# MPC-2121/2101 Series Panel Computer Windows 7 User's Manual

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**www.moxa.com/product**

# MPC-2121/2101 Series Panel Computer Windows 7 User's Manual



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# Table of Contents

# 1

# Introduction

Thank you for buying Moxa's MPC-2121/2101 Series panel computers. The panel computers come with Windows Embedded Standard 7 and Windows 7 Professional software platforms, providing a simple and familiar development environment for various industrial applications.

- **Software Components**

# Software Components

Refer to the following content for the software components of the Windows Embedded Standard 7, Windows 7 Professional preinstalled on the MPC-2121/2101 computers.

**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

**Graphics and Multimedia:**
- MPEG DTV-DVD audio decoder (MPEG-2, AAC)
- MPEG Layer-3 audio codecs(MP3)
- MPEG4 decoders
- Windows Media Video VC-1 (WMV) codecs
- DirectX and Windows Device Experience
- Photo Viewer
- Remote media streaming
- Windows Media Player

**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

# 2

# System Initialization

This chapter describes how to initialize the system settings on your MPC-2121 and MPC-2101 Series panel computers when you boot up the computers for the first time.

The following topics are covered in this chapter:

- **Overview**
- **Initializing User Settings**
  - Windows Embedded Standard 7
  - Windows 7 Professional

# Overview

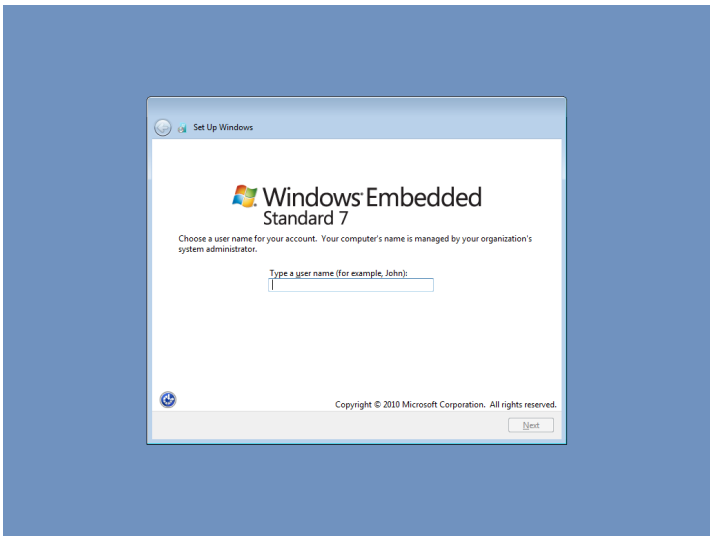
Like most laptop computer, you will need to first create a user account and initialize the user setting for the embedded computer to work.

# Initializing User Settings

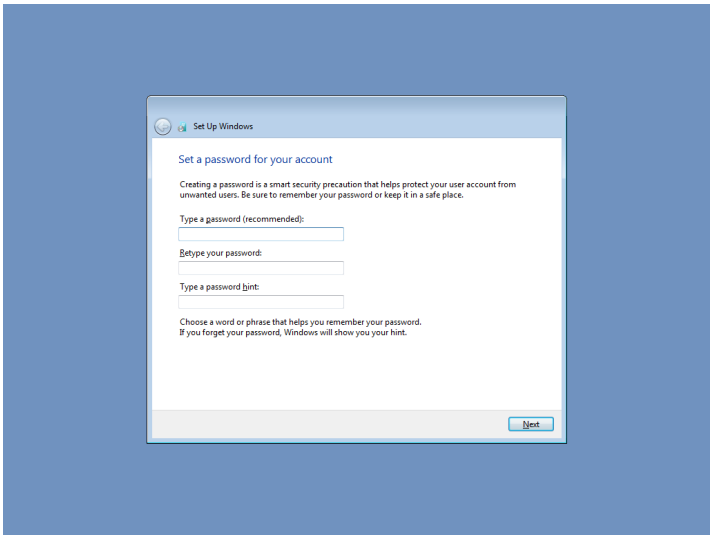
## Windows Embedded Standard 7

Follow these instructions to create a new account.

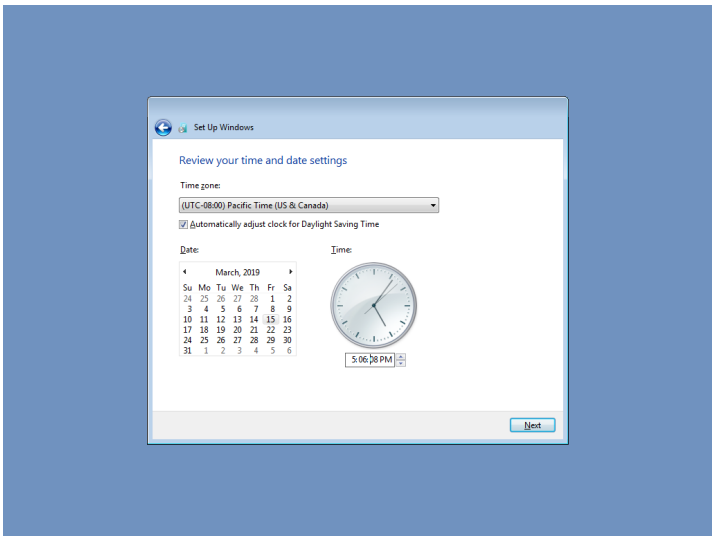
1. When you boot the embedded computer for the first time, enter a user name for this computer then click **Next**.



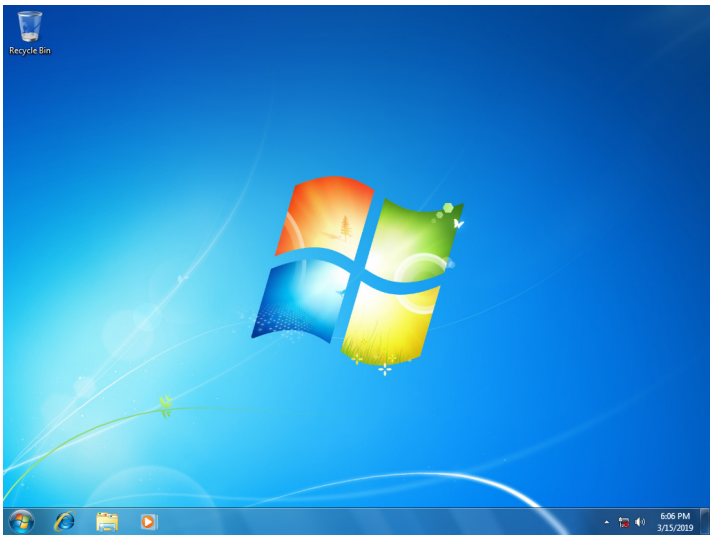

2. Type the password, retype the password to confirm. In addition, you may also type a password hint in case you forget your password. If you do not want to set a password, leave the field blank and click **Next**.



3. Select the time zone and set the date and time.



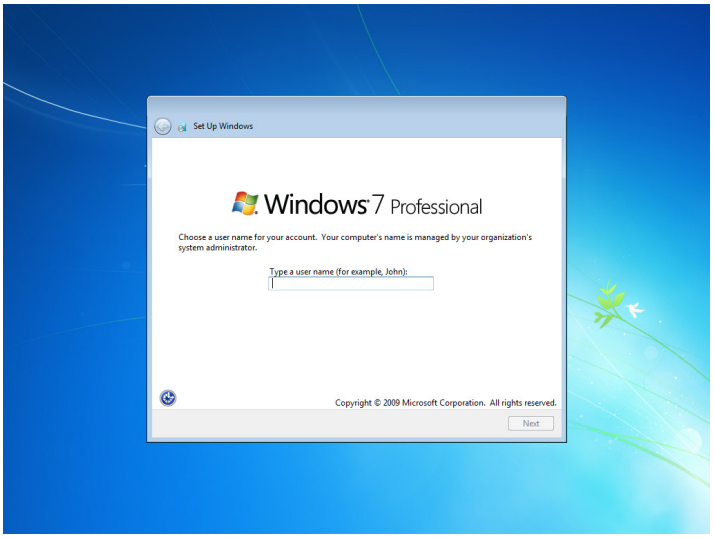

Now you can start using the embedded computer.



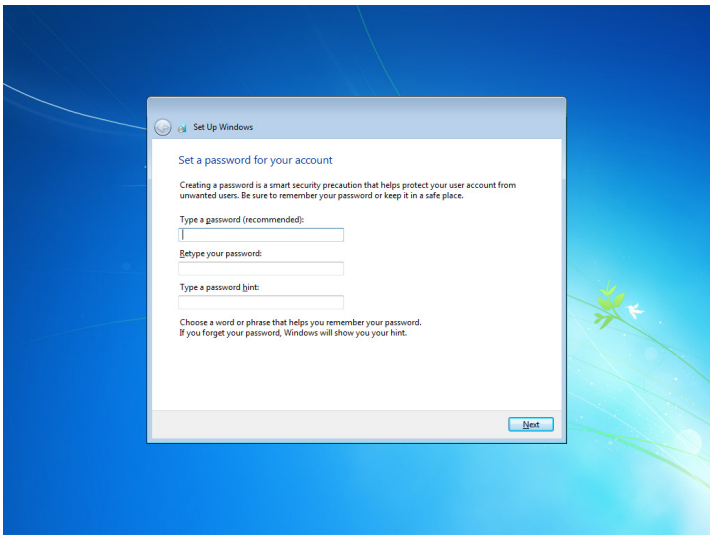
# Windows 7 Professional

Follow these instructions to create a new account.

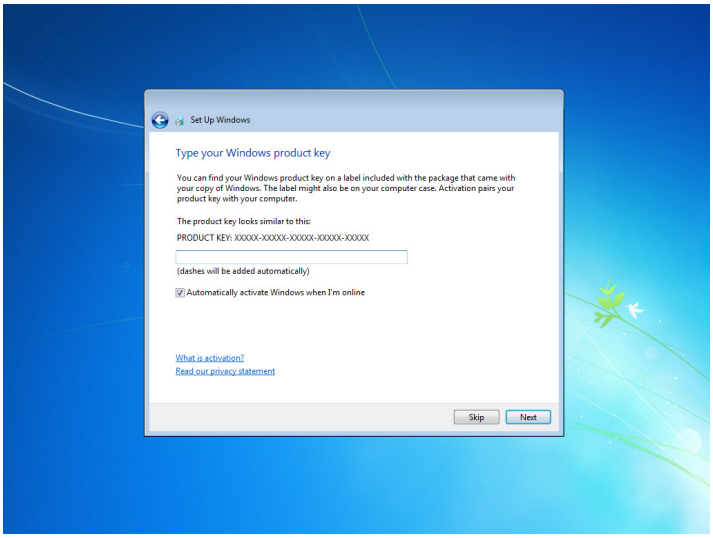
1. When you boot the embedded computer for the first time, enter a user name for the computer then click **Next**.



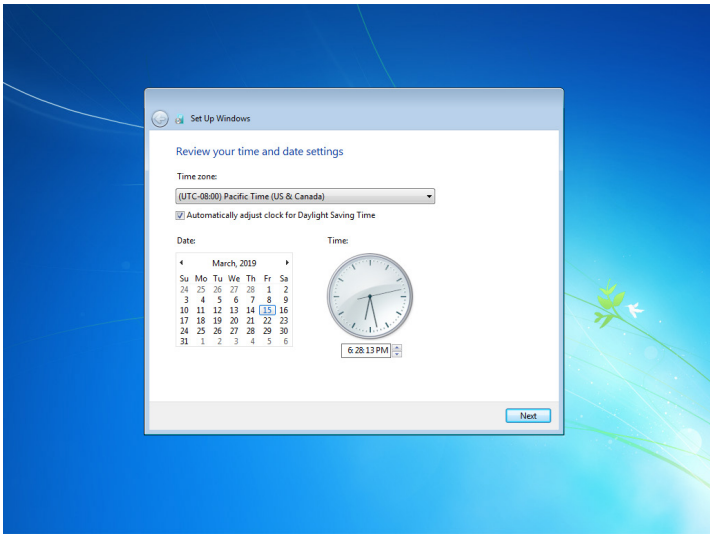

2. Type the password, retype the password to confirm. In addition, you may also type a password hint in case you forget your password. If you do not want to set a password, leave it blank and click **Next**.



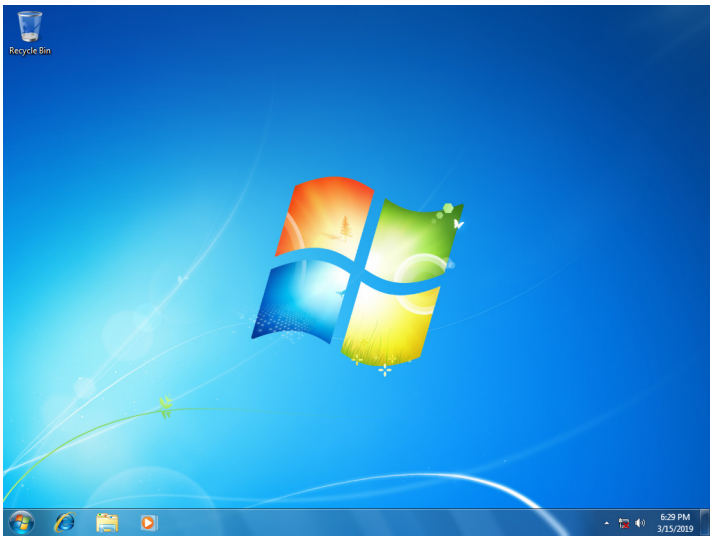
3. Click **Skip.**




4. Select the time zone and set the date and time.




Now you can start using the embedded computer.



# 3

# Utilities

This chapter describes the utilities supported on the MPC-2121/2101 computers.

The following topics are covered in this chapter:

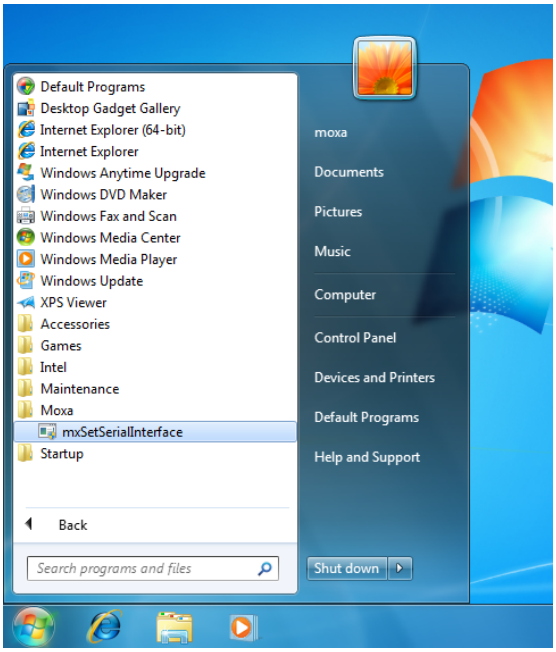
- **Serial Interface Mode**

# Serial Interface Utility

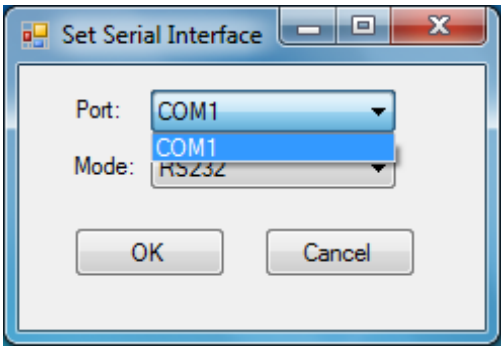
The Serial Interface utility can be used to configure different serial modes on the MC-2121 computer. The MC-2121 supports the serial modes **RS232, RS485-2-wire** and **RS422/RS485-4-wire**.

Follow these steps to change the serial interface mode settings.

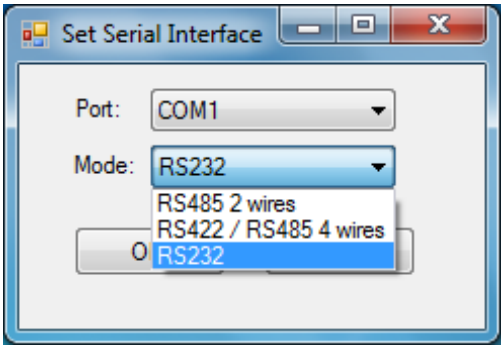
1. From the Start menu, Click **All Programs >Moxa >mxSetSerialInterface**.




2. Select the port, for which you want to set the mode, from the **Port** combo box.




3. Select the mode for the port.



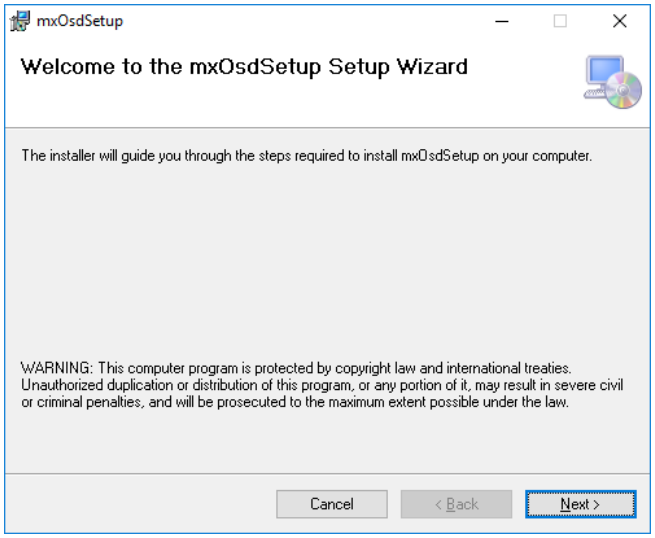

4. Click **OK**.

# OSD

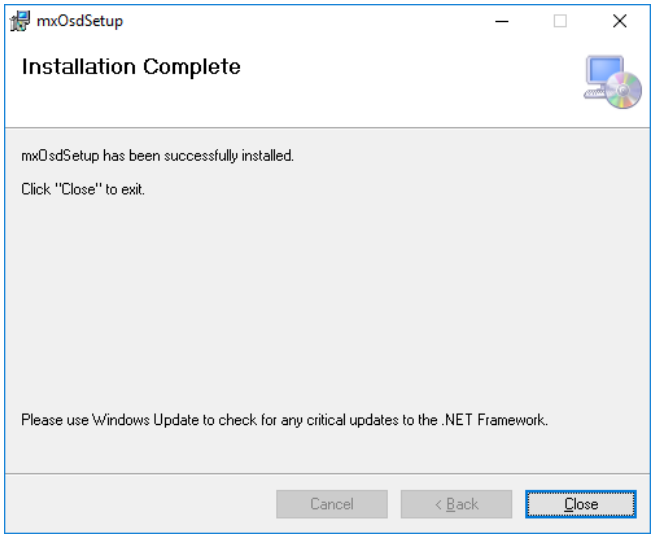
The OSD utility displays the brightness bar on the screen when the buttons on the panels are pressed.

