



# **3.5-inch Mirror Drive AT MODEL AXRB-U Series**

## **User's Manual**

P/N A203216

Revision 1.3e

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# Introduction

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Thank you for selecting the **3.5-inch Mirror Drive AT Model AXRB-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 AXRB-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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- **THE CONTENTS OF THIS DOCUMENT ARE SUBJECT TO CHANGE WITHOUT NOTICE.**
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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.

	<b>Warning</b>	Indicates a potentially hazardous situation that may result in death or serious injury to the user or severe damage to the product.
	<b>Caution</b>	Indicates a potentially hazardous situation that may result in serious injury to the user or damage to the product.
	<b>Important</b>	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**

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- 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. STR-V 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**

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- 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.
- After unpacking from transport, ensure first that each disk drive is properly inserted before turning on the power.

## ! Important

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- 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

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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.



# Important Points of the Mirror Drive Installation

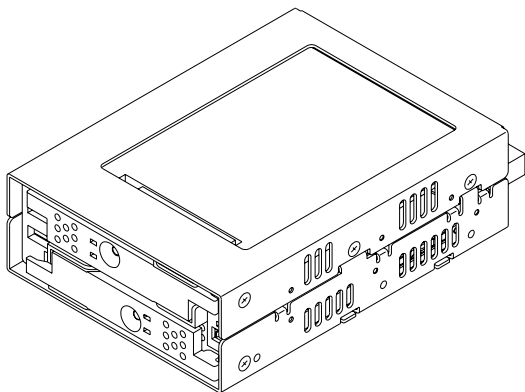
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When installing the **Mirror Drive** in the host computer, ensure that the drive unit is installed horizontally, as in <A> below.

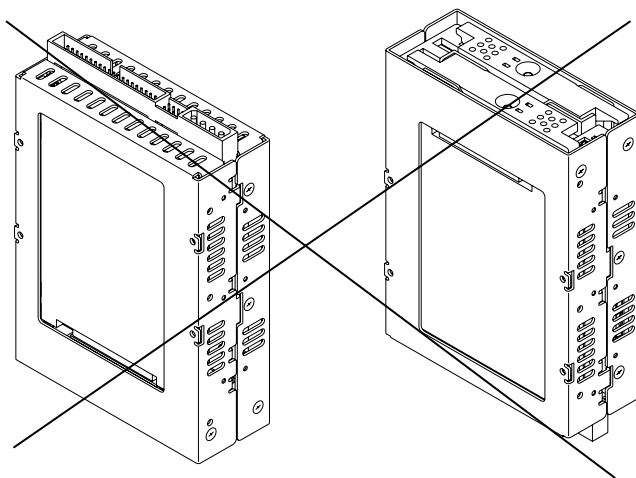
Do not install the unit vertically, i.e. with the connector facing either up or down, as in <B>.

Furthermore, when installing the unit on its side as in <C>, consult first with your distributor.

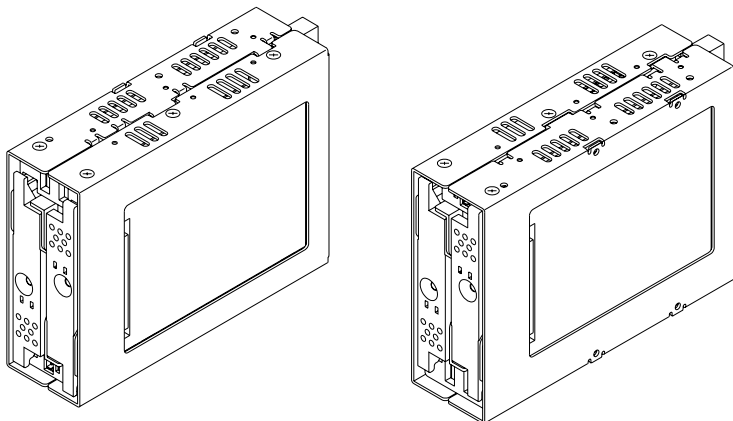
<A>Drive unit in horizontal position



<B>Drive unit in vertical position






<C>Drive unit on its side



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# 1 3.5-inch Mirror Drive Functions

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Incorporating two 2.5-inch disk drives, the STR-V **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 large cache memory capacity. 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".


	<b>Important</b>	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.

	<b>Caution</b>	Do not turn off the host computer while the <b>Mirror Drive</b> 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.

	<b>Important</b>	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.

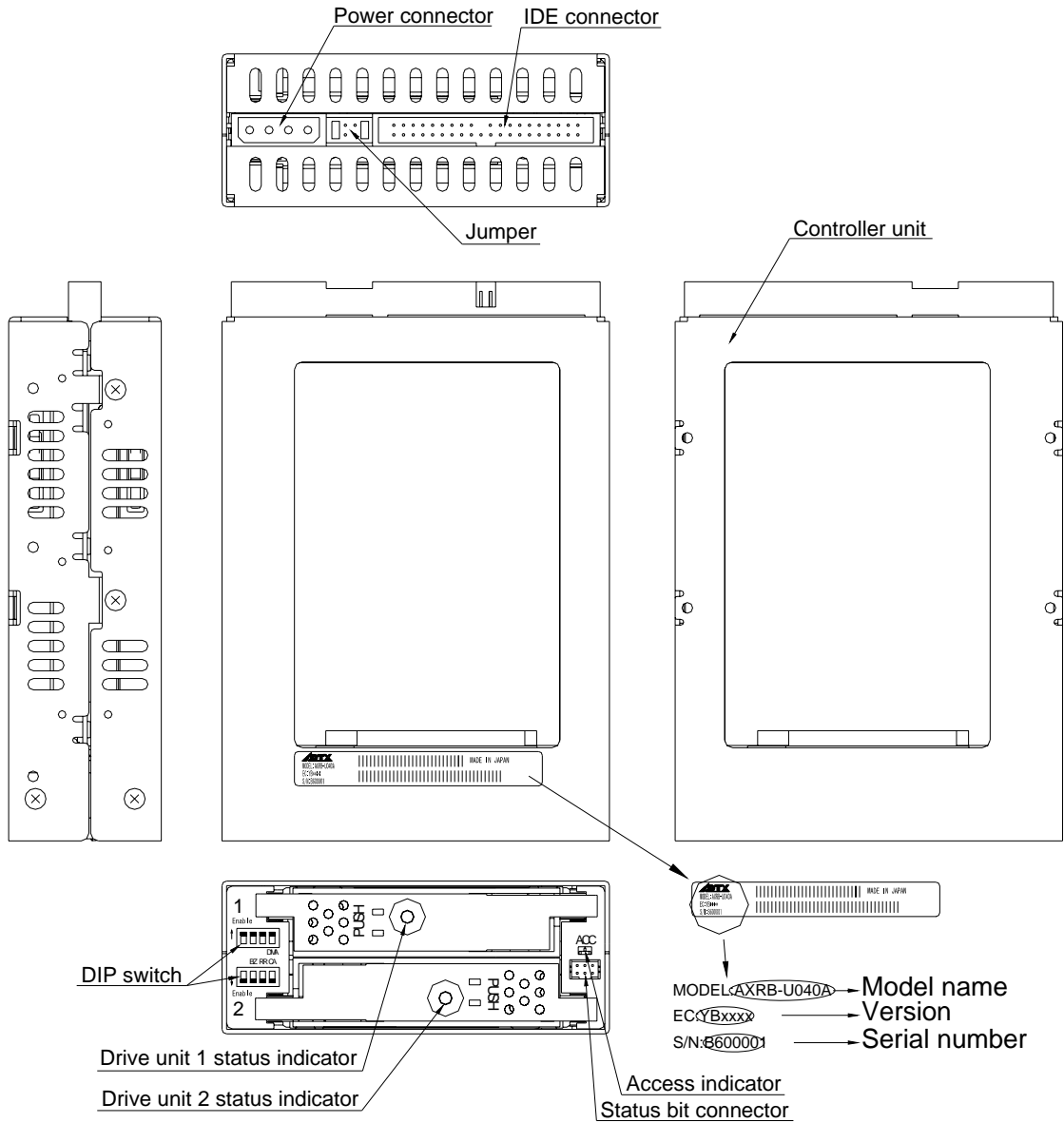
Revival reconstruction is executed up to two times. After the same error occurs three times, the **Mirror Drive** will remain in Degraded Mode. Then the failed drive status indicator (LED) will light orange.

