

# KFESB DSSI Adapter

---

## Installation and User's Guide

Order Number: EK-KFESB-OP. A01

---

**First Printing, March 1995**

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation.

Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

The software, if any, described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license. No responsibility is assumed for the use or reliability of software or equipment that is not supplied by Digital Equipment Corporation or its affiliated companies.

Copyright © Digital Equipment Corporation, 1995. All Rights Reserved.

The Reader's Comments form at the end of this document requests your critical evaluation to assist in preparing future documentation.

The following are trademarks of Digital Equipment Corporation: AXP, DEC, Digital, OpenVMS, Q-bus, VAX, VAX DOCUMENT, VMScluster, VAXcluster, the AXP logo, and the DIGITAL logo.

OSF/1 is a registered trademark of Open Software Foundation, Inc.

All other trademarks and registered trademarks are the property of their respective holders.

**FCC NOTICE:** The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference.

S2826

This document was prepared using VAX DOCUMENT Version 2.1.

---

# Contents

<b>Preface</b> .....	v
<b>1 Installation</b>	
In This Chapter .....	1-1
KFESB Configurations .....	1-1
End-Node Configurations .....	1-2
Middle-Node Configurations .....	1-2
Step 1: Shut Down and Unplug System .....	1-2
Step 2: Install KFESB: End-Node Configurations .....	1-2
Step 3: Install KFESB: Middle-Node Configurations .....	1-3
Step 4: Power Up System and Run ECU .....	1-4
Running the ECU .....	1-6
DSSI VMSccluster Configurations .....	1-8
<b>2 DSSI Device Parameters</b>	
In This Chapter .....	2-1
Setting and Examining Storage Device Parameters .....	2-1
cdp Console Command .....	2-2
Command Description .....	2-3
DSSI Parameters Displayed Using cdp .....	2-3
cdp Example .....	2-4
show device Command .....	2-4
Device Parameters Displayed .....	2-5
set host -dup -dssi Command .....	2-6
Starting DUP: Example .....	2-6
Setting Allocation Class .....	2-7
Setting Unit Number .....	2-7
Setting Node Name .....	2-9
Exiting the DUP Server Utility .....	2-9
DSSI Device Parameters .....	2-10
Principal Parameters .....	2-10

Parameter Descriptions .....	2-10
How OpenVMS Uses the DSSI Device Parameters .....	2-13
Allocation Class Zero .....	2-13
Nonzero Allocation Class .....	2-13
Multiple and Shared Buses .....	2-13
Example of Duplicate Device Names .....	2-13

### 3 Troubleshooting

Troubleshooting Procedure .....	3-1
In This Chapter .....	3-1
Common Problems .....	3-1
Symptoms and Corrective Action .....	3-2

### A KFESB Specifications

KFESB DSSI Adapter Specifications .....	A-1
Lengths of Interconnects .....	A-1
DSSI Adapter Characteristics .....	A-1
Power Requirements .....	A-3

### Index

### Figures

1-1	Installing KFESB (End-Node Configuration) .....	1-3
1-2	Installing KFESB (Middle-Node Configuration) .....	1-4
2-1	How OpenVMS Sees Unit Numbers for DSSI Devices .....	2-14

### Tables

1-1	KFESB Configuration Settings .....	1-5
3-1	DSSI Hardware Installation Troubleshooting .....	3-2
A-1	Electrical Lengths of DSSI Interconnects .....	A-1
A-2	DSSI Adapter Characteristics for Alpha Supported Adapters .....	A-2
A-3	KFESB Power Requirements .....	A-3

