# AMD RAID Installation Guide


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# 1. AMD BIOS RAID Installation Guide

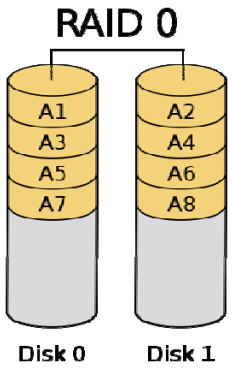
AMD BIOS RAID Installation Guide is an instruction for you to configure RAID functions by using the onboard FastBuild BIOS utility under BIOS environment. After you make a SATA driver diskette, press <F2> or <Del> to enter BIOS setup to set the option to RAID mode by following the detailed instruction of the “User Manual” in our support CD or “Quick Installation Guide”, then you can start to use the onboard RAID Option ROM Utility to configure RAID.

## 1.1 Introduction to RAID

The term “RAID” stands for “Redundant Array of Independent Disks”, which is a method combining two or more hard disk drives into one logical unit. For optimal performance, please install identical drives of the same model and capacity when creating a RAID set.

**RAID 0 (Data Striping)**

RAID 0 is called data striping that optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. It will improve data access and storage since it will double the data transfer rate of a single disk alone while the two hard disks perform the same work as a single drive but at a sustained data transfer rate.

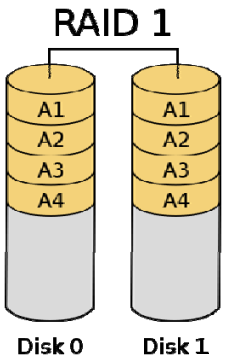



**WARNING!!**

Although RAID 0 function can improve the access performance, it does not provide any fault tolerance. Hot-Plug any HDDs of the RAID 0 Disk will cause data damage or data loss.

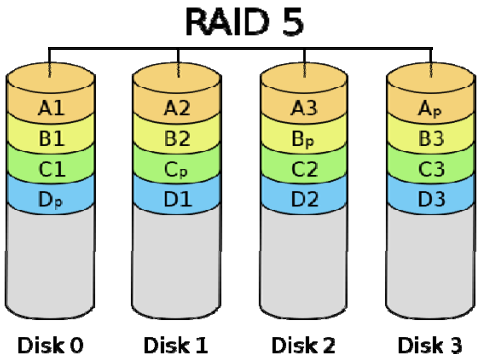
**RAID 1 (Data Mirroring)**

RAID 1 is called data mirroring that copies and maintains an identical image of data from one drive to a second drive. It provides data protection and increases fault tolerance to the entire system since the disk array management software will direct all applications to the surviving drive as it contains a complete copy of the data in the other drive if one drive fails.



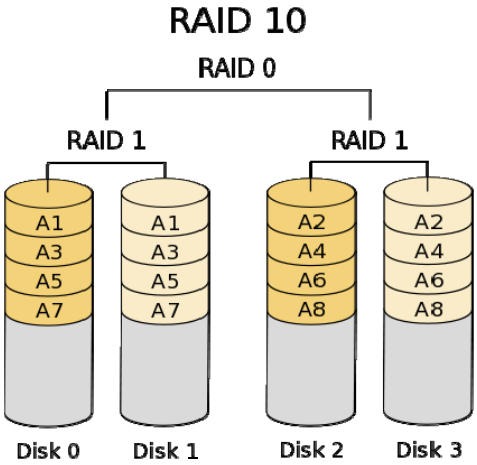

**RAID 5 (Block Striping with Distributed Parity)**

RAID 5 stripes data and distributes parity information across the physical drives along with the data blocks. This organization increases performance by accessing multiple physical drives simultaneously for each operation, as well as fault tolerance by providing parity data. In the event of a physical drive failure, data can be re-calculated by the RAID system based on the remaining data and the parity information. RAID 5 makes efficient use of hard drives and is the most versatile RAID Level. It works well for file, database, application and web servers.




**RAID 10 (Stripe Mirroring)**

RAID 0 drives can be mirrored using RAID 1 techniques, resulting in a RAID 10 solution for improved performance plus resiliency. The controller combines the performance of data striping (RAID 0) and the fault tolerance of disk mirroring (RAID 1). Data is striped across multiple drives and duplicated on another set of drives.



## 1.2 RAID Configurations Precautions

1. Please use two new drives if you are creating a RAID 0 (striping) array for performance. It is recommended to use two SATA drives of the same size. If you use two drives of different sizes, the smaller capacity hard disk will be the base storage size for each drive. For example, if one hard disk has an 80GB storage capacity and the other hard disk has 60GB, the maximum storage capacity for the 80GB-drive becomes 60GB, and the total storage capacity for this RAID 0 set is 120GB.

2. You may use two new drives, or use an existing drive and a new drive to create a RAID 1 (mirroring) array for data protection (the new drive must be of the same size or larger than the existing drive). If you use two drives of different sizes, the smaller capacity hard disk will be the base storage size. For example, if one hard disk has an 80GB storage capacity and the other hard disk has 60GB, the maximum storage capacity for the RAID 1 set is 60GB.

3. Please verify the status of your hard disks before you set up your new RAID array.

**WARNING!!**

Please backup your data first before you create RAID functions. In the process you create RAID, the system will ask if you want to “Clear Disk Data” or not. It is recommended to select “Yes”, and then your future data building will operate under a clean environment.

## 1.3 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit With RAID Functions

If you want to install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit on a RAID disk composed of 2 or more SATA HDDs with RAID functions, please follow below procedures according to the OS you install.

### 1.3.1 Installing Windows® 8 / 8 64-bit With RAID Functions

If you want to install Windows® 8 / 8 64-bit on a RAID disk composed of 2 or more SATA HDDs with RAID functions, please follow below steps.

**Way 1:**

**STEP 1: Set up UEFI.**

A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the "SATA Mode" option to [RAID].

C. Click [F10] to save and exit.

**STEP 2: Use "RAID Installation Guide" to set RAID configuration.**

Before you start to configure RAID function, you need to check this RAID installation guide for proper configuration. Please refer to the BIOS RAID installation guide part in this document for details.

**STEP 3: Make a SATA Driver Diskette. (Please use an USB floppy or a floppy disk.)**

**STEP 4: Install Windows® 8 / 8 64-bit OS on your system.**

**Way 2:**

Use this alternative to speed up Windows® 8 boot time.

**STEP 1: Set up UEFI.**

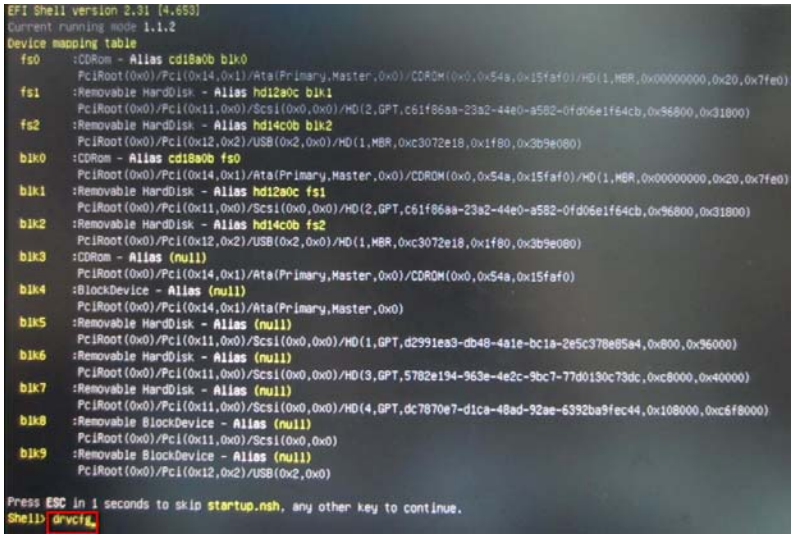
A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the "SATA Mode" option to [RAID].

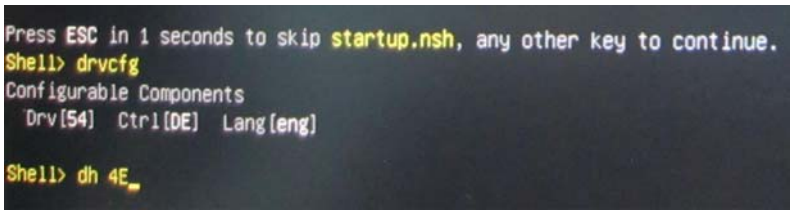
C. Click [F10] to save and exit.

