



# Highly Reliable

S Y S T E M S



## 2 Bay Rack-mount and Mini-Tower AMT™ *with USB 3.0*

*Documentation Supplement V1.4*

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# READ THIS FIRST

## **Important Quick Start Information for your 2 Bay AMT system**

- The latest Service Packs are important! Microsoft has continued to Debug removable drives on the Windows 2000, XP, 2003 and Vista product lines. If you do not have Service Pack 4 on Windows 2000 or Service Pack 2 on XP you may have problems. For example, XP machines without Service Pack 2 cannot properly recognize drives above 137GB. While it may appear to work, the drive will corrupt data when it fills above that level. Read the manual or our web site for more details.
- Not all eSATA ports are created equal. We recommend that only controllers based on the Silicon Image chip set for maximum compatibility are used. Other eSATA ports may only recognize the first drive in a multi-drive system or may not function at all.
- For troubleshooting on the most common problems, please see our website here:  
<http://high-rely.com/HR3/includes/SupportReadFirst.php>
- Particular photos in this manual may not be your exact unit.

***Although the 2 Bay AMT units may work with Windows, Linux, Mac OS X and other operating systems, at this time, our tech support can assist with Windows platforms only.***

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## 1 - Introduction.

High-Rely's 2 Bay AMT products are unique backup products which provide your backup strategy with a large, reliable, redundant means of near-line storage as well as a removable means of storing data for off-site backups. With the our 2 Bay AMTs, your backup can be both near-line and off-site without the addition of any software or configuration. This is because the 2 Bay AMTs have a built-in hardware RAID controller which can mirror (copy) the drives in your unit automatically. Thus, you're free to remove one of the drives for off-site storage while the other remains on-line to your host. Removal and replacement of the off-site drive will not interfere or even alert the host that anything has changed because the drive will never go off-line during a drive change. As far as your host computer is concerned, the 2 Bay AMT device is a single stand-alone drive (when set to RAID 1/10). Thus, special software drivers or backup software configuration is unnecessary making a 2 Bay AMT very portable from host to host.

For maximum interoperability, the the 2 Bay AMTs are also capable of accepting either a USB 2.0, USB 3.0 (Super Speed) or an eSATA connection to your host computer.

Additionally, the RAID 1 (mirror) configuration will tolerate a single drive failure without loss of data (provided the drive failure does not occur during a rebuild/copying process).

There is no information written to either drive by the RAID controller which interferes with the drive being read by another computer without special hardware or software – if our media is all you have your data can still be retrieved.

## **2 - Terminology.**

The definition of some simple terms will help in understanding this manual:

- Hard Disk – The actual hard disk drive where data is stored.
- Tray – The removable cartridge which holds the hard disk.
- Media – The assembly of the hard disk in the tray. Often times, the term “Drive” refers to media.
- Receiver – Also referred to as the bay. The slot where the Media is inserted.

### 3 - Front Panel Features.



*Figure 1. 2 Bay AMT Front Panel*



*Figure 2. 2 Bay Mini-Tower AMT Front Panel*

The 2 Bay AMT's capacity, flexibility, choice of USB or eSATA and its convenient use of sata media in stand-alone drive storage systems plus the benefits of RAID 1 data protection make 2 Bay AMTs a unique and superior proposition in the set of tools used by today's businesses for data storage and backup.

## 4 - Choosing media sizes.

The media size you chose for the 2 Bay AMT should be the same size across the whole set of media. For example, all 750 GB Seagate drives. The 2 Bay AMT will not mirror data from a larger drive to a smaller drive which may limit some of your backup options. Keeping all media the same size avoids this road block. However, 2 Bay AMT units are capable of mirroring from a smaller hard drive to a larger one. This allows for larger replacement media in the future if the current size is no longer available.

## 5 - Connecting a 2 Bay AMT to your computer.

The first order of work is to install a controller card in your host computer. If you're using USB 2.0 or USB 3.0, this may not be necessary as your system may already have such a port available. USB 2.0 is considerably slower than USB 3.0 and may not offer the performance you require. If indeed USB 2.0 is too slow for your application, then USB 3.0 or eSATA are necessary as they are considerably faster. USB 3.0 and eSATA perform nearly the same.

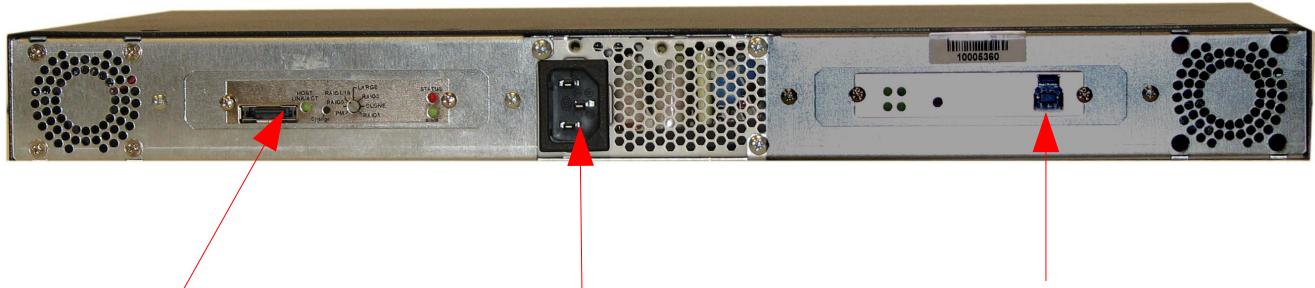
Many USB 3.0 HBA cards may require an extra power supply to the card. Be sure your computer has drive power connectors, either SATA or MOLEX power connectors, which can be adapted to fit most USB 3.0 controller power connectors.