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

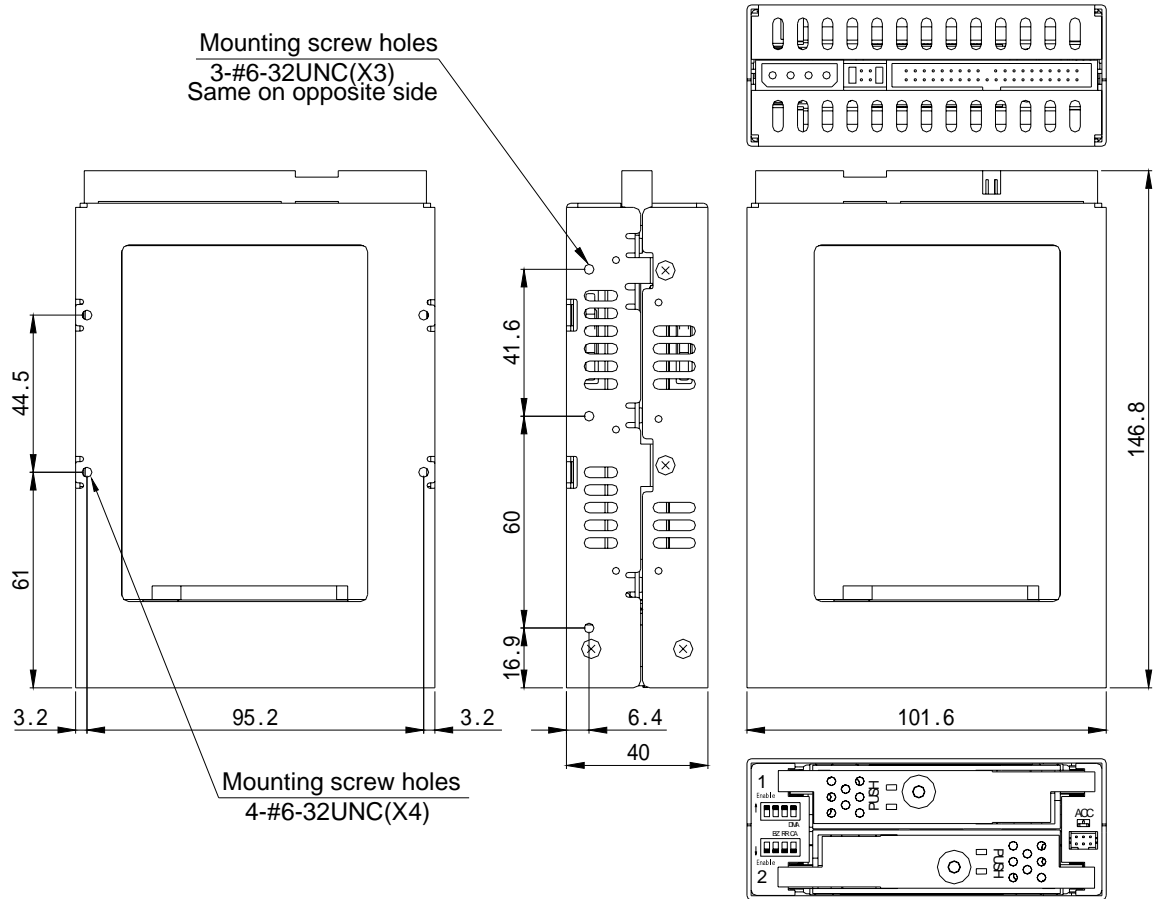
### 2.1 Part Names



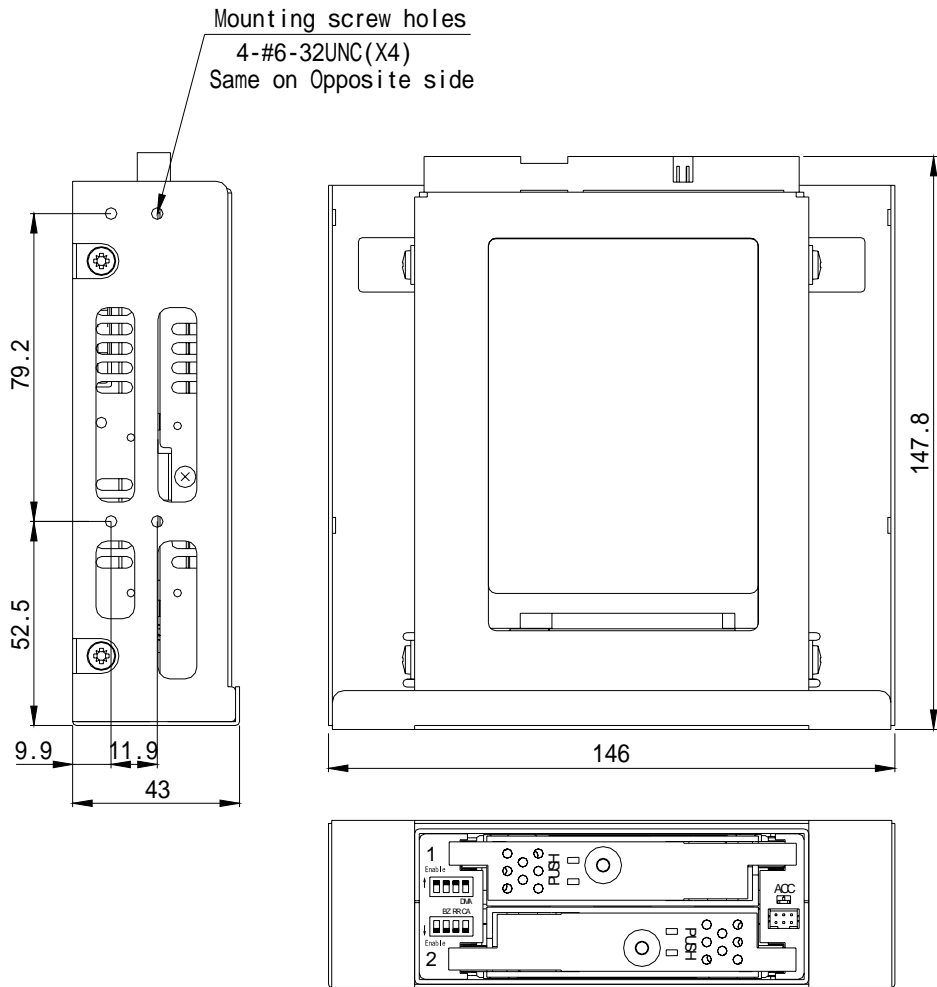


## 2.2 Dimensions

### 2.2.1 Mirror Drive




### 2.2.2 5-inch Bay Mirror Drive Installation Attachment



## 3 Installation

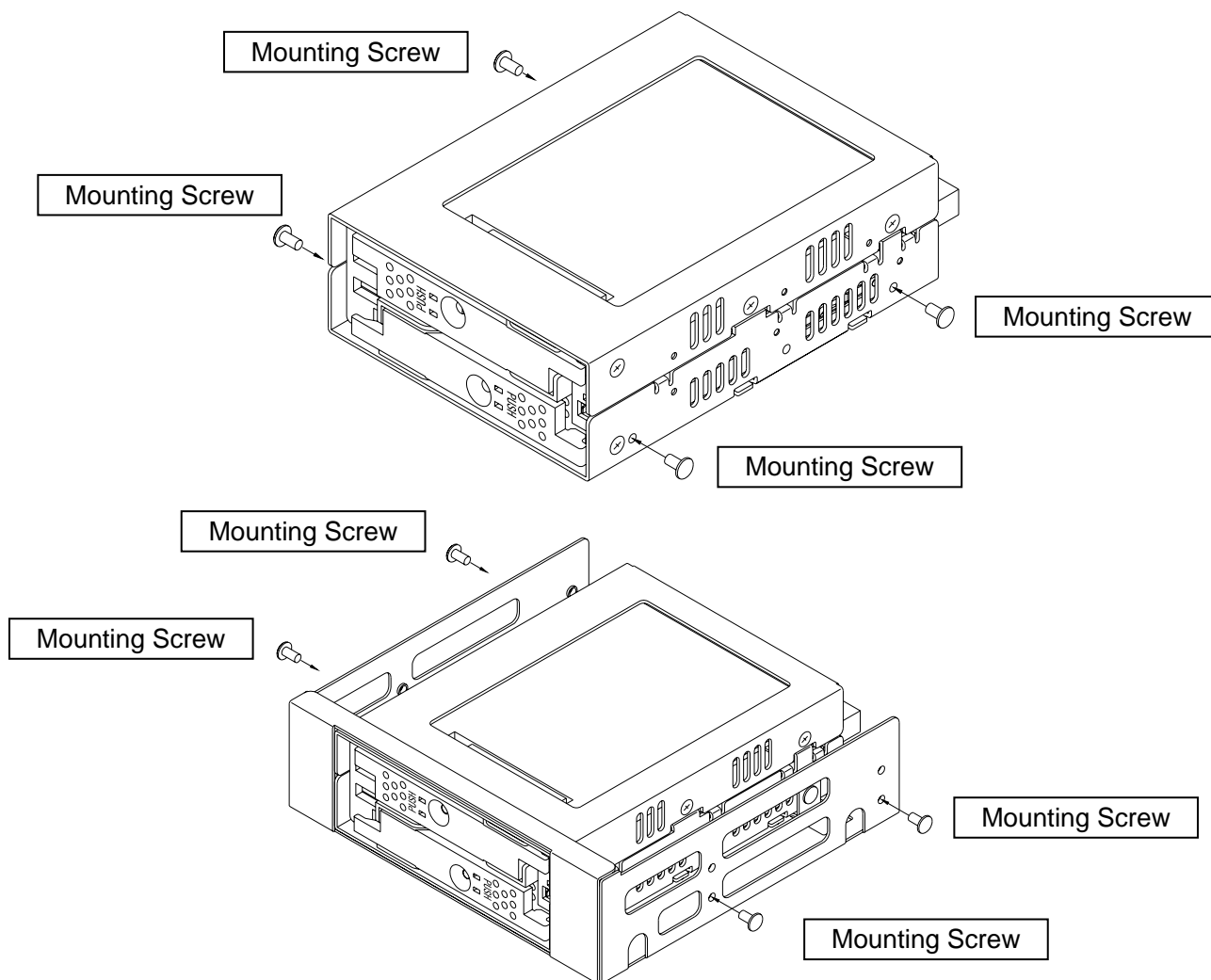
### 3.1 DIP Switch Settings


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."

