

SWXD3-WE

4.29 GB

3.5-Inch 16-bit

DiskDrive SBB



Product Notes

EK-SM2DK-PN. A01

Thank you for purchasing our SWXD3-WE StorageWorks Building Block (SBB), designed and manufactured by Digital Equipment Corporation. This 4.29-GB, 3.5-inch low-profile disk drive is compatible with SCSI-2 single-ended 16-bit interface standards. This drive has been Novell and Microsoft Windows certified and is supported on all Intel compatible Windows, Windows NT and Novell Systems. It is also supported for use with IBM RS/6000, Sun SPARC systems, and HP9000 700/800 Series platforms.

Overview of SWXD3-WE Drive:

This 3.5-inch drive has a formatted capacity of 4.29 GB. It features an average read seek time of 8 ms and an average latency of 4.2 ms, providing an average data-read access time of 12.2 ms (without cache). Average write seek time is 9 ms, yielding an average data-write access time of 13.2 ms. The drive uses a banded recording technique to maximize storage capacity and obtain media transfer rates as high as 9 MB/s. A 1.0 MB segmented cache buffer maximizes the cache hit rate for sequential reads.

The SWXD3-WE drive also offers high data integrity, ensured by a 96-bit Reed-Solomon error correction code (ECC). ECC is performed "on the fly," when data is written to or read from the disk drive; this scheme will detect and correct a single 41-bit burst or two 17-bit bursts of defective data in a single block on the disk.

Other special features of note include:

- Fast Wide SCSI-2 Single-ended interface
- Asynchronous & synchronous data-transfer protocol
- Downloadable SCSI firmware
- Programmable sector size reallocation
- Tagged command queuing
- Background queue processing
- Staggered disk spin-up
- Self diagnostics
- Labeled for Sun systems
- 5-year warranty
- UL, CSA, and VDE standards

This drive is supported for use in wide (16-bit) storage enclosures. It can co-exist with narrow (8-bit) devices in a wide enclosure.

SWXD3-WE Application Notes:

- 1.** The SWXD3-WE 3.5-inch disk drive has been designed to be compatible with many data-storage applications. This 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 RZ29BW. The drive identifies itself as DEC RZ29B when interrogated by the SCSI driver software.
- 3.** The SWXD3-WE has a turn-on circuit that automatically spins up the drive after a delay period. The delay period is 10 seconds times the SCSI address of the drive, e.g., drive in SCSI ID2 delays 20 seconds before spin-up; drive in SCSI ID6 delays 60 seconds before spin-up, etc. 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.

- 4.** Some SCSI adapters provide options in the adapter set-up menu to allow automatic spin-up of the disk drive motor. Although not required by the drive, the automatic spin-up feature can 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-WE sequences power to the disk drive motors one at a time. This sequencing avoids out-of-specification surges of power supply current that, under extreme conditions, could cause the supply to turn off.

SWXD3-WE Specifications:

Logical Configuration	
# of discs ¹	10
# of read/write heads ²	20
Servo	Dedicated
Formatted capacity	4,290 MB
Number of cylinders	3,708
Tracks per surface	3,708
Track capacity (bytes)	57,856
Bytes/sector	512
Sectors/drive	8,380,080

Recording	
Track density	4,048 tpi
Bit density	73,820 bpi
Areal density ³	298 MB/in ²
Recording method	RLL (1,7)

Environmental	
Non-Operating:	
Temperature	-40 ^o C to 70 ^o C
Humidity (RH)	5% to 95%, noncondensing
Operating:	
Temperature	5 ^o C to 50 ^o C
Humidity (RH)	5% to 95%, noncondensing
Shock	2 G half-sine 11 ms peak duration
Vibration	5–400 Hz @ 0.5 G peak

¹ The drive contains 11 physical platters.

² The drive contains 21 physical heads.