To install the utility:

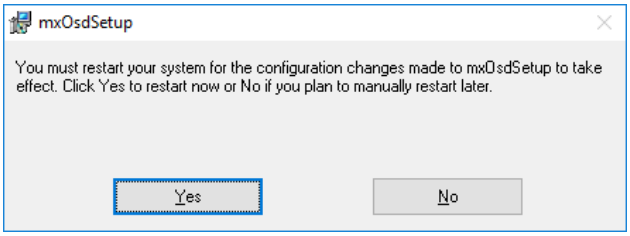
1. Run the <Software DVD>**\driver\MPC-2121/2101-W7_V1.0_Driver_Perpheral** program.
2. Follow the onscreen instructions to install the OSD utility.



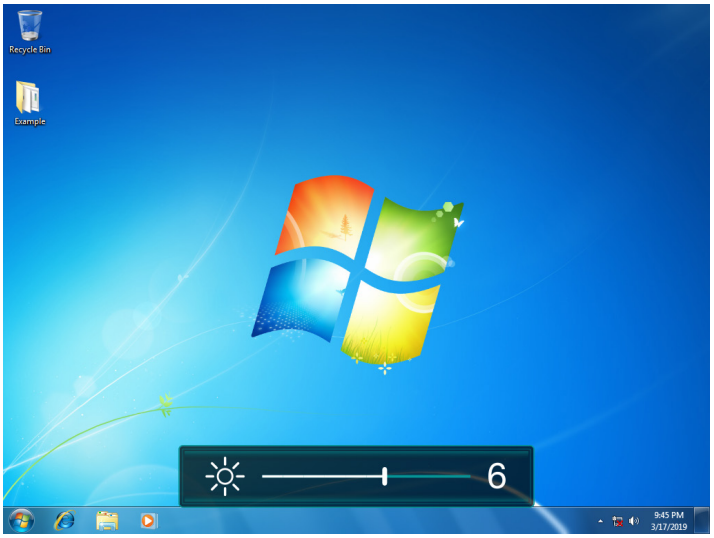

3. Close the setup program.




4. After the utility is installed on the computer, the setup program will ask to reboot the computer. Click **Yes** to reboot.



5. After reboot, press the buttons to change the brightness of the panel; a brightness bar will show the brightness level on the screen.

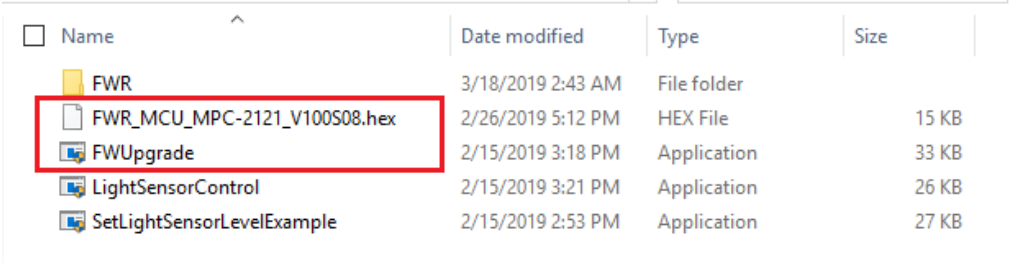



# Firmware Upgrade

The FWUpgrade utility helps you upgrade the firmware on your computer with ease. The new firmware file (*.hex file) should be located in the same folder as the utility file.

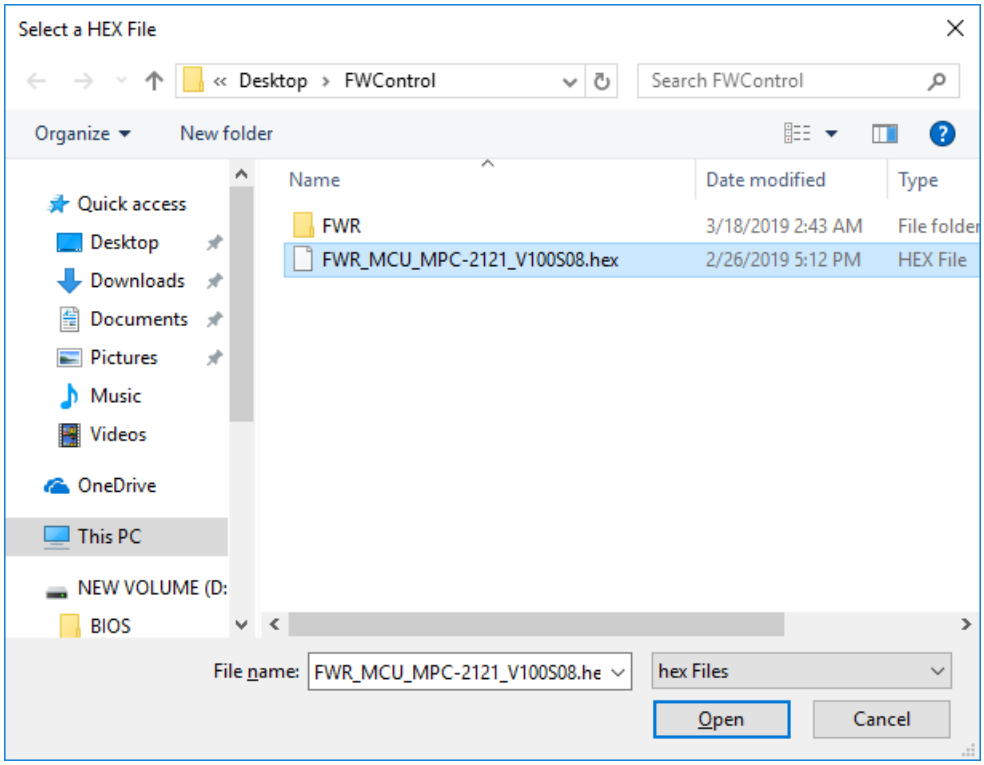
To upgrade the firmware on your computer, do the following:

1. Run the <Software DVD>**\Utility\FWControl\FWUpgrade.exe** program.

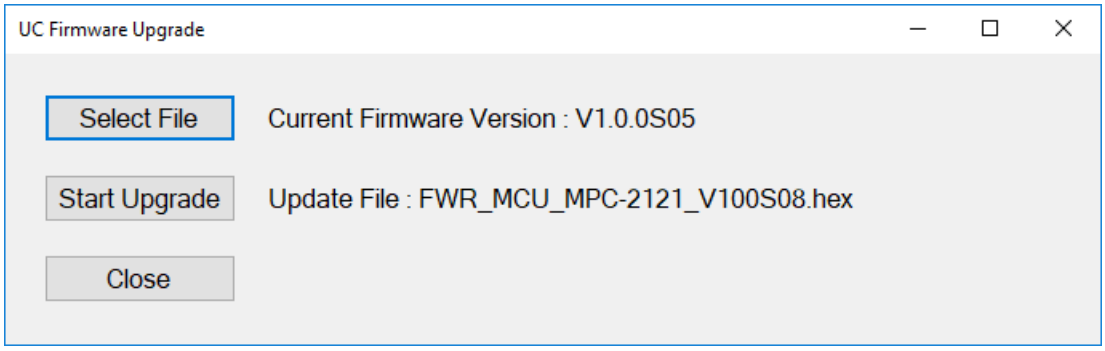



2. Click **Select File.**

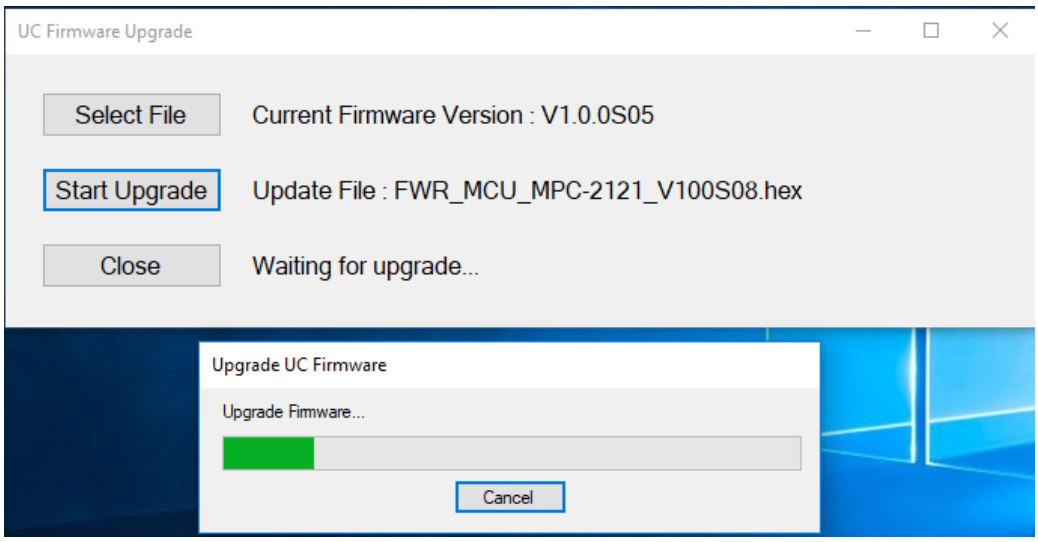
3. Select new firmware file and click **Open**.



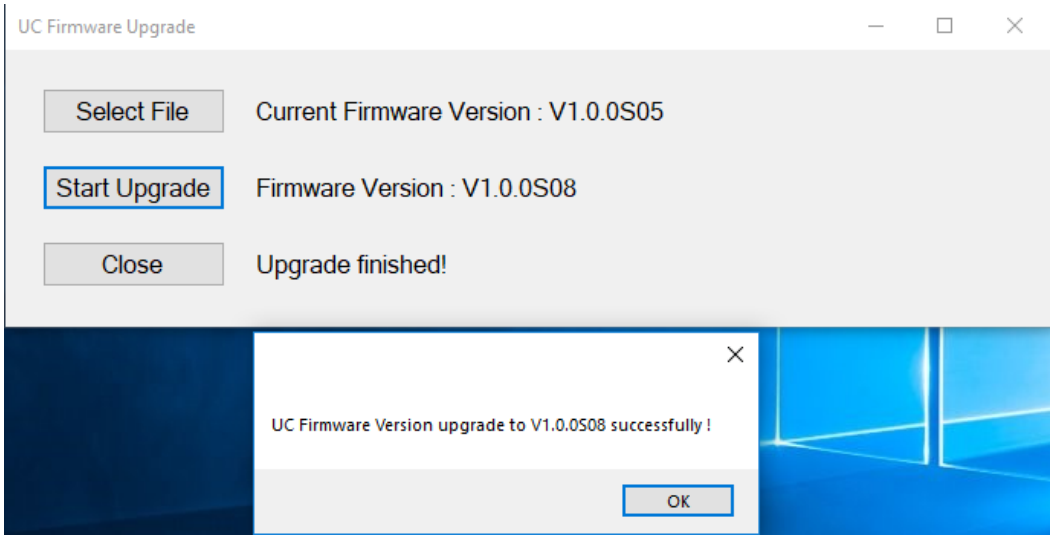

4. Check the updated file name and click **Start Upgrade**.




5. Wait for the upgrade to finish.



6. Click **OK** and the program will close automatically.

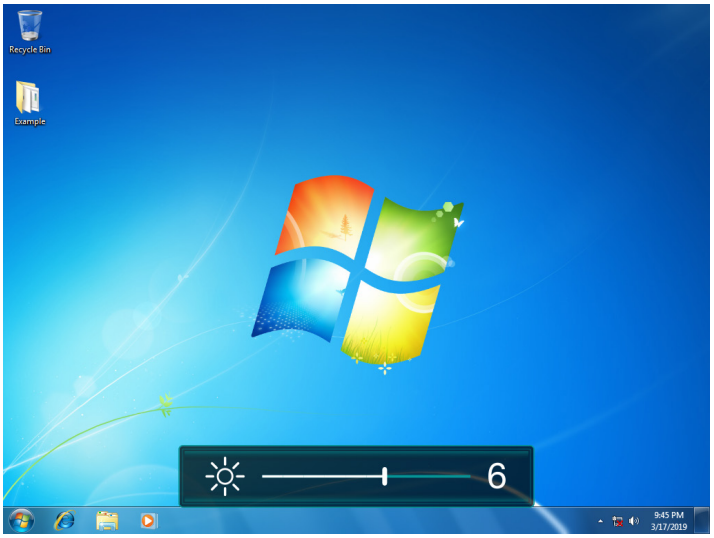



# Light Sensor Control

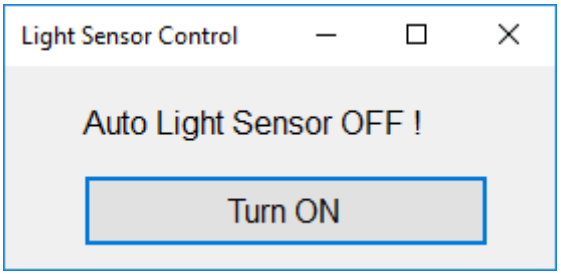
The UC Light Sensor Control utility is used to turn the Ambient Light Sensor function ON/OFF. Run the program from <Software DVD>**\Utility\FWControl** folder and follow the instructions given below to control the light sensor.

## Turning the Auto Brightness Function ON

1. If the Light Sensor function is off, press the brightness button to show the brightness bar on the screen.

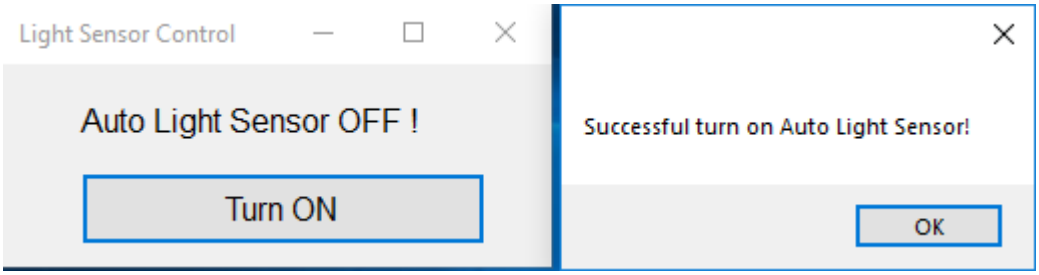



2. Run the <Software DVD>**\Utility\FWControl\LightSensorControl.exe** program.




3. Click **Turn ON.**

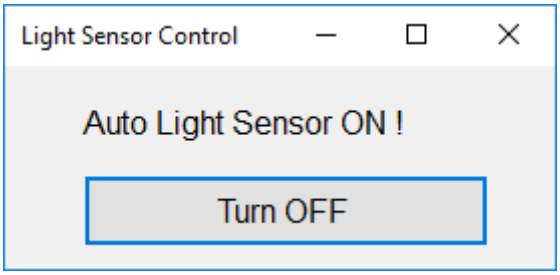
4. Wait for a message, which confirms that the function has been successfully turned ON.



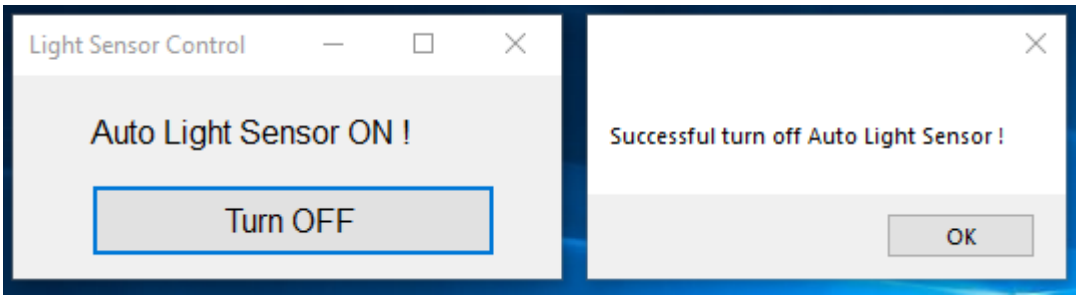

5. Click on the **OK** button in the message box to close the program.

## Turning the Auto Brightness Function OFF

1. Run the **LightSensorControl.exe** program.




2. Click **Turn OFF.**
3. Wait for a message, which confirms that the function has been successfully turned OFF.



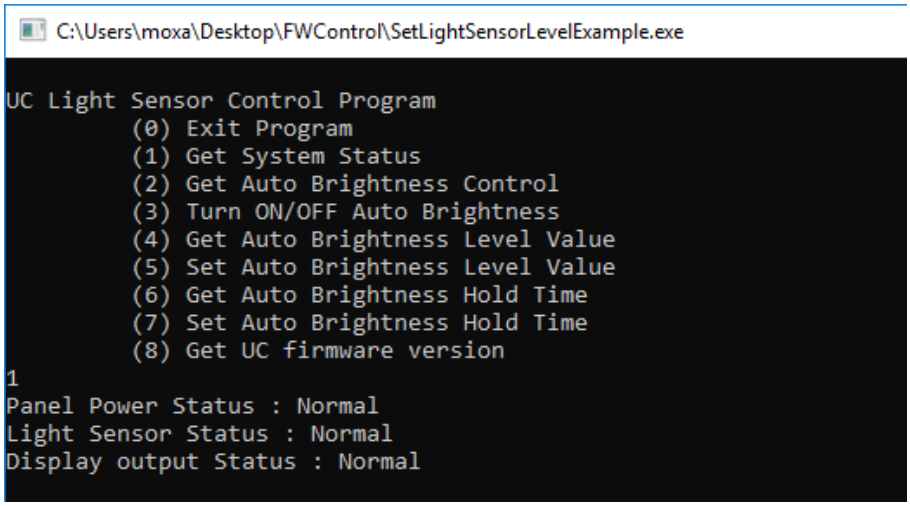

4. Click on the **OK** button in the message box to close the program.

# Set Light Sensor Level (example)

Use the **SetLightSensorLevelExample.exe** program to check the system status, turn ON/OFF Auto Brightness function, get/set Auto Brightness Level Value, get/set Auto Brightness Hold Time, and get UC firmware version. Run the program from the <Software DVD>**\Utility\FWControl** directory and follow the instructions given below.