**NOTE:** There are some slight operational differences if your unit is connected via USB instead of eSATA. If your unit is connected via USB, it is advised to leave at least one Media installed in the unit and running when swapping Media. This keeps the USB connection to the host open. If at any point, both Media are powered down/removed such that none remain on, it may be necessary to power cycle the unit after Media is inserted in order for the host to see the drives again. This is not an issue and this process is unnecessary if your unit is connected via eSATA. Also, when connected via USB, whenever a Media is inserted or removed, it is normal for the remaining devices to go offline momentarily then return.

If you're using eSATA, it is likely your computer does not have an eSATA port which meets the requirements of supporting hot-plug and port multiplier features. As this document is a supplement for the 2 Bay AMT functions only, to install your controller card into your host, please read the manual on your disk entitled "High-Reliability documentation for SATA systems", if you plan to connect to a SATA controller. Please read the manual on your disk entitled "High-Reliability documentation for USB systems" if you plan to connect with USB 2.0.

## 5.1 - Rear panel features.

There are three versions of both the Mini-Tower and RM AMT units (V1, V2 and V3). All three perform the same but have different back panels. V1 was released between February and April of 2011, V2 between April of 2011 and February of 2012. V3 is the current version as of the time of this writing. Identify the back of your device below then proceed further:



RAID control panel:  
eSATA connector

AC Power connector  
(business machine type  
plug)

USB 3.0 connector

*Figure X. Back of 2 Bay RM (Rack Mount) AMT V1*



Business machine  
chain outlet  
(usually not used).

AC Power  
connector  
(business  
machine type  
plug)



USB 3.0 connector

RAID control panel:  
eSATA connector

Figure X. Back panel of 2 Bay Mini-Tower AMT V1.

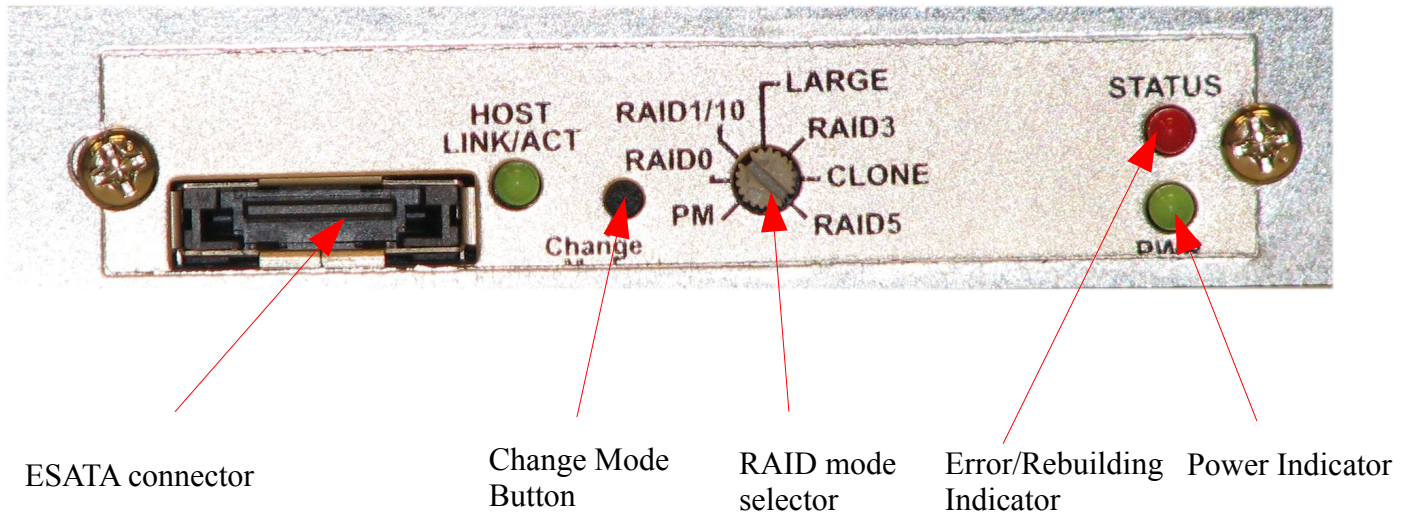
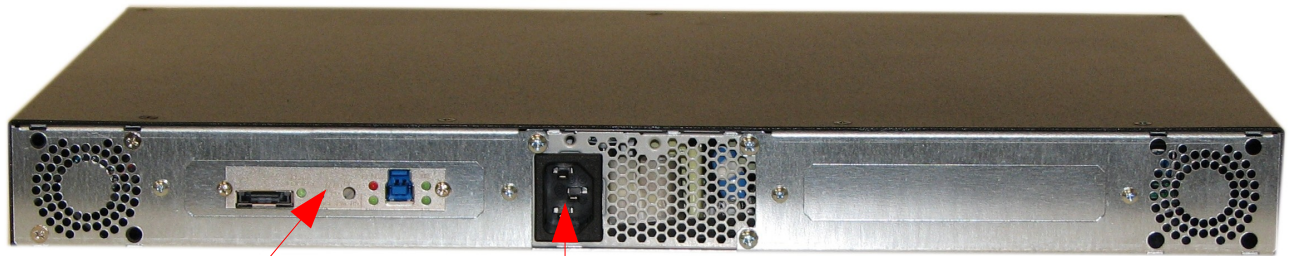