D. Click [F11] to enter boot menu and select "Built-in EFI shell".

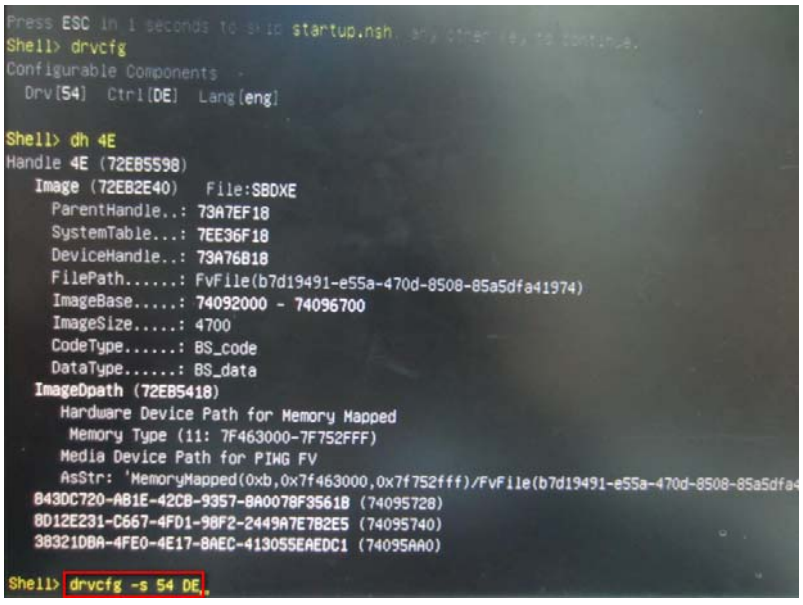
E. At the **Shell>** prompt, enter the command "drvcfg" and click [Enter].



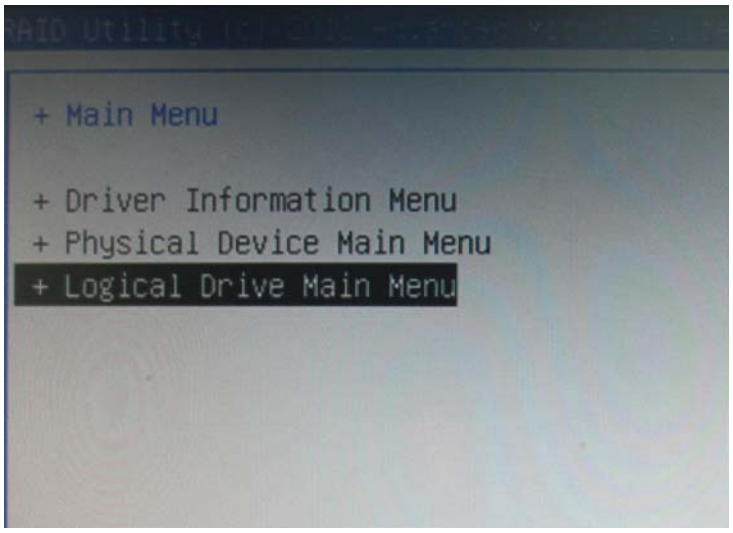

F. When the following screen appears, enter “dh [Drv number]” and click [Enter].



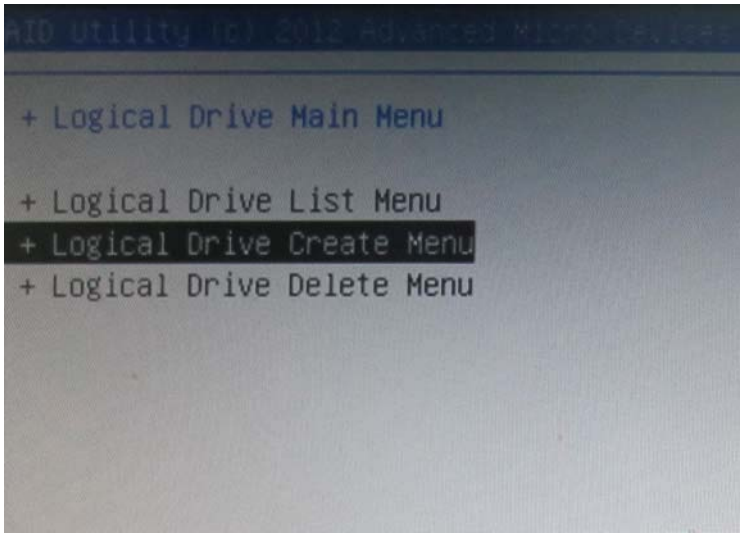

G. Enter “drvcfg(space)-s(space)[Drv number](space)[Ctrl number]” and click [Enter] to access RAID Utility.




H. Enter [Logical Drive Main Menu] to set up RAID Drive.

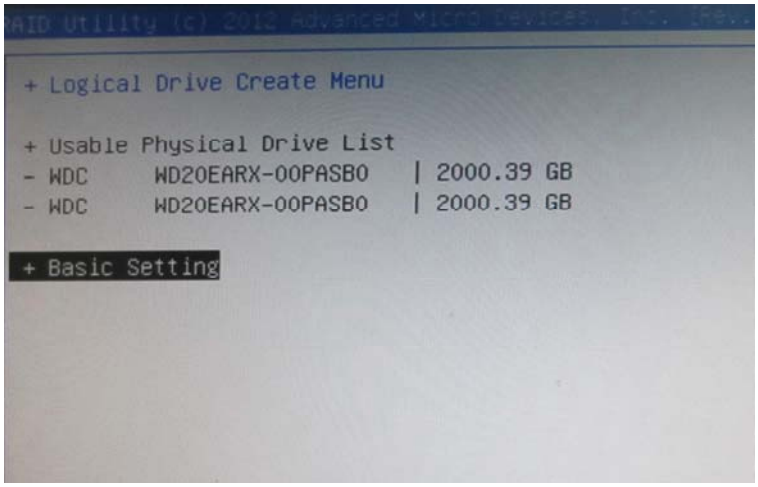



I. Choose [Logical Drive Create Menu] to create a RAID Drive.




J. Choose [Usable Physical Drive List] and select the hard drives to be included in the RAID array.

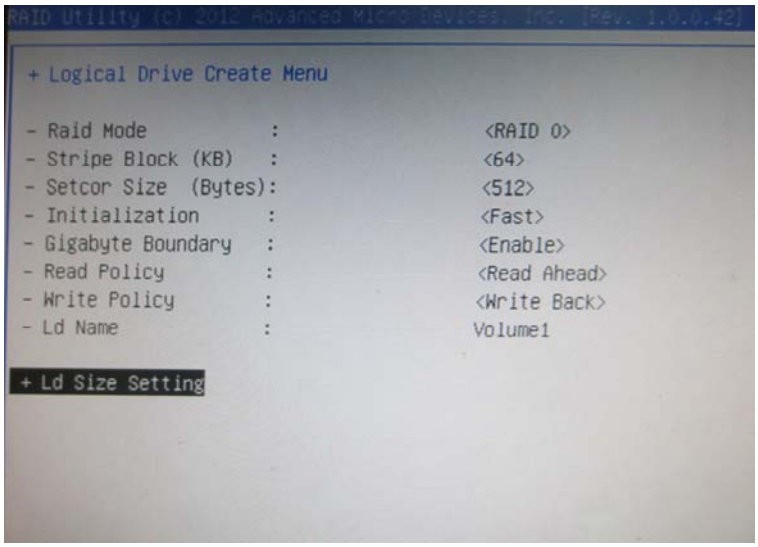
Click [Space] on keyboard to toggle checkbox. Then choose [Basic Setting].



K. Select your desired RAID Level in “Raid Mode” and enter a volume name in “Ld name”.

Click [Enter] to confirm the selection.

L. Choose [Ld Size setting] and click [Enter] three times.




M. Click [Esc] to return to the previous page and choose [Logical Drive List Menu] to check the logical drive list.

N. Enter UEFI SETUP UTILITY → Boot to set the “Fast Boot” option to [Ultra Fast]. Press [F10] to save change and exit.


**STEP 2: Install Windows® 8 / 8 64-bit OS on your system.**

### 1.3.2 Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit With RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit on a RAID disk composed of 2 or more SATA HDDs with RAID functions, please follow below steps.

**STEP 1: Set up UEFI.**

A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.

B. Set the “SATA Mode” option to [RAID].

C. Click [F10] to save and exit.

**STEP 2: Use “RAID Installation Guide” to set RAID configuration.**

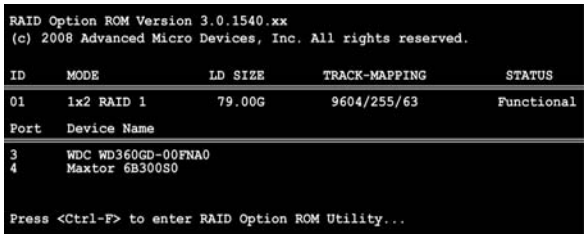
Before you start to configure RAID function, you need to check this RAID installation guide for proper configuration. Please refer to the BIOS RAID installation guide part in this document for details.

