



3.5-inch Mirror Drive AT MODEL AXRD-U Series

User's Manual

P/N A203269

Revision 1.1e

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Introduction

Thank you for selecting the **3.5-inch Mirror Drive AT Model AXRD-U Series**. This manual describes the proper installation procedures, operation and maintenance of your **Mirror Drive**, and will help you familiarize with its features.

NOTICE

Please be sure to read first the user's manual before using your **Mirror Drive**. This manual provides information on the appropriate handling procedures and configurations for all product functions. This information will allow the user to take full advantage of the **3.5-inch Mirror Drive AT Model AXRD-U Series**.

In the unlikely event that you experience problems, this manual provides helpful information and instructions.

RETAINING PACKAGING

The original packaging materials protect the **Mirror Drive** from damage during shipment. After unpacking the **Mirror Drive**, please retain the packaging materials in case you need to ship the **Mirror Drive** in the future. This product is sealed in an antistatic and moisture-proof bag before shipping. Open the bag only when you are about to begin setting it up.

RECORDING THE PRODUCT NAME, VERSION, AND SERIAL NUMBERS

Before installing the **Mirror Drive** on the host computer, please jot down the model name, version, and serial numbers in the spaces provided for at the last page of this user's manual. Kindly keep these for your record purposes. Section "2.1 Part Names" shows the label location of model name, version, and serial number.

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To ensure safe use of this product:

This user's manual uses the following symbols to highlight the important points related to the safe use of this product. Please observe all safety information as indicated.

SAFETY SYMBOLS

To protect against personal injury and product damage, the following symbols are used throughout this manual to highlight safety information.

	Warning	Indicates a potentially hazardous situation that may result in death or serious injury to the user or severe damage to the product.
	Caution	Indicates a potentially hazardous situation that may result in serious injury to the user or damage to the product.
	Important	Indicates important information wherein failure to observe may result to improper product function.

WARNING / CAUTION LABELS

Labels with black lettering against a yellow background affixed either to the exterior or interior of the product are **Warning** or **Caution** labels that provide important safety information. Observe all the directions given on these labels.

In cases where **Warning** or **Caution** labels can be found aside from those written in the manual, be sure to follow the directions as mentioned.

Warning

- If you detect any abnormal conditions, such as smoke or foul odors, shut off immediately the power of the host computer.
- If any foreign substance or material (metals, water, liquids, etc.) seeps into the **Mirror Drive**, shut off immediately the power of the host computer.
- Do not use the **Mirror Drive** in hot or damp locations. Using this product in such locations may result in fire, electrical shock, or damage.
- Do not disassemble or modify this product. ADTX cannot guarantee the performance or safety of any product that has been repaired by the customer or by an unauthorized third party. Repairing by your self may result in fire, electrical shock, or damage of the product.
- Before connecting or disconnecting the interface connector, turn off first the power of the host computer and any other connected devices. To avoid placing excessive stress on the printed circuit board of the **Mirror Drive**, push or pull the connector only along the axis perpendicular to the board. Avoid bending the connectors. Also avoid using undue force to connect or disconnect the connectors or cables, which may result in fire, electrical shock, or damage.

Caution

- Do not use the **Mirror Drive** in locations subject to vibration or shock exceeding the specified values. Usage in such locations may result in malfunctions or disk failure.
- Do not use the **Mirror Drive** in locations or conditions susceptible to condensation. Rapid temperature change may cause condensation to form in the **Mirror Drive**. If you think condensation has occurred, allow the **Mirror Drive** to acclimate to the new environment. When there is a rapid temperature change, avoid using the **Mirror Drive** until it reaches the new ambient temperature.
- Do not place the **Mirror Drive** near electronic components with strong electromagnetic fields, such as televisions or loudspeakers. Usage of the **Mirror Drive** in such locations may result in malfunctions or disk failure.
- Turn off the power before moving the unit enclosing the **Mirror Drive**. This will prevent damage to the HDD and other internal components of the **Mirror Drive**.
- Do not turn on the power immediately after turning it off, or turn off the power immediately after turning it on. Leave at least 20 seconds in-between successive operations involving power on or off. This will help prevent damage or malfunction to the mounted HDD. The HDD motor spindle requires about 20 seconds to stop rotating and come to a full rest. In addition, when removing the correctly functioning drive unit for replacement, turn off the power and wait for at least 20 seconds.
- Do not remove a fully functional drive unit while the power is still on. The **Mirror Drive** controller unit will consider the drive unit as failed if it is removed. Removing a fully functional drive unit may also damage the disk heads and platter inside the HDD.
- Store the **Mirror Drive** in the antistatic bag. Leaving this product unpacked and unused for a long period of time may lead to malfunction or disk failure.
- Avoid applying excessive pressure to the covers of the drive unit, which may lead to malfunction or disk failure.
- Avoid touching the **Mirror Drive** when its power is on.

Important




- Back up all important data stored in the **Mirror Drive** to a suitable storage medium, such as tape drive or MO drive. This product's mirroring technology prevents data loss even if one drive unit fails. However, if two drive units fail at the same time or if a non-redundant part fails, data loss may still occur. Additionally, accidental deletion of data or equipment damage may also result in data loss.
- Do not block the ventilation openings of the HDD. Lack of cooling airflow may lead to hard disk drive failure.
- Wait at least 10 seconds after the access indicator has stopped flashing before initiating the shutdown procedure for your host computer. The **Mirror Drive** uses cache memory to store the data frequently accessed from the HDD. Except in emergencies, you must follow the operating system's shutdown procedures. Failure to do so may result in loss of data stored in cache memory.
- Never remove or exchange the drive units, except to replace failed controller units or drive units, since the **Mirror Drive** controls the drive units by using its serial numbers. Thus, removal or replacement may result in failure to boot up the host computer.
- When installing it in the host computer's bay, mount the **Mirror Drive** securely using the mounting screws provided (0.49 Nm is recommended).
- In the event of a drive unit failure, it may take up to 15 seconds to start up the **Mirror Drive**. The host computer may even fail to recognize it due to BIOS timeout settings.

Handling Static-Sensitive Device

To prevent damage to components due to static electricity, observe the following precautions when handling this product.

- Before handling the **Mirror Drive** or other static-sensitive devices, touch a metal object, such as the metal enclosure of the host computer, to discharge any static electricity from your body.
- Always handle components carefully. Never touch exposed circuitry.
- When replacing controller units or drive units, or when moving the **Mirror Drive**, place the antistatic bag used in wrapping the product during shipment on a flat, level surface. Use this as your **Mirror Drive** working area.

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1 3.5-inch Mirror Drive Functions

Incorporating two 2.5-inch disk drives, the ADTX **3.5-inch Mirror Drive** uses mirroring technology to safeguard data and to provide uninterrupted operations.

Since the host computer will recognize the **Mirror Drive** as a standard AT HDD, installing the **Mirror Drive** simply involves connecting it to an IDE (ATA) cable from the host computer.

1.1 Features


- In the event that one of the drive unit fails, the **Mirror Drive** will continue to function, maintaining data integrity. When the failed disk is replaced with a new replacement disk, data reconstruction will begin automatically.
- The **Mirror Drive** uses cache memory for high performance.
- Based on the industry standard IDE (ATA) interface, the **Mirror Drive** can be used like any other standard AT HDD. This product requires no unique device drivers and is compatible with most operating systems.
- Mirroring technology implemented via hardware reduces system overhead.
- Ultra DMA/100 mode is supported. (Maximum data transfer rate: 100 MB/s)

1.2 Mirroring

Mirroring technology involves writing of data to two drive units simultaneously. If one drive unit fails, data is written to and read from the other drive unit.

1.3 Cache Buffer Function

The **Mirror Drive** is equipped with a cache memory. With write cache mode enabled, the **Mirror Drive** will signal completion of command processing to the host computer when data is written to cache memory. The performance will be improved by writing accumulated data to the HDD when the host computer is not accessing the **Mirror Drive**. Write cache mode is enabled via DIP switch. The default setting at shipment is "enable".


	Important	Always observe the shutdown procedure specified for the host computer's operating system. In emergencies, wait at least 10 seconds to be sure that both the access indicator and the drive status indicator have stopped flashing before shutting off the power. Turning off the power while the access indicator or the drive status indicator is still on may result in loss of data currently located in cache memory.
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1.4 Data Reconstruction


If a failed drive unit is correctly replaced, data reconstruction (the copying of all data from the fully functional drive unit to the new replacement drive unit) will start automatically.

During data reconstruction, the drive status indicator of the fully functional drive unit will light green. The drive status indicator of the replacement drive unit will blink orange every one second.

If one of the drive units fails, the **Mirror Drive** will continue to function, thereby maintaining data integrity.

	Caution	Do not turn off the host computer while the Mirror Drive is still reconstructing the data to prevent loss of data or failure.
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When a sector of the fully functional drive unit can not be read during data reconstruction, the **Mirror Drive** skips copying the bad sector and continues to reconstruct the remaining data. These skipped sectors will no longer be readable. Once some data is written to this sector, it can be read correctly again.