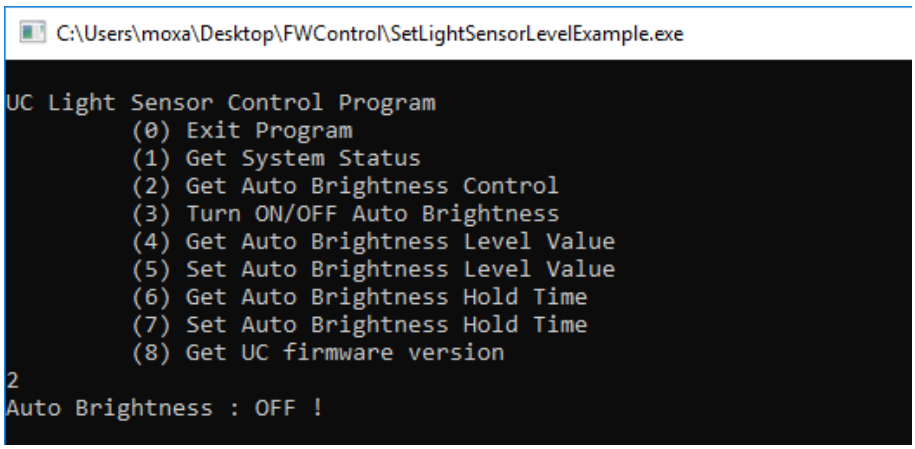
## System Status

Type **1** to get the system status; panel power status, light sensor status, and display output status.



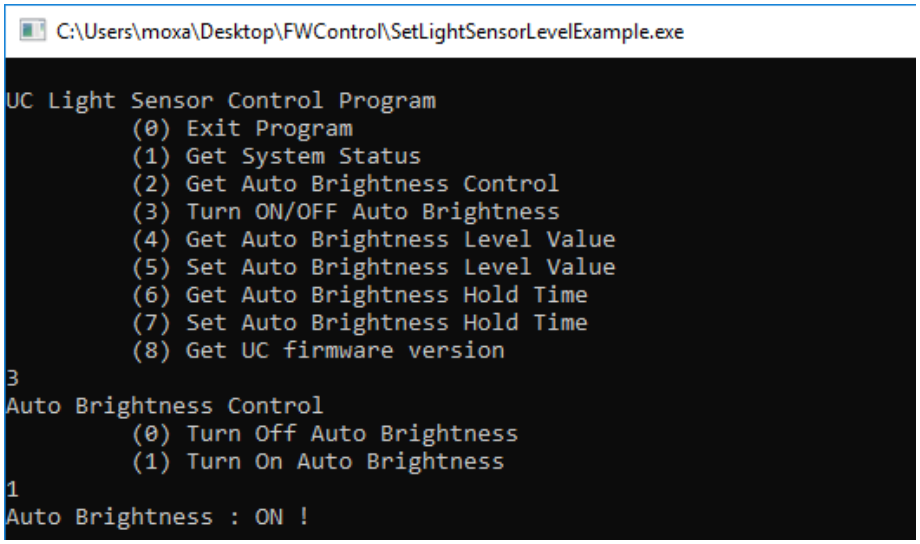

## Auto Brightness Status

Type **2** to get the Auto Brightness status.



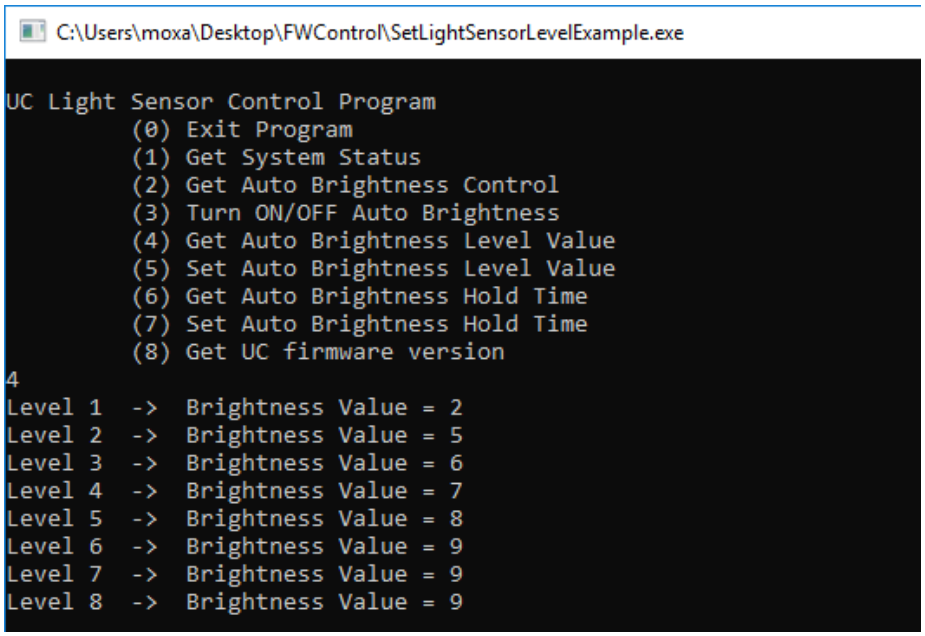
## Auto Brightness ON/OFF

Type **3** and follow the onscreen instructions to turn the Auto Brightness function ON or OFF.



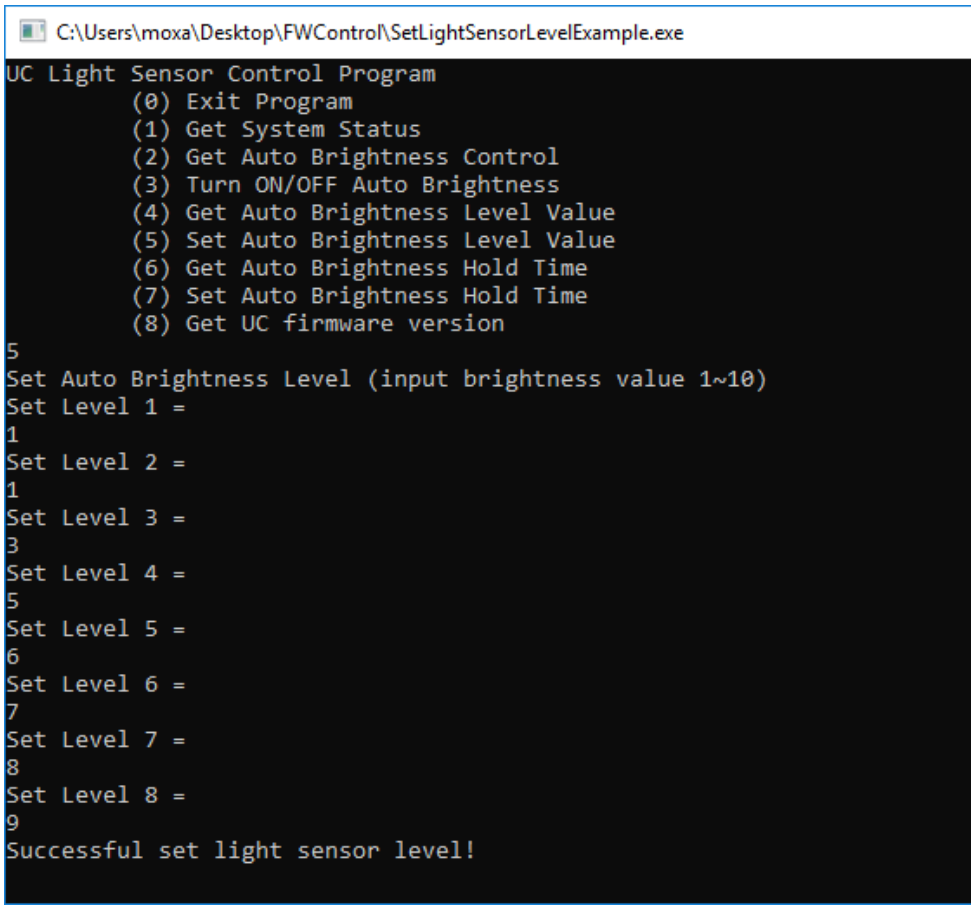

## Auto Brightness Level Value

Type **4** to get the current Auto Brightness value for each level.



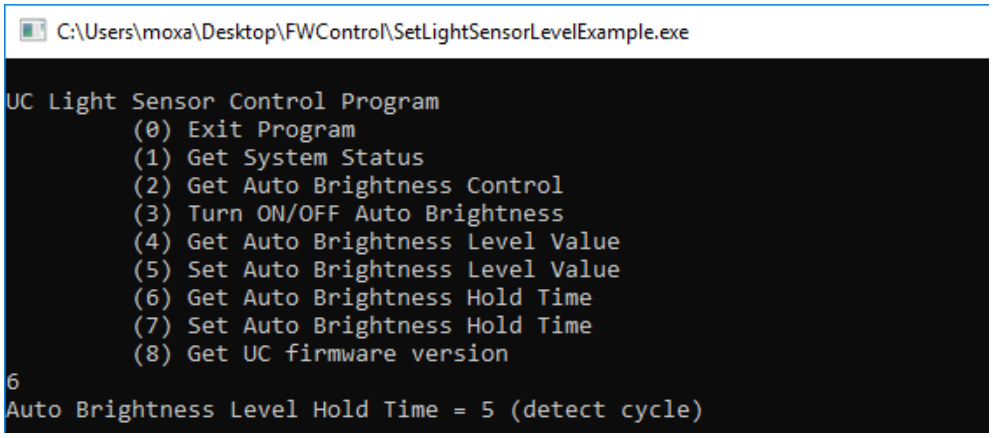
## Auto Brightness Level Value Setting

Type **5** and follow the onscreen instructions to set a value for each level.



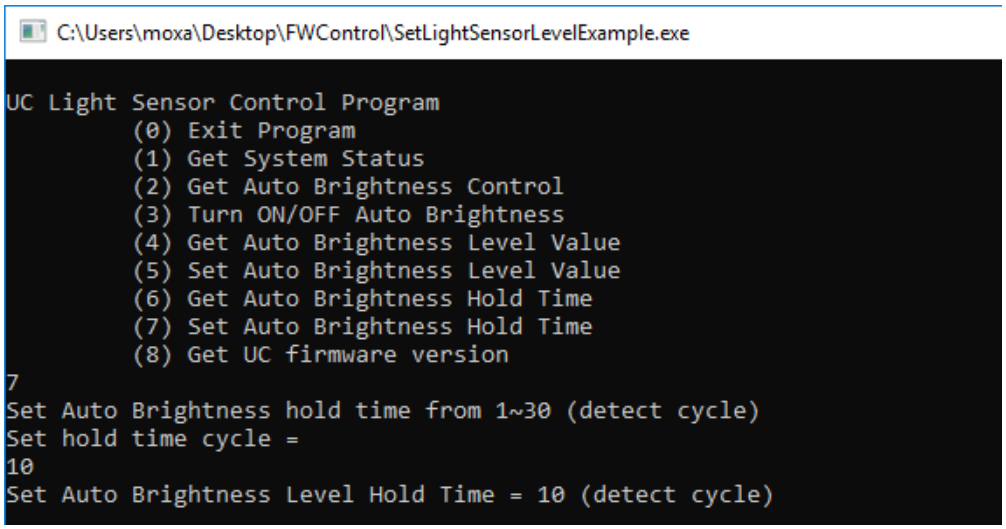

## Auto Brightness Hold Time

Type **6** to get the Auto Brightness Hold Time (by detect cycle; 1 detect cycle = 0.8 sec)



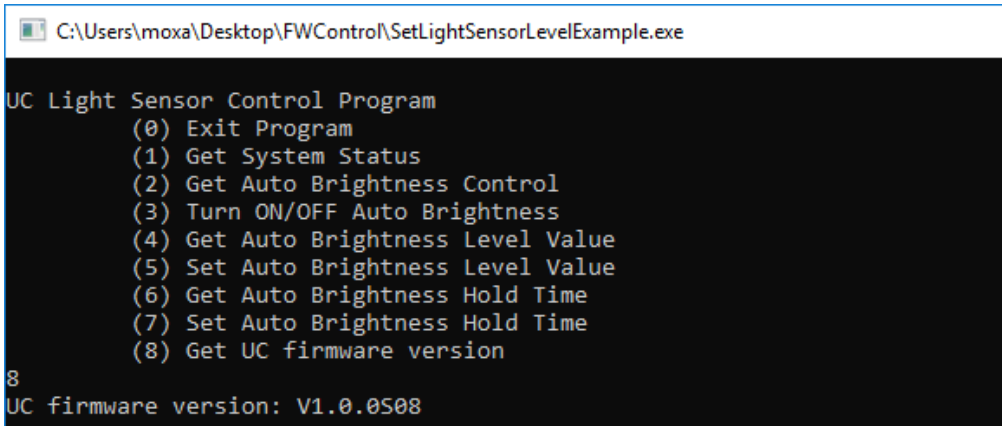
## Auto Brightness Hold Time Setting

Type **7** and follow the onscreen instructions to set the hold time (by detect cycle; 1 detect cycle = 0.8 sec).




## UC Firmware Version

Type **8** to get the firmware version.



# 4

# Enabling Embedded Filters

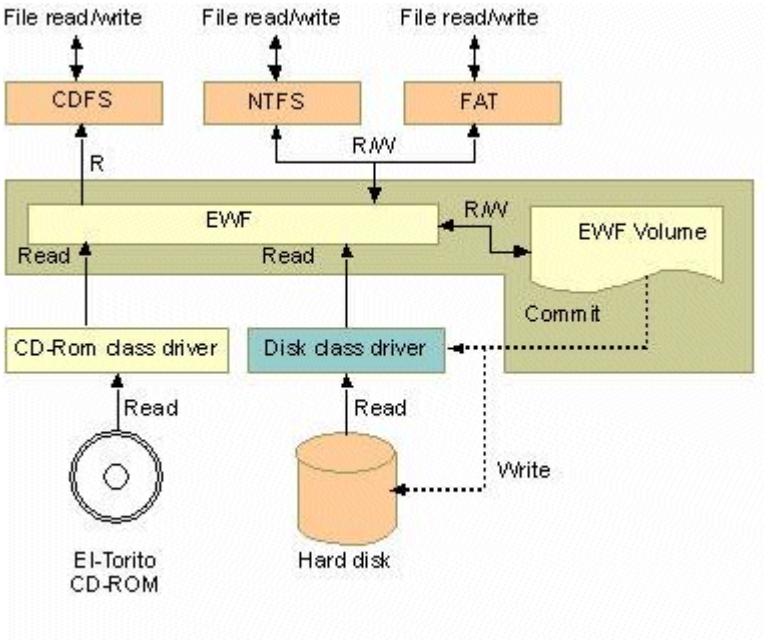
This chapter describes how to operate the embedded enabling features on the MPC-2121/2101 embedded computer.

- **Enhanced Write Filter**
- **File-based Write Filter**

# Enhanced Write Filter

## Overview

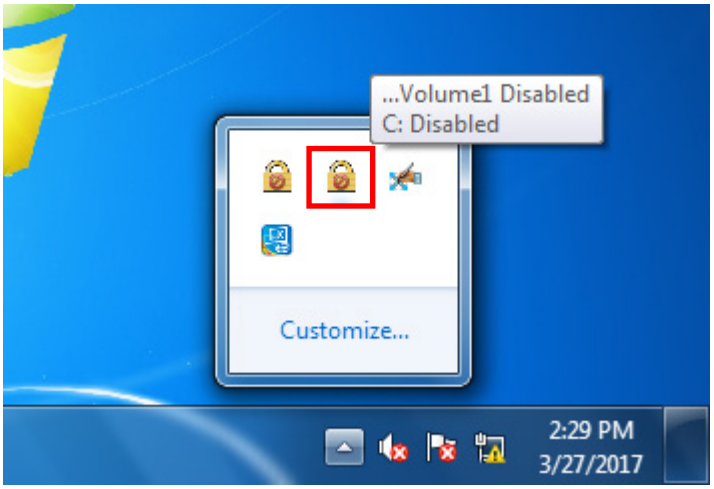
Enhanced Write Filter (EWF) provides a means of protecting a volume from writes. This allows the operating system (OS) to boot from write-protected hard disks. All written data to EWF-protected volumes (The Hard disk in the following figure) are redirected to an overlay (EWF Volume in the following figure). Because EWF does not write data to the hard disk directly, it can protect the hard disk from sudden power loss. The data written is cached in the overlay and made available as part of the volume. This gives the appearance that the volume is writeable. The overlay is an independent storage location, which exists in random access memory (RAM). If desired, the data stored in the overlay may be committed to the protected volume. Refer to the following figure for the overview of the EWF structure.