	<h3>Caution</h3>	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

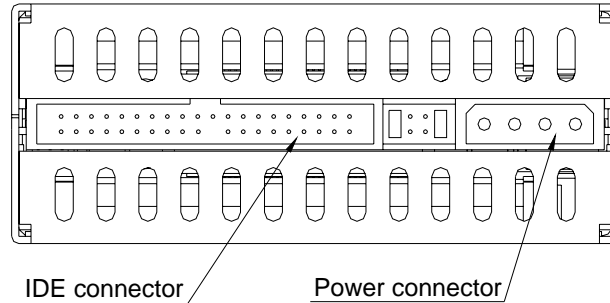
When mounting in the host computer, use the attached mounting screws and the specified mounting holes. The mounting screw hole locations are shown in "2.2 Dimensions." An example of a mounting screw hole location is shown below.



	<h3>Caution</h3>	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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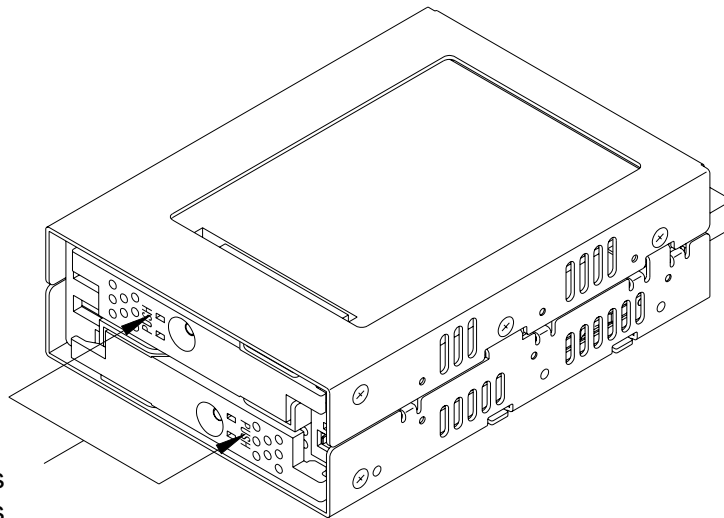
### 3.3 Cable Connection

- <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

Before turning on the host computer, gently press the front face of each drive unit to confirm that these are firmly inserted and verify if the lever lock is firmly fixed. Next, turn on the host computer's main power supply and check if the host computer detects the unit correctly.



Push the drive units and verify if the units are firmly inserted.



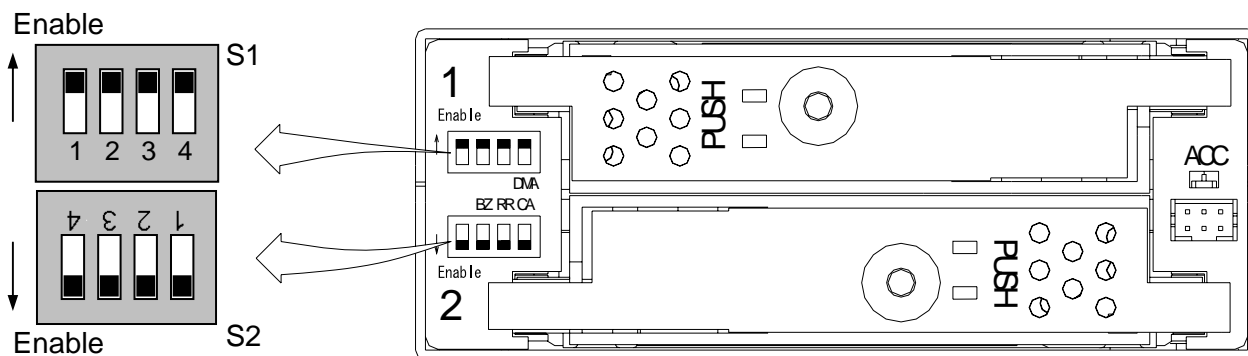
#### Caution

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.

## 4 Settings

### 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 on the left side of the front panel (two 4-bit dip switches).




DIP Switch	Functions	Default Switch position
S1-1	Mode Bit 1,2,3	Enable (Normal)
S1-2		
S1-3		
S1-4	DMA Mode	Enable (UDMA100)
S2-1	Write Cache	Enable (Write Back)
S2-2	Revival Reconstruction	Enable
S2-3	Buzzer	Enable
S2-4	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 before shipping.)
		Do not change the Mode Bit switches (S1-1, 2, 3) and S2-4.


### 4.1.1 Operating Mode (Do not change)

The operating mode switches (S1-1, 2, 3 & S2-4) are set to normal mode (mirror mode). Do not change this setting.

	<b>Important</b>	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).

	<b>Important</b>	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.

	<b>Important</b>	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 remains lit may result in loss of data currently located in cache memory.
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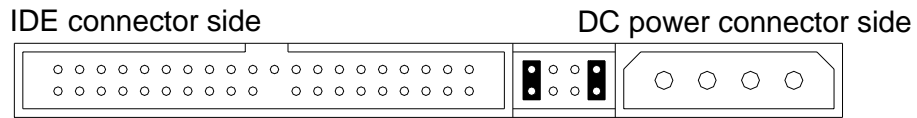
### 4.1.4 Buzzer

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 be stopped if the switch position is changed to "Disable". Set back the buzzer to "Enable" after the failed drive unit has been replaced.

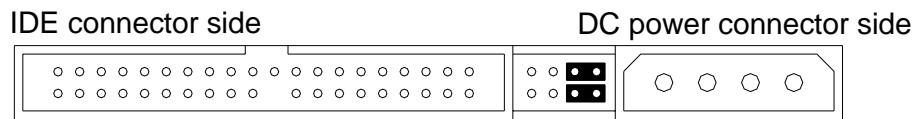
## 4.2 Master / Slave Settings

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

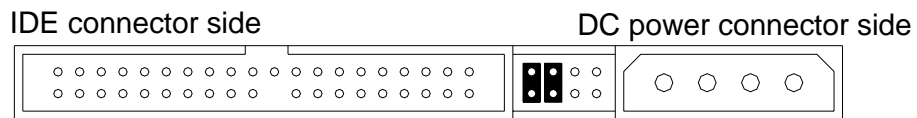
### Master



### Slave

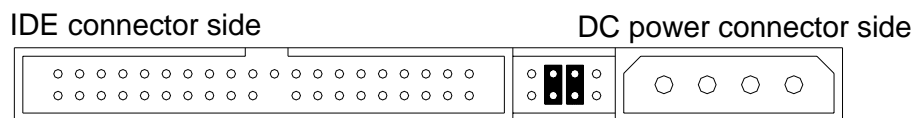


### Master (with slave)



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>&lt;1&gt; When the power is turned on. <sup>(*)</sup></p> <p>&lt;2&gt; Processing a command from the host computer. Either of the above.</p>
	Orange Flashing	<p>&lt;1&gt; Both drive units have failed, or a drive unit is not correctly inserted. (Both drive status indicators are off.)</p> <p>&lt;2&gt; 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>&lt;3&gt; 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>&lt;1&gt; When the power is turned on. <sup>(*)</sup></p> <p>&lt;2&gt; Processing a command from the host computer. &lt;3&gt; Processing an internal command. Either of the above.</p>
	Orange	<p>&lt;1&gt; When the power is turned on. <sup>(*)</sup></p> <p>&lt;2&gt; Drive unit has failed. Either of the above.</p>
	Orange Flashing	<p>Target drive unit of data reconstruction. <sup>(*)</sup> (Source drive unit LED is green at the same time.)</p>

**Note:**

<sup>(\*)</sup> 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.

<sup>(\*)</sup> Drive Status Indicator will go out after data reconstruction.

