SONY

4-649-283-**03**(2)

# *AIT Drive*

User's Guide

## *SDX-400 Series*
## *SDX-410 Series*

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- Gewerbegebiete
- Leichtindustriegebiete

(Diese Ausrüstung erfüllt die Bestimmungen der Norm EN55022, Klasse B.)

사용자 안내문

이 기기는 가정용으로 전자파 적합등록을 한 기기로서
주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

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# SDX-400 Tape Drive

The Sony SDX-400 series drive is a high capacity data storage device using Advanced Intelligent tape (AIT) technology. The SDX-400 series drive achieves high data reliability through Read-After-Write, an additional level of Error Correction Code, and other features.

The Sony SDX-400 series drive stores data on tape using a standard format called AIT (Advanced Intelligent Tape) and ALDC formats.

# Introduction

## Product Features

| | SDX-400 series |
|---|---|
| Data Capacity | 35 GB uncompressed (with AIT-1 230 m tape)<br>91 GB compressed* (with AIT-1 230 m tape) |
| Transfer Rate (sustained) | 4 MB/s uncompressed |

* Assuming a 2.6 : 1 compression ratio.
(The compression ratio varies according to the type of data.)

- Supported Format : AIT-1
- Burst Transfer Rate
  – 12 MB/s Asynchronous
  – 40 MB/s Synchronous
- Large 10 MB Buffer Memory
- 3.5” Standard Height, 5.25” Half Height
- Embedded SCSI Interface
  (ULTRA/WIDE and LVD/SE model (SDX-400C) or HVD model (SDX-410C) are available)
- Supports Variable or Fixed Record Length
- Supports SCSI Disconnection/Arbitration
- Frame Rewrite Function
- Three levels of Error Correction Code (ECC)
- High Speed search (120 times normal Read/Write speed)
- Random Read, Append Write

## Precautions

### Installation

Avoid placing the drive in a location subject to:

– high humidity

– high temperature

– mechanical shock and vibration

– direct sunlight

### Operation

- Do not move the drive while it is operating. It may cause malfunction.
- Avoid exposing the drive to sudden changes from a low to high in temperature. This may cause water condensation to collect inside the drive. If the ambient temperature should suddenly rise while the drive is turned on , wait at least one hour before turning on the drive. If you attempt to operate the drive immediately after a sudden increase in temperature, a malfunction may occur.
- Turning off the power to the drive while it is writing to tape may cause the tape to become unreadable. All previously negotiated parameters will be lost, whenever power to the drive is cycled.

### Transportation

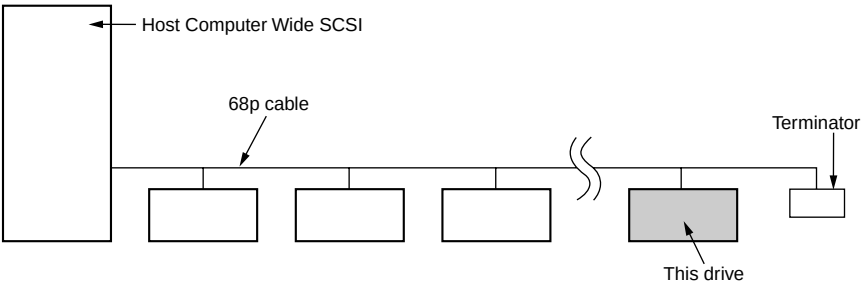
- Keep the original packing materials to facilitate transportation of the drive.
- Always remove the tape before moving the drive. After removing the drive from the computer, repack the drive into its original packing.

## Notice of SCSI Termination

The SDX-400C conforms to the Microsoft PC97 standard which requires the internal (naked) drive to be terminated with an external terminator.

#### Microsoft PC97 SCSI requirements

SCSI peripherals must not terminate the bus. Both internal and external cable ends are instead terminated by plug-in connectors.