---

## Preface

<b>Purpose of This Guide</b>	This guide describes how to install and operate the KFESB DSSI adapter for EISA-based systems.
<b>Who Should Use This Guide</b>	This guide is intended for system administrators. A system administrator should be an experienced user who is familiar with OpenVMS Alpha and OpenVMS VAX operating systems.
<b>Structure of This Guide</b>	<p>This guide is divided into three chapters and one appendix:</p> <ul style="list-style-type: none"><li>• Chapter 1 describes how to install the KFESB module.</li><li>• Chapter 2 describes how to set and examine DSSI parameters.</li><li>• Chapter 3 provides troubleshooting tips for solving DSSI-related hardware problems.</li><li>• Appendix A provides KFESB specifications.</li></ul>
<b>Finding More Information</b>	<p>The following documents provide information related to DSSI VMScLuster systems:</p> <ul style="list-style-type: none"><li>• <i>DSSI VMScLuster Installation and Troubleshooting</i>, EK-410AB-MG</li><li>• <i>VMScLuster Systems for OpenVMS</i></li><li>• <i>OpenVMS AXP Version 6.1 Upgrade and Installation Manual</i>, AA-PV6XB-TE</li><li>• <i>StorageWorks Solutions HSD05 Array Controller User's Guide</i>, EK-HSD05-UG</li></ul>

- *StorageWorks Array Controllers HS Family of Array Controllers User's Guide, EK-HSFAM-UG*

**Conventions**      The following conventions are used in this guide.

<b>Convention</b>	<b>Meaning</b>
lowercase	Lowercase letters in commands indicate that commands can be entered in uppercase or lowercase.
Caution	Cautions provide information to prevent damage to equipment or software.
[ ]	In command format descriptions, brackets indicate optional elements.
boot	Console and operating system commands are shown in this special typeface.
<i>italic type</i>	Italic type in console command sections indicates a variable.

# 1

---

## Installation

### In This Chapter

This chapter describes the procedure for installing the KFESB EISA-to-DSSI host adapter module:

- Step 1: Shut Down and Unplug System
- Step 2: Install KFESB: End-Node Configurations
- Step 3: Install KFESB: Middle-Node Configurations
- Step 4: Power Up System and Run ECU

### KFESB Configurations

Each KFESB adapter provides a DSSI bus for EISA-based systems. The number of KFESB adapters that can be installed in a single system is limited only by the number of available EISA bus slots. The KFESB can be configured as an end-node, with a single host on a bus, or as a middle-node in a DSSI VMSccluster, where up to three hosts can reside on a single DSSI bus.

Each KFESB or DSSI bus supports up to eight nodes. Each of the following counts as one DSSI node:

- A DSSI adapter
- An RF-disk controller interface
- A TF-tape controller interface
- An HSD05 array controller
- An HSD30 array controller

For a two-system DSSI VMSccluster system, for instance, a maximum of six RF-disks can be configured per DSSI bus: two DSSI adapters + six disks = eight nodes.

### **End-Node Configurations**

End-node configurations do not require the installation of the internal DSSI cable and second DSSI connector. If the KFESB will not be used in a DSSI VMScCluster configuration, you can skip step 3 of the installation.

### **Middle-Node Configurations**

Middle-node configurations require that you install the second DSSI connector and its internal DSSI cable. If your system does not have ports for standard bulkhead connectors, you can use the EISA slot bracket to install the second connector in an unused EISA slot.

---

## **Step 1: Shut Down and Unplug System**

Before installing the KFESB module:

- Perform orderly shutdown of the operating system.
- Set power switches to off.
- Unplug the AC power cord for each power supply.

---

### **Caution**

---

Static electricity can damage integrated circuits. Always use a grounded wrist strap and grounded work surface when installing or removing modules.