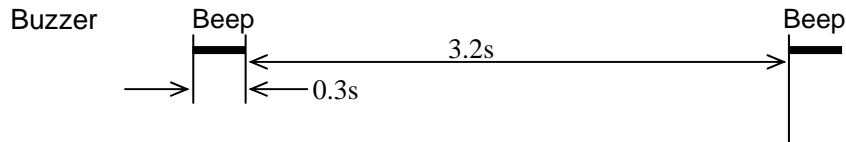
	<b>Important</b>	<p>If the drive status indicator lights orange, immediately replace the said drive unit. Leaving the <b>Mirror Drive</b> with a failed drive unit will result in data loss if the other drive unit fails.</p>
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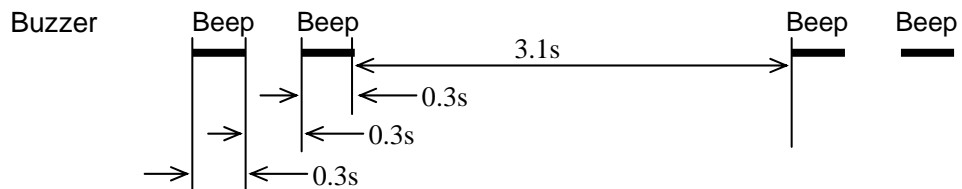
### 5.1.3 Buzzer

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

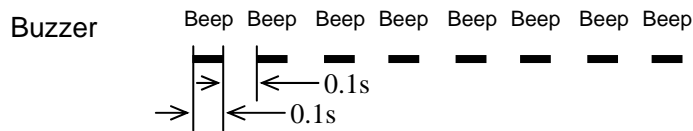
Drive unit 1 failed



Drive unit 2 failed

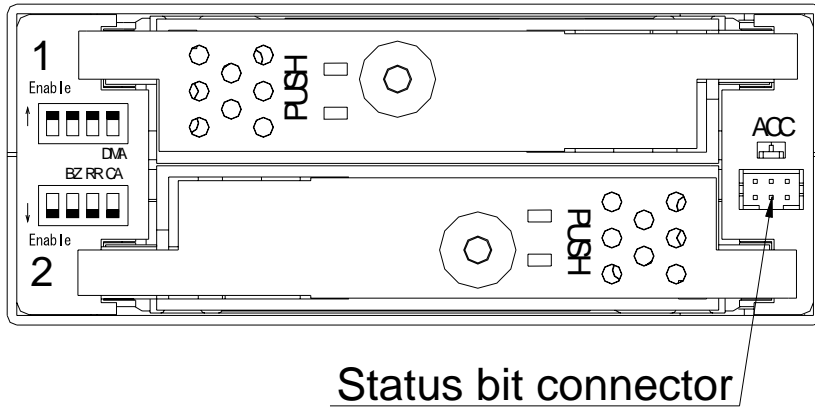


System stopped (Both drive units have failed)



## 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		<b>Mirror Drive</b> 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 <b>Mirror Drive</b> 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

A failed drive unit can be replaced while the **Mirror Drive** is accessed. When 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.

	<b>Important</b>	Before replacing the failed drive unit, be sure to prepare the replacement drive unit designated by STR-V 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, STR-V is not held liable for any consequence resulting from the use of an undesignated HDD.
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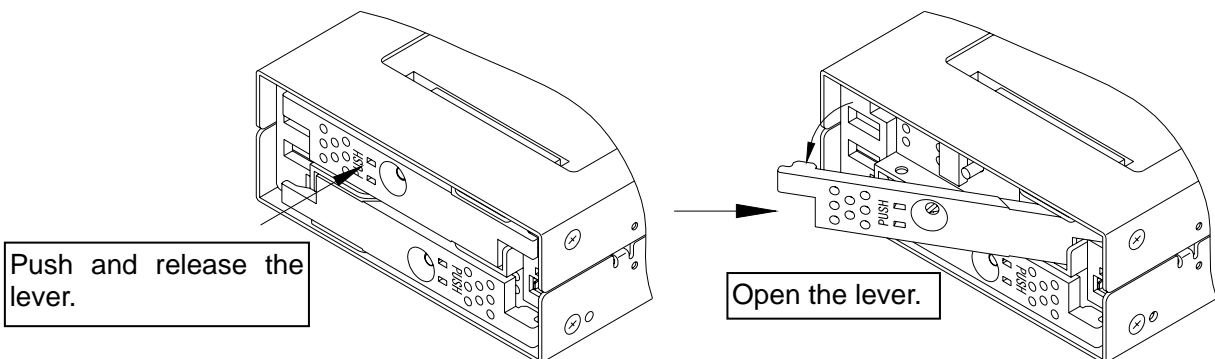
	<b>Important</b>	If the drive status indicator lights orange, immediately replace the specified drive unit with a new drive unit. Leaving the <b>Mirror Drive</b> with a single operational drive unit for an extended period will result in data loss if the other drive unit fails.
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	<b>Caution</b>	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.
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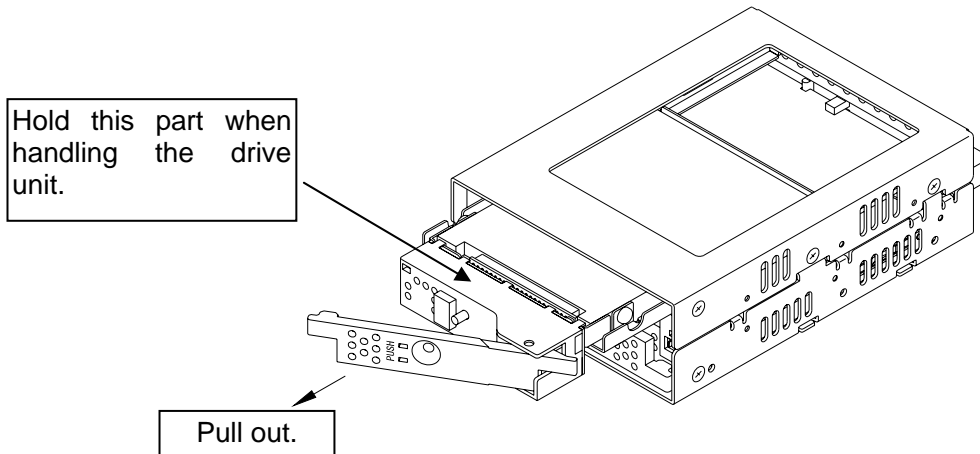
### 6.2.1 Replacement of 1 Drive Unit

Drive Unit Replacement Procedure. (Host computer is running)

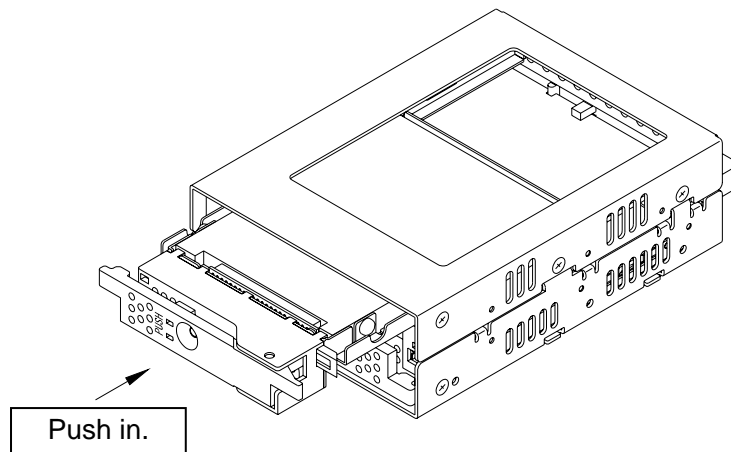
1. Prepare a new drive unit as specified in "Appendix D Replacement Parts."
2. Confirm correct identification of the failed drive unit through the drive status indicator or buzzer.
3. Push the "PUSH" mark on the front lever and open the lever.



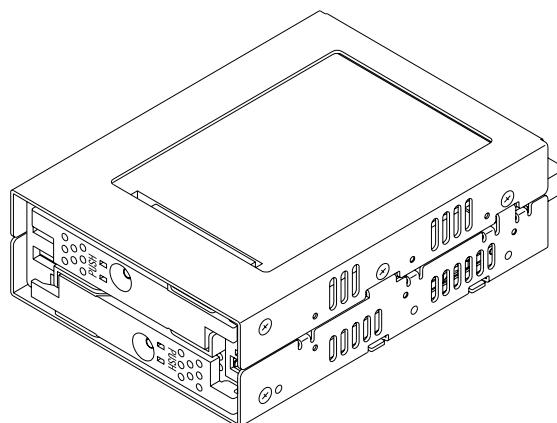
4. Pull the failed drive unit's lever, and then pull out the drive unit.




5. Close the front lever and insert the replacement unit. Push the replacement drive firmly into the unit with both hands.




6. Confirm that the front lever is closed.



7. Several seconds after replacing the drive unit, data reconstruction will start. The drive status indicator of the replaced drive unit will flash orange (@ 1 second interval).

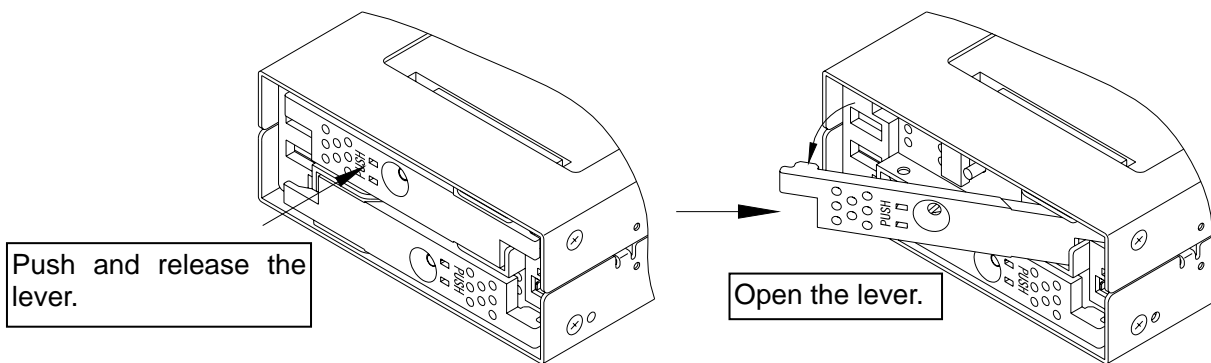
	<b>Important</b>	Do not remove the drive unit while data reconstruction is underway.
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8. During data reconstruction, the drive status indicator of the replacement drive will flash orange, and the drive status indicator of the fully functional drive unit will light green. The access indicator will not light.
9. When data reconstruction is complete, the drive status indicator will go out.
10. If the drive status indicator of the replaced drive unit turns orange once again, repeat the procedure, starting with step 2.

