

# **SWXD3-SB 2.10 GB**

## **3.5-Inch Disk Drive SBB**



**Product Notes**  
EK-SM2DD-PN. C01

Thank you for purchasing our SWXD3-SB StorageWorks Building Block (SBB), designed and manufactured by Digital Equipment Corporation. This 2.10-GB, 3.5-inch disk drive is compatible with SCSI-2 interface standards. The drive is Novell™ certified and is supported with HP 9000 Series 700 & 800 and IBM RS-6000 computers and with WINDOWS NT™.

### **Overview of the SWXD3-SB Drive:**

This 3.5-inch drive has a formatted capacity of 2.10 GB. It features an average seek time of 9.5 ms and an average latency of 5.6 ms, giving an average data-access time of 15.1 ms. The drive uses a banded recording technique to keep the bit density constant regardless of track radius, obtaining media transfer rates as high as 5.5 MB/s. This drive has a 1024-KB segmented cache buffer to maximize the cache hit rate for sequential reads.

The SWXD3-SB drive also offers unsurpassed data integrity, featuring a 264-bit ECC that can correct up to 11 non-contiguous bytes per block. The drive layout ensures proper addressing by providing four separate copies of the header for each sector, along with embedded servo data for fine-tuning the head position. In addition, the drive electronics add end-to-end checksum error detection code (EDC) to the data to ensure the integrity of the data returning to the system bus.

Other special features of note include:

- Self diagnostics.
- Fast SCSI-2 interface (8-bit & 16-bit).
- Tagged command queuing.
- Banded recording.
- Zero-latency read and messages.
- Automatic sector reallocation.
- UL, CSA, and VDE standards.
- 500,000-hour MTBF.

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### **NetWare™ Application Notes:**

**1.** The SWXD3-SB 3.5-inch disk drive has been designed to be compatible with many data-storage applications. The StorageWorks Building Block (SBB) is ready to be used when attached to qualified Industry-standard SCSI Adapters and corresponding driver software.

**2.** The generic model number of the internal 3.5-inch disk drive is RZ28. The drive will identify itself as "DEC RZ28" when interrogated by the SCSI driver software.

**3.** Standard RZ28 units do not automatically supply voltage to the spindle motor when installed in a computer system, but instead must be switched on by the host computer. The SWXD3-SB has a modified turn-on circuit that automatically spins up the drive after a delay period which is a multiple of the applicable SCSI address for that drive, each eight seconds longer than the preceding one. This arrangement is required for operating systems that do not have a facility for motor spin-up; it lets successive drives in an array automatically spin up

following a staggered delay. This sequence avoids excessive loading of the power supply. If your specific operating system is not compatible with this automatic "spin up" feature, please contact your supplier for instructions. (Similarly, please contact your supplier if you wish to reprogram the generic RZ28 drive for automatic spin-up operation.)

**4.** Some SCSI adapters provide options in the adapter set-up menu to allow automatic spin-up of the disk drive motor. Although the SWXD3-SB disk drive does not require it, this feature may be enabled, if other disk drive devices sharing the same SCSI adapter require it. SCSI adapters that have jumper or switch options to simultaneously spin up disk drive motors should not have that function enabled. The staggered spin-up feature within the SWXD3-SB sequences power to the disk drive motors one at a time. This sequencing avoids out-of-specification surges of power supply current, which under extreme conditions could cause the supply to turn off.

# SWXD3-SB Specifications:

| Physical Configuration     |                        |
|----------------------------|------------------------|
| Number of discs (platters) | 8                      |
| Number of read/write heads | 16                     |
| Servo                      | Embedded               |
| Unformatted capacity       | 2,521 MB               |
| Formatted capacity         | 2,105 MB               |
| Number of cylinders        | 3,045                  |
| Tracks per surface         | 3,045                  |
| Track capacity             | 30,720 to 61,440 bytes |
| Bytes/sector               | 512                    |
| Sectors/track              | 59-119                 |
| Sectors/drive              | 4,110,480              |

| Power Requirements       |              |
|--------------------------|--------------|
| Seeking current:         |              |
| +5 Vdc +/-5% (typical)   | 0.72 A       |
| +12 Vdc +/-5% (typical)  | 0.90 A       |
| Power consumption:       |              |
| Active (100% seeking)    | 13.2 W       |
| Active (40% seeking)     | 11.2 W       |
| Idle                     | 9.8 W        |
| Performance              |              |
| Interface transfer rate: |              |
| Synchronous (8-bit)      | 10 MB/s      |
| Asynchronous (8-bit)     | 5 MB/s       |
| Media transfer rate      | 2.7–5.5 MB/s |
| Cache buffer             | 1024 KB      |
| Track-to-track seek:     | 1 ms         |

| Recording        |                        |
|------------------|------------------------|
| Track density    | 3,256 tpi              |
| Bit density      | 64,000 bpi             |
| Areal density    | 206 MB/in <sup>2</sup> |
| Recording method | RLL (1,7)              |