	Important	If the data recovery process skips some sectors during data reconstruction, then the data on these sectors will be lost. Periodic backup is recommended.
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1.5 Revival Reconstruction

When an error occurs in a drive unit and the mirror controller cannot get the response from the drive for 30 seconds, the controller will issue the reset command to the drive and check its status again.

If the drive recovers, the **Mirror Drive** returns to the normal operation. But if not, the controller treats the drive as a failed drive.

The function "Revival Reconstruction" turns the power of the drive OFF/ON. And if the drive status becomes ready, reconstruction is started.

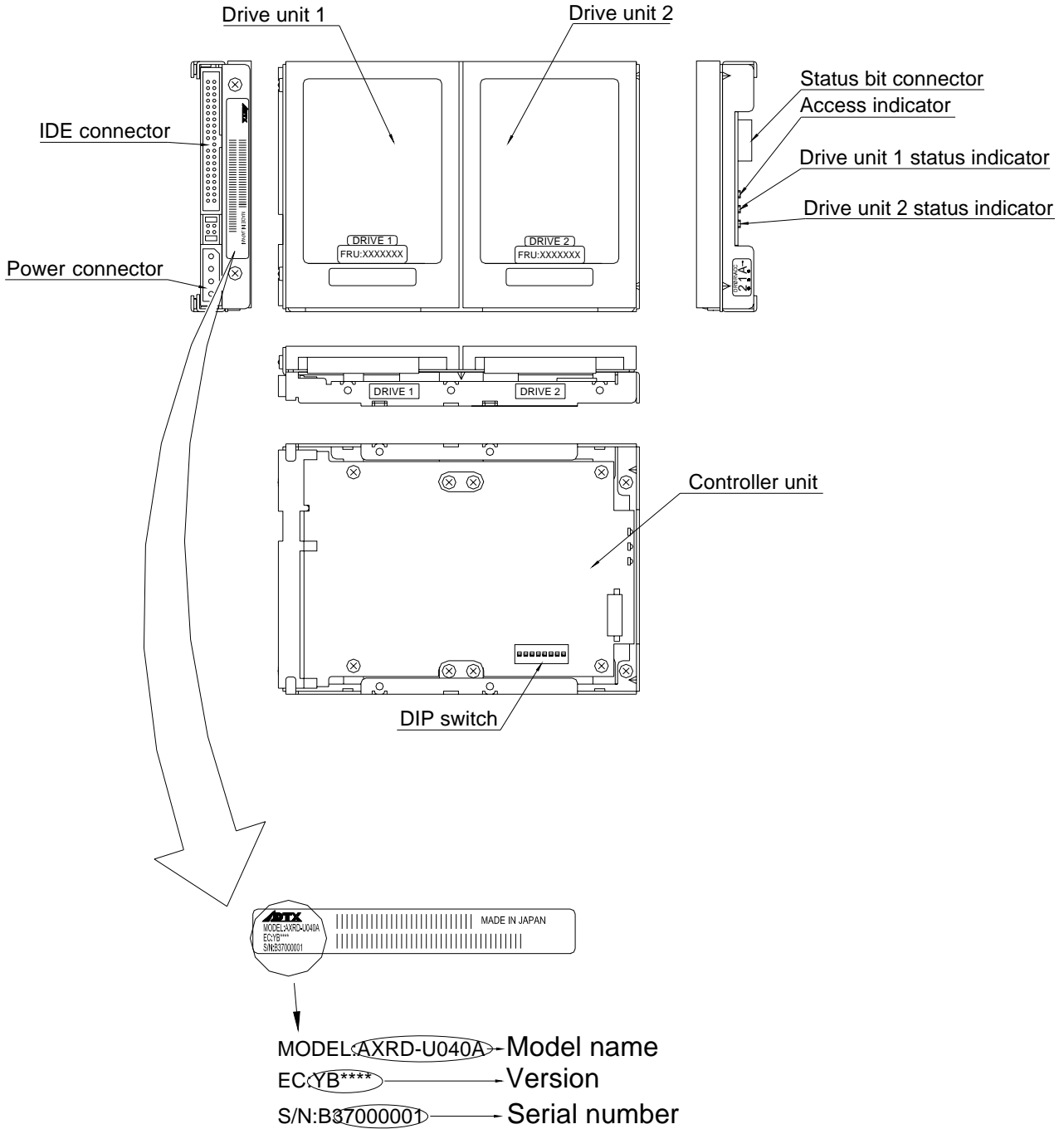
Revival reconstruction is executed up to two times. After the same error occurs three times, the **Mirror Drive** will remain in Degraded Mode. Then the failed drive status indicator (LED) will light orange.

The function can be enabled /disabled by Dip SW. Factory default is "enabled".

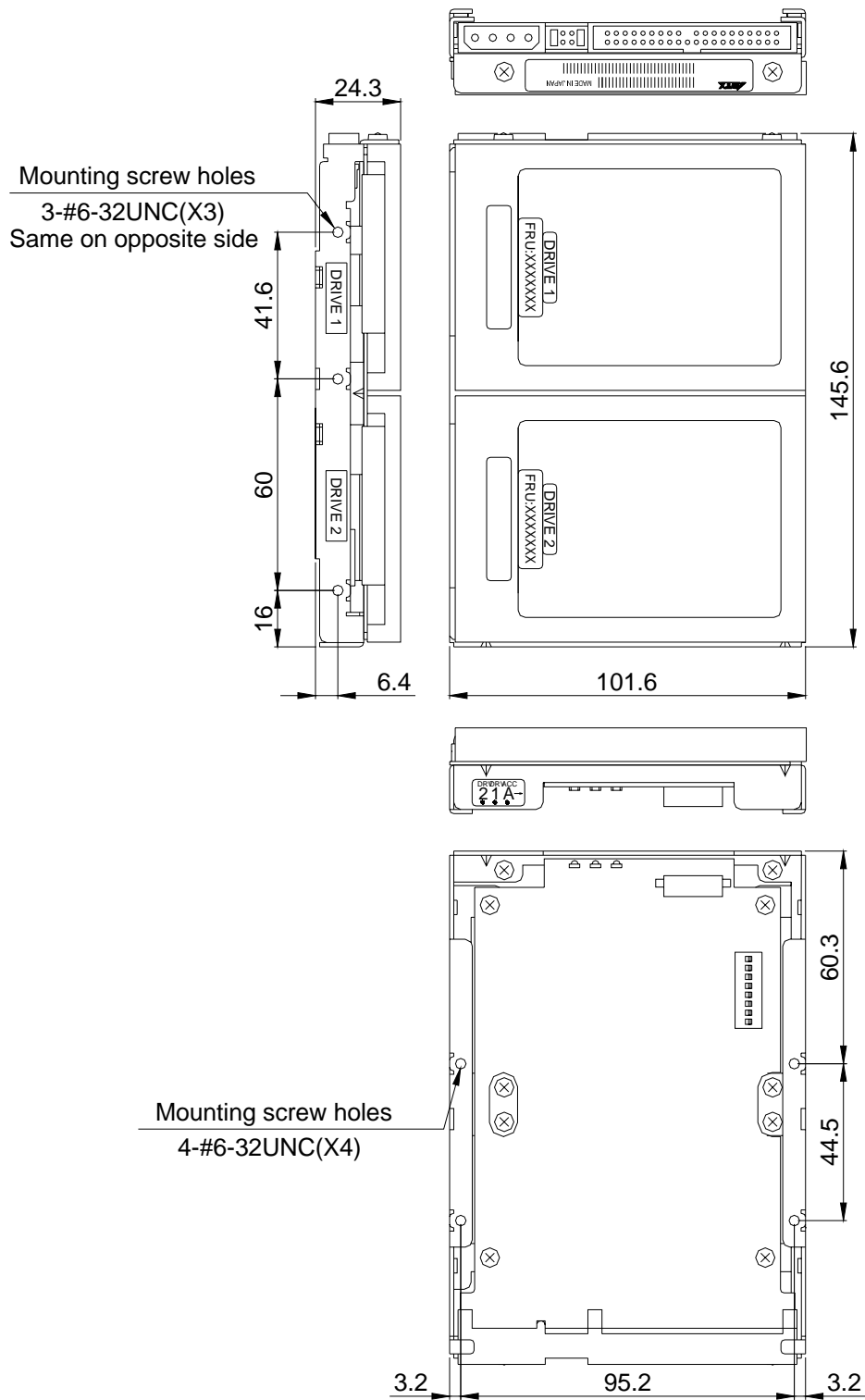
The **Mirror Drive** still responds to the host normally even during reconstruction. After the reconstruction is finished, the **Mirror Drive** returns to the normal mode automatically.