**STEP 3: Make a SATA Driver Diskette. (Please use an USB floppy or a floppy disk.)**

**STEP 4: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.**

## 1.4 Create Disk Array

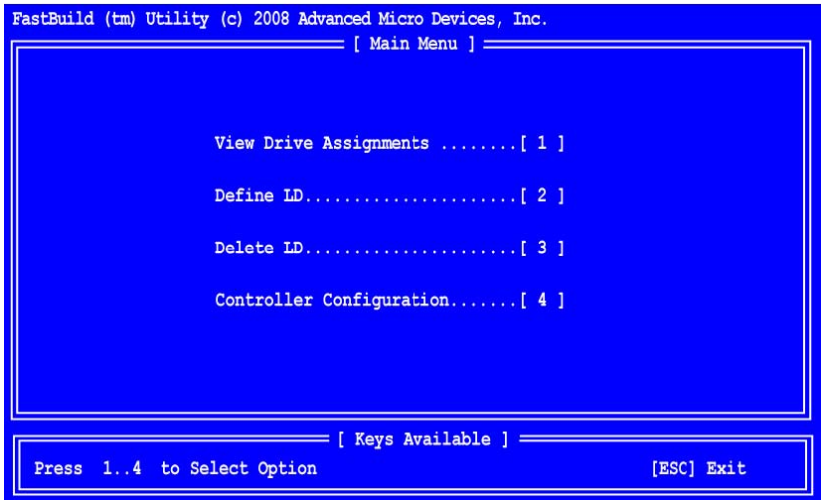
Power on your system. If this is the first time you have booted with the disk drives installed, the AMD onboard RAID Option ROM Utility will display the following screen.



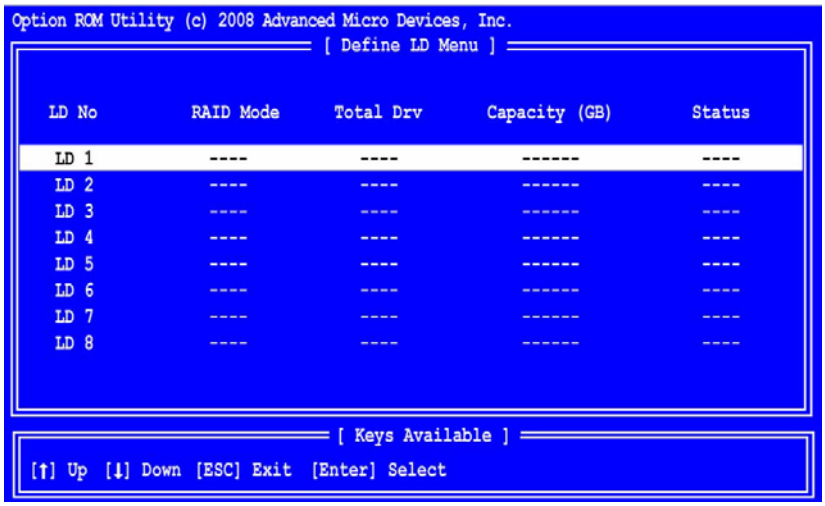

The RAID Option ROM includes a Utility with tools to set up your physical drives as RAID logical drives. The RAID Option ROM Utility can perform these functions:

- Monitoring RAID status
- Viewing physical drive assignments
- Secure erasing of all data on physical drives
- Creating RAID logical drives
- Creating multiple logical drives using the same physical drives
- Deleting RAID logical drives
- Diagnosing critical and offline RAID logical drives
- Displaying the IRQ and base address (for system diagnosis)

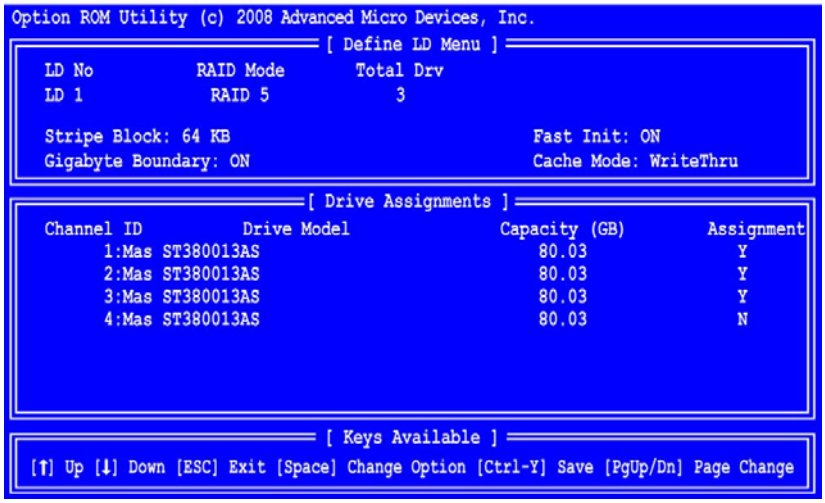
Press <Ctrl+F> keys, then the RAID Option ROM Utility Main Menu appears.



Press 2 on the Main Menu screen to display the Define LD Menu.




Press the arrow keys to highlight a logical drive number you want to define and press <Enter> to select it. The Define LD Menu for the logical drive number you selected will next appear.

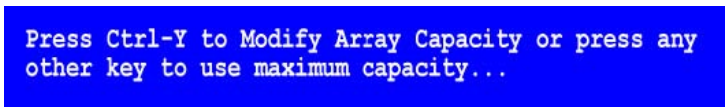



Choose the RAID level you want. In the Define LD Menu section, press the spacebar to cycle through logical drive types, including RAID 0, RAID 1, RAID 5 and RAID 10.

**WARNING!!**

While you are allowed to use any available RAID level for your bootable logical drive, it is recommended to use RAID 1 for most applications.

Press the arrow key to move to Disk Assignments. Press the spacebar to toggle between N and Y for each available drive. Y means this disk drive will be assigned to the logical drive. Assign the appropriate number of disk drives to your logical drive. Then press <Ctrl-Y> to save your logical drive configuration. You have the option of using all of the disk drive capacity for one logical drive or allocating a portion to a second logical drive.




Choose one of the following actions:

1. **Use the full capacity of the disk drives for a single logical drive**: Please read “One Logical Drive” below.
2. **Split the disk drives among two logical drives**: Please read “Two Logical Drives” below.

**One Logical Drive**

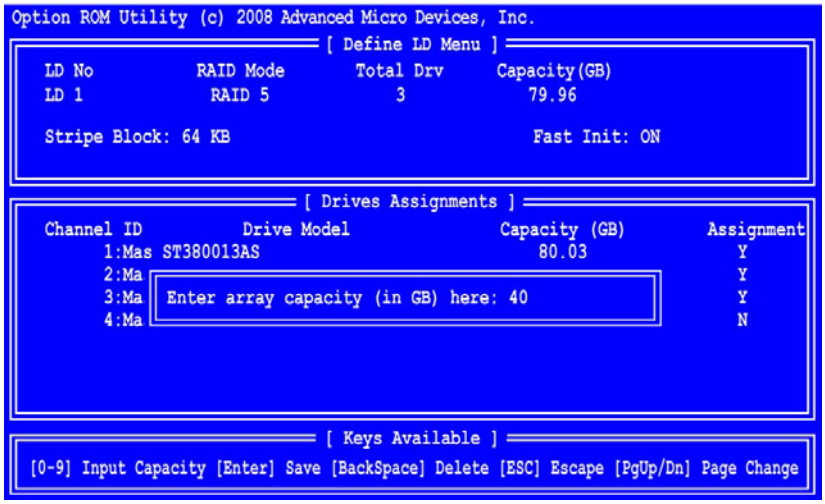
After selecting the logical drive in Disk Assignments as the above-mentioned procedures, press any key (except for <Ctrl-Y>) to use the full portion of the logical drive for one logical drive. Then please follow the steps below:

1. Press <Esc> to exit to the Main Menu.
2. Press <Esc> again to exit the Utility.
3. Press <Y> to restart your computer.

