



Scorpion 40 Installation Manual



Scorpion 40 DDS-4 Tape Drive Installation Manual



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FCC notice

This equipment generates and uses radio frequency energy and, if not installed and used in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception, which could void the user's authority to operate the equipment. It has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If interference does occur, try to correct it by taking one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the computer and the receiver.
- Connect the computer into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

You may find the following booklet prepared by the Federal Communications Commission helpful: **How to Identify and Resolve Radio-TV Interference Problems**. This booklet (Stock No. 004-000-00345-4) is available from the U.S. Government Printing Office, Washington, DC 20402. Further, this equipment complies with the limits for Class B digital apparatus in accordance with Canadian Radio Interference Regulations.

Cet appareil numérique de la classe B est conforme au Règlement sur brouillage radioélectrique, C. R. C., ch. 1374.

Introduction

This installation manual summarizes the installation and operation of Seagate® Scorpion 40 DDS-4 drives.

Note: DDS tape drives are sometimes referred to as “DAT” drives. However, only the former term is used in this manual.

The Scorpion 40 uses DDS-4 tape cartridges with a native capacity of 20 Gbytes (40 Gbytes with 2:1 data compression). It can also read and write older tapes using DDS-1, DDS-2 and DDS-3 tape formats. Data compression is supported for all these formats.

The Scorpion 40 supports the following SCSI interfaces:

- 68-pin Ultra2 SCSI (LVD)
- 68-pin SCSI Wide (single-ended)
- 50-pin SCSI-2 (requires 68- to 50-pin single-ended adapter such as Seagate PN 10006520-001)

Note: The Scorpion 40 will not work in a SCSI-1 environment.

The following Scorpion 40 models are covered in this manual:

Drive model number	Form factor
STD1401LW	3.5-inch internal drive
STD2401LW	5.25-inch internal drive
STD6401LW	External drive

Note. Additional or updated information on these drives may be available on Seagate’s web site at www.seagate.com.

If you have purchased an external Scorpion 40, please turn to page 15 for installation instructions. If you have purchased an internal drive, continue to the next page.

Installing an internal Scorpion 40

Before you begin



Caution. Observe the following precautions to avoid electrostatic damage to the internal drive during installation.

- Do not remove the drive from the antistatic bag until you are ready to install it.
- Before you remove the drive from the antistatic bag, touch a grounded metal surface to discharge any static electricity buildup from your body.
- Hold the drive only by its edges and avoid direct contact with any electronic components.
- If you need to put the drive down, lay it on top of the antistatic bag or place it inside the bag.

Installation Overview

Internal drive installation involves three main steps:

1. Configuring the drive
2. Mounting the drive
3. Connecting the power and interface cables

Note: Internal Scorpion 40 drives come in different configurations for mounting in 3.5-inch and 5.25-inch drive bays. Drives configured for 5.25-inch bays are identical to those used for 3.5-inch bays, but come with mounting brackets and a wider face plate. Installation procedures are the same for both drive configurations.

Configuring an internal Scorpion 40

Before you install the tape drive in your computer, you may need to configure the drive's SCSI ID or other drive features. Jumpers located on the back of the drive (between the SCSI interface and power connectors) are used to configure the SCSI ID, parity checking, and termination power. Other drive features are set using a bank of dip-switches on the underside of the drive.

Default settings

The default drive settings for the Scorpion 40 are listed below:

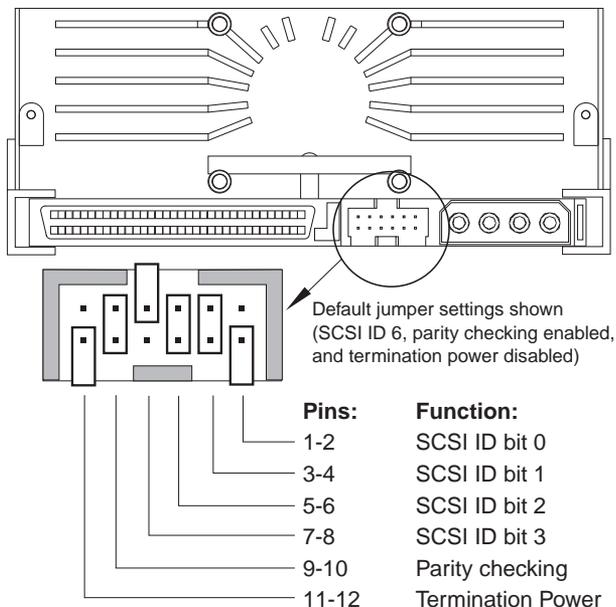
- **SCSI ID:** 6
- **Media Recognition System (MRS) checking:** enabled.
- **Parity checking:** enabled.
- **Data compression:** enabled.
- **Power-on self-test diagnostics:** enabled.
- **Host operating system:** Windows 95/98/NT/2000
- **SCSI interface compatibility:** Wide SCSI supported.

If these default settings are appropriate for your needs, skip ahead to "Mounting an internal Scorpion 40" on page 10.

Jumper settings

Configuration jumpers on the back of the drive are used to control the drive's SCSI ID, parity checking, and SCSI terminator power. The jumpers can also be used for remote SCSI address selection. Figure 1 on the following page shows the locations of the jumper blocks for the internal Scorpion 40.

Figure 1
Jumpers settings for internal Scorpion 40



SCSI ID=0	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=1	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=2	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=3	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=4	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=5	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=6	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=7	■ ■ ■ ■ ■ ■ ■ ■

SCSI ID=8	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=9	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=10	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=11	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=12	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=13	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=14	■ ■ ■ ■ ■ ■ ■ ■
SCSI ID=15	■ ■ ■ ■ ■ ■ ■ ■
Parity enable	■ ■ ■ ■ ■ ■ ■ ■
Term. power	■ ■ ■ ■ ■ ■ ■ ■

SCSI Address Selection (pins 1 through 8)

You can select the SCSI address used by the drive by placing the appropriate jumpers on pins pairs 1-2 through 7-8, as shown in Figure 1. The SCSI address can also be selected remotely by connecting a SCSI address-selection switch to pins 1 through 8.

Note: Each SCSI device on a bus must have a unique SCSI ID. The SCSI controller or host adapter generally uses ID 7. In some systems, the boot drive uses ID 0 or ID 1.

Parity checking (pins 9 and 10)

If a jumper is installed on pins 9 and 10 (the default setting), parity checking is enabled. If no jumper is installed, parity checking is disabled, but parity is still generated by the drive.

Terminator power (pins 11 and 12)

Internal Scorpion 40 drives are shipped with terminator power disabled (no jumper across pins 11 and 12, as shown in Figure 1). You can enable terminator power, if necessary, by placing a jumper across pins 11 and 12.

Note: The internal Scorpion 40 does *not* provide SCSI termination, and therefore should not be installed as the last device in a SCSI chain. See “SCSI termination” on page 13 for more information.