Figure X. Back panel detail of 2 Bay RM and Mini-Tower AMT V1.



RAID control panel:  
eSATA and USB 3.0  
connectors

AC Power connector  
(business machine type  
plug)

*Figure X. Back Panel of 2 Bay RM (Rack Mount) AMT V2.*



Business machine  
chain outlet  
(usually not used).

AC Power  
connector  
(business  
machine type  
plug)

RAID control panel:  
eSATA connector

*Figure X. Back Panel of 2 Bay MT (Mini-Tower) AMT V2.*

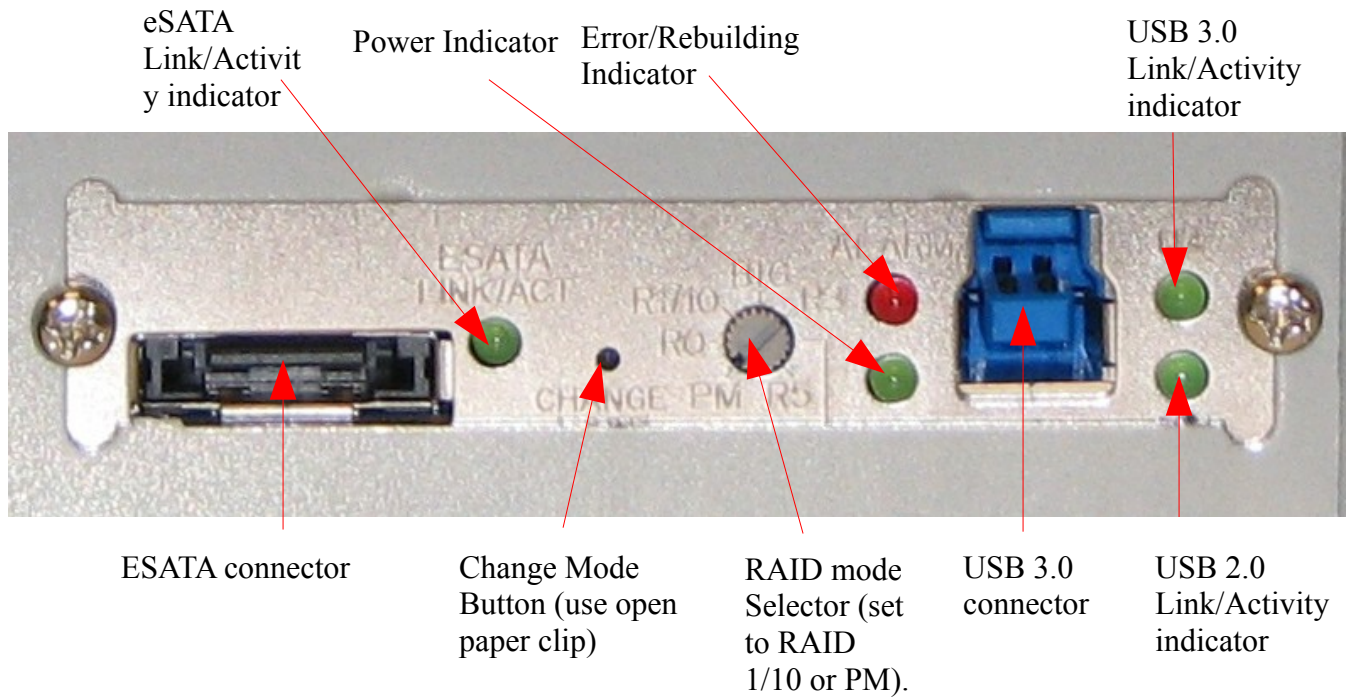
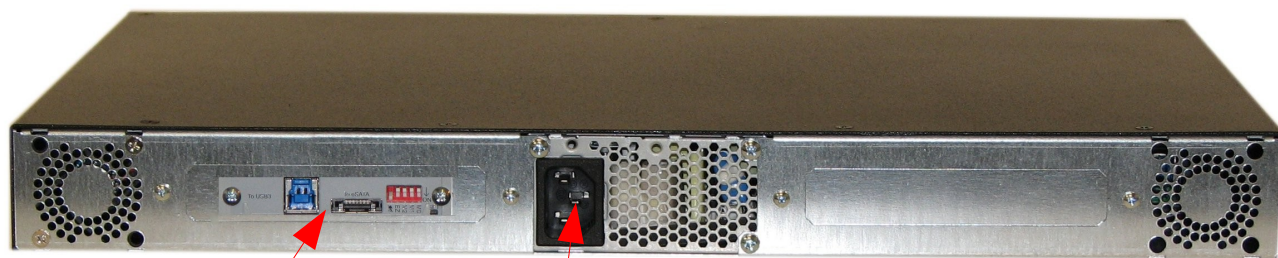