2 Outline

2.1 Part Names




2.2 Dimensions



3 Installation

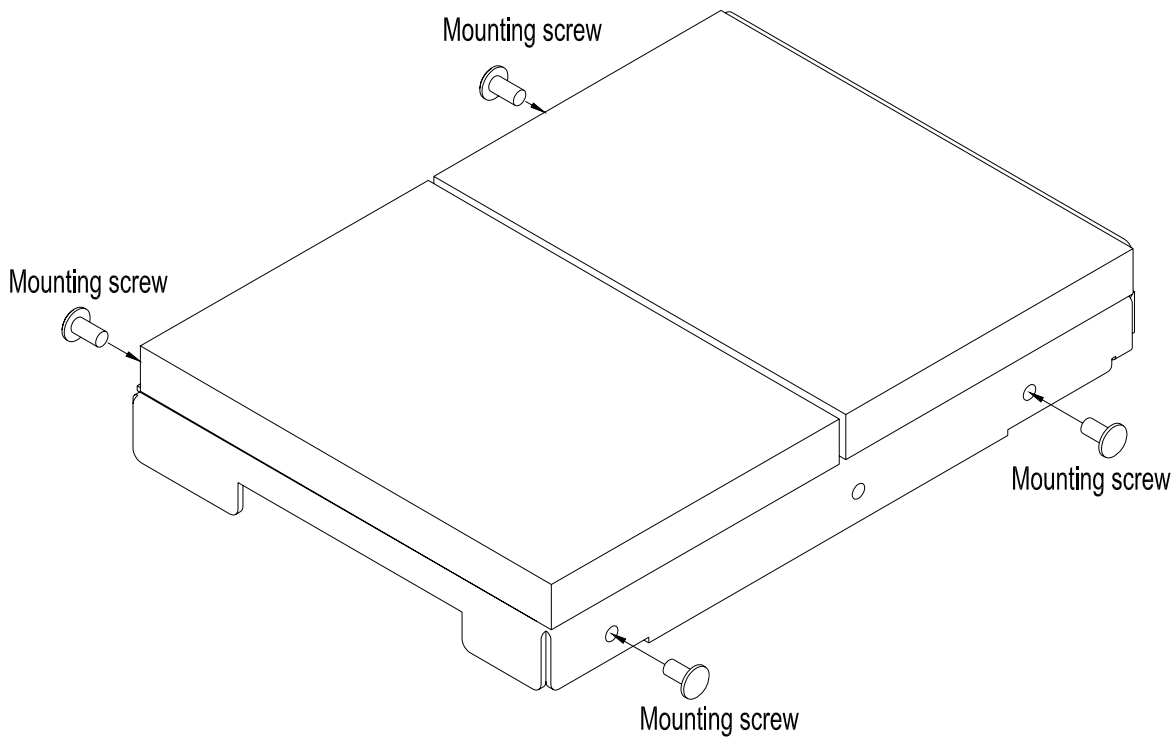
3.1 DIP Switch Setting


Before mounting the **Mirror Drive** in your host computer, double-check the DIP switch settings. Refer to "4. Settings" for the configurations of the DIP switch. For default settings, refer to "Appendix C Factory Default Settings."

	Caution	When setting switches and attaching cables, ensure first that the power supply of the host computer is turned off.
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3.2 Mounting in the Host Computer

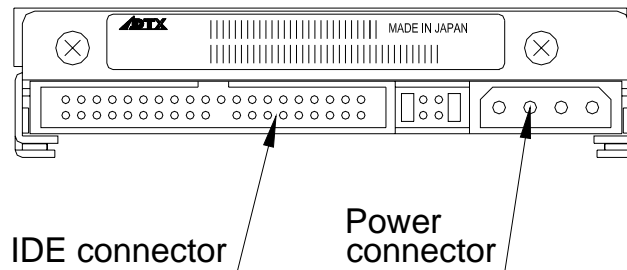
When mounting in the host computer, use the supplied mounting screws and the specified mounting holes. The mounting screw hole locations are shown in "2.2 Dimensions."
An example of a mounting screw hole location is shown below.



	Caution	When installing into the host computer, provide sufficient cooling in order to ensure that the surface temperature of the drive unit remains below 60°C.
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3.3 Cable Connection

- <1> Connect a 4-pin internal power cable that supplies DC +5V.
- <2> Use an 80-conductor IDE (ATA) cable to connect to the host computer.
A 40-conductor cable can be used for UDMA 33 mode or slower.



3.4 Turning on The Main Power

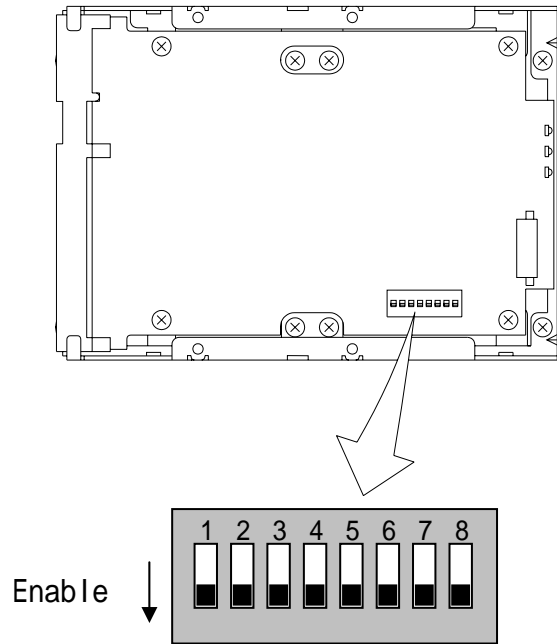
Turn on the host computer and check if the host computer detects the **Mirror Drive** correctly.

	Caution	Before turning on the host computer, make sure that the master / slave settings are properly set, and that both the IDE (ATA) and power cables are correctly connected.
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4 Configuration

4.1 DIP Switch

The DIP switch can be used to set the Ultra DMA/100 mode, write cache mode and buzzer. It is located in the bottom side of the unit. (8-bit DIP switch).




DIP Switch	Function	Default Configuration
1	Mode Bit 1,2,3	Enable (Normal)
2		
3		
4	DMA Mode	Enable (UDMA100)
5	Write Cache	Enable (Write Back)
6	Revival reconstruction	Enable
7	Buzzer	Enable
8	Reserved	Enable

	<h3>Caution</h3>	Before changing the switches, turn off the power of the host computer. (The above diagram shows the default factory settings.)
		Do not change the Mode Bit switches (1, 2, 3) and the Reserved switch (8).


4.1.1 Operating Mode (Do not change)

The operating mode switches (1,2,3) are set to normal mode (mirror mode). Do not change this setting.

	Important	Changing the operation mode switches will result in loss of data.
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4.1.2 Ultra DMA100 Mode


Sets the maximum data transfer speed between the host computer and the **Mirror Drive**. If the switch is set to "Enable" (Default Setting), the maximum data transfer rate is 100MB/s (UDMA100). Otherwise the data transfer is limited up to 33MB/s (UDMA33).

	Important	When using UDMA100 mode, use the 80-conductor Ultra ATA cable.
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4.1.3 Write Cache Mode

This bit sets the write cache mode. If set to "Enable" (Default Setting), the **Mirror Drive** will signal completion of command processing to the host computer when the data has been written to cache memory.

If set to "Disable", the **Mirror Drive** will signal completion of command processing to the host computer when data is actually written to the drive unit. The data cache in a drive unit is also disabled.

	Important	Always observe the proper shutdown procedure specified for the host computer's operating system. In emergencies, wait at least 10 seconds to be sure that both the access indicator and the drive status indicator have stopped flashing before shutting off the power. Turning off the power while the access indicator or the drive status indicator remains lit may result in loss of data currently located in cache memory.
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4.1.4 Buzzer

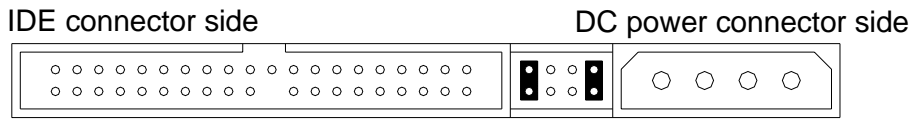
If the bit is set to "Enable" (Default Setting), the buzzer will sound when any error is detected. In the event of a drive unit failure, the buzzer will continue to sound until the failed drive unit is replaced. The buzzer can only be stopped if the switch position is changed to "Disable".

Set back the buzzer to "Enable" after the failed drive unit has been replaced.

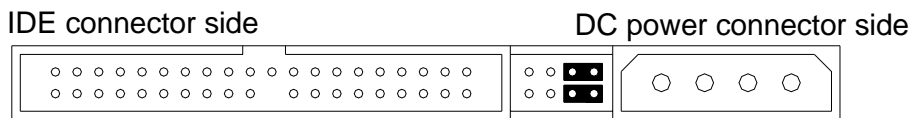
4.2 Master / Slave Setting

Set the jumper pins to one of the following:
(Refer to "2.1 Part Names".)

