

# DA-682C Windows 10 Enterprise LTSC User's Manual

---

Version 1.0, November 2019

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



© 2019 Moxa Inc. All rights reserved.

# DA-682C Windows 10 Enterprise LTSC User's Manual

The software described in this manual is furnished under a license agreement and may be used only in accordance with the terms of that agreement.

## Copyright Notice

© 2019 Moxa Inc. All rights reserved.

## Trademarks

The MOXA logo is a registered trademark of Moxa Inc.  
All other trademarks or registered marks in this manual belong to their respective manufacturers.

## Disclaimer

Information in this document is subject to change without notice and does not represent a commitment on the part of Moxa.

Moxa provides this document as is, without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Moxa reserves the right to make improvements and/or changes to this manual, or to the products and/or the programs described in this manual, at any time.

Information provided in this manual is intended to be accurate and reliable. However, Moxa assumes no responsibility for its use, or for any infringements on the rights of third parties that may result from its use.

This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

## Technical Support Contact Information

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

### **Moxa Americas**

Toll-free: 1-888-669-2872  
Tel: +1-714-528-6777  
Fax: +1-714-528-6778

### **Moxa Europe**

Tel: +49-89-3 70 03 99-0  
Fax: +49-89-3 70 03 99-99

### **Moxa India**

Tel: +91-80-4172-9088  
Fax: +91-80-4132-1045

### **Moxa China (Shanghai office)**

Toll-free: 800-820-5036  
Tel: +86-21-5258-9955  
Fax: +86-21-5258-5505

### **Moxa Asia-Pacific**

Tel: +886-2-8919-1230  
Fax: +886-2-8919-1231

# Table of Contents

<b>1. System Initialization</b> .....	<b>1-1</b>
Initializing User Settings .....	1-2
Initializing the System .....	1-5
<b>2. Configuring the Serial Interface</b> .....	<b>2-1</b>
Overview .....	2-2
Setting the UART Mode .....	2-2
<b>3. Teaming</b> .....	<b>3-1</b>
Creating an Intel Net Team .....	3-2
Adding an Intel Net Team Member .....	3-3
Removing an Intel Net Team Member .....	3-4
Removing an Intel Net Team .....	3-5
<b>4. BitLocker</b> .....	<b>4-1</b>
Enabling the BitLocker .....	4-2
Disabling the BitLocker .....	4-5
<b>5. Configuring RAID</b> .....	<b>5-1</b>
Changing the RAID Mode .....	5-2
Creating a RAID Disk From the BIOS .....	5-4
Replacing the Disk .....	5-9
Removing a RAID Volume From the BIOS .....	5-12
<b>6. Unified Write Filters</b> .....	<b>6-1</b>
Turning ON the UWF on a Running PC .....	6-2
Installing the UWF Feature Using WMI .....	6-4
<b>7. Moxa IO Control Utility</b> .....	<b>7-1</b>
Overview .....	7-2
Setting the DIO Status .....	7-2
Setting the UART Mode .....	7-3
Setting the Relay Status .....	7-4
Setting the LED Status .....	7-5
<b>8. IO Control API</b> .....	<b>8-1</b>
Downloading the API .....	8-2
mxdgi .....	8-3
GetDinStatus .....	8-3
GetDoutStatus .....	8-3
SetDoutStatus .....	8-4
mxled .....	8-5
GetLedData .....	8-5
SetLedData .....	8-5
mxrelay .....	8-6
GetRelayData .....	8-6
SetRelayData .....	8-7
mxsp .....	8-7
GetUartMode .....	8-7
SetUartMode .....	8-8
mxwdg .....	8-9
mxwdg_open .....	8-9
mxwdg_refresh .....	8-9
mxwdg_close .....	8-10
<b>9. Windows Recovery</b> .....	<b>9-1</b>
Preparing the USB Device .....	9-2
Booting From the USB Recovery Disk .....	9-7
System Image Backup .....	9-8
Restoring the System Image .....	9-12

## System Initialization

---

In this chapter, we describe how to initialize the system settings on the DA-682C computer when you boot up the computer for the first time. When users turn on their Windows PCs for the first time, they will see the Windows Out of Box Experience (OOBE). OOBE consists of a series of screens that require users to accept the license agreement, connect to the internet, log in with, or sign up for a Microsoft Account, and share information with the OEM.

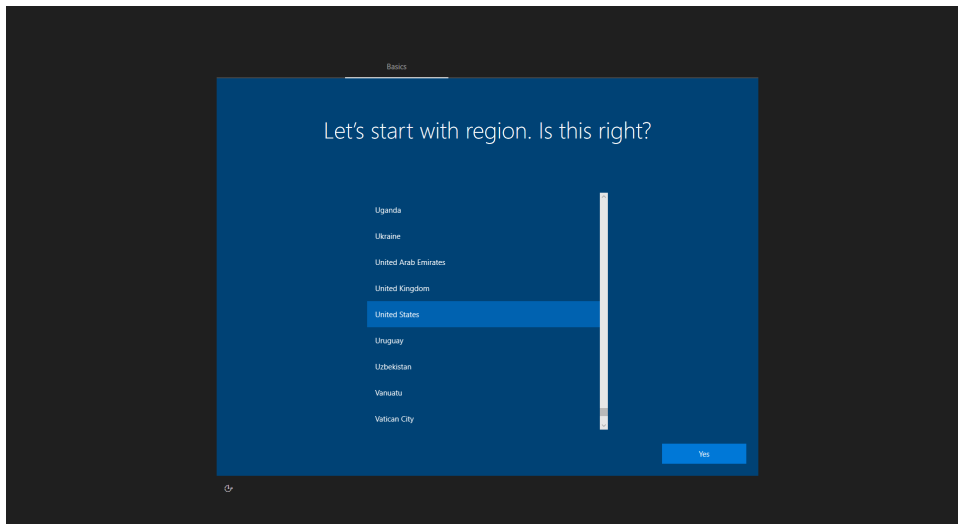
The following topics are covered in this chapter:

- ❑ **Initializing User Settings**
- ❑ **Initializing the System**

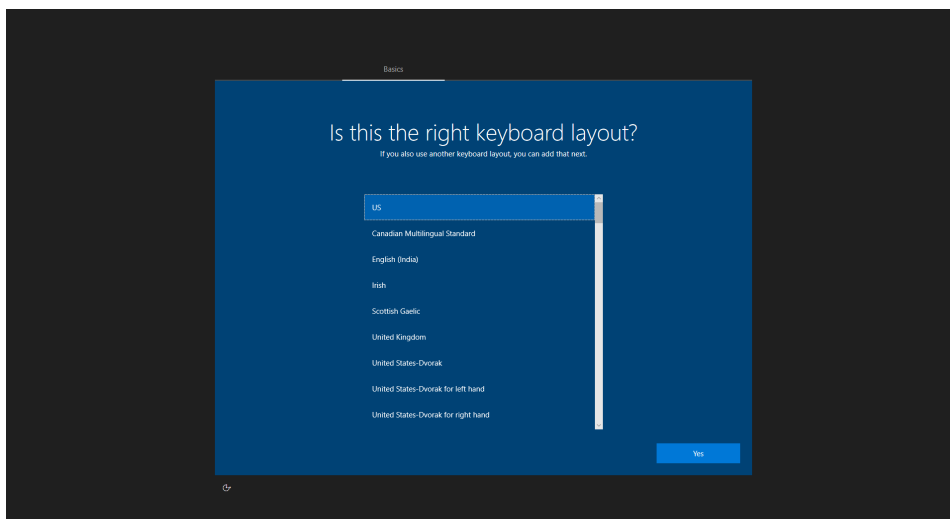
# Initializing User Settings

The following is a non-exhaustive list of screens the users may see during OOBE.

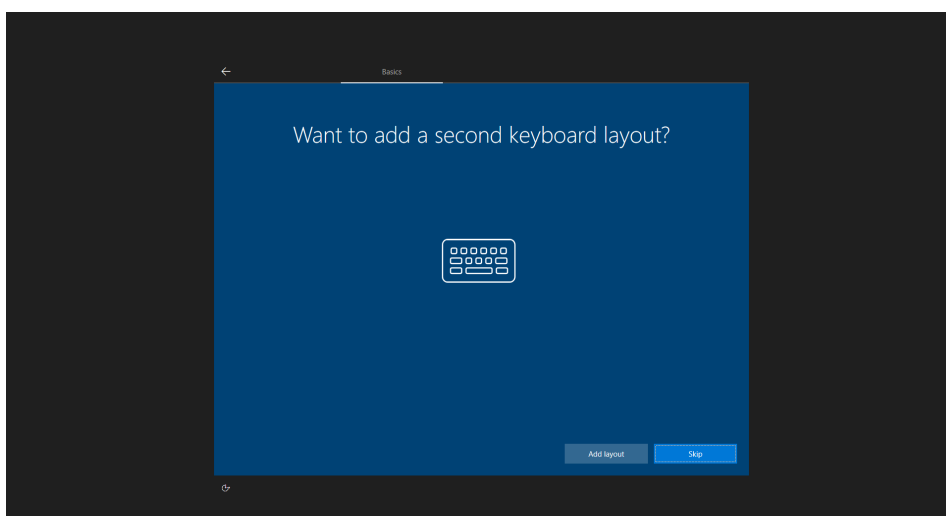
1. Select a region.



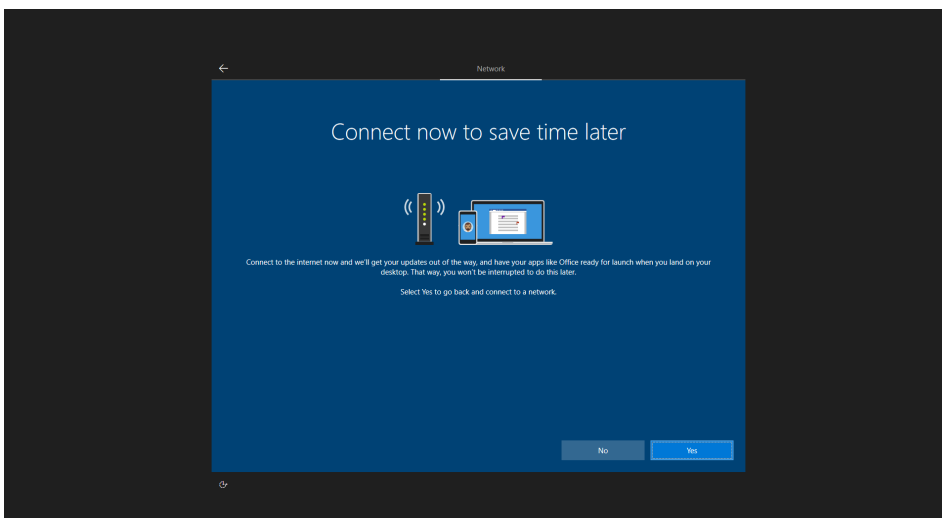
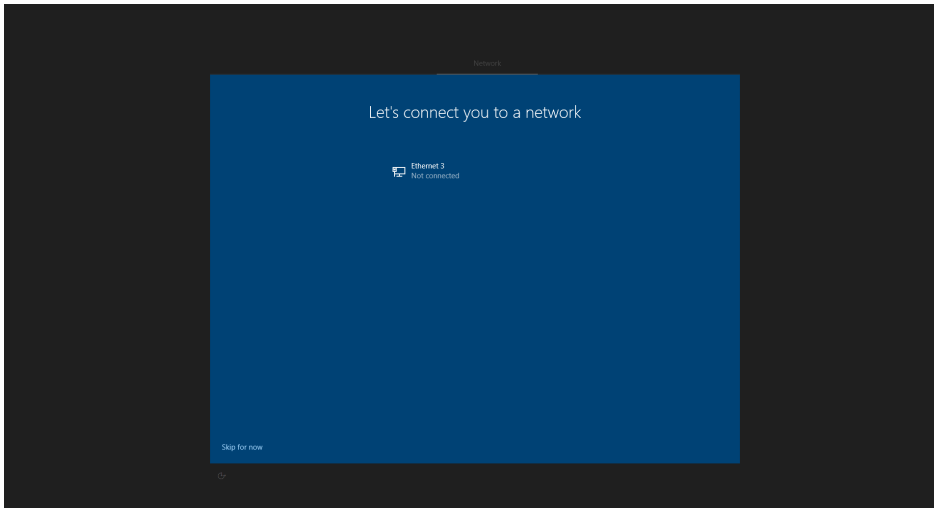
2. Select a keyboard.



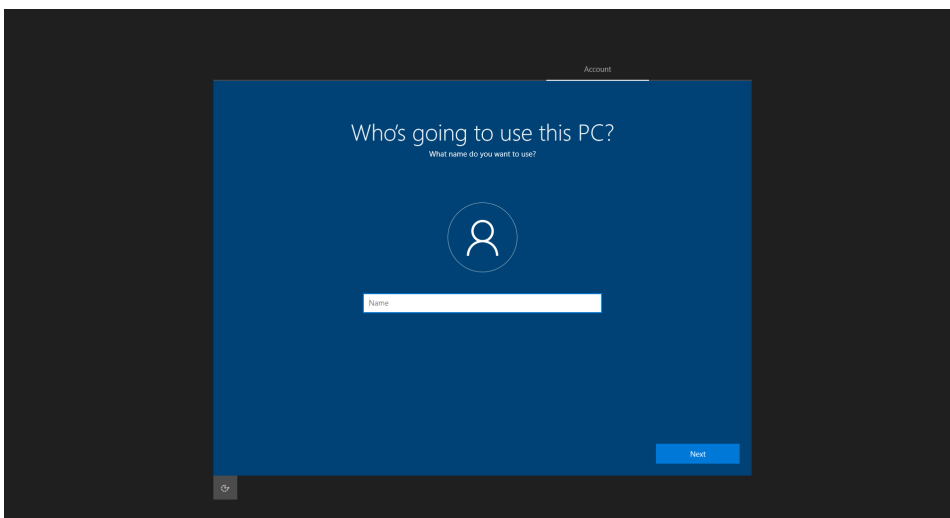
3. Select a second keyboard.



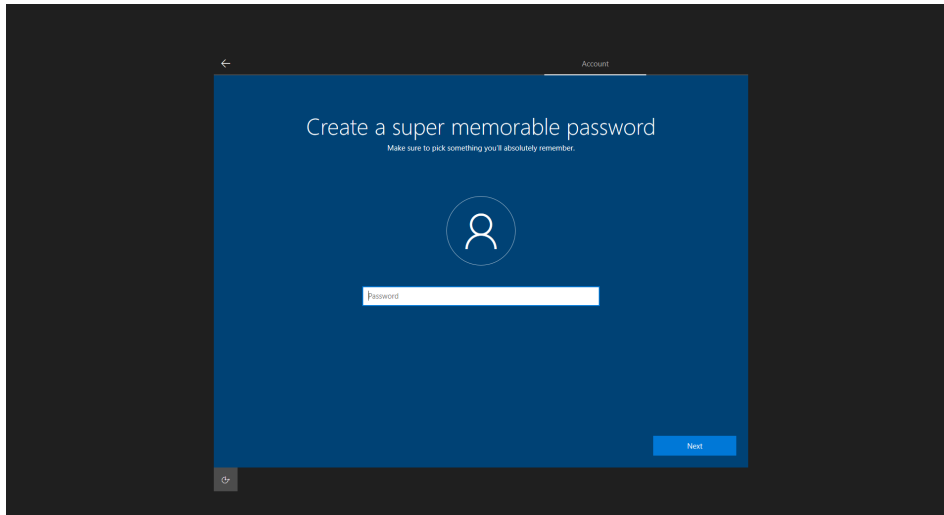
4. Connect to a network.



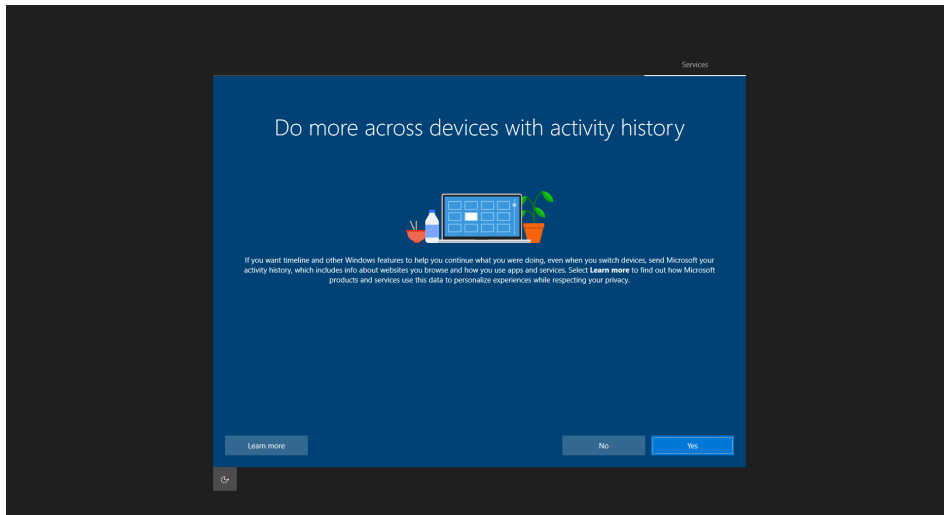
5. Sign in to, or create, a local account or Microsoft account (MSA).



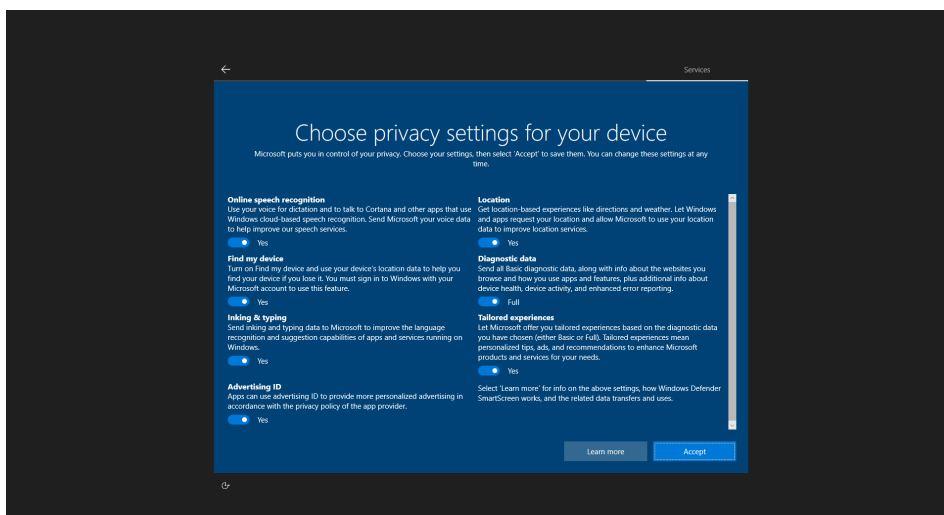
6. Create a password.



7. Do more across devices with activity history.

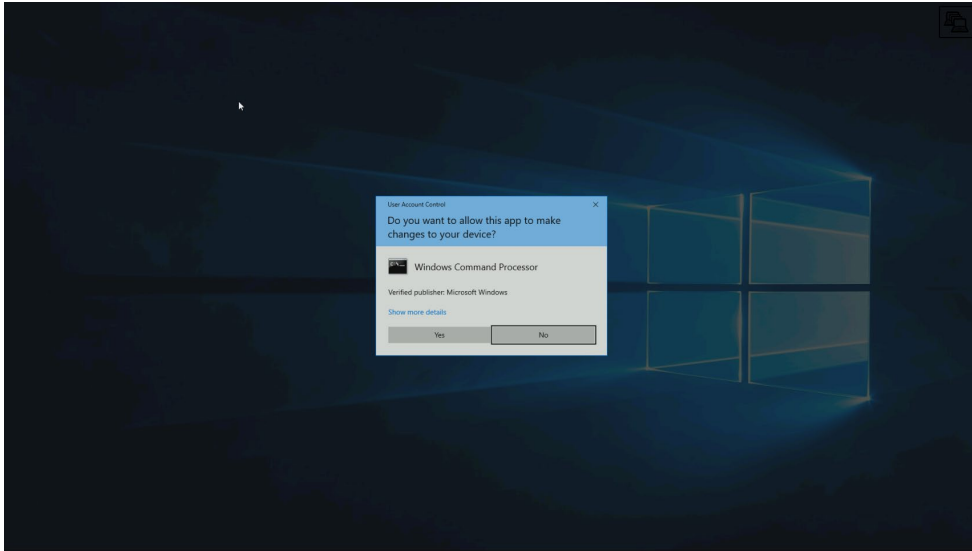


8. Choose privacy settings.

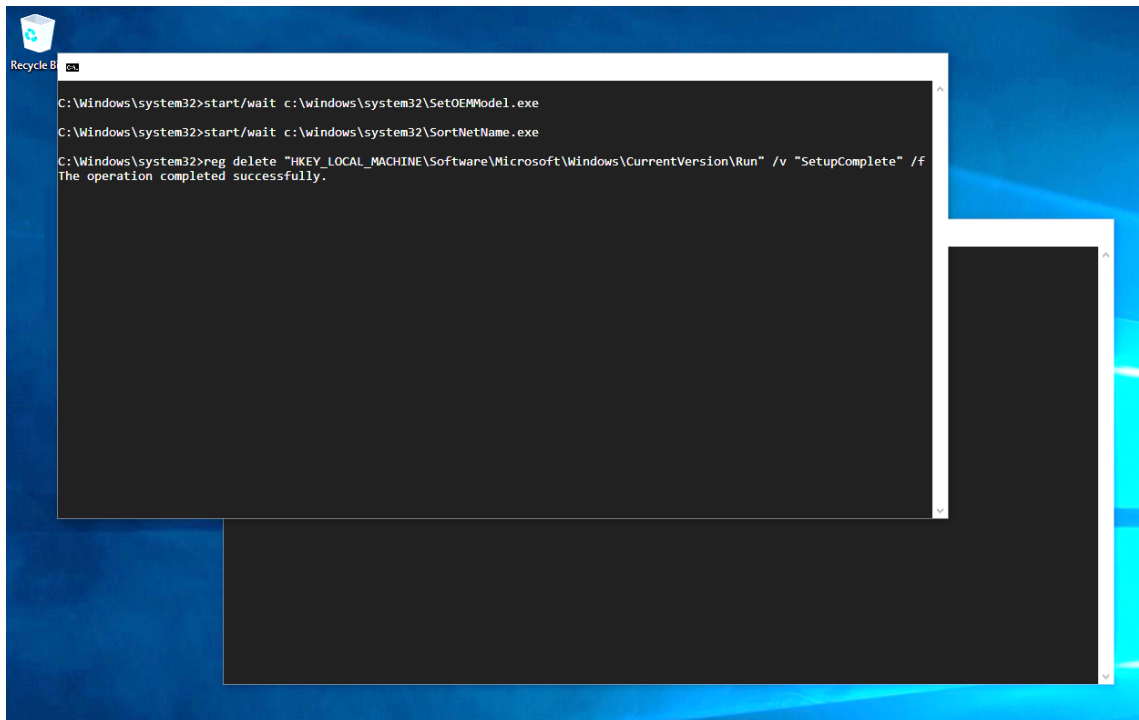


# Initializing the System

1. When users sign in into the system first time. Windows Command Processor will run and show the message **"Do you want to allow this app to make changes to your device?"** Please click **Yes**.



2. Wait until the process is complete.



When the process completes, the system is initialized.



## Configuring the Serial Interface

---

In this chapter, we describe how to use Moxa Serial Interface utility to set the UART mode in your DA-682C computer's serial interface.