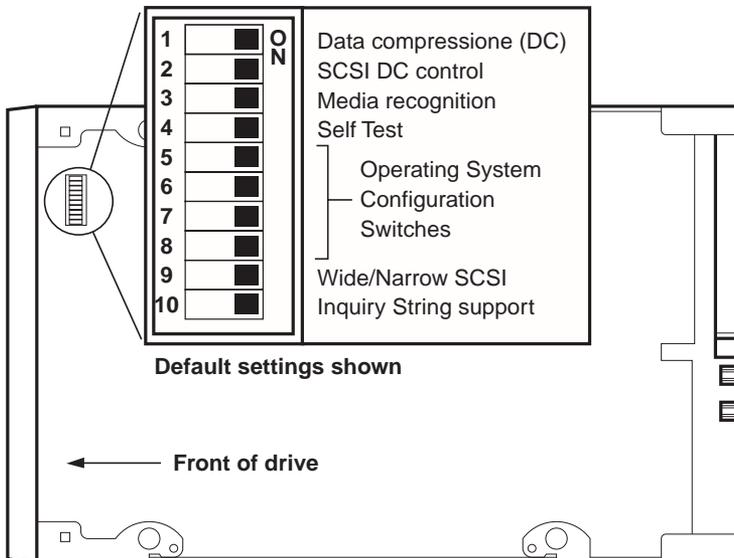
If the terminator power jumper is installed, be careful not to short the TERMPWR signal to ground. In the event of a short, terminator power to the bus will be interrupted. After the short is removed, a fuse in the drive will automatically reset, restoring terminator power.

Dip-switch settings

Figure 2 on the following page shows the location of dip switches on the *underside* of the Scorpion 40. Each of these switches is described in detail on subsequent pages.

If you change a dip switch, the new setting will not take effect until the drive is turned off and then on again.

Figure 2
Dip-switch settings for internal Scorpion 40



Data compression (switches 1 and 2)

If switch 1 is ON (the default setting), hardware data compression is enabled. If switch 1 is OFF, hardware data compression is disabled.

If dip switch 2 is ON (the default setting) then SCSI commands can be used to enable or disable hardware data compression. To prevent hardware data compression from being enabled or disabled by SCSI commands, set dip switch 2 to OFF.

Media-recognition system (switch 3)

The media-recognition system allows the drive to determine whether a given tape cartridge conforms to the DDS tape standard. Use of non-DDS media may appear to give satisfactory results, but the inferior specifications of such media can cause data-integrity problems.

Switch 3 enables or disables the media-recognition system (MRS). If switch 3 is ON (the default setting), the drive reads

and writes to MRS media and reads from but does not write to non-MRS media. If switch 3 is OFF, the drive reads or writes both MRS and non-MRS media.

Power-on self-test enable/disable (switch 4)

Switch 4 enables or disables execution of power-on self-test diagnostics when the drive is powered on. If switch 4 is ON (the default setting), the drive responds to SCSI commands only after successful completion of the self-test (about 5 seconds). If switch 4 is OFF, the drive does not perform a power-on self test.

Operating System configuration (switches 5 through 8)

Switches 5 through 8 are used to configure the drive for use with UNIX and other non-Windows operating systems, as described starting on page 25 of this manual. The default setting for all four of these switches is ON.

SCSI Wide/Narrow (switch 9)

Switch 9 enables or disables SCSI Wide operation on the SCSI bus. When switch 9 is ON (the default setting), the drive is capable of operating in Wide (16-bit) SCSI mode. When switch 9 is OFF, the drive will only operate as a Narrow (8-bit) SCSI device.

Note: If switch 9 is set to OFF, the drive can only use SCSI ID values 0 through 7.

Inquiry String (switch 10)

Switch 10 is used to select the Vendor ID that the drive returns when queried with a SCSI Inquiry command. When switch 10 is ON (the default setting), the Vendor ID will be "SEAGATE DAT." When switch 10 is OFF the Vendor ID will be "ARCHIVE Python." The "ARCHIVE Python" Vendor ID may be used by independent software vendors to provide software compatibility with previous Seagate DDS tape drives.

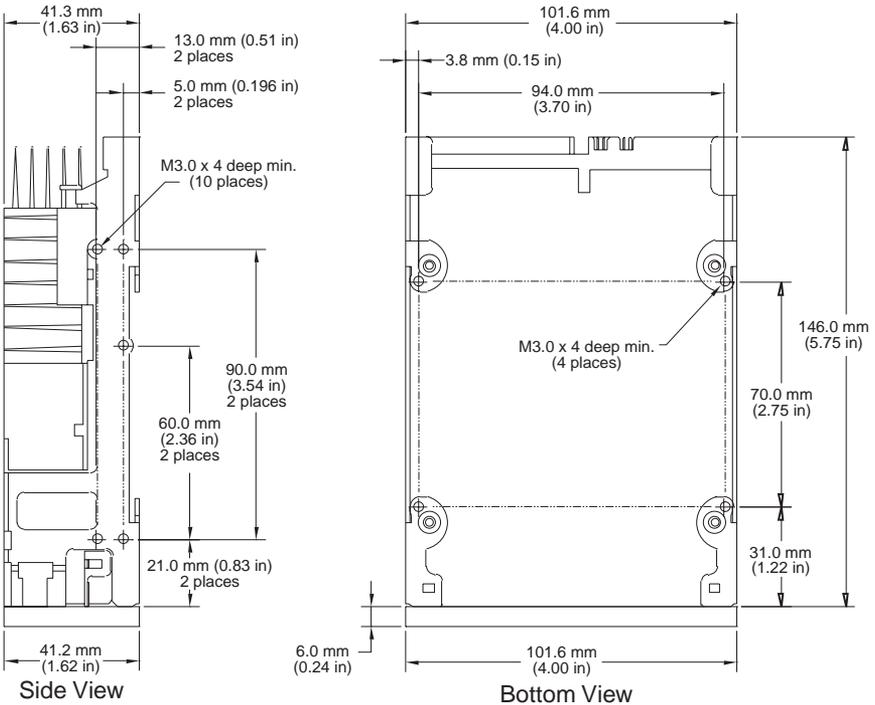
Mounting an internal Scorpion 40

You can install an internal Scorpion 40 drive horizontally or vertically (on its side).

Mounting the drive in a 3.5-inch drive bay

Mount the drive in a 3.5-inch drive bay and secure it using two M3.0 metric screws on each side of the drive. Do not use screws longer than 4 mm or you may damage the drive. As shown in Figure 3, the 3.5-inch drive has four screw holes on the bottom and five on each side.