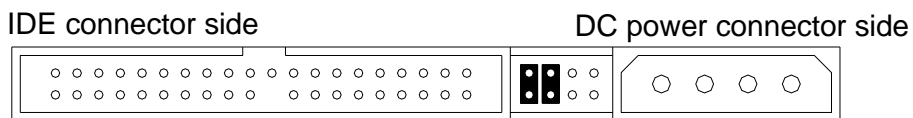
Master



Slave

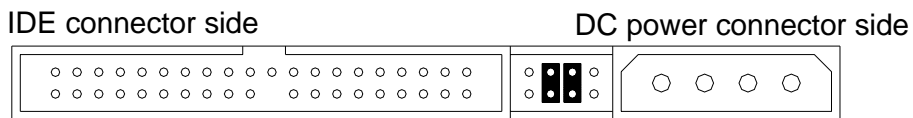


Master (with slave)



If the slave drive is not correctly recognized when set as master, use this setting.

Cable select



5 Status Display

5.1 Indicator

LED indicators on the front display the status of both controller unit and drive units.

5.1.1 Access Indicator

Access	Green	<p><1> When the power is turned on. ^(*1)</p> <p><2> Processing a command from the host computer.</p> <p>Either of the above.</p>
	Orange Flashing	<p><1> Both drive units have failed, or a drive unit is not correctly connected. (Both drive status indicators are off.)</p> <p><2> When one drive unit has failed and the fully functional drive unit has been erroneously replaced. (Both drive status indicators show green simultaneously.)</p> <p><3> Both drive units have been replaced. (Both drive status indicators show green simultaneously.)</p> <p>Any of the above.</p>


5.1.2 Drive Status Indicator

Drive1 Drive2	Green	<p><1> When the power is turned on. ^(*1)</p> <p><2> Processing a command from the host computer.</p> <p><3> Processing an internal command.</p> <p>Either of the above.</p>
	Orange	<p><1> When the power is turned on. ^(*1)</p> <p><2> Drive unit has failed.</p> <p>Either of the above.</p>
	Orange Flashing	<p>Target drive unit of data reconstruction. ^(*2)</p> <p>(Source drive unit LED is green at the same time.)</p>

Note:

^(*1) When turning the power on, the access indicator shows green, and both drive status indicators show orange then green. When **Mirror Drive** startup process is complete, all will be turned off.

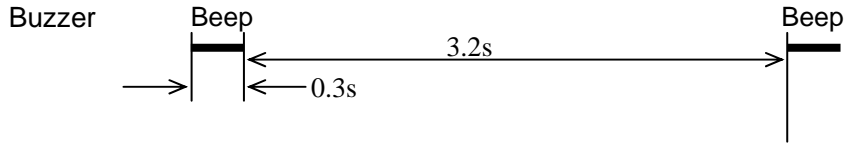
^(*2) Drive Status Indicator will go out after data reconstruction.

	Important	<p>If the drive status indicator lights orange, immediately replace the said drive unit. Leaving the Mirror Drive with a failed drive unit will result in data loss if the other drive unit fails.</p>
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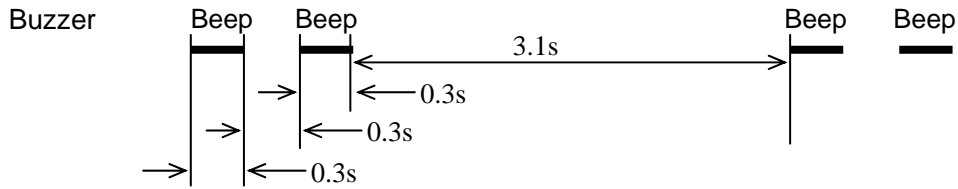
5.1.3 Buzzer

If the DIP switch bit7 is set to "Enabled", in the event of a failure, the buzzer will beep at the interval specified below.

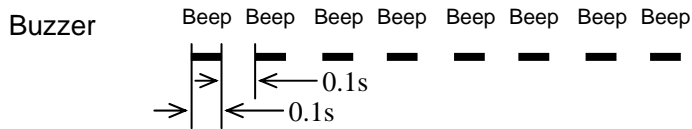
Drive unit 1 failed



Drive unit 2 failed

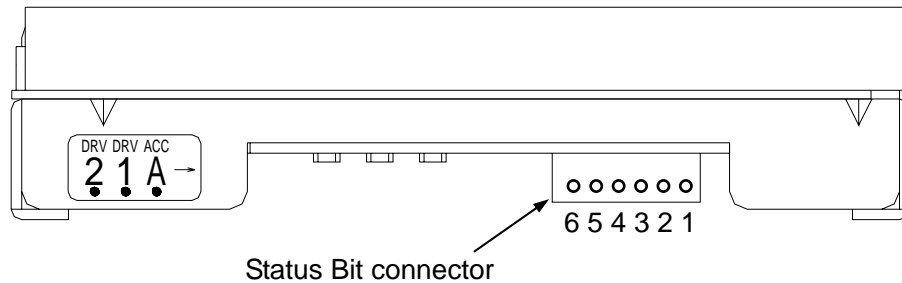


System stopped (Both drive units are failed)



5.2 External Output Signal

It is possible to monitor the Mirror Drive status externally. The location of the connector is shown in the figure below.



5.2.1 Status Signal

External status output is transmitted as a 3-bit signal through the Status Bit connector. For a detailed layout and electrical specifications of the status bit connector pins, refer to "Appendix A.2.1 Status Output Signal."

6 Trouble shooting

6.1 Trouble indication

If the **Mirror Drive** is in trouble, the access indicator will light or flash orange, while the drive status indicator will light Orange.

If buzzer switch is enabled, the buzzer will sound an alert continuously.

These status/failure indications must be considered to determine if removal and replacement of a hard disk unit is necessary.

Access indicator	Drive status indicator		Mirror Drive status and measures.
	Drive unit 1	Drive unit 2	
---	---	---	Normal operation.
---	Green	Orange flashing	Reconstructing data from drive unit 1 to drive unit 2. (Normal operation)
---	Orange flashing	Green	Reconstructing data from drive unit 2 to drive unit 1. (Normal operation)
---	Orange	---	Drive unit 1 failure. Replace the drive unit 1 with a new drive unit.
---	---	Orange	Drive unit 2 failure. Replace the drive unit 2 with a new drive unit.
Orange	---	---	Controller unit failure. Replace the controller unit with a new controller unit.
OFF	OFF	OFF	When the Mirror Drive does not respond to the host, check the condition of the power supply. If problem persists, please contact your distributor.
Orange flashing	OFF	OFF	Check the condition of both drive units. If problem persists, please contact your distributor.
Orange flashing	Green	Green	Double-check to confirm that the desired drive unit was properly replaced. Temporarily return to the original setup and repeat the process.
Other LED indications not mentioned.			Contact your distributor.


--- : Normally off but will light up or flash when accessed.


If replacing the drive unit does not fix the problem, contact your distributor.


6.2 Replacing Drive Unit

Turn off the host computer and remove the **Mirror Drive** from the host computer when replacing a drive unit. After the failed drive unit is replaced with a new drive unit, data reconstruction will begin automatically. During data reconstruction, the host computer can still access the **Mirror Drive**.

Note: Make sure that the drive status indicator (LED) lights orange before replacing a failed unit.

