5.25-inch Mirror Drive

AT MODEL

AXRA-N Series

User's Manual

P/N A203028

Revision 1.1e

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Introduction

Thank you for selecting the **5.25-inch Mirror Drive AT Model AXRA-N Series**. This manual describes how to install, operate, and maintain your **Mirror Drive**, and will help familiarize you with the **Mirror Drive** and its features.

NOTICE

Please be sure to read the user's manual before using your **Mirror Drive**.
This manual provides information on and describes appropriate handling procedures and configurations for all product functions. This information will allow the user to take full advantage of the **5.25-inch Mirror Drive AT Model AXRA-N Series**.

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

RETAINING PACKAGING MATERIALS

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

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.
Section "2.1 Part Names" shows the label location of model name, version, and serial number.

To ensure safe use of this product:

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

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, failure to observe which may result in 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 directions given on these labels.

In the case of appearing **Warning** or **Caution** labels in addition to this user's manual, be sure to follow the directions on it.

⚠ Warning

- If you detect any abnormal conditions, such as smoke or foul odors, immediately shut off power for the host computer.
- If any foreign materials (metals, water, liquids, etc.) enter the **Mirror Drive**, immediately shut off power for the host computer.
- Do not use the **Mirror Drive** in hot or damp locations. Using this product in hot or damp 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 yourself may result in fire, electrical shock, or damage.
- Before connecting or disconnecting the interface connector, shut off power for the host computer and any 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. Avoid using undue force to connect or disconnect 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. Use of the **Mirror Drive** in such locations may result in malfunctions or disk failure.

- Do not use the **Mirror Drive** in locations or circumstances subject to condensation. Rapid temperature changes may cause condensation to form on the **Mirror Drive** itself. If you believe condensation has occurred, leave the **Mirror Drive** to acclimate to the new environment. 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.
  Use of the **Mirror Drive** in such locations may result in malfunctions or disk failure.

- Turn power off before moving the unit with the **Mirror Drive**. This will prevent damage to the HDD and other internal components of the **Mirror Drive**.

- Do not turn power on immediately after turning power off, or turn power off immediately after turning power on. Leave at least 20 seconds between successive operations involving powering on or off. This will help prevent damage to or malfunction of the mounted HDD. The HDD motor spindle requires about 20 seconds to stop rotating and come to a full rest. In addition, if removing the correctly functioning drive unit for replacement, turn power off and wait at least 20 seconds.

- Do not remove the correctly functioning drive unit while power is on. The **Mirror Drive** will detect it failed if the drive unit is removed. Removing the no failed drive unit may 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 periods may lead to malfunctions or disk failure.

- Avoid applying excessive pressure to the covers of the drive unit, which may lead to malfunctions or disk failure.

- Do not block the ventilation openings. Operating without proper cooling to the **Mirror Drive** may lead to the cause of a fire.

- Do not move the **Mirror Drive** with holding the bezel.

- Do not insert hands or tools into empty slots, which may lead to electrical shock or malfunctions.

Important

- Back up all important data stored on 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. 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 HDD. Lack of the 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 data frequently accessed from the HDD. Except in emergencies, you must follow the operating system's shutdown procedures. Failure to so may result in loss of data stored in cache memory.

- Never remove or exchange the drive units, except to replace controller units or drive units, since the **Mirror Drive** controls drive units by using its serial number. 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 recommended).

- In the event of a drive unit failure, it may take up to 25 seconds to start up the **Mirror Drive**. The host computer may yet fail to recognize due to BIOS timeout settings.

Handling Static-Sensitive Devices

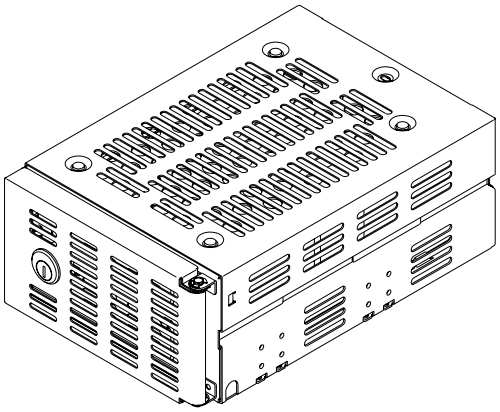
To prevent damage to components from static electricity, observe the following precautions when handling this product.

- 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 in which this product was shipped on a flat, level surface. Work on the **Mirror Drive** in this area.

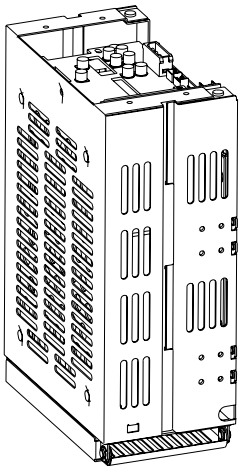
Mounting on Host Computer

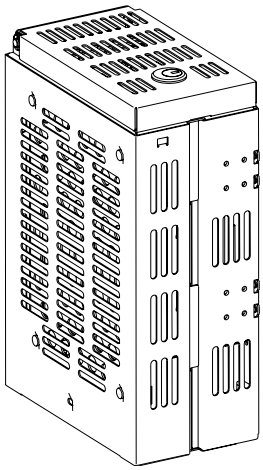
Install the **Mirror Drive** oriented horizontally, as in <A> below. Mounting the **Mirror Drive** in an orientation other than the one specified may increase operating temperatures or place unexpected mechanical stress on the **Mirror Drive**.

<A> Drive unit in horizontal position

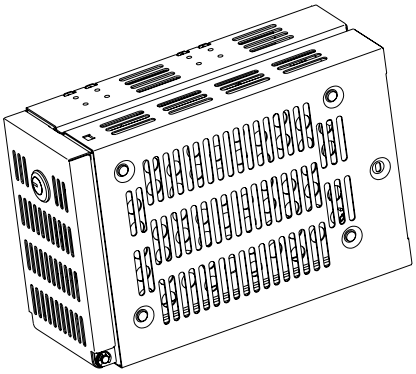


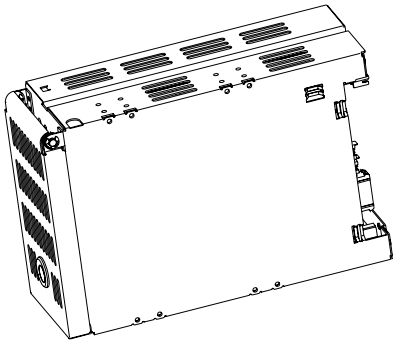
<B> Drive unit in vertical position





<C> Drive unit on its side





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1. Introducing the 5.25-inch Mirror Drive

Incorporating two 3.5-inch disk drives, the ADTX **5.25-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 a IDE (ATA) cable from the host computer.

1.1 Features

- In the event that one of the drive units fails, the **Mirror Drive** will continue to function, maintaining data integrity. When the failed disk is replaced with a new replacement disk, data rebuilding will begin automatically.
- The **Mirror Drive** is provided with large cache memory capacity 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/66 mode is supported. (Maximum data transfer rate: 66 MB/s)

1.2 Mirroring

Mirroring technology involves writing 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

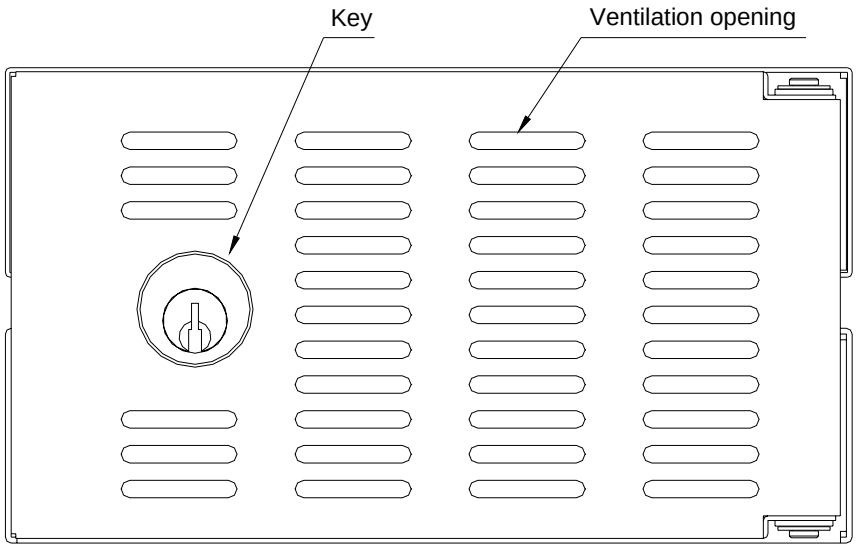
The **Mirror Drive** is equipped with large cache memory capacity. With write cache mode enabled, the **Mirror Drive** will signal completion of command processing to the host computer when data is written to cache memory. The performance will be improved by writing accumulated data to the HDD while the host computer does not access to the **Mirror Drive**. Write cache mode is enabled via DIP switch. The default setting at shipment is ON (enabled).

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

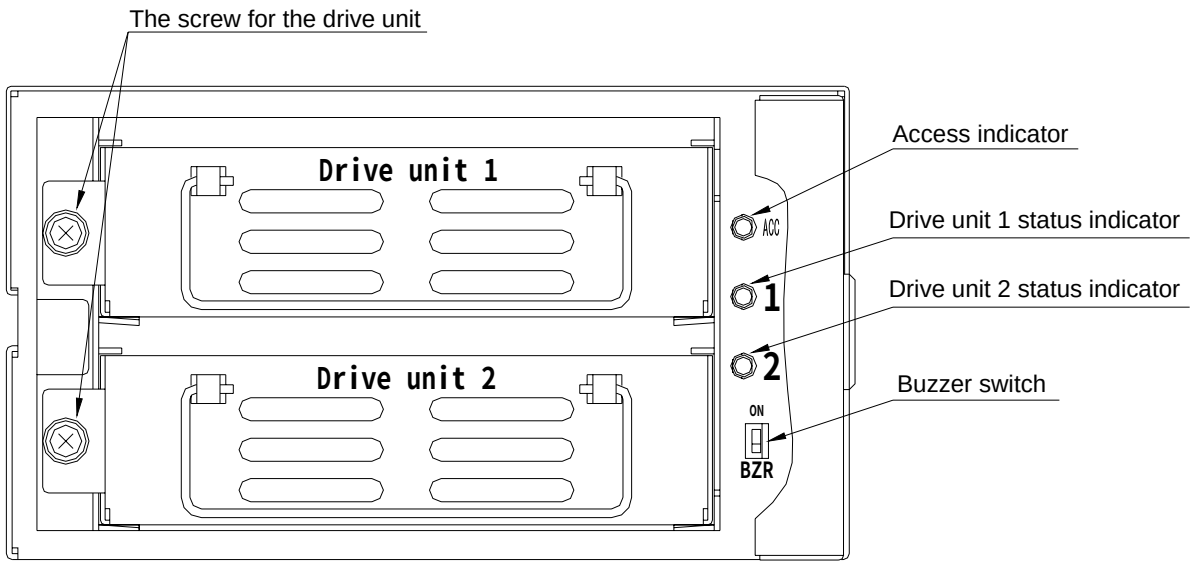
2. External Dimensions

2.1 Part Names

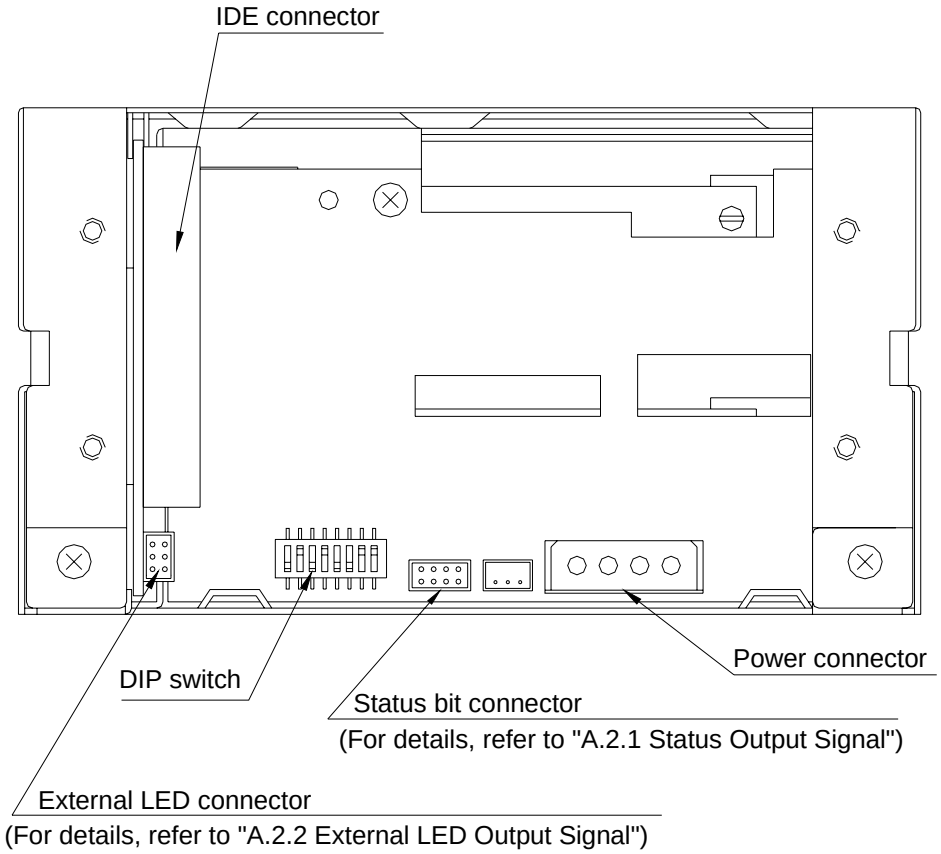
Front View (With Bezel Closed)