Figure 3
Mounting holes for Scorpion 40 drive in 3.5-inch configuration (without mounting brackets)

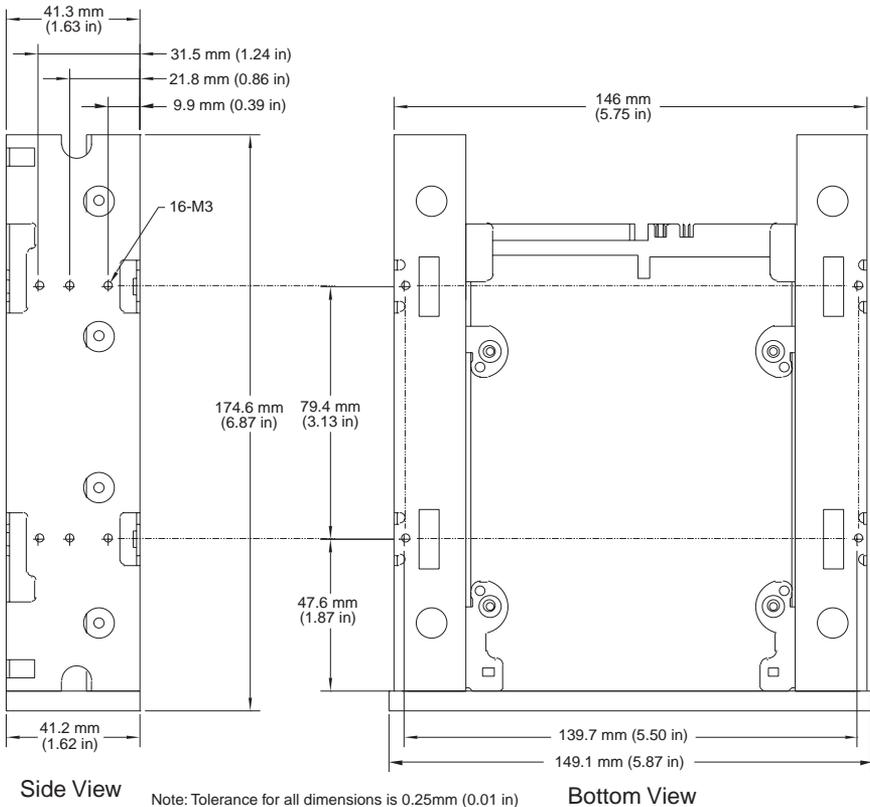


Note: Tolerance for all dimensions is 0.25mm (0.01 in)

Mounting the drive in a 5.25-inch drive bay

If you are mounting the drive in a 5.25-inch drive bay, you must use a drive with mounting brackets. As shown in Figure 4 below, the 5.25-inch drive brackets have four screw holes on the bottom and six on each side.

Figure 4
Mounting holes for internal Scorpion 40 in 5.25-inch configuration (with mounting brackets)



Connecting the SCSI interface cable

Scorpion 40 drives can be used with three different types of SCSI interfaces: Ultra2 SCSI (LVD), "Wide" (16-bit) single-ended SCSI, and "Narrow" (8-bit) single-ended SCSI. The drive can automatically detect whether it is connected to an LVD or single-ended wide SCSI bus.

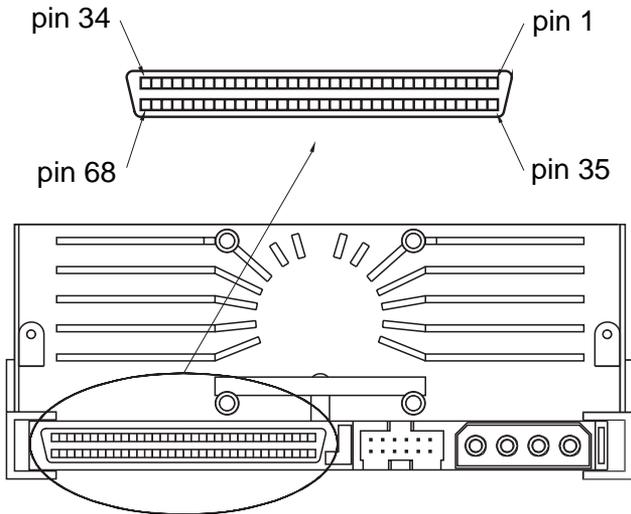
Note: The Scorpion 40 will not work in a SCSI-1 environment.

Connecting to a 68-pin Wide SCSI or LVD bus

To connect the drive to an LVD or SCSI wide bus, first turn off all power to the drive and computer. Then attach the interface cable to the SCSI interface connector on the back of the drive (see Figure 5 below).

Figure 5
Interface connectors on internal Scorpion 40

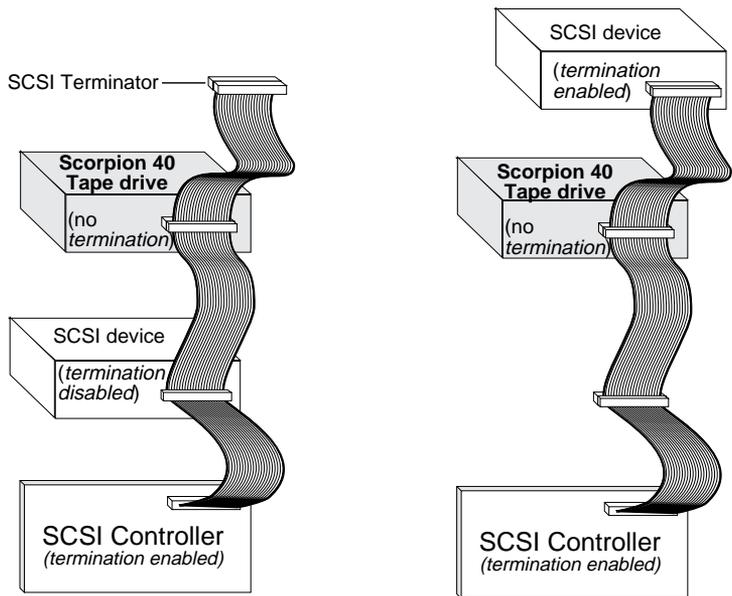
Ultra2 SCSI 68-pin high-density connector



SCSI Termination

The internal Scorpion 40 does *not* provide SCSI termination. For this reason, it should not be the last device on a SCSI chain. Two termination examples are shown in Figure 6 below. If the drive is the only SCSI device, attach the drive to the connector which is next to last on the SCSI chain and attach a multi-mode terminator to the last connector in the chain.

Figure 6
Two SCSI termination examples for internal Scorpion 40.