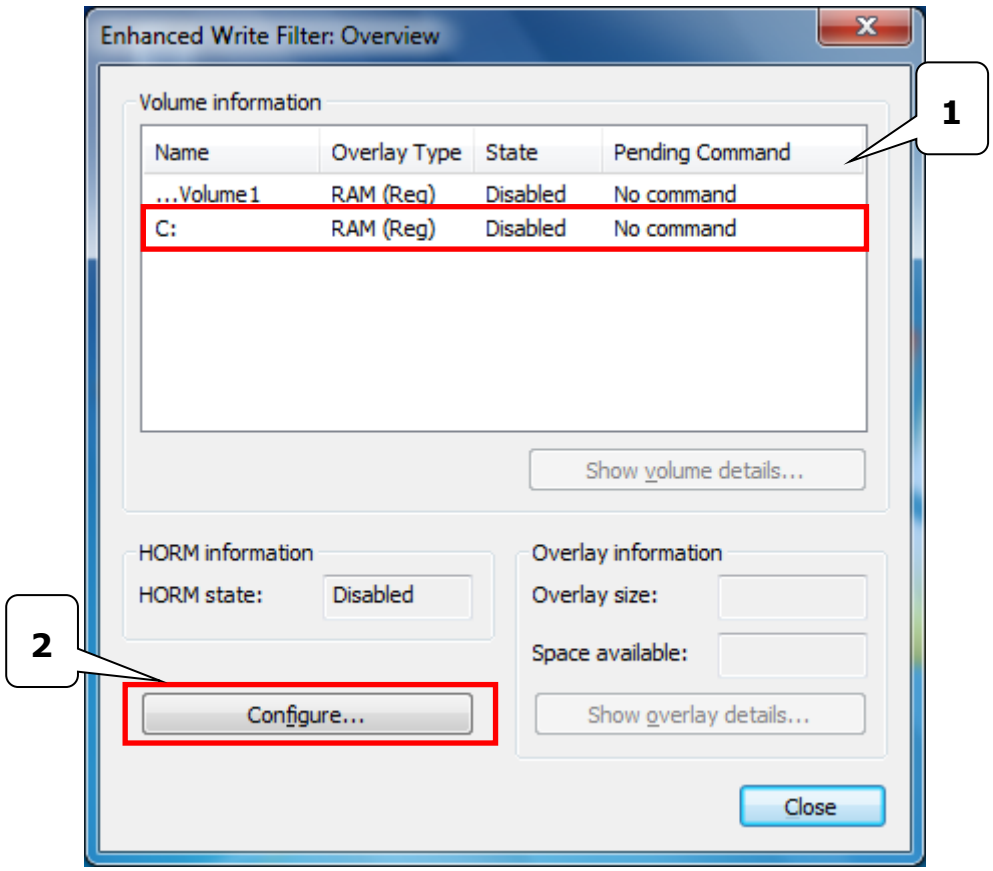

## Enabling Enhanced Write Filter

Follow these steps to enable the Enhanced Write Filter

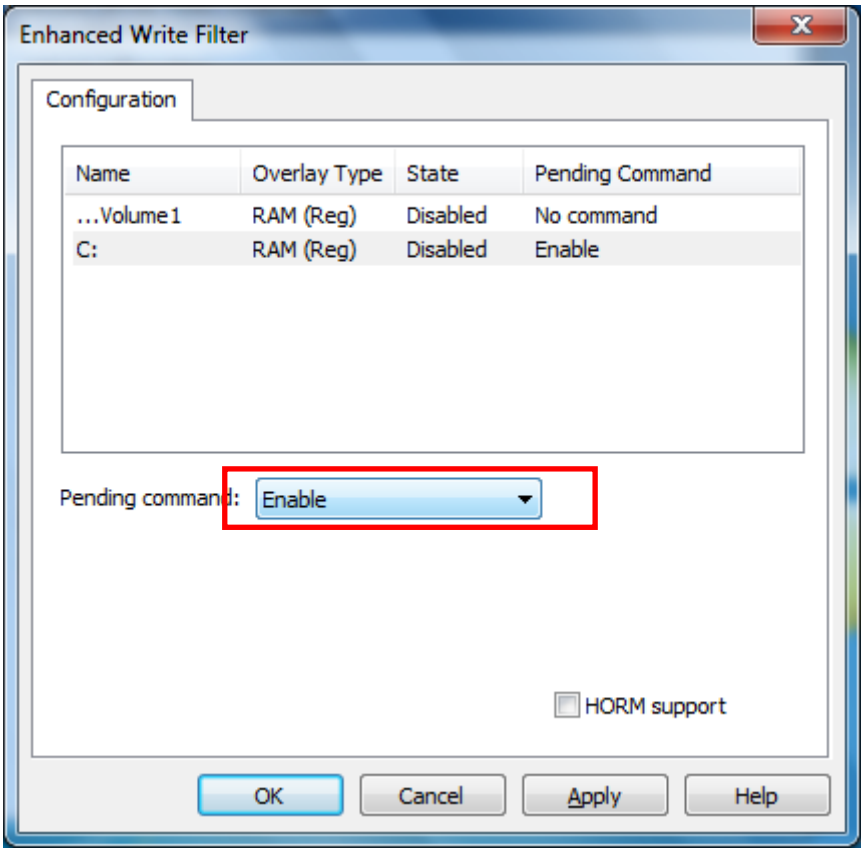
1. First open right-click the lock icon in the left side.



2. Select volume in Volume Information and then select **Configure**.

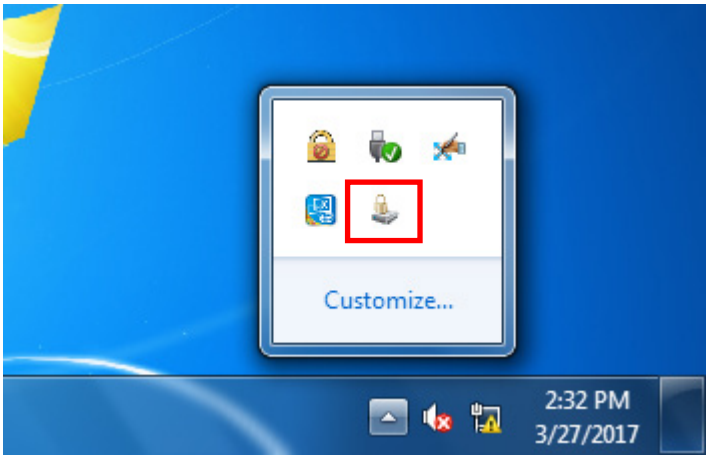



3. Select **Enable** in Pending Command.

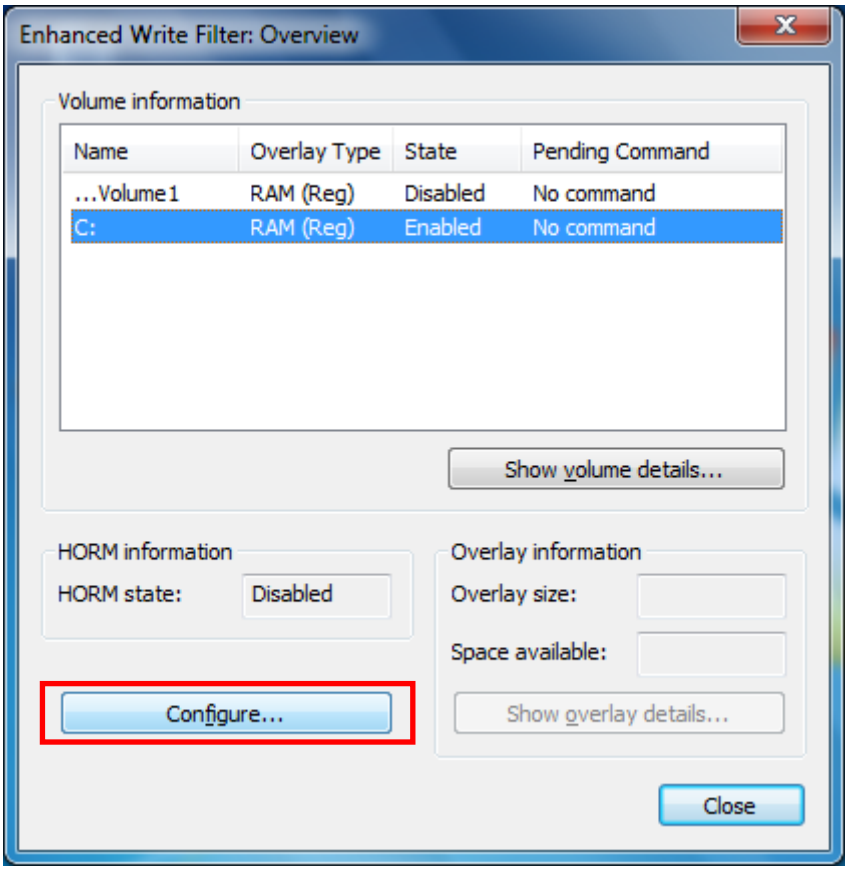



4. Reboot the system.

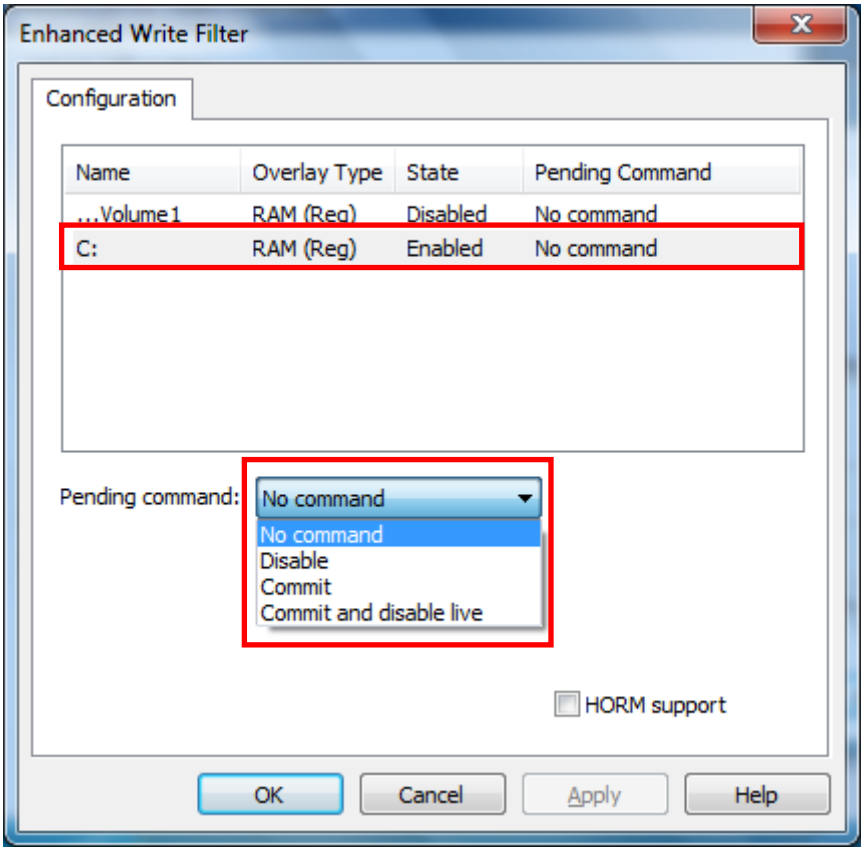
5. Check if the icon changes to lock state




6. Select **Configure**



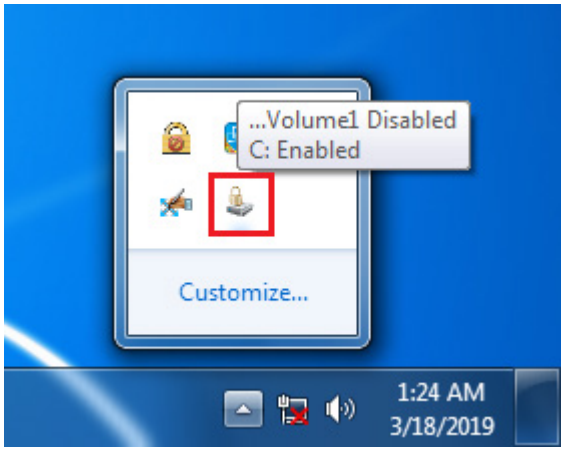
7. Select volume and select the Pending Command for your need



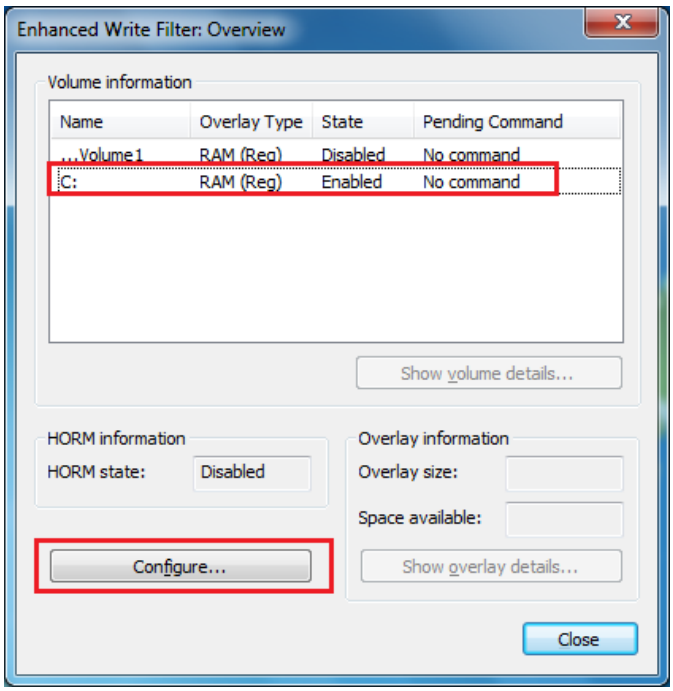

## Disable Enhanced Write Filter

Follow these steps to disable the Enhanced Write Filter

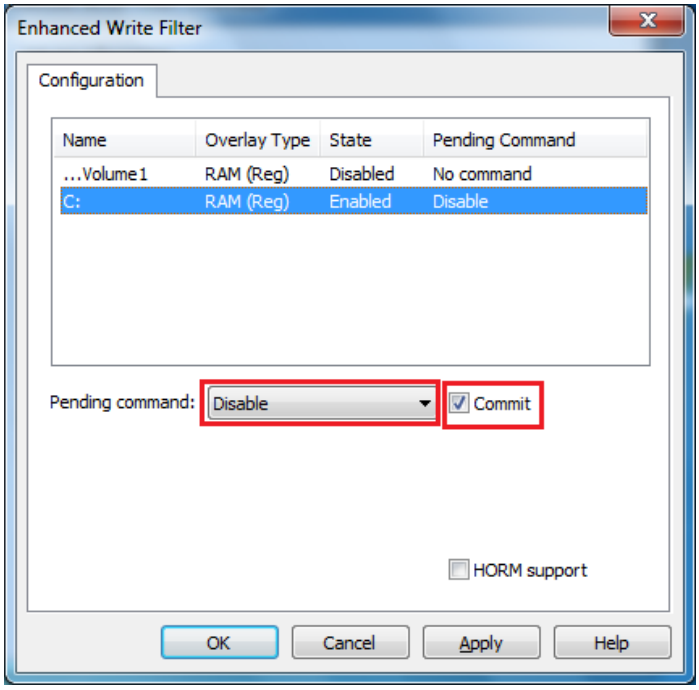
1. First open right-click the lock icon in the left side.



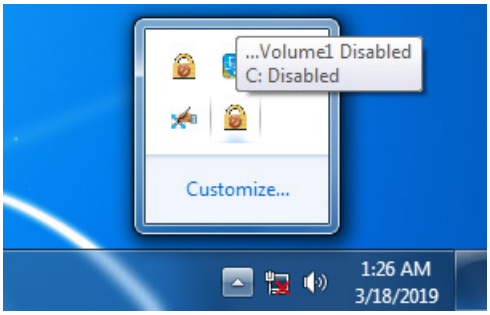
2. Select volume in Volume Information and then select **Configure**.




3. Select Volume and change pending command to **Disable** and check **commit**, click **Apply** and reboot the device.




4. The EWF will be disable



# File-based Write Filter

## Overview

According to Microsoft:

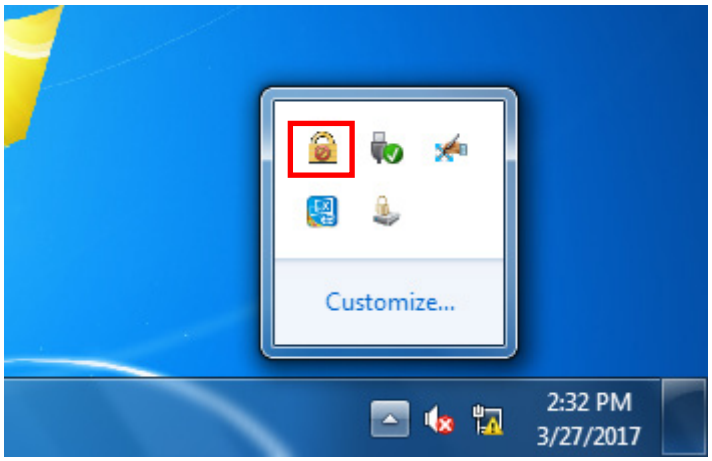
*File-Based Write Filter (FBWF) allows the Windows Embedded platform to maintain the appearance of read and write access on write-sensitive or read-only storage. FBWF makes read and write access transparent to applications.*
*Writing to storage media may be undesirable or impossible in embedded devices. 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 provides the advanced feature than EWF to let user specify the directory to write the data to disk drive directly, in our default setting, the default directory is under c:\temp, which means you can read/write the data into disk without commit action.