---

---

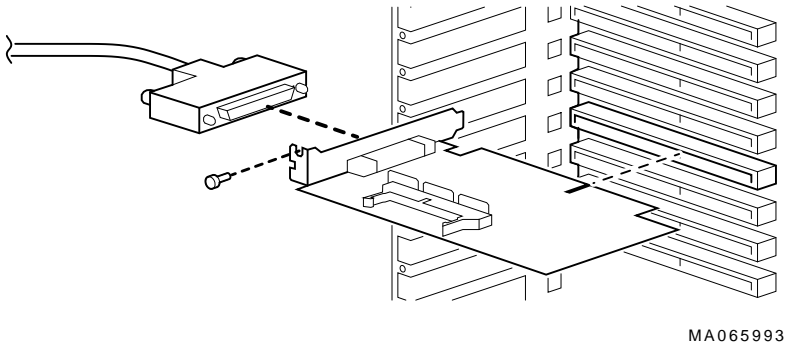
## **Step 2: Install KFESB: End-Node Configurations**

If you are installing the KFESB as an end-node adapter, install the KFESB module and attach the external DSSI cable as shown in Figure 1-1, then go to Step 4.



## Step 2: Install KFESB: End-Node Configurations

**Figure 1–1 Installing KFESB (End-Node Configuration)**



---

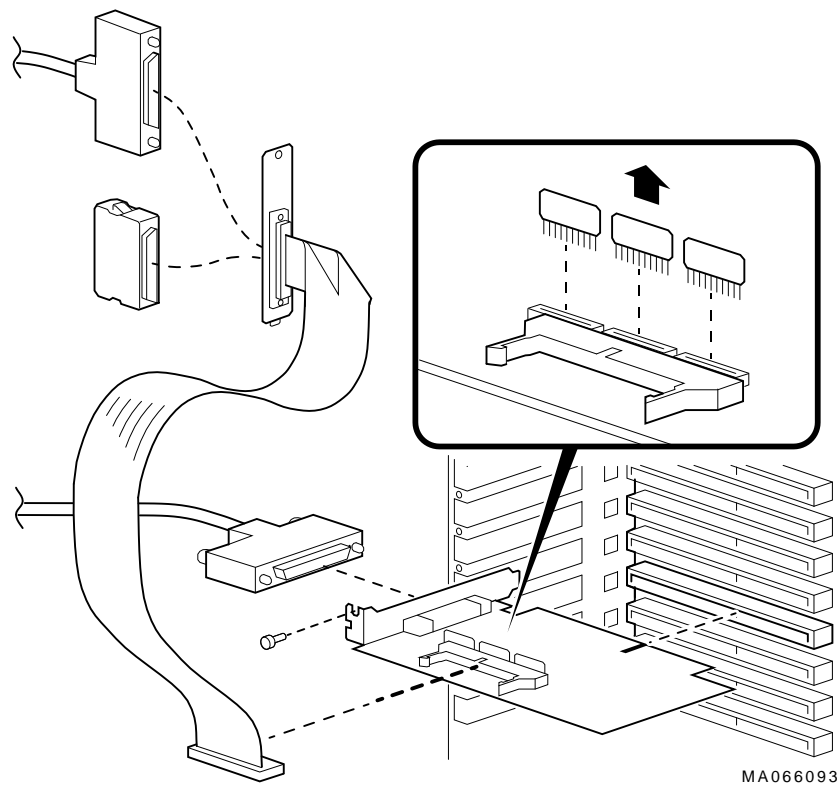
## Step 3: Install KFESB: Middle-Node Configurations

If you are installing the KFESB as a middle-node adapter, complete the following steps. Refer to Figure 1–2.

- a. Using a pair of needle-nose pliers, remove the three internal terminators.
- b. Install the KFESB module.
- c. Install the internal cable to provide the second DSSI connector. The connector is installed in a standard bulkhead port.
- d. Connect the external DSSI cables or external DSSI terminator.

### Step 3: Install KFESB: Middle-Node Configurations

**Figure 1–2 Installing KFESB (Middle-Node Configuration)**



---

### Step 4: Power Up System and Run ECU

Whenever you add, remove, or move an EISA option, you need to run a utility called the EISA Configuration Utility (ECU). The ECU uses the corresponding configuration (CFG) file for the KFESA to allocate system resources and create a conflict-free configuration. This configuration information is saved to your system's nonvolatile memory.

