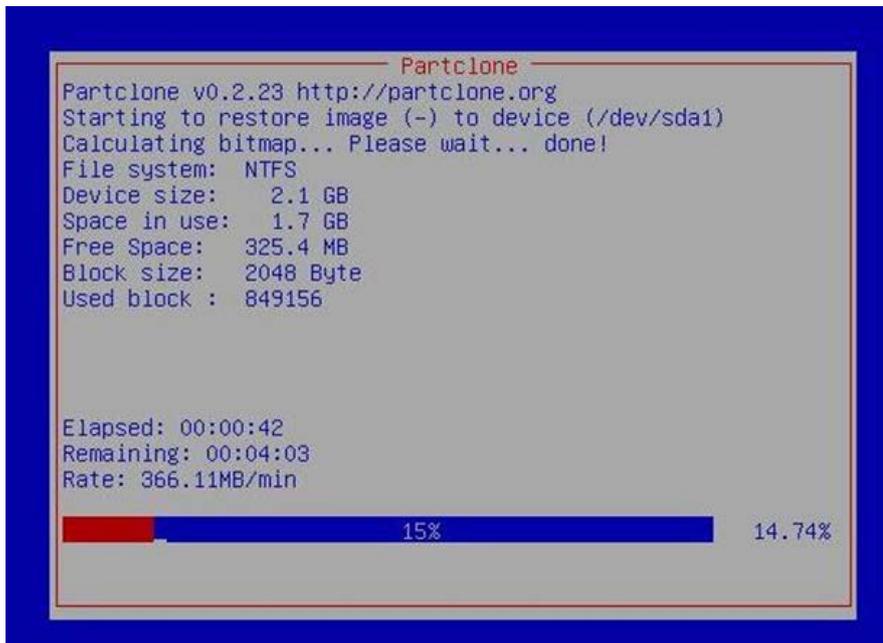
- The system will give you another warning that you are about to overwrite your hard drive and erase all data on the partition listed (**sda1**, in the example below). If you wish to continue, enter **Y** (case insensitive).

```

*****
Machine: VirtualBox
sda (2.1GB_VBOX_HARDDISK__ata-VBOX_HARDDISK_VB1c64a0a3-c9f7523d)
*****
Are you sure you want to continue? ?
[y/n] y
OK, let's do it!!
This program is not started by clonezilla server.
The following step is to restore an image to the hard disk/partition(s) on this machine: "/home/part
imag/xpe_savedisk" -> "sda (sda1)"
WARNING!!! WARNING!!! WARNING!!!
WARNING! THE EXISTING DATA IN THIS HARDDISK/PARTITION(S) WILL BE OVERWRITTEN! ALL EXISTING DATA WILL
BE LOST:
*****
Machine: VirtualBox
sda (2.1GB_VBOX_HARDDISK__ata-VBOX_HARDDISK_VB1c64a0a3-c9f7523d)
*****
Let me ask you again, Are you sure you want to continue? ?
[y/n] _

```

- Wait until the process is finished.



```

----- Partclone -----
Partclone v0.2.23 http://partclone.org
Starting to restore image (-) to device (/dev/sda1)
Calculating bitmap... Please wait... done!
File system:  NTFS
Device size:   2.1 GB
Space in use:  1.7 GB
Free Space:   325.4 MB
Block size:   2048 Byte
Used block :  849156

Elapsed: 00:00:42
Remaining: 00:04:03
Rate: 366.11MB/min

15% 14.74%

```

6. At this point, complete the restoration process by selecting **(0) Power off** to shut down the computer. However, if the **Power Switch** remains inserted in the front panel of the computer and is left in the **ON** position, the system will fail to shut down and will immediately initiate a soft reboot. To avoid this, you can use the switch to cut off power to the computer immediately following the shutdown, or simply remove the power switch from the front panel and use the console to shut down the computer by pressing **0**.

```
Restoring the first 446 bytes of MBR data, i.e. executable code area, for sda... done!
*****
Now resize the partition for sda1
ntfsresize -f /dev/sda1
ntfsresize v2.0.0 (libntfs 10:0:0)
Device name      : /dev/sda1
NTFS volume version: 3.1
Cluster size     : 2048 bytes
Current volume size: 2064511488 bytes (2065 MB)
Current device size: 2064513024 bytes (2065 MB)
New volume size   : 2064511488 bytes (2065 MB)
Nothing to do: NTFS volume size is already OK.
*****
The grub directory is NOT found. Maybe it does not exist (so other boot manager exists) or the file
system is not supported in the kernel. Skip running grub-install.
*****
Found NTFS boot partition among the restored partition(s): /dev/sda1
Head and sector no. of /dev/sda from EDD: 64, 63.
The start sector of NTFS partition /dev/sda1: 63
Adjust filesystem geometry for the NTFS partition: /dev/sda1
Running: partclone.ntfsfixboot -w -h 64 -t 63 -s 63 /dev/sda1
ntfsfixboot version 0.9
done!
*****
*****
*****
This program is not started by Clonezilla server, so skip notifying it the job is done.
Finished!
Now syncing - flush filesystem buffers...

"ocs-live-restore" is finished.
Now you can choose to:
(0) Poweroff
(1) Reboot
(2) Enter command line prompt
(3) Start over
[2]
```