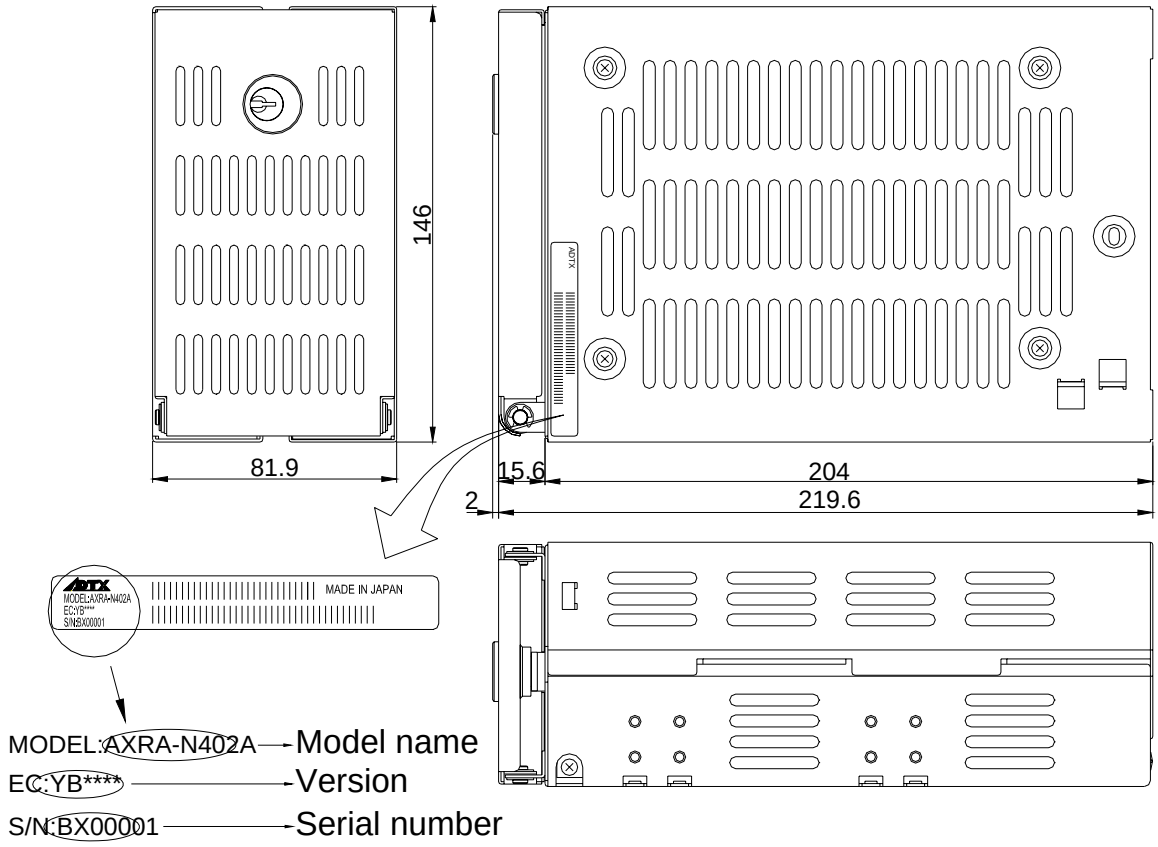
Front View (With Bezel Open)



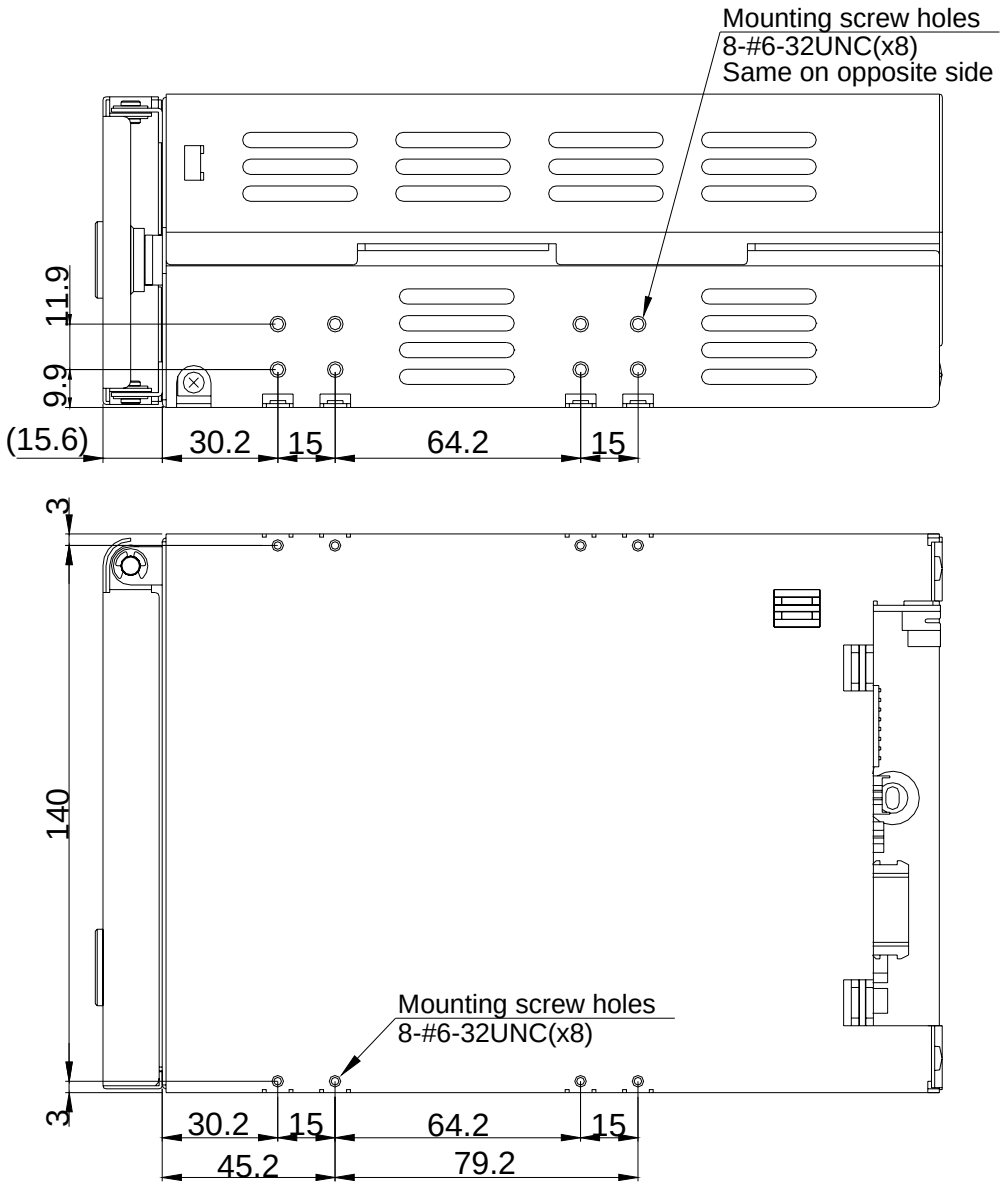
Back View


IDE connector
DIP switch
Status bit connector
(For details, refer to "A.2.1 Status Output Signal")
Power connector
External LED connector
(For details, refer to "A.2.2 External LED Output Signal")

2.2 External Dimensions



2.3 Screw Hole Dimensions for Attachment



3. Mounting in the Host Computer

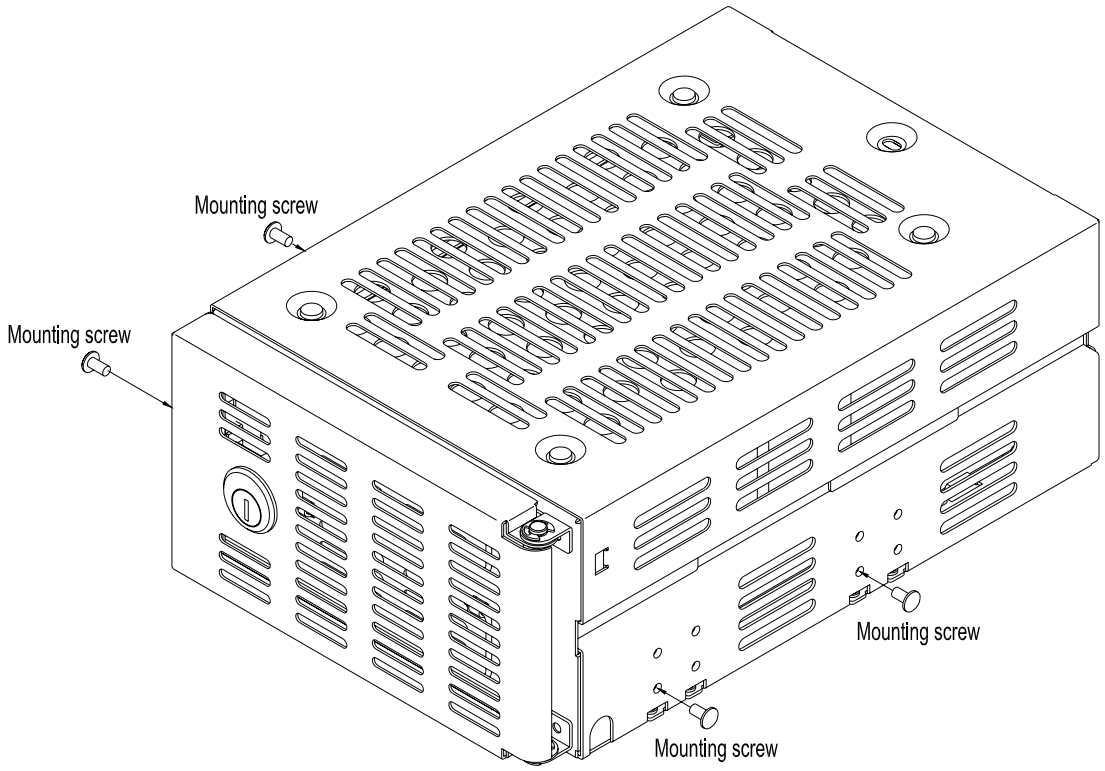
3.1 DIP Switch Settings

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

⚠	**Caution**	Before setting DIP switch or connecting cables, make sure the power supply of the host computer has been turned off.