## Enable File-Based Write Filter

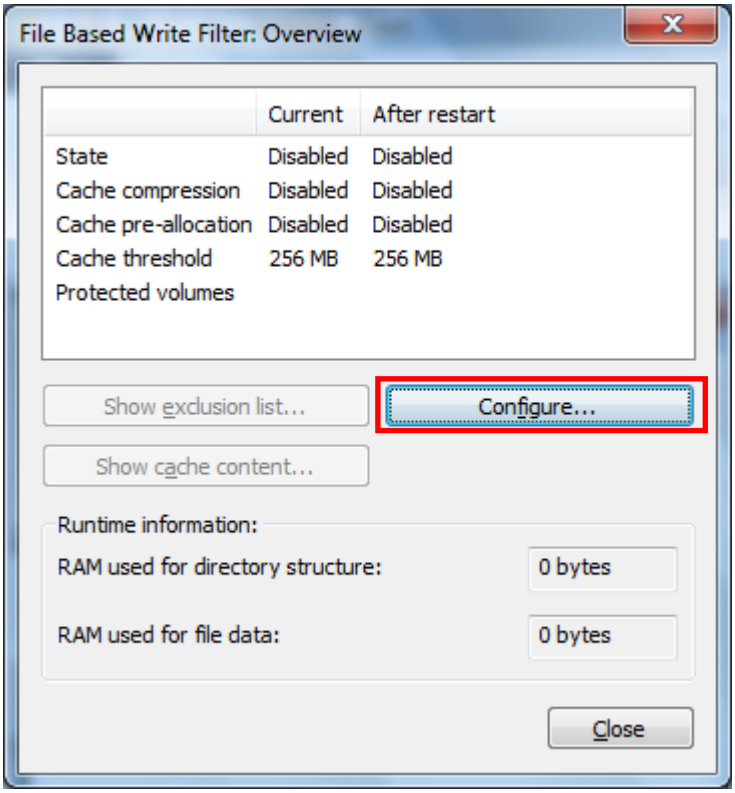
There has conflict between Enhanced Write Filter (EWF) and File-Based Write Filter (FBWF), disable EWF before enable FBWF.

To enable file-based write filtering, do the following:

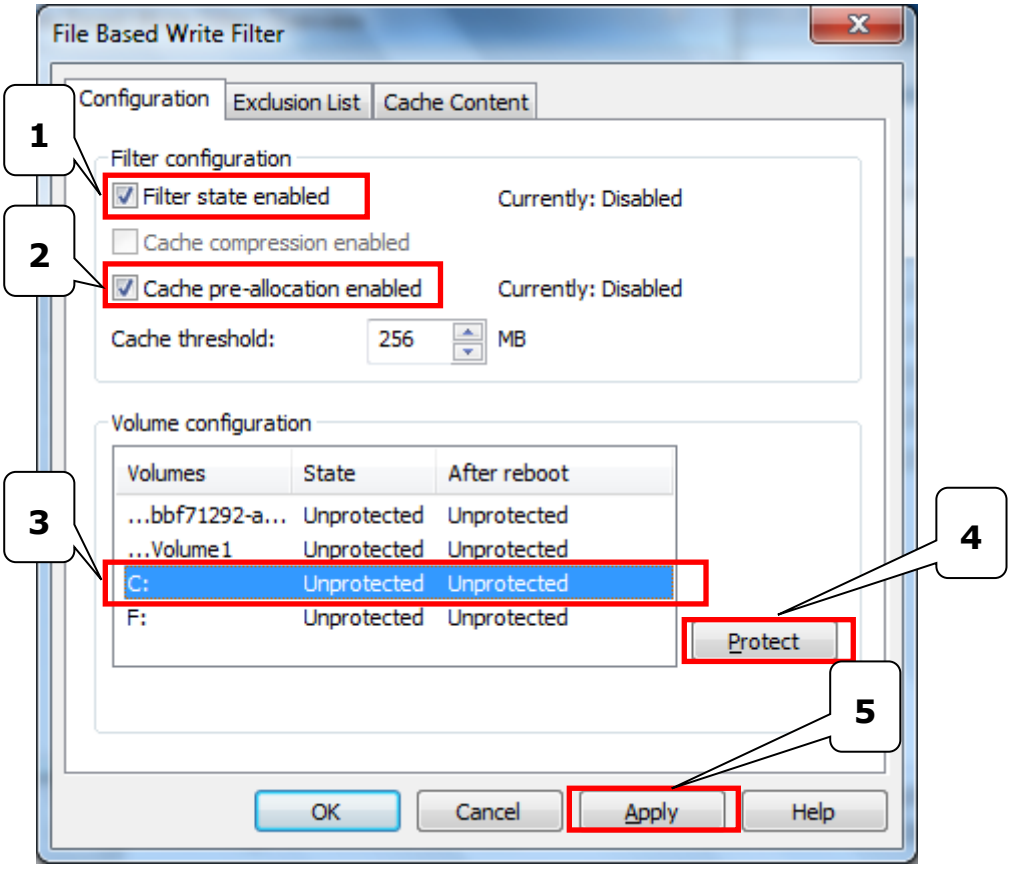
1. Right-click the lock icon.



2. Select **Configure**.

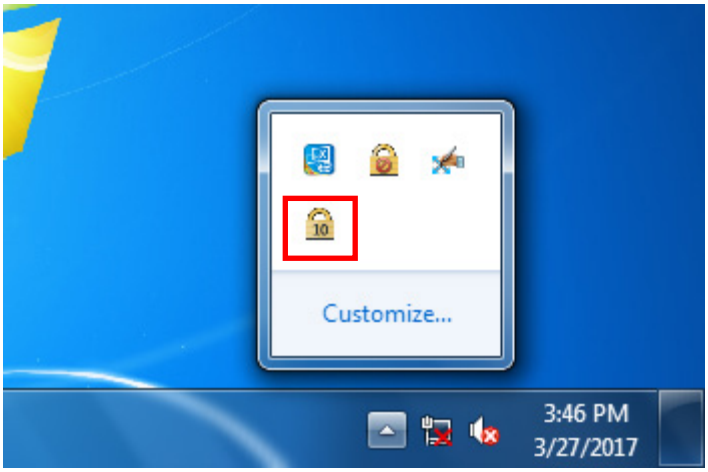



3. In the configuration tab, check on **Filter state enabled** and **Cache pre-allocation enabled**. And then select C:, and then select **Protect** and **Apply**

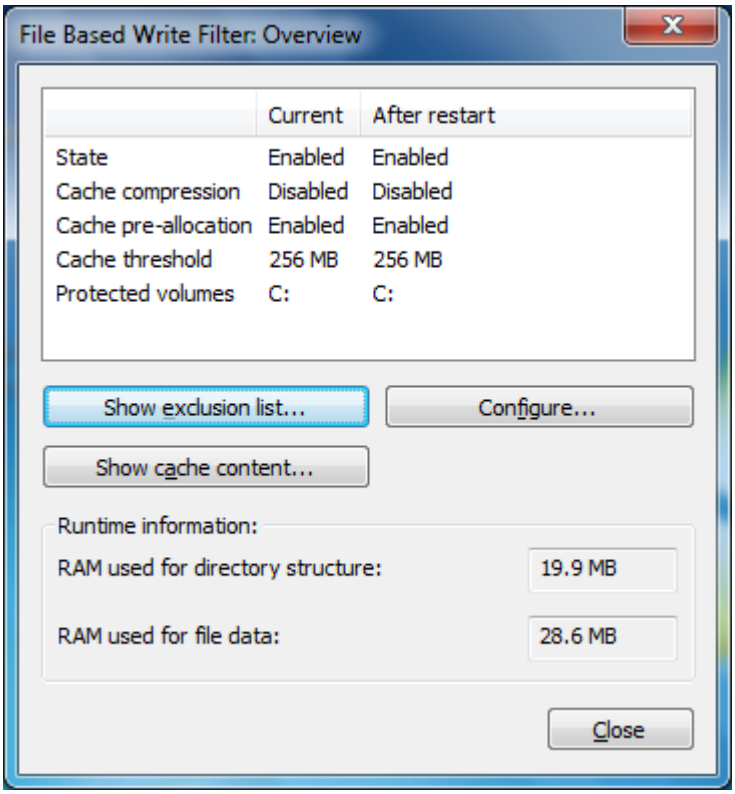



4. Reboot the system

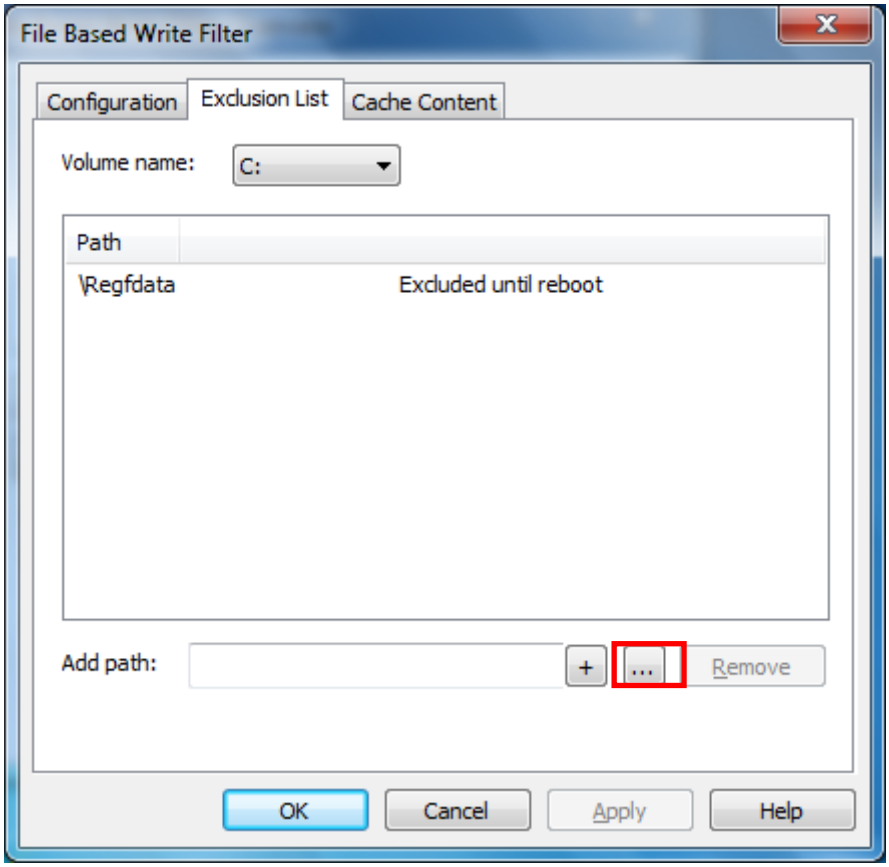
5. Right-click the icon



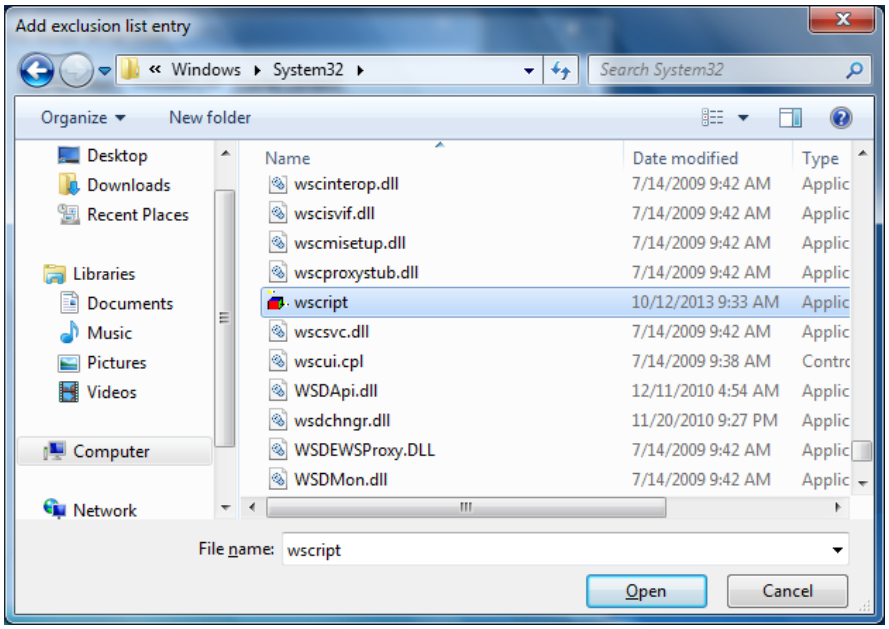

6. Click **Configure**



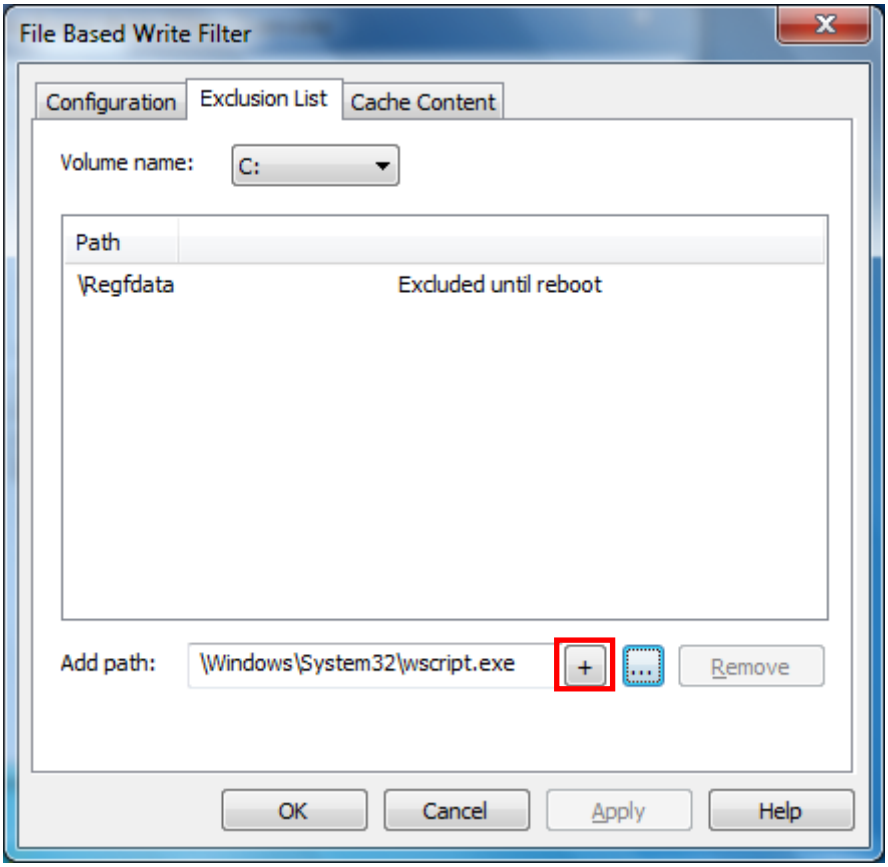
7. Change to **Exclusion List** and select browse button



