



Wide Differential to Single-Ended Signal Converter

User's Guide

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Revision Record

This Revision Record provides a concise publication history of this guide. It lists the manual revision levels, release dates, and reasons for the revisions. It also describes how the changes to affected pages are marked in the guide.

The following revision history lists all revisions of this publication and their effective dates. The publication part number is included in the *Revision Level* column, with the last entry denoting the latest revision.

Revision Level	Date	Summary of Changes
EK-SMDZB-UG. A01	February, 1995	Initial Release

About This Guide

This section identifies the users of this guide and describes the contents and structure. In addition, it includes a list of conventions used in this guide.

StorageWorks SWXA2-BA SCSI Bus Signal Converters User Guide

This guide provides a product overview and installation information for the SWXA2-BA SCSI Bus Signal Converter.

Intended Audience

This guide is intended for any user who is responsible for installing the SWXA2-BA SCSI Bus Signal Converter.

Document Structure

This guide contains the following chapters:

Chapter 1: Introduction

Introduction provides a product overview of the StorageWorks SWXA2-BA SCSI bus signal converter. It also describes their features and operating functions.

Chapter 2: Installation

Installation describes how to connect the SWXA2-BA signal converter to the host system. The chapter covers the different connections, SCSI cables, and SCSI bus termination.

Conventions

This guide uses the following conventions:

Documentation Conventions

Style	Meaning
boldface type	For emphasis
<i>italic type</i>	<i>For emphasis and manual titles</i>

Introduction

This chapter provides a product overview of the StorageWorks SWXA2-BA SCSI bus signal converter and outlines its features.

1.1 Product Overview

The StorageWorks SWXA2-BA (Differential Wide SCSI-to-SCSI Adapter) is a SCSI bus signal converter which provides a small computer system interface between controllers, hosts, or their SCSI adapters.

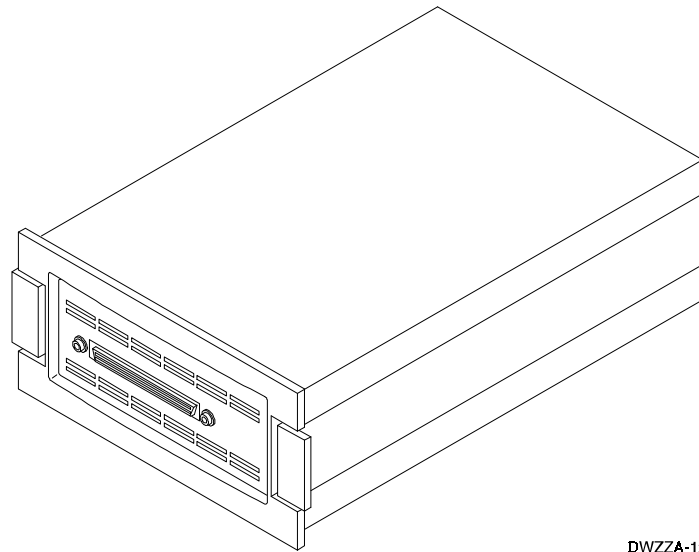
The SWXA2-BA allows you to connect the single-ended SCSI-2 bus of the StorageWorks Wide Storage Expansion Pedestal to a 16-bit, differential SCSI adapter found on many hosts. The Wide Storage Expansion Pedestal is a 16-bit single-ended storage subsystem that can contain up to seven storage devices. The SWXA2-BA establishes compatibility between the host SCSI bus (differential) and the storage subsystem SBB bus (single-ended). In establishing this compatibility, the SWXA2-BA extends the length of the bus.

The SWXA2-BA (Figures 1–1 and 1–2) is installed in slot 0 of the Wide Storage Expansion Pedestal. The SWXA2-BA is equipped with a 68-pin, high density, female cable connector on the front panel.

As presented in this chapter, the SCSI buses are one of the following types:

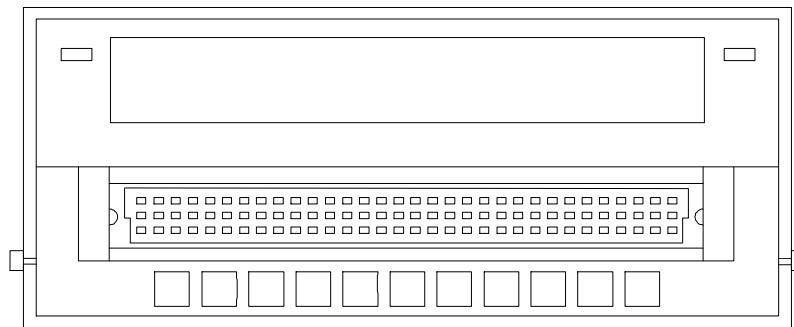
- A single-ended **physical bus**
- A differential **physical bus**
- A differential physical bus connected to a single-ended physical bus by the SWXA2-BA signal converter. This connection forms a **logical bus**.