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 "2.3 Screw Hole Dimensions for Attachment" An example of a mounting screw hole location is shown below.

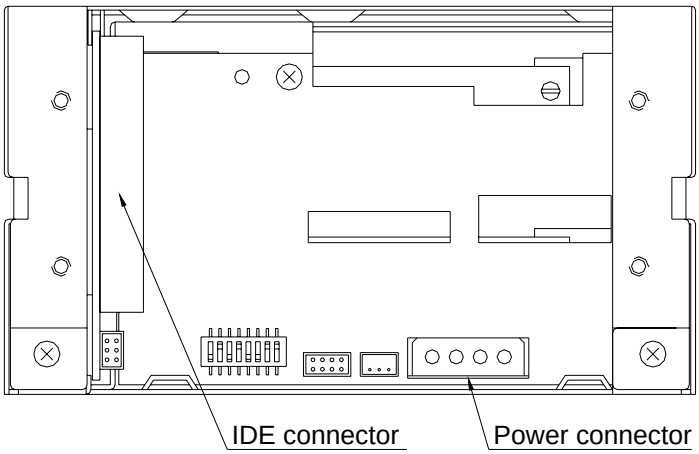


⚠	**Caution**	When installing into the host computer, provide sufficient cooling in order to ensure that the surface temperature of the drive unit remains below 60 °C.
		Do not block the ventilation openings. Without proper ventilation, the **Mirror Drive** will malfunction or fail.

3.3 Connecting Cables

<1> Connect a 4-pin internal power cable, supplied DC +5 V and 12 V.

<2> Connect an internal IDE (ATA) cable to the host computer.



⚠	**Caution**	When using Ultra DMA/66 mode, use the Ultra ATA cable.

3.4 Turning on Main Power

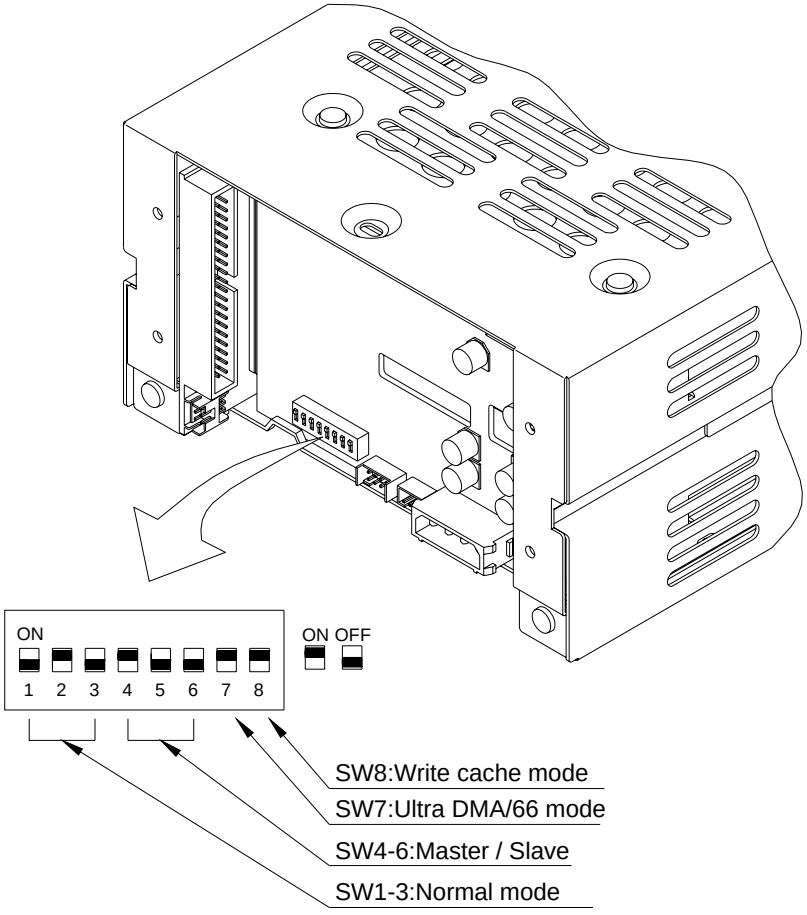
Turn on power for the host computer and confirm that the host computer recognizes the **Mirror Drive**.

⚠	**Caution**	Before turning on power for the host computer, confirm that master/slave are properly set and that the IDE (ATA) cable and the power cable are correctly connected.

4. Settings

4.1 Configuration DIP Switch

Setting DIP switch can be used to master / slave, Ultra DMA/66 mode, write cache mode. Setting DIP switch is located in the lower left. (8-bit DIP switch).



⚠	**Caution**	Before setting DIP switch, make sure the power supply for the host computer has been switched off. (The above the diagram is set to the factory shipping defaults.)
		Do not change switches 1, 2, and 3.

4.1.1 Normal Mode (Do not change)

DIP switch settings switches (1,2,3) are set to mirror mode. Do not change this setting.

	**Important**	Resetting normal mode will result in loss of data.

4.1.2 Master / Slave

This setting sets the Master / Slave. Set to the switch to one of the following:

	Switch 4	Switch 5	Switch 6
Master	ON	OFF	OFF
Slave	OFF	ON	OFF
Master (with slave)	OFF	OFF	ON

	**Important**	If the slave drive is not correctly recognized when set as master, use master (with slave) setting.

4.1.3 Ultra DMA/66 Mode

Sets the maximum Ultra DMA/66 data transfer speed between the host computer and **Mirror Drive**, and the controller unit and drive unit.
If the switch is set to “ON,” this enables a maximum 66 MB/s (Ultra DMA/66), and if the switch is set to “OFF,” data transfer is limited to a maximum of 33 MB/s (Ultra DMA/33).

	**Important**	When using Ultra DMA/66 mode, use the 80-conductor Ultra ATA cable.

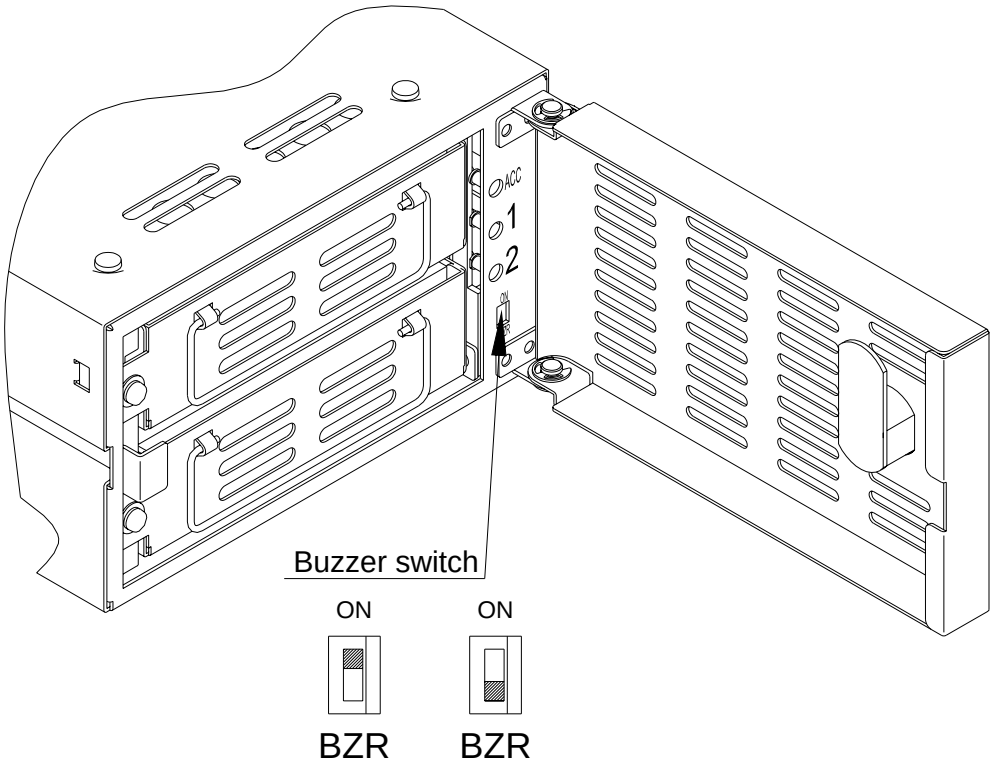
4.1.4 Write Cache Mode

This setting sets the write cache mode. If set to the Up position for "ON," the **Mirror Drive** will signal completion of command processing to the host computer when data has been written to cache memory. If set to the Down position for "OFF," the **Mirror Drive** will signal completion of command processing to the host computer when data has been written to the drive unit.
Be sure to follow the shutdown procedure specified for the host computer operating system.

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

4.2 Buzzer Switch

If set to the Up position for "ON", a buzzer will sound if 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. While the buzzer switch can be used to stop the buzzer, the setting can only be disabled after the failed drive unit has been replaced.
Buzzer switch is located in the lower right of front.



5. Status Display

5.1 Indicator

The status of the controller unit and drive units is displayed by the indicator on the front.

5.1.1 Access Indicator

ACC	Green	<1> Power is on. (1) <2> Normal operation. Any of the above.
	Orange	An error has occurred in the controller unit.
	Orange flashing	<1> Both drive units have failed, or the drive unit may not be properly inserted (if both status indicators are out). <2> The user has mistakenly replaced the correctly operating drive unit, not the one that has failed (if both status indicators are green light to same time). <3> Both of drive units are exchanged (if both status indicators are green light to same time). Any of the above.

5.1.2 Drive Status Indicator

1	Green	Access to drive unit 1 is operation.
	Orange	<1> Power is on. (1) <2> Data rebuilding copied to drive unit 1 is operation. (2) (A drive unit 2 is turned on green at the same time.) <3> Drive unit 1 has reset. (3) Any of the above.
	Red	Drive unit 1 has failed.
2	Green	Access to drive unit 2 is operation.
	Orange	<1> Power is on. (1) <2> Data rebuilding copied to drive unit 2 is operation. (2) (A drive unit 1 is turned on green at the same time.) <3> Drive unit 2 has reset. (3) Any of the above.
	Red	Drive unit 2 has failed.

Note:

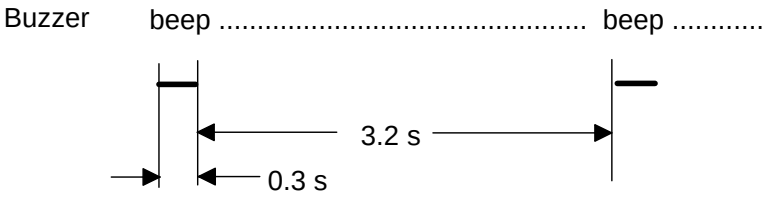
(1) When turning the power on, the access indicator shows green, and both drive status indicators show orange. When **Mirror Drive** startup process is complete, these will be turned off.
(2) Drive Status Indicator will go out after data rebuilding.
(3) In the event of reset, the buzzer will not beep.

	**Important**	If the drive status indicator flashes red, immediately replace the specified drive unit. Leaving the **Mirror Drive** with a failed drive unit will result in data loss if the other drive unit fails.

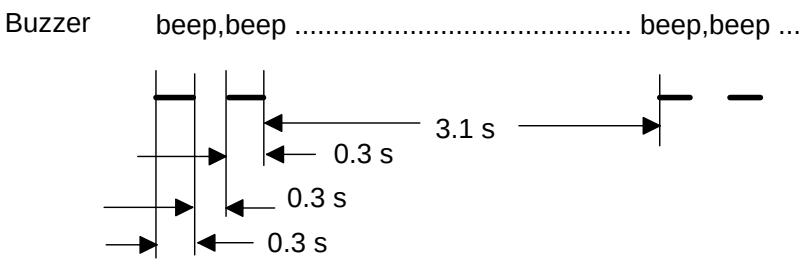
5.1.3 Buzzer

If this is set to "ON," in the event of a failure, the buzzer will beep at the interval specified below.