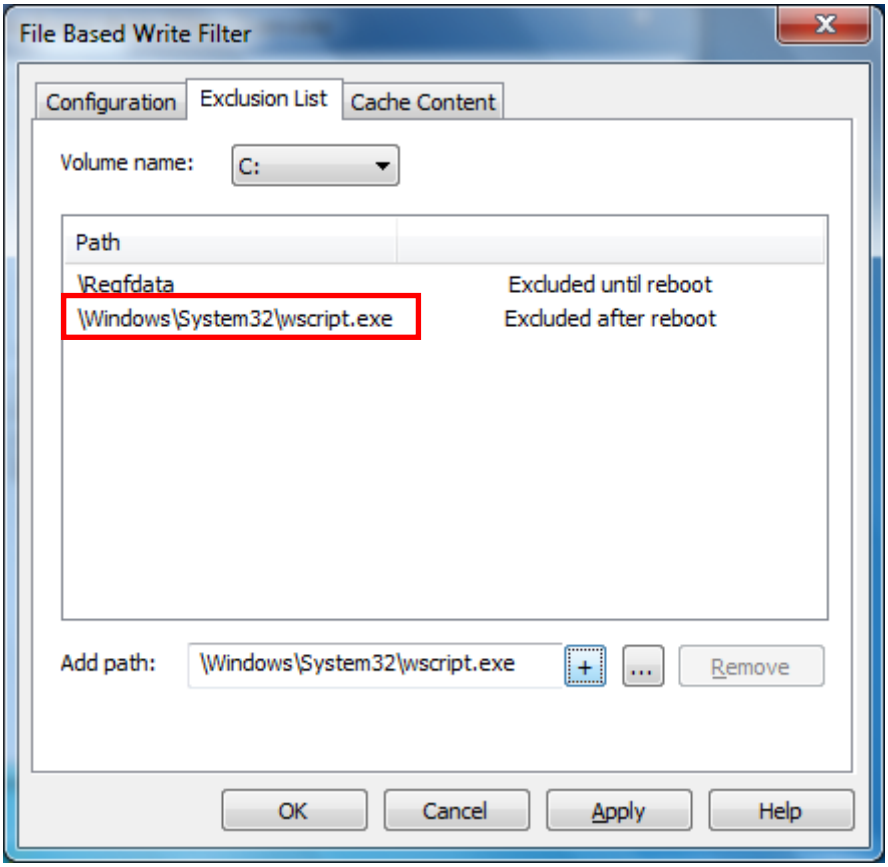

8. Select the file to exclude the protection



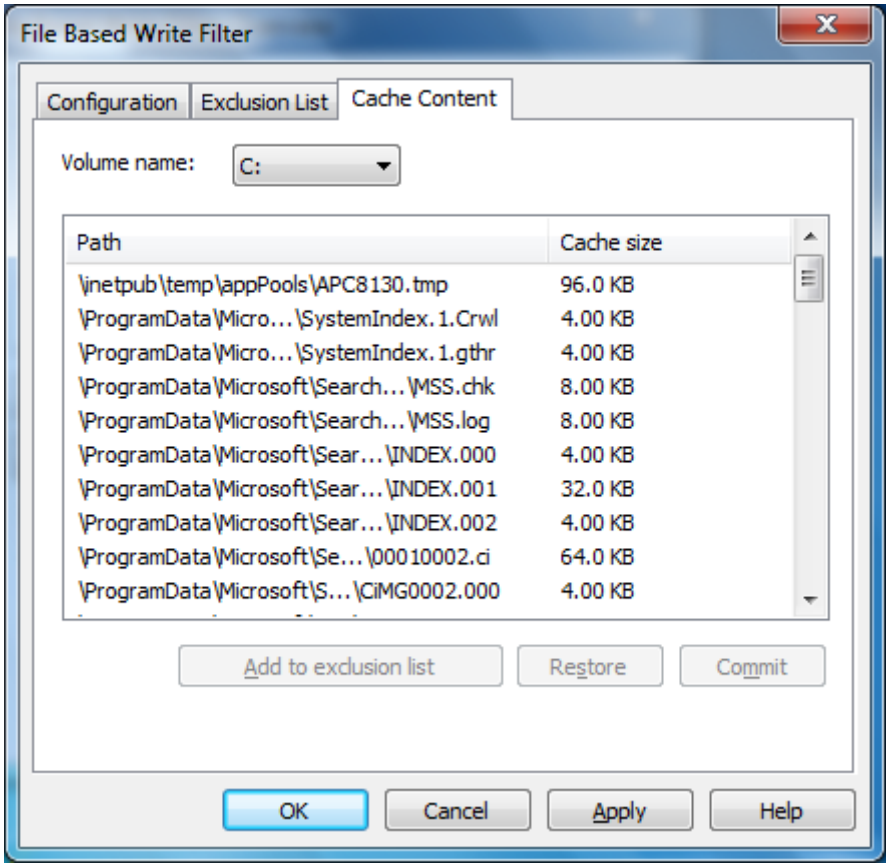
9. Click **+** button



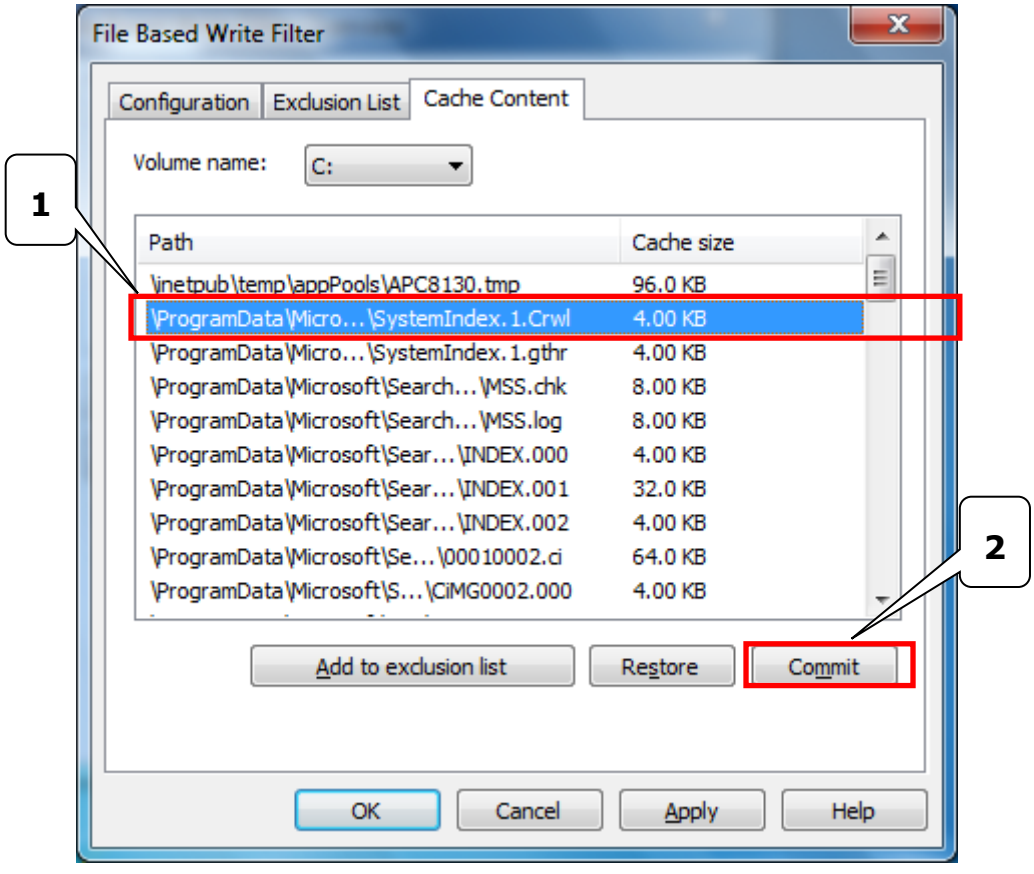

10. Check if the file path has been added



11. Change to Cache Content tab




12. Select the file to you want to save to physical disk and select **commit**

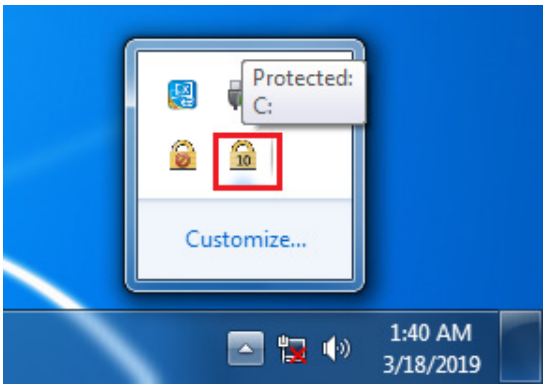



13. Reboot system to take effect

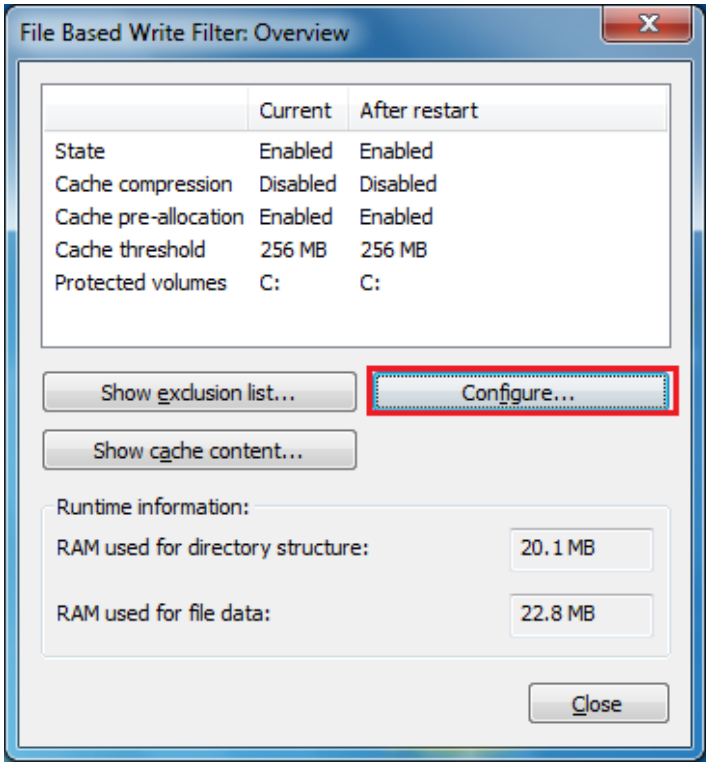
## Disable File-Based Write Filter

To disable file-based write filtering, do the following:

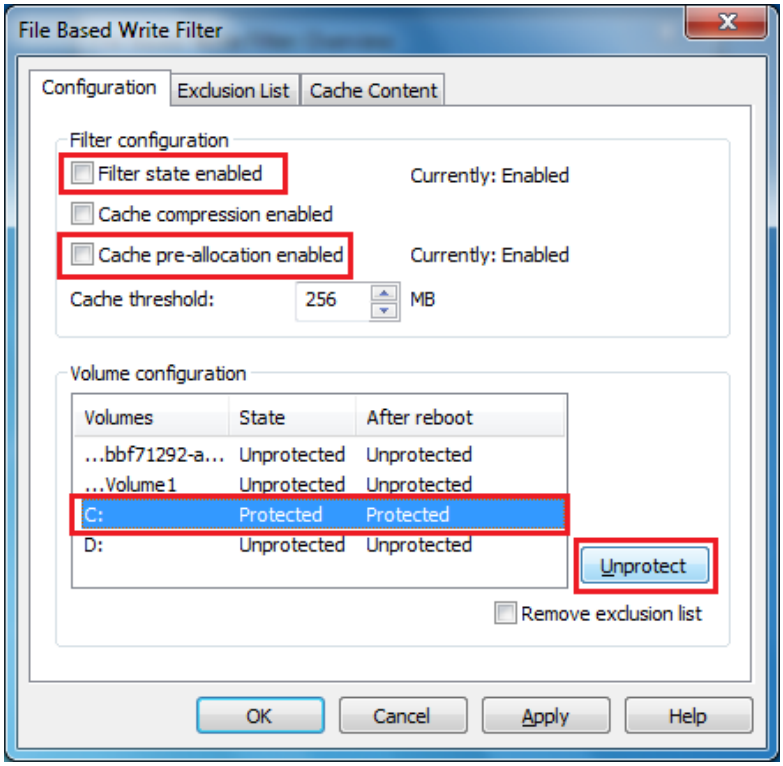
1. Double-click the lock icon on the right side



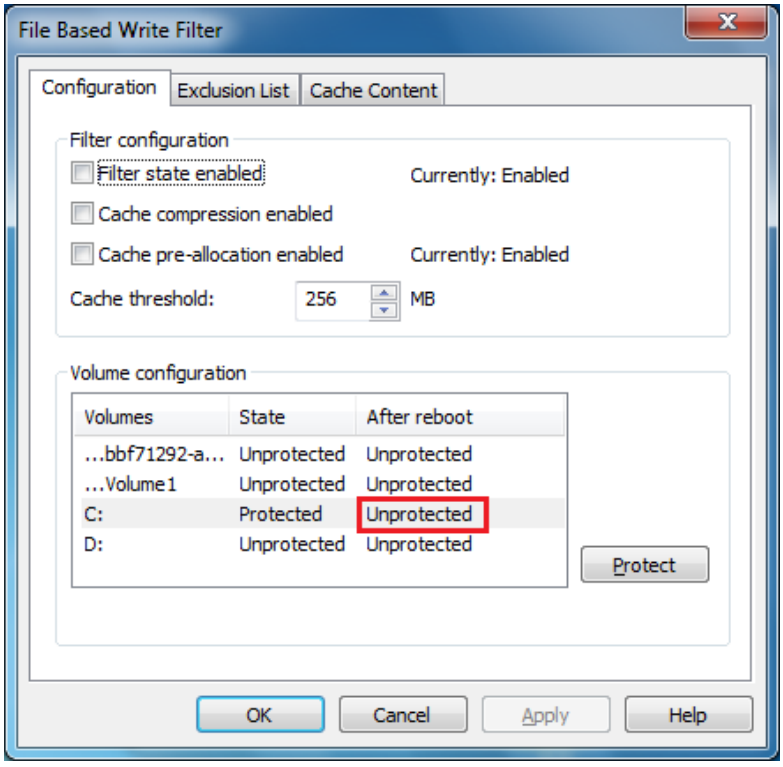

2. Select **Configure.**



3. In the configuration tab, uncheck **Filter state enabled** and **Cache pre-allocation enabled**. And then select C: and then click **Unprotect** and **Apply.**




4. The state after reboot will change to Unprotected. Click OK and reboot the computer



# 5

# Examples

The following topics are covered in this chapter:

- **Watchdog Function**
  - Enabling Watchdog Function
- **Serial Interface**
- **DIO**

# Watchdog Function

You can use the watchdog program included in the MPC-2121/2101 software DVD to implement the watchdog function.

## Enabling Watchdog Function

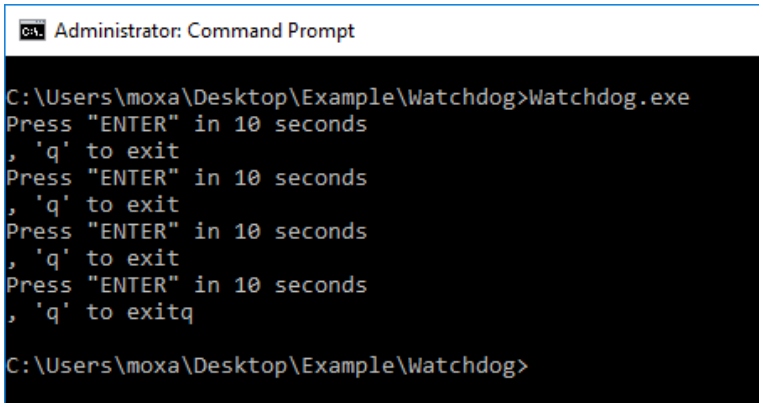
To enable the watchdog function on your MPC-2121/2101, do the following:

1. Create an **example\Watchdog** folder on your system and copy the following files from the product software DVD:

   **mxdwg.dll:** <Software DVD>\Example\[Library]\Release\x64\mxdwg\

   **Watchdog.exe:** <Software DVD>\Example\Release\x64\Watchdog\

2. Run the **Watchdog.exe** program**.**
3. You need to press **Enter** every 10 seconds to prevent the system from rebooting.
4. To stop the watchdog function and exit the program, press **q**.



# Serial Interface

The **UartMode.exe** script reports on and controls the serial interface mode.

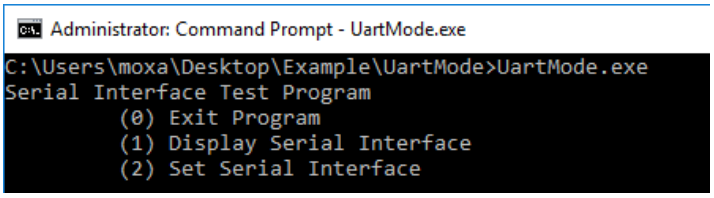
To enable the serial interface mode on your MPC-2121/2101, do the following:

1. Create an **example\UartMode** folder on the desktop and copy the following files from the product software DVD:

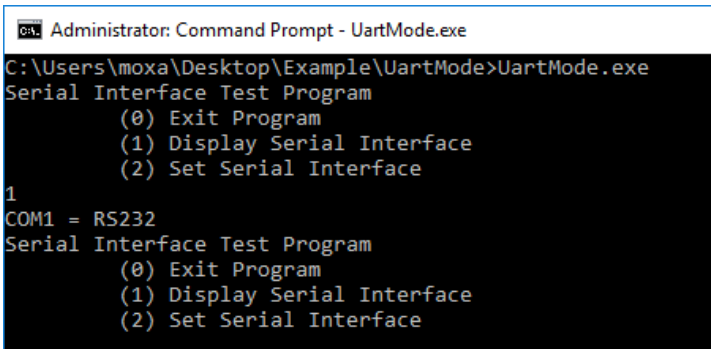
   **mxsp.dll:** <Software DVD>\Example\[Library]\Release\x64\mxsp\

   **UartMode.exe:** <Software DVD>\Example\Release\x64\UartMode\

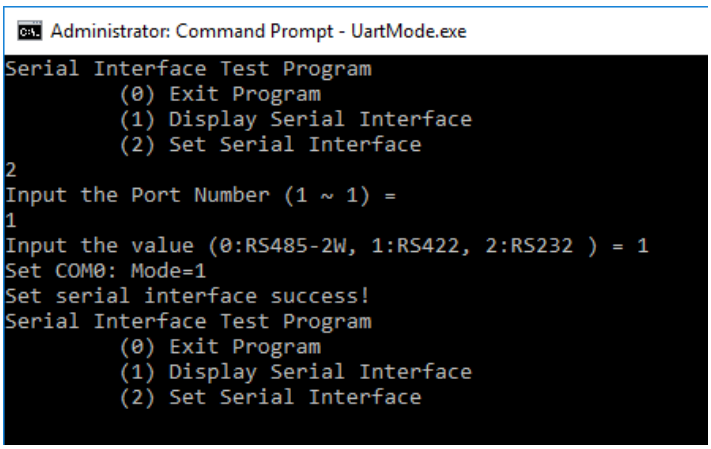
2. Run the UartMode.exe program.




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




4. Type **2** to set the serial interface. Follow the on-screen instructions.



# DIO

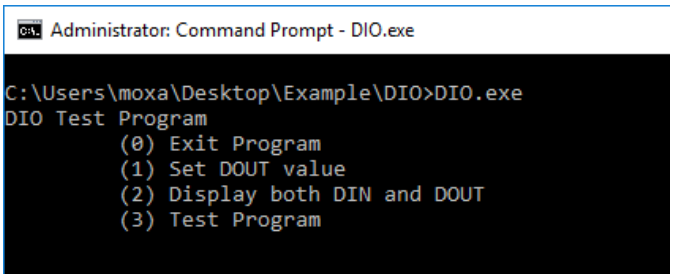
This script reports on and controls the state of the DIs and DOs, switching them between high and low.

To enable the DIO script, do the following:

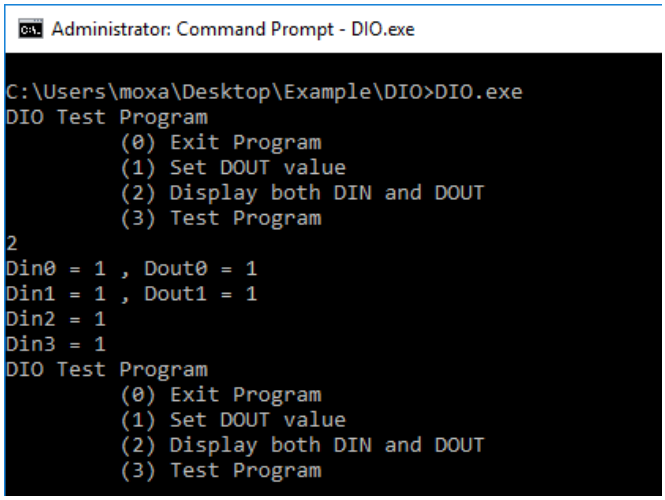
1. Make sure the DI/DO connect correctly before running the test program. (Please connect DOUT 1 to DIN 0 and DIN 1, connect DOUT 0 to DIN 2 and DIN 3.)
2. Create an **example\DIO** folder on the desktop and copy the following files from the product software DVD.