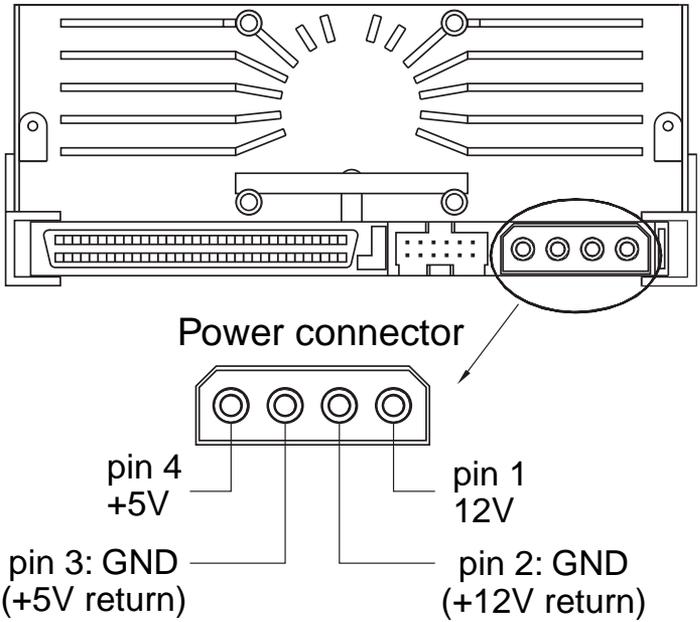


Connecting a power cable

Attach a four-pin power cable to the power connector on the back of the drive. Figure 7 on the following page shows the location of the power connector.

The recommended 4-pin power connector for the internal drive is an AMP 1-48024-0 housing with AMP 60617-1 pins or equivalent.

Figure 7
Drive power connector on internal Scorpion 40



Installing an external Scorpion 40

The external Scorpion 40 is a compact external drive that connects to the host computer as a turnkey subsystem. Installing the external drive involves three simple steps:

1. Configuring the drive
2. Connecting the SCSI interface cable
3. Connecting the power cord

Configuring the external Scorpion 40

The following is the default configuration for the external Scorpion 40:

- **SCSI ID:** 6
- **Media Recognition System (MRS) checking:** enabled.
- **Parity checking:** enabled.
- **Data compression:** enabled.
- **Power-on self-test diagnostics:** enabled.
- **Host operating system:** Windows 95/98/NT/2000
- **Termination power:** supplied to the SCSI bus.

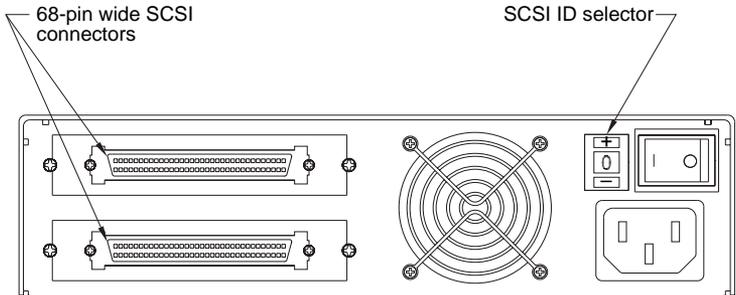
Note: Some of these configuration settings can be changed using the SCSI Mode Select command. SCSI command information for these drives is provided in the product description manual.

Setting the SCSI ID

Make sure that the drive is turned off; then set the SCSI ID for the drive using the push-button switch on the back of the external drive. Figure 8 on the following page shows this switch, as well as the two SCSI interface connectors, on/off switch, and the power-cord connector.

Note: The drive must be restarted, or a bus reset must occur for any change in SCSI ID to take effect.

Figure 8
Rear panel of external Scorpion 40



Connecting the SCSI interface cable

The Scorpion 40 provides two 68-pin, shielded connectors on the rear panel of the enclosure. Either connector can be used as a SCSI IN or SCSI OUT connection (you can use either connector to attach the drive to the host computer or to another SCSI device).

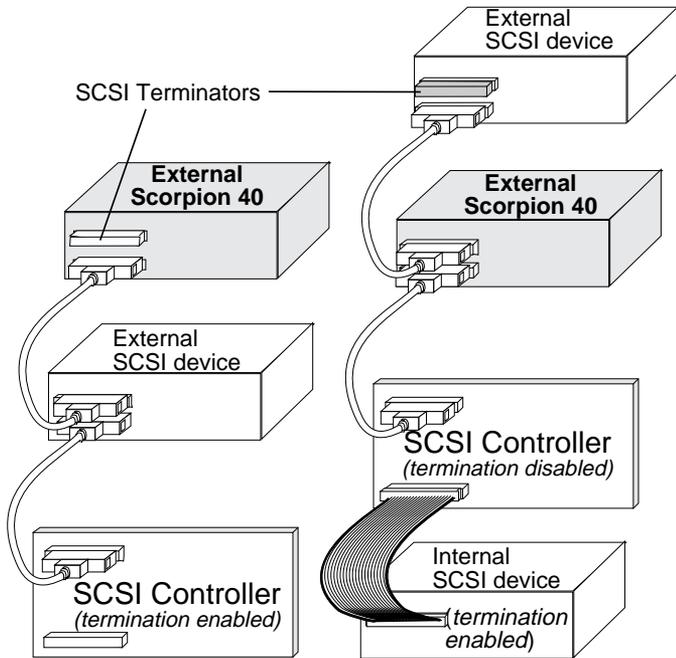
Turn off your computer and all SCSI devices. Then attach a SCSI cable from the host adapter or from another (unterminated) SCSI device to the Scorpion 40

Note: The Scorpion 40 will not work in a SCSI-1 environment.

SCSI Termination

If the Scorpion 40 is the last device or the only device in a SCSI chain, you must install a terminating plug on the unused SCSI connector. See Figure 9 on the following page for two SCSI termination examples. You can purchase a terminator for the Scorpion 40 (part number 10006525-001) from Seagate Express at 1-800-656-8419.

Figure 9
SCSI termination examples for external Scorpion 40



Example 1: SCSI termination in a system that has only external SCSI devices.

Example 2: SCSI termination in a system that has both internal and external SCSI devices.

Connecting the power cord

Attach the power cord securely to the power connector on the back of the drive. The location of the power connector on the external drive is shown in Figure 8 on page 16.

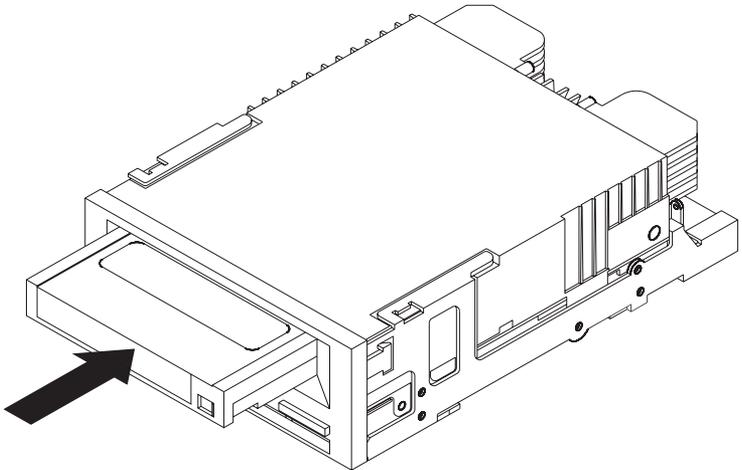
Operating and maintaining the Scorpion 40

This chapter describes how to use your internal or external Scorpion 40. It describes how to use and care for DDS cartridges. It also explains the meaning of the LEDs on the front of the drive.