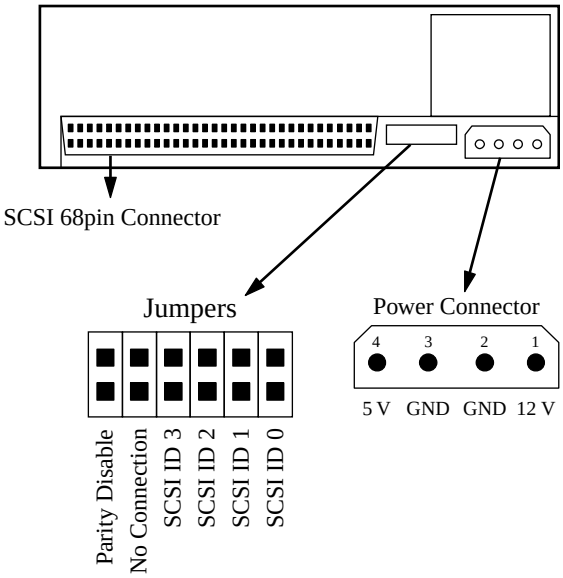

**Example of SCSI set-up**

# Installation

## SCSI Connection/Setting the SCSI ID

SCSI ID

| SCSI ID | P.D. | N.C. | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|
| 0 | | | ■ | ■ | ■ | ■ |
| 1 | | | ■ | ■ | ■ | □ |
| 2 | | | ■ | ■ | □ | ■ |
| 3 | | | ■ | ■ | □ | □ |
| 4 | | | ■ | □ | ■ | ■ |
| 5 | | | ■ | □ | ■ | □ |
| 6 | | | ■ | □ | □ | ■ |
| 7 | | | ■ | □ | □ | □ |
| 8 | | | □ | ■ | ■ | ■ |
| 9 | | | □ | ■ | ■ | □ |
| 10 | | | □ | ■ | □ | ■ |
| 11 | | | □ | ■ | □ | □ |
| 12 | | | □ | □ | ■ | ■ |
| 13 | | | □ | □ | ■ | □ |
| 14 | | | □ | □ | □ | ■ |
| 15 | | | □ | □ | □ | □ |




Parity

| | |
|---|---|
| Disable | |
| Enable | |

**Note :** = CLOSED/Jumper

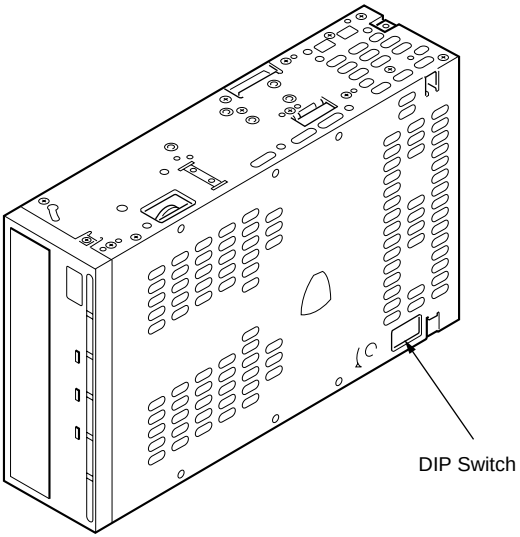
= OPEN/Jumper not installed

Don't care

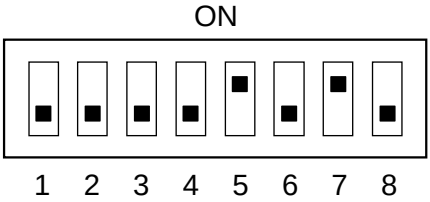
### Parity Disable Jumper

Parity check function can be disabled by Jumper. Parity check is disabled while left end jumper is installed. Parity generate function is always enabled.

## Option Switches (DIP Switch)




### DIP Switch Positions



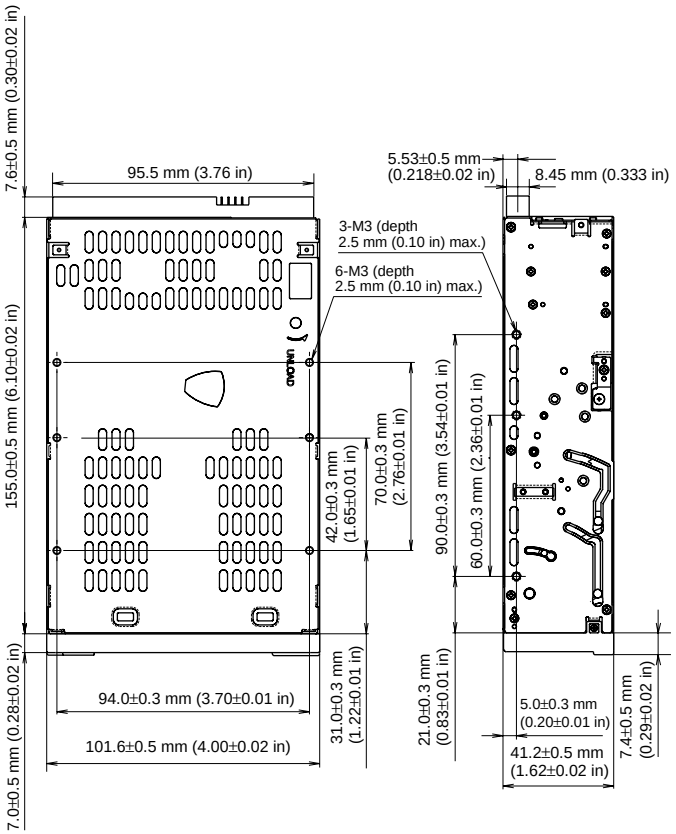

1 Reserved (OFF)
2 Reserved (OFF)
3 Reserved (OFF)
4 Reserved (OFF)
5 Terminator Power (ON)
6 Reserved (OFF)
7 DC Control (1) (ON)
8 DC Control (2) (OFF)

