StorageWorks™

16-Bit SCSI Bus Hub (DWZZH)

User's Guide

EK–DWZZH–UG. A01

Digital Equipment Corporation
Maynard, Massachusetts

October 1997

While DIGITAL believes the information included in this publication is correct as of the date of publication, it is subject to change without notice.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

This equipment requires the use of shielded SCSI cables such as the Digital Equipment Corporation BN37A-series.

Contents

About This Guide

This guide describes the DWZZH family of 16-Bit SCSI Bus Hubs and provides procedures for installation and configuring.

The *StorageWorks DWZZH SCSI Bus Hubs User's Guide* describes the purpose, function, operation, and use of the 16-bit SCSI bus HUBs. These SCSI bus Hubs allow for the connection of up to 3 ports on one logical SCSI bus.

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Intended Audience

This publication is for use by customers and DIGITAL employees responsible for configuring, installing, and maintaining the StorageWorks subsystem and its components.

Documentation Conventions

The following conventions are used in this manual:

boldface type	Boldface type indicates the first instance of terms being defined in text, in the glossary, or both.
italic type	Italic type indicates emphasis and complete manual titles. In the glossary, italic type also is used to indicate cross–references.

Structure

This manual is organized as follows:

Chapter 1	**Introducing the 16-Bit SCSI Hub** Provides a product overview of the StorageWorks SCSI bus HUBs.
Chapter 2	**Installing the 16-Bit SCSI Hub** Describes the procedures for configuring a StorageWorks SCSI bus using a SCSI bus Hub.
Glossary	UltraSCSI and Hub terms with definitions

Related Documents

The following is a list of the StorageWorks- documents relative to this product:

Document Title	Order Number
StorageWorks Solutions Configuration Guide	EK–BA350–CG
StorageWorks Solutions Shelf and SBB User's Guide	EK–BA350–UG
StorageWorks SBB Shelf I/O Modules	EK–SBBIO–UG
StorageWorks UltraSCSI Configuration Guidelines	EK–ULTRA–CG
StorageWorks Solutions BA356–SB 16-Bit Shelf User's Guide	EK–BA356–UG

Revision Record

This Revision Record provides a concise publication history of this manual. It lists the manual revision level, release date, and summary of changes.

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–DWZZH–UG. A01	October 1997	Original release.

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Introducing the 16-bit SCSI Bus Hub

This chapter provides a product description for the DWZZH SBB Hubs and SCSI Bus components. Priduct specifications are also included.

Introducing the 16-bit SCSI Bus Hubs

The DWZZH-series SCSI bus Hubs are SCSI–2 and draft SCSI–3 (ANSI 379.2/91-10R3) compliant SCSI 16-bit converters capable of data transfer rates of up to 40 mega bytes per second (40 MB/s).

SCSI Bus HUB Functions

- Connect a differential physical bus to a single-ended physical bus.
- Extend the maximum length of a SCSI bus.
- Provide radial disconnect where remaining connections can continue to operate.

Product Descriptions

There are two variations of DWZZH SCSI bus Hubs.

DWZZH 3.5” SBB Hubs

The DWZZH Hub comes in two versions.

1. DWZZH-21 contains two Single Ended SCSI bus connections and one Differential SCSI connection.
2. DWZZH-03 contains three Differential SCSI bus connections.

CAUTION

Connecting a differential bus cable to the single-ended connector, or a an single-ended bus cable to the differential connector will cause the SCSI bus to fail.