The following topics are covered in this chapter:

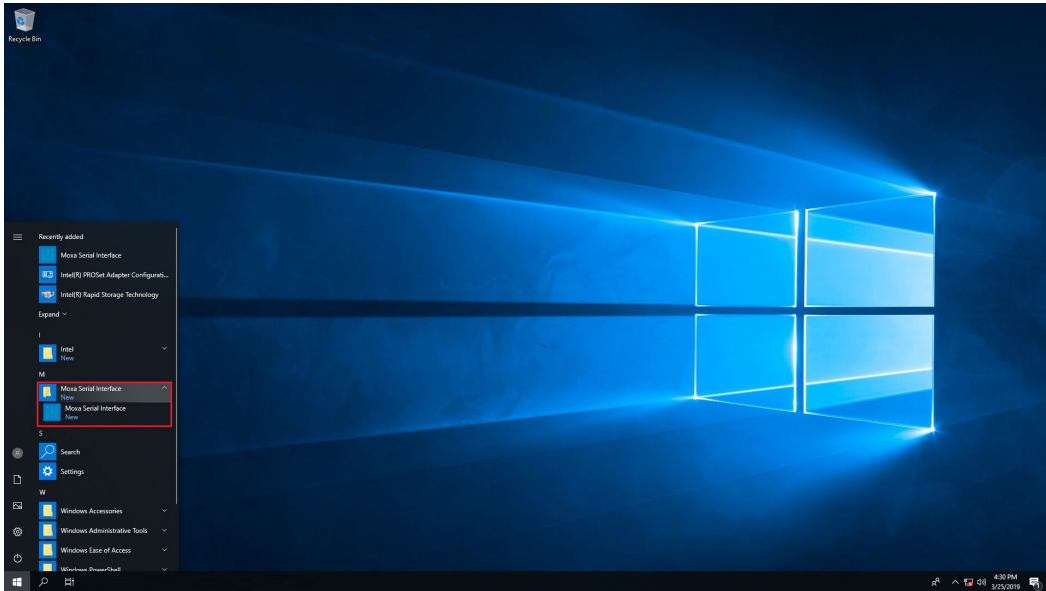
- **Overview**
- **Setting the UART Mode**

## Overview

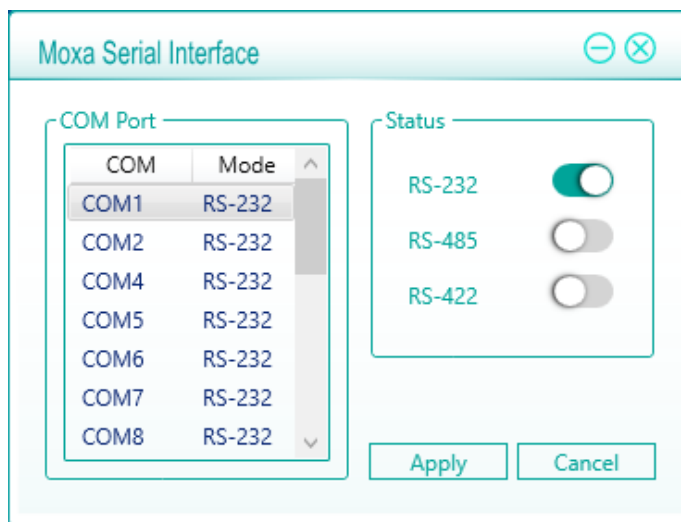
The DA-682C has two serial ports, labeled COM1 and COM2. Each serial port can be configured to use any of the following serial interface modes: **RS-232**, **RS-485**, or **RS-422**.

## Setting the UART Mode

1. Install the Moxa Serial Interface Utility.
2. From the Windows programs menu, run the Moxa Serial Interface utility.



3. Select the target COM port and UART mode, click **Apply** to save the settings.



# 3

## Teaming

---

This chapter describes the setup process for the Intel Teaming function.

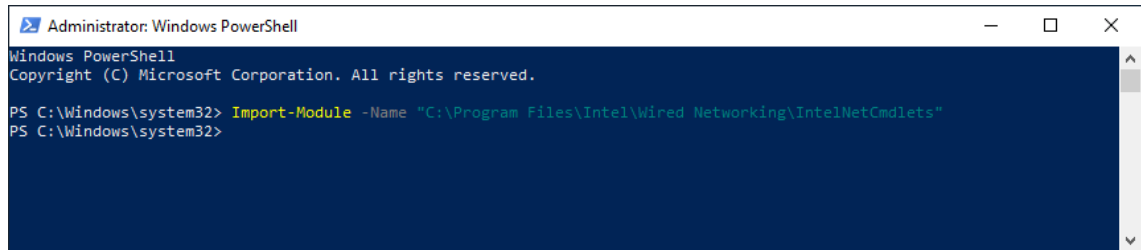
The following topics are covered in this chapter:

- ❑ **Creating an Intel Net Team**
- ❑ **Adding an Intel Net Team Member**
- ❑ **Removing an Intel Net Team Member**
- ❑ **Removing an Intel Net Team**

# Creating an Intel Net Team

1. Run the Windows PowerShell as administrator
2. Run the command:

```
Import-Module -Name "C:\Program Files\Intel\Wired Networking\IntelNetCmdlets"
```

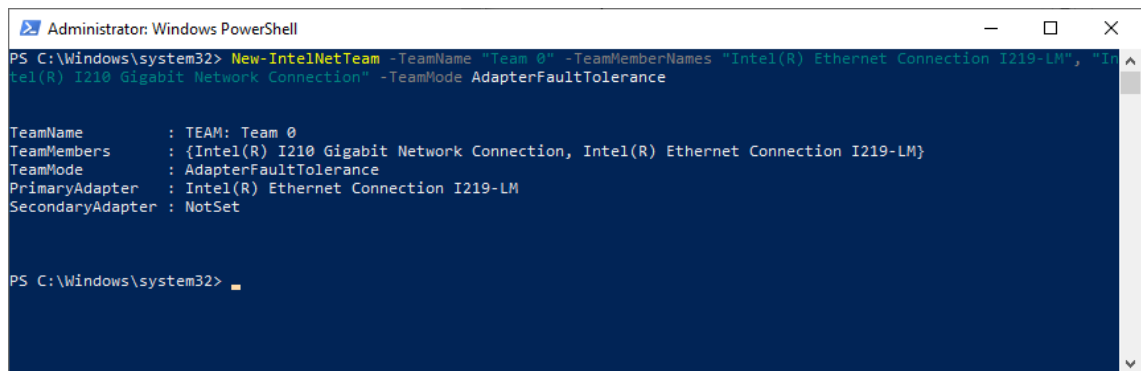


```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Windows\system32> Import-Module -Name "C:\Program Files\Intel\Wired Networking\IntelNetCmdlets"
PS C:\Windows\system32>
```

3. Run the **New-IntelNetTeam** command.

This command creates a new Intel ANS team consisting of one or more adapters. A team may consist of both Intel and non-Intel adapters. Adapter objects obtained using the **Get-IntelNetAdapter** command may be passed into this cmdlet using the **TeamMembers** parameter.

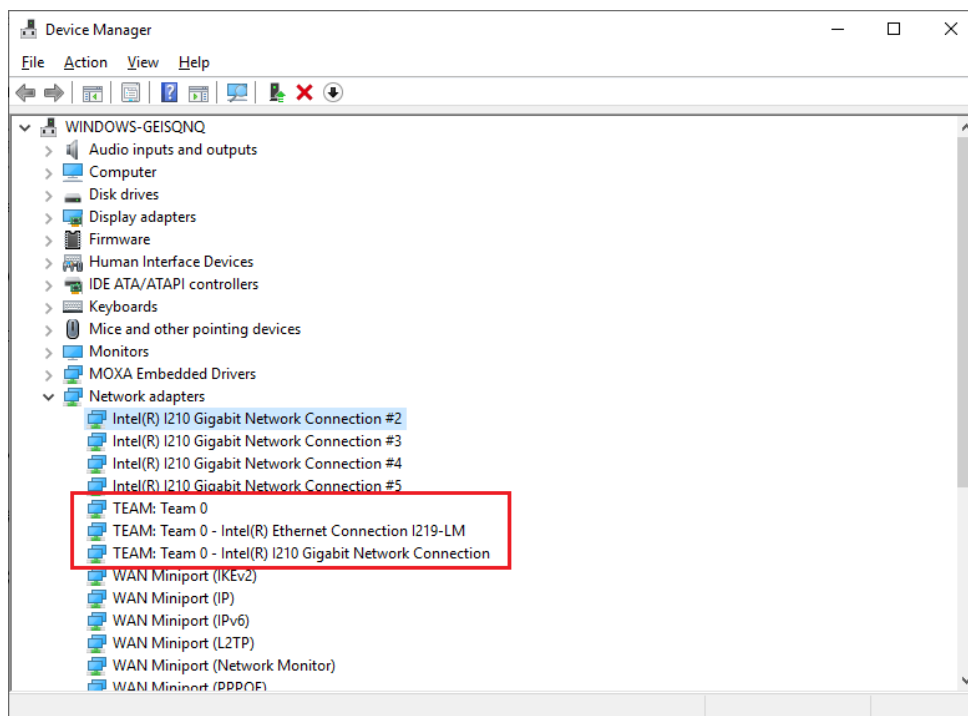


```
Administrator: Windows PowerShell
PS C:\Windows\system32> New-IntelNetTeam -TeamName "Team 0" -TeamMemberNames "Intel(R) Ethernet Connection I219-LM", "Intel(R) I210 Gigabit Network Connection" -TeamMode AdapterFaultTolerance

TeamName       : TEAM: Team 0
TeamMembers    : {Intel(R) I210 Gigabit Network Connection, Intel(R) Ethernet Connection I219-LM}
TeamMode       : AdapterFaultTolerance
PrimaryAdapter : Intel(R) Ethernet Connection I219-LM
SecondaryAdapter : NotSet

PS C:\Windows\system32>
```

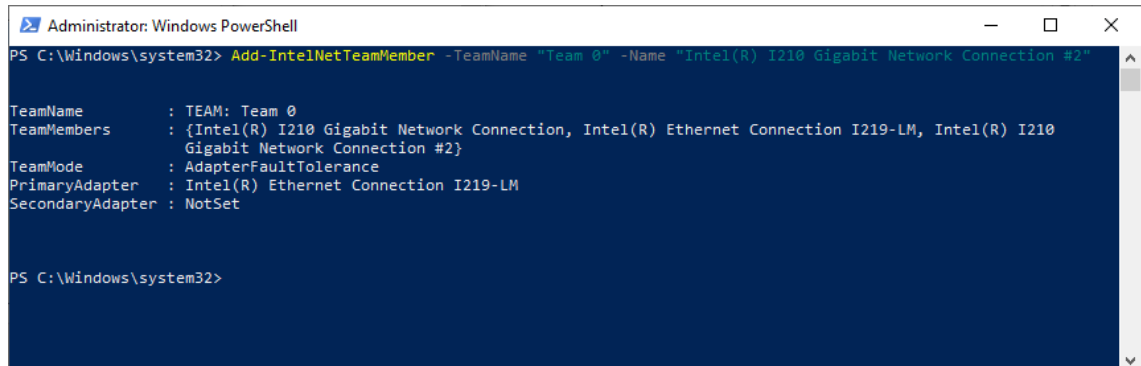
4. Check the Network adapters in the Windows Device Manager.



# Adding an Intel Net Team Member

1. Run the `Add-IntelNetTeamMember` command.

This command adds a new team member to an existing Intel® Advanced Network Services (Intel® ANS) Team. The new team member can be piped into the cmdlet or passed in using the adapter's name. An Intel ANS team can contain a maximum of eight members.

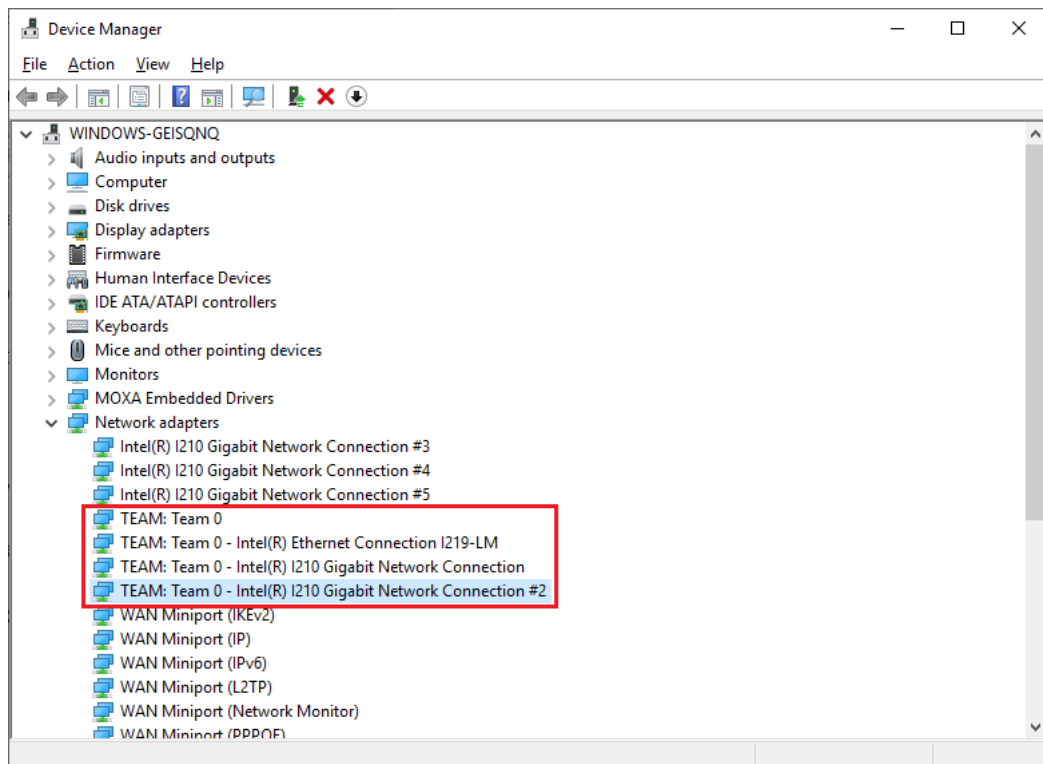


```
Administrator: Windows PowerShell
PS C:\Windows\system32> Add-IntelNetTeamMember -TeamName "Team 0" -Name "Intel(R) I210 Gigabit Network Connection #2"

TeamName      : TEAM: Team 0
TeamMembers   : {Intel(R) I210 Gigabit Network Connection, Intel(R) Ethernet Connection I219-LM, Intel(R) I210
                Gigabit Network Connection #2}
TeamMode      : AdapterFaultTolerance
PrimaryAdapter : Intel(R) Ethernet Connection I219-LM
SecondaryAdapter : NotSet

PS C:\Windows\system32>
```

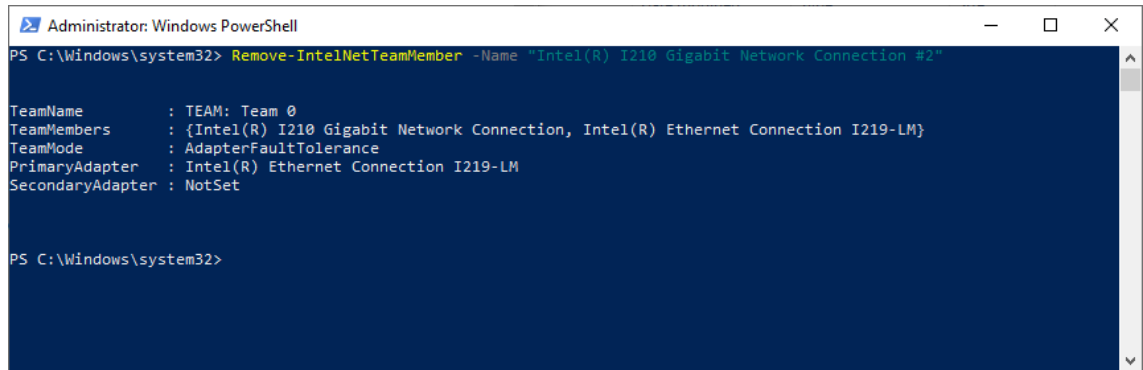
2. Check the Network adapters in the Windows Device Manager.



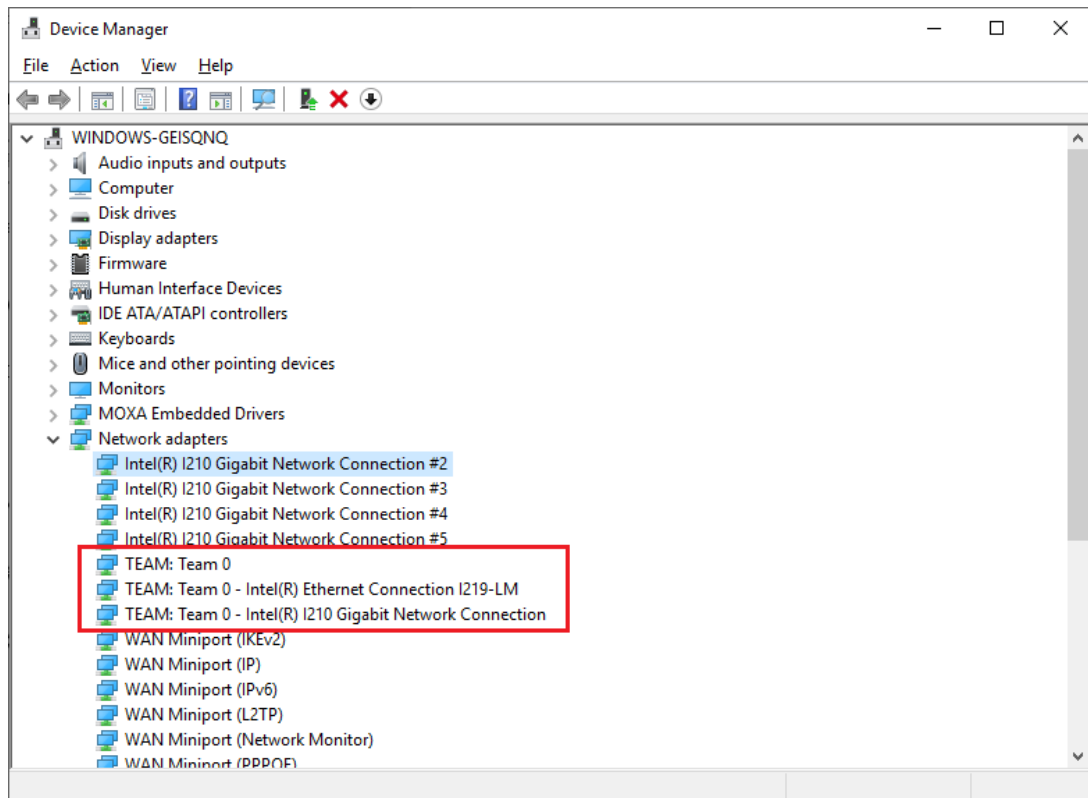
# Removing an Intel Net Team Member

1. Run the `Remove-IntelNetTeamMember` command.

Allows users to remove a team member from an Intel ANS team. The team member can be piped into the cmdlet or passed in using the team member's name.

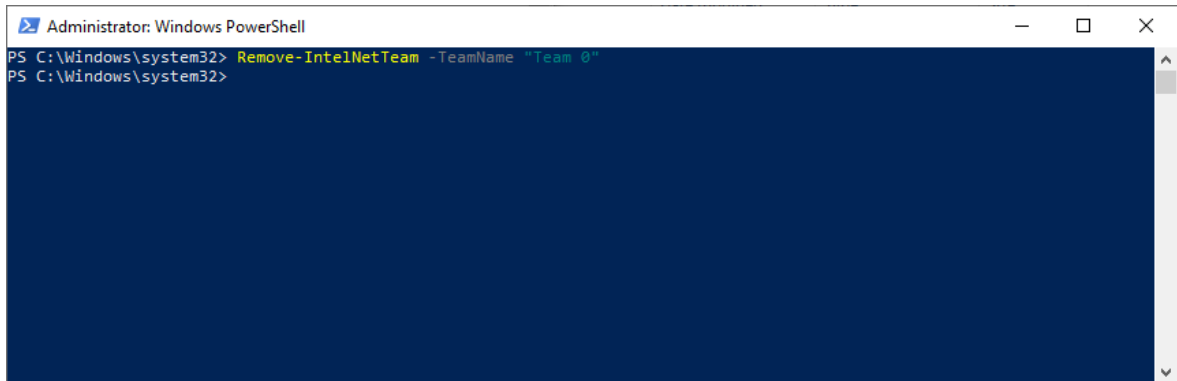


2. Check the Network Adapters in Device Manager.



## Removing an Intel Net Team

Run the `Remove-IntelNetTeam` command.  
Removes the specified Intel ANS team.



```
Administrator: Windows PowerShell
PS C:\Windows\system32> Remove-IntelNetTeam -TeamName "Team 0"
PS C:\Windows\system32>
```

This chapter describes the BitLocker setup process. This function requires the TPM module to be installed and may require customization of the module.

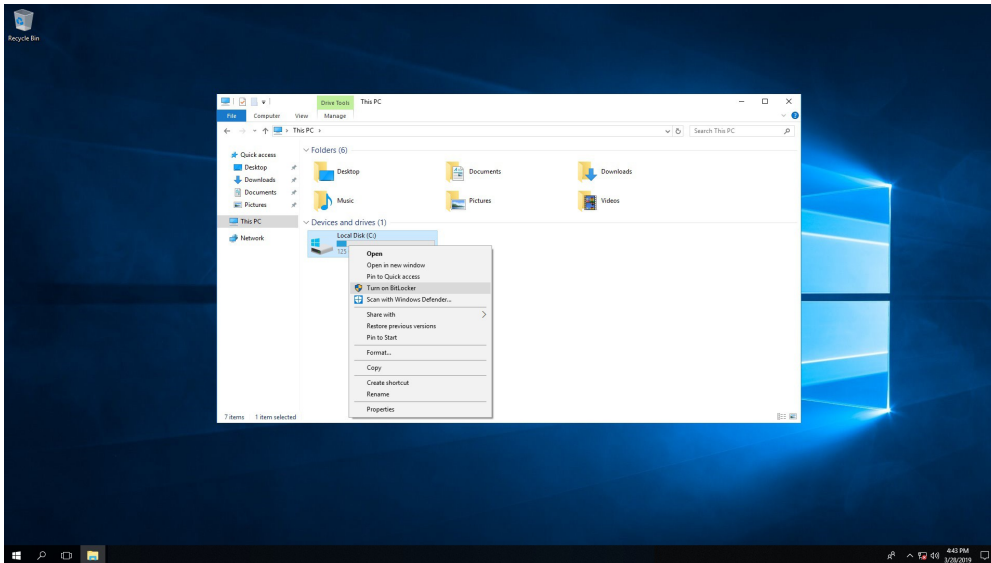
The following topics are covered in this chapter:

- ❑ **Enabling the BitLocker**
- ❑ **Disabling the BitLocker**

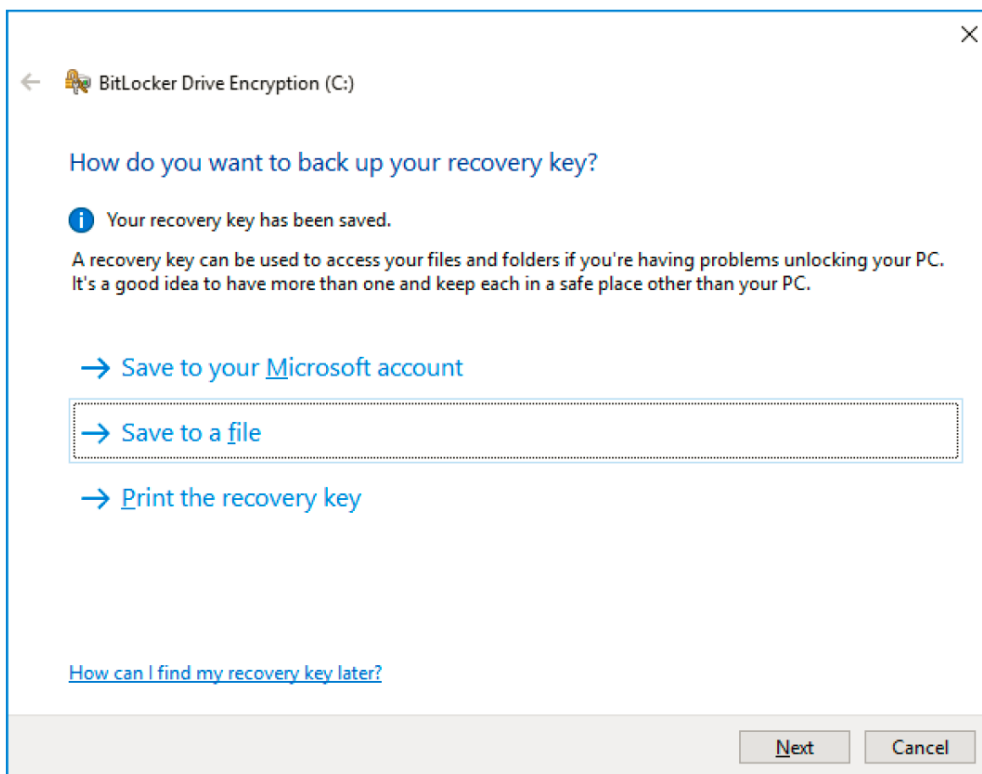


# Enabling the BitLocker

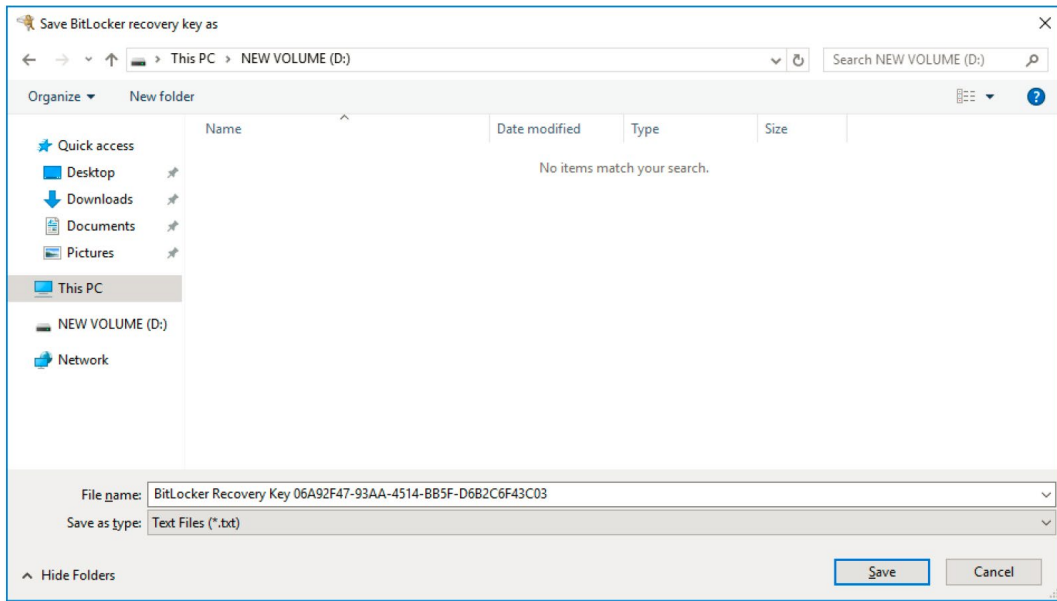
1. Right-click the drive and select the **Turn on BitLocker** option.