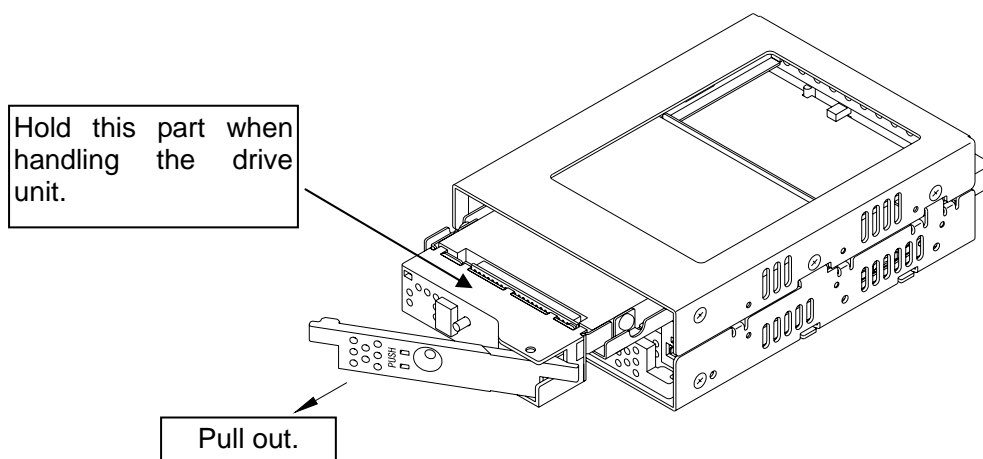
	<b>Important</b>	If you have mistakenly replaced the correctly functioning drive unit, the drive status indicator of both drive units will light green. Then the access indicator will flash orange. The host computer will be unable to operate the <b>Mirror Drive</b> . In this case, turn off the host computer. 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.
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Drive unit replacement. (When Host computer's power supply is turned off)

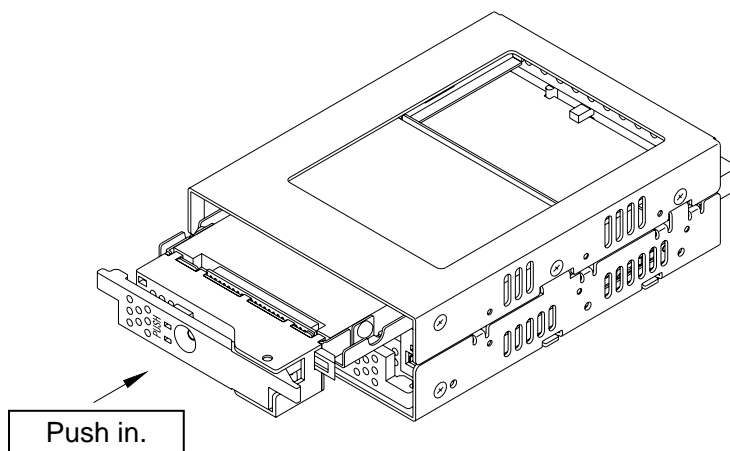
1. Prepare a new drive unit as specified in "Appendix D Replacement Parts."
2. Confirm correct identification of the failed drive unit through the drive status indicator or buzzer.
3. Turn off the power supply of the host computer.
4. Push the "PUSH" mark on the front lever and open the lever.



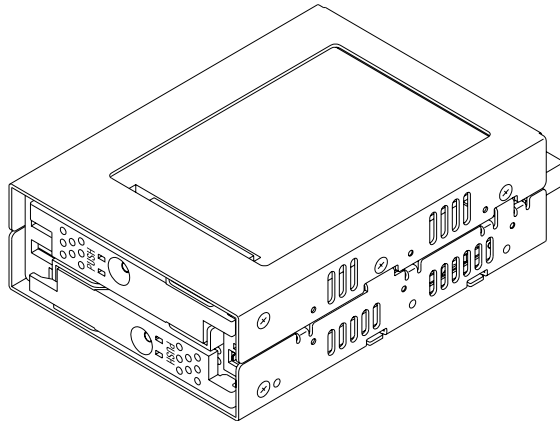
5. Pull the failed drive unit's lever, and then pull out the drive unit.



6. With the replacement unit's drive lever closed, push the replacement drive firmly right into the unit using both hands.



- 7. Confirm that the front lever is closed.



- 8. Turn on the power supply of the host computer.
- 9. Several seconds after replacing the drive unit, data reconstruction will start. The drive status indicator of the replacement drive unit will flash orange (@ 1 second interval).

	<b>Important</b>	Do not remove the drive unit while data reconstruction is underway.
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- 10. During data reconstruction, the drive status indicator of the replacement drive will flash orange, while the drive status indicator of the fully functional drive unit will light green. The access indicator will not light.
- 11. When data reconstruction is complete, the drive status indicator will go out.
- 12. If the drive status indicator of the replaced drive unit turns orange once again, repeat the procedure, starting with step 2.

	<b>Important</b>	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 operate the <b>Mirror Drive</b> . 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.
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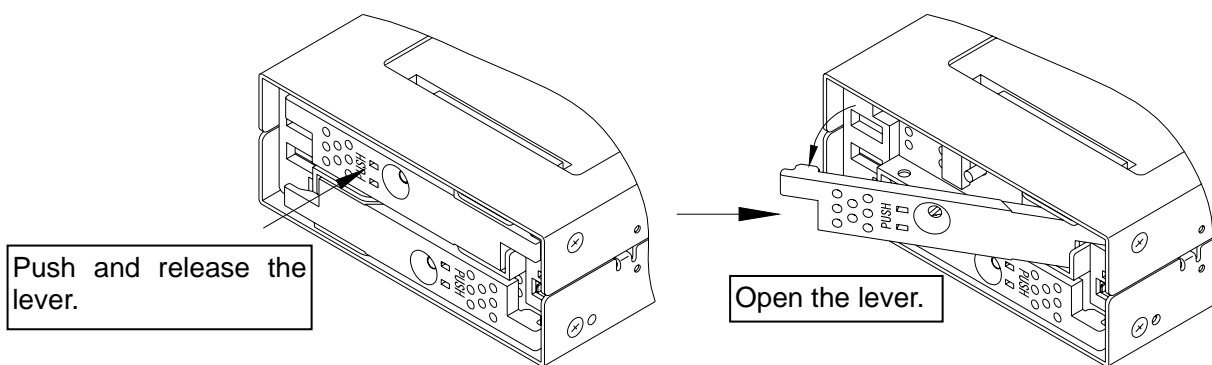


### 6.2.2 Replacement of Both Drive Units

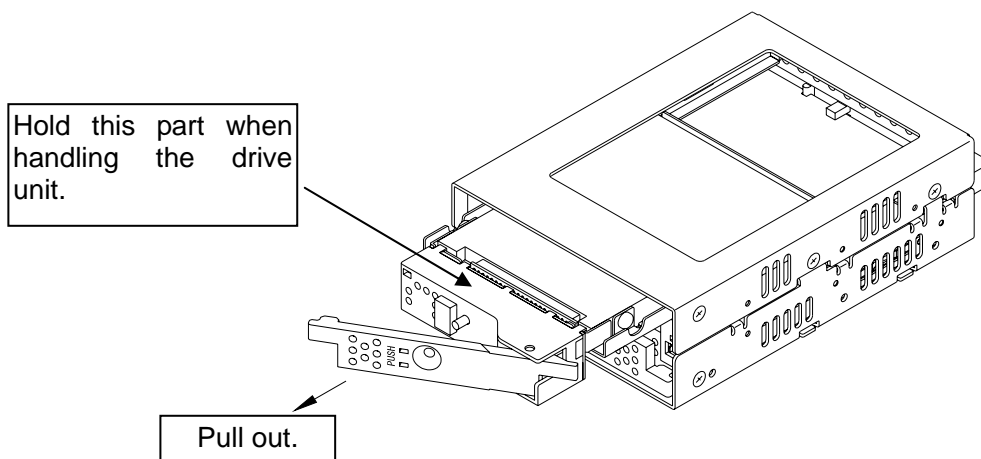
When both drive units seem to have failed, replace the units according to the following procedure.

	<h2 style="margin: 0;">Important</h2>	<p>This is an emergency recovery procedure; data corruption may or may have already occurred. To avoid further data loss, back up your data in a suitable medium, such as tape or MO drive.</p>
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1. Prepare the two new drive units as specified in "Appendix D Replacement Parts."
2. Turn off the power supply of the host computer.
3. The drive unit to be replaced first should be the one that failed first. Push the "PUSH" mark on the front lever and open the lever of the drive unit that failed first.