Figure 1–1 DWZZH-21 or DWZZH-03 SCSI Bus Hub

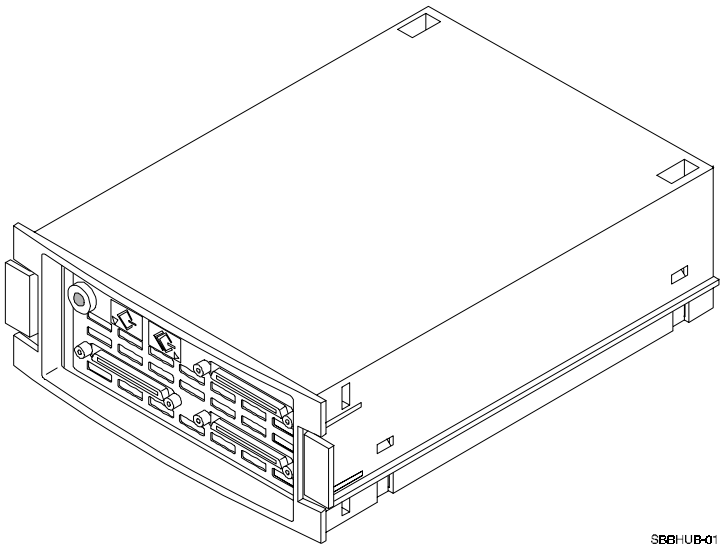


Figure 1–2 DWZZH-21 SCSI Bus Hub Front Panel

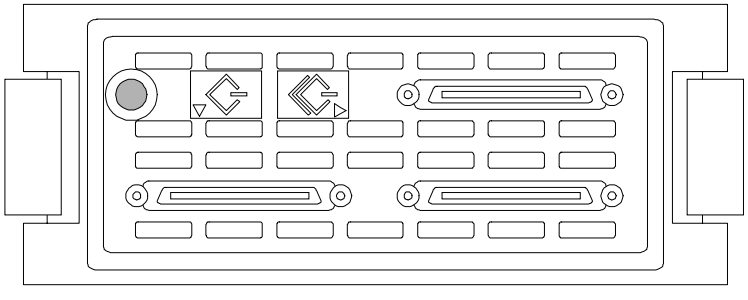
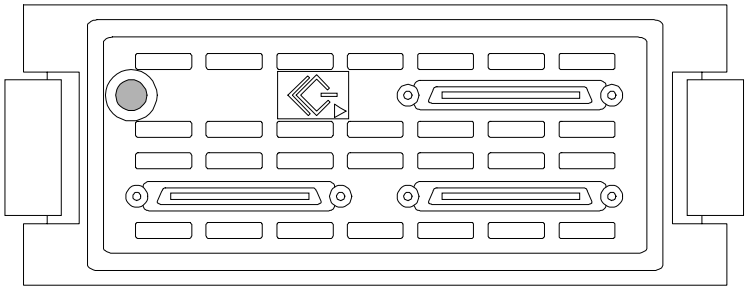


Figure 1–3 DWZZH-03 SCSI Bus Hub Front Panel



The single ended symbol with the down pointing diamond indicates that the lower two connectors are single ended SCSI connections. The differential symbol with the right pointing diamond indicate the top connector is a differential SCSI connection.

The differential symbol indicates that all connectors are differential SCSI connections.

SCSI Bus Components

To install a DWZZH SCSI bus converter you need SCSI BN37 series cables. Please refer to the *StorageWorksUltraSCSI Configuration Guidelines* for a complete list of the available cables.

Product Specifications

Table 1–1 lists the functional specifications for the DWZZH SCSI Bus Hubs.

Table 1–1 SCSI Bus HUB Functional Specifications

Features	Description
SCSI ID SCSI Addresses	The SCSI HUB does not use a SCSI ID
Overload Protection DTERMPOWER STERMPOWER	TERMPOWER is not supplied to the external ports of the SCSI HUB. Internal TERMPOWER is protected via a resetable fuse. TERMPOWER must be supplied from the remote connection to enable each HUB port.
Shielding Enclosure &Connectors	Shielded for ESD, EMI, and safety requirements
Power-Up Reset	Automatically clears: • Initiator detection circuit • Target detection circuit • BSY glitch filter
SCSI Bus Reset	Automatically clears: • Initiator detection circuit • Target detection circuit • BSY glitch filter
Single-Ended SCSI Bus Length Ultra (20 megatransfers per second or 40 MB/s)	20 Meters (66 feet) per segment
Differential SCSI Bus Length	25 meters (82 feet) per segment
Data Timing	The relationship between the data and the control signals is brought to SCSI compatibility before transmission to the other SCSI bus.
Design	High reliability SMT
Cable Fault	DIFFSENSE support and port disable on cable fault
Glitch Elimination	100% glitch free operation during power-up BUSY GLITCH trap eliminates cable length constraint due to wired-OR glitches on the BSY line
Termination	
Singled-ended	Active termination for 16bit operation.
Differential	Termination for 16bit operation.
Service There are no user servicable functions on these products. Contact DIGITAL service personnel for all service.	
Agency Approvals UL, CSA, FCC Class B, TUV	

Table 1–1 SCSI Bus Converter Functional Specifications (Continued)

Environmental Specifications	
Relative Humidity	10% to 85% non-condensing
Operating Temperature	10°C to 40°C (50°F to 104°F)
Storage Temperature (non-operating)	–40°C to 66°C (–40°F to 151°F)
Power Requirements	
DWZZH	+5V
Input Current Electronics Terminators	 0.5 Amps 0 to 2.5 Amps (in addition to electronics)
TERMPOWER	Supplied to internal terminators only.
SCSI Connectors and Cables	
Single-Ended	Board mounted 68pin VHDCI SCSI connector
Differential	Board mounted 68pin VHDCI SCSI connector
Cables	BN37A-series shielded SCSI cables

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Installing a 16-bit SCSI Bus Hub

This chapter explains how to install a 16-Bit SCSI Bus Hub and also lists important references.