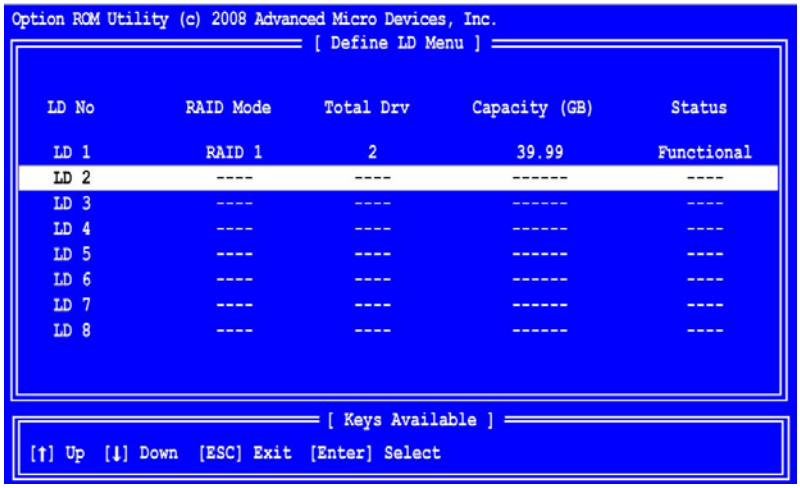
You have successfully created a new RAID logical drive. Please install the operating system to your computer by following the detailed instruction of the “User Manual” in our support CD or “Quick Installation Guide”.

**Two Logical Drives**

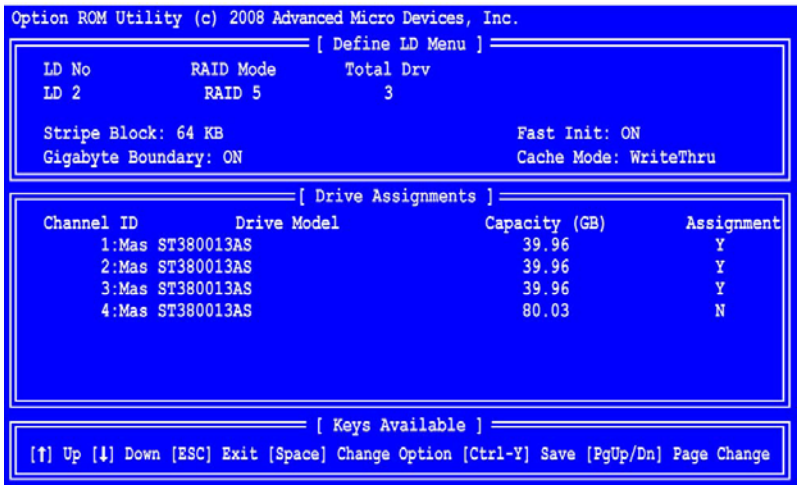
After selecting the logical drive in Disk Assignments as the above-mentioned procedures, press <Ctrl-Y> to allocate a portion of the disk drives to the first logical drive. Then please follow the steps below.



1. Enter the desired capacity (MB) for the first logical drive and press <Enter>. The Define LD Menu displays again.




2. Press the up and down arrow keys to select an available logical drive number and press <Enter>.




3. Choose the RAID level and options for the second logical drive. Note that the disk drives in Channels 1 and 2 reflect smaller capacities because a portion of their capacity belongs to the first logical drive. In this example the disk drives in Channels 3 and 4 are not assigned to a logical drive.
4. Press <Ctrl-Y> to save your logical drive configuration.
5. Press <Esc> to exit to the Main Menu. Press <Esc> again to exit the Utility.
6. Press <Y> to restart the computer.

You have successfully created a new RAID logical drive. Please install the operating system to your computer by following the detailed instruction of the “User Manual” in our support CD or “Quick Installation Guide”.

# 2. AMD Windows RAID Installation Guide

AMD Windows RAID Installation Guide is an instruction for you to configure RAID functions by using RAIDXpert RAID management software under Windows environment. The RAIDXpert software offers local and remote management and monitoring of all AMD SATA logical drives that exist anywhere on a network. Its browser-based GUI provides email notification of all major events/alarms, memory cache management, drive event logging, logical drive maintenance, rebuild, and access to all components in the RAID configuration (server, controller, logical drives, physical drives, and enclosure). RAIDXpert is designed to work with AMD SATA RAID controllers. Other brands of RAID controllers are not supported. Please read this guide carefully and follow the instructions below to configure and manage RAID functions.

## 2.1 Components of RAIDXpert Installation Software

RAIDXpert installation software will install two major components to your system:

1. RAIDXpert RAID management software: The RAIDXpert software installs on the PC with the AMD SATA RAID Controller (the “Host PC”).
2. Java Runtime Environment (in a private folder): The RAIDXpert installation program installs a private JRE in folder _jvm under the same directory where RAIDXpert is installed. RAIDXpert uses this private JRE to avoid incompatibility issues with any other JREs that may be present on your system.

## 2.2 Browser Support

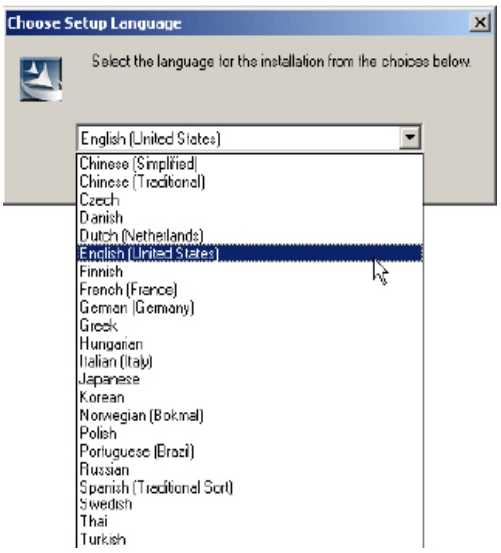
On the Host PC with the AMD Controller, where you install RAIDXpert, you must have one of the following browsers: Internet Explorer 6.0, Mozilla Suite 1.7, Mozilla Firefox 1.0, or Netscape Navigator 7.1.

If you do not have one of the above browsers, install the browser first and make it the default browser. Then install RAIDXpert. You must use one of the browsers listed above on your networked PC in order to access RAIDXpert over the network.

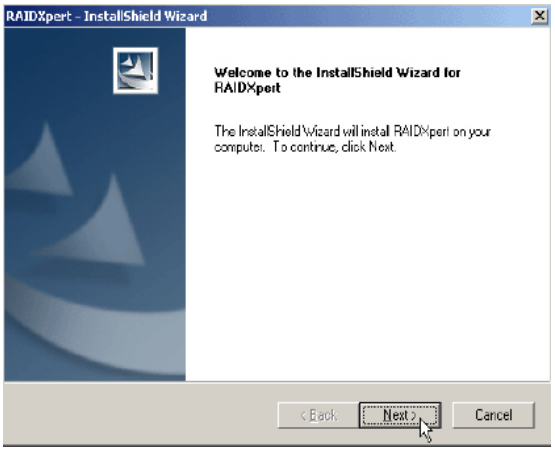
## 2.3 Installing RAIDXpert

Follow these steps to install RAIDXpert on your Windows-based PC or Server.

1. Boot the PC or server, launch Windows, and log in as the Administrator. If the computer is already running, exit all programs. If you are not logged in as the Administrator, log out, then log in again as the Administrator.
2. Insert the software CD into your CD-ROM drive.
3. Double-click the Install CD’s icon to open it.
4. Double-click the Installer icon to launch it (right). The first RAIDXpert installation dialog box appears.
5. Follow the prompts in the installation dialog boxes.
6. When the first installation screen appears, choose an installer language from the dropdown menu.



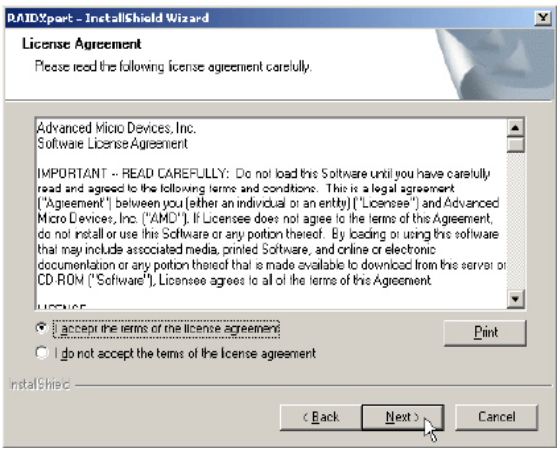

7. When the Welcome screen appears, click the **Next** button.




8. When the License Agreement screen appears, click the “I accept the terms of the license agreement” option to proceed with installation. Then click the **Next** button to continue.

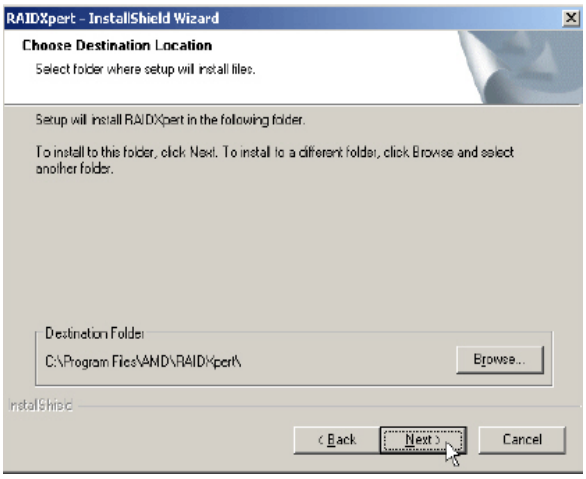
**Note:**

If you leave the “I do not accept the terms of the license” option selected, the installation will quit when you click **Next**.