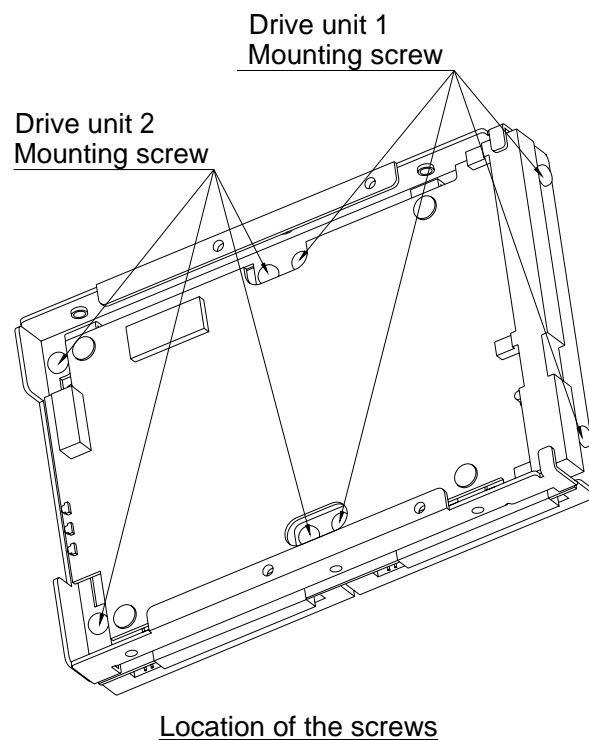
	<p>Important</p>	<p>Before replacing the failed drive unit, be sure to prepare the replacement drive unit designated by ADTX as described in "Appendix D Replacement Parts." Do not replace with HDDs other than the designated model, even if the capacity, manufacturer, or model numbers on the label are the same. Using an unauthorized HDD may result in malfunction or damage. The warranty does not cover any damage encountered due to replacement with a non-specified HDD. Furthermore, ADTX is not held liable for any consequence resulting from the use of an undesignated HDD.</p>
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	<p>Important</p>	<p>If the drive status indicator lights orange, immediately replace the specified drive unit with a new drive unit. Leaving the Mirror Drive with a single operational drive unit for an extended period will result in data loss if the other drive unit fails.</p>
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	<p>Caution</p>	<p>Before handling the drive unit when replacing a failed drive, touch a metal object first, such as the metal enclosure of the host computer, to discharge static electricity from your body.</p>
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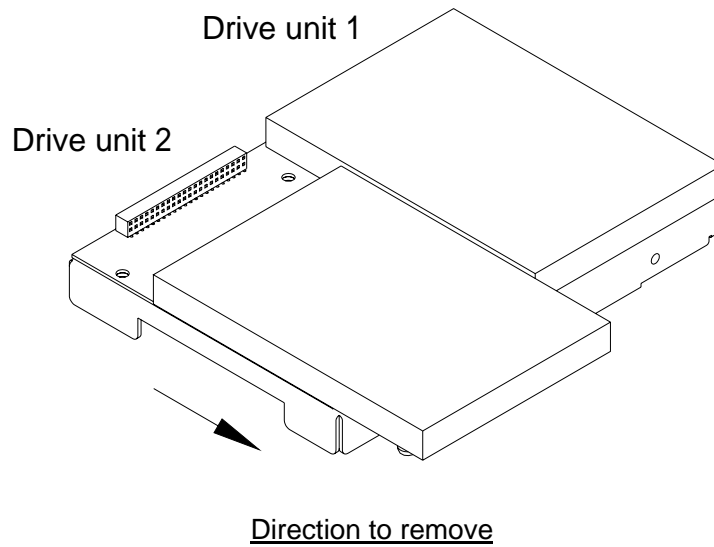
Replacing a Drive Unit


1. Prepare a new drive unit as specified in "Appendix D Replacement Parts."
2. Confirm correct identification of the failed drive unit through the drive status indicator or buzzer.
3. Disconnect the IDE and power cable. Then remove the **Mirror Drive** from the host computer.
4. Remove the four screws that are used to mount the failed drive unit.



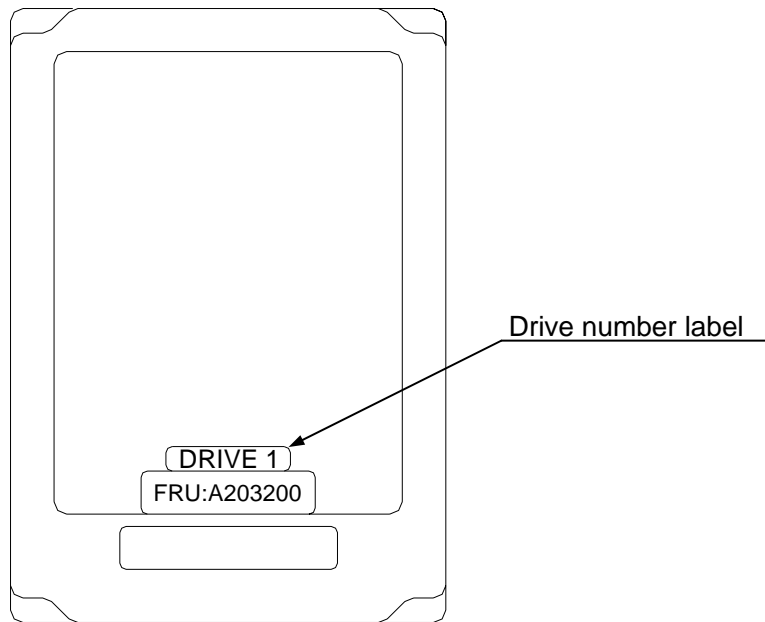
	Caution	Make sure to replace the correct drive. Do not change the jumper setup of the new drive unit to prevent a malfunction.
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5. Place the **Mirror Drive** on the antistatic bag lying on a flat surface. Remove the failed drive unit from the controller unit. Refer to the figure below for the direction to remove.



	Caution	When removing a failed drive unit from the fixed connector of the controller, do not lift the failed drive unit or shift right and left to prevent damage to the connector and the controller card.
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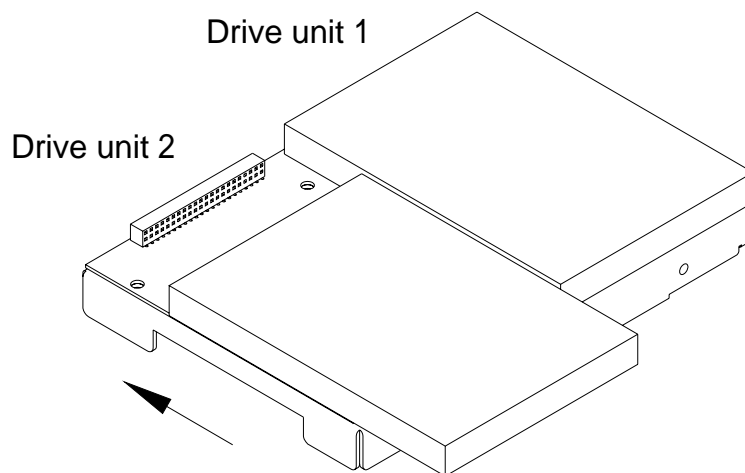
- Affix the drive number label on the new drive unit as shown below.
The labels for drive 1 and 2 are shipped with the replacement drive unit.



(E.g.) In case of drive unit 1


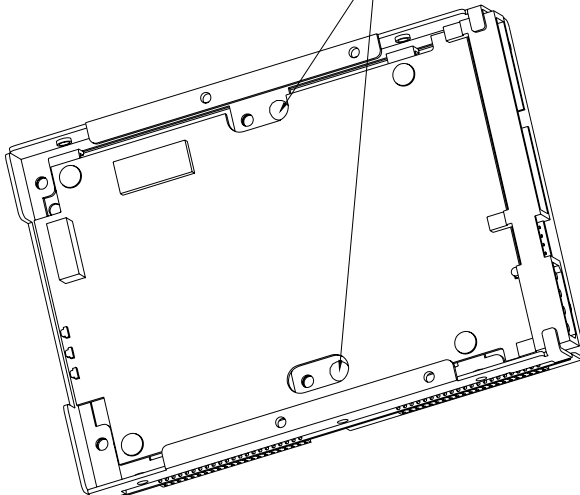
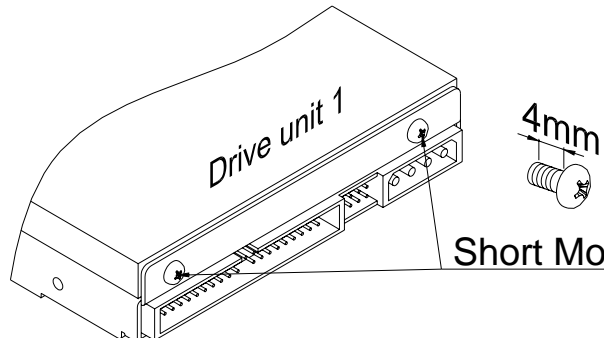
	Caution	When affixing the drive number label, do not exert too much pressure on the surface of the drive unit.
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- Attach the new drive unit to the designated connector of the controller unit. Confirm that the marking on the label of the new drive unit matches with the actual drive number.



(E.g.) Direction to attach


8. Tighten the screws with the designated torque (0.29 Nm Recommended) and equally by turns.

	<h2>Caution</h2>	<p>(1) Tighten first the screws indicated below for the Drive unit 1.</p> <p style="text-align: center;">Drive unit 1 Mounting screw</p>  <p>(2) The length of screws for the side holes of the Drive unit 1 is 4 mm shorter than the others. Do not use long screws.</p>  <p style="text-align: center;">Short Mounting screw X2</p>
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9. Several seconds after replacing a drive unit and turning on the power, data reconstruction will start. The drive status indicator of the replaced drive unit will flash orange (@ 1 second interval). The drive status indicator for the correctly functioning drive unit will light green. The access indicator will not light as long as there is no host access.