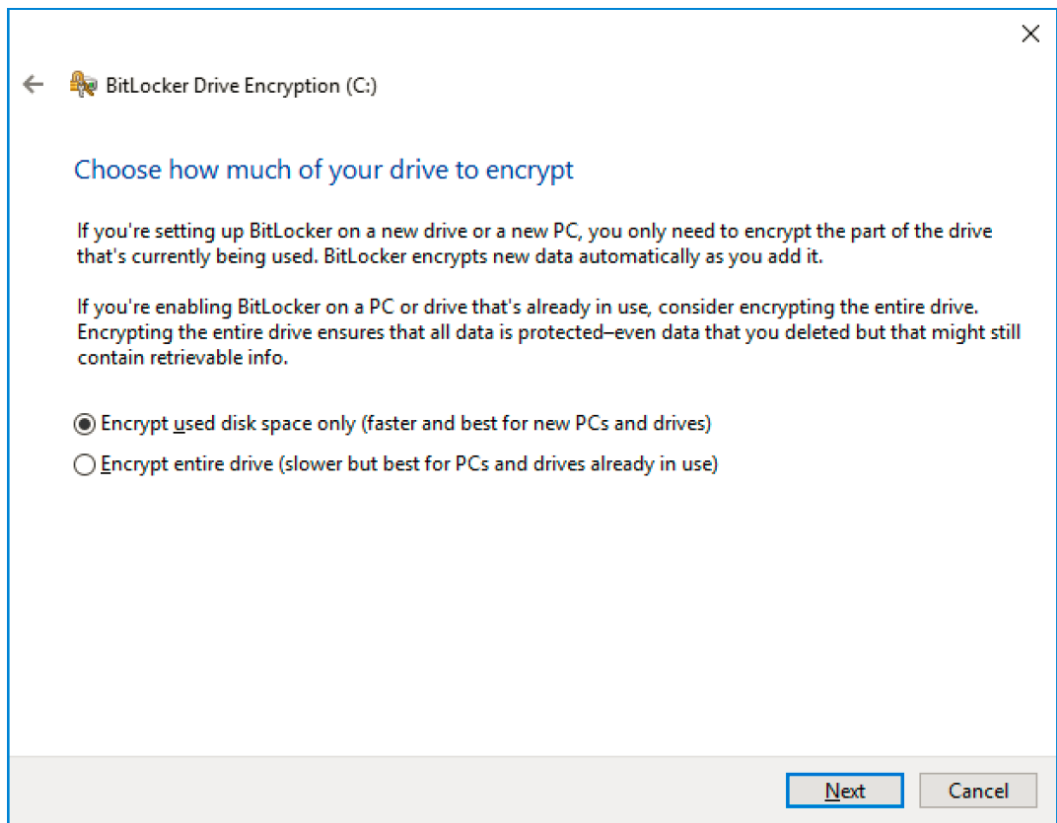
2. Select an option to back up the recovery key.  
For example, Select **Save to a file**.

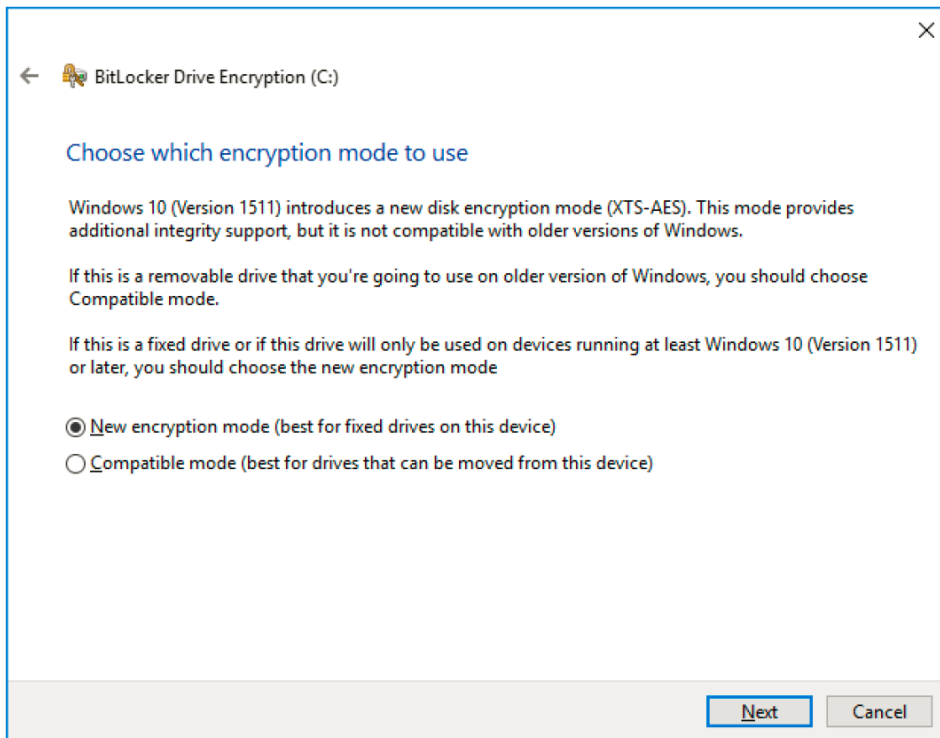


3. Select the path to store the file in.

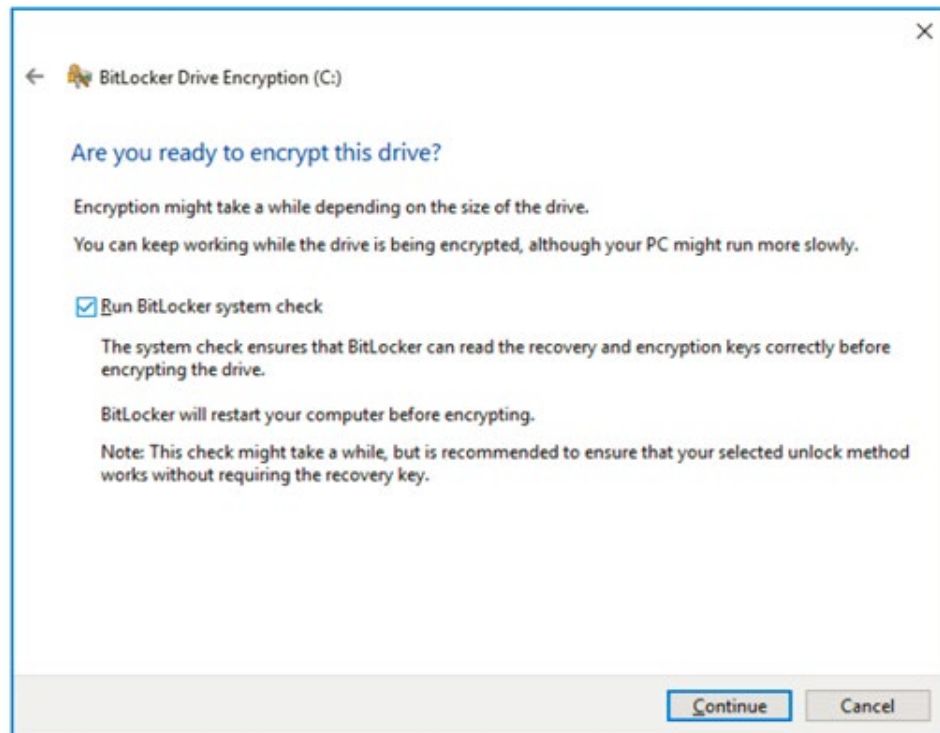


4. Follow the onscreen instructions to specify the drive encryption options.





5. Click **Continue**.



6. Restart the computer.

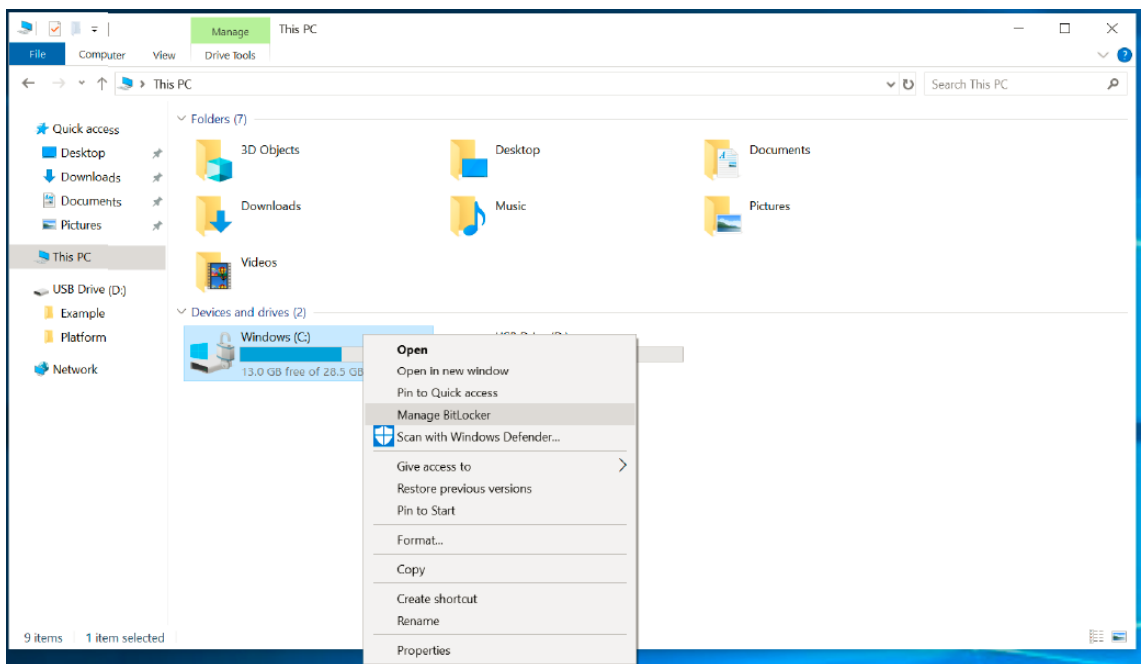


7. Wait for the encryption process to complete and click **Close**.



## Disabling the BitLocker

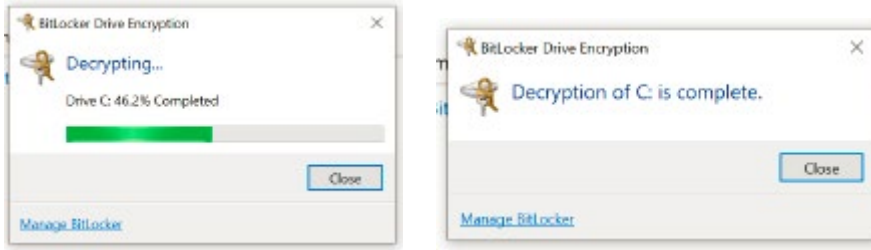
1. Right-click on the drive and select the **Turn off BitLocker** option



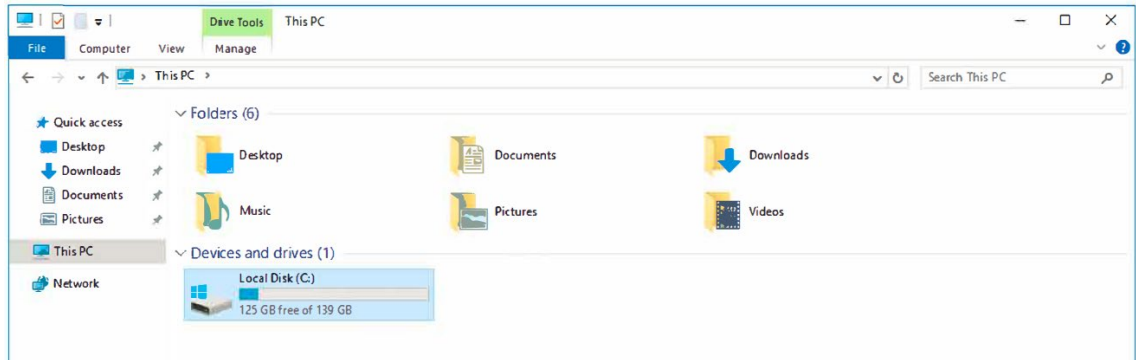
2. Click on the Turn off BitLocker button.



3. Wait for the decryption process to complete and click **Close** to exit the program.



4. Check the status of the disk after the decryption process is completed.



# 5

## Configuring RAID

---

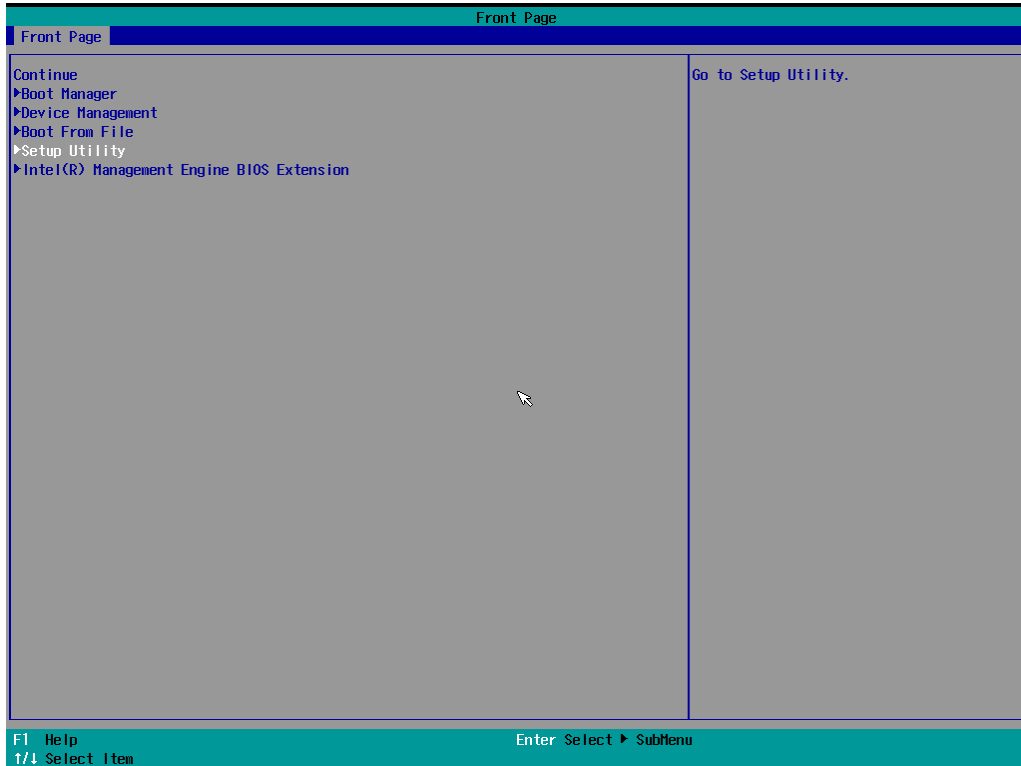
This chapter describes the setup process for RAID.

The following topics are covered in this chapter:

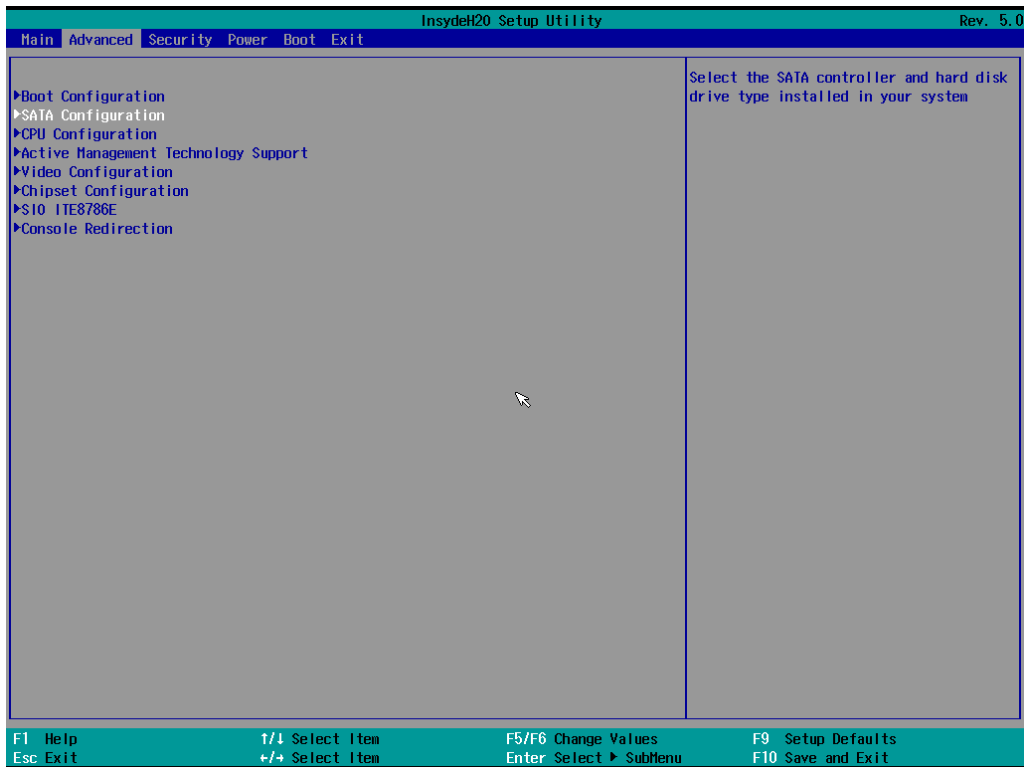
- ❑ **Changing the RAID Mode**
- ❑ **Creating a RAID Disk From the BIOS**
- ❑ **Replacing the Disk**
- ❑ **Removing a RAID Volume From the BIOS**

# Changing the RAID Mode

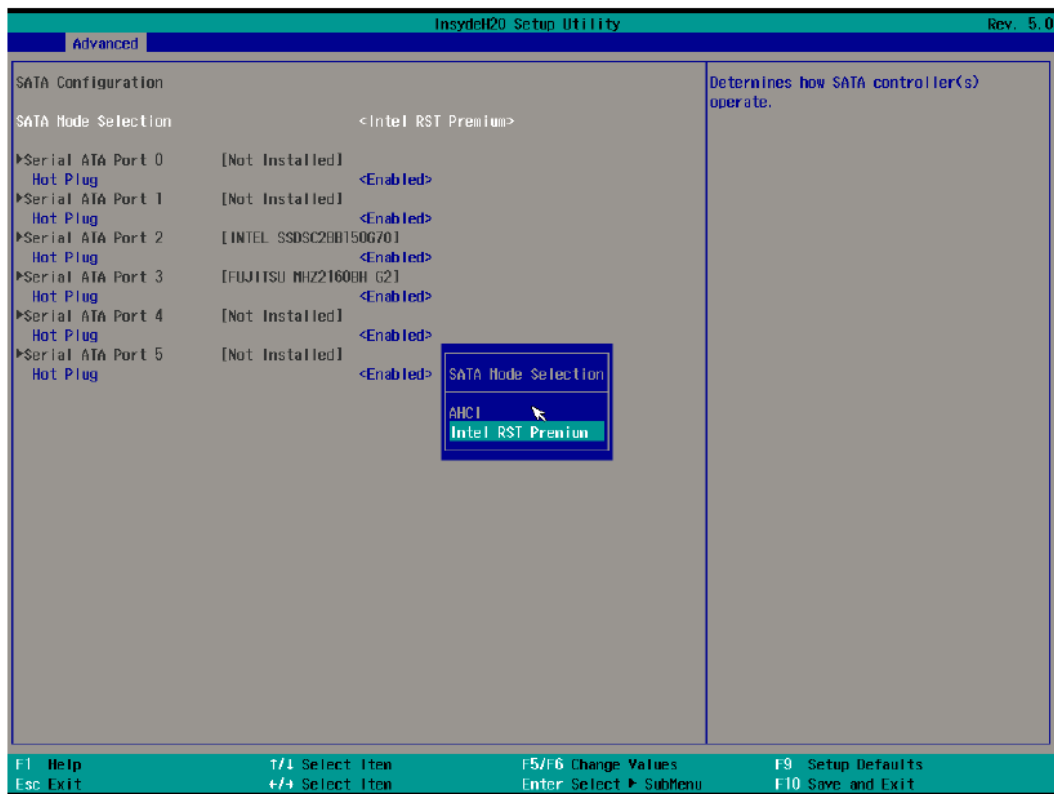
1. Power on the computer and press F2 to enter the BIOS menu.
2. Select the **Setup Utility** option.



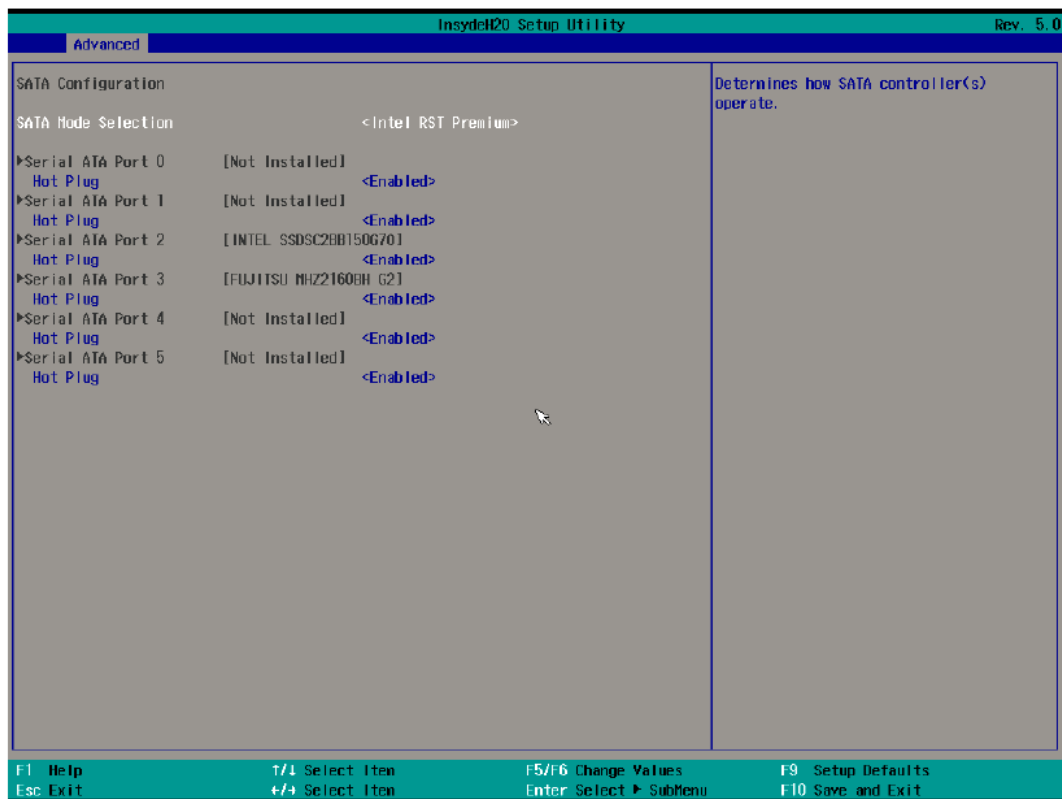
3. Select the **SATA Configuration** option.