   **mxdgio.dll:** <Software DVD>\Example\[Library]\Release\x64\mxdgio

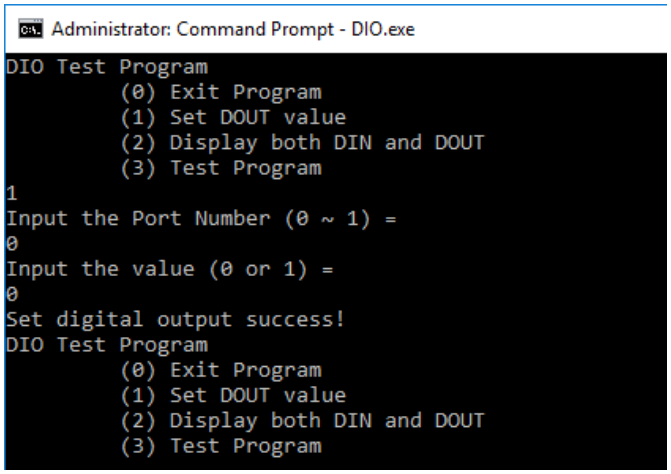
   **DIO.exe:** <Software DVD>\Example\Release\x64\DIO
3. Run the **DIO.exe** program



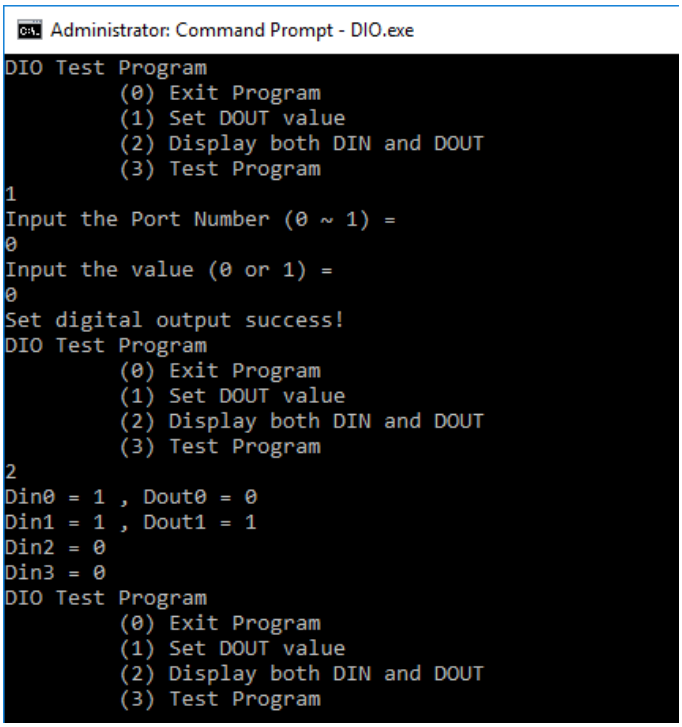

4. Type **2** to display the current DIO status. Follow the on-screen instructions.



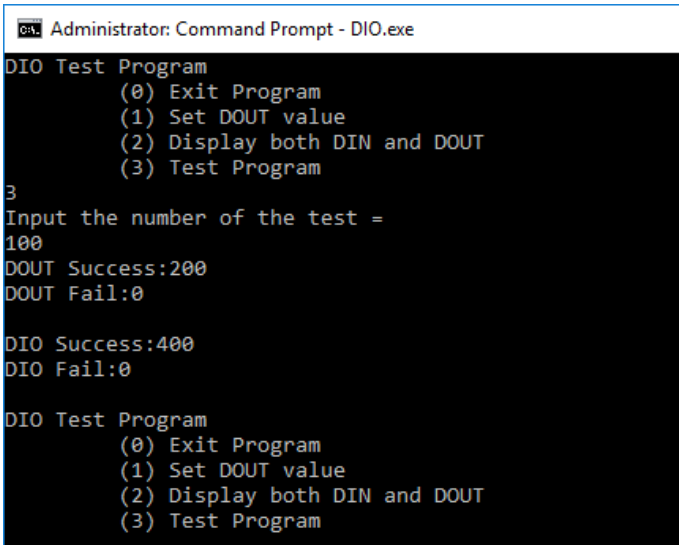

5. Type **1** to set DOUT value. Follow the on-screen instructions. Enter the target port and value.



6. Type **2** to check the DIO status.




7. Type **3** to execute the test program. Enter the number of test. After the test program finished, the test report will be shown on the screen. (100 times * 2 DOUT ports, 100 times * 4 DIN ports)



# 6

# System Recovery

This chapter describes the recovery process in the event of system instability.

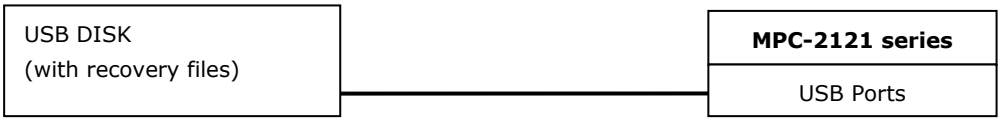
The following topics are covered in this chapter:

- **Recovery Environment**
- **Recovery Procedure**
- **Saving the System to the USB Drive**

# Recovery Environment

The recovery environment includes a PC, a MPC-2121/2101 computer, and a bootable USB disk with the recovery programs and system image file.

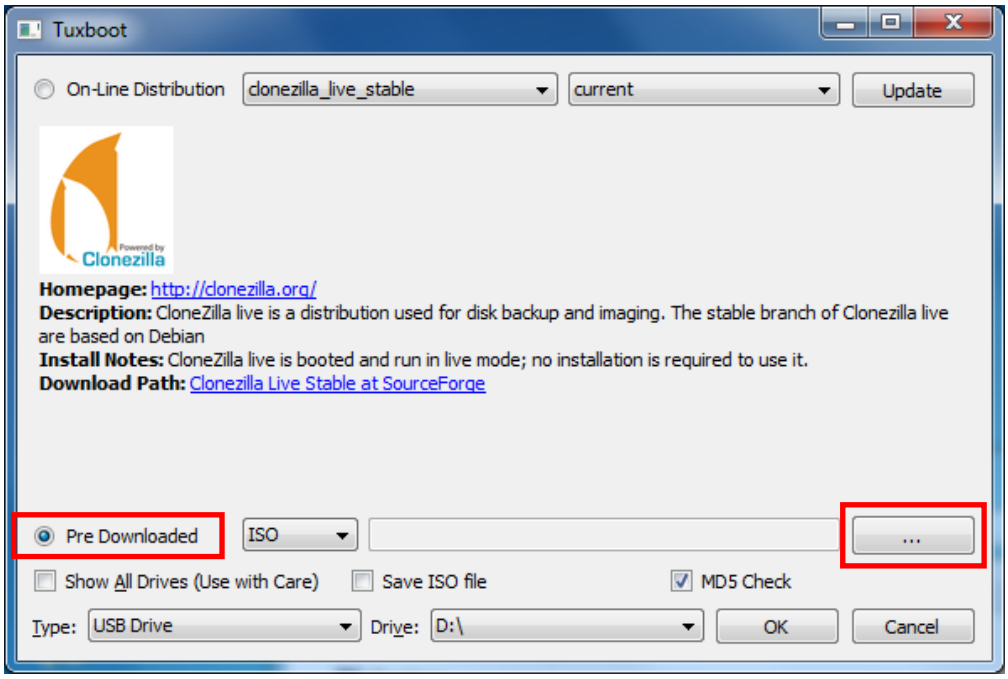
**(Note: The USB disk should be at least 8GB.).**



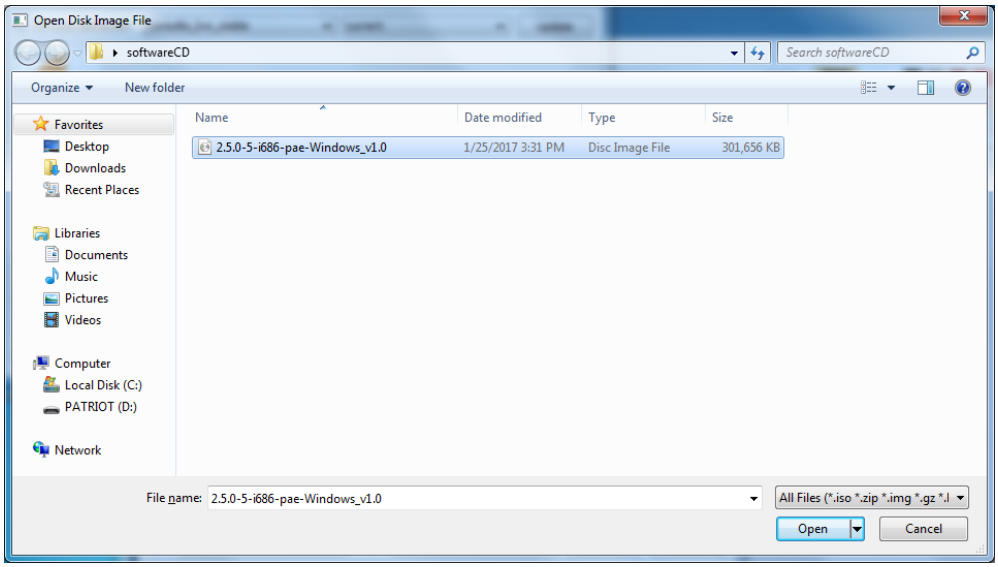

# Recovery Procedure

### Step 1: Prepare your USB drive

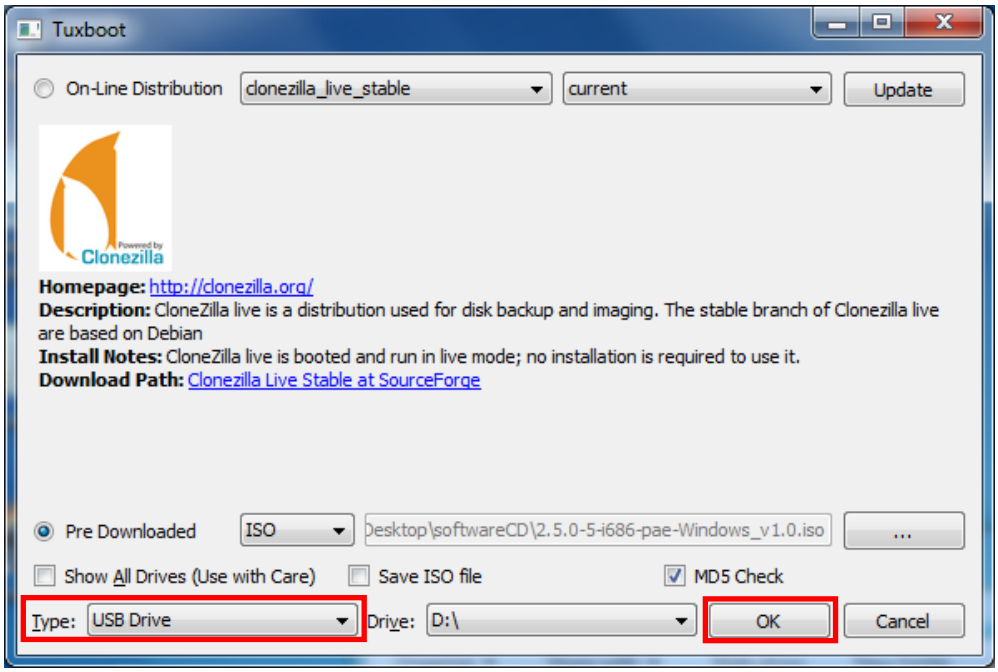
1. Format the USB disk to the **FAT32** file system
2. Run the **tuxboot-windows-23.exe** program from the <Software DVD>**\recovery** folder, then select **Pre Download**, and then click "**...**".



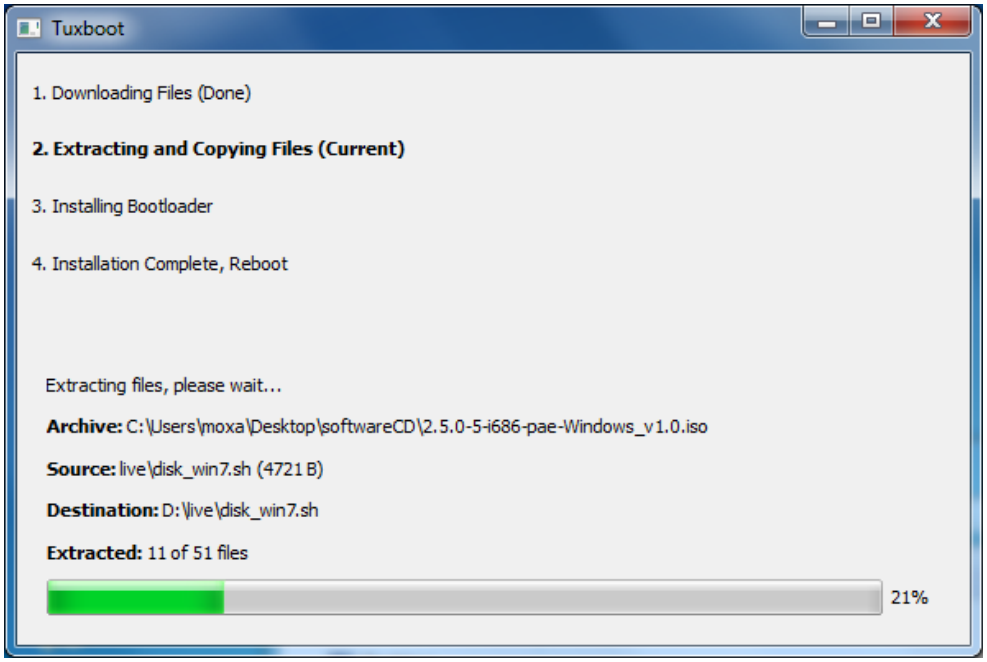
3. Select the ISO file from <Software DVD>**\recovery**



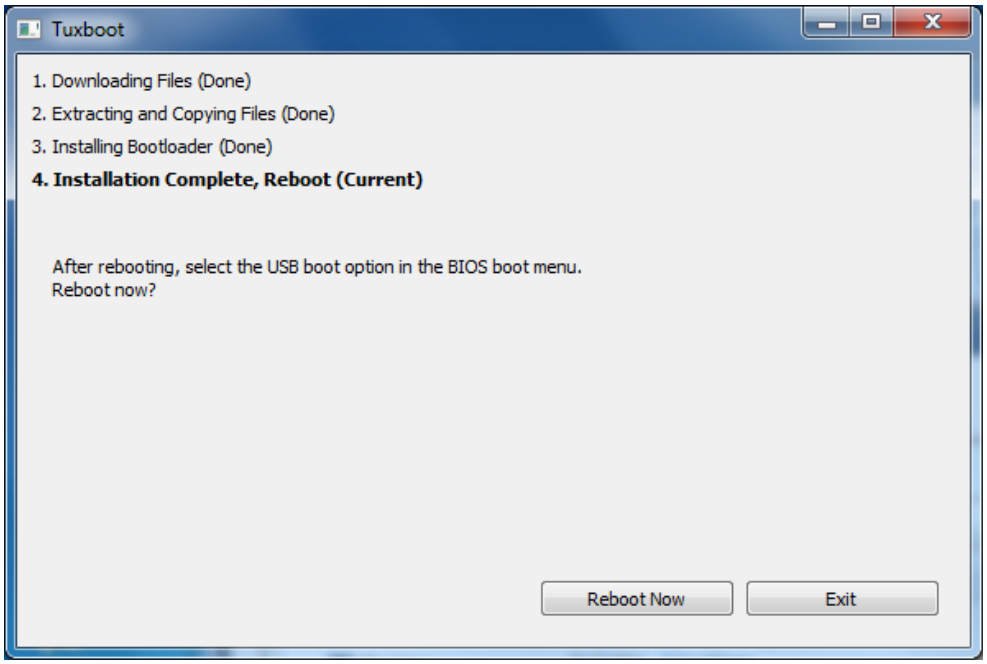

4. Select **USB Drive** type, select a **Drive**, and then click **OK** to continue.



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




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

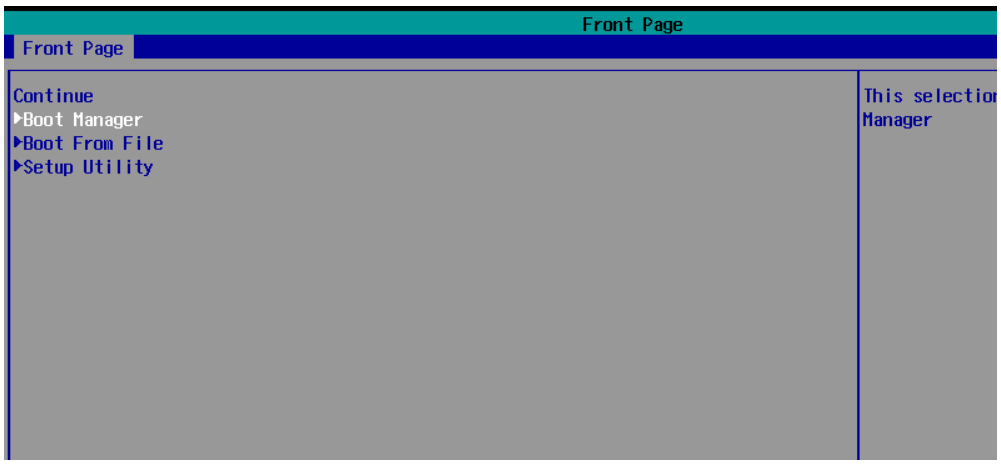



7. Copy the **os_image** directory from the <Software DVD>**\recovery** folder to the **\home\partimag** folder on the USB drive.
   The USB disk is now ready for use in the recover process.