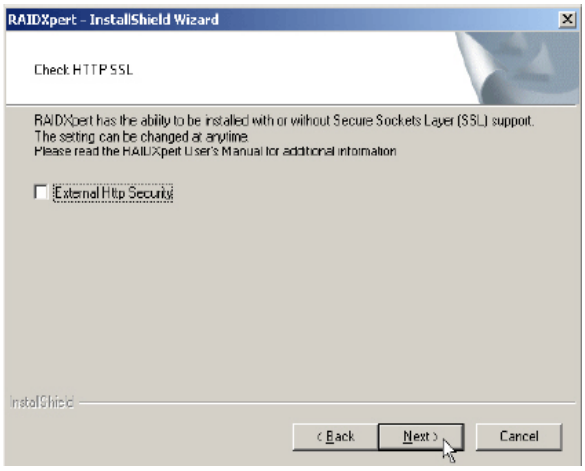
9. When the Choose Install Folder screen appears, make your selection of a folder for the RAIDXpert applications you are installing. For example, the Windows default folder is: **C:\Program Files\AMD\RAIDXpert**

   If you want a different folder, type its location or click the **Choose...** button and select a new location. Click the **Next** button when you are finished.

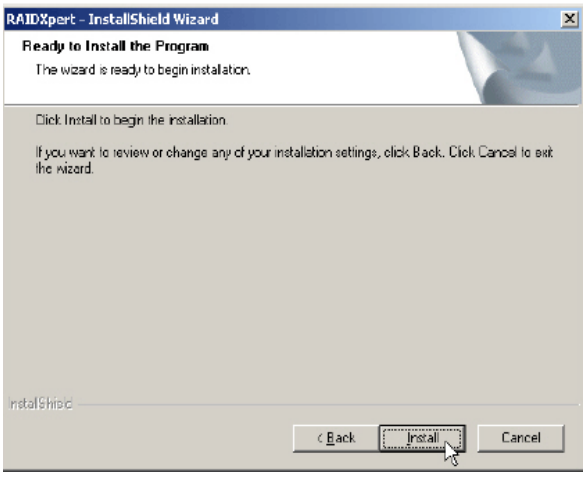



10. When the Check HTTP SSL screen appears, you can choose External Security. An explanation follows.

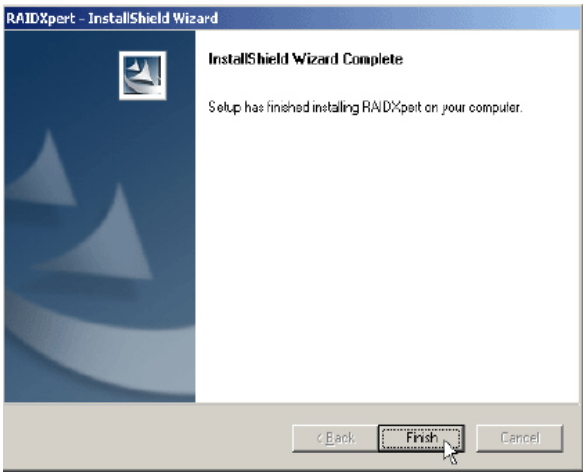
    **External SSL Security** – Applies security to all connections involving the Internet or outside your company firewall. Security options are invisible to authorized users. AMD provides a default certificate for the server as well as for internal data communication. However, in some cases it is better to install and verify your own certificate for the webserver. And, if possible, verify your certificate by certificate authority like Verisign or Thwate. See your MIS Administrator for guidance. Click the **Next** button when you have made your choice.




11. When the Ready to Install screen appears, click the **Install** button to continue.




12. When the Install Complete screen appears, click the **Finish** button.




## 2.4 Logging into RAIDXpert

Choose RAIDXpert in the Windows Programs menu. Or, log on manually with your browser:

1. Launch the Browser.
2. In the Browser address field, type the entry explained below.

   If you did *not* choose the External Security option during RAIDXpert installation, use the *Regular* connection.

   If you chose the External Security option during RAIDXpert installation, use the *Secure* connection.

## 2.5 Regular Connection

RAIDXpert uses an HTTP connection . . . . . .http://

• Enter the Host PC's IP address . . . . . .127.0.0.1 or localhost

• Enter the Port number . . . . . :25902

• Add to launch RAIDXpert. . . . . /amd

Together, your entry looks like this:

**http://127.0.0.1:25902/ati** or **http://localhost:25902/ati**

## 2.6 Secure Connection

RAIDXpert uses a secure HTTP connection . . . . . .https://

• Enter the Host PC's IP address . . . . . .127.0.0.1 or localhost

• Enter the Port number . . . . . :8443

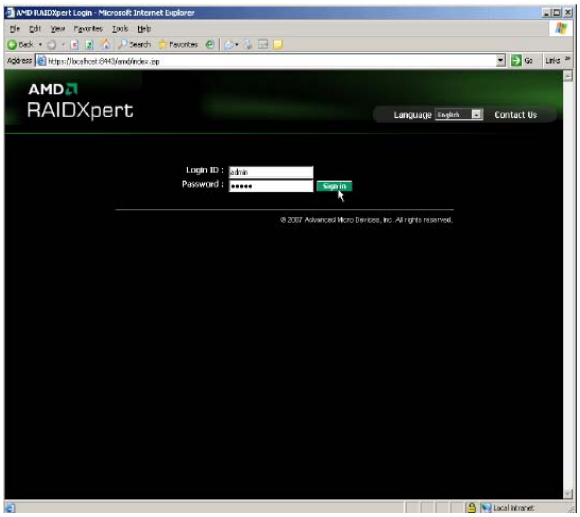
• Add to launch RAIDXpert. . . . . /amd

Together, your entry looks like this:

**https://127.0.0.1:8443/amd** or **https://localhost:8443/amd**

Note that the IP address shown above applies to a log-in at the Host PC. When you log in over a network, enter the Host PC's actual IP address or hostname.

Press the **Enter** key. Then, when the login screen appears, type **admin** in the Login ID field. Type **admin** again in the Password field. The RAIDXpert login and password are case sensitive.

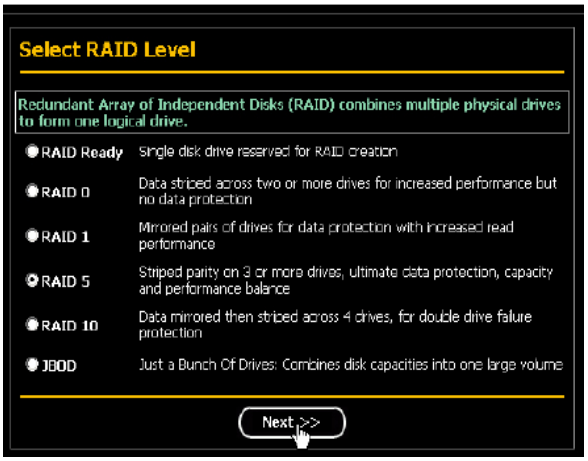



Click the **Sign in** button. After sign-in, the RAIDXpert opening screen appears.


## 2.7 Creating a New Logical Drive

A logical drive is a collection of physical drives in a RAID. To create a new logical drive:

1. Click **Logical Drive View** in Tree View.
2. Click the **Create** tab in Management View. The Select RAID Level screen appears.
3. Select the option beside the RAID level you want for your logical drive. RAIDXpert displays the RAID levels you can use with the available physical drives.




4. In the Select Drive Type screen, click the following option:

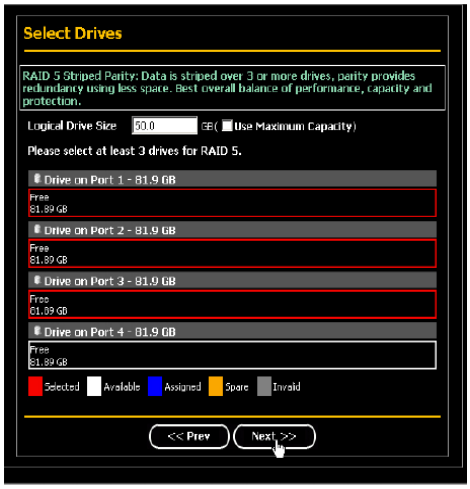
   • **Free Drives** – Select all Free (unassigned) physical drives

   The Select Drives screen appears.