- Select the **SATA Mode Selection** followed by the **Intel RST Premium** option and then enable **Hot Plug** function on each port.



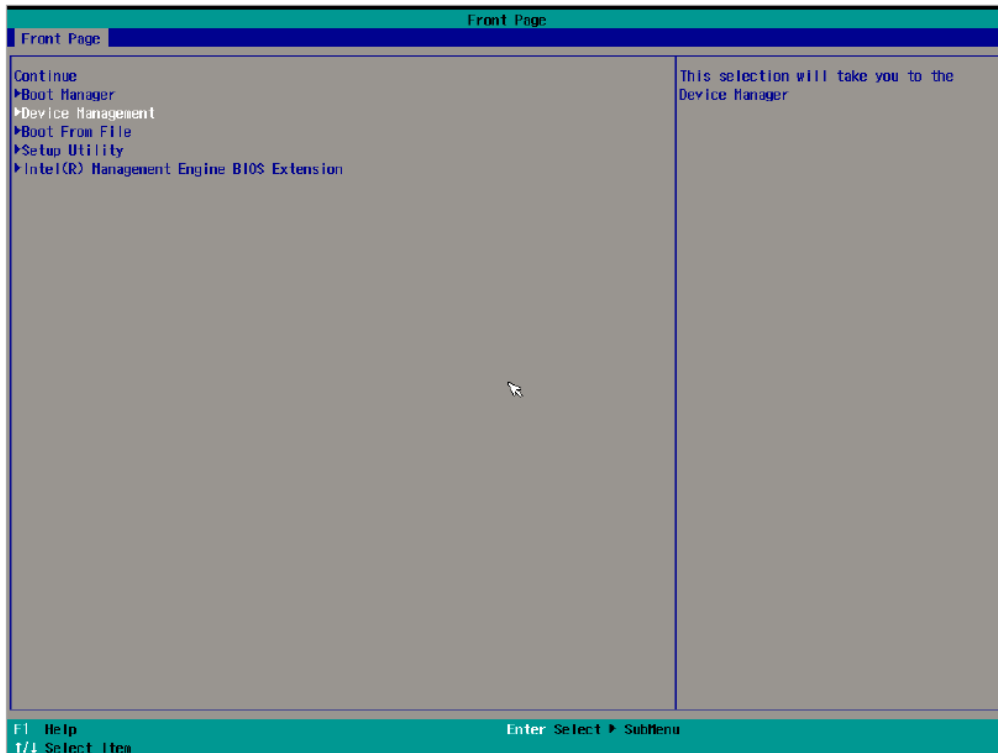
- Press F10 to save the settings and trigger a system reboot.





# Creating a RAID Disk From the BIOS

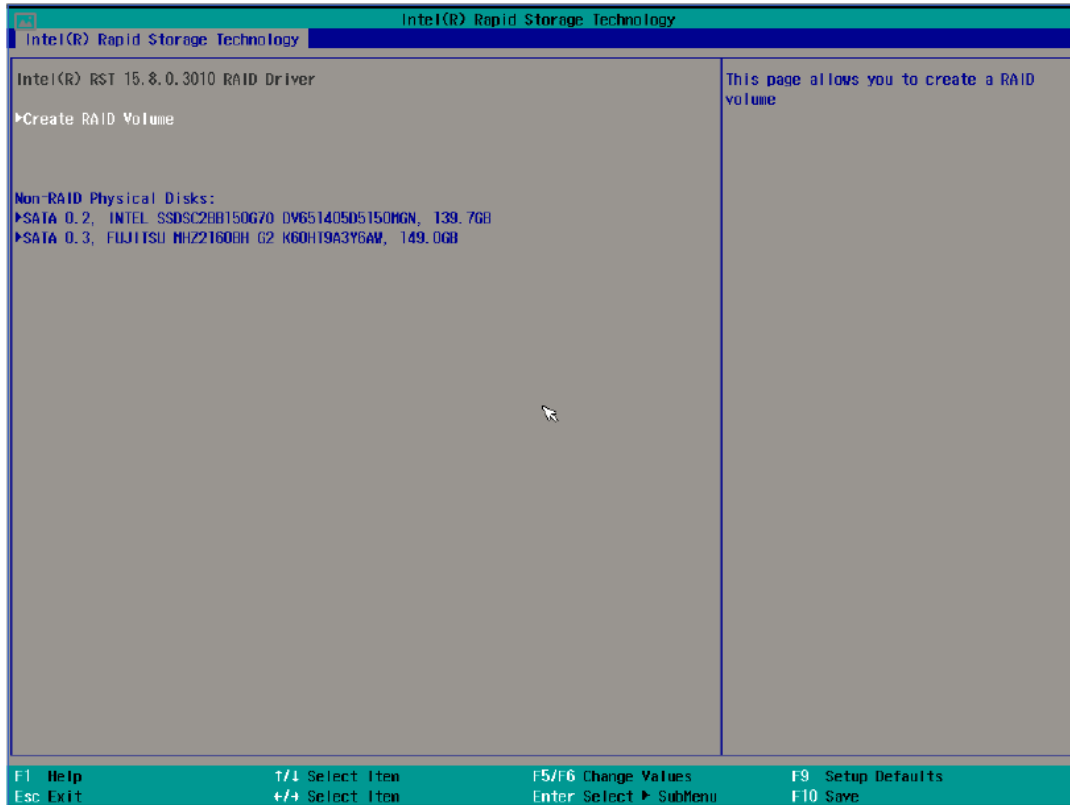
1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select the **Device Management** option.



3. Select the **Intel(R) Rapid Storage Technology** option.

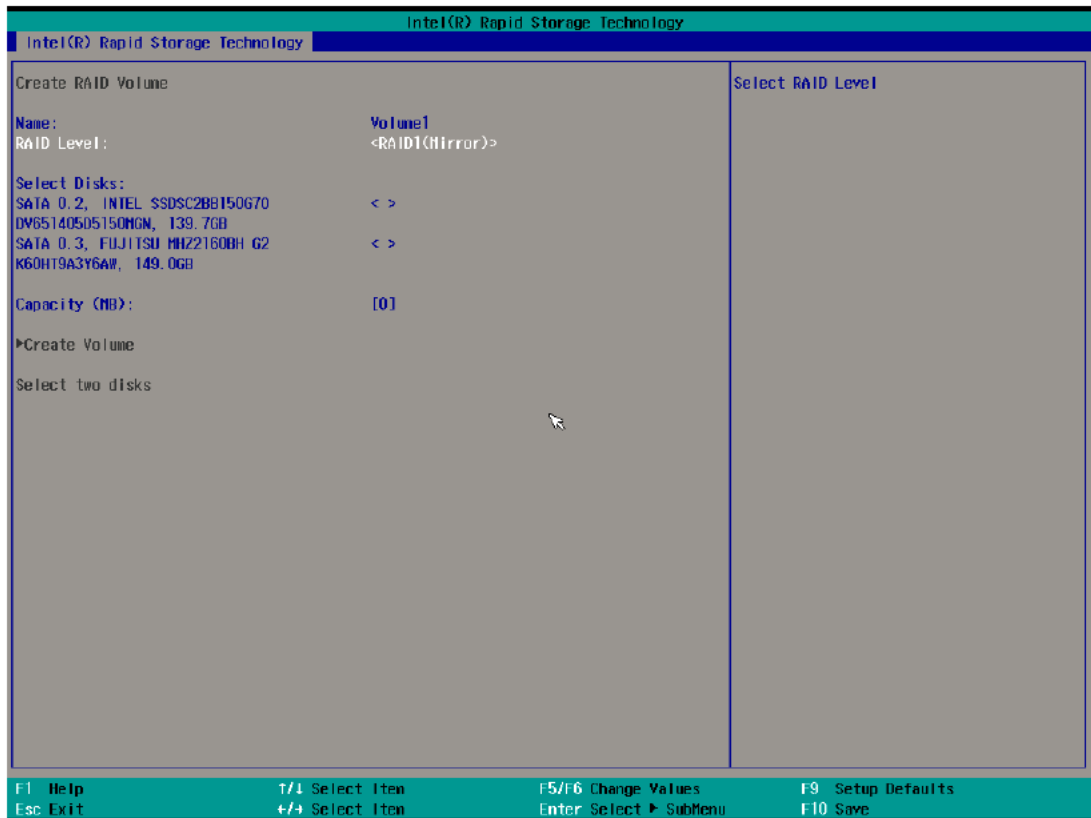


- Select the **Create RAID Volume** option.

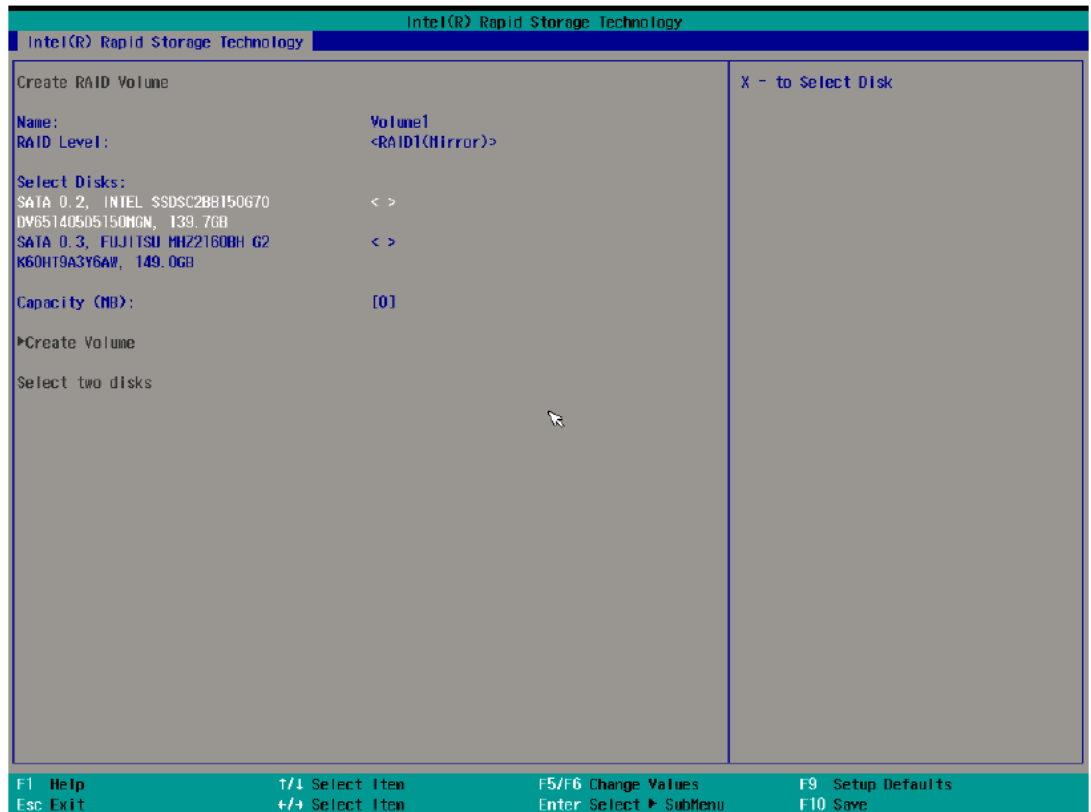


- Select the **RAID Level** option and then press **Enter** to select the raid level. For example, RAID1(Mirror).

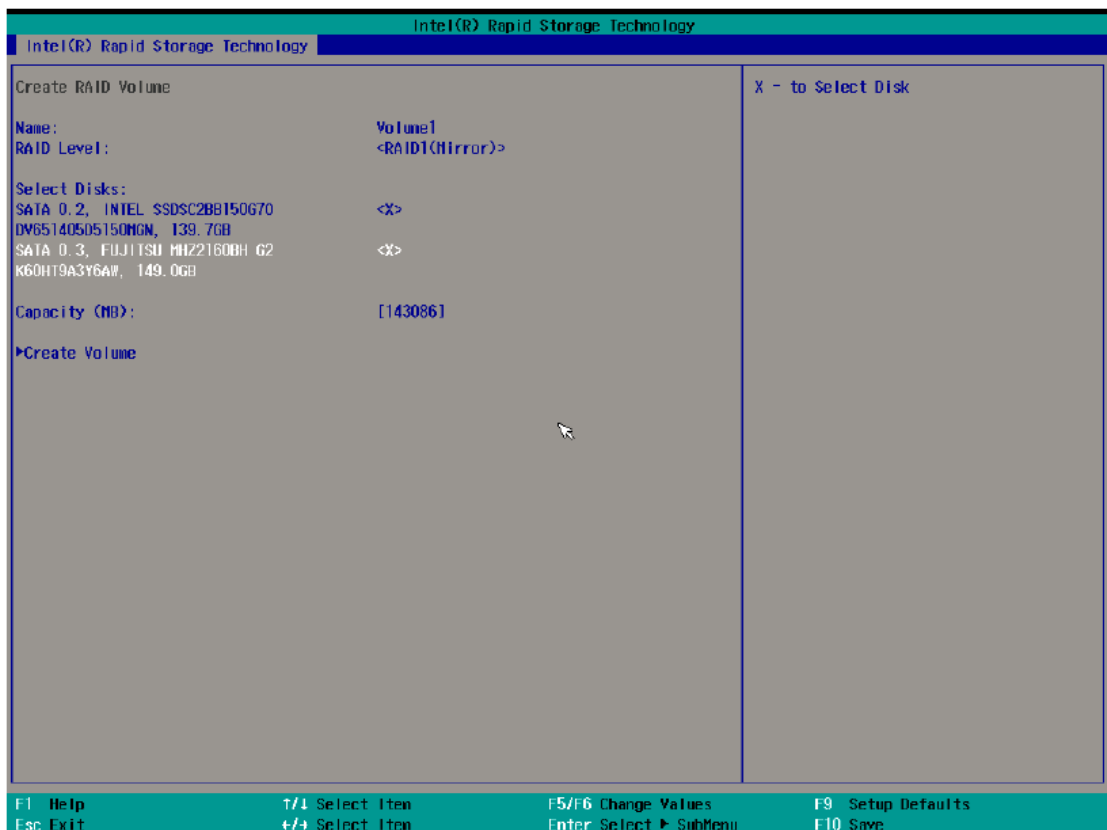
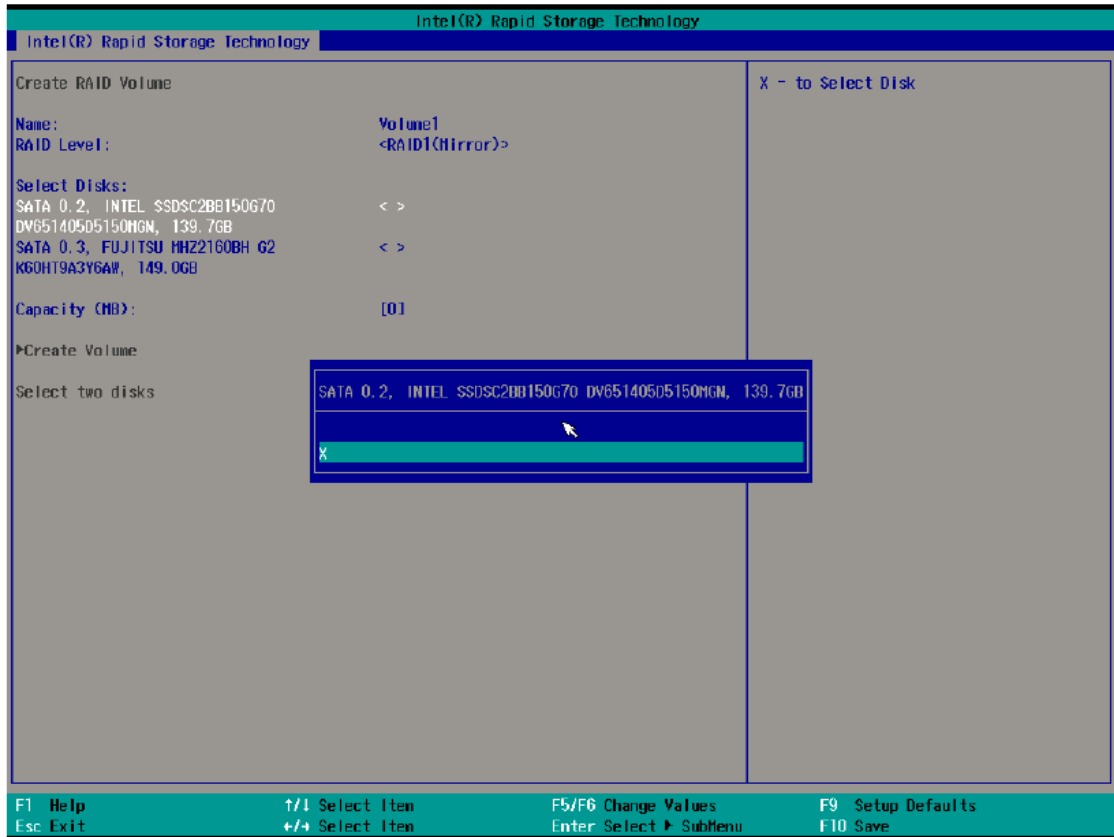




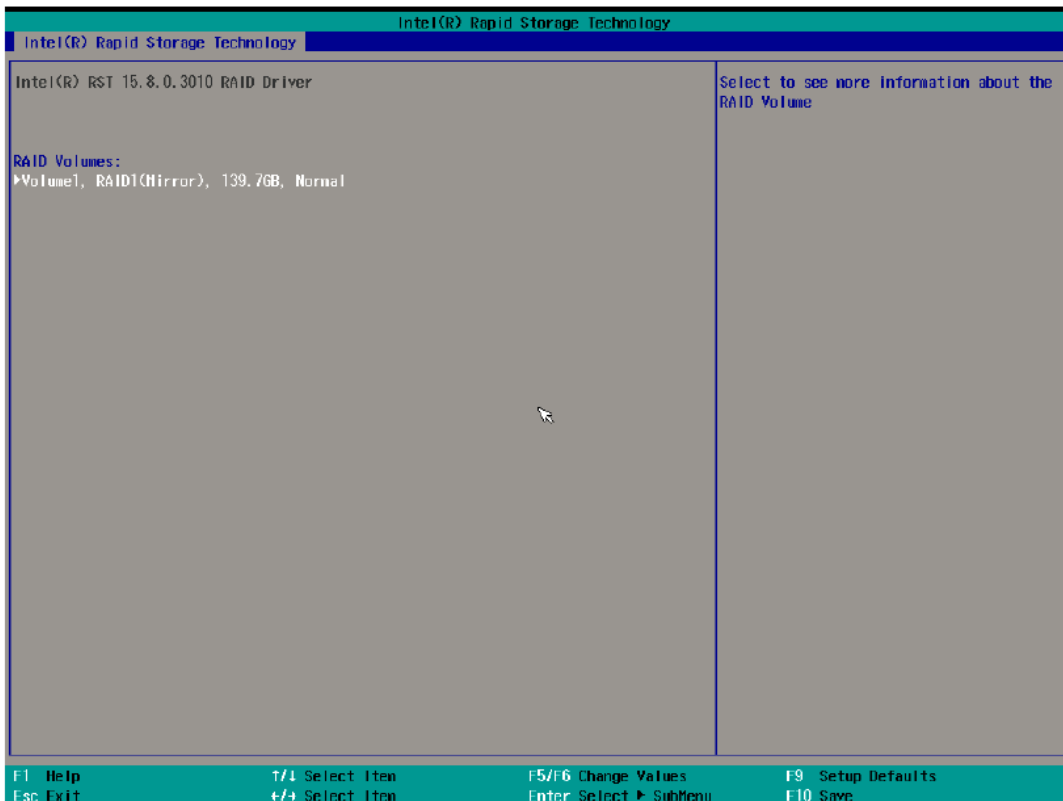
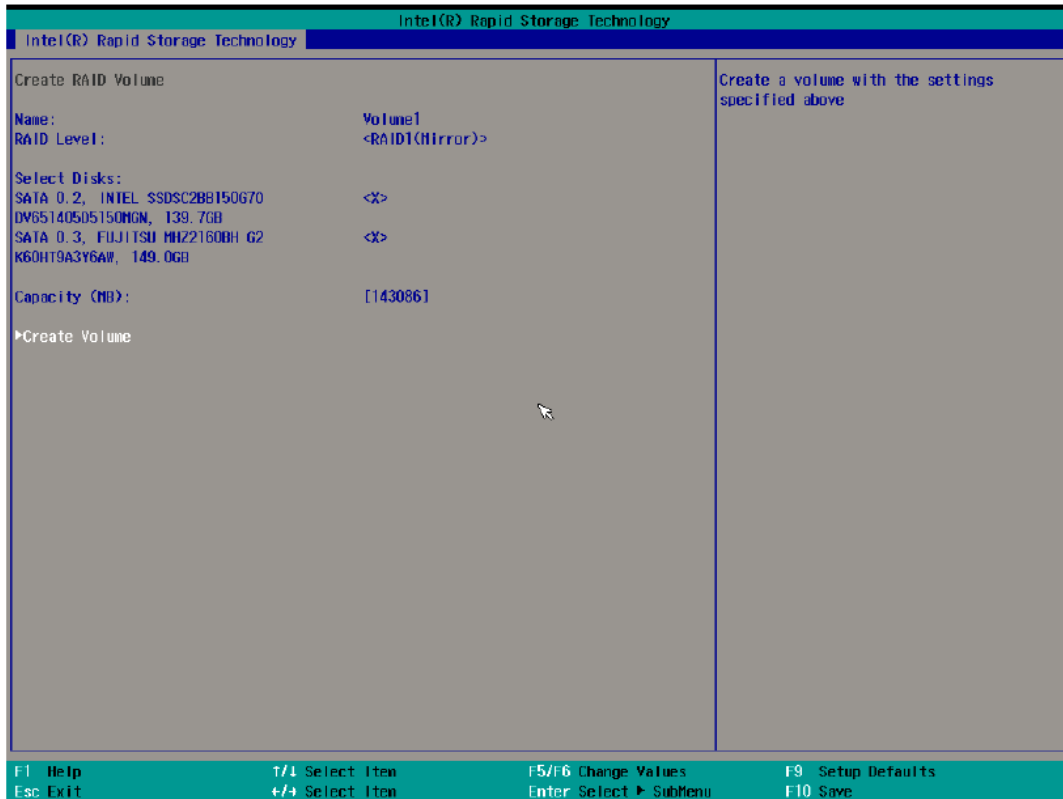
6. Select the disk and then press **Enter**.