7. After the computer has powered down, remove the USB drive and store it in a secure place.

## Step 4: Reset the BIOS to its Original State

At this point, you will need to return the boot priority to its original configuration so that the system will boot from the main system storage drive. This is done for two reasons:

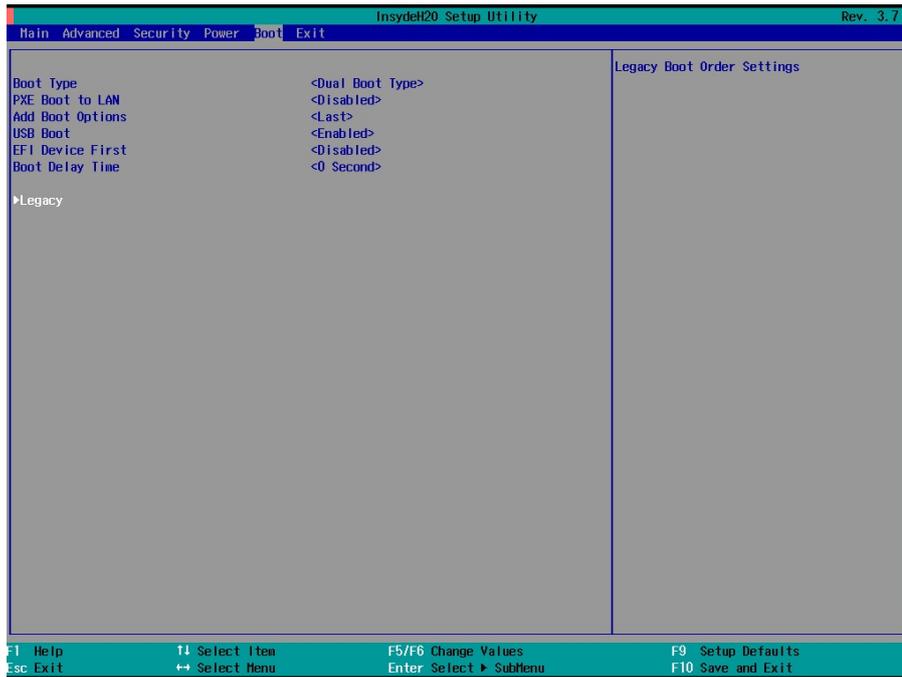
- The first reason is for security, since the computer will not be able to be rebooted from unauthorized USB drives.
- The second reason is because the computer is unable to *not* boot up from a non-bootable USB drive. Currently, **if the DA-681A is set to boot from the USB drive, then the DA-681A's boot process will hang any time a non-bootable USB data drive is inserted into the machine.** The DA-681A does not currently have the ability to distinguish between simple USB data drives and boot-capable OS drives.

Take the following steps to update the boot priority setting:

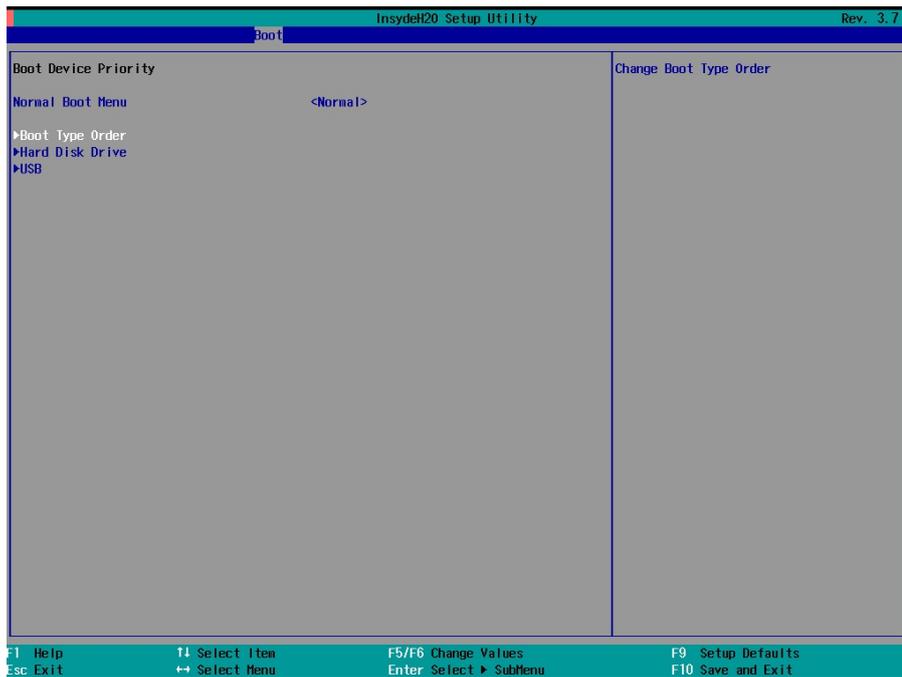
1. Reboot the system, and, during the POST process, press **F2 until you hear a long beep**. Click **SCU** to enter the BIOS setup menu.



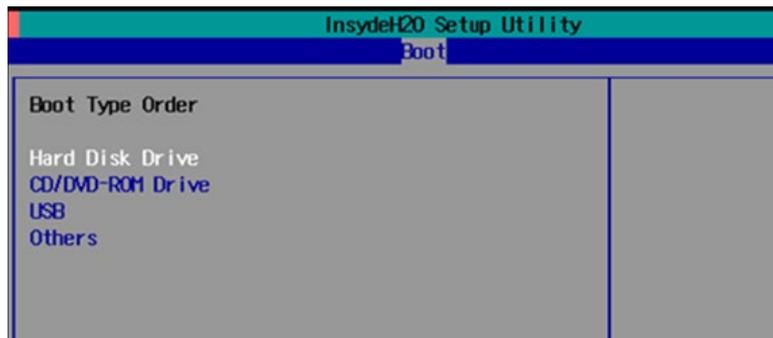
- 2. Use the left/right arrow keys to navigate to the **Boot** menu, and then press **Enter**.
- 3. Use the up/down arrows to navigate to the **Legacy** link, and then press **Enter**.



- 4. Use the up/down arrow keys to navigate to the **Boot Type Order** link, and then press **Enter**.



5. Use the up/down arrows to highlight **Hard Disk Drive** and then use the plus/minus (+/-) keys to move "Hard Disk Drive" to the first boot priority position.



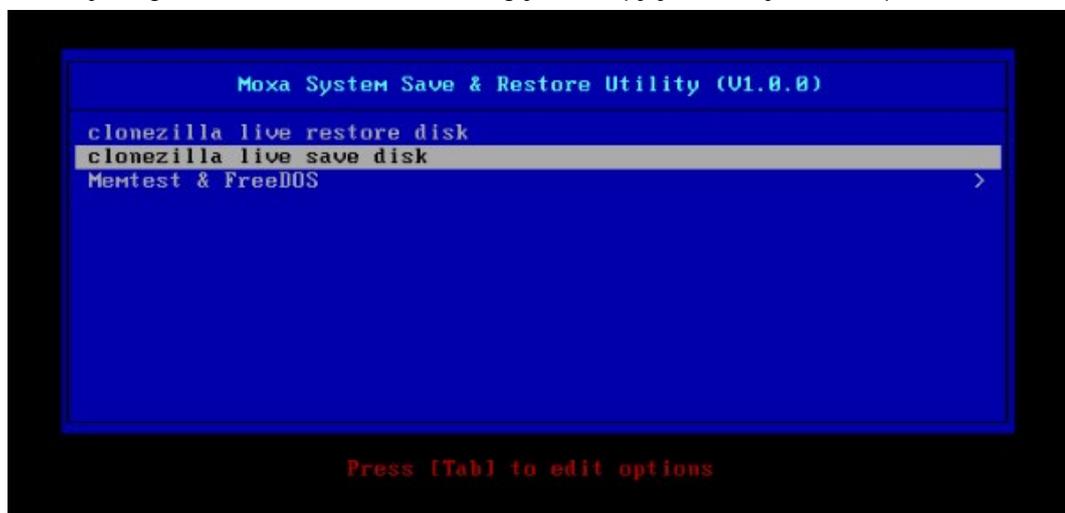
6. Press **F10**, and then press **Enter** to save and exit the BIOS configuration interface. This should initiate the next reboot, and your system should now boot from the hard drive.