Loading a cartridge

Seagate DDS drives have a front-loading cartridge bay for easy operation. The drive-bay door opens automatically when a cartridge is inserted. Figure 10 shows a cartridge being inserted into a 3.5-inch internal drive. After you insert the cartridge, there will be a brief delay while the drive identifies the cartridge type and state and moves the tape to the data area.

Figure 10
Loading a tape cartridge



Unloading a cartridge

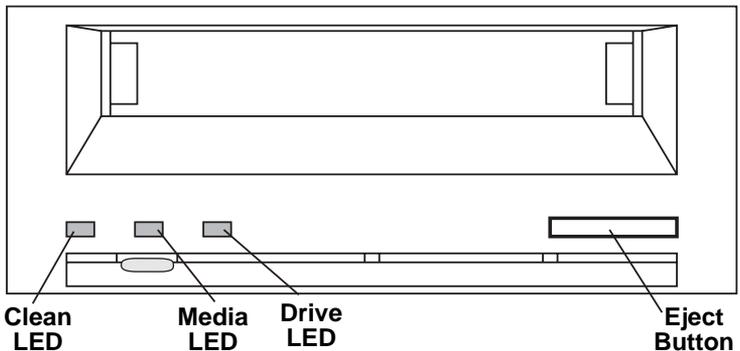


Caution. Do not push the eject button while the Drive LED is ON. You may lose data.

Make sure that the Drive LED is not lit. Then unload the cartridge by pressing the eject button. For the location of the eject button, see Figure 11 below. After you press the eject button, the drive automatically flushes the drive buffer to tape, rewinds the cartridge, and updates the system log before ejecting the cartridge.

Several seconds may elapse between the time you press the eject button and the time the cartridge is ejected. Do not power down the tape drive or the host computer during this time.

Figure 11
Location of Eject button and LEDs on internal Scorpion 40 (external drive is similar)



Initializing a blank cartridge

When you insert a blank cartridge into the drive for the first time, the drive takes about 10 to 12 seconds to determine that the tape is blank. The drive will automatically initialize the tape as soon as it receives a Write command from the host computer. Initializing a blank tape takes about 30 seconds.

DDS cartridge compatibility

Seagate Scorpion 40 drives are designed to use data-grade DDS cartridges, which comply with ANSI specifications listed in the “3.81 mm Helical-Scan Digital Computer Tape Cartridge for Information Interchange,” ANSI X3B5/89-156 standard. The drive supports 90-meter DDS-1 media, but not 60-meter DDS-1 media.

To ensure optimal data integrity and reliability, Seagate recommends using the following DDS cartridges:

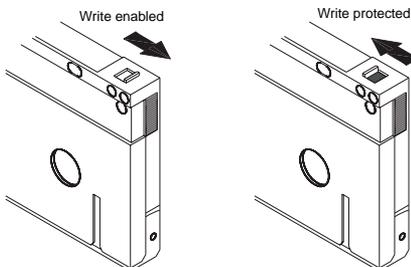
- Model M34000
(DDS-2: 120 meters; 4-Gbyte native capacity)
- Model STDM24G
(DDS-3: 125 meters; 12-Gbyte native capacity)
- Model STDM40
(DDS-4: 150 meters; 20-Gbyte native capacity)

MRS cartridges have a series of alternate opaque and clear stripes at the beginning of the tape. These stripes classify the media as data-grade.

Write-protecting a cartridge

Figure 12 shows how to write-protect or write-enable a DDS tape using the sliding write-protect tab. You can only write data to the tape when the tab is in the write-enabled (closed) position.

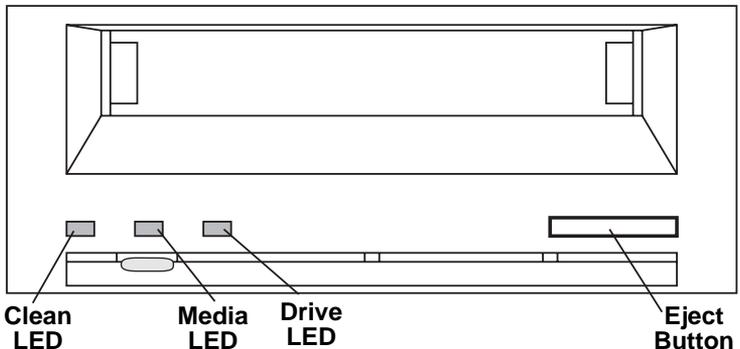
Figure 12
Write-protect tab on a DDS cartridge



LED codes

As shown in Figure 13 below, the front panel of the Scorpion 40 contains three LEDs. These LEDs provide information about both normal and error conditions.

Figure 13
Front panel of internal Scorpion 40 (external drive is similar)



Clean LED

The Clean LED functions as follows:

- If the Clean LED is ON continuously, the drive requires cleaning. Specifically, this indicates that the drive has been operating for at least 25 hours (for DDS-1 or DDS-2 media) or for at least 50 hours (for DDS-3 or DDS-4 media). Use only a Seagate-approved cleaning cartridge to clean the drive.
- If the Clean LED is flashing slowly, the tape cartridge currently in use has exceeded a predefined soft-error threshold. This signal is a warning only and does not indicate that data has been lost. If you see this signal, remove the tape at your earliest convenience and clean the drive using a Seagate-approved DDS cleaning cartridge. If, after cleaning the drive and reinserting the original data cartridge, the Clean LED still flashes, then you should use a new cartridge for future backups.

Media LED

The Media LED functions as follows:

- If the Media LED is ON (lit) continuously, a DDS cartridge has been inserted and the drive is operating normally.
- If the Media LED is flashing rapidly, the drive could not write the tape correctly (maximum rewrite count exceeded) and the write operation failed. Clean the drive heads using an approved DDS cleaning cartridge. If you reinsert the original data cartridge and the LED continues flashing, insert a new data cartridge and retry the operation.

Note: As routine maintenance, you should clean the drive heads after every 25 hours of operation using DDS-1 or DDS-2 tapes or after every 50 hours when using DDS-3 or DDS-4 tapes.

Drive LED

The Drive LED functions as follows:

- If the Drive LED is ON continuously, the drive is reading or writing the tape (that is, SCSI or tape activity is present). If you push the eject button while the Drive LED is ON, you may lose data.

Note: If a SCSI Prevent Media Removal command has been issued, the Drive LED remains ON and the eject button is disabled so that the tape cannot be accidentally ejected.