7. Select **X** and then press **Enter** to select the disks.



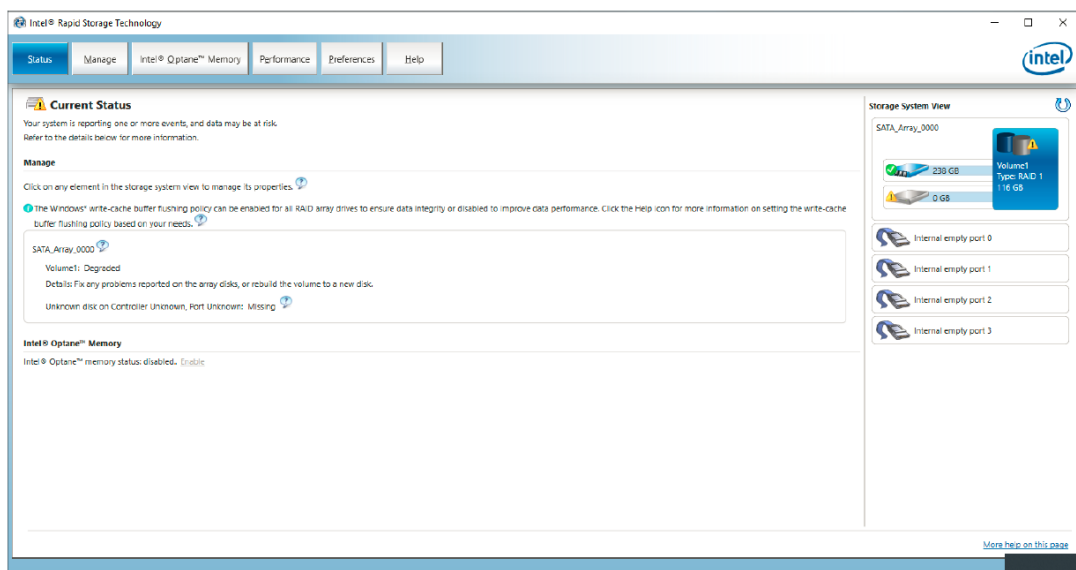
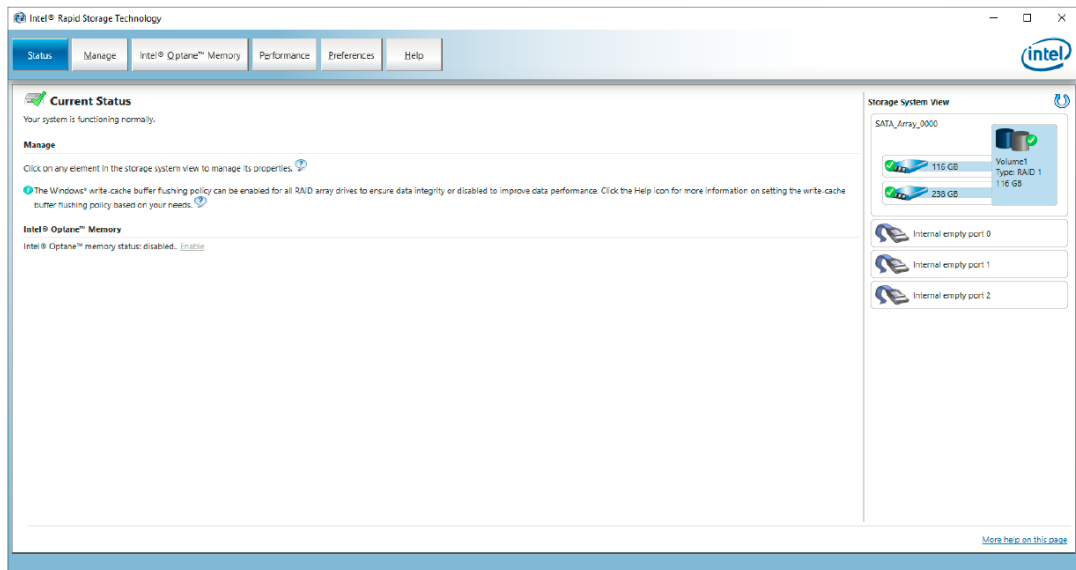
- Select the **Create Volume** option.



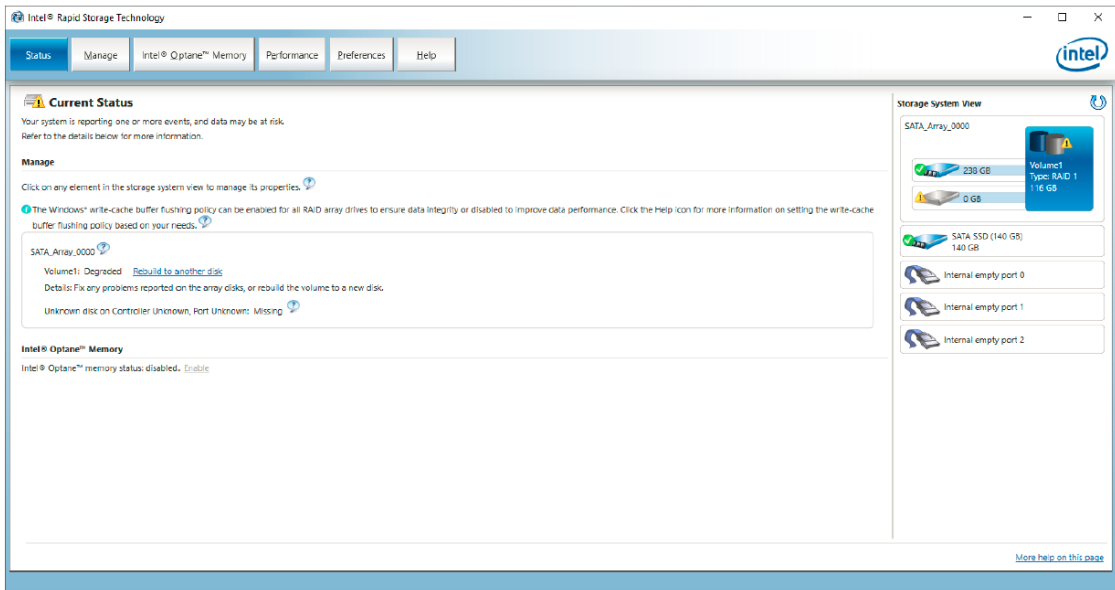
- Press **F10** to save the settings.

# Replacing the Disk

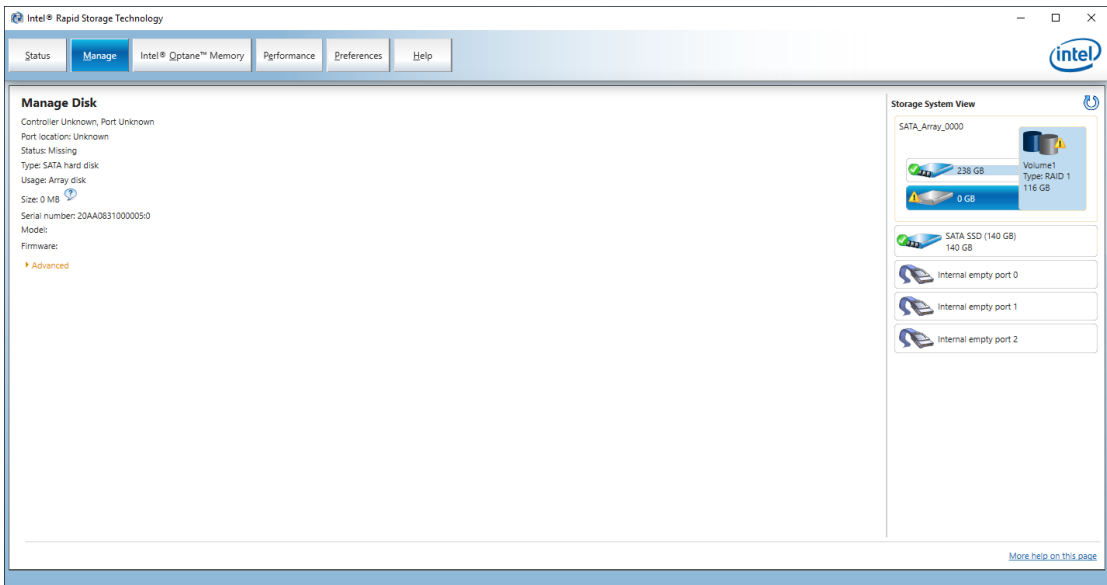
1. Unplug the current SSD.



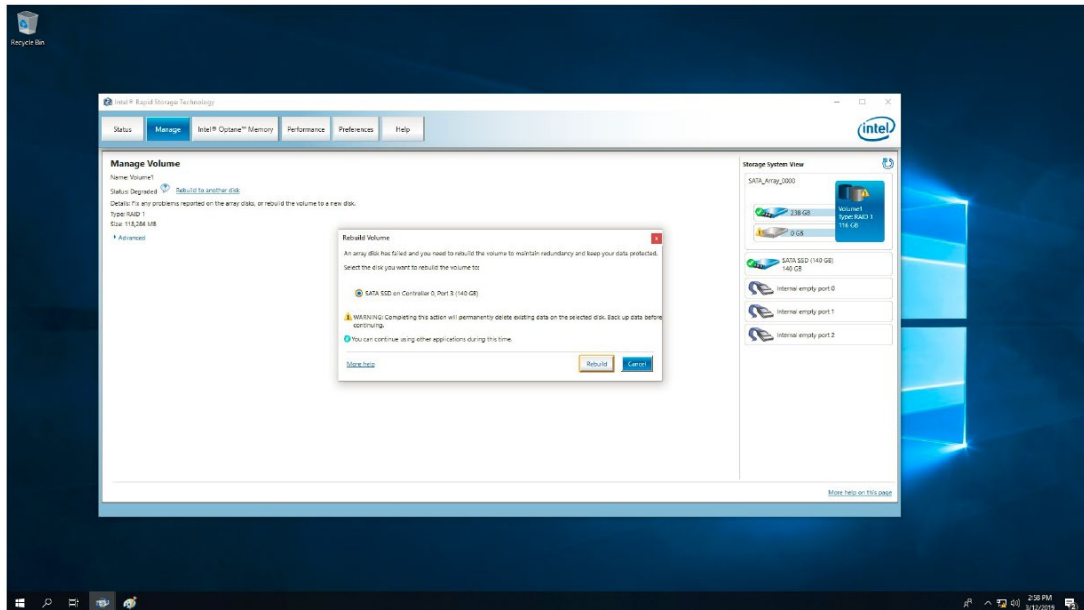
2. Install the new SSD.



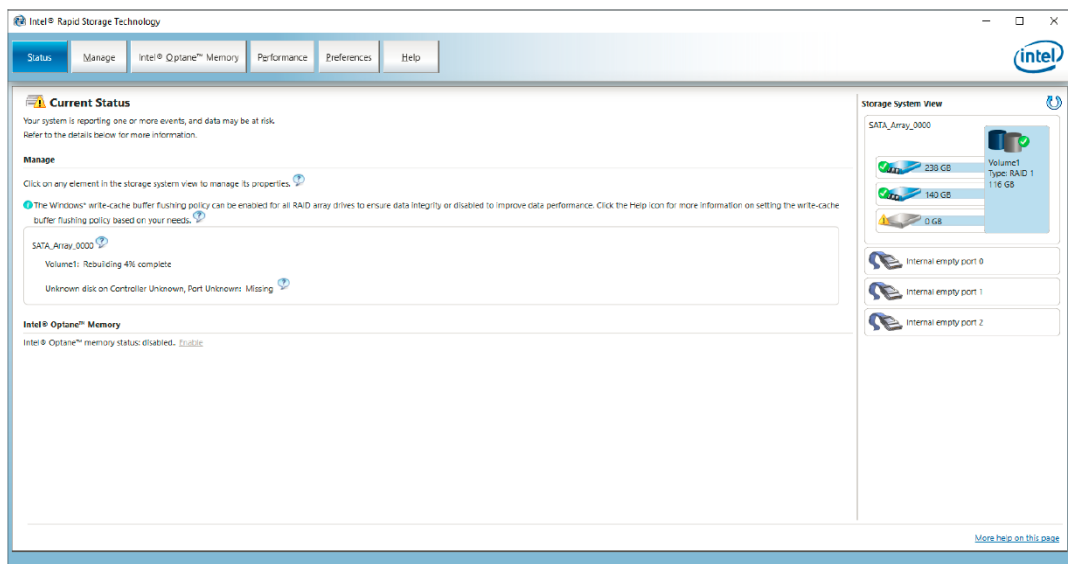
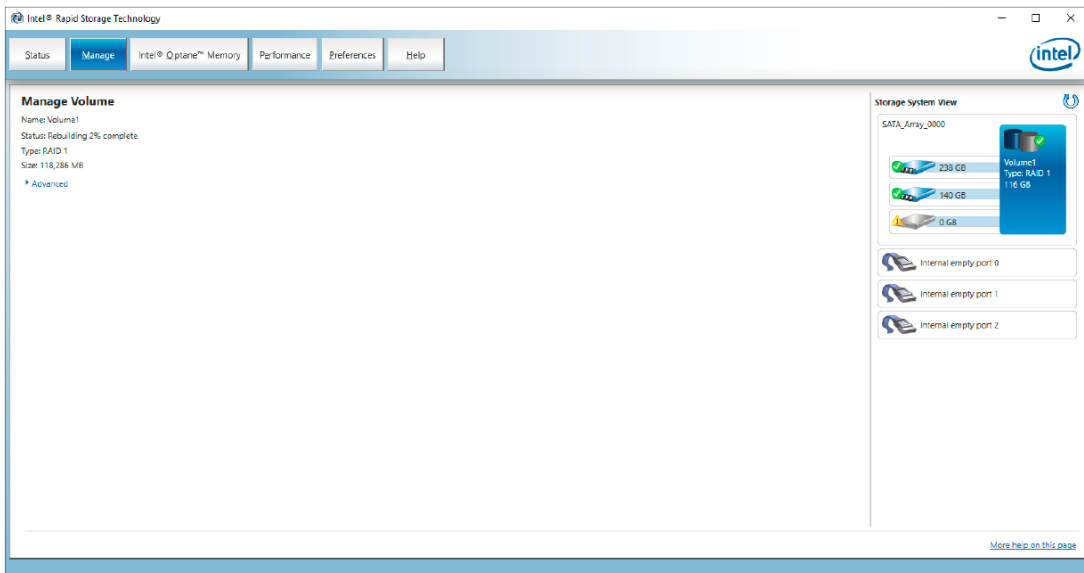
3. Click on the **Manage** tab.



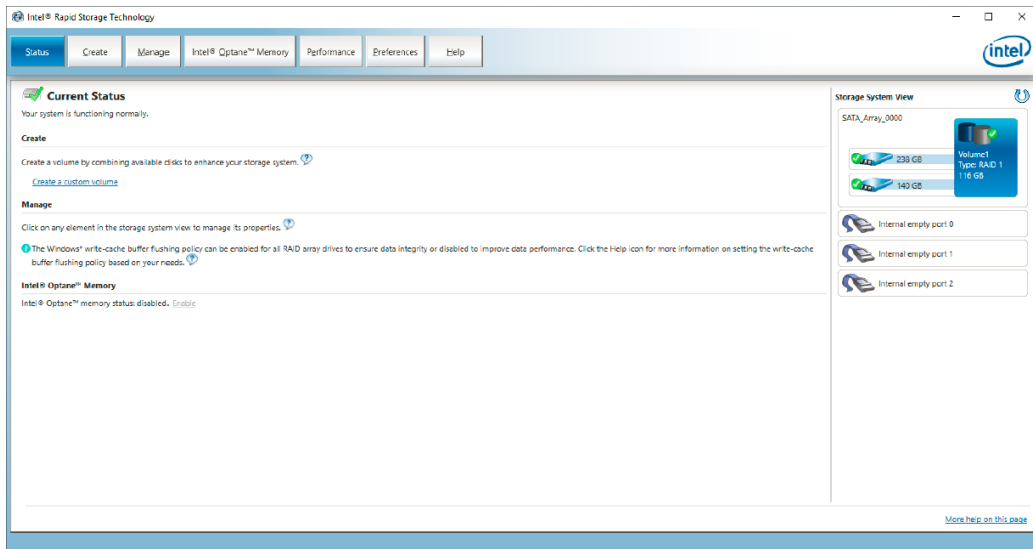
- Select the new SSD and then click **Rebuild**.



- Wait for the rebuild process to complete.

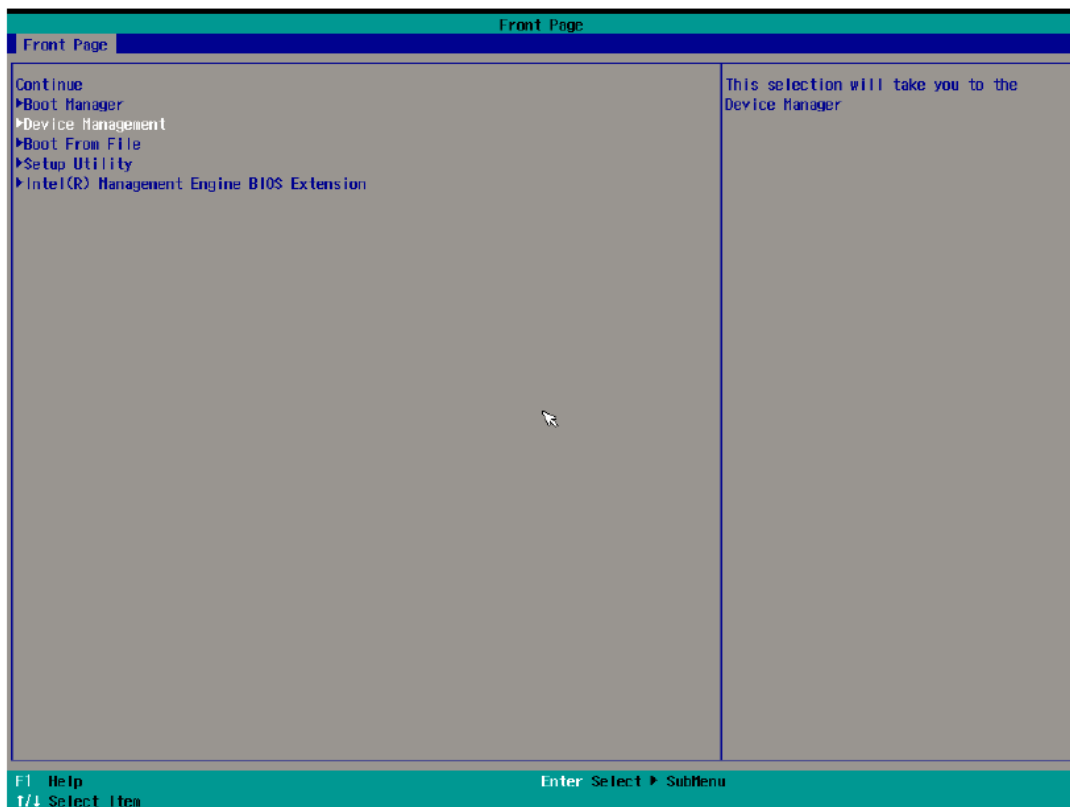






## Removing a RAID Volume From the BIOS

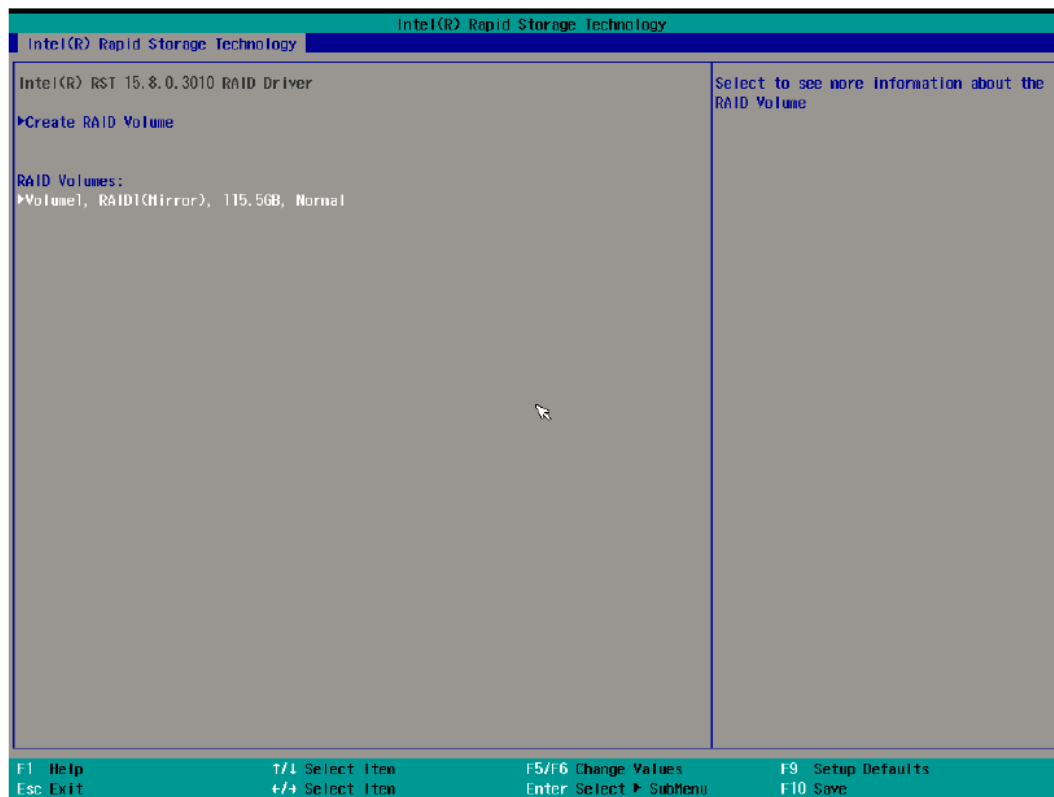
1. Power on the computer and press **F2** to enter BIOS menu.
2. Select the **Device Management** option



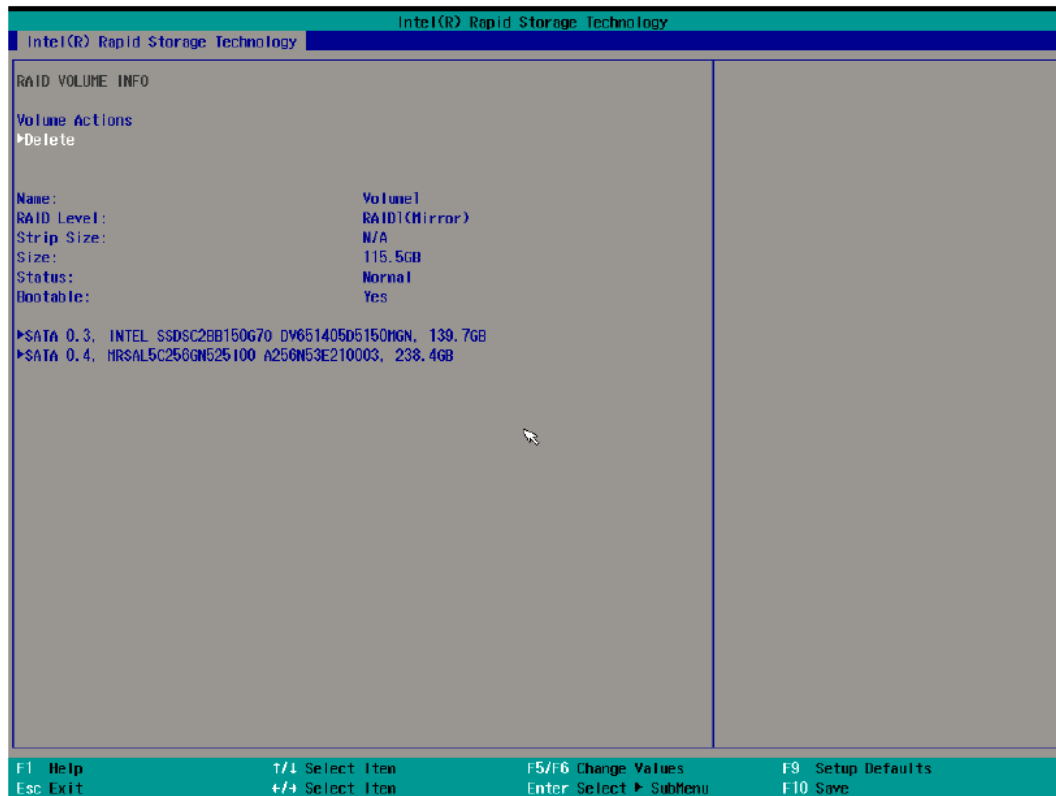
3. Select the **Intel(R) Rapid Storage Technology** option.