Figure X. Back control panel detail of AMT V2.





RAID control panel:  
eSATA and USB 3.0  
connectors

AC Power connector  
(business machine type  
plug)

*Figure X. Back Panel of 2 Bay RM (Rack Mount) AMT V3.*



Business machine  
chain outlet  
(usually not used).

AC Power  
connector  
(business  
machine type  
plug)

RAID control panel:  
eSATA connector

*Figure X. Back Panel of 2 Bay MT (Mini-Tower) AMT V3.*

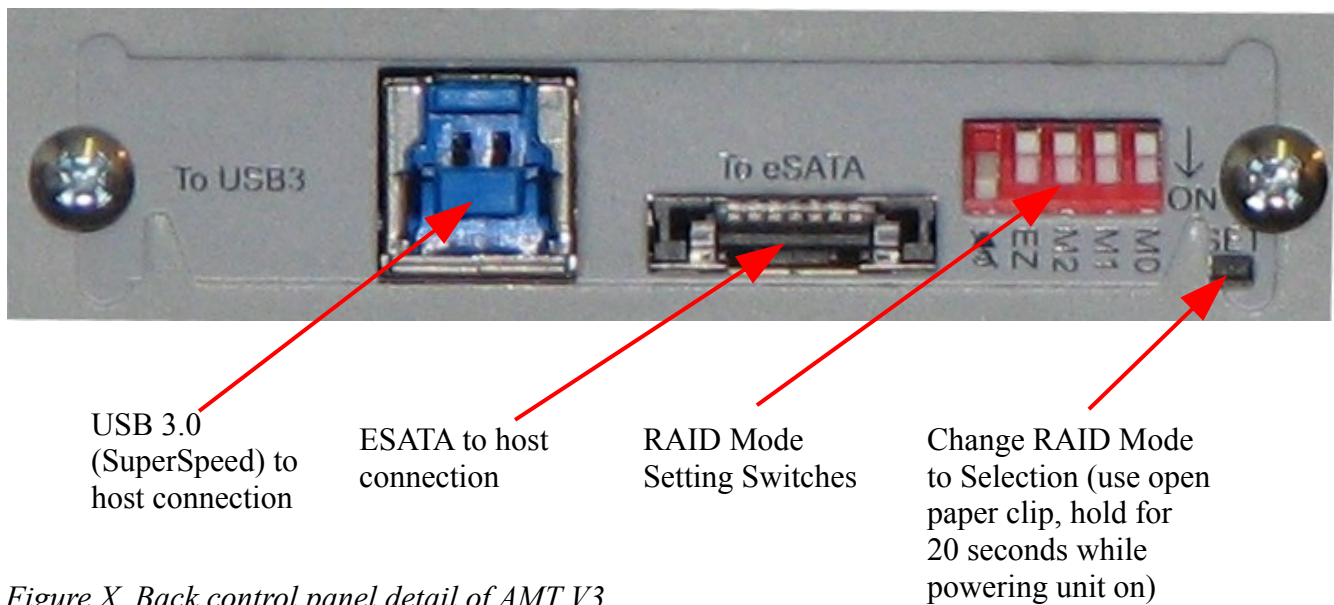


Figure X. Back control panel detail of AMT V3.

**WARNING!** Changing the RAID Mode can cause all data to be lost!!! Pick and set the RAID Mode prior to formatting and using the volume(s).

**Note:** JM RAID Manager software can be used to override the settings below as well as monitor the condition of the unit.

Mute (Speaker)	Off – Audible Alarm heard during degraded or failed conditions.	On – Audible alarm is muted -recommended.
EZ	Auto rebuild - Leave in OFF position	

RAID Type	Description	M0	M1	M2
PM (JBOD)	Individual Volumes. Bay 1, Bay 2	Off	Off	Off
RAID 0	<b>** Not Recommended.</b> Striped.	On	On	On
RAID 1/10	Mirror. Bay 1 and Bay 2 are mirrored.	Off	On	On
BIG	<b>** Not Recommended.</b> Concatenate.	On	Off	On

Figure X. Back control panel switch settings of AMT V3

## 5.2 - Connecting procedure

Make sure the 2 Bay unit is turned off. Connect the business machine power cord and either your eSATA or USB cables – ONLY one OR the other. Make sure your eSATA or USB is connected to your host. Turn power on.