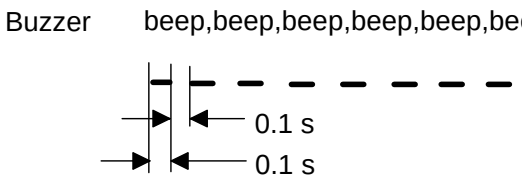
When drive unit 1 has failed



When drive unit 2 has failed

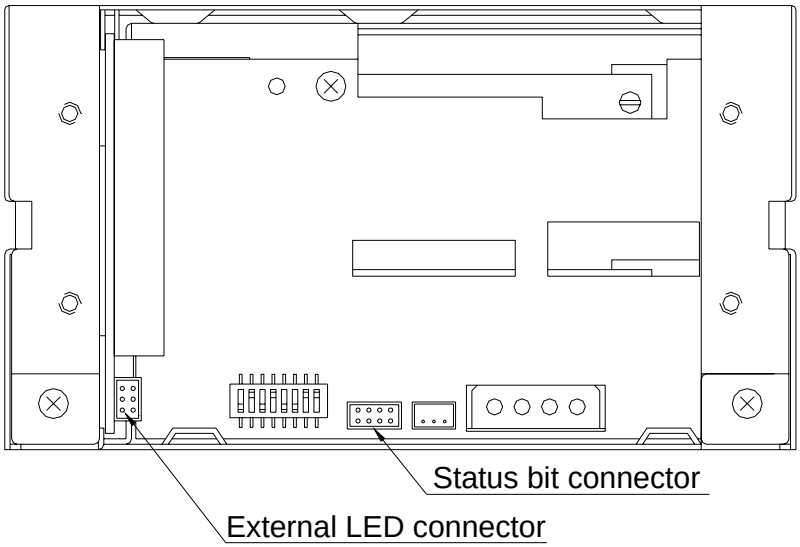


When both drive units have failed



5.2 External Output Signal

The output signal can be transmitted to monitor the detected status externally. The **Mirror Drive** has two types of signals; a status output signal and an external LED output signal. The connectors for these signals are shown in the figure below.



5.2.1 Status Output Signal

Status output is transmitted as a 3-bit signal.
For detail layouts and electrical specifications for the status bit connector pins, refer to "Appendix A.2.1 Status Output Signal."

5.2.2 External LED Output Signal

The drive status indicators of the **Mirror Drive**, green and red signals for each drive unit, can be monitored externally in the same manner. These connections and settings will permit transmission of these signals to remote LEDs. For detail layouts and electrical specifications for the external LED connector pins, refer to "Appendix A.2.2 External LED Output Signal."

6. Removal and Replacement

If the **Mirror Drive** fails, the access indicator will light or flash orange, while the drive status indicator will light red.
If buzzer switch is enabled, the buzzer will continue to sound an alert.
Determination of removal and replacement must account for these status/failure indications.

6.1 Troubleshooting

Access indicator	Drive status indicator		**Mirror Drive** status and measures.
	Drive unit 1	Drive unit 2	
---	---	---	Normal operations.
---	Green	Orange	Rebuilding data from drive unit 1 to drive unit 2. (Normal operation)
---	Orange	Green	Rebuilding data from drive unit 2 to drive unit 1. (Normal operation)
---	Red	---	To confirm the connect status of drive unit 1, remove and reinsert drive unit 1 while power is on. If recovery does not occur, replace drive unit 1.
---	---	Red	To confirm the connect status of drive unit 2, remove and reinsert drive unit 2 while the power is on. If recovery does not occur, replace drive unit 2.
Orange	---	---	Controller unit failure. Replace the controller unit with a new controller unit.
OFF	OFF	OFF	Check the condition from of the power supply status. If not recovered, replace the controller unit with a new controller unit.
Orange flashing	OFF	OFF	Check the condition of both drive units. If not recovered, replace the controller unit with a new controller unit.
Orange flashing	Green	Green	Check to confirm that the desired drive unit was properly replaced. Temporarily return to the original setup and repeat the process.
Other lit or flashing indicator.			Contact your distributor.

--- : Normally off, or light, or flashing when accessed. If replacing the drive unit does not fix the problem, replace the controller unit with a new controller unit.

6.2 Replacing Drive Units

If one of the drive units fails, the **Mirror Drive** will continue to function, maintaining data integrity without requiring you to reboot your host computer. When the failed drive unit is replaced with a new drive unit, data rebuilding will begin automatically.
When replacing a drive unit, check to be sure that the drive status indicator lights red.

	Important	Before replacing the failed drive unit, be sure to prepare the 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 same. Using unauthorized HDD will result in malfunction or damage. The warranty does not cover any damages resulting from replacement with non-specified HDD, and ADTX will not be liable for any consequences of using identified HDD.
		If the drive status indicator light orange, immediately replace the specified drive unit with a new drive unit. Leaving the **Mirror Drive** with a single operating drive unit will result in data loss if the other drive unit fails.

	Caution	Before handling the controller unit or drive unit while replacing the drive unit, touch a metal object, such as the metal enclosure of the host computer, to discharge static electricity from your body.
		Avoid subjecting the drive unit or controller unit to vibrations or shock when replacing. Subjecting the drive unit or controller unit to vibration or shock may result in malfunction or failure.
		Do not insert hands or tools into empty slots, which may lead to electrical shock or malfunctions.

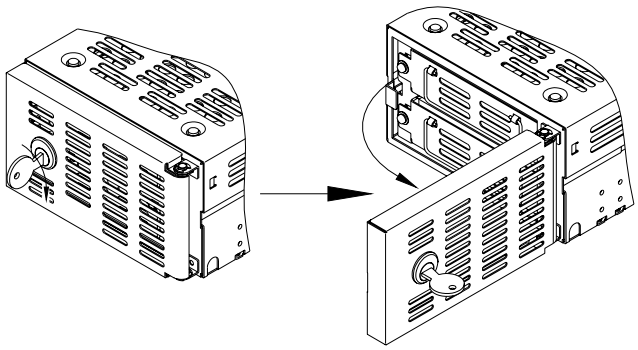
6.2.1 Replacing a Drive Unit

● Replacement Procedure (with power on)

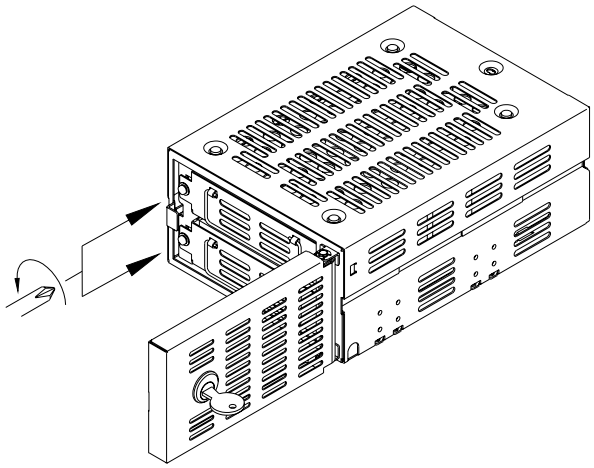
1. Prepare the new drive unit specified in "Appendix D Replacement Parts."

2. Confirm correct identification of the failed drive unit by the drive status indicator or buzzer.

3. Turn the key of the bezel clockwise, remove a lock, and open the bezel.

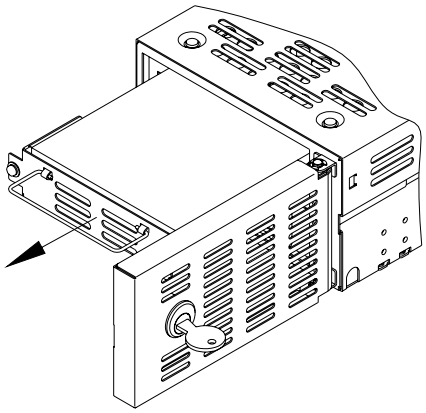


4. Remove the screw with the drive unit intended to replace in the left side.



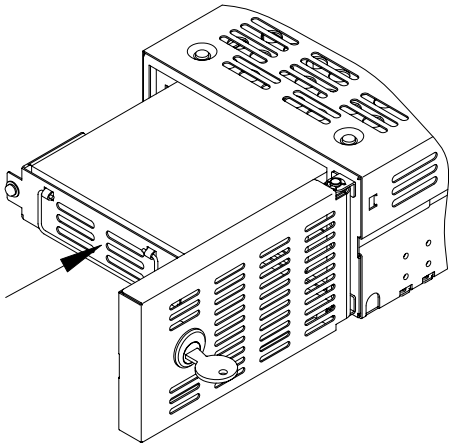
⚠	**Caution**	The drive unit cannot remove when the screw for the drive unit is fixed.

5. Carefully pull out the failed drive unit from the **Mirror Drive**.



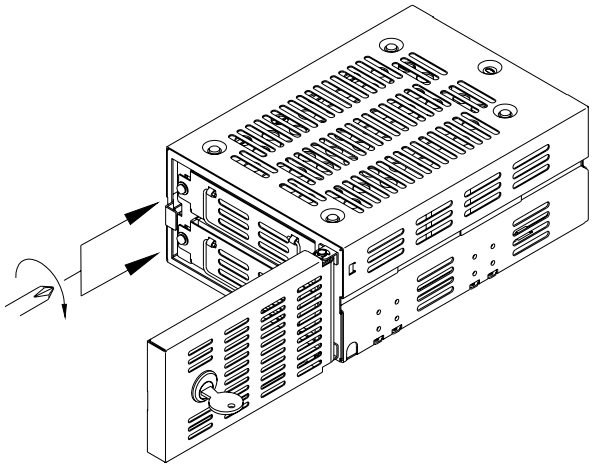
(E.g.) When drive unit 1 failed

6. Insert to slide the new drive unit firmly to the backplane with your both hands.



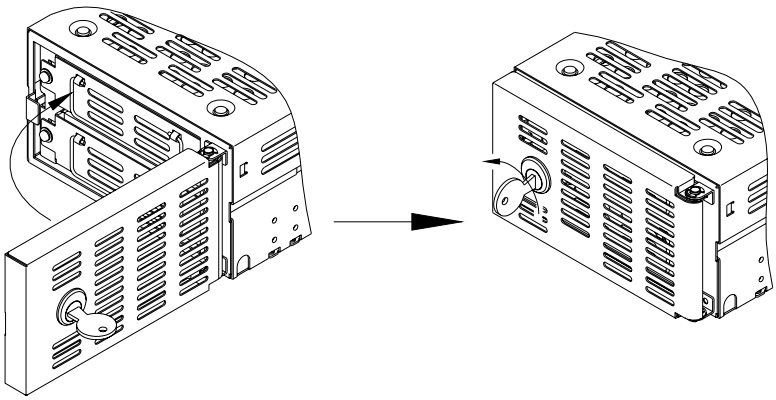
(E.g.) When drive unit 1 failed

7. Tighten the screw with the designated torque (0.29 Nm Recommended).



⚠	**Caution**	Do not tighten the screw in case of improper connection. Misalignment may lead to malfunction.

8. Close a bezel and lock a key.



9. In seconds, data rebuilding will start, while the drive status indicator for the replaced drive unit lights orange. The drive status indicator for the correctly functioning drive unit will light green. The access indicator will not light.

❗	**Important**	Do not remove the drive unit while rebuilding data.

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

11. If the drive status indicator for the replaced drive unit does not turn orange or turns red once again, repeat the procedure, starting with step 2.

❗	**Important**	If you mistakenly replace the correctly functioning drive unit, the drive status indicator for both drive units will light green. Then the access indicator will flash orange. The host computer will be unable to operate the **Mirror Drive**. In this case, turn off the host computer. Replace the failed drive unit with the new drive unit, and replace the correctly functioning drive unit. Turning on the host computer will begin data rebuilding.