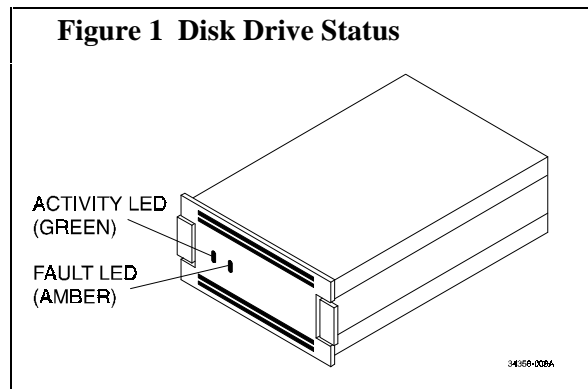
| Physical |                     |
|----------|---------------------|
| Height   | 41.4 mm/1.63 inches |
| Width    | 101 mm/4.0 inches   |
| Length   | 146 mm/5.75 inches  |
| Weight   | 0.82 Kg/1.8 lbs     |

| Environmental  |                                         |
|----------------|-----------------------------------------|
| Non-Operating: |                                         |
| Temperature    | -40 <sup>o</sup> C to 66 <sup>o</sup> C |
| Humidity (RH)  | 8% to 95%, noncondensing                |
| Operating:     |                                         |
| Temperature    | 5 <sup>o</sup> C to 55 <sup>o</sup> C   |
| Humidity (RH)  | 10% to 90%, noncondensing               |
| Shock          | 10 G peak half sine<br>10 ms duration   |
| Vibration      | 22–500 Hz @ 0.5 G peak                  |
| Acoustics:     |                                         |
| Seeking        | 36 dBA @ 1.0 meter                      |
| Idle           | 32 dBA @ 1.0 meters                     |

## Power-On Test

Disk drive status is displayed by LEDs on the front of the storage device (Figure 1). Each LED has three states: *on*, *off*, and *flashing*. When the drive is powered on, verify the following normal operating LED status activity.

- The left LED (green) is a device-controlled activity LED and is on or flashing when the drive is active.
- The right LED (amber) is the drive fault LED and indicates an error condition when either on or flashing.



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## Notes for HP-UX Users

### Model HP 9000 Series 700 */etc/disktab* Information:

This disk has been formatted and is ready for a file system. For the convenience of HP 9000 Series 700 users, we have provided a few suggested disktab entries, as listed below, that you can use with the *newfs* command. We recommend that you enter this information into your */etc/disktab* file at your earliest convenience so that the data will be readily available for future use.

```
DEC_RZ28|DEC_RZ28_noswap:\
      :ty=direct access:ns#84:nt#16:nc#1529:\
      :s0#2054976:b0#8192:f0#1024:\
      :se#512:rm#5400:
DEC_RZ28|DEC_RZ28_100MB:\
      :100 MB reserved for swap & root:ns#84:nt#16:nc#1453:\
      :s0#1952832:b0#8192:f0#1024:\
      :se#512:rm#5400:
DEC_RZ28|DEC_RZ28_200MB:\
      :200 MB reserved for swap & root:ns#84:nt#16:nc#1376:\
      :s0#1849344:b0#8192:f0#1024:\
      :se#512:rm#5400:
DEC_RZ28|DEC_RZ28_300MB:\
      :300 MB reserved for swap & root:ns#84:nt#16:nc#1300:\
      :s0#1747200:b0#8192:f0#1024:\
      :se#512:rm#5400:
```

### Model HP 9000 Series 800 */etc/disktab* and LVM Information:

We recommend that HP 9000 Series 800 users use the *disksecn* command to create a disktab entry. This must be done before creating partitions or logical volumes. To do this, issue the following HP-UX command (you must be a superuser):

```
disksecn -dn RZ28 >> /etc/disktab
```

and supply the following values as answers for the questions asked by the program during the process:

|                            |                   |
|----------------------------|-------------------|
| Disk type:                 | <b>Winchester</b> |
| Sector size:               | <b>1024</b>       |
| Number of sectors/track:   | <b>84</b>         |
| Number of tracks/cylinder: | <b>16</b>         |
| Number of cylinders:       | <b>1529</b>       |
| Revolutions per minute:    | <b>5400</b>       |