- If the Drive LED is flashing rapidly, a hardware fault has occurred. If this occurs immediately after powering on the drive, then the Power-On Self Test switch is enabled and a Power-On Self Test has failed. The front panel LEDs may be flashing together. If this occurs contact the Seagate Technical Support department for information. If the Drive LED is flashing rapidly during drive operation, you should attempt to remove the tape by pressing the front panel button. If the tape does not eject within 2 minutes, press and hold the front panel button

continuously for more than 5 seconds. The tape should eject within 40 seconds. Contact Seagate Technical Support for more information.

LED Code summary

The following table summarizes LED flash codes for the Scorpion 40.

LED	Action	Meaning
Clean	ON (lit)	Cleaning is required because the drive has been operated for at least 25 hours (DDS-1 and DDS-2) or 50 hours (DDS-3 or DDS-4).
	Flashing Slowly	The internal error rate threshold has been exceeded and cleaning is required.
	Flashing	The cleaning cartridge in the drive has exceeded its useful life. Replace the old cleaning cartridge with a new one.
Media	ON (lit)	A cartridge is inserted and is not generating excessive errors.
	Flashing	The drive could not write the tape correctly (a write error has occurred). Use a DDS cleaning cartridge to clean the drive.
Drive	ON (lit)	The drive is reading or writing the tape normally.
	Flashing Rapidly	A hardware fault occurred.

Cleaning the tape heads

When to clean the tape heads

If excessive dust or debris from the tape media collects at one or more of the tape heads, your drive may not be able to read from or write to tape. To avoid this situation, you must clean the tape heads on your Scorpion 40 in the following circumstances:

- after every 25 hours of read/write operation using DDS-1 or DDS-2 tapes or every 50 hours of operation using DDS-3 or DDS-4 tapes
- if the Clean LED lights up or flashes, or
- if the Media LED flashes during drive operation.

Note: If cleaning the head does not correct a flashing LED condition, try using a new data cartridge.

How to clean the tape heads

To clean the tape heads on your drive, use only a Seagate-qualified DDS cleaning cartridge. Seagate offers a cleaning cartridge, part number 25883-001, available from Seagate Express at 1-800-656-8419.

Note: Do not use an audio DAT cleaning cartridge. The drive cannot recognize it.

After you insert the cleaning cartridge, the drive detects that the cartridge is a cleaning cartridge, then loads and runs the cartridge for about 30 seconds. When cleaning is complete, the drive ejects the cartridge.

Note: Each time the cleaning cartridge is loaded, a new, unused portion of cleaning tape is advanced over the entire tape path. The drive does not rewind a cleaning cartridge. After about 30 cleaning cycles, the entire tape is used up. In this case, the Clean LED will flash rapidly and the cleaning cartridge should be replaced.

Configuration for non-Windows operating systems

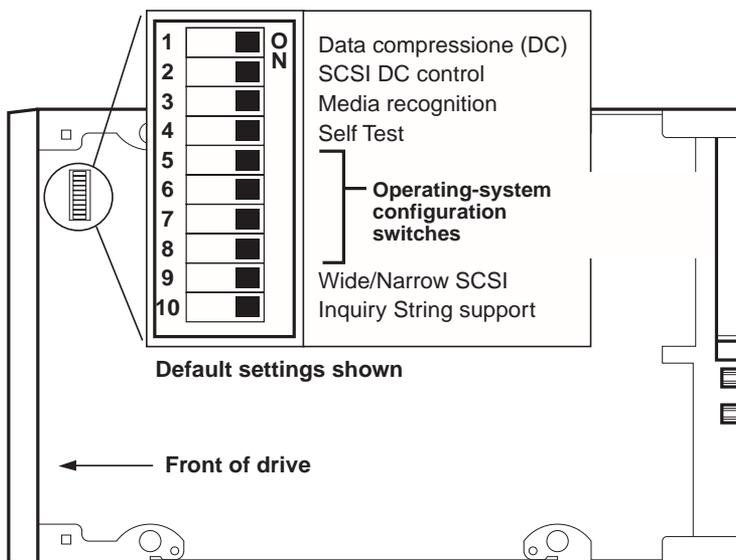
This section explains how to configure Scorpion 40 drives and various UNIX and Novell operating systems for optimum compatibility.

Operating-system configuration dip switches

Figure 14 shows the location of the operating-system configuration dip switches on the bottom of the internal Scorpion 40.

Note: If the drive is to be used with an operating system other than those described here, these switches should be left in their default positions.

Figure 14
Operating-system configuration dip switches on underside of the Scorpion 40



Configuration for the Novell environment

Before using the Scorpion 40 in a Novell environment, set the operating-system dip switches as shown below:



To configure the drive for various UNIX operating systems, see the following pages.

Configurations for the DEC UNIX environment

Dip switch settings

Before using the Scorpion 40 in a DEC UNIX environment, set the operating-system dip switches as shown below:



Digital UNIX Version 4.0 and later

With Version 4.0 of their UNIX operating system, DEC introduced a new method of configuring the CAM SCSI driver. Modify the file **/etc/ddr.dbase** as follows:

1. Look through the file and locate the database entry for the DEC TLZ07 DAT drive
2. Copy this entry and paste it later in the file, taking care to maintain the file syntax.
3. Modify this new entry as shown below.

```
SCSIDEVICE
#
Type = tape
Name = "SEAGATE" "DAT"
#
PARAMETERS:
    TypeSubClass          = rdat
    TagQueueDepth         = 0
    MaxTransferSize       = 0x0fffffff # (16MB - 1)
    ReadyTimeSeconds      = 60         # seconds
```

```
DENSITY:
#
DensityNumber = 0,3,4,5,6,7
DensityCode = default
CompressionCode = 0x0
Buffered = 0x1
```

```
DENSITY:
#
DensityNumber = 1,2
DensityCode = default
CompressionCode = 0x1
Buffered = 0x1
```

4. Save the database file.

5. Run the following command: **ddr_config -c**. This takes the default input file, `ddr.dbase`, and builds a new device database. The new device database is effective immediately, and there is no need to rebuild the kernel.

Digital UNIX Versions earlier than 4.0.