5. Click the **Next** button.

6. If you want to split the capacity of your physical drives between two logical drives, enter the capacity for the first logical drive in the Logical Drive Size field. Or, to use the maximum capacity of the physical drives, check the Use Maximum Capacity box.


7. Click the physical drives to select them. Available drives have a black frame. Selected drives have a red frame.




8. Click the **Next** button. The Assign a Name screen appears.

9. Enter a name for the logical drive in the field provided.


10. Click the **Next** button. The Final Settings screen appears.

11. RAID 0, 5, and 10. Choose a Stripe Block Size from the dropdown menu. The choices are 64 and 128 KB. The Write Cache policy is None. You cannot change this setting.

12. RAID 0, 1, and 5. Select a Gigabyte Boundary policy from the dropdown menu.

    • **GigaByte Boundary** – Rounds the size of the logical drive down to the nearest whole gigabyte. This is the default. For more information.

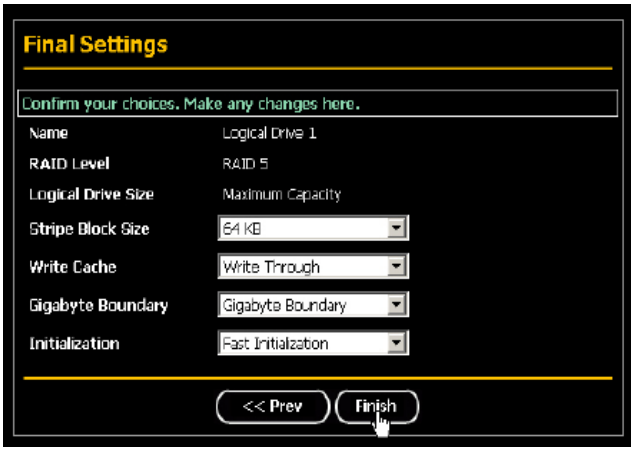
    • **None** – No Boundary function.

13. Select an Initialization policy from the dropdown menu.

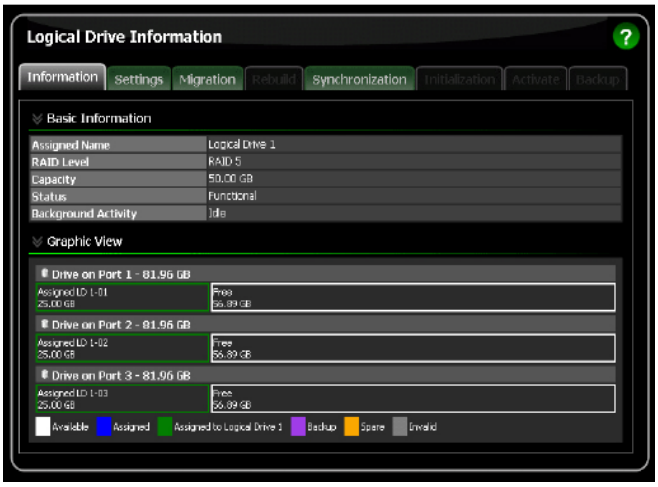
    • **Fast Initialization** – Erases the reserve and master boot sectors of the physical drives being added to the logical drive.

    • **Full Initialization** – Erases all sectors of the physical drives being added to the logical drive. RAID 0, 1 and 5 only.

    • **None** – No initialization. This choice is not recommended.




14. Click the **Finish** button. If there are physical drives available, the Select RAID Level screen appears again, where you can create an additional logical drive. Click the **Logical Drive** in Tree View to see all of the information about your new logical drive.




Before you can use your new logical drive, you must partition and format the logical drive using your PC's operating system.

## 2.8 Connecting to RAIDXpert from the Internet

The above instructions cover connections between the Host PC and other PCs using RAIDXpert over your company network. It is also possible to connect to a Host PC from the Internet.

Your MIS Administrator can tell you how to access your network from outside the firewall. Once you are logged onto the network, you can access the Host PC using its IP address.

Please note that only the Host PC can read and write data to the logical drives. However, other PCs can monitor the Host PC from virtually any location.

## 2.9 Running RAIDXpert without Network Connection

While RAIDXpert was designed to run over a network, you can run RAIDXpert without a network connection but only from the Host PC. Follow this procedure:

1. Choose RAIDXpert in the Windows Programs menu.Or choose RAIDXpert in the Linux Applications menu.Your browser opens and displays a "no connection to the Internet is currently available" message.
2. Click the Work Offline button.
3. In the RAIDXpert login screen, enter your user name and password (if used), then click the Sign in button. A "webpage unavailable while offline" message will display.
4. Click the Connect button. A "no connection to the Internet is currently available" message will display.
5. Click the Try Again button.

After a few moments, RAIDXpert will display normally in your browser.

## 3. Installing OS on a HDD Larger Than 2TB

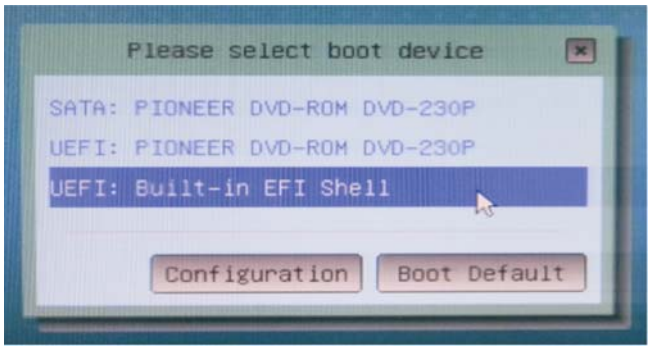
This motherboard is adopting UEFI BIOS that allows Windows® OS to be installed on a large size HDD (>2TB). Please follow below procedure to install the operating system.

1. Please make sure to use **Windows® Vista™ 64-bit (with SP1 or above)**, **Windows® 7 64-bit** or **Windows® 8 64-bit**.
2. Press <F2> or <Delete> at system POST. Set **AHCI Mode** in UEFI Setup Utility > Advanced > Storage Configuration > SATA Mode.
3. Choose the item **"UEFI:xxx"** to boot in UEFI Setup Utility > Boot > Boot Option #1. ("xxx" is the device which contains your Windows® installation files. Normally it is an optical drive.) You can also press <F11> to launch boot menu at system POST and choose the item **"UEFI:xxx"** to boot.
4. Start Windows® installation.

# 4. Installing OS on a HDD Larger Than 2TB in RAID Mode

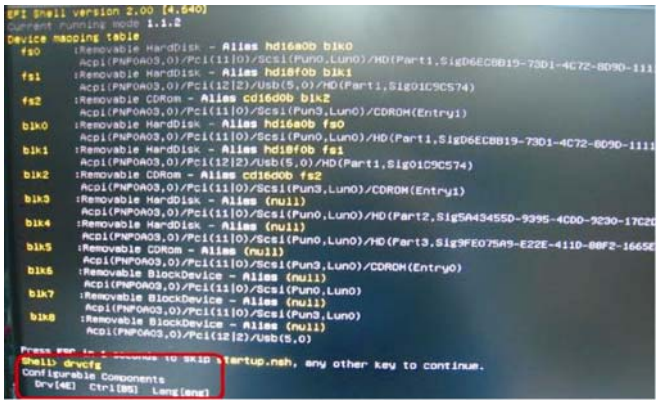
This motherboard is adopting UEFI BIOS that allows Windows® OS to be installed on a large size HDD (>2TB). Please follow below procedure to install the operating system.

1. Please make sure to use **Windows® Vista™ 64-bit (with SP1 or above)**, **Windows® 7 64-bit** or **Windows® 8 64-bit**.
2. Press <F2> or <Delete> at system POST. Set **RAID Mode** in UEFI Setup Utility > Advanced > Storage Configuration > SATA Mode.
3. Choose **onboard RAID 3TB+ unlocker** > **UEFI Mode For GPT partition**. Press <F10> to save the change and exit.
4. Press <F11> to enter Boot Menu. Choose **UEFI : Built - in EFI Shell**.