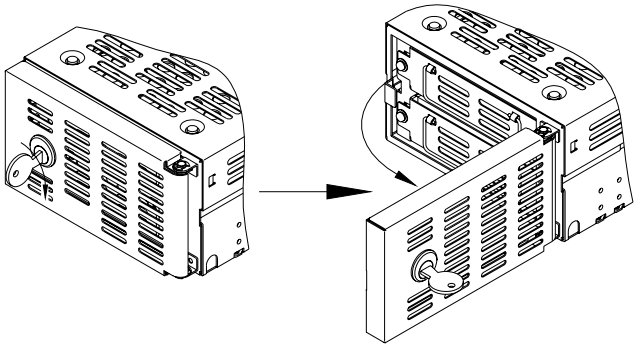
● Replacement Procedure (with power off)

1. Prepare the new drive unit specified in "Appendix D Replacement Parts."

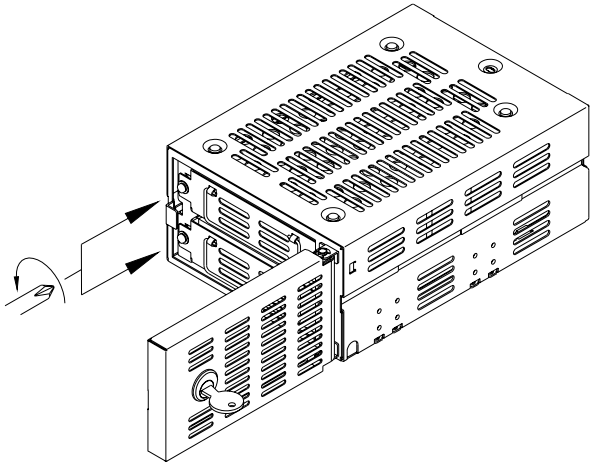
2. Confirm the identify of the failed drive unit by the drive status indicator or buzzer.

3. Turn off the host computer.

4. Turn the key of the bezel clockwise, remove a lock, and open the bezel.

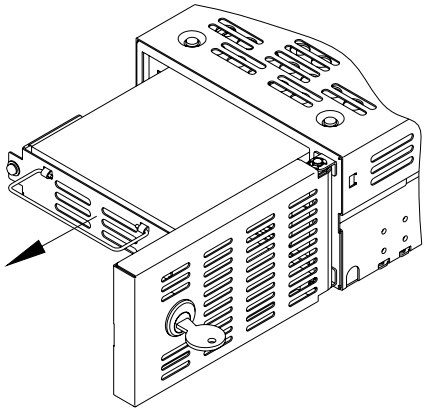


5. Remove the screw with the drive unit intended to replace in the left side.



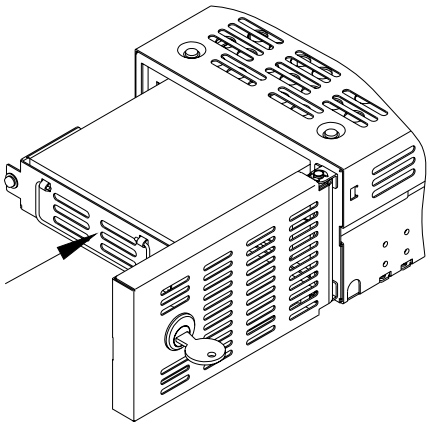
⚠	**Caution**	The drive unit cannot remove when the screw for the drive unit is fixed.

6. Carefully pull out the failed drive unit from the **Mirror Drive**.



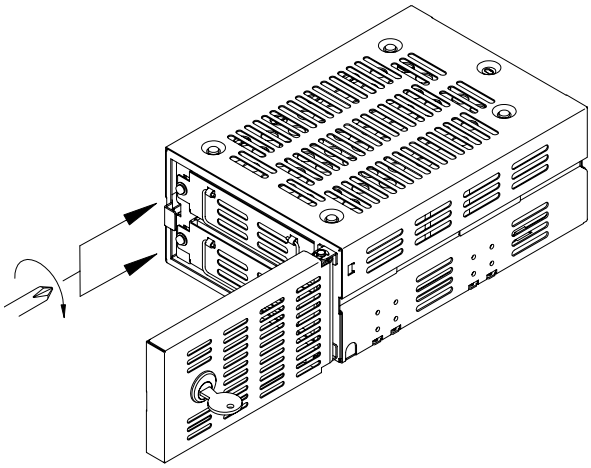
(E.g.) When drive unit 1 failed

7. Insert to slide the new drive unit firmly to the backplane with your both hands.



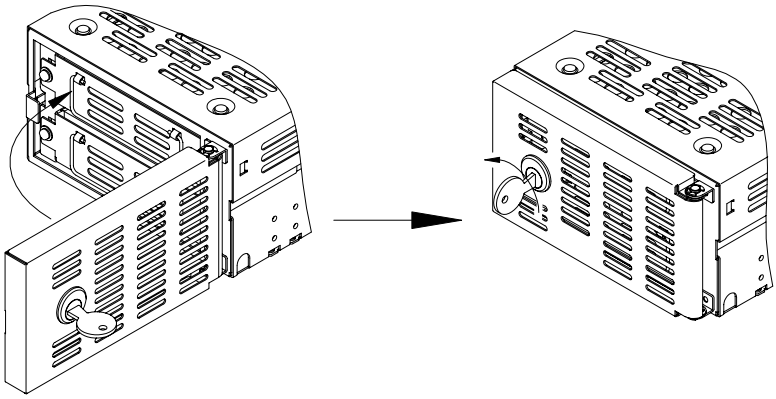
(E.g.) When drive unit 1 failed

8. Tighten the screw with the designated torque (0.29 Nm Recommended).



⚠	**Caution**	Do not tighten the screw in case of improper connection. Misalignment may lead to malfunction.

9. Close a bezel and lock a key.



10. Turn on the host computer.

11. In seconds, data rebuilding will start, while the drive status indicator for the replaced drive unit will light orange. The drive status indicator for the correctly functioning drive unit will light green. The access indicator will not light.

	**Important**	Do not remove the drive unit while data is rebuilding.

12. When data rebuilding is complete, the drive status indicator will go out.
13. If the drive status indicator for the replaced drive unit does not turn orange or turns red once again, repeat the procedure, starting with step 2.

	**Important**	If you mistakenly replace the correctly functioning drive unit, the drive status indicator for both drive units will light green. Then the access indicator will flash orange. The host computer will be unable to operate the **Mirror Drive**. In this case, turn off the host computer. Replace the failed drive unit with the new drive unit, and replace the correctly functioning drive unit. Turning on the host computer will begin data rebuilding.

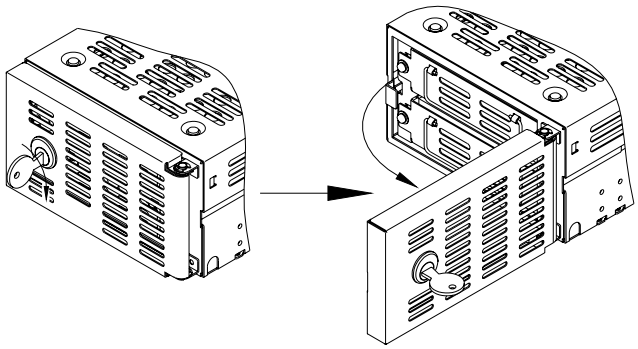
6.2.2 Replacing Both Drive Units

	Important	Because this is an emergency recovery procedure, data corruption may occur. To avoid further data loss, back up all important data stored on the **Mirror Drive** to a suitable storage medium, such as tape drive or MO drive.

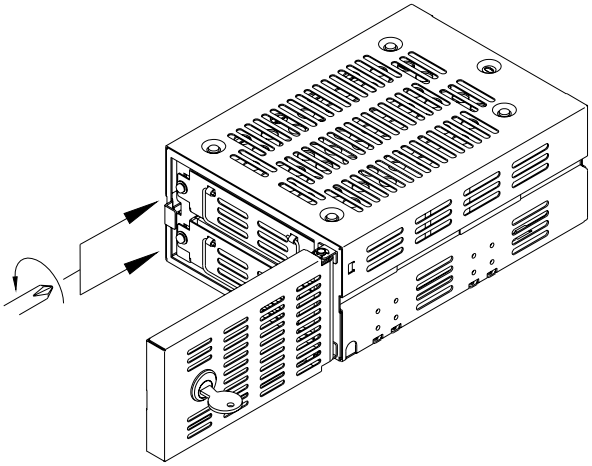
1. Prepare the new drive unit specified in "Appendix D Replacement Parts."

2. Turn off the host computer.

3. Turn the key of the bezel clockwise, remove a lock, and open the bezel.

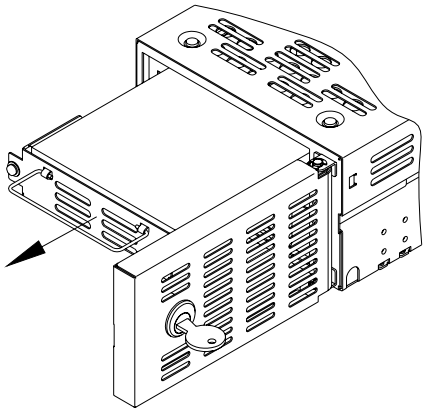


4. Remove the screw with the drive unit intended to replace in the left side.



	Caution	The drive unit cannot remove when the screw for the drive unit is fixed.

5. Carefully pull out the failed drive unit from the **Mirror Drive**.

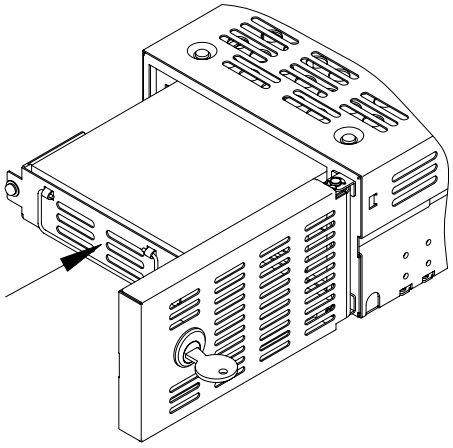


(E.g.) When drive unit 1 failed first

6. Turn on the host computer.

7. Confirm that the host computer recognizes the **Mirror Drive**.

8. After confirming that the host computer recognizes the **Mirror Drive**, insert to slide the new drive unit firmly to the backplane with your both hands.



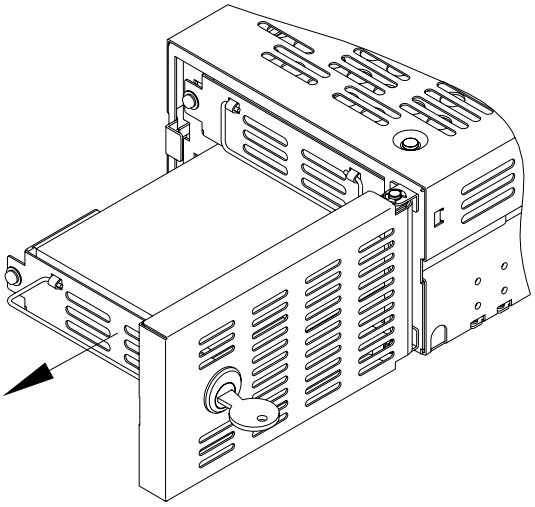
(E.g.) When drive unit 1 failed

9. In seconds, data rebuilding will start, while the drive status indicator for the replaced drive unit will light orange. The drive status indicator for the correctly functioning drive unit will light green. The access indicator will not light.

	Important	Do not remove the drive unit while data is rebuilding.

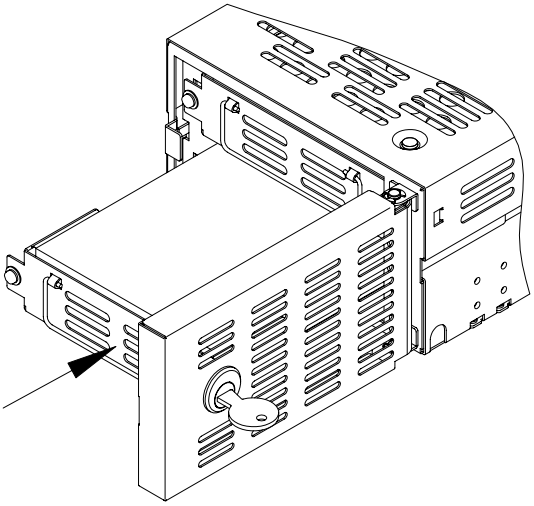
10. When data rebuilding is complete, the drive status indicator will go out. Turn off the host computer.