Configure the system by modifying the file **cam_data.c**. This is located in either `/usr/sys/data` or `/sys/data`, depending on the system configuration. The `cam_data.c` file should be modified as shown below:

1. Look through the file to locate the database entry for the "TLZ07 - RDAT" drive.
2. Make a copy of this entry and paste it later in the file, taking care to maintain the syntax of the C source.
3. Modify the new entry as shown below.

```
/* Seagate DAT Drive Returning "SEAGATE DAT" Inquiry */
{"SEAGATE DAT", 14, DEV_TLZ07,
 (ALL_DTYPE_SEQUENTIAL << DTYPE_SHFT) | SZ_RDAT_CLASS,
 (struct pt_info *)ccmn_null_sizes, SZ_NO_BLK, (DEC_MAX_REC - 1),
 &tlz07_dens, NO_MODE_TAB, SZ_NO_FLAGS,
 NO_OPT_CMDS, SZ_READY_DEF, SZ_NO_QUE,
 DD_REQSNS_VAL | DD_INQ_VAL, 36, 64
},
```

4. Rebuild the kernel using the `doconfig` script. Then reboot the system.

Configurations for the Sun UNIX environment

Dip switch settings

Before using the Scorpion 40 in a Sun UNIX environment, set the operating-system dip switches as shown below:



Sun OS 4.1.x

To configure SunOS 4.1.x to use the Scorpion 40, you must modify the **stdef.h** and **st_conf.c** files (in the directory `/usr/sys/scsi/targets`), then rebuild the kernel, as described below:

1. Modify the **stdef.h** file by adding a define statement for the Seagate drive like the one shown below:

```
#define ST_TYPE_SEAGATE_DAT <value>
```

This statement should be added after the last `ST_TYPE_` define statement in the file. `<value>` should be the next unused hexadecimal value. This value will depend on the release and number of devices supported by the system. For example, if the last value for an existing device is `0x2d`, then use a value of `0x2e`.

2. Modify the **st_conf.c** file by adding the following lines at the end of the device definition list:

```
/*Seagate DAT drive support */
{
    "SEAGATE DAT", 7, "SEAGATE", ST_TYPE_SEAGATE_DAT, 10240,
    (ST_VARIABLE | ST_BSF | ST_BSR | ST_LONG_ERASE | ST_KNOWS_EOD)
    ,
    5000, 5000,
    {0x0, 0x8c, 0x8c, 0x8c},
    {0, 0, 0, 0}
}
```

3. Use the *config* command to rebuild the kernel and include the new device definition. Refer to the *config* man page for details.

Solaris 2.x

1. To configure Solaris 2.x for compatibility with the Scorpion 40, add the following lines to the file **st.conf** in the directory */kernel/drv*.

```
tape-config-list=  
    "SEAGATE DAT    05573-XXX", "Seagate DAT Drive", "SEAGATE_DAT";  
SEAGATE_DAT = 1,0x2c,0,0xd639,4,0x00,0x8C,0x8C,0x8C,3;
```

Note: The inquiry string above contains four spaces between the word `DAT` and the value `05573`.

2. After modifying the file **st.conf**, you must reconfigure the kernel by booting the system using the *boot -r* command

Configurations for the SGI environment

Dip switch settings

Before using the Scorpion 40 in a SGI UNIX environment, set the dip switches as shown below:



Note: The main difference between tape drive support in Irix 5.x and 6.x is the introduction for Data Compression switching via software in Irix version 6.2. When running Irix 5.x, the drive will always operate in the compression setting determined by switch 6 on the bottom of the drive (off=compression enabled (default), on=compression disabled).

Irix V5.x

To configure Irix 5.x to use the Scorpion 40, you must modify the file `/var/sysgen/master.d/scsi` as described below:

1. Edit the file `/var/sysgen/master.d/scsi` and add the following entry:

```
{DATTAPE,TPDAT,7,12,"SEAGATE","DAT    05573"/*DAT*/,0,0,{0,0,0,0},
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|MTCAN_PREV|
MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|MTCAN_SETSZ|
MTCAN_SILI|MTCAN_SEEK|MTCAN_CHTYPEANY,
/* minimum delay on i/o is 12 minutes, to allow the Drives
* full error recovery sequence to be performed. */
40, 12*60, 12*60, 12*60, 512, 512*512 },
```

Note: The string above contains four spaces between the word `DAT` and the value `05573`.

2. Rebuild the kernel using the `autoconfig` command (see the `autoconfig` man page for details). After the kernel is rebuilt you will need to reboot the system again to bring the changes into effect.

Note: Irix 5.3 and later will detect the changes made and automatically rebuild the kernel the next time the system boots.

Irix V6.x through V6.5

To configure Irix 6.x-6.5 to use a Scorpion 40, you must modify the files **/var/sysgen/master.d/scsi** and **/dev/MAKEDEV.d/TPS_base**, as described below. After modifying these files you must rebuild the kernel.

1. Edit the file **/var/sysgen/master.d/scsi** and add one of the following entries, depending on your version of IRIX:

For IRIX V6.x through V6.4:

```
{ DATTAPE, TPDAT, 7, 12, "SEAGATE", "DAT    05573"/*DAT*/, 0, 0, {0},
/* This drive uses mode select page 0xf for compression control;
* most of the other drives supporting compression use page 0x10 */
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|MTCAN_PREV|
MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|MTCAN_SETSZ|
MTCAN_SILI|MTCAN_SEEK|MTCAN_CHTYPEANY|MTCAN_COMPRESS,
/* minimum delay on i/o is 12 minutes, to allow the Drives
* full error recovery sequence to be performed. */
40, 12*60, 12*60, 12*60, 512, 512*512, 0, (u_char *)0 },
```

For IRIX V6.5:

```
{ DATTAPE, TPDAT, 7, 12, "SEAGATE", "DAT    05573"/*DAT*/, 0, 0, {0},
/* This drive uses mode select page 0xf for compression control;
* most of the other drives supporting compression use page 0x10 */
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|MTCAN_PREV|
MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|MTCAN_SETSZ|
MTCAN_SILI|MTCAN_SEEK|MTCAN_CHTYPEANY|MTCAN_COMPRESS,
/* minimum delay on i/o is 12 minutes, to allow the Drives
* full error recovery sequence to be performed. */
40, 12*60, 12*60, 12*60, 512, 512*512,
tpsc_default_dens_count, tpsc_default_hwg_dens_names,
tpsc_default_alias_dens_names,
{0},0,0,0,
0, (u_char *)0 },
```

2. Edit the file `/dev/MAKEDEV.d/TPS_base` and make the following modification (this modification is not required on systems running IRIX 6.4 or 6.5).

Locate the area of code which deals with DAT drives.
This starts with:

```
*Drive?type:*DAT*
```

Then insert the following text before or after the similar entries for other supported devices:

```
*Device:*DAT*05573*) # DAT drive with
compression
    mdev=`expr $mdev + 8`;
    mknod ${prf}$1c c ${C_TPS} $mdev;
; ;
```

3. Restart the system. Irix 6.x will detect the changes made and automatically rebuild the kernel on startup.

Alternatively, you could manually rebuild the kernel using the `autoconfig` command (see the `autoconfig` man page for details), then reboot the system again to bring the changes into effect.

Troubleshooting installations on the SGI platform

Checking the drives inquiry string

It may be useful to confirm the drive's inquiry string. This is done using the `mt` command. The following command line will retrieve the Inquiry string and other status data from a drive on SCSI bus 1, ID 4.

```
mt -f /dev/rmt/tps1d4 status
```

System Interchange Problems

If the following error appears when trying to restore a `cpio` archive from another system, it is likely that a mistake was made in the installation sequence in section 7.1 above:

```
Byte swapped Data - re-try with correct device
```

If this error is encountered, make sure that the correct modifications were made to the file `/var/sysgen/master.d/scsi`.