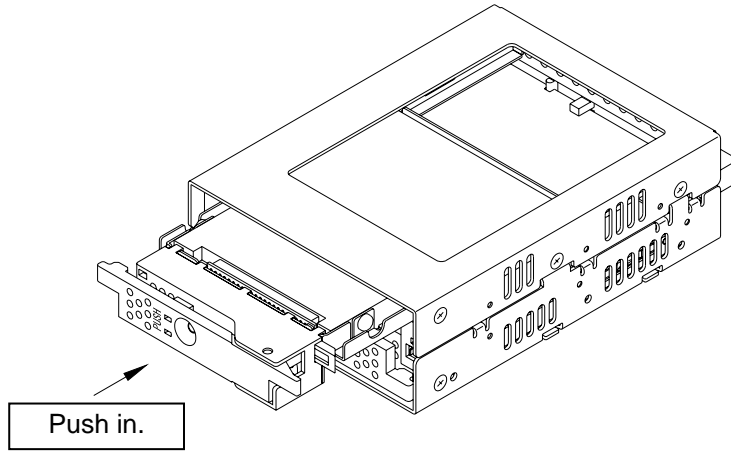
4. Hold the lever of the drive unit that failed first and then pull it out.



(E.g.) When drive unit 1 failed first.

5. Turn on the power supply of the host computer.
6. Confirm that the host computer recognizes the **Mirror Drive**.

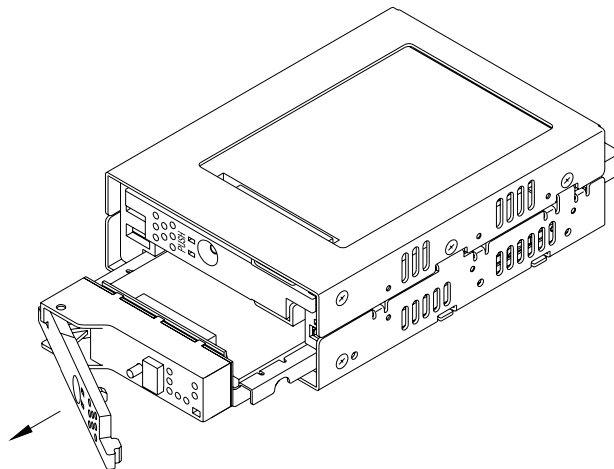
7. After confirming that the host computer recognizes the **Mirror Drive**, insert the replacement drive. With the lever closed, push the replacement drive firmly right into the unit using both hands.



8. Several seconds after replacing the drive unit, data reconstruction will start. The drive status indicator of the replacement drive unit will flash orange (@1 second interval).

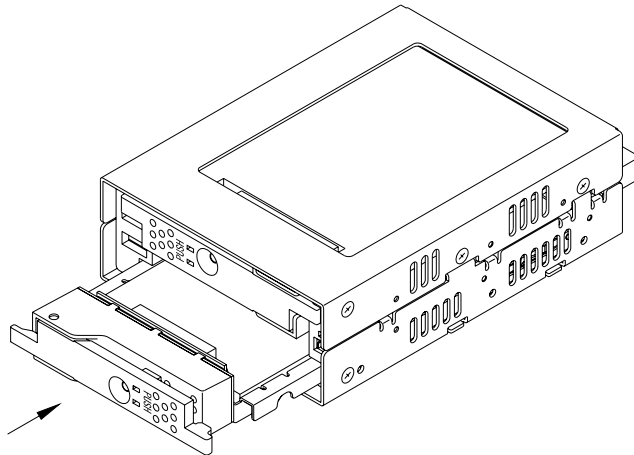
	<b>Important</b>	Do not remove the drive unit while data reconstruction is underway.
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9. During data reconstruction, the drive status indicator of the replacement drive will flash orange, while the drive status indicator of the other drive unit will light green. The access indicator will not light.
10. When data reconstruction is complete, the drive status indicator will go out. After confirming that the drive status indicator has gone out, turn off the power supply of the host computer.
11. Hold the lever of the un-replaced drive unit and pull it out.

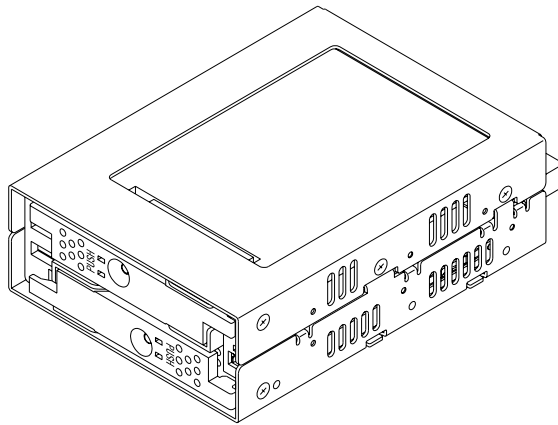


(E.g.) When drive unit 2 failed after drive unit 1.

12. With the replacement unit's drive lever closed, push the drive firmly right into the unit.



13. Confirm that the front lever is locked.



14. Turn on the power supply of the host computer.
15. Several seconds after replacing the drive unit, data reconstruction will start. The drive status indicator of the replacement drive unit will flash orange (@1 second interval).

	<b>Important</b>	Do not remove the drive unit while data reconstruction is underway.
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16. During data reconstruction, the drive status indicator of the replacement drive will flash orange, while the drive status indicator of the fully functional drive unit will light green. The access indicator will not light.
17. When data reconstruction is complete, the drive status indicator will go out.
18. If the drive status indicator of the replaced drive unit turns orange once again, repeat the procedure, starting with step 10.

### 6.3 Controller Unit Replacement

If the access indicator or the drive status indicator lights orange even after drive replacement, the controller may have a problem. In this case, replace the controller unit.

The hot plug function of the **Mirror Drive** cannot be used when replacing the controller unit. Turn off the power supply of the host computer before replacement.

When replacing the controller unit, data can be kept safe by following the correct replacement procedure.

Note that the replacement procedure will differ depending on the drive units' status.


<1> When both drive units are functioning normally:

Switch over both drive units to a new controller unit.

Ensure that each drive unit is inserted into exactly the same drive bays as before.

<2> When one drive unit has failed:

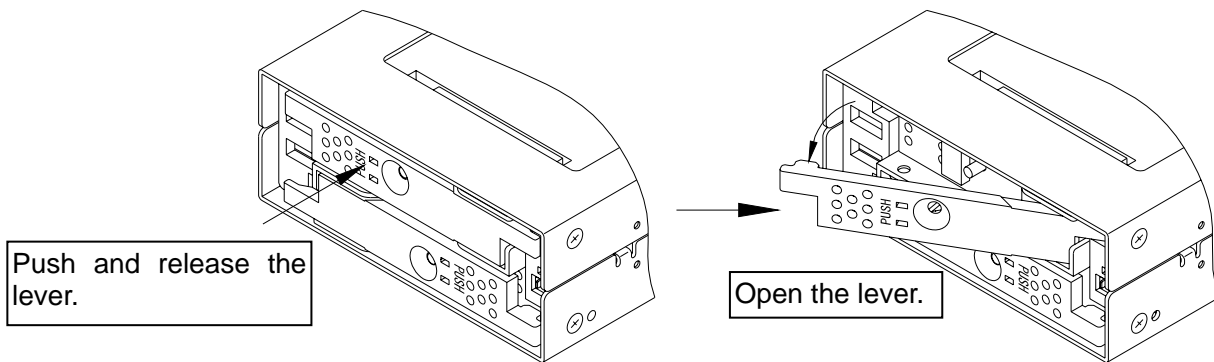
When it has been confirmed that one drive unit has failed, ensure that only the correctly functioning drive unit is inserted into the same bay of the new controller.

	<b>Caution</b>	When replacing controller units, make sure to turn off the power of the host computer, and the AC power cable is removed from the socket.
		When replacing drive units, ensure that you touch the chassis or any other grounded parts, to discharge static electricity from your body.
		Do not subject the drive units or the controller to vibration or shock. It may result in malfunction or disk failure.

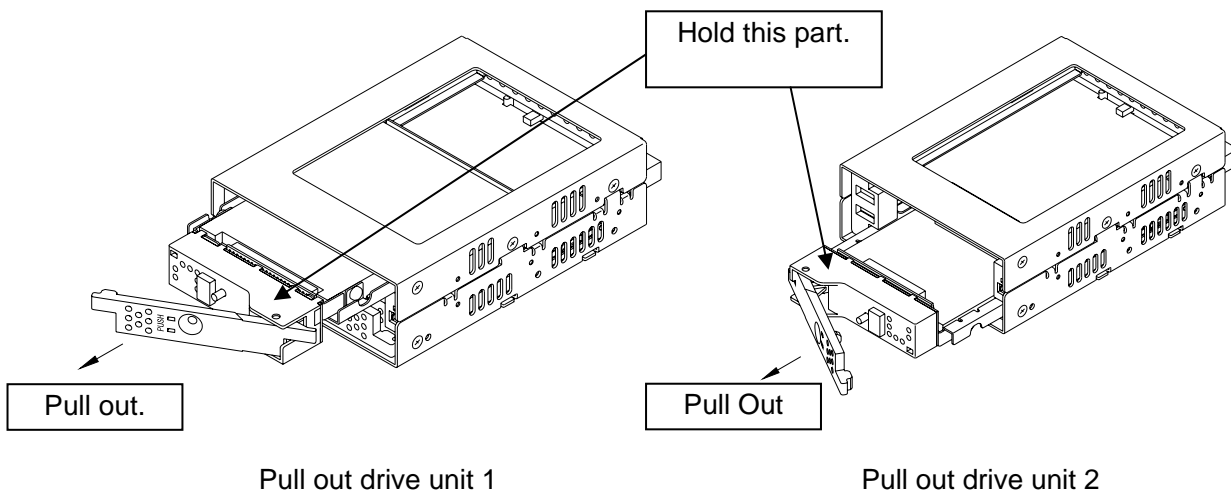
### 6.3.1 When both drive units are functioning normally