The 2 Bay AMT allows for either a USB 2.0, USB 3.0 or an eSATA connection to the host computer. The 2 Bay AMTs support several different configurations (RAID0, RAID 1, PM). In RAID 0 or RAID 1, the 2 Bay AMT will appear to your host computer as a single drive. Because of this, a multi-drive (PM or Port multiplier aware) capable eSATA controller is not necessary. However, cards other than our tested High-Rely eSATA controllers may present other problems. This document will not explore all possibilities of configurations of the 2 Bay AMT. But, if you set the AMT to PM mode, your host's controller will need to be multi-drive (PM) capable if you're using eSATA. This means it must be able to see multiple drives through a single eSATA channel (connection). If you're using USB, this is not an issue.

The 2 Bay AMT system will automatically sense whichever port you plug into and operate from that port (USB or eSATA). However, even though both connectors are present, it will only function correctly through one port at a time. Thus only one of either type maybe plugged in at one time.

## 6 - Status indicators and changing backup drives (media) in RAID1 (Mirror Mode) for V1 (see next section for V2)

The factory configuration for the 2 Bay AMT is RAID 1 (Mirror). In this mode, the 2 Bay AMT will prepare off-site duplicates of your backup media (drive) automatically. Your master drive can be in either bay, but we suggest you choose one for consistency and to avoid confusion. Occasionally, you should swap out the other bay to keep the media cycling. Once the media has been synchronized by the AMT, it assumes that whichever media is left upon removal of the other is to be the master drive. Once the replacement media is inserted, it will copy the complete contents of the master drive to the replaced drive until they are synchronized once again.

The 2 Bay V1's behavior is slightly different depending on whether it is connected via USB or eSATA. Below are the FRONT panel status signals for each condition:

Connected Via	State	Left/Bottom Status Indicator	Power/Error Indicator	Right/Top Status Indicator
ESATA	Left/Bottom Media Out or Off	Off	Off	On-Green
USB	“	Off	On	On-Green
ESATA	Right/Top Media Out or Off	On-Green	Off	Off
USB	“	On-Green	On	Off
ESATA/USB	Replacement/new media installed and On in Left/Bottom bay and rebuilding.	Flashing Red	Flashing	On – Green flickering
ESATA/USB	Replacement/new media installed and On in Right/Top bay and rebuilding.	On – Green flickering	On	Flashing Red
ESATA	Disk Damaged	If Disk damaged, Status indicator Solid Red, otherwise Green	Off	If Disk damaged, Status indicator Solid Red, otherwise Green
USB	Disk Damaged	If Disk damaged, Status indicator Solid Red, otherwise Green	On	If Disk damaged, Status indicator Solid Red, otherwise Green

Figure 1. Table of FRONT Panel Status indicators and conditions for (RAID 1) Mirror Mode (AMT V1).



## 6.1 - Mini Tower unit

Will function like rack-mount unit described below. However, the Mini-Tower unit's power and error LED are separated. The power LED will always be lit if the unit has power. If there is an error, the RED error LED will come on. If the unit is mirroring, the RED error LED will flash until completed then go off.

## 6.2 - RackMount unit

When connected via eSATA, when the media to be replaced is switched off, the power light will go out. However if connected via USB, the power light remains lit. When the new media is inserted and mirroring begins, the power light will blink.

**NOTE:** if the Power light remains off or the Status light for the drive is RED for more than 1 minute beyond the time the replacement drive was inserted, then it is likely that the AMT is unable to use the replacement drive for some reason – either a failure or error was detected on the target drive, or the replacement is smaller than the master and therefore can not be used. The disk activity indicators on the LCD display will also show a rotating disk and may flicker the blue latch light bars if copying is occurring. Both indicators should be showing activity (the little disk image will appear to rotate) when mirroring is working.

**Assuming no problems and copying has started, during this copying period, if the Master drive is removed, permanent data loss or corruption can occur! Usually replacing the drive immediately will be OK if the host has not been writing during the mirroring process.**

Depending on the size of your drives, this copying (mirroring) can take between 1 and ½ hours to 12 hours or more (about 1 hour per 200 to 300 GB). Such will also depend on if your host is creating extra activity on the 2 Bay AMT while it is mirroring. This is because the AMT controller will grant priority to the host's disk requests, delaying it's own internal copying. The RAID Status indicator next to the drive being copied to will flash Red during this whole time. Once the light has ceased flashing red and remains on in the Green color, the drives are synchronized and either drive maybe removed provided the windows “safely remove” (or equivalent) procedure (this is outlined in the High-Rely eSATA or USB manual) is followed. If the blue indicators on the media itself or the disk graphic indicate activity or the green Drive Status indicator is flickering green, it may not be safe to remove the media as the host is performing operations, cease the host's operations before performing the removal.

