KM-TB235

USER'S GUIDE

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Your perfect storage management partner in digital age!

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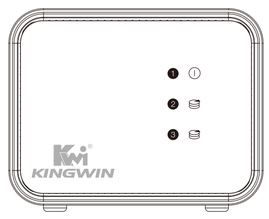
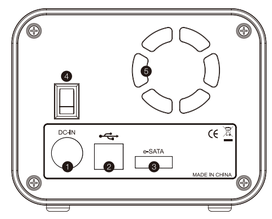
Front View



1. Power LED & Alarm LED :
   When blue lights on, it means the enclosure is activated.
   When purple lights on, it means the HDD volume degradation (RAID-1) or unavailability (Normal, Span / Big, RAID-0)
2. Upper hard disk status LED
3. Lower hard disk status LED

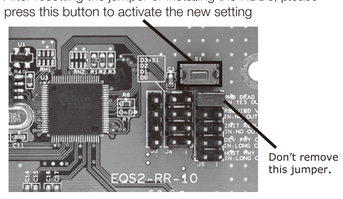
Rear View

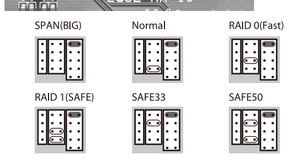


1. Power Input
2. USB 2.0 Port
3. eSATA Port
4. ON/OFF Power Switch
5. Fan

RAID setting & changing the RAID mode

After resetting the jumper or installing the HDDs, please press this button to activate the new setting





NOTE:
Changing the RAID setup will require you to re-format the drives. Make sure you backup all data before doing so!

Device LED Modes (Normal)

The KM-TB235 storage processor has two hard disk LEDs (SATA Port to hard disk). The table shows hard disk LEDs functions and operation in Normal mode.

Description	LED Blue	LED Red
HDD Unplugged / No Power	Off	Off
HDD Plugged (Idle)	On	Off
HDD Plugged (Activity)	On	Flash (On)

Device (Normal) LED Modes and Descriptions

Device LED Modes SPAN(BIG) , RAID 0 (FAST), RAID 1 (SAFE), SAFE33, SAFE50

The KM-TB235 storage processor has two hard disk LEDs (SATA Port to device). The table shows hard disk LED function and operation in SPAN(BIG), RAID 0 (FAST), RAID 1 (SAFE), SAFE33, SAFE 50 modes. These LEDs behave as follows:

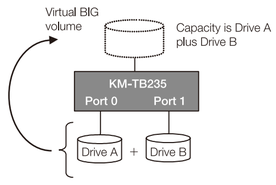
Description	LED Blue	LED Red
HDD Unplugged / No Power	Blink	Blink
HDD Plugged (Idle)	On	Off
HDD Plugged (Activity)	On	Flash (On)
Disk Rebuild (A Physical Partition is being Rebuilt; Safe Mode (RAID-1)	Blink	On
Disk Rebuild-Verify (A Physical Partition is being Verified; Safe Mode (RAID-1)	On	Flash (On) Will Appear As On
Error State Incorrect Serial Number One or More Bad Partial Volumes	Blink	Blink

LED Modes and Descriptions

SPAN (BIG)

The BIG storage policy concatenates a series of physical hard drives as a single large volume;resulting in a seamless expansion of virtual volumes beyond the physical limitations of singularly connected hard drives. KM-TB235 BIG storage policy delivers maximum storage space without a single large capacity and costly hard drive.

Hard drive A and B are concatenated into a single virtual volume in the Figure below with a storage capacity that is equal to the sum of each of the physical hard drives A and B.



BIG storage policy sample configuration

It is also possible to create a BIG volume using only a single hard disk drive connected to Port 0, and then increase the storage capacity of the volume later by adding another hard disk drive (or another KM-TB235 Storage Processor with at least one hard disk drive) to Port 1 and pressing the Mode Change push-button.

The new disk blocks of Port 1 will be concatenated to the end of the disk blocks of Port 0, and any data that is stored on the existing BIG volume will be preserved.

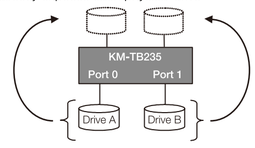
However, it is not possible to expand an existing BIG volume by adding another hard disk drive to Port 0 and still preserve any existing data on that volume.

Normal

The Normal storage policy enables each hard drive to be seen separately as one drive. When using a SATA host controller, Normal should only be used if the SATA host controller provides Port Multiplier (PM) support. If a host is not PM-aware, only a single drive is presented (drive 0). No such limitation if using a USB host connection.

Normal storage policy is available in the KM-TB235 Manager for a standalone (non-cascaded) Storage Processor or the top-level node of a cascaded configuration, but not for subordinate nodes. Even though you can use the rotary switch to select Normal mode for any node in a cascaded configuration, only the first Normal volume of any subordinate node is detected by your host. Therefore, selecting Normal mode for any subordinate node is not recommended.