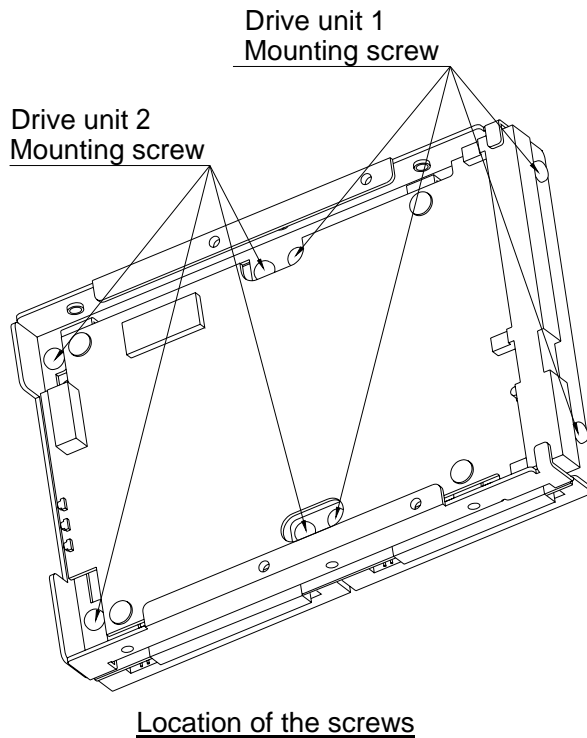
10. When data reconstruction is complete, the drive status indicator will go out.


11. If the drive status indicator of the replaced drive unit turns orange once again, repeat the procedure, starting with step 2.

	<h2>Important</h2>	<p>If you have mistakenly replaced the correctly functioning drive unit, the drive status indicator of both drive units will light green. Then the access indicator will flash orange. The host computer will be unable to access the Mirror Drive.</p> <p>In this case, turn off the host computer. Replace the failed drive unit with the new drive unit, and return the fully functional drive unit. Data reconstruction will immediately start after turning on the host computer.</p>
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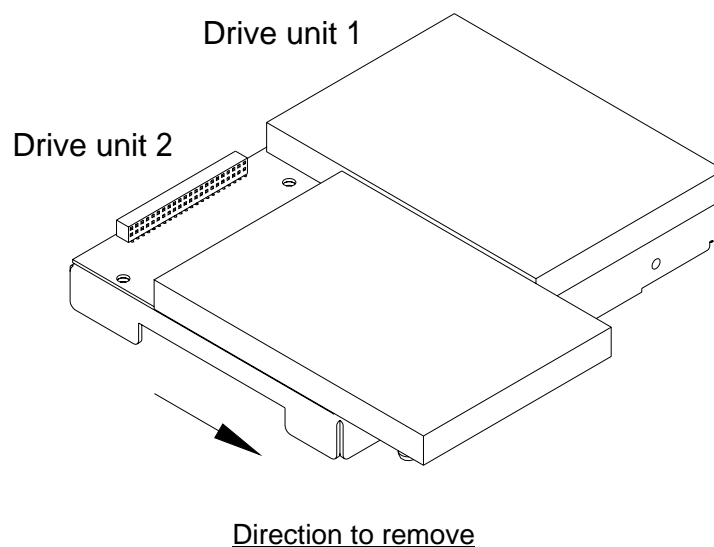
Replacing Both Drive Units


1. Prepare a new drive unit as specified in "Appendix D Replacement Parts."
2. Disconnect the IDE and power cable and then remove the **Mirror Drive** from the host computer.
3. Remove the eight screws that fix both drive units.



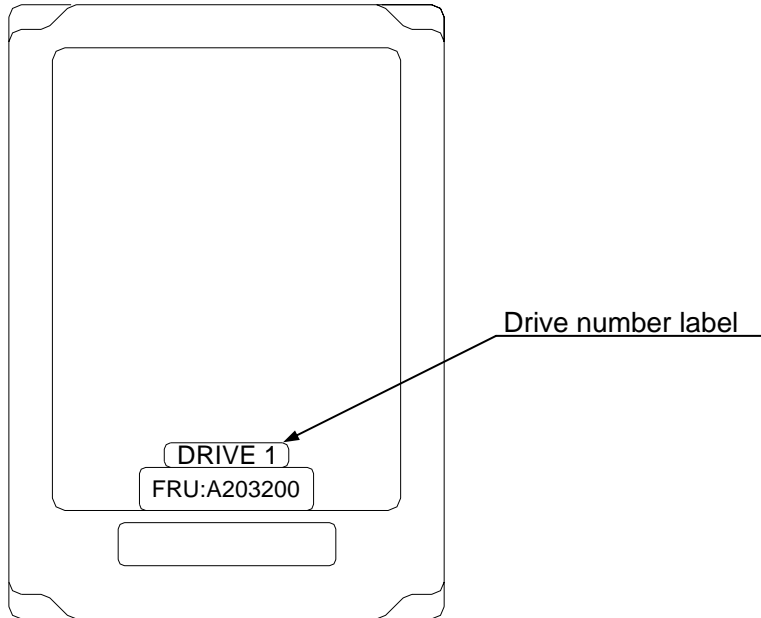
	<h3>Caution</h3>	<p>Do not change the jumper setup of the new drive unit to prevent a malfunction.</p>
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4. Place the **Mirror Drive** on the antistatic bag lying on a flat surface. Remove both failed drive units from the controller unit. Refer to the figure below for the direction to remove.




	Caution	When removing a failed drive unit from the fixed connector of the controller, do not lift the failed drive unit or shift right and left to prevent damage to the connector and the controller card.
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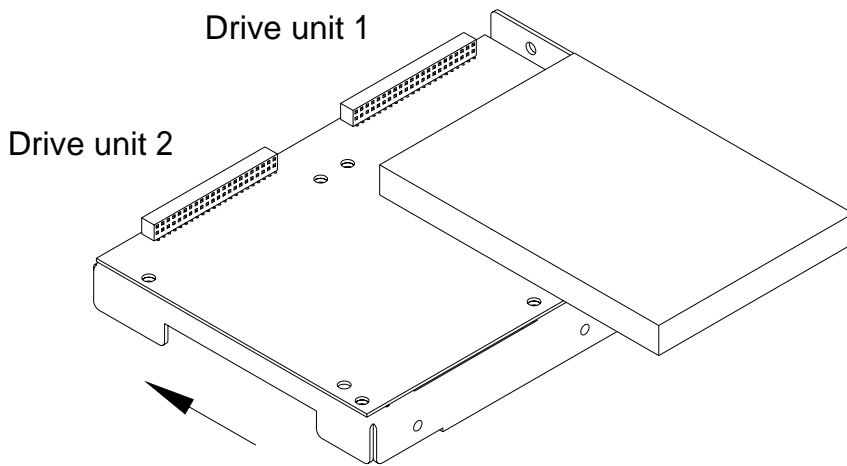
- 5. Affix the drive number label on the new drive unit as shown below. The labels for drive 1 and 2 are shipped with the replacement drive unit.



(E.g.) In case of drive unit 1


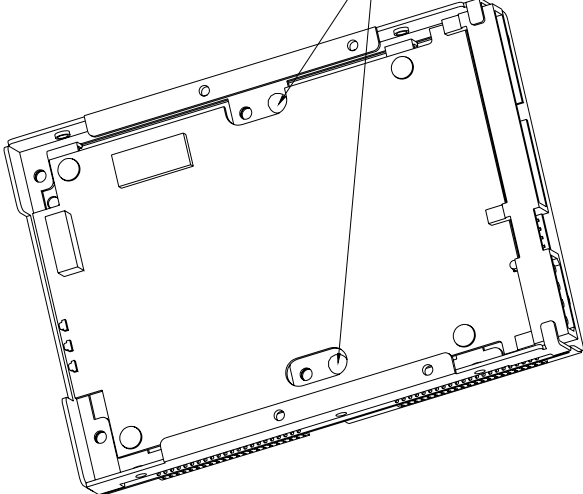
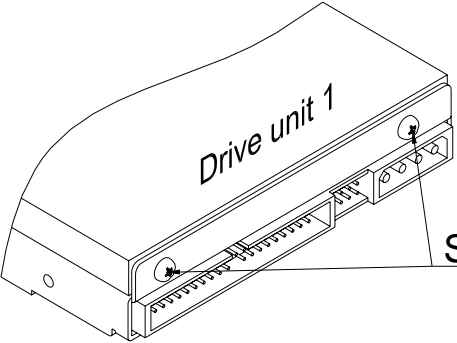
	Caution	When affixing the drive number label, do not exert too much pressure on the surface of the drive unit.
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- 6. Attach the new drive unit to the designated connector of the controller unit. Confirm that the marking on the label of the new drive unit matches with the actual drive number.



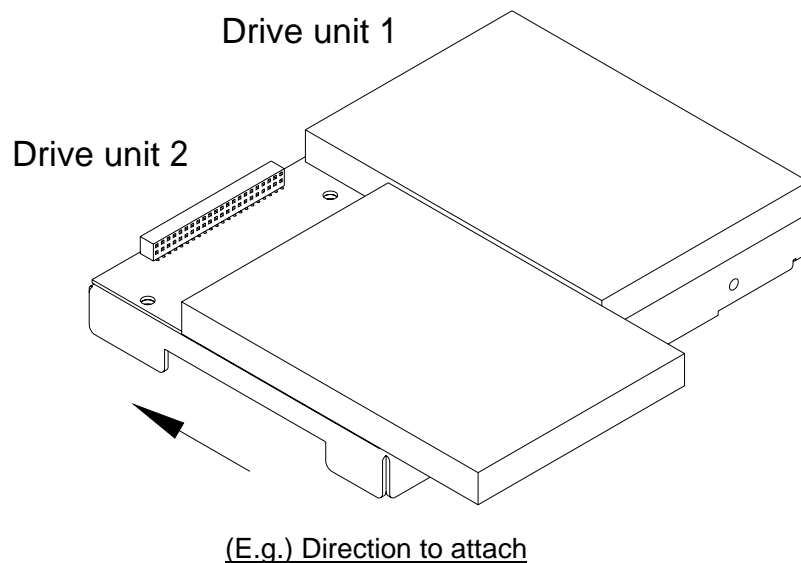
(E.g.) Direction to attach

- Tighten the screws with the designated torque (0.29 Nm Recommended) and equally by turns.