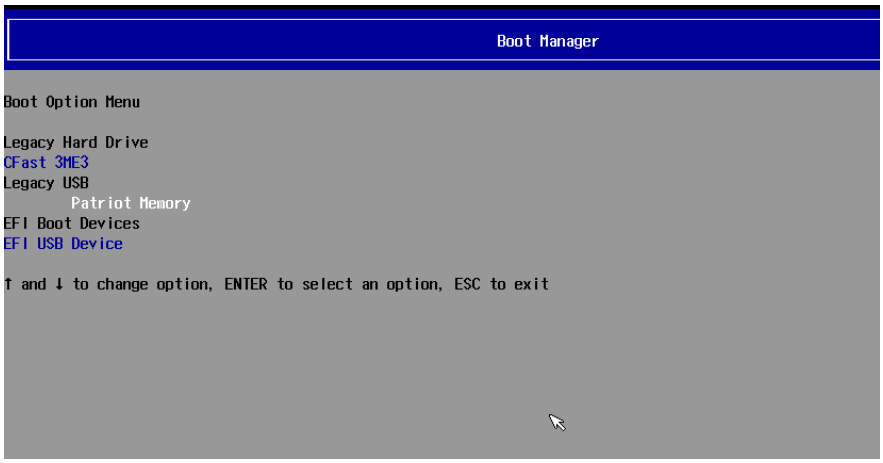
## Step 2: Boot from USB disk

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

1. Turn on the computer and press **F2** when you hear the beep sound to enter the BIOS setup menu.
2. Select **Boot** and then select **Legacy**. Press **Enter** to continue.



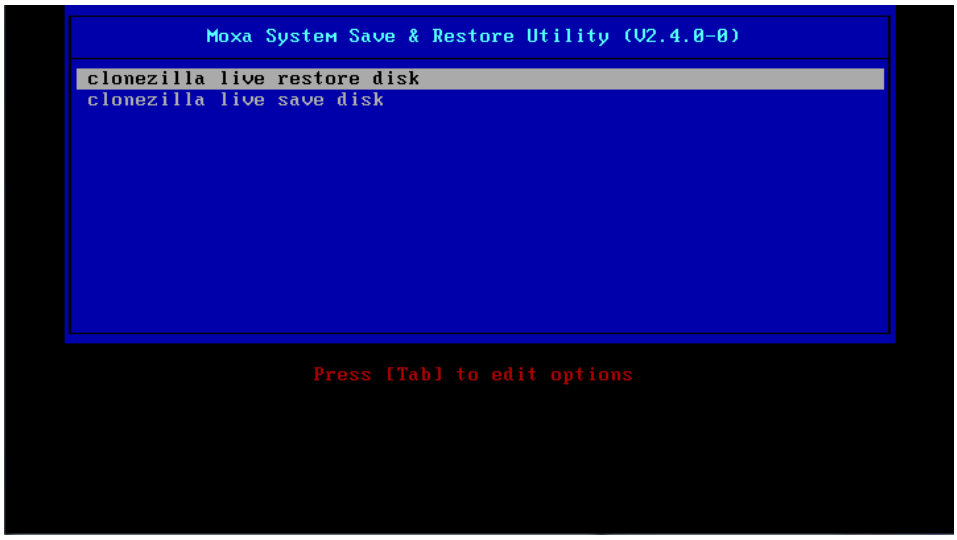

3. Select the **USB device** on the computer and press **Enter** to continue to boot from USD device.



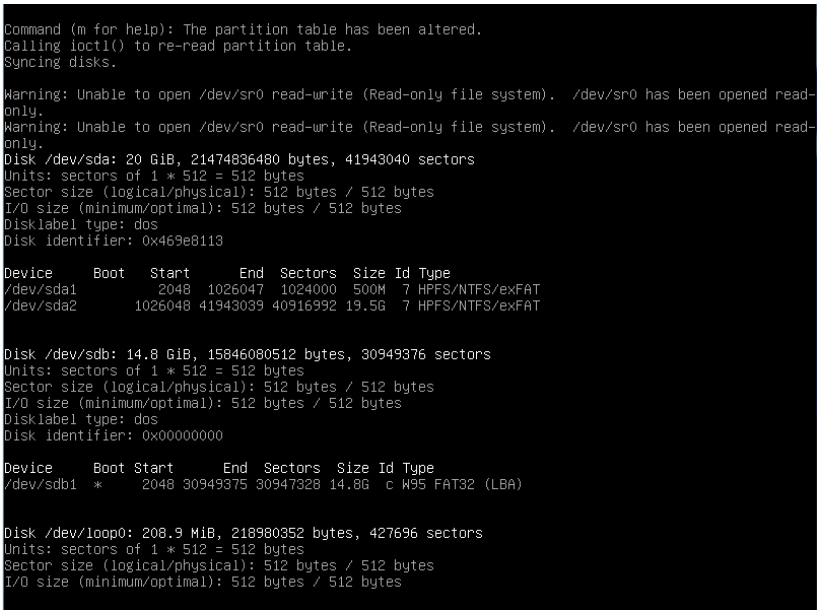
### Step 3: Restore the system from USB drive

After select the USB device, the system will boot from the USB disk. The Pre-installation Environment and the recovery utility will displayed.

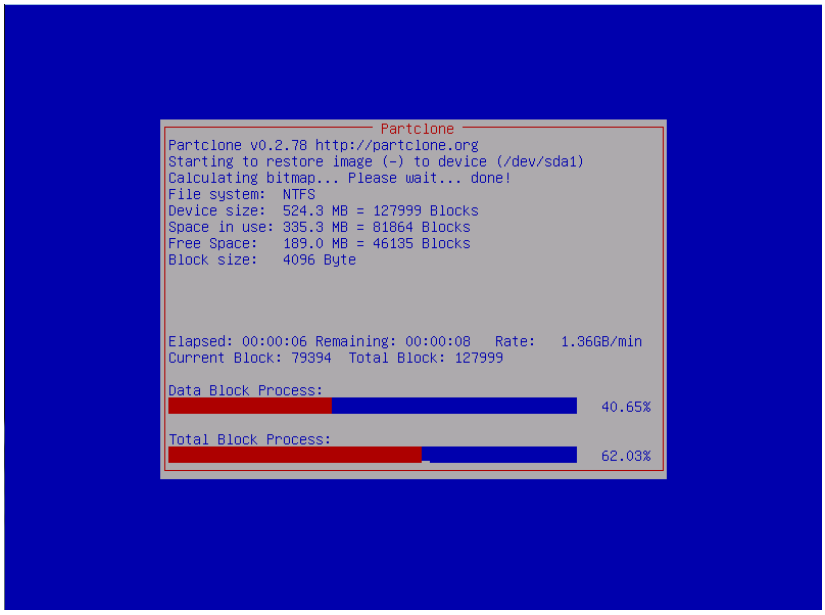
1. Select **clonezilla live restore disk**.



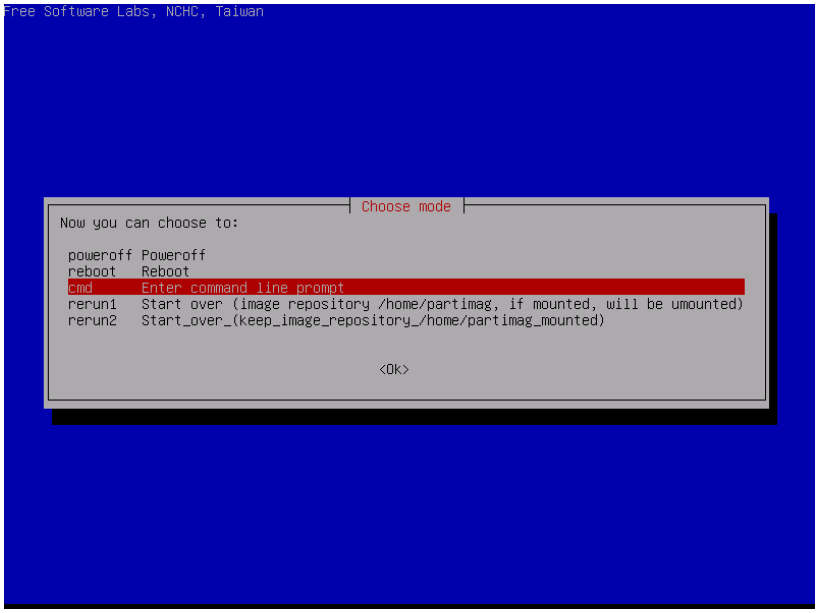

2. Wait for the USB drive boot process to finish.



3. Wait for the process to finish.




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




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

## Step 4: Reboot the Computer

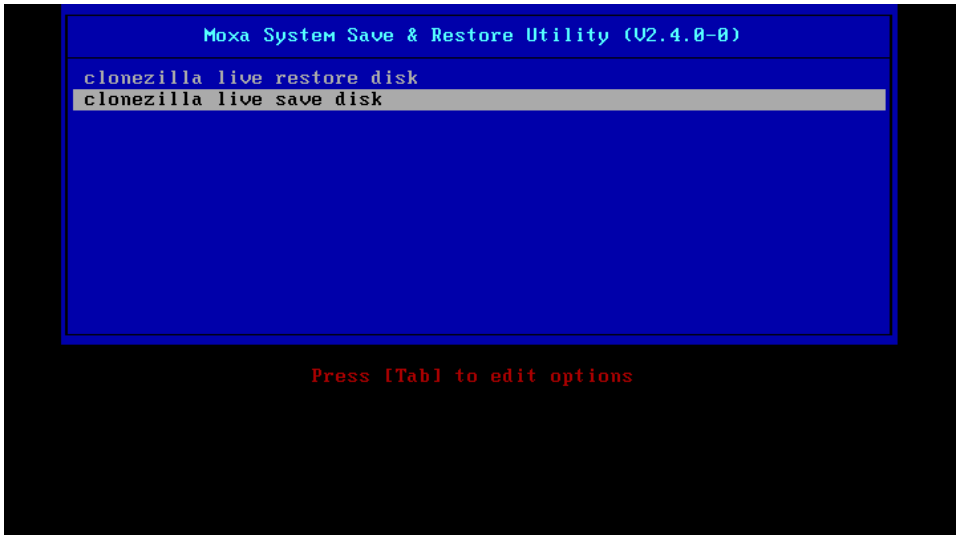
When you restart the computer, you will need to wait about 5 minutes for the computer to go through two cycles of the reboot process. The system configuration files will be initiated during the first boot-up process. **Do not turn off the computer or shut down the computer** while the system is restarting. When the operating system has successfully launched, follow the "System Initialization" to process.

# Saving the System to the USB Drive

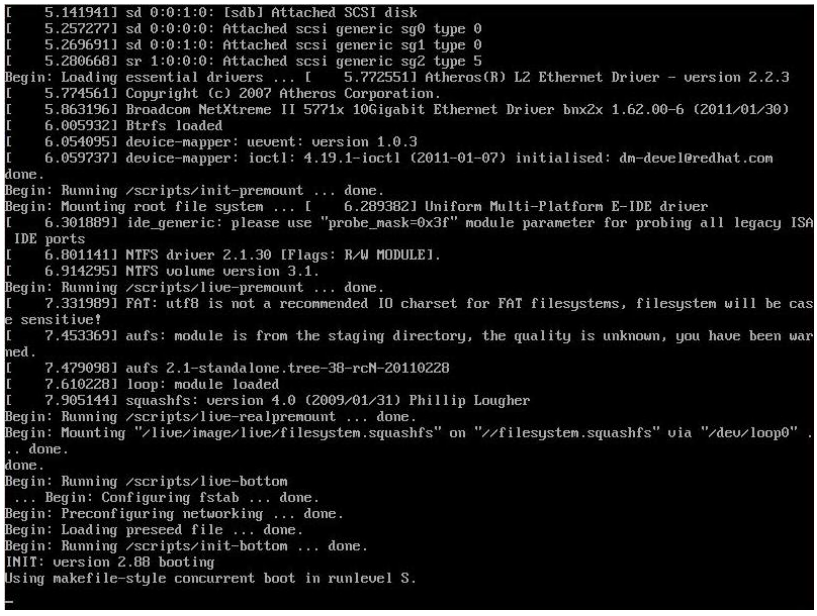
You can save the current system to the USB drive for system recovery in case the system crashes. Before saving the system image to the USB drive, we suggest you remove all files under **\home\partimag** on the USB drive.

Boot from USB disk, when the system has been launched, and take the following steps.

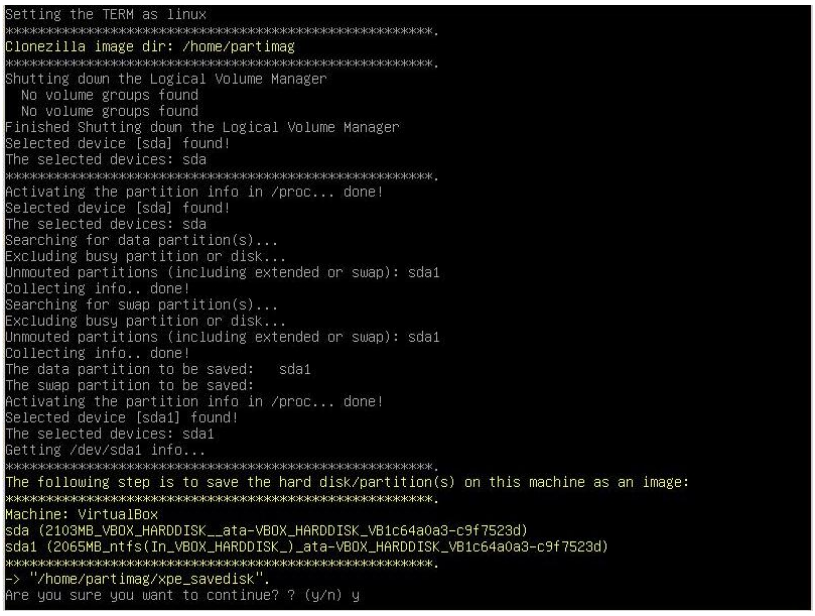
1. Select **clonezilla live save disk.**



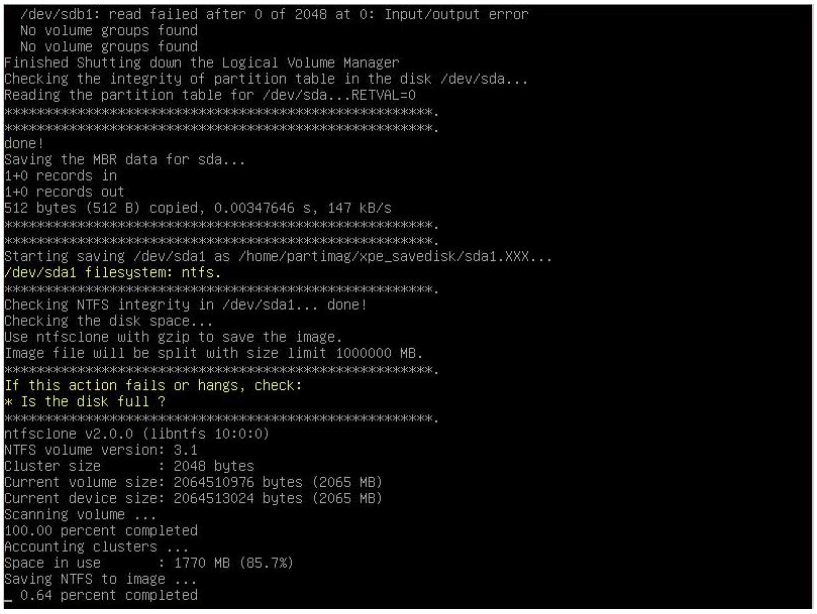

2. Wait for the USB drive boot process to finish.



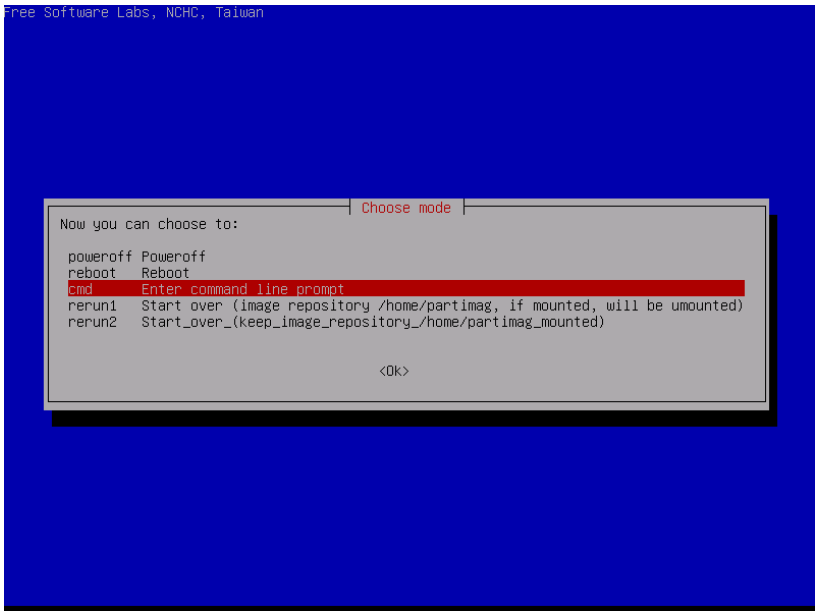
3. Enter **y** to continue.




4. Wait for the process to finish.



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




The system image is store in the **\home\partimag\os_image** folder on the USB disk, keep the USB disk save for system recover in the future.