#### Controller Unit Replacement Procedure.

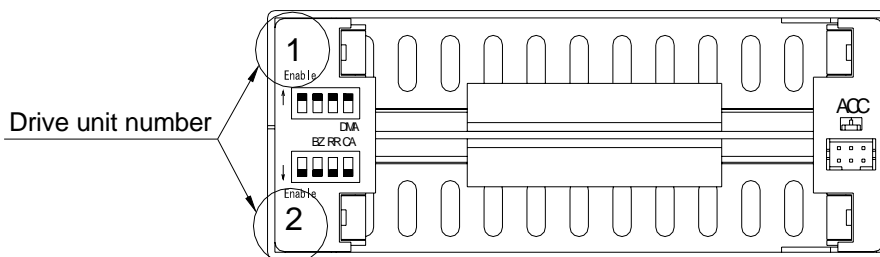
1. Prepare a new controller unit as specified in "Appendix D Replacement Parts."
2. Turn off the power supply of the host computer.
3. Disconnect the 40-pin IDE (ATA) cable and the 4-pin internal power cable. Then remove the **Mirror Drive** from the host computer.
4. Push the "PUSH" mark on the front lever and open the lever.



5. Release both drive units' lever one after the other and then pull it out.

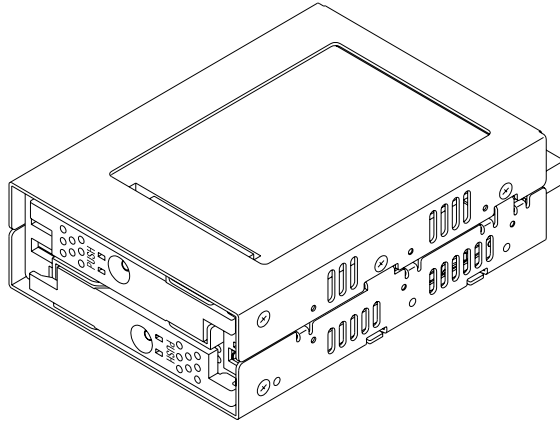


6. Insert the drive units into the new controller unit. Make sure drive unit numbers 1 and 2 are kept as they were before replacement.  
With the front levers closed, push the drives firmly right into the unit using both hands.



The location of the drive unit number

7. Confirm that the front lever is closed.

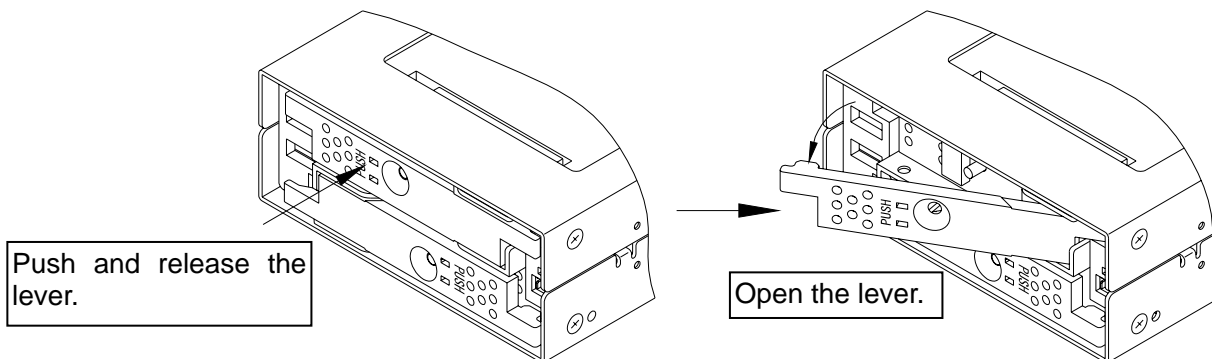


8. Re-install the **Mirror Drive** back into the host computer, and connect the 40-pin IDE (ATA) cable and the 4-pin power cable.
9. Turn on the power supply of the host computer.

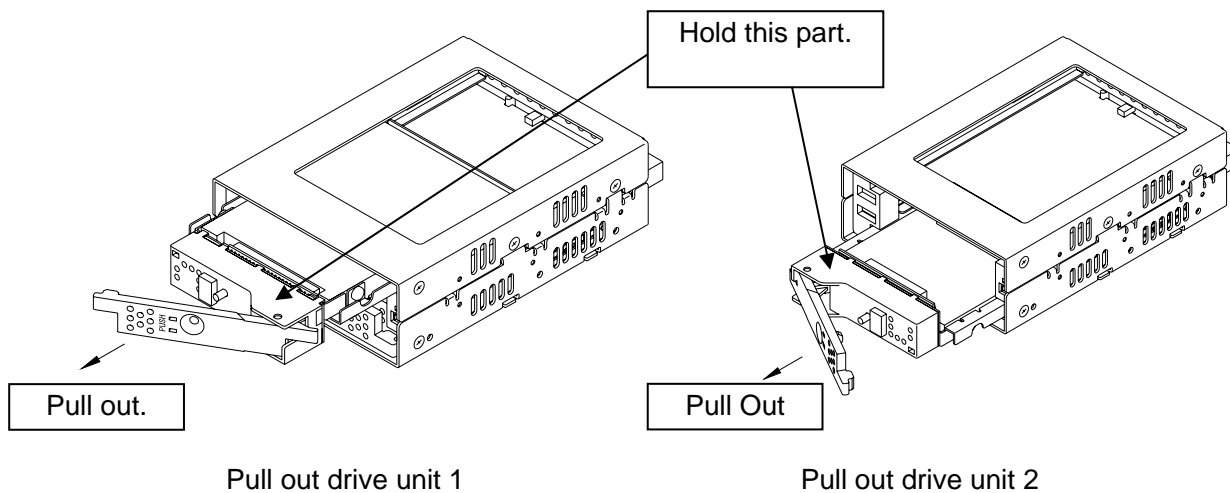
### 6.3.2 When one drive unit has failed.

#### Controller Unit Replacement Procedure.

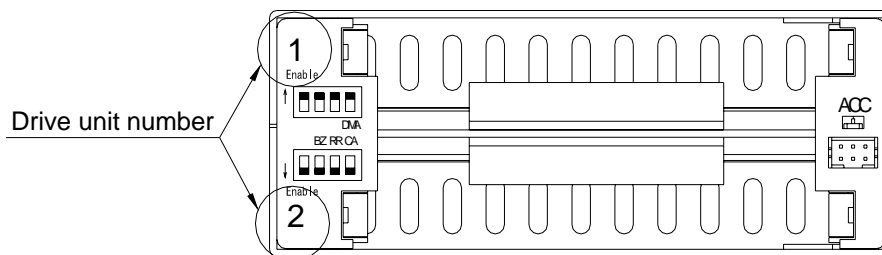
1. Prepare a new drive unit and a new controller unit as specified in "Appendix D Replacement Parts."
2. Confirm which drive unit has failed through the drive status indicator or buzzer.
3. Turn off the power supply of the host computer.
4. Disconnect the 40-pin IDE (ATA) cable and the 4-pin internal power cable. Then remove the **Mirror Drive** from the host computer.
5. Push the "PUSH" mark on the front lever and open the lever.



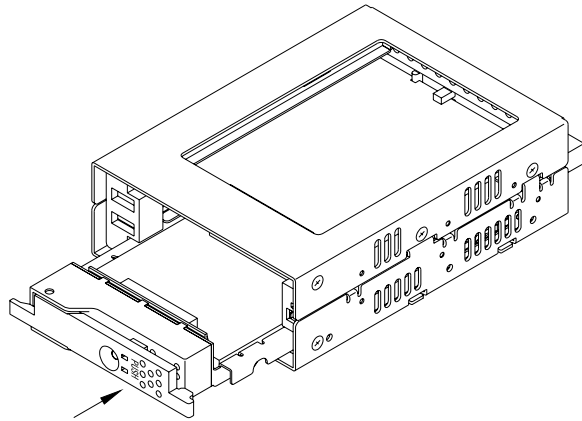
6. Pull out both drive units one after the other.



7. Insert the good drive unit into the new controller unit.  
Please keep the location of the drive unit (number 1 or 2) as it was before.  
With the front lever closed, push the drive firmly right into the unit using both hands.