#### Data Compression Control DIP switch

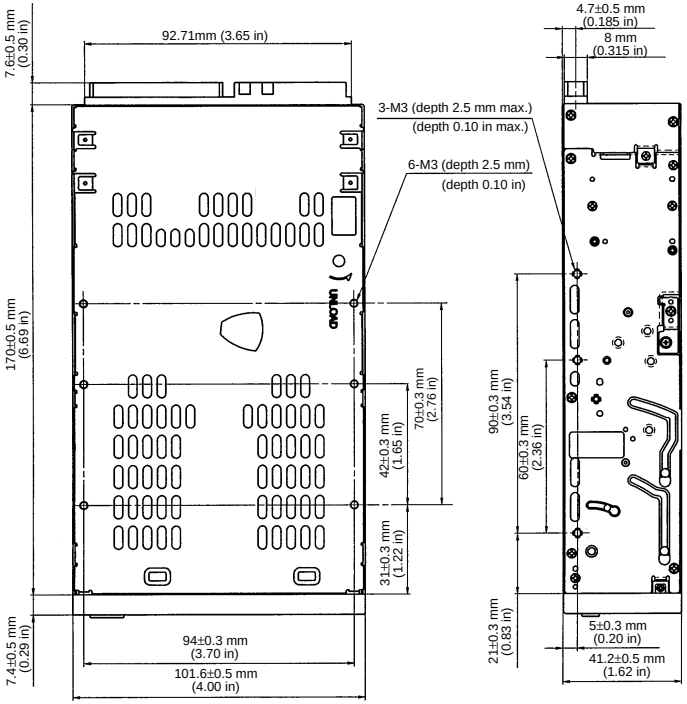
Data compression can be selected by DIP switches. Data compression is enabled while position 7 [DC Control (1)] is ON. Control by host can be disabled when position 8 [DC Control (2)] is ON.

# Mounting Holes

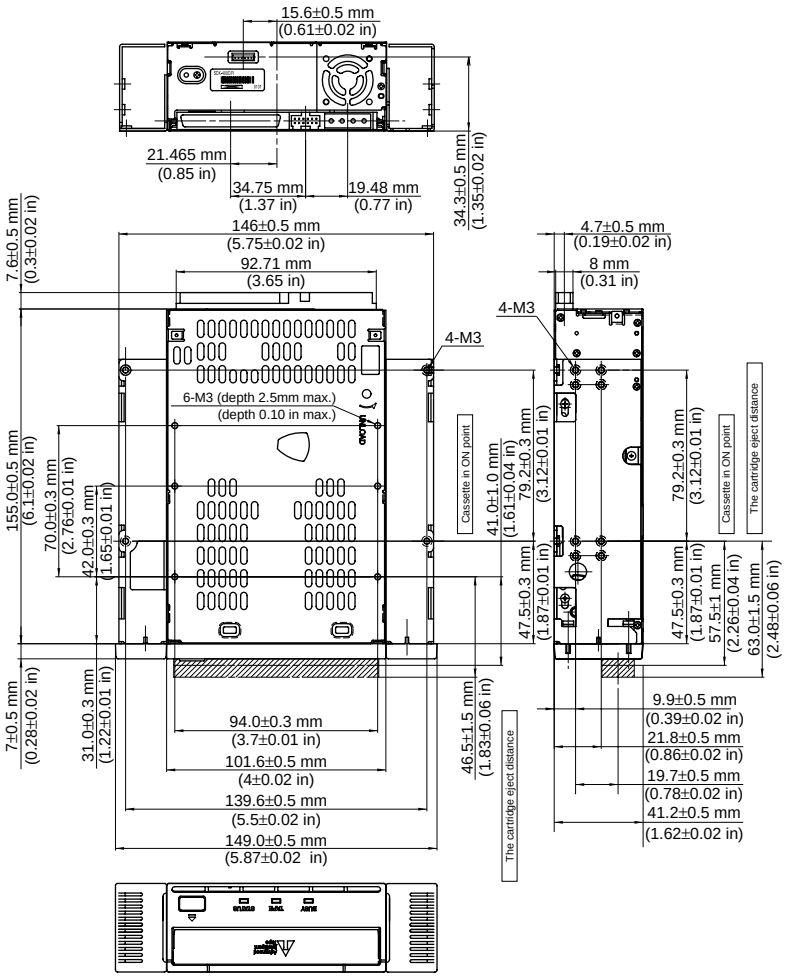
## For 3.5" Standard Height (SDX-400C)