11. Carefully pull out the failed other drive unit from the **Mirror Drive**.



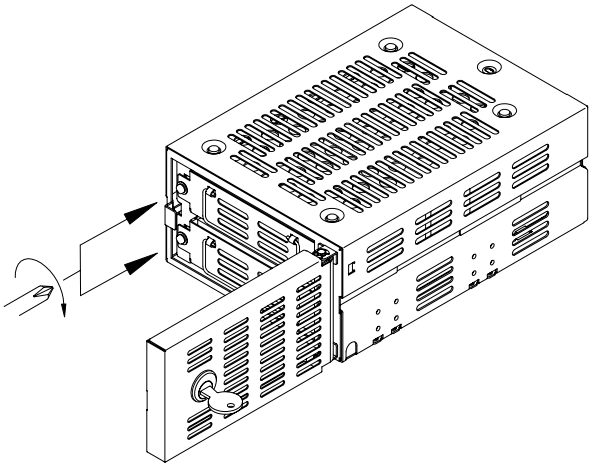
(E.g.) When drive unit 2 was the next to fail

12. Insert to slide the new drive unit firmly to the backplane with your both hands.



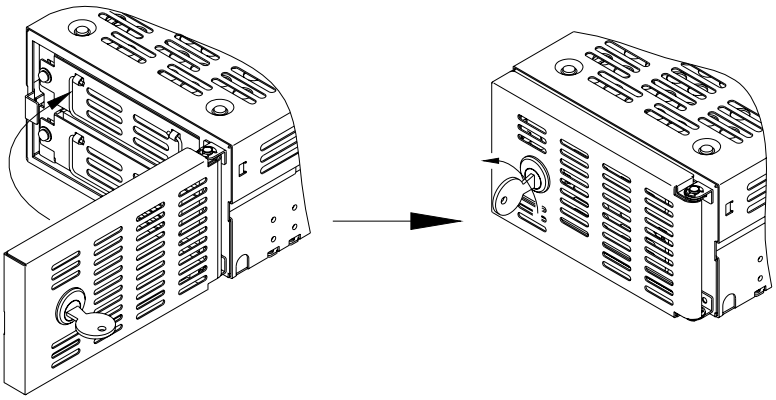
(E.g.) When drive unit 2 was the next to fail

13. Tighten the screw with the designated torque (0.29 Nm Recommended).



⚠	**Caution**	Do not tighten the screw in case of improper connection. Misalignment may lead to malfunction.

14. Close a bezel and lock a key.



15. Turn on the host computer.

16. In seconds, data rebuilding will start, while the drive status indicator for the replaced drive unit will light orange. The drive status indicator for the correctly functioning drive unit will light green. The access indicator will not light.

	Important	Do not remove the drive unit while data is rebuilding.

17. When data rebuilding is complete, the drive status indicator will go out.

18. If the drive status indicator for the replaced drive unit does not turn orange or turns red once again, repeat the procedure, starting with step 2.

6.3 Replacing the controller unit

If the access indicator remains light orange, or the drive status indicator light red despite replacement of the drive unit, the controller unit may be defective. Replace the controller unit immediately.
Replace the controller unit with a new controller unit while power is off. There are two replacement procedures, depending on the condition of the drive unit, as follows:

<1> If both drive units are function normally:
Transfer both drive units to the new controller unit.
Ensure that each drive unit is inserted into the appropriate drive bays.

<2> If one drive unit fails:
Transfer only the correctly functioning drive unit to the new controller unit.

⚠	**Caution**	Before replacing controller units, check to confirm that the host computer has been turned off.
		Before handling the controller unit or drive unit while replacing the controller unit, touch a metal object, such as the metal enclosure of the host computer, to discharge static electricity from your body.
		Avoid subjecting the drive unit or controller unit to vibrations or shock when replacing. Subjecting the drive unit or controller unit to vibration or shock may result in malfunction or failure.
		Do not insert hands or tools into empty slots, which may lead to electrical shock or malfunctions.

6.3.1 Replacing the Controller Unit (with both drive units functioning normally)

● Replacement Procedure

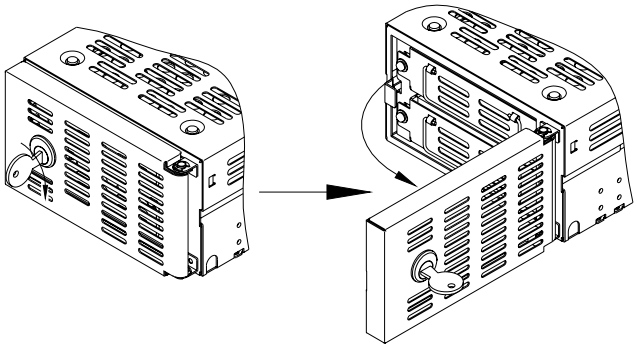
1. Prepare the new controller unit specified in "Appendix D Replacement Parts."

2. Turn off the host computer.

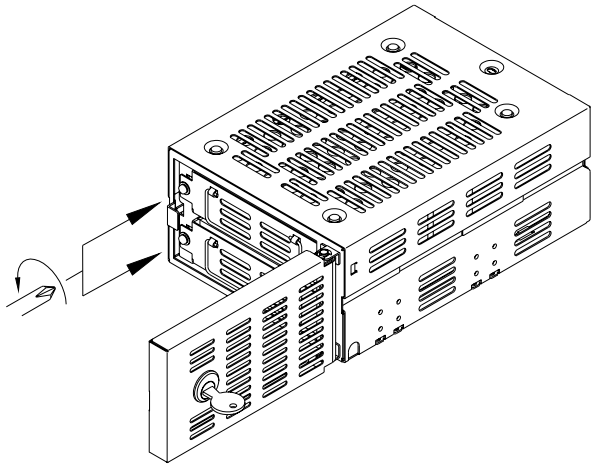
3. Disconnect the IDE (ATA) cable and 4-pin internal power cable and remove the **Mirror Drive** from the host computer.

⚠	**Caution**	When replacing controller units, place the antistatic bag in which this product was originally packed on a flat, level surface. Work on the **Mirror Drive** in this area.

4. Turn the key of the bezel clockwise, remove a lock, and open the bezel.

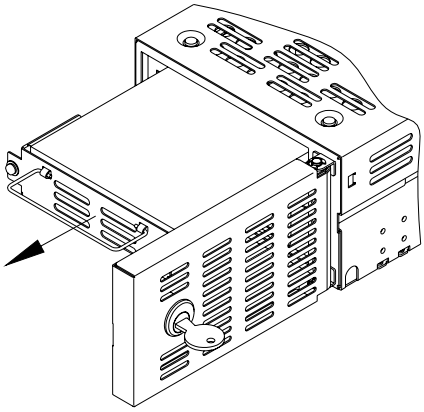


5. Remove the screw with the drive unit intended to replace in the left side.

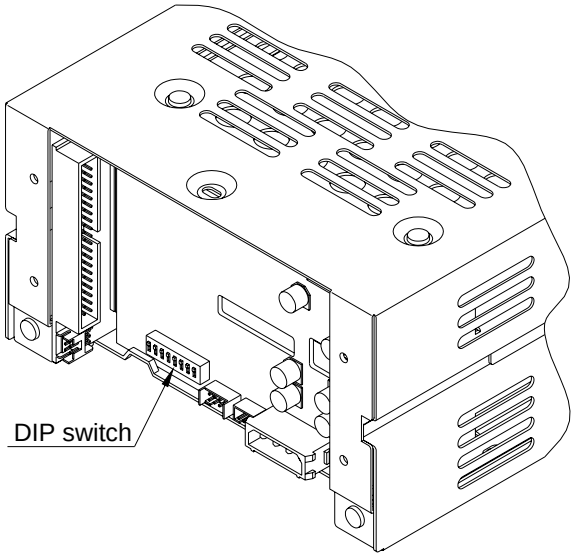


⚠	**Caution**	The drive unit cannot remove when the screw for the drive unit is fixed.

6. Carefully pull out the failed drive unit from the **Mirror Drive**.

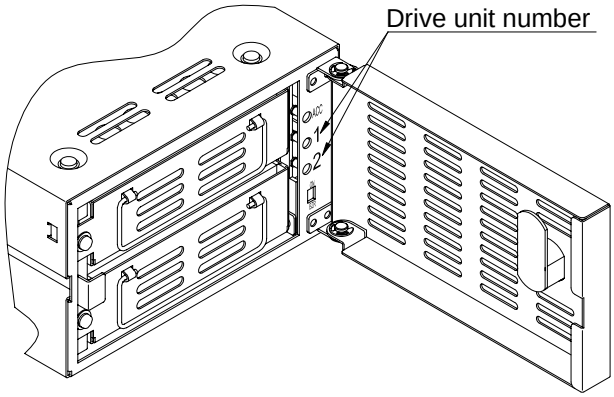


7. Setting the DIP switch of the controller unit for exchange to the same setting as the DIP switch of the failed controller unit.

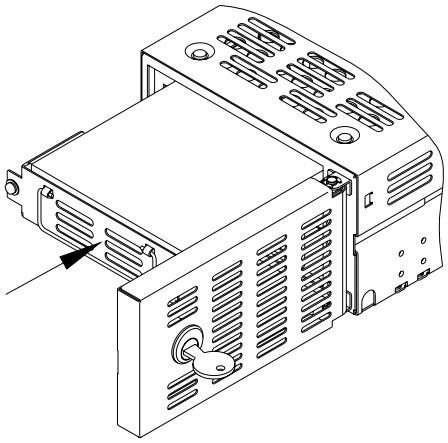


location of DIP switch

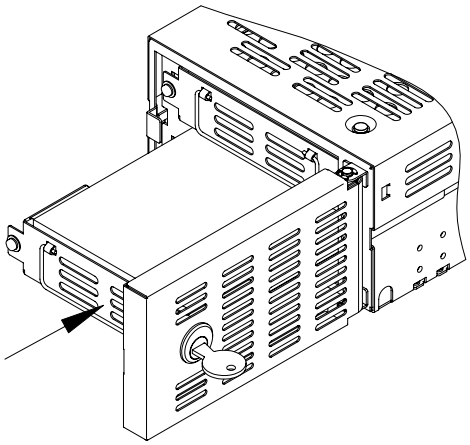
8. Insert the drive unit into the same numbered bay. Insert to slide the drive unit firmly to the backplane with your both hands.



Drive unit number display location

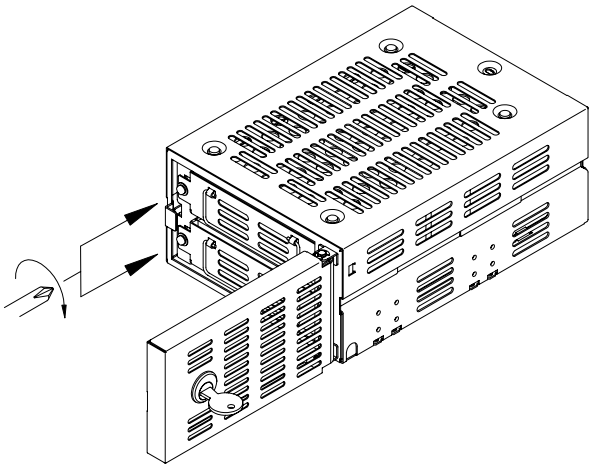


Insert drive unit 1



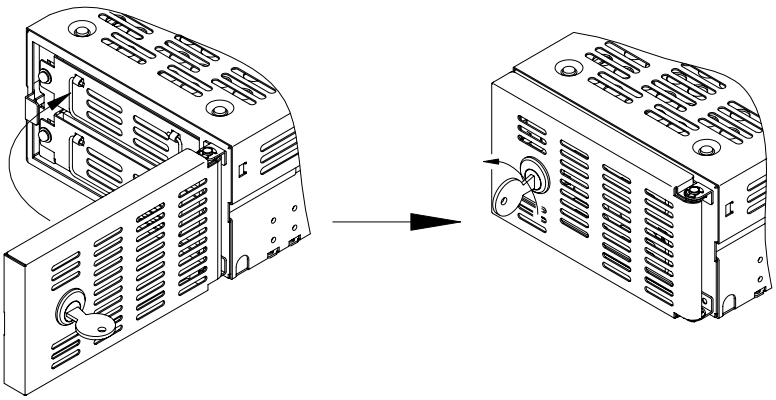
Insert drive unit 2

9. Tighten the screw with the designated torque (0.29 Nm Recommended).



⚠	**Caution**	Do not tighten the screw in case of improper connection. Misalignment may lead to malfunction.