## 7 - Status indicators and changing backup drives (media) in RAID1 (Mirror Mode) for V2 and V3

The factory configuration for the 2 Bay AMT is RAID 1 (Mirror). In this mode, the 2 Bay AMT will prepare off-site duplicates of your backup media (drive) automatically. Your master drive can be in either bay, but we suggest you choose one for consistency and to avoid confusion. Occasionally, you should swap out the other bay to keep the media cycling. Once the media has been synchronized by the AMT, it assumes that whichever media is left upon removal of the other is to be the master drive. Once the replacement media is inserted, it will copy the complete contents of the master drive to the replaced drive until they are synchronized once again. Once synchronized, subsequent writes by the host will write to both drives simultaneously.

The 2 Bay RM V2's behavior, unlike V1, is the same whether connected via eSATA or USB. Below are the FRONT panel status signals for each condition:

State	Left Status Indicator	Power/Error Indicator	Right Status Indicator
Left Media Out or Off	Off	Off	On-Green
Right Media Out or Off	On-Green	Off	Off
Both media out or off	Off	On	Off
Replacement/new media installed and On in Left bay and rebuilding.	Flashing Red	Flashing	On – Green flickering
Replacement/new media installed and On in Right bay and rebuilding.	On – Green flickering	On	Flashing Red
Disk Damaged	If Disk damaged, Status indicator Solid Red, otherwise Green	Off	If Disk damaged, Status indicator Solid Red, otherwise Green

Figure 1. Table of FRONT Panel Status indicators and conditions for (RAID 1) Mirror Mode (Rack Mount AMT V2 and V3).

Because the 2 Bay Mini Tower AMT V2 and V3's front panel power and error/rebuild indicators are separated (red and blue leds), it is slightly different for the above behaviors:

State	Bottom Status Indicator	Error/Rebuild Indicator (Red LED)	Top Status Indicator
Bottom Media Out or Off	Off	On	On-Green

Right/Top Media Out or Off	On-Green	On	Off
Both media out or off	Off	Off	Off
Replacement/new media installed and On in Top bay and rebuilding.	On – Green flickering	Flashing Red	Flashing Red
Replacement/new media installed and On in Bottom bay and rebuilding.	On – Green flickering	Flashing Red	Flashing Red
Disk Damaged	If Disk damaged, Status indicator Solid Red, otherwise Green	Off	If Disk damaged, Status indicator Solid Red, otherwise Green

Figure x. Table of FRONT Panel Status indicators and conditions for (RAID 1) Mirror Mode (Mini-Tower AMT V2 and V3).

**Mini Tower:** Will function like rack-mount unit described below. However, the Mini-Tower unit's power and error LED are separated. The power LED will always be lit if the unit has power. If there is an error, the RED error LED will come on. If the unit is mirroring, the RED error LED will flash until completed then go off.

**RackMount unit:** When connected via eSATA, when the media to be replaced is switched off, the power light will go out. When the new media is inserted and mirroring begins, the power light will blink.

**NOTE:** if the Power light remains off on the RM unit, the Red error light remains on, or the Status light for the drive is RED for more than 1 minute beyond the time the replacement drive was inserted, then it is likely that the AMT is unable to use the replacement drive for some reason – either a failure or error was detected on the target drive, or the replacement is smaller than the master and therefore can not be used. The disk activity indicators on the LCD display will also show a rotating disk and may flicker the blue latch light bars if copying is occurring. Both indicators should be showing activity (the little disk image will appear to rotate) when mirroring is working.

**Assuming no problems and copying has started, during this copying period, if the Master drive is removed, permanent data loss or corruption can occur! Usually replacing the drive immediately will be OK if the host has not been writing during the mirroring process.**

Depending on the size of your drives, this copying (mirroring) can take between 1 and ½ hours to 12 hours or more (about 1 hour per 200 to 300 GB). Such will also depend on if your host is creating extra activity on the 2 Bay AMT while it is mirroring. This is because the AMT controller will grant priority to the host's disk requests, delaying it's own internal copying. The RAID Status indicator next to the drive being copied to will flash Red during this whole time. Once the light has ceased flashing red and remains on in the Green color, the drives are synchronized and either drive maybe removed provided the windows “safely remove” (or equivalent) procedure (this is outlined in the High-Rely eSATA or USB manual) is followed. If the blue indicators on the media itself or the disk graphic indicate activity or the green Drive Status indicator is flickering green, it may not be safe to remove the media as the host is performing operations, cease the host's operations before performing the removal.

## 8 - Changing Drives in JBOD (PM) mode (V1 and V2).

Because this mode performs no RAID functions, its use is much simpler:

State	Left Status Indicator	Power/Error Indicator	Right Status Indicator
Left Media Out or Off	Off	On	On-Green
Right Media Out or Off	On-Green	On	Off
Disk Damaged	If Disk damaged, Status indicator <b>Red</b> , otherwise <b>Green</b>	On	If Disk damaged, Status indicator <b>Red</b> , otherwise <b>Green</b>

Figure 4. Table of front Status indicators and conditions for RM unit in (PM) JBOD Mode.