## For 3.5" Standard Height (SDX-410C)



## For 5.25" Half Height (SDX-400C/R)

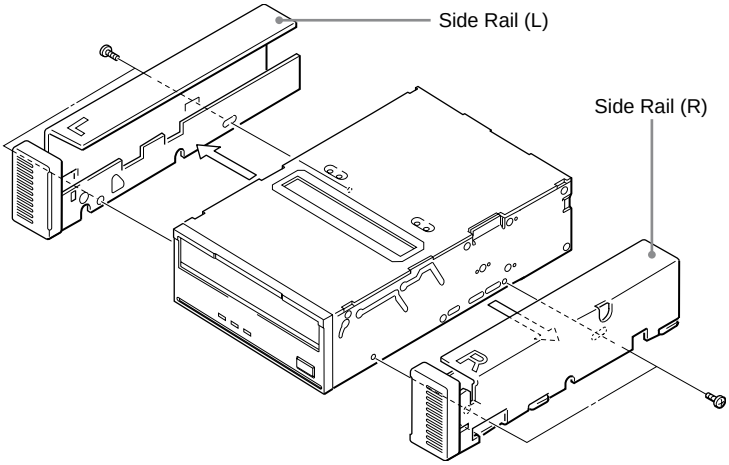


## Remodeling from 5.25" Model to 3.5" Model

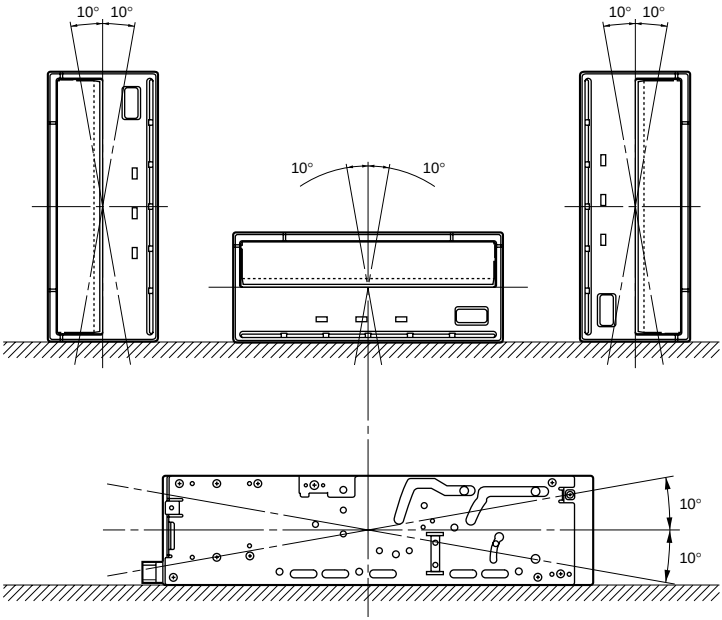
You can remodel the SDX-400C/R (5.25" model) to the SDX-400C (3.5" model) yourself.

**1** Remove the 2 screws for each side rail.

**2** Take the side rail off.



## Orientation

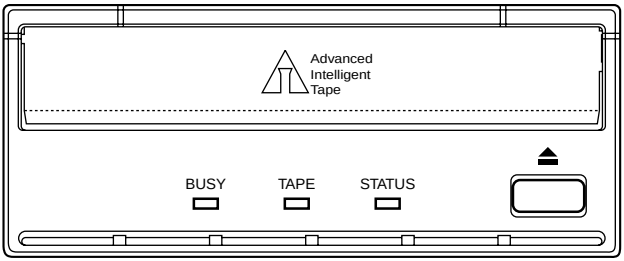


# Operation

## Location of 3 LEDs

There are three LED indications (BUSY,TAPE and STATUS) and an EJECT button on the front panel of the unit.

### Front Panel (for 3.5" Standard Height)

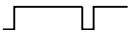


## LED Indication for Drive Status

The LED indicators are defined as follows.

| LED | | | State | | |
|---|---|---|---|---|---|
| **BUSY** | **TAPE** | **STATUS** | **Activity** | **Cartridge** | **Other** |
| | | | None | None | None |
| | | | SCSI | None | None |
| | | | Drive | Loading/Unloading | None |
| | | | Drive | Loading/Unloading | Write Protected |
| | | | None | Loaded | Cleaning Tape at EOM |
| | | | None | Loaded | None |
| | | | SCSI | Loaded | None |
| | | | SCSI/Drive | Loaded | None |
| Independent | | | ✻ | Loaded | Write Protected |
| Independent | | Independent | ✻ | Loaded | Error Rate Warning |
| ✻ | ✻ | | ✻ | ✻ | Cleaning Request |
| ✻ | ✻ | | ✻ | ✻ | Self test Failure |
| | ✻ | ✻ | ✻ | ✻ | Waiting for Reset |
| ✻ | | ✻ | ✻ | ✻ | Waiting for Eject |

✻ : Not defined.