## Creating a Custom System Image

In this section, we describe how to create a custom system image so that all of your applications can be kept and recovered. Using this procedure, you will save to the USB drive a copy of the entire system **as it is currently configured**, and to be used as a **full system recovery image** if the system crashes. **All files under F:\home\partimag\ will be overwritten.**

Before proceeding, make sure you have already completed **Step 1: Prepare the USB drive** and **Step 2: Setting the BIOS to Boot via USB**, and then continue with the following steps to create a custom system image.

1. Once the system has launched and the DA-681A has booted the recovery environment from the USB drive, navigate to **clonezilla live save disk**, and then select it by pressing Enter. This will take you into the recovery image creation environment, allowing you to copy your full system setup to the USB drive.



2. The DA-681A will now boot into the image creation environment. Wait until the boot process has finished.

```
[ 5.141941] sd 0:0:1:0: [sdb] Attached SCSI disk
[ 5.257277] sd 0:0:0:0: Attached scsi generic sg0 type 0
[ 5.269691] sd 0:0:1:0: Attached scsi generic sg1 type 0
[ 5.280668] sr 1:0:0:0: Attached scsi generic sg2 type 5
Begin: Loading essential drivers ... [ 5.772551] Atheros(R) LZ Ethernet Driver - version 2.2.3
[ 5.774561] Copyright (c) 2007 Atheros Corporation.
[ 5.863196] Broadcom NetXtreme II 5771x 10Gigabit Ethernet Driver bnx2x 1.62.00-6 (2011/01/30)
[ 6.005932] Btrfs loaded
[ 6.054095] device-mapper: uevent: version 1.0.3
[ 6.059737] device-mapper: ioctl: 4.19.1-ioctl (2011-01-07) initialised: dm-devel@redhat.com
done.
Begin: Running /scripts/init-premount ... done.
Begin: Mounting root file system ... [ 6.289382] Uniform Multi-Platform E-IDE driver
[ 6.301889] ide_generic: please use "probe_mask=0x3f" module parameter for probing all legacy ISA
IDE ports
[ 6.801141] NTFS driver 2.1.30 [Flags: R/W MODULE].
[ 6.914295] NTFS volume version 3.1.
Begin: Running /scripts/live-premount ... done.
[ 7.331989] FAT: utf8 is not a recommended IO charset for FAT filesystems, filesystem will be cas
e sensitive!
[ 7.453369] aufs: module is from the staging directory, the quality is unknown, you have been war
ned.
[ 7.479098] aufs 2.1-standalone.tree-38-rcN-20110228
[ 7.610228] loop: module loaded
[ 7.905144] squashfs: version 4.0 (2009/01/31) Phillip Lougher
Begin: Running /scripts/live-realpremount ... done.
Begin: Mounting "/live/image/live/filesystem.squashfs" on "/filesystem.squashfs" via "/dev/loop0"
... done.
done.
Begin: Running /scripts/live-bottom
... Begin: Configuring fstab ... done.
Begin: Preconfiguring networking ... done.
Begin: Loading preseed file ... done.
Begin: Running /scripts/init-bottom ... done.
INIT: version 2.88 booting
Using makefile-style concurrent boot in runlevel S.
```