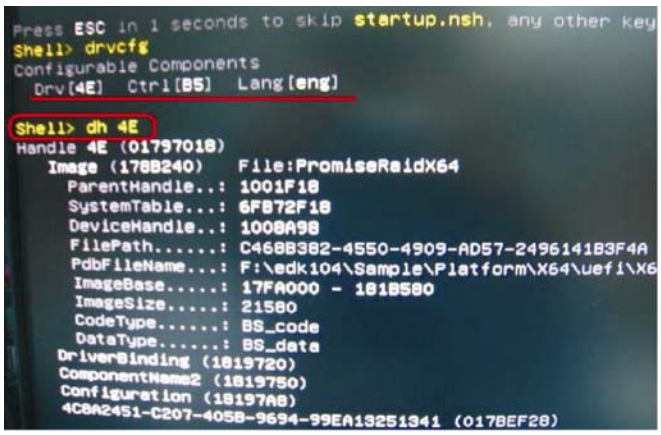



5. Key in **drvcfg**, for example you will see below:

   **Drv[4E] Ctrl[B5] Lang[eng]**

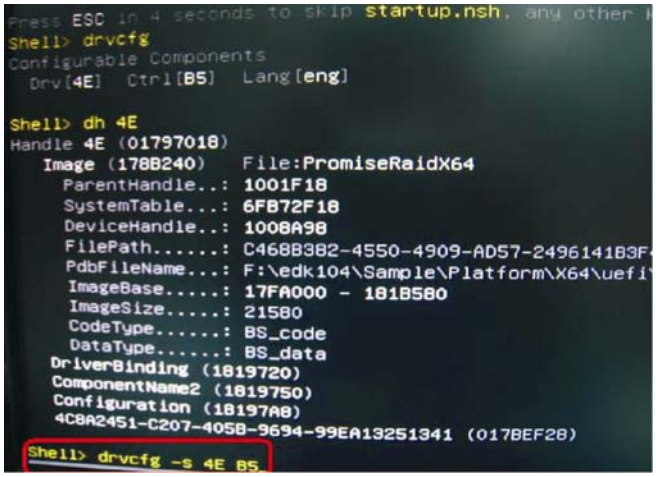



6. Key in **dh [Drv number]**, for example: key in **dh 4E**.

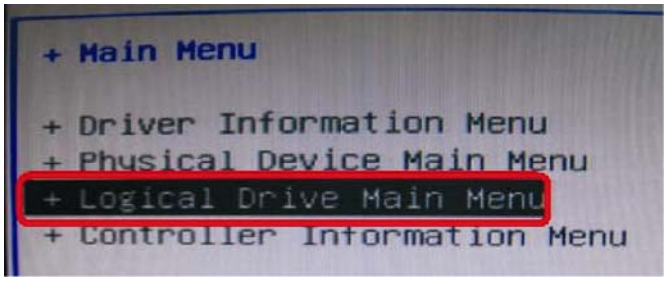



7. And then key in **drvcfg –s [Drv number] [Ctrl number]** to enter Raid Utility.

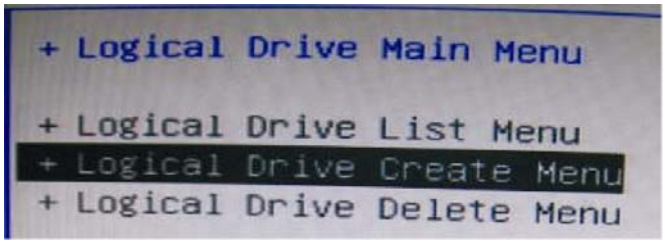
   For example: key in **drvcfg –s 4E B5**.




8. Choose **Logical Drive Main Menu** to set up Raid Drive.

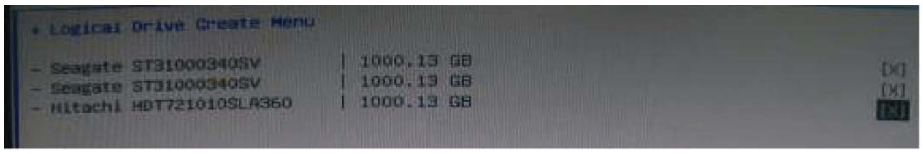



9. Choose **Logical Drive Create Menu** to create a Raid Drive.

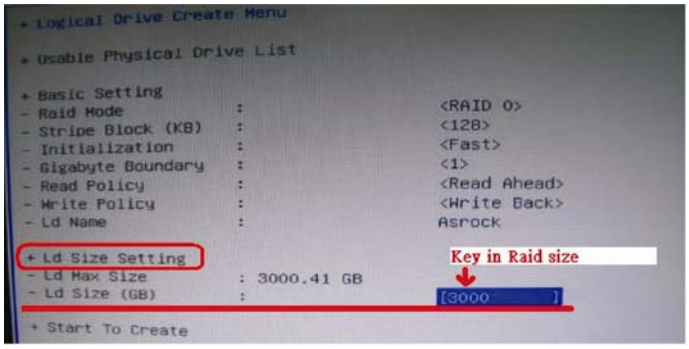



10. Choose **Usable Physical Drive List** to select Raid HDD.

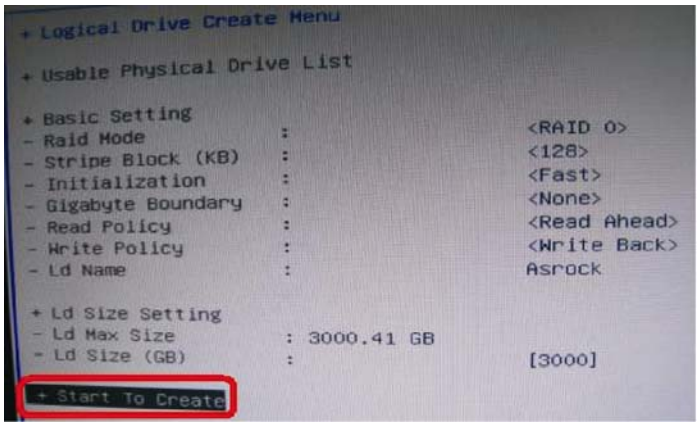

11. Press **Space** on keyboard to toggle checkbox.




12. Choose **Ld Size setting**, and key in the Raid size.

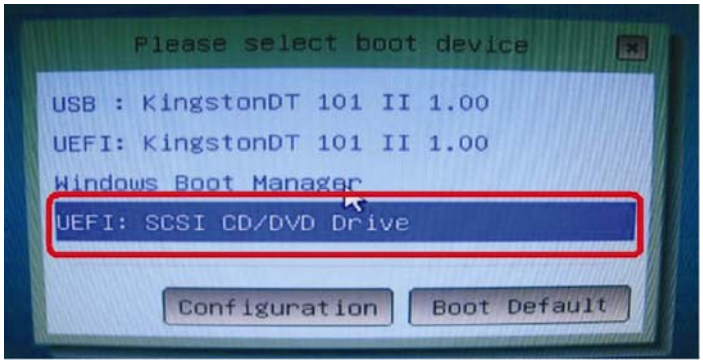



13. After set up Raid size, please click **Start to Create**.




14. Press <F10> to exit Utility.

15. During reboot, please press <F11> to enter Boot Menu. Choose **UEFI: SCSI CD/DVD Drive**.




* This option only shows on Windows® 8 64-bit, 7 64-bit and Vista™ 64-bit OS.

16. Follow Windows® Installation Guide to install OS.

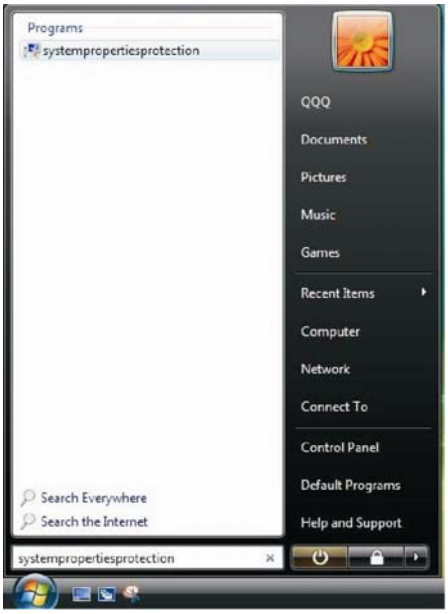
If you install Windows® 8 64-bit / 7 64-bit / Vista™ 64-bit in a large hard disk (ex. Disk volume > 2TB), it may take more time to boot into Windows® or install driver/utilities. If you encounter this problem, you will need to following instructions to fix this problem.