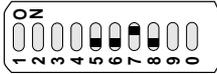
Switching Hardware Compression

Irix 6.x provides support for software switching of hardware compression through the use of different device drivers. Drivers including a "c" in the device name should enable compression. You may be able to resolve problems with data compression by installing the latest Irix 6.x patch set.

Configurations for the HP-UX environment

Dip switch settings

Before using the Scorpion 40 in an HP UNIX environment, set the operating-system configuration dip switches as shown below:



HP-UX Version 10.2 and later

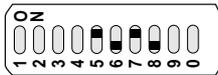
Follow the steps below to configure HP-UX systems:

1. Log in as root.
2. Run the SAM utility.
3. Choose the Peripheral Devices option.
4. Choose Tape Drives.
5. From the Actions menu in the Tape Device Manager window, choose Add.
6. Within the Add a Tape Drive window, read the instructions, then click on OK.
7. SAM may detect that your HP-UX kernel lacks the drivers necessary to make use of your new tape drive. If so, within the "Device Driver Check" window, read the message and choose the appropriate action. If the chosen option is Build a new kernel and shut down the system immediately, SAM will create a new kernel, and automatically reboot the system. Once the system comes back up, the necessary drivers will be loaded, and the system will be able to use the tape drive.
8. If you had to shut down the system in order to physically connect the tape drive, re-enter SAM and repeat steps 3 through 6 above.
9. Choose the new tape drive.
10. From the *Actions* menu, choose *Create Device Files*.
11. Press OK and then exit from SAM.

Configurations for the IBM AIX environment

Dip switch settings

Before using the Scorpion 40 in an IBM AIX environment, set the operating-system configuration dip switches as shown below:



AIX Version 3.2 and later

AIX Versions 3.2 and later can be configured to work with the Scorpion 40 by using the SMIT “Other SCSI Tape Drive” option.

Note: To use this procedure, you will need to know the SCSI ID being used by the tape drive.

To configure AIX using the SMIT utility, use the following procedure:

1. Enter SMIT at the Tape Drive menu by typing “smit tape”
2. Select “Add a tape drive”
3. Select the type of tape drive you will be adding. Use the “Other SCSI Tape Drive” option.
4. Select the parent SCSI Adapter from the available list
5. The Add a tape Drive entry fields now appear. Some of the standard options need to be changed to maximize drive performance and functionality:
 - Set the “Connection Address” with the tape drive’s Target and LUN (always use 0 for the LUN). In the list, the Target is the first number and the LUN is the second. For example, if the drive is ID 5, choose 5,0
 - Set the Fixed “Blocksize” to 1024
 - Set “Density 1” to 140

- Set the “Maximum delay for the Read/Write command” to 900
6. Press the RETURN key. The drive will be installed in the system database and the appropriate devices created
 7. Exit SMIT

Controlling data compression under AIX

After you run SMIT, device files will have been created for your new tape drive. Typical filenames are listed below:

```
/dev/rmt0      /dev/rmt0.1  /dev/rmt0.2  /dev/rmt0.3  
/dev/rmt0.4   /dev/rmt0.5  /dev/rmt0.6  /dev/rmt0.7
```

If you enter the configuration information specified in step 5 of the configuration process, devices rmt0, rmt0.1, rmt0.2 and rmt0.3 will cause the drive to write in compressed mode. Using devices rmt0.4, rmt0.5, rmt0.6 and rmt0.7 will cause the drive to write with compression disabled.

Technical support

If you experience problems installing or using your tape drive, contact one of the technical support services listed below.

World-wide services:

World-wide web: A wide variety of technical support services are available on Seagate's World Wide Web site, located at <http://www.seagate.com>

Seagate E-mail Technical Support: You can e-mail questions or comments to: tapesupport@seagate.com

Regional services

Seagate provides technical support through several regional centers worldwide. These services may include:

- **Seagate phone technical support:** For one-on-one help, you can talk to a technical support specialist during local business hours. Before calling, note your system configuration and drive model number.
- **Seagate Technical Support FAX:** You can FAX questions or comments to technical support specialists. Responses are sent during local business hours.
- **SeaFAX:** You can use a touch-tone telephone to access Seagate's automated FAX system to receive technical support information by return FAX. This service is available 24 hours daily.
- **SeaBOARD:** SeaBOARD is Seagate's automated computer bulletin board system, available 24 hours daily. Set your modem to 9,600 baud, eight data bits, no parity and one stop bit (8-N-1).

Support services in the Americas

Telephone support

(you will be directed to a product-specific phone or SEAFAX number)

US customers: 1-800-SEAGATE

International customers: 1-405-936-1234

Seagate Technical Support FAX (US and international):
1-405-936-1683

SeaTDD (Telephone support for the deaf; US and international): 1-405-936-1687

SeaBOARD (US and international): 1-405-936-1630

Support services in Europe

For European customer support and SeaFAX, dial the toll-free number for your specific country from the table below. The **Seagate Technical Support FAX** number for all European countries is 31-20-653-3513.

Country	Phone / SeaFAX
Austria	0 800-20 12 90
Belgium	0 800-74 876
Denmark	80 88 12 66
France	0 800-90 90 52
Germany	0 800-182 6831
Ireland	1 800-55 21 22
Italy	800-790695
Netherlands	0 800-732 4283
Norway	800-113 91
Poland	00 800-311 12 38
Spain	900-98 31 24
Sweden	0 207 90 073
Switzerland	0 800-83 8411
Turkey	00 800-31 92 91 40
United Kingdom	0 800-783 5177

If your country is not listed in the table on the previous page, dial our European call center in Amsterdam at 31-20-316-7222 between 8:30 A.M. to 5:00 P.M. (European central time) Monday through Friday or send a FAX to 31-20-653-3513.

Support services for Africa and the Middle East

For presales, technical support, warranty repair and FAX services in Africa and the Middle East, dial our European call center in Amsterdam at 31-20-316-7222 between 8:30 A.M. to 5:00 P.M. (European central time) Monday through Friday, or send a FAX to 31-20-653-3513.

Support services in Asia and the Western Pacific

Various technical support services are available from different regional centers, as shown in the table below. SeaFAX is available in Australia at 61-2-9756-5170.

Technical Support	Phone	FAX
Australia	61-2-9725-3366	61-2-9725-4052
Hong Kong	852-2368 9918	852-2368 7173
Japan	—	81-3-5462-2979
Singapore	65-488-7584	65-488-7528
Taiwan	886-2-2514-2237	886-2-2715-2923

If your country is not listed in the table above, dial our Asia/Pacific headquarters in Singapore at 65-488-7584 during business hours (9:00 A.M. to 5:00 P.M. Singapore time).



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