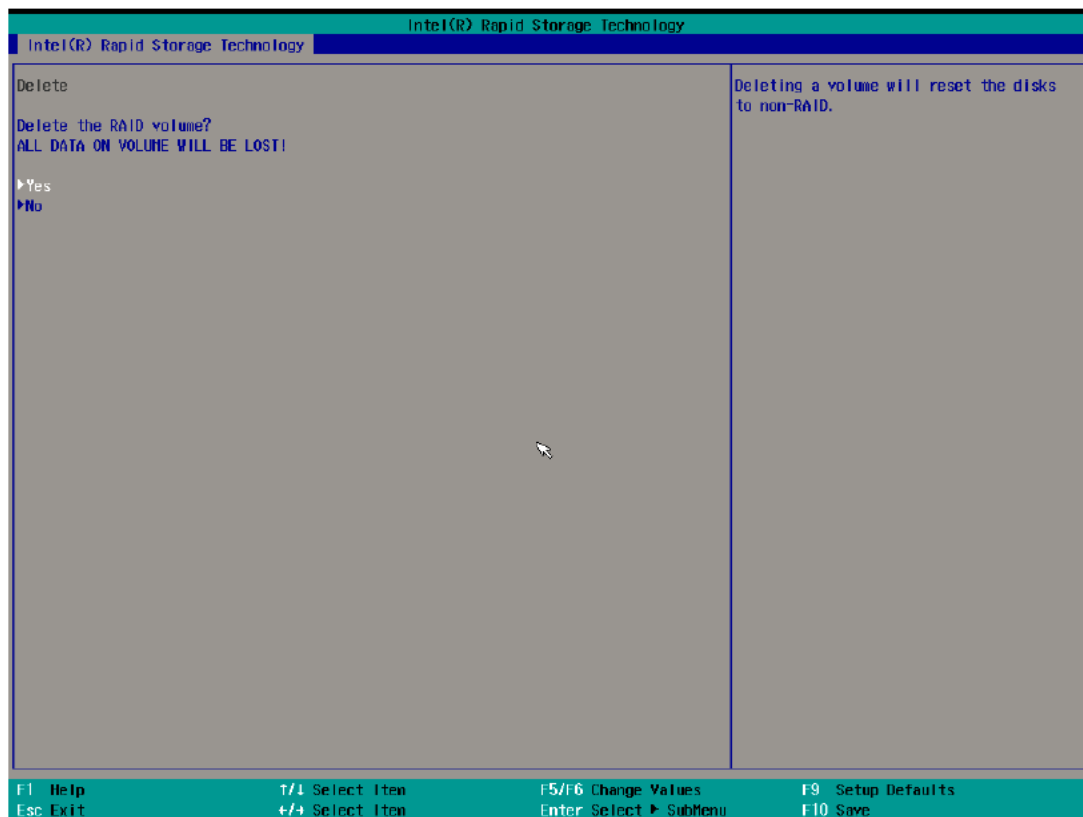
4. Select the RAID volume to be removed.



5. Select **Delete** and then press **Enter**.



6. Select **Yes** and then press **Enter**.



7. Press **F10** to save the settings.

## Unified Write Filters

---

You can install unified write filters (UWF) for running PCs and devices, and to manage them remotely using Windows Management Instrumentation (WMI). To use UWF, you'll need to install the feature and enable (and optionally configure) it. The first time you enable UWF on your device, UWF makes the following changes to your system to improve the performance of UWF:

- Paging files are disabled.
- System restore is disabled.
- SuperFetch is disabled.
- File indexing service is turned off.
- Fast boot is disabled.
- Defragmentation service is turned off.
- BCD setting bootstatuspolicy is set to ignoreallfailures.
- After UWF is enabled, you can finally select a drive to protect and start using UWF.

In this chapter, we describe how to use the unified write filters (UWF).

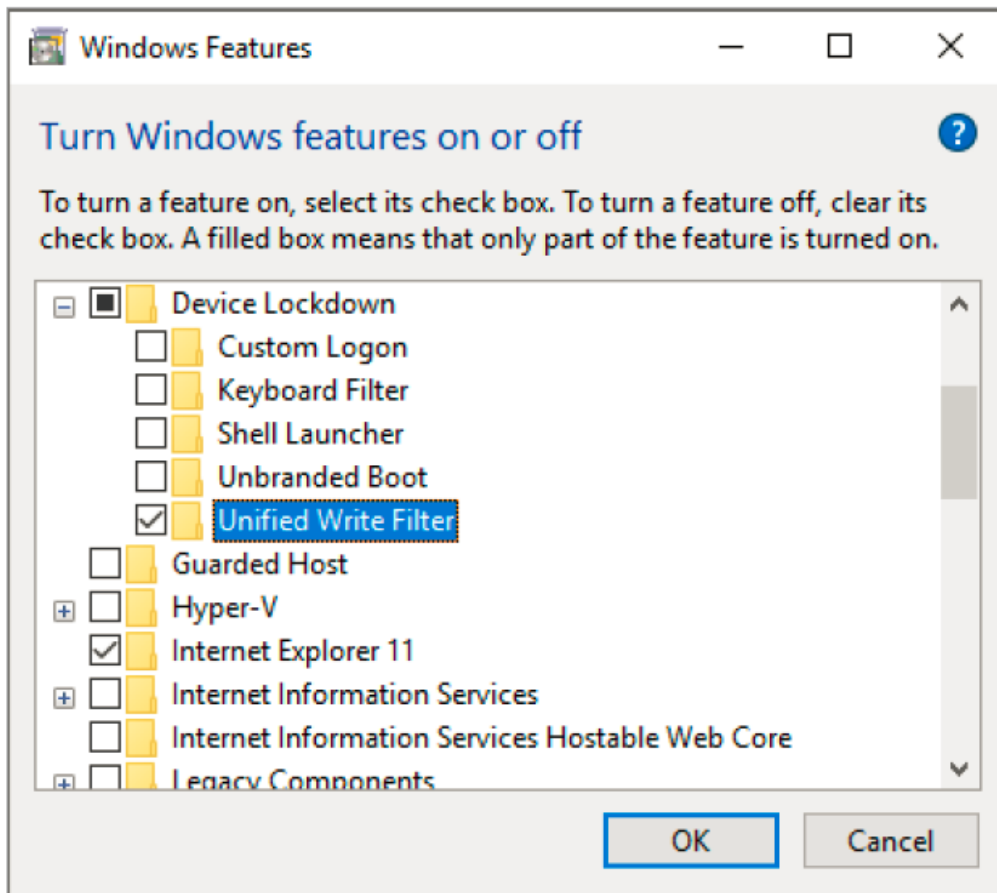
The following topics are covered in this chapter:

- ❑ **Turning ON the UWF on a Running PC**
- ❑ **Installing the UWF Feature Using WMI**

# Turning ON the UWF on a Running PC

1. Install the UWF feature, do the following:
  - a. In the Windows start menu, type **Turn Windows features on or off** and press **Enter**.
  - b. In the **Windows Features** window, expand the **Device Lockdown** node, and select the **Unified Write Filter**.
  - c. **Click** OK.

The Windows Features window indicates Windows is searching for required files and displays a progress bar. Once found, the window indicates Windows is applying the changes. When completed, the window indicates the requested changes are completed.
  - d. Click **Close** to close the Windows Features window.



2. Enable the filter.

Run the `uwfmgr filter enable` command.

```
Administrator: Command Prompt

C:\Windows\system32>uwfmgr filter enable
Unified Write Filter Configuration Utility version 10.0.17763
Copyright (C) Microsoft Corporation. All rights reserved.

Unified Write Filter will be enabled after system restart.

C:\Windows\system32>
```

3. Enable write protection for a drive. For example, the C: drive.  
Run the `uwfmgr.exe volume protect C:` command.

```
Administrator: Command Prompt

C:\Windows\system32>uwfmgr filter enable
Unified Write Filter Configuration Utility version 10.0.17763
Copyright (C) Microsoft Corporation. All rights reserved.

Unified Write Filter will be enabled after system restart.

C:\Windows\system32>uwfmgr.exe volume protect C:
Unified Write Filter Configuration Utility version 10.0.17763
Copyright (C) Microsoft Corporation. All rights reserved.

The volume C: will be protected by Unified Write Filter after system restart.

C:\Windows\system32>
```

4. Restart your computer.
5. Confirm that the UWF feature is running and run the `uwfmgr.exe get-config` command.

```
Administrator: Command Prompt

C:\Windows\system32>uwfmgr.exe get-config
Unified Write Filter Configuration Utility version 10.0.17763
Copyright (C) Microsoft Corporation. All rights reserved.

Current Session Settings

FILTER SETTINGS
  Filter state:      OFF
  Pending commit:   N/A
  Shutdown pending: No

SERVICING SETTINGS
  Servicing State:  OFF

OVERLAY SETTINGS
  Type:              RAM
  Maximum size:     1024 MB
  Warning Threshold: 512 MB
  Critical Threshold: 1024 MB
  Freespace Passthrough: OFF
  Persistent:       OFF
  Reset Mode:       N/A
```

# Installing the UWF Feature Using WMI

If Windows has already been installed and you do not want to use a provisioning package, you can also configure the UWF feature by using the Windows Management Instrumentation (WMI) providers. To turn on UWF using the WMI providers, you can use the **UWF\_Filter** function, specifically the **UWF\_Filter.Enable** method. You can do this in one of the following ways:

- Use the WMI providers directly in PowerShell script.
- Use the WMI providers directly in an application.
- Use the command line tool, `uwfmgr.exe`.

You must restart your device after you turn on or turn off UWF before the change takes effect.

You can change these settings after you turn on UWF if you want to. For example, you can move the page file location to an unprotected volume and re-enable paging files.



## **IMPORTANT!**

If you add UWF to your image by using SMI settings in a `unattend.xml` file, turning on UWF only sets the `bootstatuspolicy` BCD setting and turns off the defragmentation service. In this case, you must manually turn off the other features and services if you want to increase the performance of UWF.

All configuration settings for UWF are stored in the registry. UWF automatically excludes these registry entries from filtering.

UWF maintains configuration settings in the registry for the current session and for the next session after a device restart. Static configuration changes do not take effect until after a device restart, and these changes are saved in the registry entries for the next session. Dynamic configuration changes occur immediately and persist after a device restart.

# Moxa IO Control Utility

---

This chapter describes how to use Moxa IO Controller utility.

The following topics are covered in this chapter:

- **Overview**
- **Setting the DIO Status**
- **Setting the UART Mode**
- **Setting the Relay Status**
- **Setting the LED Status**



## Overview

To use the Moxa IO Controller utility, first install the utility and enable the utility to configure the DIO, UART mode, relay, and LED settings. After the installation process is complete, run the Command Prompt as an Administrator and change the path to **C:\Program Files\Moxa\Moxa Computer IO Controller**.

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.292]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Windows\system32>cd /d C:\Program Files\Moxa\Moxa Computer IO Controller

C:\Program Files\Moxa\Moxa Computer IO Controller>_
```

## Setting the DIO Status

Type the command `mx-dio-ctl --help` to see the instructions on using this utility and follow the onscreen description to get or set the DIO status.



### IMPORTANT!

The DIN and DOUT indices start at 0. If the printing starts from 1, the index still starts from 0 in this utility

```
Administrator: Command Prompt

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-dio-ctl --help
mx-dio-ctl 1.0.1903.0
Copyright (C) 2019 Moxa Inc. All rights reserved.
USAGE:
Get value from DIN port 1:
  mx-dio-ctl -i 1
Get value from DOUT port 1:
  mx-dio-ctl -o 1
Set DOUT port 2 value to HIGH:
  mx-dio-ctl -m 1 -o 2

-i          -i <#DIN index> (Start from 0)

-o          -o <#DOUT index> (Start from 0)

-m          -m <status>
            0 --> LOW
            1 --> HIGH

--help     Display this help screen.

--version  Display version information.

C:\Program Files\Moxa\Moxa Computer IO Controller>
```

Example:

```

Administrator: Command Prompt

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-dio-ctl -i 0
DIN port 0 status: 1

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-dio-ctl -o 0
DOUT port 0 status: 1

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-dio-ctl -o 0 -m 0
DOUT port 0 status: 0

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-dio-ctl -i 0
DIN port 0 status: 0

C:\Program Files\Moxa\Moxa Computer IO Controller>_

```

## Setting the UART Mode

Type the `mx-uart-ctl --help` command to see instructions on using this utility and follow the onscreen instructions to get or set the UART mode.



### IMPORTANT!

The UART index start from 0. If the printing starts at 1, the index still starts from 0 in this utility.

```

Administrator: Command Prompt

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-uart-ctl --help
mx-uart-ctl 1.0.1903.0
Copyright (C) 2019 Moxa Inc. All rights reserved.
USAGE:
Get uart mode from port 2:
  mx-uart-ctl -p 2
Set port 1 to mode RS-422:
  mx-uart-ctl -m 2 -p 1

-p          Required. -p <#port index> (Start from 0)

-m          -m <#uart mode>
            0 --> set to RS232 mode
            1 --> set to RS485-2W mode
            2 --> set to RS422 mode

--help     Display this help screen.

--version  Display version information.

C:\Program Files\Moxa\Moxa Computer IO Controller>

```

Example:

```
Administrator: Command Prompt

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-uart-ctl -p 0
Current uart mode is RS232 interface.

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-uart-ctl -p 0 -m 1
Set OK.

Current uart mode is RS485-2W interface.

C:\Program Files\Moxa\Moxa Computer IO Controller>_
```

## Setting the Relay Status

Type the `mx-relay-ctl --help` command to see instructions on using this utility and follow the onscreen instructions to get or set the status of the relay output.



### IMPORTANT!

The relay output index starts at 0. If the printing starts at 1, the index still starts at 0.

```
Administrator: Command Prompt

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-relay-ctl --help
mx-relay-ctl 1.0.1903.0
Copyright (C) 2019 Moxa Inc. All rights reserved.
USAGE:
Get value from relay index 1:
  mx-relay-ctl -i 1
Turn on relay index 2:
  mx-relay-ctl -i 2 -m 1

-i          Required. -i <#Relay index> (Start from 0)

-m          -m <status>
            0 --> turn off
            1 --> turn on

--help     Display this help screen.

--version  Display version information.

C:\Program Files\Moxa\Moxa Computer IO Controller>_
```

Example:

```

Administrator: Command Prompt

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-relay-ctl -i 0
Relay index 0 data: 1

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-relay-ctl -i 0 -m 0
Relay index 0 data: 0

C:\Program Files\Moxa\Moxa Computer IO Controller>

```

## Setting the LED Status

Type the command `mx-led-ctl -help` to see instructions on using this utility and following the onscreen instructions to get or set LED status.



### IMPORTANT!

All the LED indices start at 0. If the printing starts from 1, the index still starts from 0 in this utility.

```

Administrator: Command Prompt

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-led-ctl --help
mx-led-ctl 1.0.1903.0
Copyright (C) 2019 Moxa Inc. All rights reserved.
USAGE:
Get value from LED index 1:
  mx-led-ctl -i 1
Turn on LED index 2:
  mx-led-ctl -i 2 -m 1
Set LED index 3 to blink mode:
  mx-led-ctl -i 3 -m 2

-i          Required. -i <#LED index> (Start from 0)

-m          -m <status>
            0 --> led off
            1 --> led on
            2 --> led blink

--help     Display this help screen.

--version  Display version information.

C:\Program Files\Moxa\Moxa Computer IO Controller>_

```

Example:

```
C:\Program Files\Moxa\Moxa Computer IO Controller>mx-led-ctl -i 0
LED index 0 data: 0

C:\Program Files\Moxa\Moxa Computer IO Controller>mx-led-ctl -i 0 -m 1
LED index 0 data: 1

C:\Program Files\Moxa\Moxa Computer IO Controller>_
```

This chapter describes how to use IO Control API.

The following topics are covered in this chapter:

▣ **Downloading the API**

▣ **mxgio**

- GetDinStatus
- GetDoutStatus
- SetDoutStatus

▣ **mxled**

- GetLedData
- SetLedData

▣ **mxrelay**

- GetRelayData
- SetRelayData

▣ **mxsp**

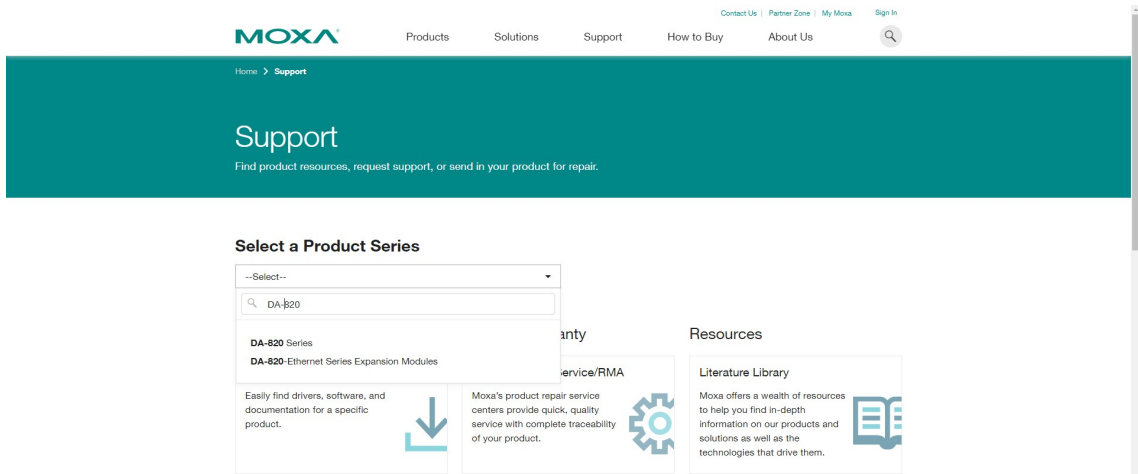
- GetUartMode
- SetUartMode

▣ **mxwdg**

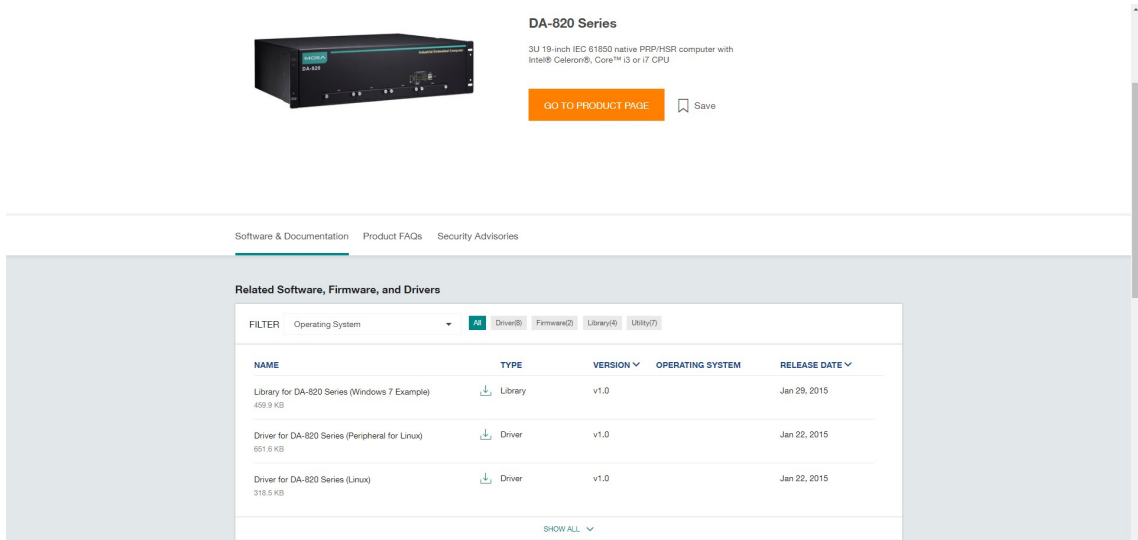
- mxwdg\_open
- mxwdg\_refresh
- mxwdg\_close

# Downloading the API

1. Access the Moxa support page: <https://www.moxa.com/en/support>
2. Select the product series DA-682C.



3. Download the related files.



# mxdgio

The **mxdgio** library operates on the digital I/O.

## GetDinStatus

### Syntax:

```
int GetDinStatus(int port);
```

### Description:

Gets the status of a digital input port.

### Parameters:

Parameter	Description
port	The index of the digital input port; starts at 0.

### Return Value:

The status of the digital input port; 0 for low and 1 for high.

### Error Codes:

The following error codes can be retrieved by the **DIO\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxdgio library initialization failed. Can't open the json profile.
PORT_OUTOF_INDEX	Target port index is out of range.

### Requirements:

Item/Name	File
Header	mxdgio.h
Library	mxdgio.lib
DLL	mxdgio.dll
Profile	MxdgioProfile[ModelName].json

## GetDoutStatus

### Syntax:

```
int GetDoutStatus(int port);
```

### Description:

Gets the status of a digital output port.

### Parameters:

Parameter	Description
port	The index of the digital output port; starts at 0.

### Return Value:

The status of the digital output port;

0 for low and 1 for high.



**Error Codes:**

The following error codes can be retrieved by the **DIO\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxduino library initialization failed. Can't open json profile.
PORT_OUTOF_INDEX	Target port index is out of range.

**Requirements:**

Item/Name	File
Header	mxduino.h
Library	mxduino.lib
DLL	mxduino.dll
Profile	MxduinoProfile[ModelName].json

## SetDoutStatus

**Syntax:**

```
int SetDoutStatus(int port, int status);
```

**Description:**

Sets the status of a digital output port.

**Parameters:**

Parameter	Description
port	The index of the digital output port; starts at 0.
status	The status of the digital output port; 0 for low and 1 for high.

**Return Value:**

Returns the value 0 if the digital output status is successfully set.

**Error Codes:**

The following error codes can be retrieved by the **DIO\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxduino library initialization failed. Can't open json profile.
PORT_OUTOF_INDEX	The target port index is out of range.
SET_STATUS_ERR	Sets the status to fail.

**Requirements:**

Item/Name	File
Header	mxduino.h
Library	mxduino.lib
DLL	mxduino.dll
Profile	MxduinoProfile[ModelName].json

# mxled

The **mxled** library operates on the programmable LEDs.

## GetLedData

### Syntax:

```
int GetLedData(int port);
```

### Description:

Gets the status of the LED port.

### Parameters:

Parameter	Description
port	The index of the LED port; starts at 0.

### Return Value:

The status of a LED port; 0 for OFF, 1 for ON.

### Error Codes:

The following error codes can be retrieved by the **LED\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxled library initialization failed. Can't open json profile.
PORT_OUTOF_INDEX	The target port index is out of range.

### Requirements:

Item/Name	File
Header	mxled.h
Library	mxled.lib
DLL	mxled.dll
Profile	MxledProfile[ <i>ModelName</i> ].json

## SetLedData

### Syntax:

```
int SetLedData(int port, int status);
```

### Description:

Sets the status of the LED port.

### Parameters:

Parameter	Description
port	The index of the LED port; starts at 0.
status	The status of the LED; 0 for OFF, 1 for ON, and 2 for blinking.

### Return Value:

Returns 0 if the LED status is set successfully.

**Error Codes:**

The following error codes can be retrieved by the **LED\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxled library initialization failed. Can't open json profile.
PORT_OUTOF_INDEX	The target port index is out of range.
SET_STATUS_ERR	Sets the status to fail.

**Requirements:**

Item/Name	File
Header	mxled.h
Library	mxled.lib
DLL	mxled.dll
Profile	MxledProfile[ModelName].json

## mxrelay

The **mxrelay** library operates on the relay output.

### GetRelayData

**Syntax:**

```
int GetRelayData(int port);
```

**Description:**

Gets the status of the relay output port.

**Parameters:**

Parameter	Description
port	The index of the relay output port; starts at 0.

**Return Value:**

The status of a relay output port; 0 for OFF, 1 for ON.

**Error Codes:**

The following error codes can be retrieved by the **RELAY\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxrelay library initialization failed. Can't open json profile.
PORT_OUTOF_INDEX	The target port index is out of range.

**Requirements:**

Item/Name	File
Header	mxrelay.h
Library	mxrelay.lib
DLL	mxrelay.dll
Profile	MxrelayProfile[ModelName].json

## SetRelayData

### Syntax:

```
int SetRelayData(int port, int status);
```

### Description:

Sets the status of the relay output port.

### Parameters:

Parameter	Description
port	The index of the relay output port; starts at 0.
status	The status of a relay output; 0 for OFF, 1 for ON.

### Return Value:

Returns 0 if the status of the relay output is successfully set.

### Error Codes:

The following error codes can be retrieved by the **RELAY\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxrelay library initialization failed. Can't open json profile.
PORT_OUTOF_INDEX	The target port index is out of range.
SET_STATUS_ERR	Sets the status to fail.

### Requirements:

Item/Name	File
Header	mxrelay.h
Library	mxrelay.lib
DLL	mxrelay.dll
Profile	MxrelayProfile[ModelName].json

## mxsp

The mxsp library operates on the serial port.

## GetUartMode

### Syntax:

```
int GetUartMode(int port);
```

### Description:

Gets the status of the UART port.

### Parameters:

Parameter	Description
port	The index of the UART port; starts at 0.

### Return Value:

The mode of a UART interface; **0** for RS-232, **1** for RS-485, and **2** for RS-422.

**Error Codes:**

The following error codes can be retrieved by the **RELAY\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxsp library initialization failed. Can't open json profile.
PORT_OUTOF_INDEX	The target port index is out of range.

**Requirements:**

Item/Name	File
Header	mxsp.h
Library	mxsp.lib
DLL	mxsp.dll
Profile	MxspProfile[ <i>ModelName</i> ].json

## SetUartMode

**Syntax:**

```
int SetUartMode(int port, int mode);
```

**Description:**

Sets the status of the UART port.

**Parameters:**

Parameter	Description
port	The index of the UART port; starts at 0.
mode	The mode of a UART interface; 0 for RS-232, 1 for RS-485-2w, and 2 for RS-422.

**Return Value:**

Returns 0 if the UART mode is successfully set.

**Error Codes:**

The following error codes can be retrieved by the **UART\_STATUS** function.

Name	Meaning
LIB_INITIALIZE_FAIL	The mxsp library initialization failed. Can't open json profile.
PORT_OUTOF_INDEX	The target port index is out of range.
SET_STATUS_ERR	Sets the status to fail.

**Requirements:**

Item/Name	File
Header	mxsp.h
Library	mxsp.lib
DLL	mxsp.dll
Profile	MxspProfile[ <i>ModelName</i> ].json

# mxwdg

The **mxwdg** library operates on the watchdog timer.

## mxwdg\_open

### Syntax:

```
int mxwdg_open(unsigned long time);
```

### Description:

Initializes the watchdog timer.

### Parameters:

Parameter	Description
time	The interval at which the watchdog timer is refreshed; unit is seconds.

### Return Value:

Returns pointer to the watchdog handle; return -1 on failure to initialize the watchdog timer.

### Requirements:

Item/Name	File
Header	mxwdg.h
Library	mxwdg.lib
DLL	mxwdg.dll

## mxwdg\_refresh

### Syntax:

```
int mxwdg_refresh(PVOID fd);
```

### Description:

Refreshes the watchdog timer.

### Parameters:

Parameter	Description
fd	The handle of the watchdog timer.

### Return Value:

Returns 0 on success; otherwise the function has failed.

### Requirements:

Item/Name	File
Header	mxwdg.h
Library	mxwdg.lib
DLL	mxwdg.dll

## mxwdg\_close

**Syntax:**