1 pulse (3.5 sec on / 0.5 sec off)

1 pulse (0.25 sec on)

2 pulses (0.25 sec on/0.5 sec off)

off

on

1 pulse (0.25 sec on / 0.25 sec off)

## Drive Operation

### Loading a Tape

Insert a cassette into the slot on the front panel with the arrow on the cassette pointing towards the drive. As the cassette is inserted, the drive takes it and automatically loads it into drive mechanism.

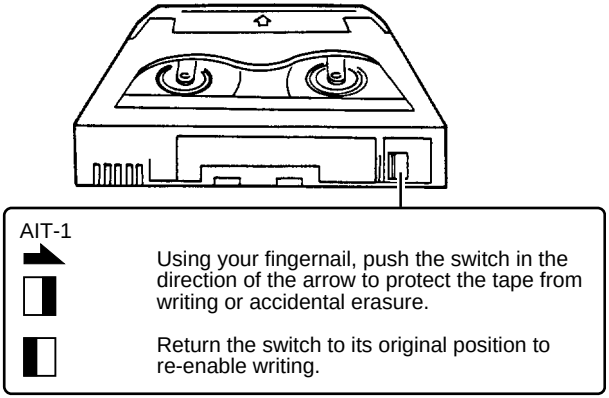
### Unloading a Tape

The cassette can be removed from the SDX-400/SDX-410 either in response to a SCSI Unload Command, or by pressing the eject bottom.

By pressing Eject button, the tape goes to BOT, the drive unthreads it, and ejects the cassette from the slot.

### Write-protecting a Tape

Cassettes can be write-protected by sliding the tab on the back of the cassette. In this state, data can be read from the tape but not written onto it.




### Using a Cleaning Cassette

In case of SDX-400 series/SDX-410 series, a cleaning function is built into the drive and hence the use of a c leaning cartridge is not needed. If however the drive experiences excessive errors, the use of a cleaning cartridge is recommended.

## Emergency Tape Removal Procedure

**1** Remove the drive from the chassis or enclosure to allow access to the bottom and right side of the drive.

**2** Remove the drive's top cover.

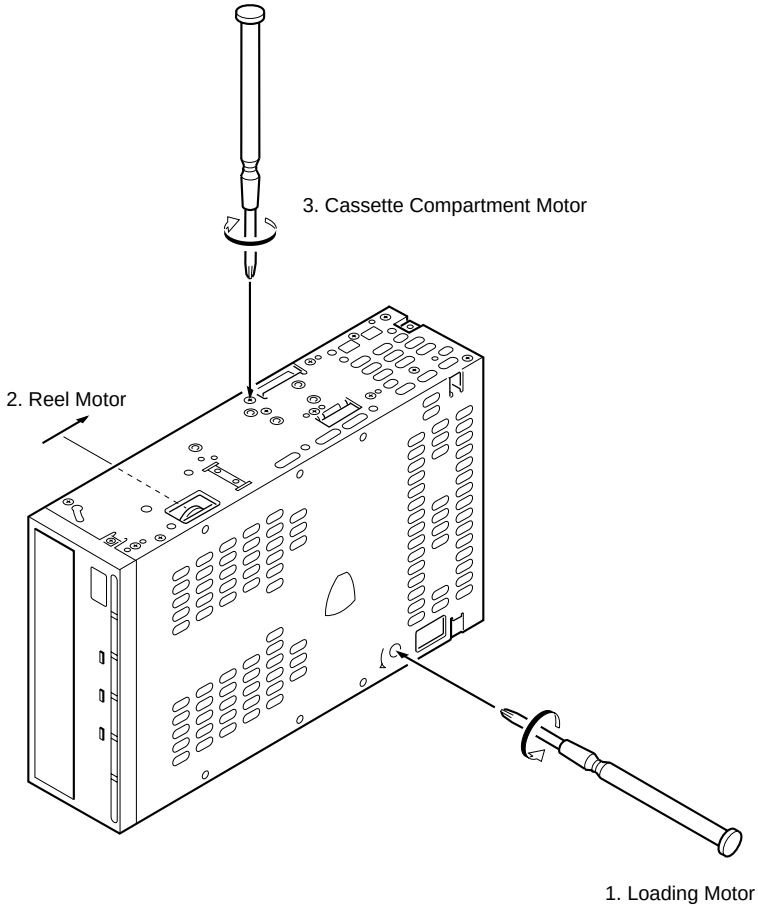
**3** Locate the small opening in the bottom of the drive and insert the tip of a precision screwdriver so that the Threading motor shaft can be rotated.

**4** Rotate the motor shaft counterclockwise to bring the threading mechanism back to the initial position. (Refer to the photo-1 on page 19.)

**5** Before manual eject procedure, tape slack must be removed in order to prevent tape damage. Press and rotate the gear mechanism located on the right side of the drive clockwise to tighten the tape.