## Step 4: Power Up System and Run ECU

The ECU also allows you to change user-selectable settings. Table 1–1 describes the KFESB functions or settings you can change using the ECU, as well as the default settings for the option.

---

### Note

---

In most cases, the CFG file for the KFESB is provided with the ECU diskette for Alpha systems that was shipped with your system. If the file is not found, the ECU program will prompt you to insert the CFG diskette (AK-Q767A-CA) shipped with the KFESB option.

---

**Table 1–1 KFESB Configuration Settings**

Function	Choice of Settings	Description
Host Adapter Interface	Edge (Default) Level	Sets the trigger type for the host adapter interface. All AXP systems use the Edge trigger type.
Host Adapter Interrupt	IRQ 15 (Default) IRQ 14 IRQ 12 IRQ 11 IRQ 10	Sets the host adapter IRQ. Choose a unique IRQ for each host adapter on the system. The ECU program prevents you from assigning duplicate IRQs for multiple KFESB options. Never use a host adapter IRQ of 9.
Host Adapter DSSI ID	Device ID 7 (Default) Device ID 6 Device ID 5 Device ID 4 Device ID 3 Device ID 2 Device ID 1 Device ID 0	Sets the DSSI bus node ID for the host adapter. Bus node ID 7 is normally reserved for the host adapter. In a DSSI VMScLuster, where up to three host adapters can share a single DSSI bus, unique bus node IDs must be selected for each host adapter. For example, in a multi-host DSSI VMScLuster, leave one KFESB at bus node ID 7, set the second to 6, and the third to 5.

## Step 4: Power Up System and Run ECU

### Running the ECU

Run the ECU as follows:

1. Start the ECU according to the instructions provided with your system documentation.
2. After the ECU copyright is displayed, the ECU will load the configuration file for the KFESB. If the file is not included on the ECU diskette, the ECU program will prompt you to insert the configuration diskette for the option.

While the configuration files are loading, the ECU displays the message:

```
Loading configuration files
Please wait...
```

When the files have finished loading, a menu similar to the following is displayed.

```
EISA Configuration Utility
  Steps in configuring your computer

STEP 1: Important EISA configuration Information
STEP 2: Add or remove boards
STEP 3: View or edit details
STEP 4: Examine required details
STEP 5: Save and exit

>Select=ENTER< <Cancel=ESC>
```

3. If you are using the default values for the host adapter interrupt (IRQ 15) and host adapter DSSI ID (device ID 7), you can skip this step.

Select the View or edit details option (Step 3 in the example below) and press the Enter key. Scroll through the file until you find the KFESB option and its slot number. The display lists the current settings. A sample file is shown below:

```
Step 3: View or edit details

Slot 7 -- Digital KFESB DSSI EISA Host Adapter   Added
Host Adapter Interface.....Trigger EDGE
Host Adapter IRQ.....IRQ 15
Host Adapter DSSI ID.....Device ID 7
```

#### Step 4: Power Up System and Run ECU

To change the settings (edit details), select a function or setting you want to change and press the Return key. Table 1-1 describes the KFESB functions or settings you can change using the ECU.

When you have finished with the option settings, press F10. A main menu similar to the following is displayed.

```
EISA Configuration Utility
  Steps in configuring your computer

STEP 1: Important EISA configuration Information
STEP 2: Add or remove boards
STEP 3: View or edit details
STEP 4: Examine required details
STEP 5: Save and exit
>Select=ENTER< <Cancel=ESC>
```

4. Select Save and exit (Step 5 in the example above) and press the Enter key. A screen will verify that you want to save the configuration and a screen similar to the following is then displayed:

```
EISA Configuration Utility
```

Your configuration file has been saved, and if possible a backup SYSTEM.SCI file has been made on the current drive.

To complete your configuration, you must do one of the following:

If you need to install boards or change switches and jumpers on boards already installed, turn off your computer and do so.