	<p>Caution</p>	<p>(1) Tighten first the screws indicated below for the Drive unit 1.</p> <p style="text-align: center;">Drive unit 1 Mounting screw</p>  <p>(2) The length of screws for the side holes of the drive unit is 4 mm shorter than the others. Do not use long screws.</p>  <p style="text-align: center;">4mm</p> <p style="text-align: center;">Short Mounting screw X2</p>
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- Mount the **Mirror Drive** in the host computer. Firmly connect the IDE (ATA) cable and the 4-pin internal power cable.
- Turn on the host computer. Confirm that the host computer recognizes the **Mirror Drive**. The drive status indicator of drive unit that is not yet connected, will light Orange.
- Turn off the host computer. Disconnect the IDE cable and power cable and then remove again the **Mirror Drive** from the host computer.


11. Attach the new drive unit to the other unoccupied connector of the controller unit. Confirm that the marking on the label of the new drive unit matches with the actual drive number.




12. Tighten the screws with the designated torque (0.29 Nm Recommended) and equally by turns.
13. Mount the **Mirror Drive** in the host computer. Firmly connect the IDE (ATA) cable and the 4-pin internal power cable.
14. Turn on the host computer.
After a few seconds, data reconstruction will start. The drive status indicator of the drive unit replaced last will flash orange (@ 1 second interval). The drive status indicator of the drive unit replaced first will light green. The access indicator will not light as long as there is no host access.
15. When data reconstruction is complete, the drive status indicator will go out.
16. If the drive status indicator of drive unit replaced last turns orange once again, check the condition of both drive units. Then repeat from step #11. If the problem still persists even after you have replaced the drive unit, please contact your distributor.

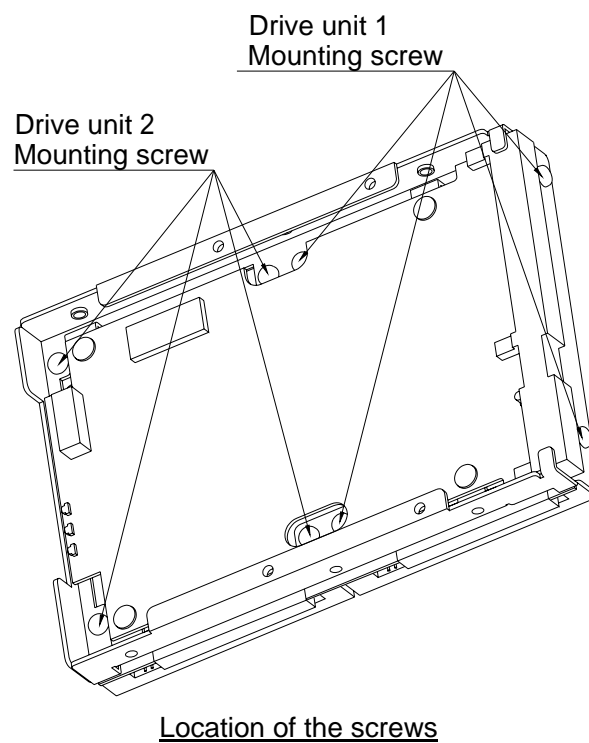
6.3 Replacing The Controller Unit

Turn off the host computer and remove the **Mirror Drive** from the host computer when replacing the drive unit.

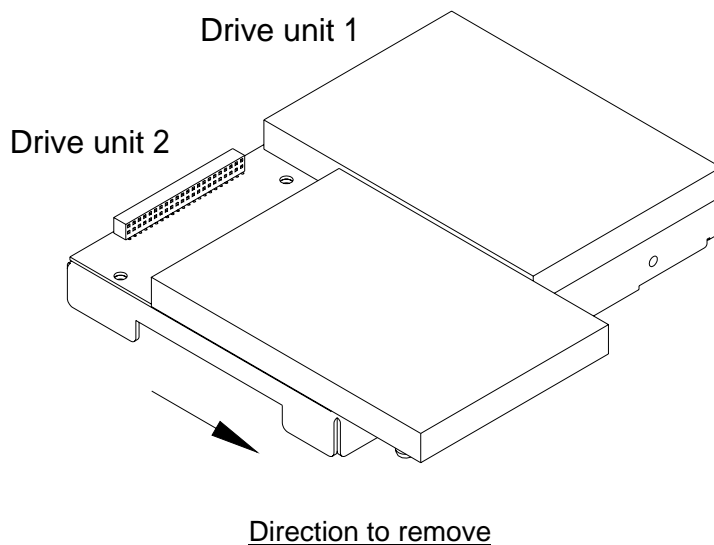
	Important	Before replacing the failed controller unit, be sure to prepare the specified controller unit designated by ADTX as described in "Appendix D Replacement Parts."
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	Caution	Before handling the controller unit, touch a metal object first, such as the metal enclosure of the host computer, to discharge static electricity from your body.
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1. Prepare a new controller unit as specified in "Appendix D Replacement Parts."
2. Disconnect the IDE and power cable and then remove the **Mirror Drive** from the host computer.
3. Remove the eight screws that fix both drive units.

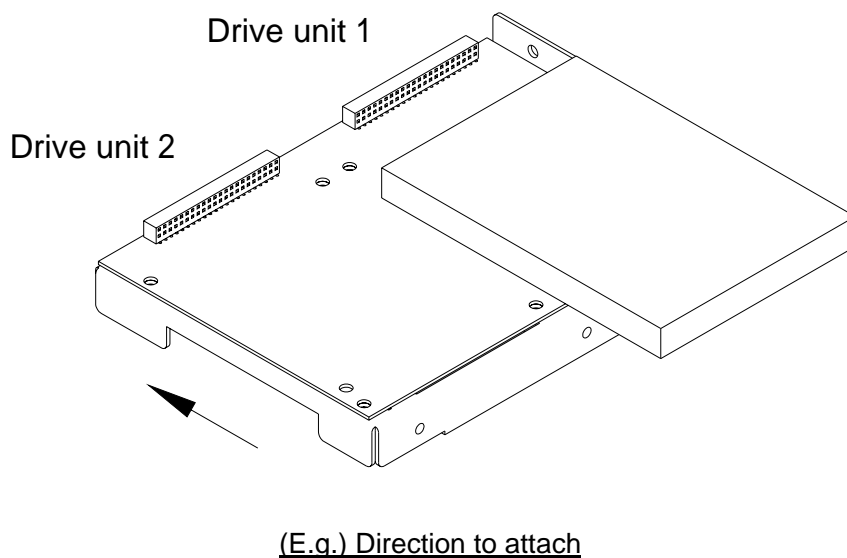


- Place the **Mirror Drive** on the antistatic bag lying on a flat surface. Remove the drive units from the controller unit. Refer to the figure below for the direction to remove.


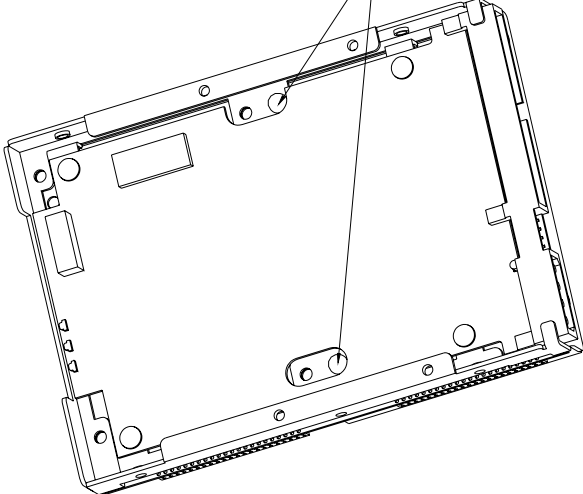
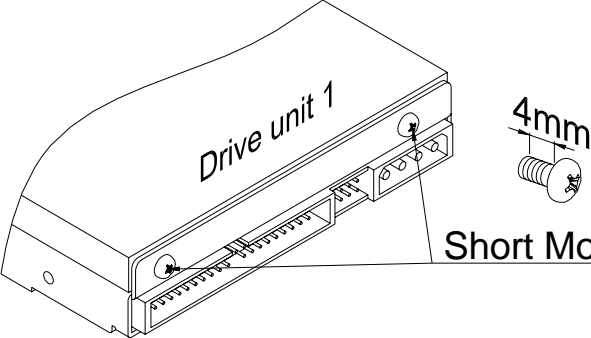


	Caution	When removing the drive unit from the fixed connector of the failed controller, do not lift the drive unit or shift right and left to prevent damage to the connector.
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- Attach back the drive units to its corresponding slots in the controller unit.