**Windows® Vista™ 64-bit:**

Microsoft® does not provide hotfix for this problem. Below steps are Microsoft® suggested solution:

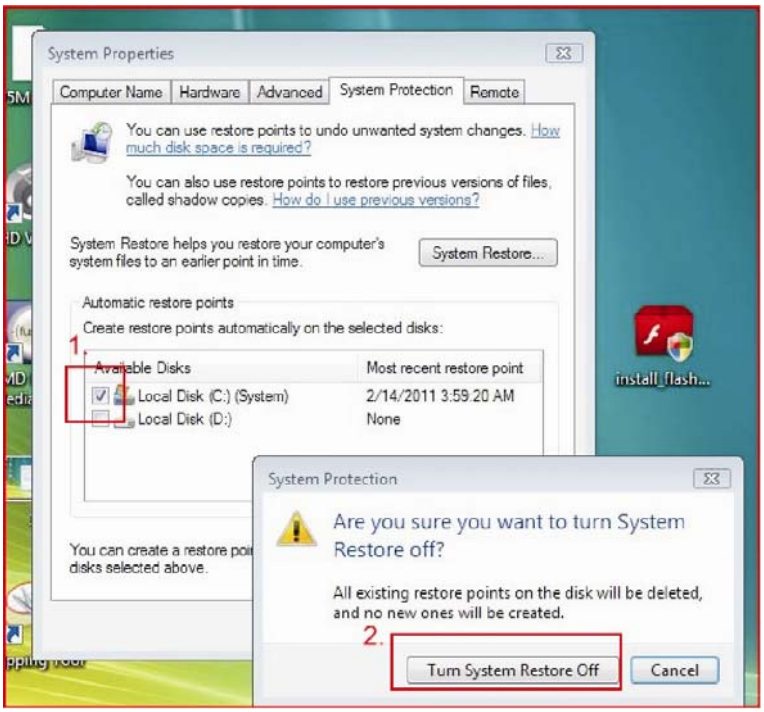
A. Disable System Restore.

a. Type “systempropertiesprotection” in the Start Menu. Then press "Enter".



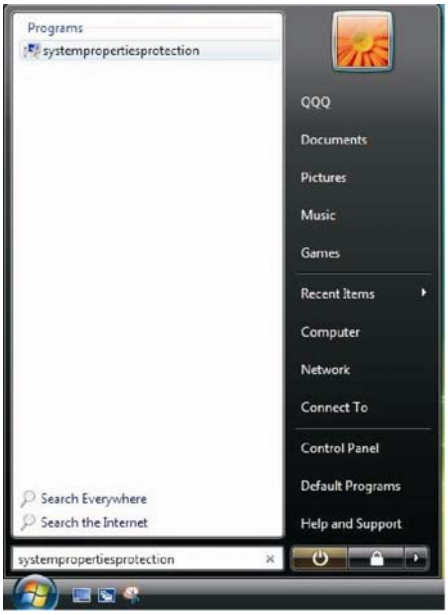

b. De-select Local Disks for System Restore. Then Click “Turn System Restore Off” to confirm.

Then Press “Ok”.

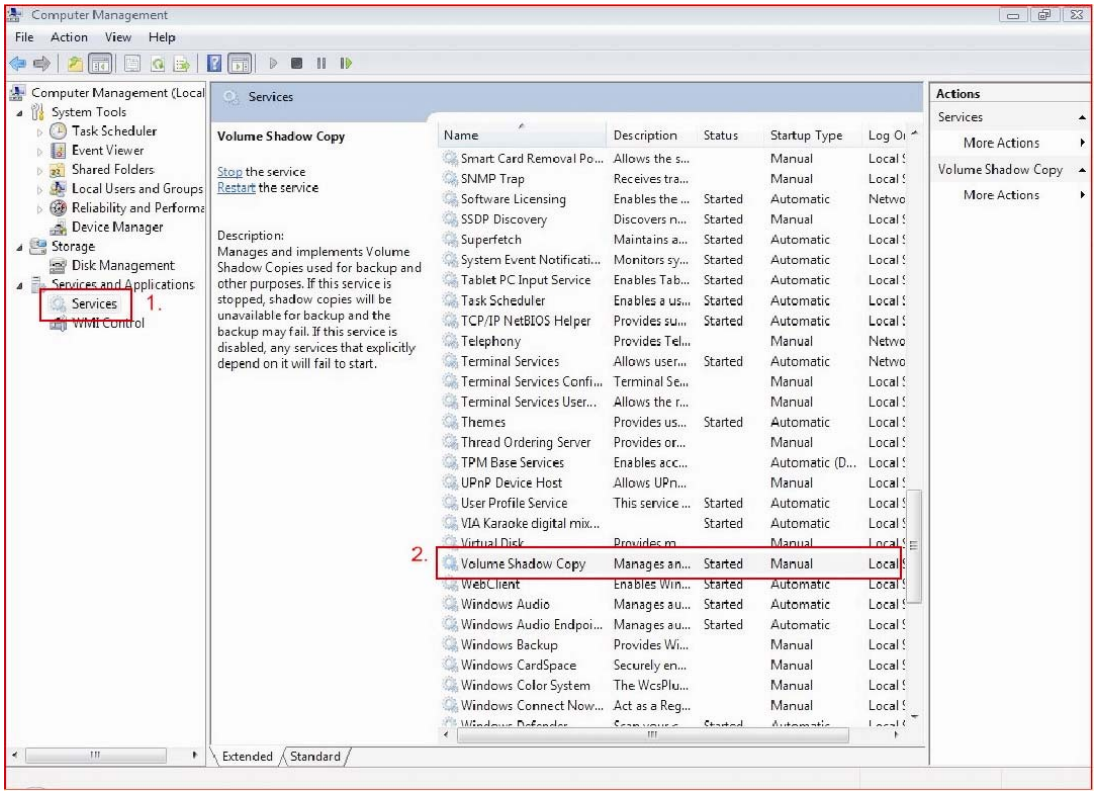



B. Disable “Volume Shadow Copy” service.

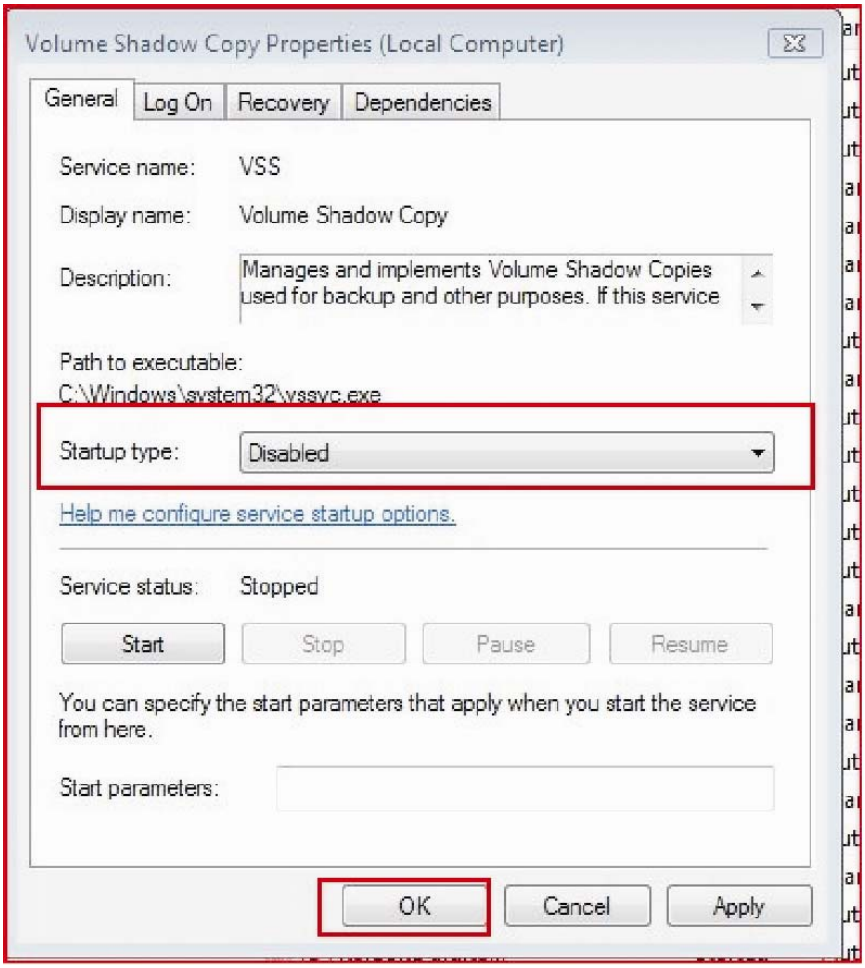
a. Type “computer management” in the Start Menu, then press “Enter”.




b. Go to “Services and Applications>Services”; Then double click “Volume Shadow Copy”.




c. Set “Startup type” to “Disable” then Click “OK”.



C. Reboot your system.

D. After reboot, please start to install motherboard drivers and utilities.

**Windows® 8 64-bit / 7 64-bit:**

A. Please request the hotfix KB2505454 thru this link: http://support.microsoft.com/kb/2505454/

B. After installing Windows® 8 64-bit / 7 64-bit, install the hotfix kb2505454.

(This may take long time; >30 mins.)

C. Reboot your system. (It may take about 5 mins to boot.)

D. The Windows® will install this hotfix then reboot by itself.

E. Please start to install motherboard drivers and utilities.

17. Finish.