If you want to test your system or install an operating system, press ENTER to restart your computer, run the configuration utility again, and select the appropriate main menu item.

If you are finished configuring, remove the SYSTEM CONFIGURATION diskette if it is in drive A and press ENTER to restart your system.

Ok=ENTER

Follow the directions on the screen displays until you have saved and exited the ECU.

5. Return to your system documentation for instructions on returning to the SRM console, which supports OpenVMS.

Step 4: Power Up System and Run ECU

**DSSI  
VMCluster  
Configurations**

For more information on DSSI VMCluster configurations, refer to the *DSSI VMCluster Installation and Troubleshooting Guide*, EK-410AB-MG.

# 2

---

## DSSI Device Parameters

### **In This Chapter**

This chapter describes DSSI device parameters and the commands used to set and examine them.

---

### **Setting and Examining Storage Device Parameters**

When you change a DSSI configuration by adding a new bus or devices, or by adding devices to a cluster, you must set DSSI parameters. Console commands are used to set and examine these DSSI parameters.

If you are not familiar with DSSI parameters and their function, refer to the next section, “DSSI Device Parameters.”

---

**Caution**

---

The HSD05 and HSD30 array controllers do not currently support the `cdp` command. If your configuration includes the HSD05/HSD30, do not use the `cdp` command. Doing so will cause the console subsystem to hang and you will have to press the Reset button to return to the console prompt.

For systems configured with the HSD05/HSD30 array controller, use the `set host -dup -dssi device_name` command to set and examine DSSI parameters using the Diagnostic and Utility Program (DUP).

For examples of the `set host -dup -dssi` command, see the section “Set host -dup -dssi Command.”

For more information, refer to the *StorageWorks Solutions HSD05 Array Controller User's Guide*, EK-HSD05-UG and *StorageWorks Array Controllers HS Family of Array Controllers User's Guide*, EK-HSFAM-UG.

---

**cdp Console Command**

The SRM console command `cdp` allows you to modify the NODENAME, ALLCLASS, and UNITNUM parameters. The `cdp` command automatically connects to the device's DUP server for all devices or any number of specified devices.

---

**Note**

---

When a DSSI bus is shared with a VAX system, the `cdp` console command can connect to all the shared drives, even though they physically reside in the VAX enclosure (and/or expansion enclosure).

---

Enter `cdp` without an option or target device to list the DSSI parameters for all DSSI drives on the system.



## Setting and Examining Storage Device Parameters

### Command Description

`cdp` (`[-{i,n,a,u,o}] [-sn] [-sa allclass] [-su unitnum] [dssi_device]`)

#### Arguments:

`[dssi_device]` Name of the DSSI device or DSSI adapter. Only the parameters for the specified device or devices on this adapter will be modified.

#### Options:

- `[-i]` Selective interactive mode, set all parameters.
- `[-n]` Set device node name, NODENAME (alphanumeric, up to 6 characters).
- `[-a]` Set device allocation class, ALLCLASS.
- `[-u]` Set device unit number, UNITNUM.
- `[-sn]` Set node name (NODENAME) for all DSSI drives on the system to either `RFhscn` or `TFhscn`, where:
  - `h` is the device hose number (0)
  - `s` is the device slot number (0–3)
  - `c` is the device channel number (0)
  - `n` is the bus node ID (0–6).
- `[-sa]` Set ALLCLASS for all DSSI devices on the system to a specified value.
- `[-su]` Specify a starting unit number for a device on the system. The unit number for subsequent DSSI devices will be incremented (by 1) from the starting unit number.