10. Close a bezel and lock a key.



11. Mount the **Mirror Drive** in the host computer and firmly connect the IDE (ATA) cable and 4-pin internal power cable.

12. Turn on the host computer.

6.3.2 Replacing the Controller Unit (with one drive unit failed)

With the controller unit failed, you cannot see if the drive units are functioning correctly. Check first the condition of the drive units, and follows the procedure below.

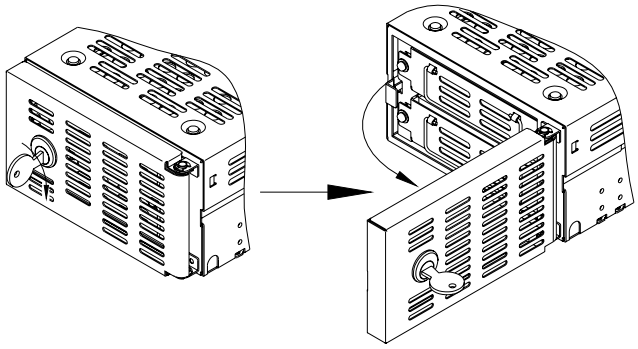
	Important	When the one drive unit failed, exchange a drive unit promptly.

● Unit Replacement Procedure

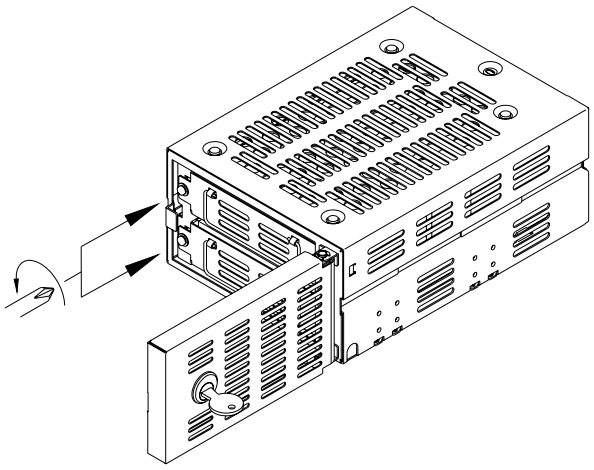
1. Prepare the new controller unit in "Appendix D Replacement Parts."
2. Turn off the host computer.
3. Disconnect the IDE (ATA) cable and 4-pin internal power cable and remove the **Mirror Drive** from the host computer.

	Caution	When replacing controller units, place the antistatic bag in which this product was originally packed on a flat, level surface. Work on the **Mirror Drive** in this area.

4. Turn the key of the bezel clockwise, remove a lock, and open the bezel.

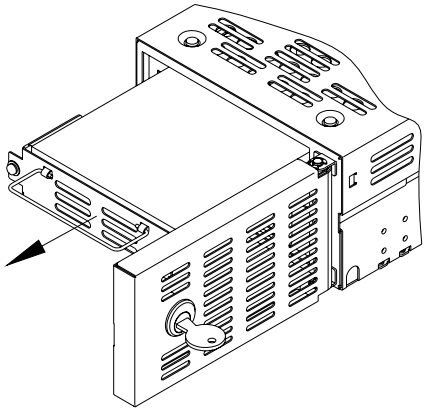


5. Remove the screw with the drive unit intended to replace in the left side.

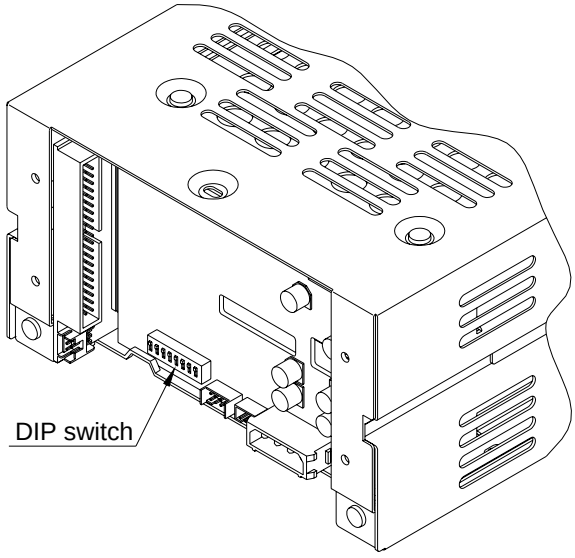


	Caution	The drive unit cannot remove when the screw for the drive unit is fixed.

6. Carefully pull out the failed drive unit from the **Mirror Drive**.

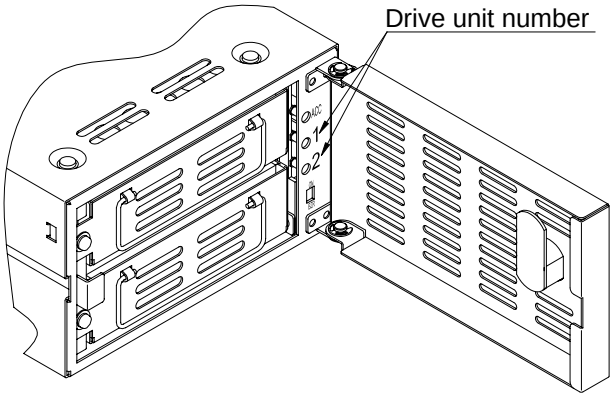


7. Setting the DIP switch of the controller unit for exchange to the same setting as the DIP switch of the failed controller unit.

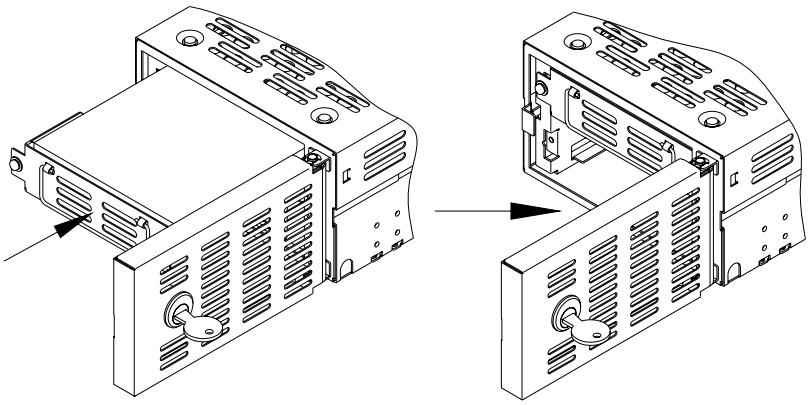


location of DIP switch

8. Insert the correctly functioning drive unit into the same numbered bay.
   Insert to slide the drive unit firmly to the backplane with your both hands.

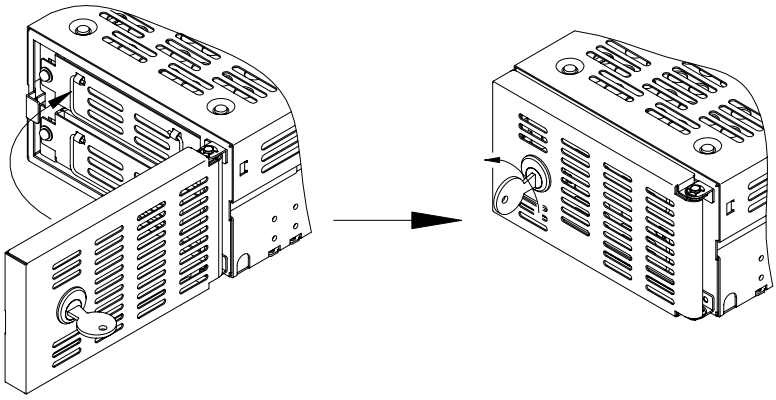


Drive unit number display location



(E.g.) When drive unit 1 is normal

9. Close a bezel and lock a key.

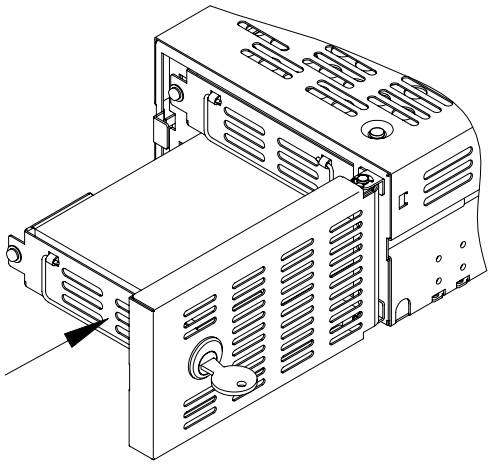


10. Mount the **Mirror Drive** in the host computer. Firmly connect the IDE (ATA) cable and 4-pin internal power cable.

11. Turn on the host computer. Confirm that the host computer recognizes the **Mirror Drive**. If the drive unit inserted in the controller unit for exchange is normal, it will start only in the drive unit. (The drive status indicator of a drive unit which is not inserted will light red.)

12. Turn the key of the bezel clockwise, remove a lock, and open the bezel.

13. Insert to slide the new drive unit firmly to the backplane with your both hands.



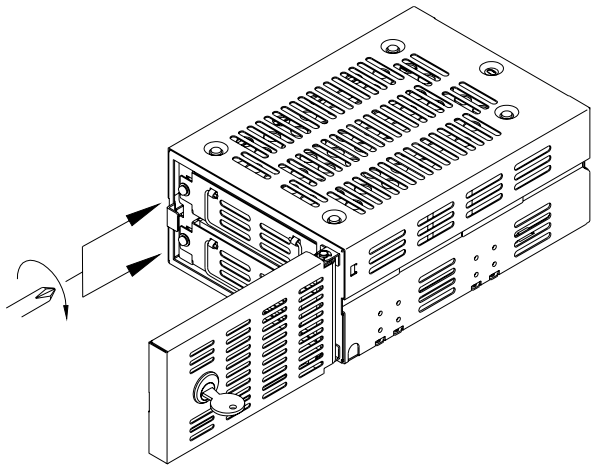
(E.g.) When replacing drive unit 2.

14. In seconds, data rebuilding will start, while the drive status indicator for the replaced drive unit will light orange. The drive status indicator for the correctly functioning drive unit will light green. The access indicator will not light.

	Important	Do not remove the drive unit while data is rebuilding.

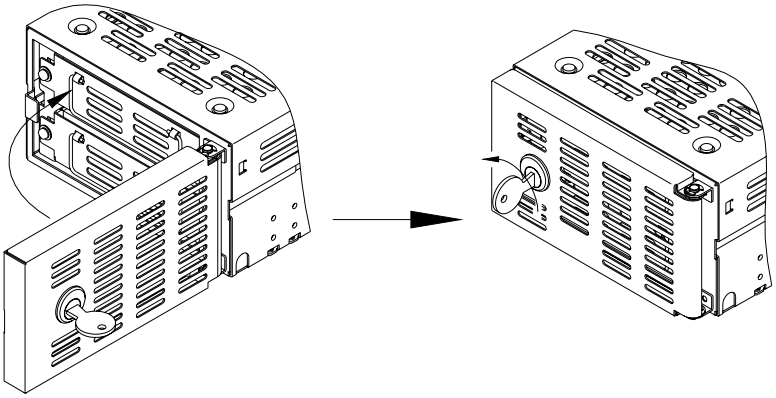
15. When data rebuilding is complete, the drive status indicator will go out.