State	Bottom Status Indicator	Error/Rebuild Indicator	Top Status Indicator
Bottom Media Out or Off	Off	Off	On-Green
Top Media Out or Off	On-Green	Off	Off
Disk Damaged	If Disk damaged, Status indicator <b>Red</b> , otherwise <b>Green</b>	On	If Disk damaged, Status indicator <b>Red</b> , otherwise <b>Green</b>

Figure 4. Table of front Status indicators and conditions for Mini-Tower unit in (PM) JBOD Mode.

Simply insert and remove drives (media) as needed from either or both bays. Be sure to follow all other precautions and procedures regarding the mechanical insertion and removal, and the operating system's requirements for safely removing a volume.

## 9 - Resetting the RAID 1 (Mirror).

**WARNING! THIS WILL ERASE DATA ON THE DRIVES.**

Note: While other modes are possible as indicated on the RAID Mode Selector, only PM and RAID1/10 modes are supported by High-Rely.

In the event that the mirror is damaged or all the drives are being changed, it may be necessary to create a new RAID 1. This is done with the following steps:

1. Install both drives (media) which will make up the new RAID 1. Your additional drives can be swapped out later without a different procedure. But, to establish a new RAID 1, you will need two drives.
2. Turn on both drives with the key lock. On the back of your 2 Bay AMT unit, set the RAID mode to the PM (JBOD) setting (See figures or tables above for your type).
3. Turn off the power on the unit. With a small pointed object such as an opened paper clip, press and hold the Change Mode button on the rear of the unit WHILE turning power on. Continue to hold the button in for 10 seconds after turning the power on.
4. Your unit should now be in the JBOD (PM) mode which will allow your computer to see both media volumes as separate volumes raw.
5. Now change the Mode selector again back to the RAID 1/10 setting.
6. Now repeat step 3. You should be in a RAID 1 configuration after that and both Sync indicators should be solid green.
7. Your host should now show a single volume, of just slightly less than the smallest drive in the mirror. You should now partition and format the volume as needed.

If no other drives were ever used in a mirror, no other steps should be necessary. However, if other drives were used, the RAID stamp will need to be removed so that the new RAID stamp can be established on them. If this is the case, you must first delete the old RAID Stamp using either the HW RAID Manager software or by repeating steps 1-4 above for each set of drives. If you have an odd number of drives, use one of the drives twice.

If you're using the RAID manager/monitoring program (HW Manager), these operations can all be performed from the GUI of the program without changing anything on the back of the unit. HW Manager is available for download from our website for free on your product page.

## 10 - Repairing a Broken RAID 1 or transferring a Mirror.

The 2 Bay AMT units store RAID information on their drives, that's why proper set up is important. If all you have from a mirror out of a 2 Bay AMT model is one drive which was the master or 1 of a fully mirrored set, bringing up a mirror based on that drive is simple. Make sure the unit is already in RAID 1/10 mode before doing this:

1. Turn off the unit.
2. Install the known master or good mirror drive.
3. Turn on the unit.
4. Wait up to 2 minutes. The volume should appear to the host. Then, simply install a swap drive of same or larger size in the remaining bay and it will automatically remirror (unless the target or source drive is damaged).

## 11 - HW RAID Manager Software

The HWRAID Manager software allows for the configuration and remote monitoring of the Mirror and drive status of a 2 Bay AMT unit. It will function whether the unit is connected via USB or eSATA. The HW RAID Manager software is available from the High-Rely.com website if necessary. HW RAID Manager runs as a service in Windows 2003 Server, 2008 and 2008 R2. It can be configured to send out SMTP messages based on various events selected by the user such as a drive failure. It can also be used to remotely configure the the mirror. It keeps a log of events as well which is useful for diagnosis review. HW RAID Manager is not a High-Rely product, it is provided by the maker of the RAID controller chip used in the 2 Bay AMT unit. For further instructions, see the HW RAID Manager help. HW Manager is available for download from our website for free on your product page.

## 12 - Assigning Drive Letters

Because the AMT in Mirror (RAID 1/10 mode) is one volume (default configuration), and drive swaps go undetected by the host. Thus, there are not multiple drive letter issues with media as in a standard High-Rely systems when using Windows operating systems. The HRDM2 utility should have little use in this instance. However, in JBOD (PM) mode, the host will see every drive swap and use of the High-Rely utility HRDM2 will allow you to set multiple drive (media) to the same letter or designate a particular letter each time the drive is inserted without letting Windows allocate the drive letter based on the next available drive letter.

## 13 - 2 Bay AMT Additional Notes

### 13.1 - Degradation

When the AMT is re-syncing, this is also referred to as “running degraded”. Performance will be less for host accesses during this time because of the background activity of the AMT re-syncing (mirroring) the drives.