In a Normal configuratution, the KM-TB235 Storage Reference Design directly exposes each physical drive.



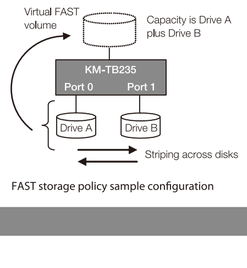
Normal storage policy sample configuration

RAID 0 (FAST)

The FAST storage policy distributes access across all hard disks, also called striping (equivalent to RAID 0). FAST presents the best data speed but no data redundancy. FAST storage policy accelerates hard disk operating speed by using many disks in parallel. Hard drive data segments are written to different disks simultaneously which increases performance while sacrificing data redundancy.

To implement the FAST storage policy, KM-TB235 Storage Processor creates a single virtual volume that is striped across both hard drives, with a storage capacity that is equal to the sum of both hard disk drives.

It is possible to set any node within a cascaded configuration to FAST, although there is no perfmrance benefit when using multiple layers of striping.



FAST storage policy sample configuration

RAID 1 (SAFE)

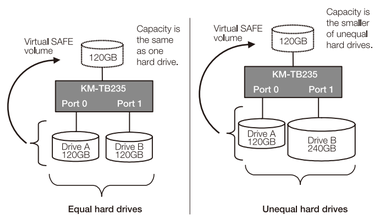
The SAFE storage policy stores all data in duplicate on separate drives to protect against data loss due to drive failure. One drive mirrors the other at all times, equivalent to RAID 1. Every write operation goes to both drives. SAFE provides the highest level of data protection for critical data that you cannot afford to lose if a hard drive fails, but halves the amount of storage capacity because all data must be stored twice. The resulting storage capacity of the virtual SAFE volume will be equivalent to the size of one hard drive (if both drives are the same) or the smaller of the two drives (if they are different).

If one drive fails, the SAFE volume is still usable, but it is in a vulnerable state because its mirrored hard drive is inaccessible. When the offline drive comes back online, the appliance begins a rebuild process immediately to restore data redundancy.

Although the volume remains available during the rebuild process, the volume is susceptible to data loss through damage to the remaining drive until redundancy is restored at the end of the rebuild and verification process. Host access takes precedence over the rebuild process. If you continue to use the SAFE volume during the rebuild, the rebuild process will take a longer time to complete, and the host data transfer performance will also be affected.

Any node within a cascaded configuration can be set to SAFE, but it is more efficient to use the SAFE policy at the lowest possible level within the hierarchy.

It is also possible to create a SAFE volume using one hard disk drive connected to Port 0 of the KM-TB235 Storage Reference Design although no mirroring will occur until a second hard disk drive is connected to Port 1. With only one hard disk drive connected, the SAFE volume will be available, although no data protection will be provided until a second hard disk drive is connected.



SAFE storage policy sample configuration

SAFE33

The SAFE33 storage policy creates two virtual volumes; one SAFE volume and one BIG volume, and should be used when you need the high reliability for some of your data (with the added overhead of mirroring) but you don't need high reliability for the remainder of your data.

SAFE33 reduces the cost of additional hard drives in operations where non-critical data could be lost without severe consequences.

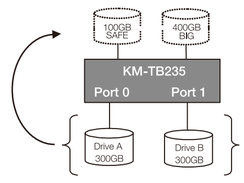
SAFE33 uses a SAFE volume that is mirrored across two hard drives to protect your critical data in the event a hard drive failure. If one drive fails the SAFE volume is retrievable although the BIG volume is not. When you replace the failed drive, the SAFE volume is automatically rebuilt on to the replacement drive.

For example, if you are using a video editing application that stores the primary source data and also uses some temporary storage for editing, you need protected storage that is offered by SAFE for the primary source data, but you do not need protected storage for the temporary data.

Therefore, the combination of SAFE and BIG would be the most efficient utilization of your available storage capacity. If either hard drive fails the primary data stored on the SAFE volume would still be available whereas the temporary data stored on the BIG volume would be lost.

The size of the SAFE volume of a s SAFE33 policy will be 1/3 of the size of one hard drive (if they are equal) or 1/3 of the size of the smaller (if they are not equal). The size of the BIG volume will be the combination of all remaining capacities.

Example
In figure below, assume that Drives A and B are 300 GB each. When the SAFE33 Storage Policy is selected, the resulting virtual volumes will include SAFE volume of 100 GB (1/3 of 300 GB) and a BIG volume of 400 GB (the remaining capacity after allocating 100GB from each of the hard drives).



SAFE33 storage policy sample configuration

When using a SATA host connection, you must have a PM (Port Multiplier) aware host adapter when using SAFE33 on the top level node of a cascaded configuration so that ALL volumes can be detected by the host. If your SATA host adaptor is not PM aware, then ONLY the SAFE volume will be detected and the BIG volume will not be accessible. No such limitation exists when using a USB host connection.