16. Tighten the screw with the designated torque (0.29 Nm Recommended).



	Caution	Do not tighten the screw in case of improper connection. Misalignment may lead to malfunction.

17. Close a bezel and lock a key.



18. If the drive status indicator for the replaced drive unit does not turn orange or turns red once again, repeat the procedure, starting with step 2.

6.4 Other problems

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

6.5 Data Rebuilding

If a failed drive unit was correctly replaced, data rebuilding (the copying of all data on the correctly functioning drive unit to the replaced new drive unit) will start automatically.
During data rebuilding, the drive status indicator for the correctly functioning drive unit will light green. The drive status indicator for the replaced drive unit will light orange.
If one of the drive units fails, the **Mirror Drive** will continue to function, maintaining data integrity.

	**Caution**	Do not turn off the host computer while the **Mirror Drive** is rebuilding data, which may result in loss of data or failure.

When the correctly functioning drive unit fails during data reconstruction, the **Mirror Drive** omits copy of bad the sector and continues to reconstruct the remaining data. These skipped sectors will no longer be readable. In order to avoid copying incorrect data, the data pattern of an ECC error is written in the replaced drive unit. This function is named "Skip Reconstruction." When data rebuilding is complete, becomes normal mode. Occurrence of skip reconstruction can be confirmed by the ADTX monitoring program. The drive status indicator and the access indicator will not light.

	**Important**	If the data recovery process skips errors during data rebuilding, then the data on those sectors will be lost. It is recommended you make periodic backups.

Appendix A Specifications

A. 1 Product Specification

Model name		**AXRA-N402A**
RAID levels		1
Storage capacity		40 GB
Number of LBA		80,414,080
Number of Cylinders		79,775
Number of Heads		16
Sectors		63
Host interface		IDE (ATA)
Data transfer rate (max.)		66 MB/s
Number of HDDs		2
External dimensions		146.0 mm (W) x 219.6 mm (L) x 81.9 mm (H)
Weight (max.)		2.8 Kg
Operational environment (1)	Temperature	In operation 5 to 45 °C (4) Not in operation -40 to 65 °C
	Humidity	In operation 8 to 90% Not in operation 5 to 95%
Voltage (Vcc)		4.85 to 5.25 VDC / 11.15 to 13.20 VDC
Power supply ripple (2) (max.)		100 mV p-p (0 to 20 MHz)
Power startup time (3)		5 to 100 ms
Power consumption	Startup (max.)	2.1A (5 VDC) / 4.1A (12 VDC)
	Idle (max.)	1.2A (5 VDC) / 0.7A (12 VDC)
	Read/Write (max.)	1.5A (5 VDC) / 1.1A (12 VDC)

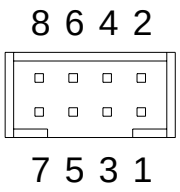
Note:
(1): With no condensation.
(2): Including startup time.
(3): Time until Vcc reaches 4.85 V and 11.15 V.
(4): When mounting in your host computer, provide sufficient cooling to keep the surface temperature of the drive unit below 60 °C.

A.2 External Output Signal Specifications

A.2.1 Status Output 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	Pin configuration
1	GND	
2	VCC	
3	Status bit 2	
4	Status bit 1	
5	Status bit 0	
6	GND	
7	Reserved	
8	GND	

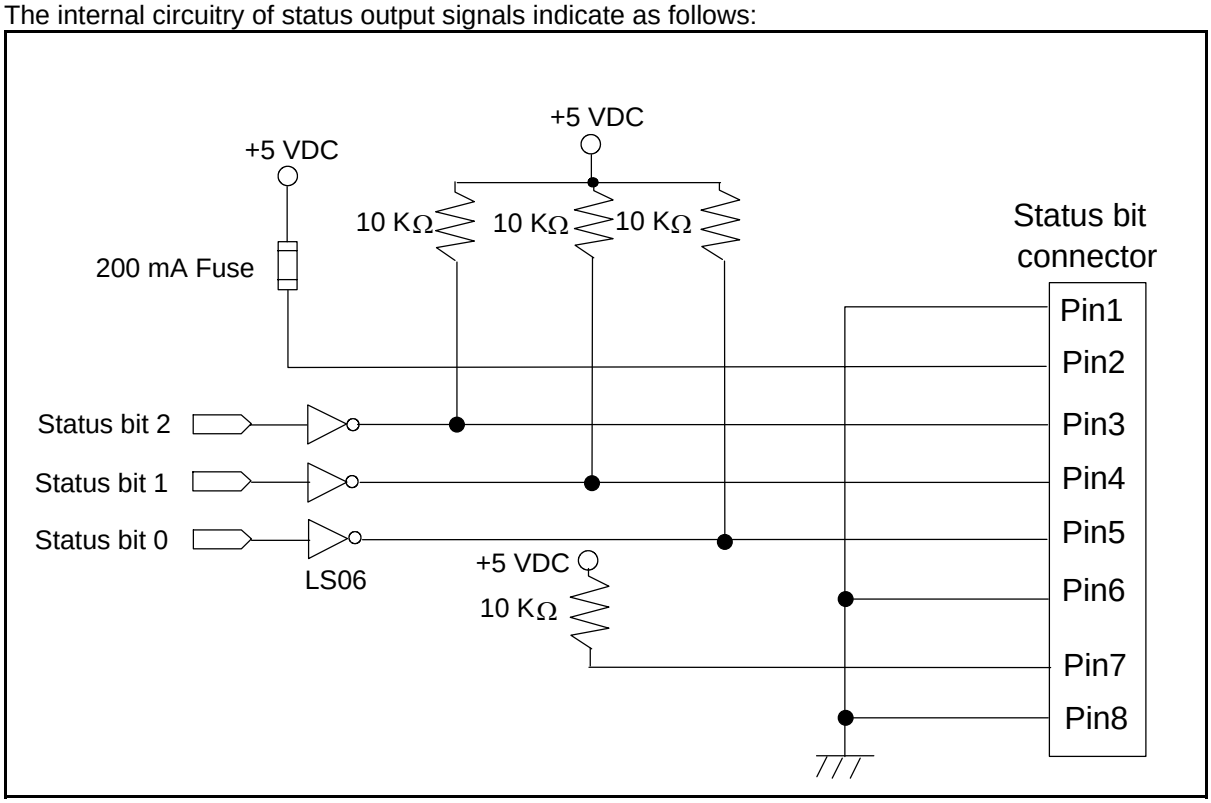
Status output is transmitted in 3-bit signals, as follows:

Number	Status bit 2	Status bit 1	Status bit 0	Status
0	L	L	L	Normal operation
1	L	L	H	Drive unit 1 has failure
2	L	H	L	Drive unit 2 has failure
3	L	H	H	Data rebuilding
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	Initializing

H: TTL level output high.
L: TTL level output low.

Note:
(1) The following may indicate damage to the controller unit.
- If both drive units fail to power on.
- If both drive units are properly connected, with power on
- If the correctly functioning drive unit is erroneously replaced, rather than the drive unit that failed.

The internal circuitry of status output signals indicate as follows:



Status output signal uses LS06 (open corrector).
Each output has a 10 K**Ω** pull-up resistor.

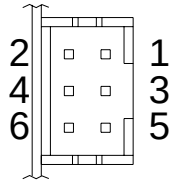
Connector specifications

	Part name	Manufacturer
Mirror Drive header	DF11-8DP-2DSA	HIROSE Electric Co., Ltd.
External connectors – connector side (recommended)	DF11-8DS-2C	HIROSE Electric Co., Ltd.
External connectors – connector crimp contacts (recommended)	DF11-2428SCF/SC	HIROSE Electric Co., Ltd.

A.2.2 External LED Output Signal

This table shows the pin configuration, status definitions, external connection circuit diagram, electrical specifications, and connector specifications for the external LED connector.

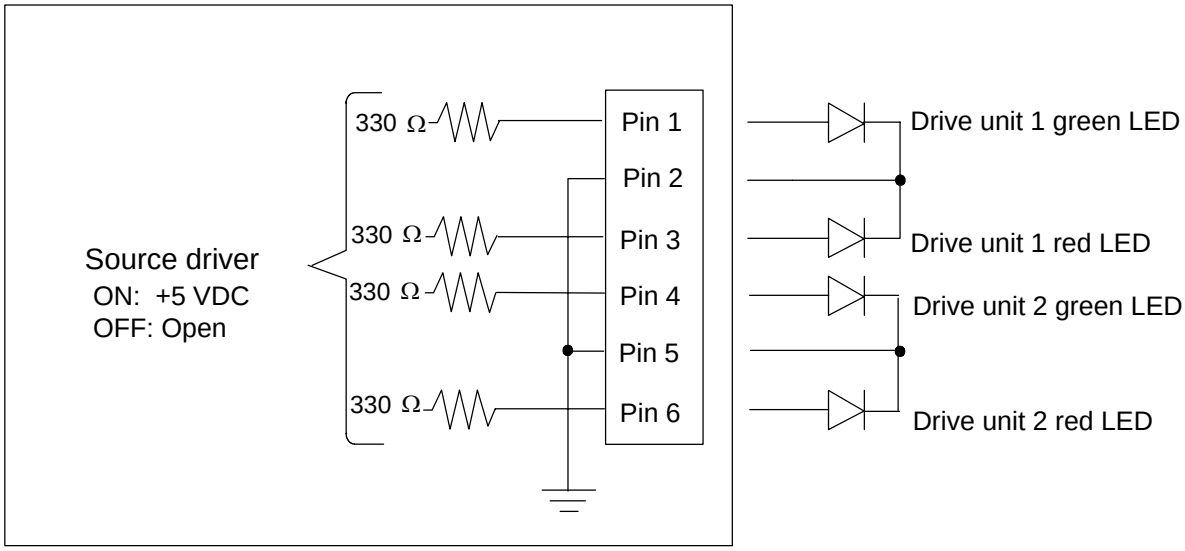
The connector signal pins are configured as follows:

Pin Number	Signal	Pin configuration
1	Drive unit 1 green LED	
2	GND	
3	Drive unit 1 red LED	
4	Drive unit 2 green LED	
5	GND	
6	Drive unit 2 red LED	

Output signals and drive status indicators **Mirror Drive** of correspond as below.

Mirror Drive – Drive status indicators	External LED output signal			
	Pin 1	Pin 3	Pin 4	Pin 6
Drive unit 1 green LED	ON	OFF	OFF	OFF
Drive unit 1 red LED	OFF	ON	OFF	OFF
Drive unit 1 orange LED	ON	ON	OFF	OFF
Drive unit 2 green LED	OFF	OFF	ON	OFF
Drive unit 2 red LED	OFF	OFF	OFF	ON
Drive unit 2 orange LED	OFF	OFF	ON	ON

The internal circuitry of external LED output signal indicate as follows:



External LED output signal electrical specifications. (The signal pins 1, 3, 4, 6)

Source current (output: High)	Max. 15 mA

⚠	**Caution**	The output signal voltage will vary with internal control resistance.

Connector specifications

	Part name	Manufacturer
Mirror Drive header	DF11-6DP-2DS22	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

5.25-inch Mirror Drive AT Model AXRA-N Series is shipped with following accessories.

- 5.25-inch Mirror Drive AT Model AXRA-N Series user's manual. (This manual)
- Mounting screws. (x4)

Appendix C Factory Default Setting

The **Mirror Drive**'s factory default setting is as follows:

Setting DIP switch

	Factory default setting		
	Setting	DIP switch No.	DIP switch setting
Normal mode	Mirror mode	1	OFF
		2	ON
		3	OFF
Master / Slave	Master	4	ON
		5	OFF
		6	OFF
Ultra DMA/66 mode	ON	7	ON
Write cache mode	ON	8	ON

Setting buzzer switch

	Factory default setting	
	Setting	DIP switch setting
Buzzer	ON	ON

Appendix D Replacement Parts

The following are supplied as user-replaceable parts.

Part name	Part number	
40 GB drive unit	A202760	Replacement drive unit for AXRA-N402A.
Controller unit	A202665	Replacement controller unit for AXRA-N 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