## **13.2 - Back Panel Status Indicators**

In addition to the regular High-Rel media indicators, and the front panel indicators, the AMT controller V1 and V2 back panels have some as well, but not the V3. Those are:

- The Host Link/ACT indicator will light green when connected via eSATA and will flicker during eSATA activity. The USB link activity indicators will flicker during USB activity.
- The Pwr indicator will light Green when the unit is powered up.
- The Red STATUS indicator has been disabled and its function moved to the front of the unit via the Power/Error indicator.

### 13.3 - Selecting Different RAID types

Although not included in our technical support service, the 2 Bay AMT supports other RAID configurations as well. These are engaged by changing the RAID Type Selector and holding the Change Mode button down for 20 seconds during a power-on. Note: Supported modes are in black.

RAID Type Setting	Description
PM	The drives are presented to the host as individual drives.
RAID 0	The drives are striped (RAID 0) meaning the capacities of the smallest drive in the set of two are multiplied by 2 and presented to the host as one volume. Data is split between both drives resulting in higher access and throughput speed.
RAID 1/10	This is the factory default setting and is supported by High-Rely's Technical support department. The drives are mirrored (RAID 1) and presented to the host as a single volume. One drive can fail and be replaced without disturbing the availability of the volume to the host.
LARGE	The drives are “spanned” or joined meaning that both drives appear as a single volume to the host and each drives entire capacity is added together (sizes can vary with no waste). The drives will become a set and data loss will occur if they are separated under this configuration.
RAID 3	Not Applicable
CLONE	Not Applicable
RAID 5	Not Applicable

**Note:** Even if power is removed between RAID type changes, the type will only change and initialization will begin (if applicable) once the mode is switched FROM PM. This means that you must always change to PM first, then the desired mode to reinitialize or change. To cause the change, the unit must be powered-on while holding the change mode button depressed for 20 seconds.



## **14 - Examples of usage in Common Backup Scenarios**

### ***14.1 - Backup Software writes to 2 Bay in SAFE/Mirror mode:***

In this scenario, backup software such as Backup Exec, Acronis or Shadow Protect, Windows backup, etc. is used to write it's backup to the 2 Bay High-Rely. The software is configured such that it does a full backup each night.

The typical set up is such that the backup job should complete as close to before the time the media is swapped as possible. This allows the maximum time between when the media was swapped, and the backup job is started, for the syncing to complete. If the backup job starts before the syncing operation completes, things will slow down considerably thus stretching the backup window out and the sync window out and possibly never allowing a complete or proper sync to occur before the next swap.

Do for this example, the office opens at 8:00am and closes at 5:00 pm. The backup job takes 2 hours to run. Hence, the backup job has been set to start at 4:00am. That leaves a 2 hour buffer for the job to grow or handle exceptions. At 8:00am, the secretary checks to see that the swap bay's sync indicator is steady green. If so, she swaps the media out. The newly installed media begins to rebuild. Some time between 3 and 12 hours later (depending on media size) the swapped media is synced up and the blinking red light turns solid green. Now, it's around 8:00pm and the unit is set write data to both drives simultaneously. At 4:00am, the backup job runs. Both drives receive the backup data at the same time and remain in sync. At 8:00am, the cycle starts over again.

If the red light was still blinking when the secretary came in to change the media, then something happened and the media is not ready to remove. If she removes it, the copy she keeps will not be complete and thus is corrupted. If either bay's light was steady red, she should call IT.

### ***14.2 - Softwareless backup with 2 Bay in SAFE/Mirror mode:***

In this situation, the unit's volume has been shared out to multiple people to use and put and change data on all day. When they all leave at night, there is no more activity on the unit. Thus, nighttime proves to be the best time to resync because that is when the unit will be the least busy. So the unit starts the day with steady green lights because it's drives are synced up. When the office closes, the manager swaps a media out. The swapped media then begins to get copied to and synced with the remaining drive installed. This leaves a 15 hour window (5:00pm to 8:00am) before the unit will have activity again. 15 hours is enough time to mirror up to 3 TB. When the office opens at 8:00 am, the flashing red has turned solid green, and is safe to remove and swap again. This is a truly softwareless backup configuration as there is no backup software running.

### ***14.3 - Backup in JBOD mode with two servers:***

In this situation, two drive volumes appear, J: and K:. The company has two servers. One server backs up the other server as well. The host's server is backed up to drive J, the other server is backed up to drive K:.

#### **14.4 - Backup in JBOD mode with one server:**

In this situation, two drive volumes appear, J: and K:. The backup program is set to backup to drive J:, When it is done, the backup program then is set to back up drive J: to drive K.

### **15 - Procedure for Swapping Media**

**For information on how to mechanically swap High-Rely media, please see page 11 and forward of HR Documentation SATAV2-2 ( the manual for the 1 Bay Slimline, 5 Bay, 7, 8 and 10 Bay high-rely models).**



# Highly Reliable

S Y S T E M S

## 16 - Contact Information

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