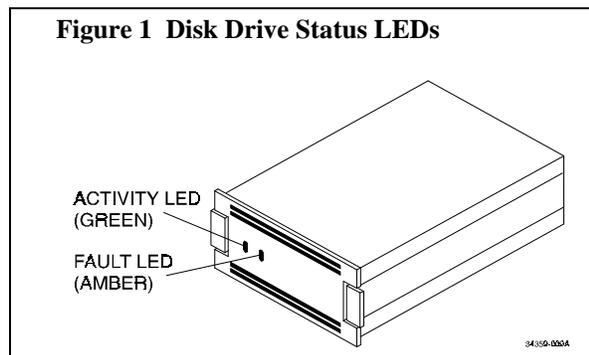
³ Areal density varies according to disk band.

Performance	
Interface transfer rate:	
Synchronous (8-bit)	10 MB/s
Synchronous (16-bit)	20 MB/s
Asynchronous (8-bit)	5 MB/s
Asynchronous (16-bit)	10 MB/s
Media transfer rate (≤ 1 sector)	5.3-8.94 MB/s
Cache buffer	1.0 MB
Track-to-track read seek (typical):	0.6 ms
Rotational Speed	7200 rpm

SBB Physical Data	
Height	51 mm/2.0 inches
Width	121 mm/4.8 inches
Length	216 mm/8.5 inches
Weight	1.32 kg/2.9 lbs

Power Requirements	
Seeking current (maximum):	
+5 Vdc +/-5%	0.90 A max.
+12 Vdc +/-5%	1.20 A max.
Power consumption:	
Typical operations:	15.0 W
Idle	12.0 W

Figure 1 Disk Drive Status LEDs



Drive Status LEDs

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 the device-controlled activity LED and is on or flashing when the drive is active
- The right LED (amber) is the drive-associated fault LED and indicates an error condition when either on or flashing. This LED is controlled by some adapters or RAID controllers.

Notes for SunOS and Solaris Users

/etc/format.dat information: For your convenience, we have labeled this drive with a format utility that provides the following settings, giving the drive traditional partitions, so you can install this unit and get it up and running quickly. Note that we designated a fixed *nsect* value, even though this banded drive allows a different number of sectors/track, depending on the radius of a given track. We determined this value by dividing the total number of blocks by the total number of heads, dividing that result by the total number of cylinders, and then rounding down the result to the next whole number. Some partition sizes also were selected to be consistent with the *newfs* command. (For example, we reduced the “g” partition to avoid truncation of the last cylinder group.) We recommend that you enter this information into your */etc/format.dat* file so that the data will be readily available for any possible future use:

```
Common disk type information for both SunOS and Solaris systems:

disk_type = "DEC_RZ29B      (C) DEC" \
: ctrl = SCSI : fmt_time = 9 \
: trks_zone = 21 : atrks = 0 : asect = 9 \
: ncy1 = 3705 : acyl = 2 : pcy1 = 3708 : nhead = 20 \
: nsect = 113 \
: rpm = 7200 : bpt = 66444

For SunOS systems, the partition data is as follows:

partition = "DEC_RZ29B      (C) DEC" \
: disk = "DEC RZ29B      (C) DEC" : ctrl = SCSI \
: a = 0, 65540 : b = 29, 196620 : c = 0, 4185520 \
: g = 116, 3923360 : h = 1852, 4185520

For Solaris systems, the partition data is as follows:

partition = "DEC_RZ29B      (C) DEC" \
: disk = "DEC RZ29B      (C) DEC" : ctrl = SCSI \
: 0 = 0, 65540 : 1 = 29, 196620 : 2 = 0, 4185520 \
: 6 = 116, 3923360 : 7 = 1852, 4185520
```

Note: Under SunOS Solaris v1, the largest file system that can be created is 2 GB.

Notes for HP-UX Users

HP-UX Operating System Information

The following required disktab information is provided for users of HP-UX V9 and earlier. Starting with HP-UX V10.0, disktab information is provided for reference only and its use is discouraged by HP. The *newfs* command uses geometry information stored on the disk and therefore no longer requires a disktab entry.