For subordinate nodes in a cascaded configuration, it is possible to configure a SAFE33 storage policy, although you will only see the SAFE volume from that node. Therefore, the SAFE33 storage policy should only be used at the top-level node of a cascaded configuration.

SAFE50

The SAFE50 storage policy creates two virtual volumes; one SAFE volume and one BIG volume, and should be used when you need the high reliability for some of your data (with the added overhead of mirroring) but you don't need high reliability for the remainder of your data.

SAFE50 reduces the cost of additional hard drives in operations where non-critical data could be lost without severe consequences.

SAFE50 uses a SAFE volume that is mirrored across two hard drives to protect your critical data in the event a hard drive failure. If one drive fails the SAFE volume is retrievable although the BIG volume is not. When you replace the failed drive, the SAFE volume is automatically rebuilt on to the replacement drive.

For example, if you are using a video editing application that stores the primary source data and also uses some temporary storage for editing, you need protected storage that is offered by SAFE for the primary source data, but you do not need protected storage for the temporary data.

Therefore, the combination of SAFE and BIG would be the most efficient utilization of your available storage capacity. If either hard drive fails the primary data stored on the SAFE volume would still be available whereas the temporary data stored on the BIG volume would be lost.

The size of the SAFE volume of a SAFE50 policy will be one-half of the size of one hard drive (if they are equal) the size of the BIG volume will be the combination of all remaining capacities.

Example
In figure below, assume that Drives A and B are 300 GB each. When the SAFE50 Storage Policy is selected, the resulting virtual volumes will include SAFE volume of 150 GB (1/2 of 300 GB) and a BIG volume of 300 GB (the remaining capacity after allocating 150 GB from each of the hard drives).

SAFE50 storage policy sample configuration

When using a SATA host connection, you must have a PM (Port Multiplier) aware host adapter when using SAFE50 on the top level node of a cascaded configuration so that ALL volumes can be detected by the host. If your SATA host adaptor is not PM aware, then ONLY the SAFE volume will be detected and the BIG volume will not be accessible. No such limitation exists when using a USB host connection.

For subordinate nodes in a cascaded configuration, it is possible to configure the SAFE50 storage policy, although you see the SAFE volume from that node. Therefore, the SAFE50 storage policy should only be used at the top-level node of a cascaded configuration.

System Requirements

PC user
- Intel Pentium-III 500MHz equivalent or faster
- USB 1.1/2.0 equipped PC; Windows 2000, XP, Vista

Mac user
- PowerMac G5, MacBook Pro or Mac Pro
- USB 1.1/2.0 equipped Mac; Mac OS 9.2, 10.1.5 or above

Connection to Computer

1. Open the enclosure; assemble two hard disks into enclosure. Please refer to retail box for assembling procedure.

2. Plug the power supply into an AC outlet and connect the power cable to the KM-TB235.

3. Decide which interface cable you will use:

A. eSATA Connection:
   Connect the eSATA cable to your computer & to KM-TB235
B. USB 2.0 Connection:
   Connect the USB 2.0 cable to your computer & to KM-TB235

NOTE:
If both a USB and an eSATA cable are connected, the USB connection will remain active and the eSATA connection will be disabled.

4. Turn on the KM-TB235 by moving the power switch on the back to the ON position.

5. Push the reset button to reset the setting of HDDs.

6. The device will restart automatically and OS will recognize the HDDs

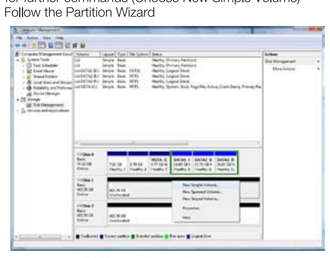
7. Refer to "Partitioning & Formatting" chapter to format the disks

The KM-TB235 is configured in SPAN/BIG mode. If you would like to change the RAID mode, see the RAID Setting & Changing.

Partitioning & Formatting

Be aware that this will destroy all your existing data on the drive, so make sure you have a backup! This step is usually only required the first time you install a factory new hard drive, if you change the format or want to erase all data on your drive.

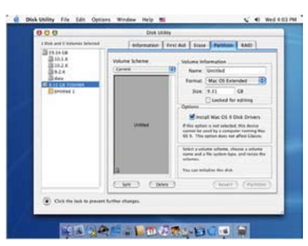
Windows 2000 or XP or Vista
- Right click on "**My Computer**" and choose "**Manage**"
- Select "**Disk Management**"
- Choose the drive you want to format and right click on it for further commands (Choose New Simple Volume)
- Follow the Partition Wizard



For Windows2000 or XP or Vista, we recommend formating the drive using the NTFS file system.

Mac OS

- Select "Disk Utility" in the utilities folder
- Choose your external drive and format it according to your requirement.



For Mac OS X, we recommend formatting the drive using the native Mac file system HFS+

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