**6** After the tape slack has been removed, turn the screw located on the right side of the drive clockwise by a precision screwdriver until the tape cartridge is lifted out of the drive mechanism and is ejected.

**7** Return the drive to Sony for repair.



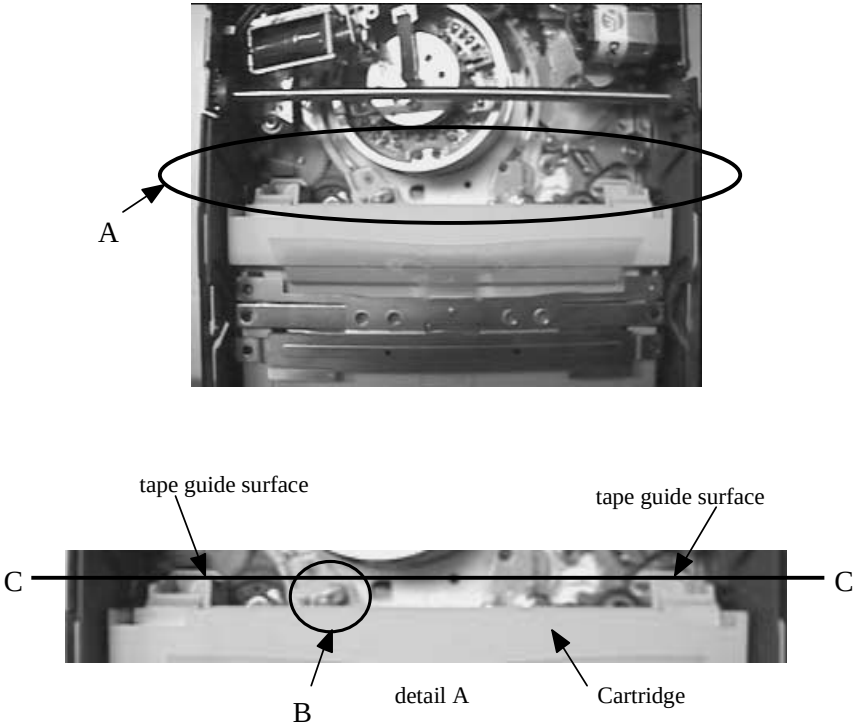



**Photo-1: The Initial Position of the Threading Mechanism**

**Caution**

Stop rotating the motor shaft immediately, when the guide B (see detail A of Photo-1) gets to the area below the line C-C (This line is defined by 2 circular tape guide surfaces of the cartridge). Otherwise the gear of the drive can be damaged.

# Interface Implementation

## Supported SCSI Messages

Abort
Bus Device Reset
Command Complete
Disconnect
Extended Message
– Synchronous Data Transfer Request
– Wide Data Transfer Request
Identify ( w/&w/o Disconnect )
Ignore Wide Residue
Message Parity Error
Message Reject
No Operation
Restore Pointers
Save Data Pointer

## Supported SCSI Commands

Erase
Inquiry
Load/Unload
Locate
Log Sense
Log Select
Mode Select
Mode Sense
Prevent Allow Medium Removal
Read
Read Block Limits
Read Buffer
Read Position
Report Diagnostic Result
Release Unit
Receive Density Support
Report Luns
Request Block Address
Request Sense
Reserve Unit
Rewind
Seek Block
Send Diagnostic
Space
Test Unit Ready
Verify
Write
Write Buffer
Write Filemarks

# Specification

## Product Specifications

### Dimensions

| | SDX-400C | SDX-410C | SDX-400C/R |
|---|---|---|---|
| Height | 41.2 mm (1.62 in) | 41.2 mm (1.62 in) | 41.2 mm (1.62 in) |
| Width | 101.6 mm (4.0 in) | 101.6 mm (4.0 in) | 146.0 mm (5.75 in) |
| Depth | 155.0 mm (6.1 in) | 170.0 mm (6.7 in) | 155.0 mm (6.1 in) |

### Altitude

| | |
|---|---|
| Operating | 0 to 10,000 feet |

### Vibration

| | |
|---|---|
| Operating | Swept Sine 5 to 500 Hz<br>*0.25 G Peak 1 Octave/min.<br>3 axes, 3 directions |
| Non-Operating | Swept Sine 5 to 500 Hz<br>*0.5 G Peak 1 Octave/min.<br>3 axes, 3 directions |

### Acoustic Noise

(A) curve weight

| | |
|---|---|
| Streaming Write/Read | 35 db (A) |
| Insert/Eject | 60 db (A) |

**Note**

The sound-meter on (A) scale is located 1m in front of the center of the drive front panel.