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_RZ29B|DEC_RZ29B_noswap:\
:ty=direct access:ns#113:nt#20:nc#1854:\
:s0#4190040:b0#8192:f0#1024:\
:se#512:rm#7200:
DEC_RZ29B_200MB:\
:200 MB reserved for swap & boot:ns#113:nt#20:nc#1763:\
:s0#3984380:b0#8192:f0#1024:\
:se#512:rm#7200:
DEC_RZ29B_400MB:\
:400 MB reserved for swap & root:ns#113:nt#20:nc#1672:\
:s0#3778720:b0#8192:f0#1024:\
:se#512:rm#7200:
```

Note: If you use SAM to add this device (*newfs*) to your system, you must also put the following entry in */usr/sam/lib/C/pd_devinfo.tx*:

```
DISK:::scsi:::DEC RZ29B.*;.*:.....:SCSI DEC RZ29B Disk Drive:.....:DEC_RZ29B
```

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, as superuser, issue the following HP-UX command:

```
disksecn -dn RZ29B >> /etc/disktab
```

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

- Disk type: **Winchester**
- Sector size: **1024**
- Number of sectors/track: **113**
- Number of tracks/cylinder: **20**
- Number of cylinders: **1854**
- Revolutions per minute: **7200**

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.

Note: Although a logical volume or partition can be created with a size of 4 GB, due to HP-UX operating system limitations, the largest file that can be created is limited to 2 GB.

Notes for IBM AIX RS/6000 Users

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

Enter **# smit dev**

and then perform the following to 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.

Note: When the drive is not used as part of a volume group, only the first 2 gigabytes of the SWXD3-WE can be accessed due to AIX operating system 3.2.5 limitations.

Notes for MS-DOS, Windows, Windows NT, and Netware Users

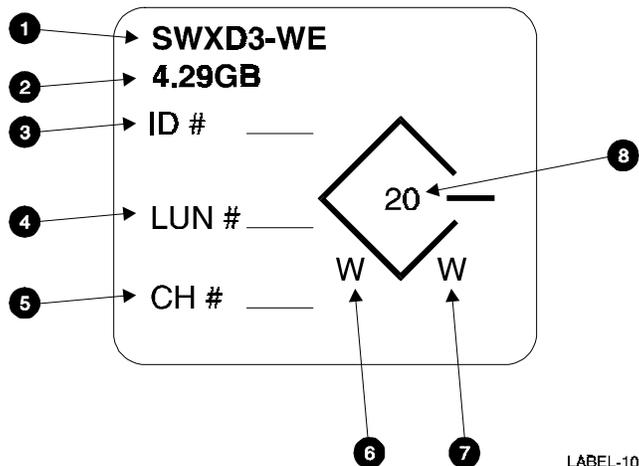
MS-DOS has some internal limitations as to how large a disk it can work with. Because of this, the disk controller provides a physical to logical mapping of the disks head/sector geometry. Most controllers allow the mapping to be set for disks less than 1 gigabyte or greater than 1 gigabyte. For this drive, the mapping should be for a disk greater than 1 gigabyte.

Additionally, MS-DOS limits a primary partition or logical drive to 2.047 gigabytes or less. WindowsNT doesn't have this limitation. If compatibility with MS-DOS is a consideration, then partitions should be kept to 2.047 gigabytes or less and formatted for the FAT file system. If MS-DOS compatibility is not important, then partitions can be any size and should be formatted for the NT File System.

There are no known special limitations applicable to installing this unit into a Novell system.

StorageWorks Building Block Identification Labels

Each SBB contains an identification label that shows the SBB device type, capacity, and user-specific information. The 16-bit label that appears on the front of the SWXD3-WE is shown below.



1. Device type.
2. Device capacity.
3. The SCSI ID assigned to the device¹.
4. The SCSI Logical Unit Number assigned to the device¹.
5. The RAID Controller Number assigned to the device¹.
6. The device bus width. For the SWXD3-WE, this value is W.
7. 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 compatible.
 - N/W – The device is compatible with either shelf.
8. The data transfer rate in MB per second.

¹ These values are determined by the user.

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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