If you wish to use partitions, only segment 2 can work with this drive under the HP-UX operating system. We therefore suggest that you use the Logical Volume Manager (LVM) to allocate disk space in accordance with the sizes of your filesystems or raw data instead of a single partition. You can do this from the command line or by using the System Administration Manager (SAM) utility. For more information on LVM, refer to *How HP-UX Works: Concepts for the System Administrator* (B2355-90029), Chapter 9. After creating logical volumes and filesystems, you will have more control over the disk than you would have with traditional partitions.

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## Notes for IBM AIX RS-6000 Users

After you have appropriately connected the drive to the SCSI bus, you can install the SWXD3-SB drive from the root account either by using **SMIT**, as follows:

```
Enter:      # smit dev
```

and then perform the following two steps:

1. Choose “Configure Devices Added After IPL” from the menu and then exit.
2. Execute either of the following selections, as applicable:
  - a. If you want to add the disk to a new volume group, enter `# smit vg`, choose “Add a Volume Group” from the menu, and follow normal procedures.
  - b. If you want to add the disk to an already existing volume group, enter `# smit lv`, choose “Add a Logical Volume” from the menu, and follow normal procedures.

As an alternative to using **SMIT**, you can use the following commands while logged into the root account:

1. `# cfmgr`
2. `# lsdev -Cc disk`

*Example:*

```
# lsdev -Cc disk
hdisk1 Available 00-03-00-20 Other SCSI Disk Drive
```

3. Depending on whether :
  - a. A new volume group is to be added:
    - i. `# mkvg -f -y<newvg> -s<size> <new-disk>`
    - ii. `# varyonvg <newvg>`

or

- b. The drive is added to an existing volume group.  
`#extendvg -f <oldvg> <new-disk>`

where the angle-bracketed options are:

<newvg> is the volume group name to be added.

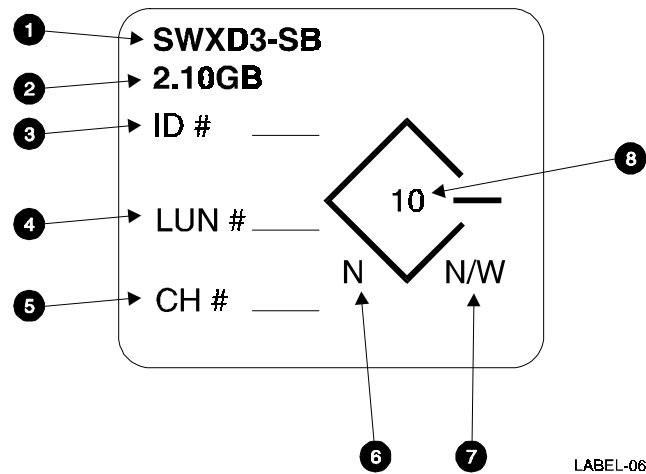
<oldvg> is an existing volume group.

<size> is the physical partition size (normally 4).

<new-disk> is the disk added, as identified by the `lsdev` command.

## StorageWorks Building Block Identification Labels

Each StorageWorks Building Block (SBB) contains an identification label that shows the SBB device, the shelf bus type (8- or 16-bit), and user specific information. The label that appears on the side of the SWXD3-SC is shown below.



- ⊇ The type of device.
- ∅ The total amount of data that the device can store.
- ⊂ The SCSI Logical Unit Number assigned to the device<sup>1</sup>.
- ⊆ The SCSI ID assigned to the the device<sup>1</sup>.
- ∈ The RAID Controller Number assigned to the device<sup>1</sup>.
- ∉ The device bus width. For the SWXD3-WC this value is W.
- ∠ Indicates the type of shelf in which the drive can function:
  - N – the device is 8-bit shelf compatible.
  - W – The device is 16-bit shelf compatible.
  - N/W – The device is compatible with either shelf.
- ∇ The data transfer rate in MB per second.

<sup>1</sup> These values are assigned by the user. The others are assigned when the device is assembled.

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Digital Equipment Corporation does not warrant that the predicted values represent any particular unit installed for customer use. The actual values will vary from unit to unit. These specifications are subject to change without notice. Digital is not responsible for inadvertent errors.

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