```
int mxwdg_close(PVOID fd);
```

**Description:**

Disables the watchdog timer.

**Parameters:**

Parameter	Description
fd	The handle of the watchdog timer.

**Return Value:**

This function does not return a value.

**Requirements:**

Item/Name	File
Header	mxwdg.h
Library	mxwdg.lib
DLL	mxwdg.dll

# Windows Recovery

---

This chapter describes the setup process for the Windows Recovery function.

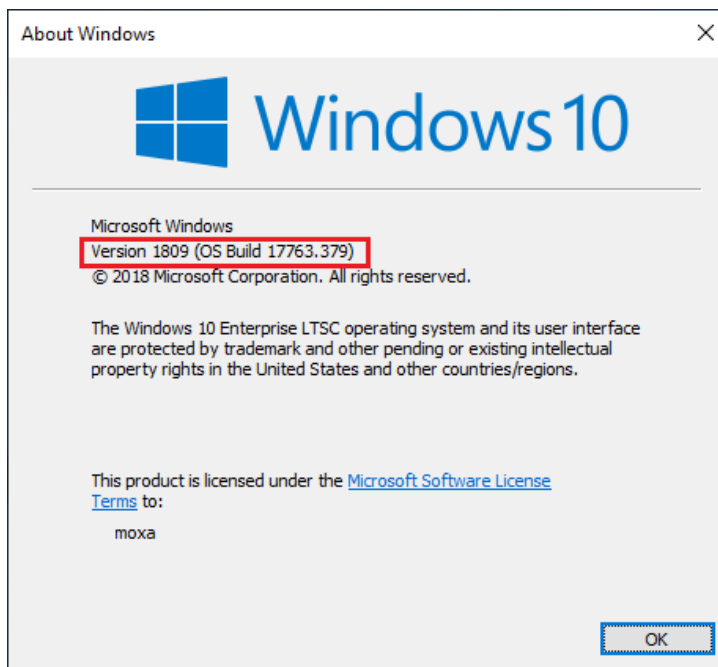
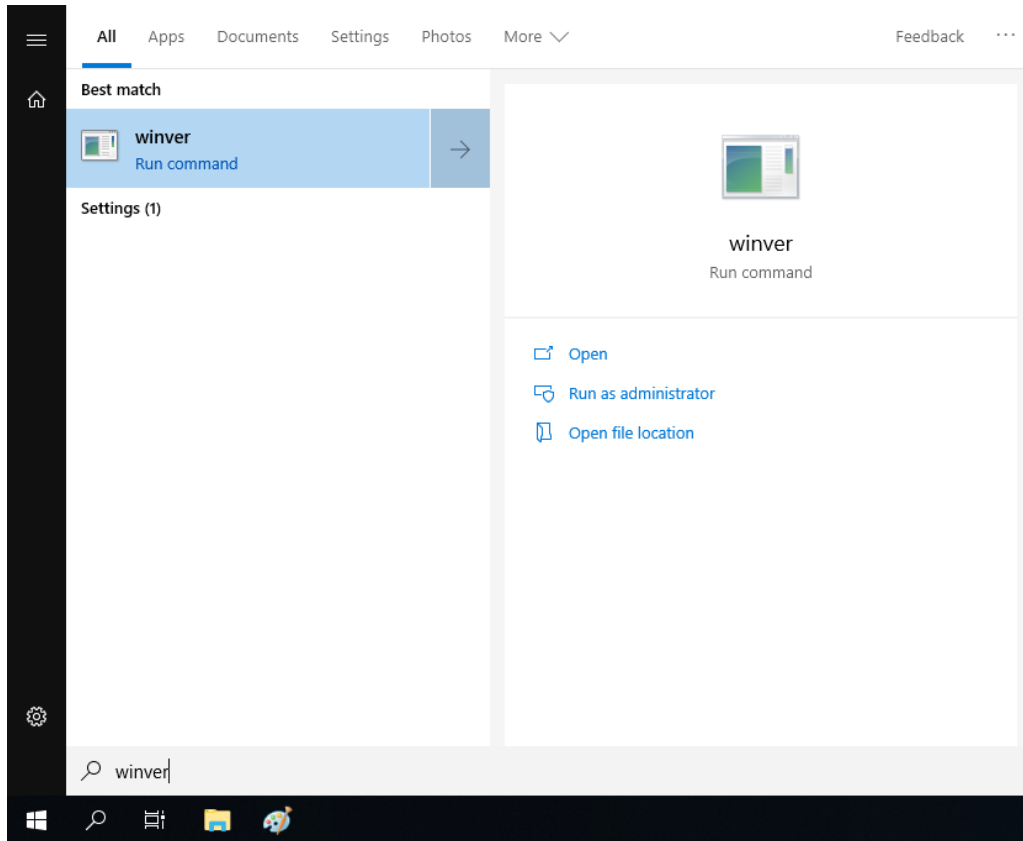
The following topics are covered in this chapter:

- ❑ **Preparing the USB Device**
- ❑ **Booting From the USB Recovery Disk**
- ❑ **System Image Backup**
- ❑ **Restoring the System Image**

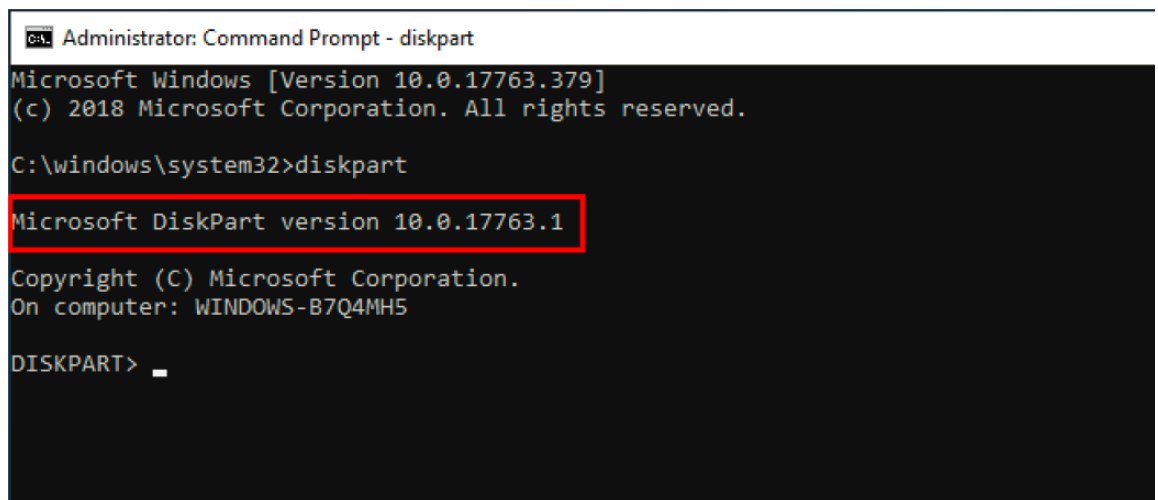
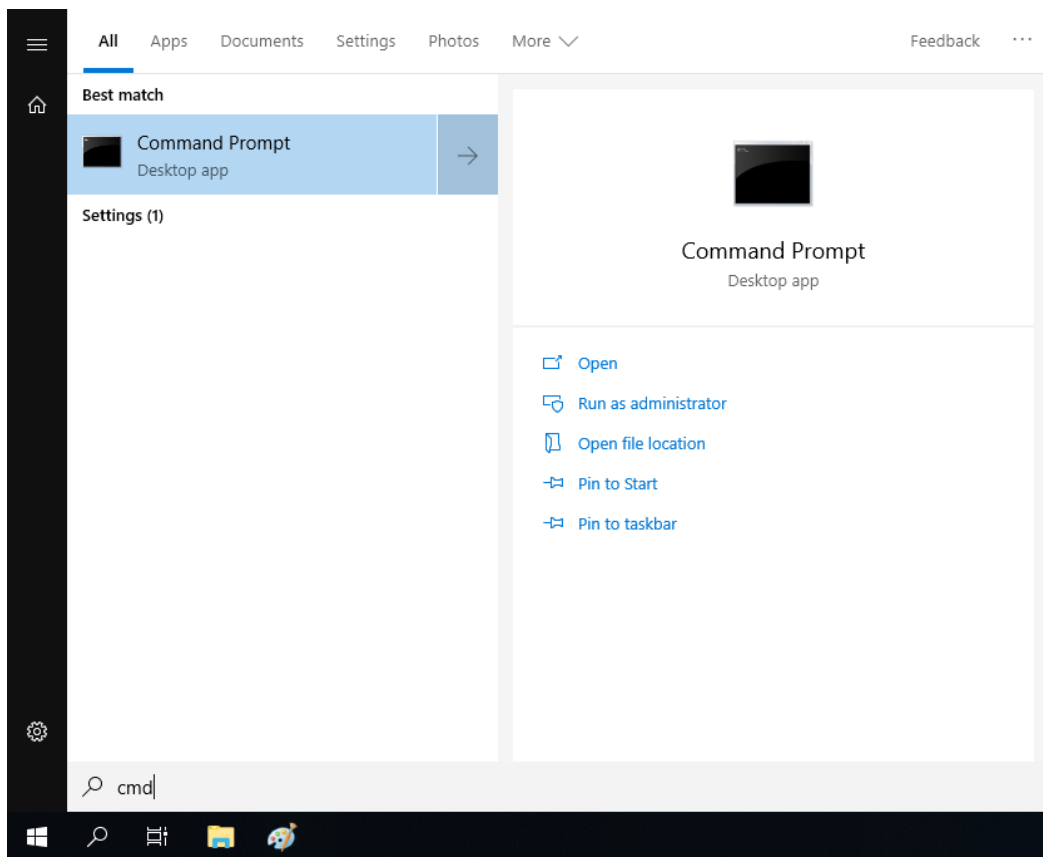


# Preparing the USB Device

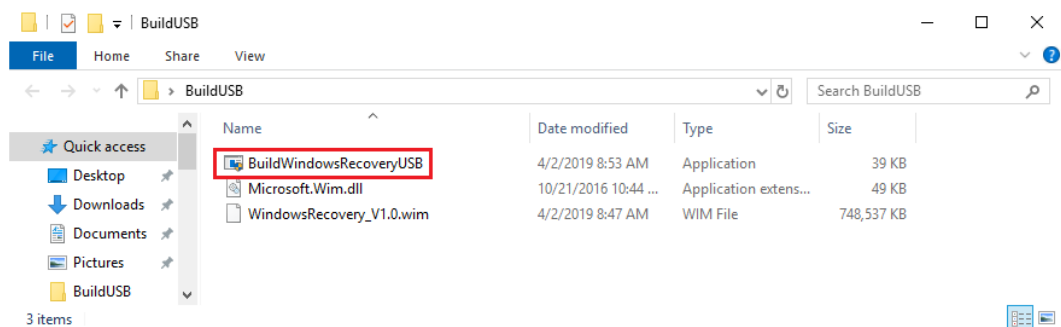
1. Ensure that your computer has the Diskpart version 10.0.17134.0 or higher installed. There are two ways to check the version of the Diskpart tool.
  - a. In the Windows start menu, type winver to check OS Build, the OS version must have 1803 or later version and the specific OS Build will be 17763 or later.



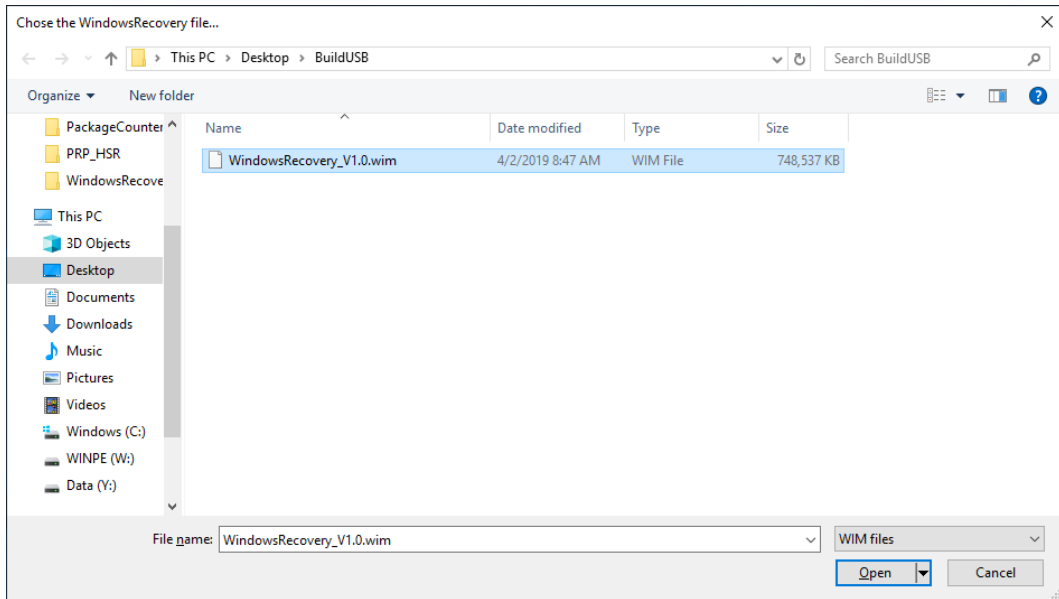
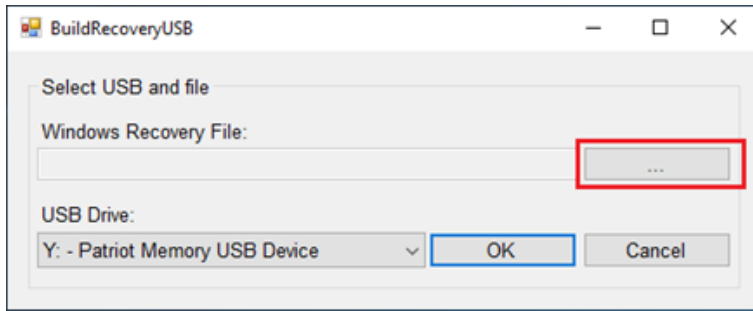
- b. Run the command line as an **Administrator** and type diskpart to run diskpart and check the diskpart version.



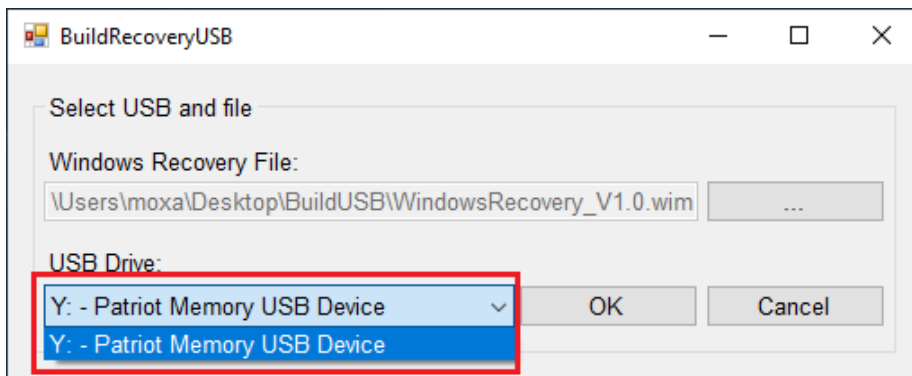
- 2. Run the **BuildWindowsRecoveryUSB.exe** program from the <Software DVD>\recovery folder.



3. Click "..."/>

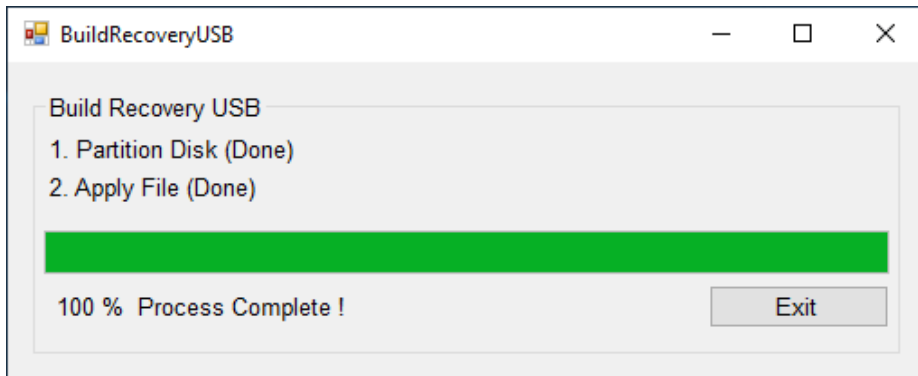


4. Select the USB drive option and click **OK**.  
The USB disk will be formatted.

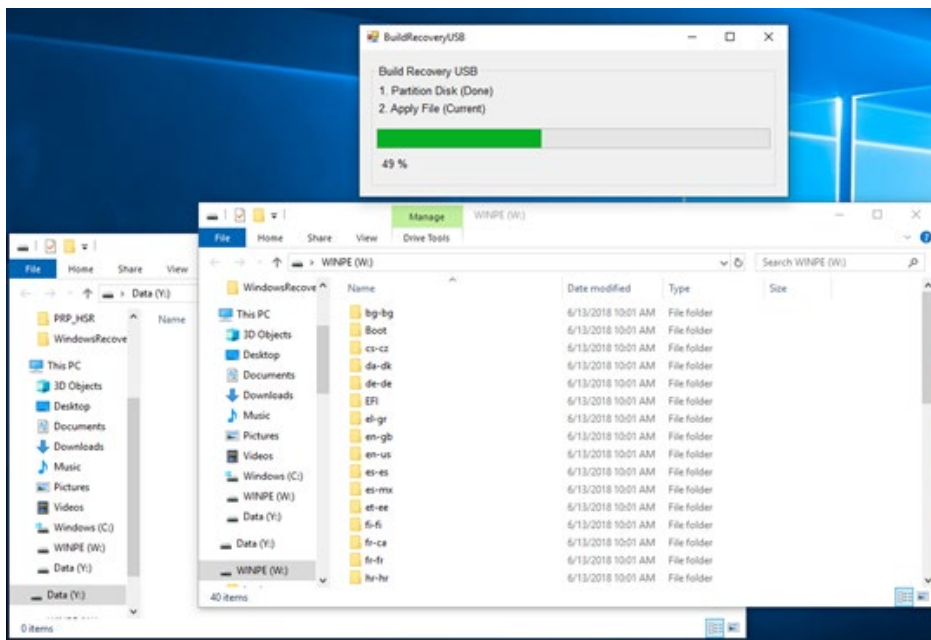


The program will create two volumes on the USB disk and the boot file will be copied to your USB. Some additional windows may appear during this process. You can close these windows after the process is completed.

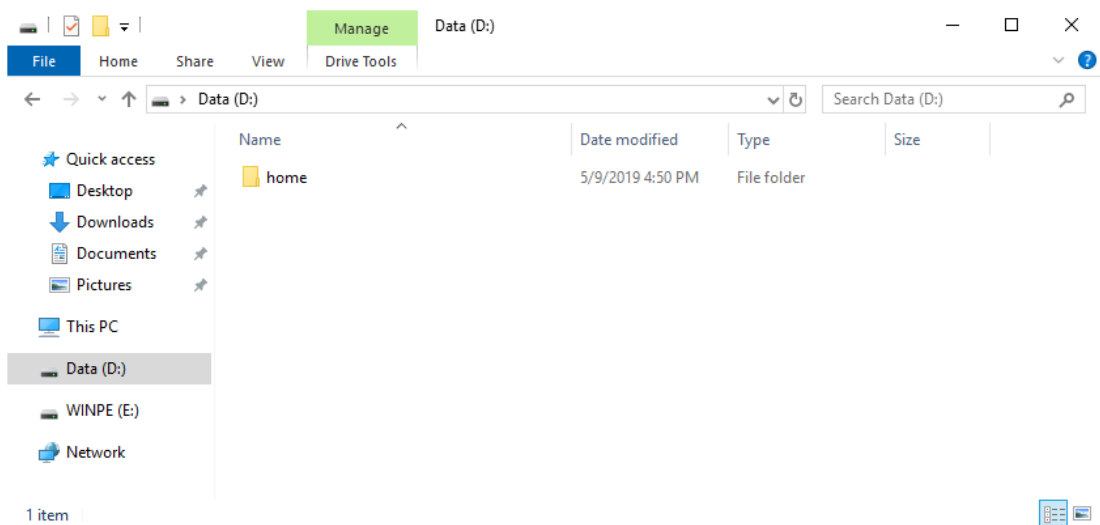
- 5. Click **Exit** to close the program.



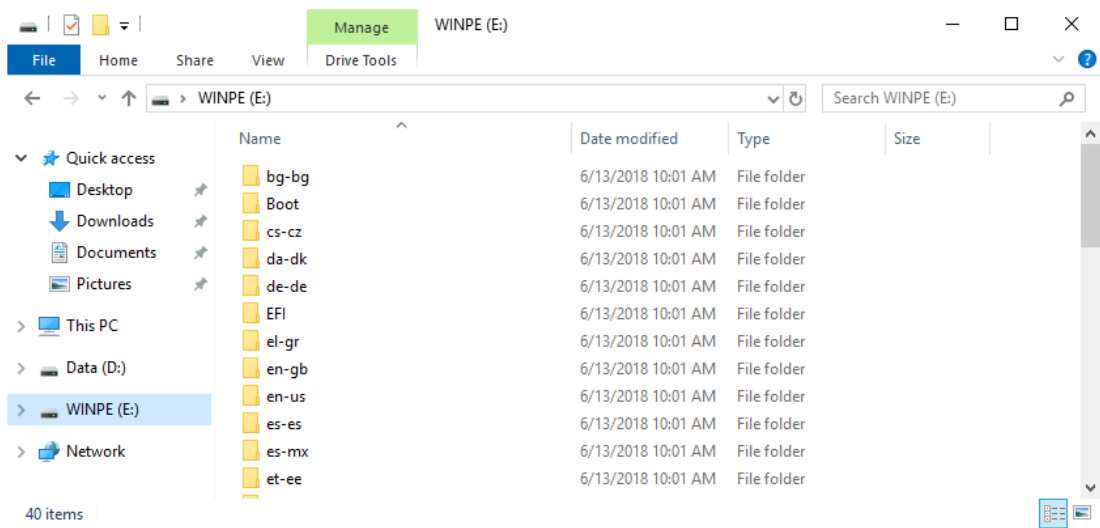
After the process is completed, two volumes are created on the USB disk.



- a. One volume has a "home" folder, which can be used to store the OS image.

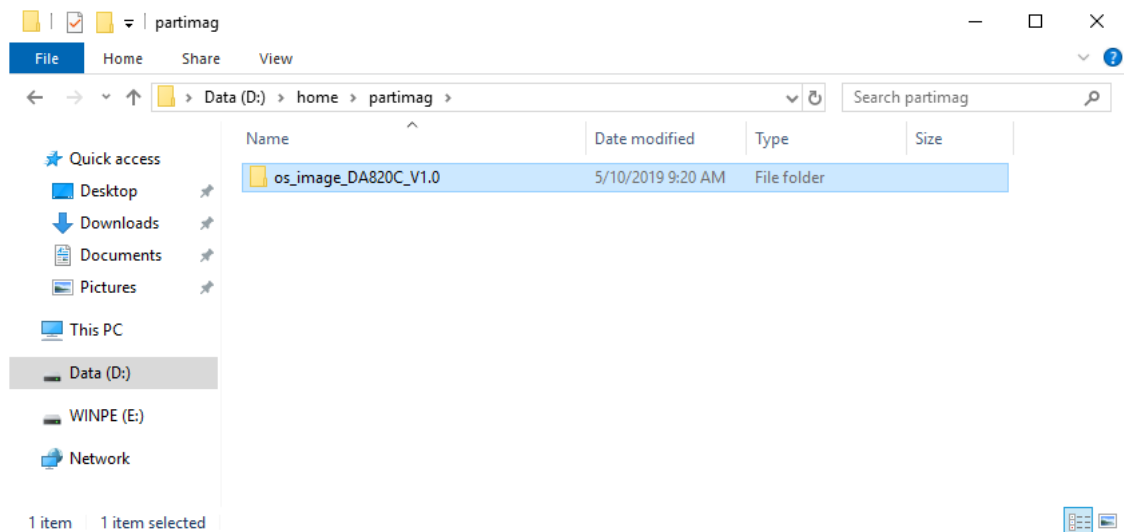


- b. The second volume has many folders, which contain data for booting into WinPE to run the recovery program. This volume may not be visible in systems running Windows 7 or Windows 10 versions prior to 1803.



- 6. Copy the **os\_image\_ModelName** directory from the <Software DVD>\**recovery** folder to the **\home\partimag** folder on the USB drive.

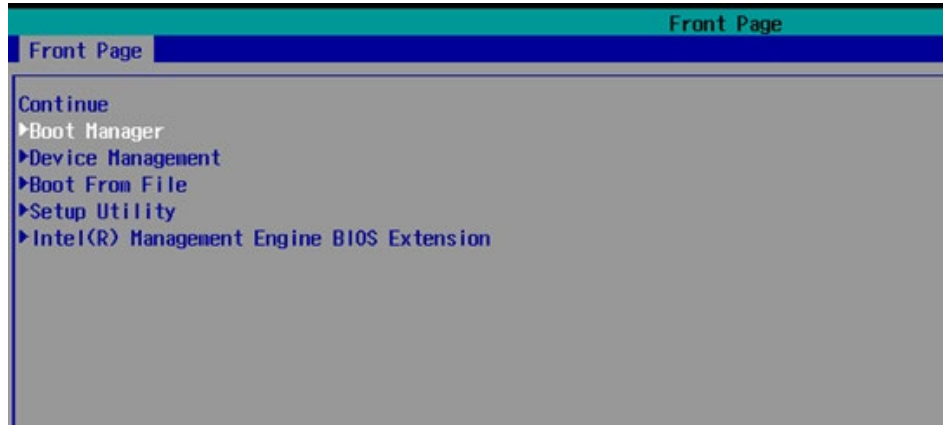
The USB disk is now ready for use in the recover process.



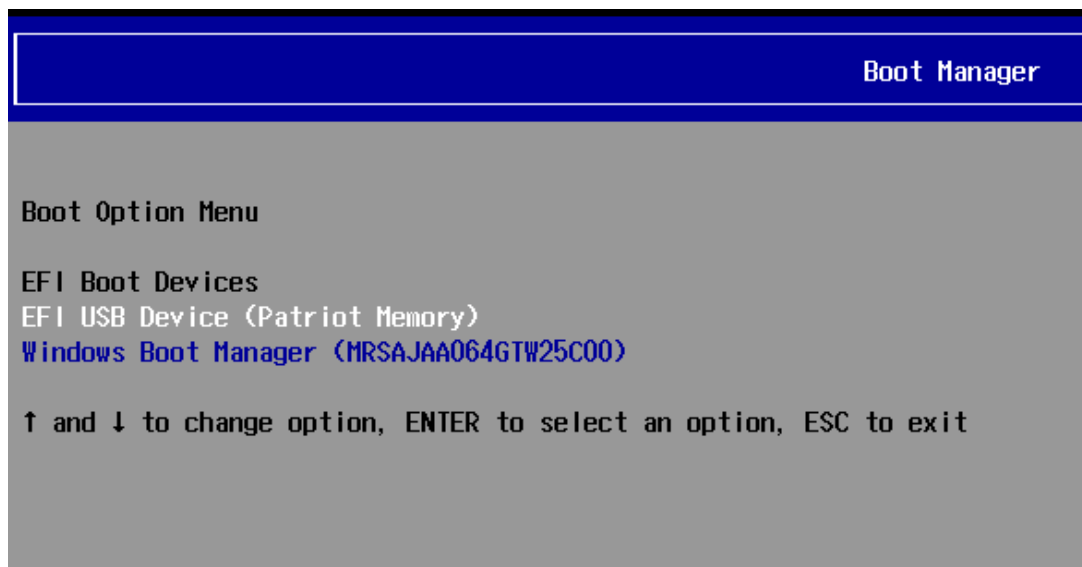
# Booting From the USB Recovery Disk

To boot up from the USB recovery disk, do the following:

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



3. Select the **EFI USB Device** option and press **Enter** to continue to boot from a USB device.



# System Image Backup

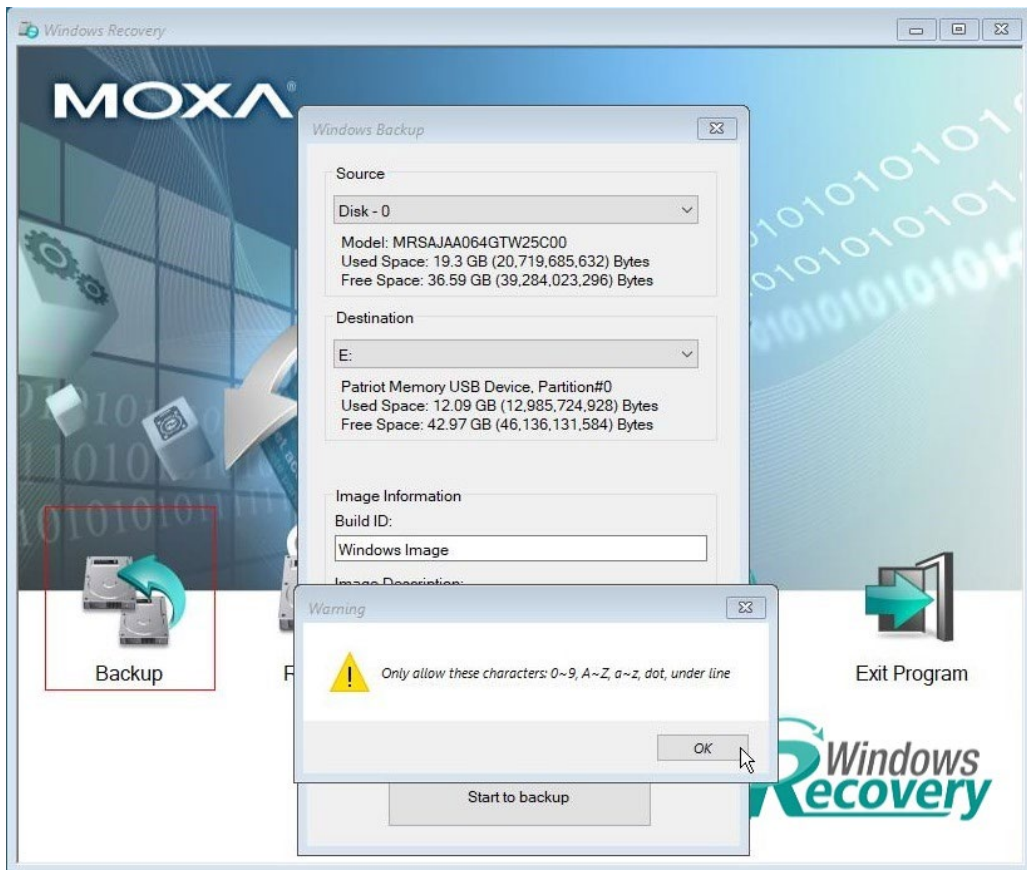
To back up a system image on to a USB disk, do the following:

1. Boot the system from the USB disk. The Windows Preinstallation Environment (WinPE) and the WindowsRecovery utility will be displayed.
2. Click **Backup**.

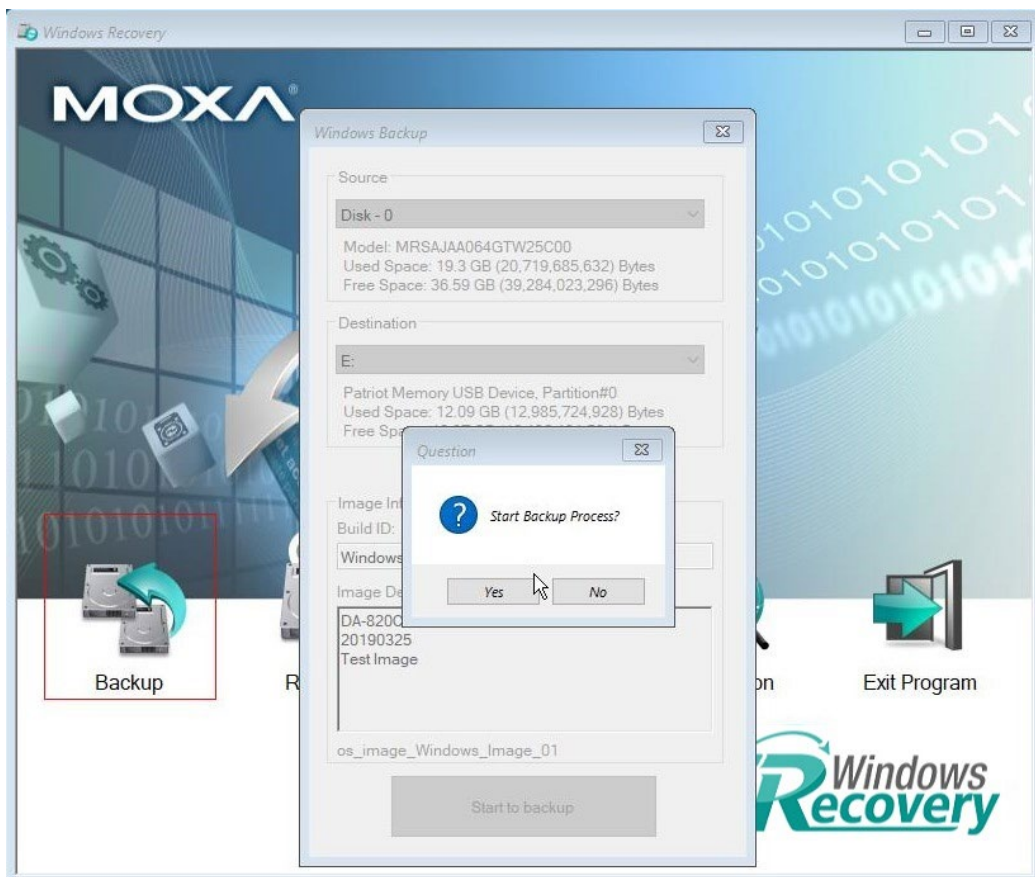


3. Select the **Source** disk to backup and the **Destination** USB to store the OS image in, and specify a **Build ID** and an **Image Description** for the image file.

- 4. Click **Start to backup.**

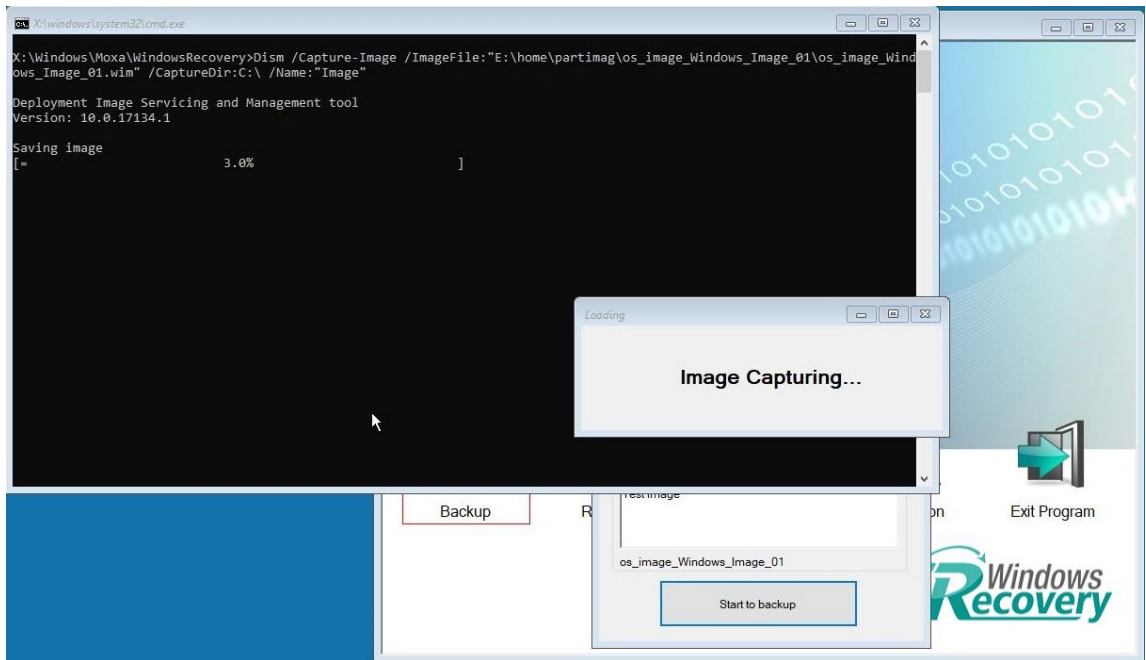


- 5. Click **Yes** to continue the process.





- 6. Wait for the backup process to finish.



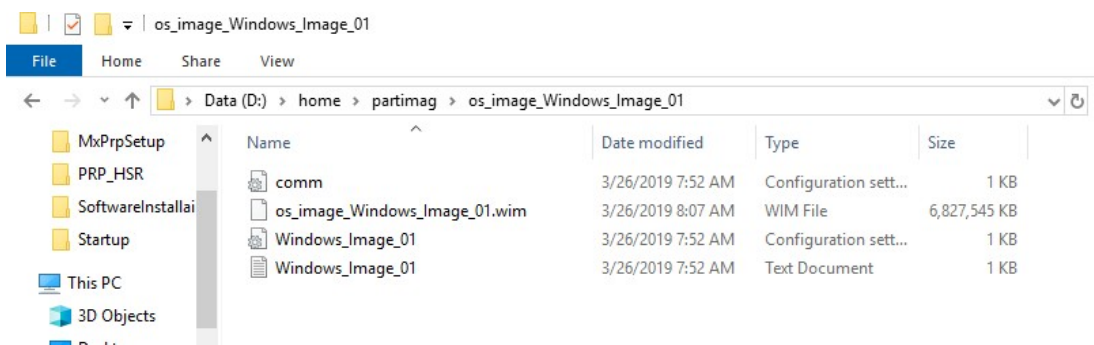
- 7. After the backup process is completed, click **OK**.



- Click **Shutdown** and click **OK**.  
The program will shut down the computer automatically.



- The OS image will be save in the USB disk at **home\partimag\**.



The **os\_image** folder will have the backup information and the image file.

## Restoring the System Image

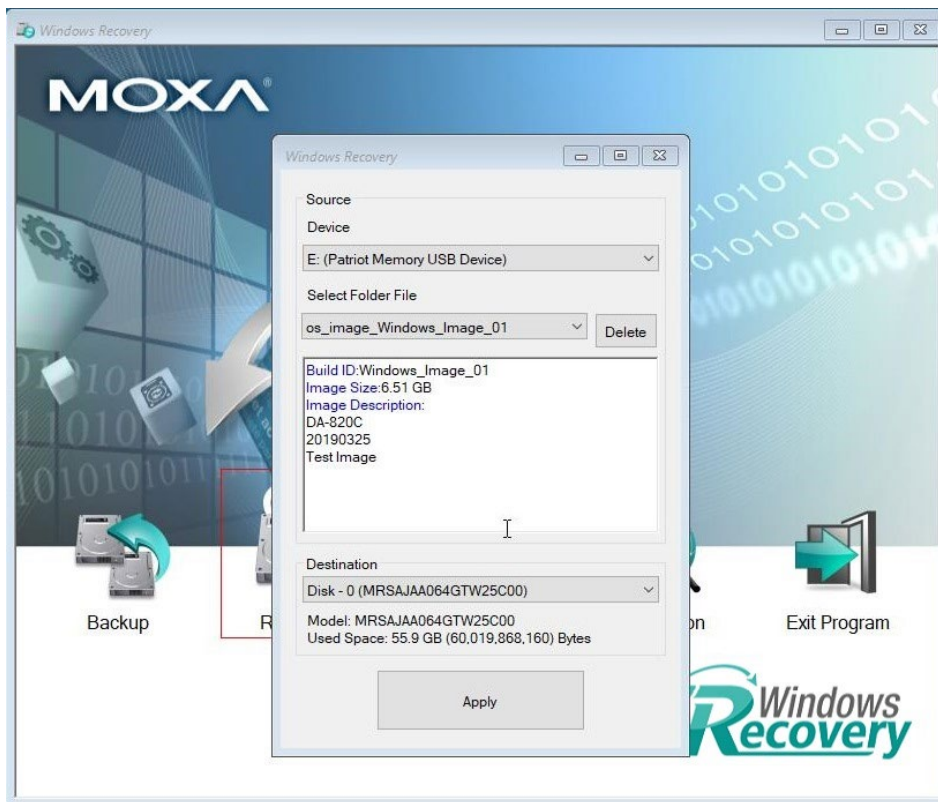
To restore the system image from a USB disk, do the following:

1. Boot the system from the USB disk.  
The Windows Preinstallation Environment (WinPE) and the **WindowsRecovery** utility will be displayed.
2. Click **Recovery**.

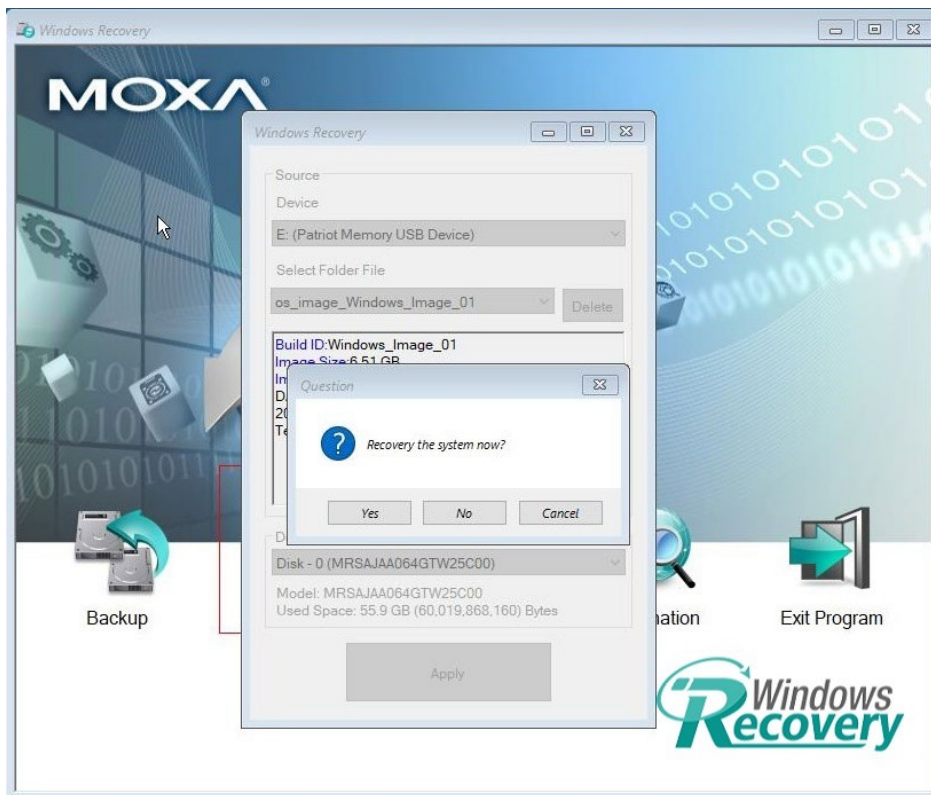




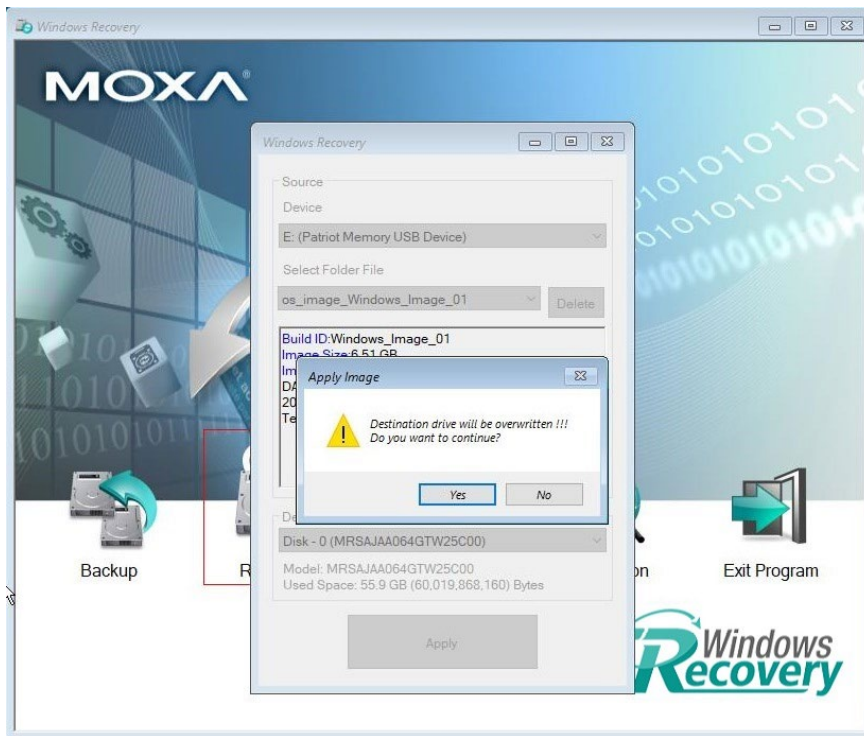
3. Select the **Source** USB Device and the folder for the image file and check the image information. Select the **Destination** Disk to restore. Click **Apply**.



4. Click **Yes** to start the recovery process.



5. Click **Yes** to confirm.



6. Wait for the restore process to complete.



7. Click **OK**.



8. Click **Shutdown** and click **OK**, the program will shut down the computer automatically.



9. Reboot the computer.



**IMPORTANT!**

When you restart the computer, you will need to wait about 5 minutes for the computer to go through two cycles of reboots. The system configuration files will be initialized during the first boot-up process. Do not turn off the computer or shut down the computer while the system is restarting.