Configuration guidelines are documented in *UltraSCSI Configuration Guidelines* (EK-ULTRA-CG). These guidelines include a list of all UltraSCSI components and example configurations include a SCSI Hub.Reference the *UltraSCSI Configuration Guidelines* for bus length and SCSI bus data transmission rates.

Installing a SCSI Bus Hub

The UltraSCSI Hubs are designed to be installed in StorageWorks BA350 and BA356 shelves. The Hub may be installed in any open SBB slot. The Hub does not consume a SCSI ID and uses the shelf only to provide its power and mechanical support.

Determining the Configuration

The SCSI Hub is used in end-bus SCSI bus configurations only. The three SCSI bus segments require TERMPOWER supplied from the remote connection to enable the SCSI Hub port for that segment. Each port on the SCSI Hub has its own terminators.

All SCSI buses are terminated at the physical ends of the bus. This is true even when using a DWZZH SCSI Hub. Both DWZZH SCSI Hubs are factory set to terminate the SCSI bus. No user configuration of the SCSI terminators is required.

Selecting the SCSI Cables

The *UltraSCSI Configuration Guidelines* describe SCSI cables in detail. When selecting a cable you must consider the cable connector clearance. Be sure to determine the type connector compatible with the controller connector. In some cases you must use a right-angle connector because there is not enough clearance to use a straight connector. Cables connected to DWZZH Hubs are from the BN37A series.

Glossary

The Glossary lists many UltraSCSI and Hub terms and definitions.

adapter
See SCSI bus converter.

building block shelf
See **SBB shelf.**

controller
A hardware/firmware device that manages communications on behalf of host systems over the SCSI bus to devices, such as the HSC-series, HSJ-series, and HSZ-series controllers. Controllers typically differ by the type of interface to the host and provide functions beyond what the devices support.

differential SCSI bus
A signal's level is determined by the potential difference between two wires. A differential bus is more robust and less subject to electrical noise than is a single-ended bus.

DWZZC
A StorageWorks compatible 16-bit SCSI bus converter.
See **SCSI bus converter.**

DWZZH
A StorageWorks compatible 16-bit SCSI bus HUB.

electrostatic discharge
See **ESD**.

ESD
Electrostatic discharge is the discharge of a potentially harmful static electric voltage as a result of improper grounding.

host
The primary or controlling computer or any such unit (in a multiple computer network) to which storage is attached.

initiator
A SCSI device that requests another device on the but to perform an operation. Any device on the bus can be an initiator or a target.

logical bus
A single-ended, physical bus connected to a differential, physical bus by a SCSI bus converter.

personality module
The BA356 module that interfaces the SCSI-bus to the BA356 shelf.

physical bus
Two SCSI terminators separated by cables, connectors, and/or the backplane circuitry.

SBB
StorageWorks building block. The basic building block of the StorageWorks product line. Any device conforming to shelf mechanical and electrical standards installed in either a 3½-inch or 5¼-inch carrier is considered to be an SBB, whether it is a storage device, a power supply, or other device.

SBB shelf
The common name for any StorageWorks shelf that contains only power supply and storage SBBs.

SCSI
Small Computer System Interface. This ANSI interface defines the physical and electrical parameters of a parallel I/O bus used to connect computers and devices. The StorageWorks subsystem implementation uses SCSI–2 for the transfer of data.

SCSI bus converter
Sometimes referred to as an adapter. (1) A connecting device that permits the attachment of accessories or provides the capability to mount or link units. (2) The device that connects a differential SCSI bus to a single-ended SCSI bus.

SCSI device
A host computer adapter, a peripheral controller, or an intelligent peripheral that can be attached to the SCSI bus.

SCSI device ID
The bit-significant, representation of the SCSI addressing referring to one of the signal lines numbered 0 through 15. Also referred to as target ID. For example, SCSI device ID 1 would be represented as 00001.

SCSI mid-bus position
The physical location of a controller or a device that the SCSI bus passes through enroute to the controller or device that contains the SCSI bus termination.

SCSI cable
A 68-conductor (34 twisted pairs) cable used for differential bus connections.

single-ended SCSI bus
A bus in which each signal's logic level is determined by the voltage of a single wire in relation to ground.

Small Computer System Interface
See SCSI.

StorageWorks
The DIGITAL set of enclosure products that allows customers to design and configure their own storage subsystem. Components include power, packaging, and interconnections in a StorageWorks shelf. SBBs and array controllers are integrated therein to form level enclosures to house the shelves. Standard mounting devices for SBBs are also included.

StorageWorks building block
See **SBB**.

target
A SCSI device that performs an operation requested by an initiator. Any device on the bus can be an initiator or a target.

target ID
See SCSI device ID.

termpower
Is an electrical current that is limited by self-resetting fuses.

Reader's Comments

Manual Order Number:
EK–DWZZH–UG. A01

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Manual Rating	Excellent	Good	Fair	Poor
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