### Shock

| | |
|---|---|
| Operating | No Data Loss<br>Half Sine<br>5 G Peak 3 ms<br>3 axes, 3 directions<br>*Interval 10 seconds |
| Non-Operating | No Device Damage<br>Half Sine<br>90 G Peak 3 ms<br>(30 G Peak 11 ms)<br>3 axes, 3 directions |

## Temperature and Humidity Range

Temperature

| | |
|---|---|
| Operating | 5 ˚C to 40 ˚C (ΔT<10 ˚C/h) |
| Non-Operating (mech.) | – 40 ˚C to 70 ˚C (ΔT<20 ˚C/h) |
| Non-Operating (tape) | – 40 ˚C to 45 ˚C (ΔT<20 ˚C/h) |

Humidity

| | |
|---|---|
| Operating | 20 to 80% RH, non-condensing<br>Maximum wet bulb temperature = 26 ˚C |
| Non-Operating (mech.) | 5 to 95% RH (ΔT<30%/h) |
| Non-Operating (tape) | 20 to 80% RH (ΔT<30%/h) |

## Power Requirements

| Model | Voltage | Max Ripple | Current | |
|---|---|---|---|---|
| | | | Typical | Maximum |
| SDX-400 series | 5 V +/– 5 % | 100 mVp-p | 1.3 A | 2.5 A |
| | 12 V +/– 10 % | 150 mVp-p | 0.4 A | 1.2 A |
| SDX-410 series | 5 V +/– 5 % | 100 mVp-p | 1.5 A | 2.5 A |
| | 12 V +/– 10 % | 150 mVp-p | 0.45 A | 1.2 A |

## Suspended Particulate

| | |
|---|---|
| Operating | Less than 150 microgram/$m^3$<br>Based Sampling period 24 hours |

## ESD

| | |
|---|---|
| Discharge<br>Voltage | < 15 kV: No operation failure<br>< 20 kV: No drive damage |

## Air-cooling Requirement

| | |
|---|---|
| Surrounding temperature | < 40 ˚C |

Clean air flow is recommended to minimize the possibility of data loss.

# Third Party Support Contacts (In the USA)

| Host Adapter Vendors | Phone Numbers |
|---|---|
| Adaptec | 408-945-8600 |
| ATTO | 716-691-1999 |
| Bus Logic | 408-492-9090 |
| DPT | 407-830-5522 |
| Future Domain | 714-253-0400 |
| Initio | 408-988-1919 |
| Qlogic | 714-438-2200 |
| Ultera Systems Inc. | 714-367-8800 |

| Operating Systems | Backup Software Vendors | Phone Numbers |
|---|---|---|
| DOS | Arcada | 407-333-7500 |
| | Cheyenne | 516-484-5110 |
| | Columbia Data Products | 407-869-6700 |
| | Corel | 613-728-8200 |
| | NovaStor | 805-579-6700 |
| | Palindrome | 708-505-3300 |
| | ST. Bernard Sofware | 619-676-2277 |
| | Sytron | 508-898-0100 |
| | Tapedisk | 715-235-3388 |
| Macintosh | Cheyenne | 516-484-5110 |
| | Corel | 613-728-8200 |
| | Dantz | 510-253-3000 |
| | NovaStor | 805-579-6700 |
| OS/2 | Cheyenne | 516-484-5110 |
| | Corel | 613-728-8200 |
| | IBM | 800-426-3333 |
| | NovaStor | 805-579-6700 |
| | Sytron | 407-333-7500 |
| Windows | Arcada | 407-333-7500 |
| | Cheyenne | 516-484-5110 |
| | Corel | 613-728-8200 |
| | Creata | 909-595-8811 |
| | NovaStor | 805-579-6700 |
| | ST. Bernard Software | 619-676-2277 |
| | Sytron | 508-898-0100 |
| Windows NT | Arcada | 407-333-7500 |
| | Cheyenne | 516-484-5110 |
| | Creata | 909-595-8811 |
| | Microsoft | 206-882-8080 |
| | NovaStor | 805-579-6700 |
| | Avail Systems | 303-444-4018 |
| Windows NT Advanced Server | Microsoft | 206-882-8080 |

* All phone numbers listed are in the USA.

  Add the country code (1) prior to those numbers when calling from outside the USA.