3. Once the image creation environment has booted up, you will be given a warning and asked if you wish to continue. Keep in mind that if you create the recovery image, then **any residual files currently copied to the /home/partimag directory will be deleted**. If you would like to save any of the files in the USB partition image directory, you must exit the recovery environment and copy the files to another disk. Press **Y** (case insensitive) to continue with the image creation.

```
Setting the TERM as linux
*****
Clonezilla image dir: /home/partimag
*****
Shutting down the Logical Volume Manager
  No volume groups found
  No volume groups found
Finished Shutting down the Logical Volume Manager
Selected device [sda] found!
The selected devices: sda
*****
Activating the partition info in /proc... done!
Selected device [sda] found!
The selected devices: sda
Searching for data partition(s)...
Excluding busy partition or disk...
Unmounted partitions (including extended or swap): sda1
Collecting info.. done!
Searching for swap partition(s)...
Excluding busy partition or disk...
Unmounted partitions (including extended or swap): sda1
Collecting info.. done!
The data partition to be saved: sda1
The swap partition to be saved:
Activating the partition info in /proc... done!
Selected device [sda1] found!
The selected devices: sda1
Getting /dev/sda1 info...
*****
The following step is to save the hard disk/partition(s) on this machine as an image:
*****
Machine: VirtualBox
sda (2103MB_VBOX_HARDDISK__ata-VBOX_HARDDISK_VB1c64a0a3-c9f7523d)
sda1 (2065MB_ntfs(In_VBOX_HARDDISK_)_ata-VBOX_HARDDISK_VB1c64a0a3-c9f7523d)
*****
-> "/home/partimag/xpe_savedisk".
Are you sure you want to continue? ? (y/n) y
```

4. At this point, the recovery environment will copy the entire hard drive to your USB drive. This will likely take several minutes, and could take up to half an hour. Do not remove the USB drive during this time; wait patiently for the process to finish.

```

/dev/sdb1: read failed after 0 of 2048 at 0: Input/output error
No volume groups found
No volume groups found
Finished Shutting down the Logical Volume Manager
Checking the integrity of partition table in the disk /dev/sda...
Reading the partition table for /dev/sda...RETV=0
*****
*****
done!
Saving the MBR data for sda...
1+0 records in
1+0 records out
512 bytes (512 B) copied, 0.00347646 s, 147 kB/s
*****
*****
Starting saving /dev/sda1 as /home/partimag/xpe_savedisk/sda1.XXX...
/dev/sda1 filesystem: ntfs.
*****
Checking NTFS integrity in /dev/sda1... done!
Checking the disk space...
Use ntfsclone with gzip to save the image.
Image file will be split with size limit 1000000 MB.
*****
If this action fails or hangs, check:
* Is the disk full ?
*****
ntfsclone v2.0.0 (libntfs 10:0:0)
NTFS volume version: 3.1
Cluster size      : 2048 bytes
Current volume size: 2064510976 bytes (2065 MB)
Current device size: 2064513024 bytes (2065 MB)
Scanning volume ...
100.00 percent completed
Accounting clusters ...
Space in use      : 1770 MB (85.7%)
Saving NTFS to image ...
_ 0.64 percent completed

```

5. At this point, you can choose to power down the computer (press **0**), reboot (press **1**), enter a console terminal (to access a console TTY, press **2**), or re-initiate the entire procedure (press **3**). **Do not remove the USB drive until you have rebooted or powered down the system.**

```

Restoring the first 446 bytes of MBR data, i.e. executable code area, for sda... done!
*****
Now resize the partition for sda1
ntfsresize -f /dev/sda1
ntfsresize v2.0.0 (libntfs 10:0:0)
Device name      : /dev/sda1
NTFS volume version: 3.1
Cluster size     : 2048 bytes
Current volume size: 2064511488 bytes (2065 MB)
Current device size: 2064513024 bytes (2065 MB)
New volume size  : 2064511488 bytes (2065 MB)
Nothing to do: NTFS volume size is already OK.
*****
The grub directory is NOT found. Maybe it does not exist (so other boot manager exists) or the file
system is not supported in the kernel. Skip running grub-install.
*****
Found NTFS boot partition among the restored partition(s): /dev/sda1
Head and sector no. of /dev/sda from EDD: 64, 63.
The start sector of NTFS partition /dev/sda1: 63
Adjust filesystem geometry for the NTFS partition: /dev/sda1
Running: partclone.ntfsfixboot -w -h 64 -t 63 -s 63 /dev/sda1
ntfsfixboot version 0.9
done!
*****
*****
This program is not started by Clonezilla server, so skip notifying it the job is done.
Finished!
Now syncing - flush filesystem buffers...

"ocs-live-restore" is finished.
Now you can choose to:
(0) Poweroff
(1) Reboot
(2) Enter command line prompt
(3) Start over
[2]

```

6. Power down the system and remove the USB drive to complete the process of configuring the recovery environment. Your OS image is now under **USB Folder\home\partimag\os\_image**. The USB drive should be clearly labeled and stored in a safe place.