Figure 1–1 StorageWorks SWXA2-BA SCSI Bus Signal Converter SBB



DWZZA-12

Figure 1–2 SWXA2-BA Converter SBB Rear Panel



DWZZA-13

1.2 SWXA2-BA Features and Functions

The following is a list of features and functions of the SWXA2-BA SCSI bus signal converter:

- The SWXA2-BA establishes a physical connection between the 16-bit differential bus (from host) and the 16-bit single-ended SCSI device (Wide Storage Expansion Pedestal) The SWXA2-BA converts the two physical buses into a single logical bus.
- The logical bus has a total of sixteen device addresses (0 – 15)
- The converter does not use a SCSI device address
- Data transfer rates of up to 20 Mbytes are supported
- SWXA2-BA operation is transparent to both buses

This chapter describes how to install and connect the SWXA2-BA to the SCSI host.

2.1 Unpacking

Before unpacking, check all packing slips to ensure the correct equipment has been shipped. Also, inspect the shipping containers for damage (crushed corners, punctures, and so forth). All boxes and packing material should be retained at the installation site for reshipment, if necessary.

2.2 SCSI Bus Considerations

NOTE

Unless otherwise stated, SWXA2-BA signal converters are installed in the end-bus position. When the SWXA2-BA is installed in the end-bus position, no additional termination modifications are required to either the differential or the single-ended SCSI bus. This is because the SWXA2-BA provides the necessary termination for both the differential and the single-ended bus where they connect at the SWXA2-BA.

The SCSI bus signal converter connects the differential SCSI bus with the single-ended SCSI bus. In doing so, the converter extends the maximum overall length of the SCSI bus. The overall maximum distance is measured from the terminator on the SCSI host to the terminator on the SBB shelf. This length includes the following:

- The distance from the host terminator to the host SCSI cable connector
- The length of all cables
- The distance from the SBB shelf input connector or the SWXA2-BA connector to the shelf terminator

Table 2–1 lists the maximum bus lengths using the end-bus configuration for all SWXA2-BAs.

Table 2–1 StorageWorks SCSI Buses

SCSI Bus		SCSI Bus Length			Cable
Type	MB/s	SBB Shelf†	Cable-Host‡	Maximum§	Order No.
No SCSI Bus Signal Converters					
Fast SE	20	0.9 m (3.0 ft.)	2.1 m (6.9 ft)	3 m (9.9 ft.)	BN21K
Slow SE	10	0.9 m (3.0 ft.)	5.1 m (17 ft.)	6 m (20 ft.)	BN21K
Differential SCSI Host One SCSI Bus Signal Converter					
Fast DF	20	3 m (9.8 ft.)	23 m (75 ft.)	26 m (84.8 ft.)	BN21K, BN21L
Slow DF	10	6 m (19.7 ft.)	23 m (75 ft.)	29 m (94.7 ft.)	BN21K, BN21L

Legend:

† – First shelf input connector to last shelf terminator.

‡ – Host terminator to SBB shelf SWXA2-BA input connector.

§ – Host terminator to SBB shelf terminator.

SE – SCSI-A SCSI cable, 50-conductor.**DF** – SCSI-P SCSI cable, 68-conductor.

In the end-bus configuration, all the cables are terminated in the converter as well as at the host and the SBB shelf. Note that this connection effectively starts a new bus at each connection.

For example, when using a slow single-ended bus and no converters, the maximum length of the single-ended SCSI bus from the host terminator to the SBB shelf terminator is 6 meters (19.7 ft.). By using a differential bus, the maximum distance from the host terminator to the SBB shelf terminator through the converter would theoretically be 37 meters (121.4 ft.). However, the actual maximum length when using approved cables is as shown in Table 2–1.

- The maximum bus length from the host terminator to the SBB shelf converter 68-pin connector is 23 meters (75.5 feet).
- The maximum bus length from the SBB shelf converter backplane connector to the shelf terminator can be either 3 meters (9.8 ft.) or 6 meters (19.7 ft.) depending upon the speed of the bus.