| Operating Systems | Backup Software Vendors | Phone Numbers |
|---|---|---|
| Windows 95 | NovaStor | 805-579-6700 |
| DEC Unix | Cheyenne | 516-484-5110 |
| | NovaStor | 612-933-8790 |
| | Software Moguls | 612-933-8790 |
| | Work Station Solutions | 603-880-0080 |
| SUN Unic | Legato | 415-812-6000 |
| | NovaStor | 818-707-9900 |
| | Software Moguls | 612-933-8790 |
| | Sun Soft | 310-348-8649 |
| | Work Station Solutions | 603-880-0080 |
| Solaris Unix | Cheyenne | 516-484-3150 |
| | Legato | 415-812-6000 |
| | NovaStor | 818-707-9900 |
| | Software Moguls | 612-933-8790 |
| | Sun Soft | 310-348-8649 |
| | Work Station Solutions | 603-880-0080 |
| SCO Unix | Cheyenne | 516-484-3150 |
| | Legato | 415-812-6000 |
| | Software Moguls | 612-933-8790 |
| | Work Station Solutions | 603-880-0080 |
| NCR Unix | NovaStor | 818-707-9900 |
| | Work Station Solutions | 603-880-0080 |
| HP Unix | Cheyenne | 516-484-3150 |
| | NovaStor | 818-707-9900 |
| | Work Station Solutions | 603-880-0080 |
| AIX Unix | Cheyenne | 516-484-3150 |
| | Legato | 415-812-6000 |
| | NovaStor | 818-707-9900 |
| | Software Moguls | 612-933-8790 |
| | Work Station Solutions | 603-880-0080 |
| Interactive Unix | Sun Soft | 310-348-8649 |
| SGI Unix | Software Moguls | 612-933-8790 |
| | Work Station Solutions | 603-880-0080 |
| Novell UNIXware | Novell | 801-263-3500 |
| Novell NLM | Arcada | 407-263-3500 |
| | Avail Systems | 303-444-4018 |
| | Cheyenne | 516-484-3150 |
| | Columbia Data Products | 407-682-0265 |
| | Creata | 909-595-8811 |
| | Legato | 415-812-6000 |
| | NovaStor | 818-707-9900 |
| | Novell | 801-419-5544 |
| | Palindrome | 708-505-3300 |
| | Performance Tech | 210-979-2110 |
| | ST. Bernard Software | 619-676-2277 |
| | Symantec | 310-449-4156 |
| | Sytron | 508-898-0100 |
| Banyan | Performance Tech | 210-979-2110 |
| Lantastic | NovaStor | 818-707-9900 |
| Amiga | Moonlighter | 407-384-9484 |
| RS6000 | Legato | 415-812-6000 |
| | NovaStor | 818-707-9900 |
| | Software Moguls | 612-933-8790 |

# Sony Contacts

## For further information, please contact:

**Sony Electronics Inc., Technical Support**

3300 Zanker Road San Jose, CA95134, 1940. USA
TEL: (1) 800-801-7927
URL: http://sony.storagesupport.com/
E-mail: tape.support@am.sony.com

**Sony Corporation**
**Electronic Devices Marketing Group, Product Marketing Div.**
**Computer Peripherals Dept. Tape Streamer Section**

Osaki Gate City East Tower, 1-11-1, Osaki
Shinagawa-ku, Tokyo, 141-0032 Japan
TEL: (81) 3-5435-3486 FAX: (81) 3-5435-3565

**Sony of Canada Ltd., AV/IT Marketing Group**
**Computer Peripherals Product Marketing**

115 Gordon Baker Road Toronto, Ontario, M2H 3R6 Canada
TEL: (416) 499-1414 or (1) 800-961-7669
FAX: (416) 499-8541

**Sony Computer Peripherals & Compornents Europe**

URL: http://www.sonyisstorage.com/

**Electronics Devices Marketing (Singapore)**
**(A division company of Sony Electronics (S) Pte. Ltd.)**
**Enterprise Storage Solutions Dept.**

2 International Business Park, #01-10 Tower One,
The Strategy, Singapore 609930
TEL:65-6544-8000 FAX:65-6544-7390

**Sony Corporation of Hong Kong Ltd.**
**Computer Peripheral Sales & Marketing Division**
**Electronic Devices Marketing Hong Kong**

45/F, The Lee Gardens, 33 Hysan Avenue, Causeway Bay, Hong Kong
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**Sony Corporation of Hong Kong Ltd. Beijing Rep. Office**
**Computer Peripheral Div.**

Full Link Plaza Tower A 11/F., No.18 Chaoyangmenwai Ave., Beijing
100020 P.R.C.
TEL:86-10-6588-0558 FAX:86-10-6588-0855
URL: http://www.sony.com.cn

**Sony Corporation of Hong Kong Ltd. Shanghai Rep. Office**

44F., HSBC Tower, 101 Yin Cheng East Road, Pudong, New Area,
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**Sony Brasil Ltda.**

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**Sony Australia Ltd., Information Technology Products Division**

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TEL: 1800-226-429 FAX: (61) 2-9870-8564 A.C.N. 001 215 354
URL: http://www.sony.com.au/home.asp
E-mail: informatica@ssp.br.sony.com

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**Sony Korea Corporation EDMK CP Sales & Marketing Team**

34F, ASEM Tower, World Trade Center, 159-1, Samsung-Dong,
Kangnam-Ku, Seoul, 135-798, Korea
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URL: http://www.sony.co.kr/cp/

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