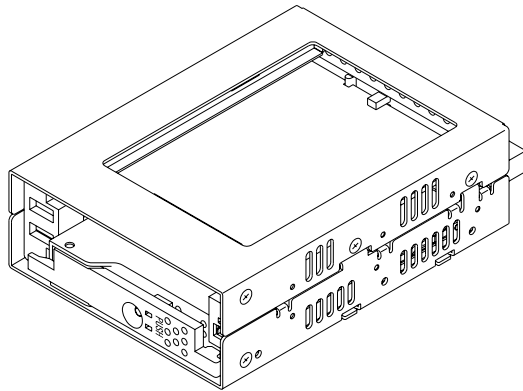


The location of the drive unit number

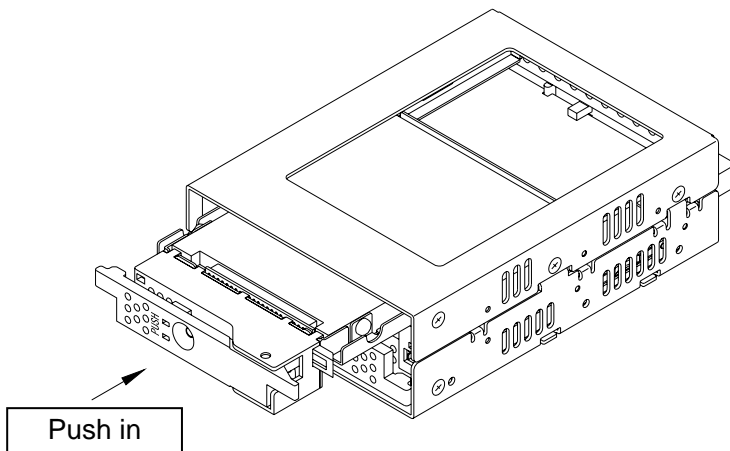


(E.g.) in the case that drive unit 2 works normally

- 8. Confirm that the front lever is closed.



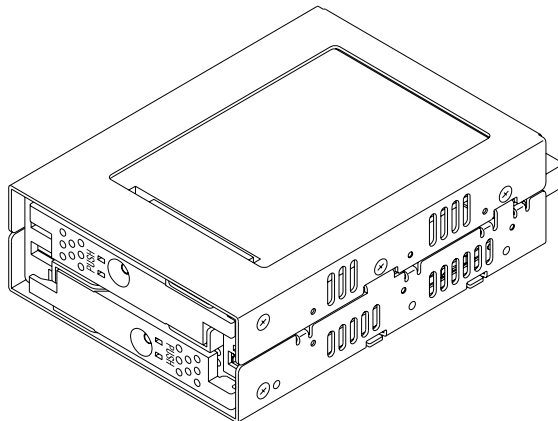
- 9. Install the **Mirror Drive** into the host computer, and connect the 40-pin IDE (ATA) cable and the 4-pin power cable.
- 10. Turn on the power supply of the host computer.
- 11. Confirm that the host computer recognizes the **Mirror Drive**.
- 12. Insert the new drive unit into the other empty slot.  
With the front lever closed, push the drive firmly right into the unit using both hands.



(E.g.) When inserting drive unit 1.



13. Confirm that the front levers are closed.



14. Several seconds after replacing the drive unit, data reconstruction will start. The drive status indicator of the replacement drive unit will flash orange (@1 second interval).

	<b>Important</b>	Do not remove the drive unit while data reconstruction is underway.
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15. During data reconstruction, the drive status indicator of the replaced drive will flash orange, while the drive status indicator of the fully functional drive unit will light green. The access indicator will not light.
16. When data reconstruction is complete, the drive status indicator will go out.
17. If the drive status indicator of the replaced drive unit turns orange once again (not flashing), turn off the power, pull out the replaced drive unit and repeat the procedure beginning from step 10.

## **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		AXRB-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)	Mirror Drive	101.6mm x 146.8mm x 40.0mm
	5-inch Bay Mirror Drive Installation Attachment	146.0mm x 147.8mm x 43.0mm
Weight (max.)	Mirror Drive	700 g
	5-inch Bay Mirror Drive Installation Attachment	900 g
Voltage (Vcc)		4.85 VDC ~ 5.25VDC
Power supply ripple <sup>(*2)</sup> (max.)		100mV p-p (0 ~ 20MHz)
Power startup time <sup>(*3)</sup>		5 ~ 100ms
Operating Environment <sup>(*1)</sup>	Temperature	5 to 45 °C <sup>(*4)</sup> (Operating), -40 to 65 °C (Non-operating)
	Humidity	8 to 90% (Operating), 5 to 95% (Non-operating)
	Max. Bulb Temp.	29°C (Operating), 40°C (Non-operating)
Power consumption	Startup (max.)	2.5 A
	Idle (max.)	1.3 A
	Read/Write (max.)	1.8 A

**Note:**

<sup>(\*1)</sup>: With no condensation.

<sup>(\*2)</sup>: Including startup time.

<sup>(\*3)</sup>: Time until Vcc reaches 4.85 V.

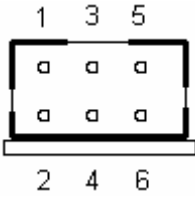
<sup>(\*4)</sup>: When mounting in your host computer, provide sufficient cooling to keep the surface temperature of the drive unit below 60 °C.

## A.2 External Output Signal Specification

### A.2.1 Status Signal

This table shows 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	<b>Mirror Drive</b> startup processing
7	H	H	H	Reserved (2)

H: TTL level output high.

L: TTL level output low.

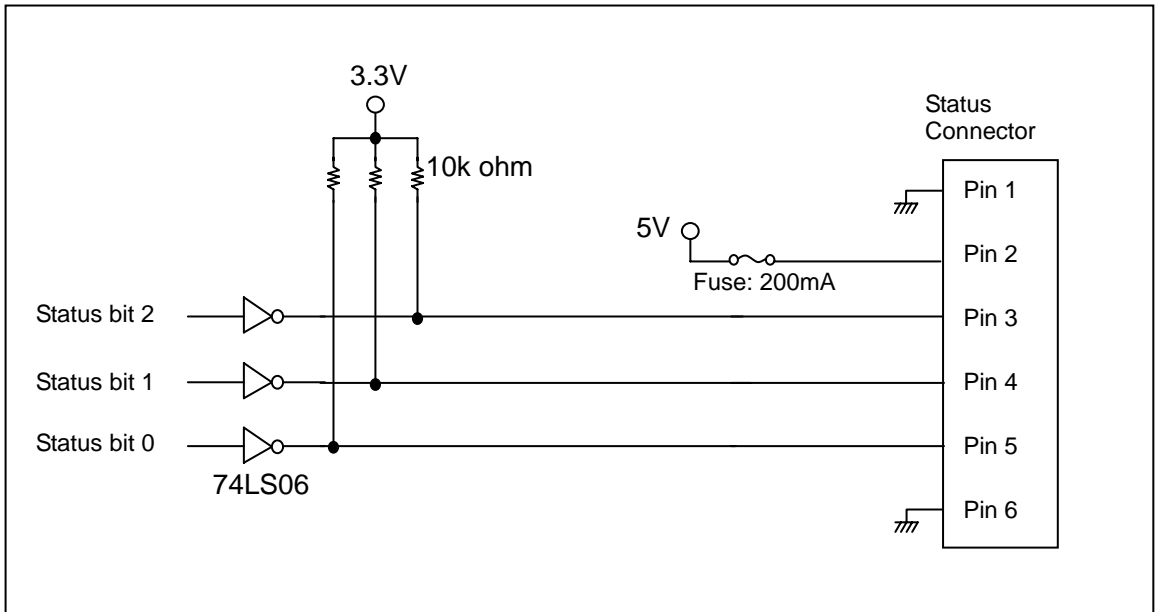
**Note:**

(1) The following condition will transmit the status as Controller unit failure.

- 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 are 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
<b>Mirror Drive</b> header	DF11-6DP-2DS	HIROSE Electric Co., Ltd.
External connectors – connector side (recommended)	DF11-6DS-2C	HIROSE Electric Co., Ltd.
External connectors – connector crimp contacts (recommended)	DF11-2428SCF/SC	HIROSE Electric Co., Ltd.

## **Appendix-B Accessories**

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

- Mounting screws. (x4)

## Appendix-C Factory Default Setting

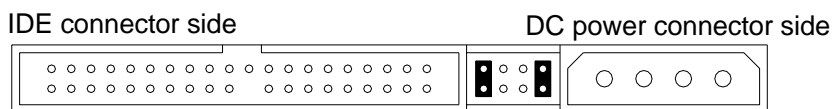
The **Mirror Drive's** factory default settings are as follows:

### DIP switch Setting

	Default Setting 		
	Function / Mode	SW No.	DIP SW
Mode	Mirror Mode	S1-1	Enable
		S1-2	Enable
		S1-3	Enable
UDMA100 Mode	Enable (UDMA100)	S1-4	Enable
Write Cache	Enable (Write Back)	S2-1	Enable
Revival Reconstruction.	Enable	S2-2	Enable
Buzzer	Enable	S2-3	Enable
Reserved	---	S2-4	Enable

### Jumper Setting

Master / Slave Selection	Master
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## **Appendix-D Replacement Parts**

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The following are supplied as user-replaceable parts.

<b>Part name</b>	<b>Part number</b>	
40 GB drive unit	A203533	Replacement drive unit for AXRB-U040A.
Controller unit	A203220	Replacement controller unit for AXRB-U series AT.



## Information

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

Distributor's information
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- Product Records

Model Name : \_\_\_\_\_

Model / Type : \_\_\_\_\_

Serial Number : \_\_\_\_\_

- *Manufacturer*



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

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