NOTE

Maximum SCSI bus length is not the same as maximum cable length. The longest StorageWorks BN21K or BN21L SCSI-P cable is 23 meters. Do not use a longer SCSI-P cable. For IBM platform applications, use either the BN31R cable or the H8589 cable interposer (adapter/converter) in combination with the BN21K cable.

2.3 Installing SCSI Bus Signal Converters

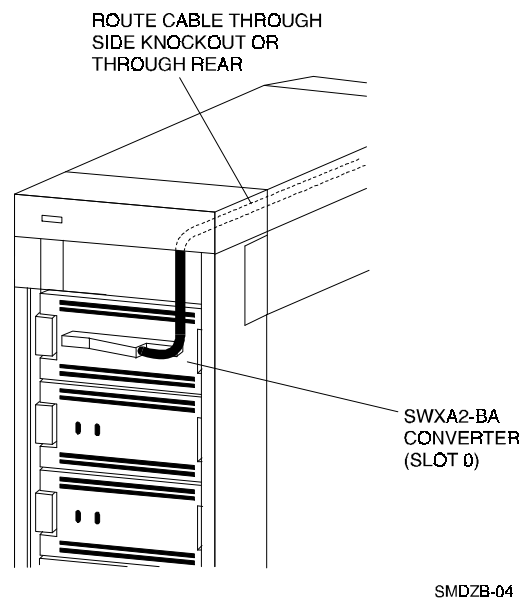
The pedestal does not need to be shut down to install the SWXA2-BA.

NOTE

During installation, no activity should take place on the SCSI bus(es) being attached to the SWXA2-BA. Otherwise, possible data corruption may occur.

To install the SWXA2-BA, first remove the front housing of the pedestal to provide better installation access. Then, install the SWXA2-BA into slot 0 of the pedestal (see Figure 2-1). Slot 0 is the topmost SBB slot.

Figure 2–1 SWXA2-BA Installation



2.4 SCSI Cables

The *StorageWorks Solutions Configuration Guide* describes SCSI cables in detail. The particular cable used with a SCSI bus signal converter depends upon the following:

- The bus type: A SWXA2-BA has a 68-pin, high density, differential connector at the front panel
- The maximum allowable bus length
- The cable connector clearance. In some cases you *must* use a right-angle connector because there is not enough clearance to use a straight connector.

SWXA2-BA compatible cable types are listed in Table 2–2.

Table 2–2 SCSI Cable Types

Bus Connector	Cable Type	Connectors
Single-Ended	BN21K-01	The single-ended connector is a 96-pin connector that mates with the SBB shelf connector. The BN21K-01 connector is used to connect a second expansion pedestal.
Differential IBM	BN21K-23 BN31R-20	One, 68-pin, high-density, straight connector and one 68-pin, high-density, right-angle connector.
Differential	BN21L-23	Two 68-pin, high-density, right-angle connectors.

2.5 Terminating SCSI Buses

All SCSI buses are terminated at the physical ends of the bus or cable. This is true even when using a SCSI bus signal converter. The SWXA2-BA SCSI bus signal converter supplies terminator power (TERMPOWER) and termination to both the differential and the single-ended bus. TERMPOWER is electrical current that is limited by self-resetting fuses.

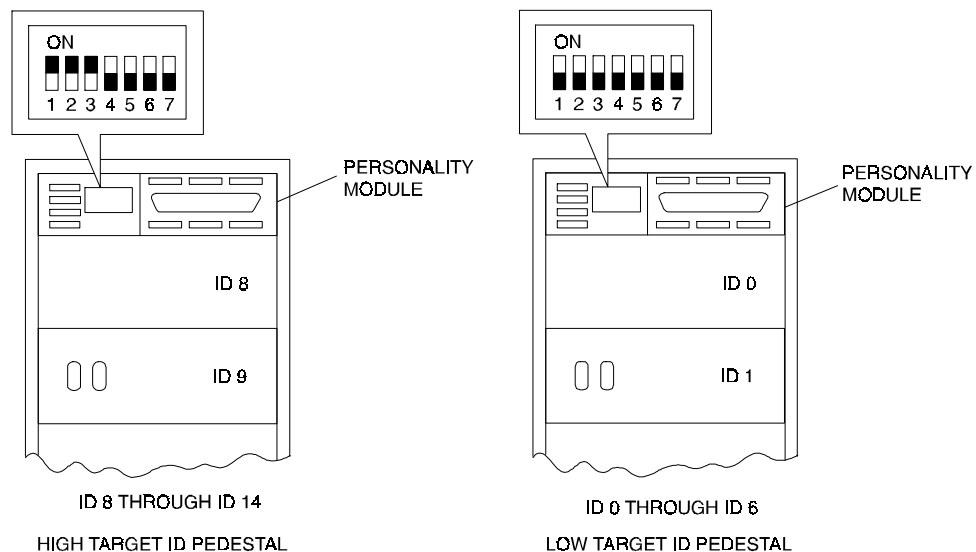
2.6 Adding Second Expansion Storage Pedestal

A second Expansion Storage Pedestal can be connected to the first pedestal.