6. Tighten the screws with the designated torque (0.29 Nm Recommended) and equally by turns.

	<p>Caution</p>	<p>(1) Tighten first the screws indicated below for the Drive unit 1.</p> <p style="margin-left: 40px;">Drive unit 1 Mounting screw</p>  <p>(2) The length of screws for the side holes of the drive unit is 4 mm shorter than the others. Do not use long screws.</p>  <p style="margin-left: 40px;">4mm</p> <p style="margin-left: 40px;">Short Mounting screw X2</p>
---	-----------------------	---

7. Mount the **Mirror Drive** in the host computer. Firmly connect the IDE (ATA) cable and the 4-pin internal power cable, and turn on the host computer.
8. Turn on the host computer. Confirm that the host computer recognizes the **Mirror Drive**.

6.4 Other problems

If the problem persists even after you have replaced the drive unit or the controller unit, please contact your distributor.

If you happen to encounter other types of problems not mentioned in this manual, please contact your distributor.

Appendix-A Specifications

A.1 Product Specifications

Model Name	AXRD-U040A	
RAID Level	1	
Number of HDDs	2	
Storage Capacity	40GB	
Number of LBAs	78,136,064	
Number of Cylinders	77,515	
Number of Heads	16	
Sectors	63	
Host interface	ATA (IDE)	
Data transfer rate (max.)	100MB/s (Ultra DMA mode 5)	
Dimensions (W x L x H)	101.6mm x 145.6mm x 24.3mm	
Weight (max.)	370 g	
Voltage (Vcc)	4.85 VDC ~ 5.25VDC	
Power supply ripple ^(*2) (max.)	100mV p-p (0 ~ 20MHz)	
Power startup time ^(*3)	5 ~ 100ms	
Operating Environment ^(*1)	Temperature	5 to 45 °C ^(*4) (Operating), -40 to 65 °C (Non-operating)
	Humidity	8 to 90% (Operating), 5 to 95% (Non-operating)
	Max. Bulb Temp.	29.4°C (Operating), 40°C (Non-operating)
Power consumption	Startup (max.)	2.5A
	Idle (max.)	1.3A
	Read/Write (max.)	1.9A

Note:

^(*1): With no condensation.

^(*2): Including startup time.

^(*3): Time until Vcc reaches 4.85 V.

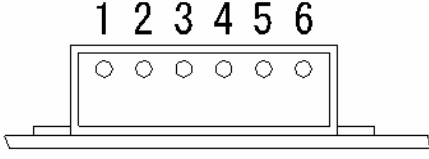
^(*4): When mounting the unit in your host computer, make sure to provide sufficient cooling in order to keep the surface temperature of the drive unit below 60 °C.

A.2 External Output Signal Specification

A.2.1 Status Signal

These tables show the pin configurations, status definitions, internal circuitry, electrical specifications, and connector specifications for the status output signal.

The connector signal pins are configured as follows:

Pin Number	Signal	Connector Pin Assignment
1	GND	
2	+5VDC	
3	Status Bit 2	
4	Status Bit 1	
5	Status Bit 0	
6	GND	

Status output is transmitted in 3-bit signals as follows:

	Bit 2	Bit 1	Bit 0	Status
0	L	L	L	Normal Operation
1	L	L	H	Drive Unit 1 Failed
2	L	H	L	Drive Unit 2 Failed
3	L	H	H	Data reconstruction
4	H	L	L	Controller unit failure (1)
5	H	L	H	Reserved
6	H	H	L	Mirror Drive startup processing
7	H	H	H	Reserved (2)

H: TTL level output high.

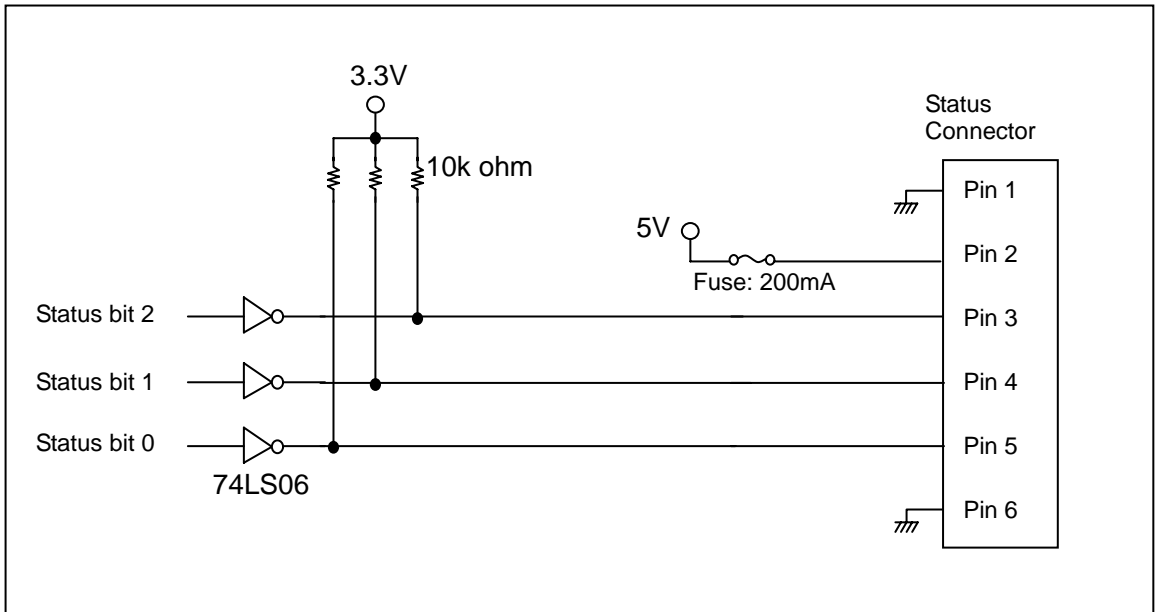
L: TTL level output low.

Note:

- (1) Any of the following conditions will cause the transmittal of Controller unit failure status.
- If both drive units fail when the power is turned on.
 - If both drive units are not properly connected when the power is turned on.
 - If the correctly functioning drive unit is erroneously replaced when one of the drive units failed.

- (2) When the power is turned on, this status will appear for about 0.2sec (system reset).

The internal circuitry of status output signals is indicated as follows:



Status Output Signal electrical specification

Status bit 0/1/2 (Pin 3/4/5)	Output Voltage High	+3.3V (max.)
	Output Voltage Low	+0.4V (max.)
	Output Sink Current (Low)	20mA (max.)
	Output Source Current (High)	0.25mA (max.)
5V (Pin 2)		100mA (max.)

Connector specifications

	Part name	Manufacturer
Mirror Drive header	DF3-6P-2H	HIROSE Electric Co., Ltd.
External connectors – connector side (recommended)	DF3-6S-2C	HIROSE Electric Co., Ltd.
External connectors – connector crimp contacts (recommended)	DF3-22SC	HIROSE Electric Co., Ltd.

Appendix-B Accessories

The **Mirror Drive** (AXRD-U Series) is shipped with following accessories.

- Mounting screws (x4).

Appendix-C Factory Default Setting

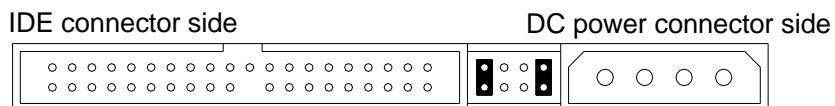
The **Mirror Drive's** factory default settings are as follows:

DIP switch Setting

		Default Setting	
	Function / Mode	SW No.	DIP SW
Mode	Mirror Mode	1	Enable
		2	Enable
		3	Enable
UDMA100 Mode	Enabled (UDMA100)	4	Enable
Write Cache	Enabled (Write Back)	5	Enable
Revival Reconstruction.	Enabled	6	Enable
Buzzer	Enabled	7	Enable
Reserved	---	8	Enable

Jumper Setting

Master / Slave Selection	Master
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Appendix-D Replacement Parts

The parts in the table below are supplied as user-replaceable parts.

Part name	Part number	
40 GB drive unit	A203534	Replacement drive unit for AXRD-U040A1.
Controller unit	A203207	Replacement controller unit for AXRD-U series AT.

Information

For more information about this product, please contact your distributor.

Distributor's information

- Product Records

Model Name : _____

Model / Type : _____

Serial Number : _____

- *Manufacturer*



This product is manufactured by
Storage Vision Co., Ltd. in Japan.

<http://www.str-v.com/>