NOTE

The configuration switch pack on the Personality Module is normally preconfigured with all seven switches in the off position. When all switches are in the off position, the pedestal is configured for low target IDs (ID 0 through ID 6). See Figure 2-2.

Figure 2–2 Personality Module Switch Pack Settings



SMDZB-03

To add a second Expansion Storage Pedestal, you must reconfigure the Personality Module switch pack for one of the Expansion Storage Pedestals (see Figure 2-2). Doing so configures the pedestal for high target IDs (ID 8 through ID 14).

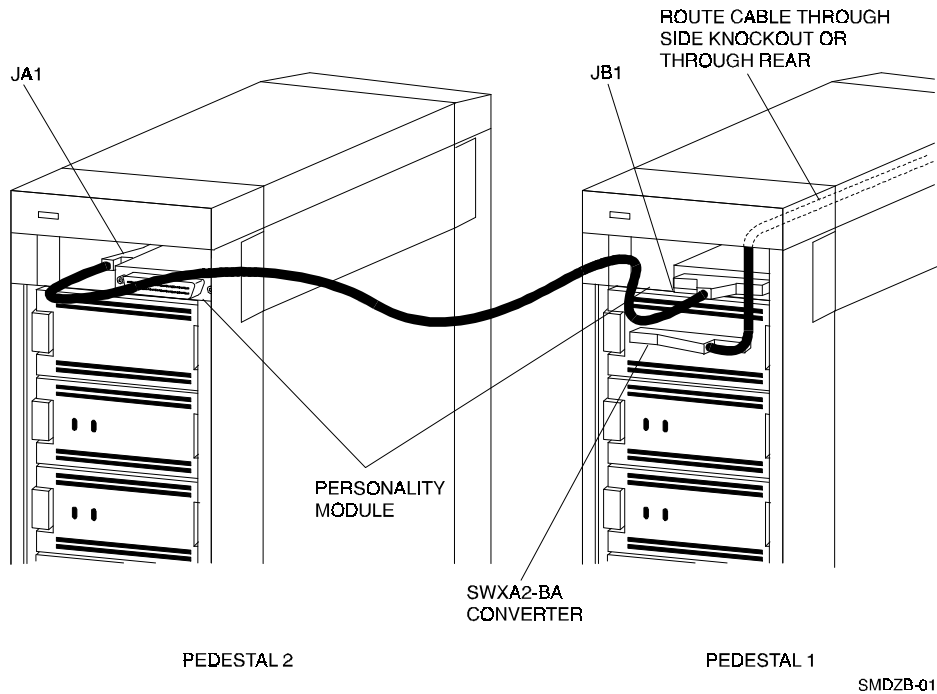
After you have configured the switch pack(s), connect the Personality Module of Pedestal Number 1 to the Personality Module of Pedestal Number 2 using cable BN21K-01(see Figure 2-3).

NOTE

It does not matter which pedestal has the high target IDs and which has the low target IDs.

To make the connections (see Figure 2-3), attach the straight 68HD connector to JB1 of the Personality Module in Pedestal Number 1. Route the cable from JB1 through the side opening in the front of the enclosure. Attach the 68HD right angle connector to JA1 of the Personality Module in Pedestal Number 2. The connections automatically configure the termination characteristics for the storage units.

Figure 2-3 Adding Second Expansion Storage Pedestal



The SWXA2-BA converter and associated cable can be installed in either Pedestal Number 1 or Pedestal Number 2; however, it must be installed in the topmost SBB slot of the pedestal, immediately below the Personality Module (see Figure 2-2).

If your system software requires the presence of a boot device at target ID 0, you must configure the pedestal that contains the converter for high target IDs.

Reader's Comments

Manual Order Number:

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Manual Rating	Excellent	Good	Fair	Poor
Accuracy (correct presentation of facts)	[]	[]	[]	[]
Completeness (adequate information)	[]	[]	[]	[]
Clarity (easy to understand)	[]	[]	[]	[]
Organization (logical sequence of information)	[]	[]	[]	[]
Layout (easy to follow subject matter)	[]	[]	[]	[]
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