### DSSI Parameters Displayed Using `cdp`

A sample display of DSSI device information using the `cdp` command is shown below:

```
>>> cdp
   ①           ②           ③           ④ ⑤ ⑥
pua0.0.0.0.0 ALPHA0      0411214901371    2 0 $2$DIA0
pua0.1.0.0.0 ALPHA1      0411214901506    2 1 $2$DIA1
pua0.2.0.0.0 ALPHA2      041122A001625    2 2 $2$DIA2
pua0.3.0.0.0 ALPHA3      0411214901286    2 3 $2$DIA3
pua0.4.0.0.0 ALPHA4      0411224904506    2 4 $2$DIA4
pua0.5.0.0.0 ALPHA5      0411233087412    2 5 $2$DIA5
>>>
```

① Storage adapter device name

## Setting and Examining Storage Device Parameters

- ❷ Node name (NODENAME)
- ❸ System ID (SYSTEMID) — modified during warm swap
- ❹ Allocation class (ALLCLASS)
- ❺ Unit number (UNITNUM)
- ❻ Operating system device name

### cdp Example

In the following example:

- The unit numbers for drives on DSSI buses B, C, and D are changed to avoid duplicate unit numbers. Bus B is given unit numbers starting with 10; Bus C starting with 20; and Bus D starting with 30.
- The allocation class for all drives is changed to 1.
- Drive dub0 is given the new node name, SYSTEM.

```
>>> cdp -sa 1
pua0.0.0.0.0 ALPHA0 0411214901371 1 0 $1$DIA0
pua0.1.0.0.0 ALPHA1 0411214901506 1 1 $1$DIA1
pua0.2.0.0.0 ALPHA2 041122A001625 1 2 $1$DIA2
pua0.3.0.0.0 ALPHA3 0411214901286 1 3 $1$DIA3
pua0.4.0.0.0 ALPHA4 0411224904506 1 4 $1$DIA4
pua0.5.0.0.0 ALPHA5 0411233087412 1 5 $1$DIA5
>>> cdp -sa 1 -su 10 dub
pub0.0.0.1.0 SNEEZY 0411214906794 1 10 $1$DIA10
pub1.1.0.1.0 DOPEY 0411214457623 1 11 $1$DIA11
pub2.2.0.1.0 SLEEPY 0478512447890 1 12 $1$DIA12
pub3.3.0.1.0 GRUMPY 0571292500565 1 13 $1$DIA13
pub4.4.0.1.0 BASHFL 0768443122700 1 14 $1$DIA14
pub5.5.0.1.0 HAPPY 0768443122259 1 15 $1$DIA15
>>> cdp -sa 1 -su 20 duc
puc0.0.0.2.0 RF0200 0347500845133 1 20 $1$DIA20
puc1.1.0.2.0 RF0201 0889734564411 1 21 $1$DIA21
puc2.2.0.2.0 RF0202 0411780351455 1 22 $1$DIA22
puc3.3.0.2.0 RF0203 0555613903222 1 23 $1$DIA23
puc4.4.0.2.0 RF0204 0744673884100 1 24 $1$DIA24
puc5.5.0.2.0 RF0205 0298438401226 1 25 $1$DIA25
>>> cdp -sa 1 -su 30 dud
pud0.0.0.3.0 RF0300 0620707250334 1 30 $1$DIA30
pud1.1.0.3.0 RF0301 0889734564411 1 31 $1$DIA31
>>> cdp -n dub0
pub0.0.0.1.0:
Node Name [SNEEZY]? SYSTEM
>>>
```

### show device Command

The show device command displays information for all DSSI and SCSI devices in the system.

## Setting and Examining Storage Device Parameters

### Device Parameters Displayed

`show device`

*Example:*

>>> `show device`

<p>① dka600.6.0.1.0 dua0.0.0.2.1 dua1.1.0.2.1 dua2.2.0.2.1 dua3.3.0.2.1 dua4.4.0.2.1 dua5.5.0.2.1 dva0.0.0.0.1 mka500.5.0.1.0 ewa0.0.0.0.0 pka0.7.0.1.0 pua0.7.0.2.1 pub0.6.0.3.1 &gt;&gt;&gt;</p>	<p>② DKA600 \$2\$DIA0 (ALPHA0) \$2\$DIA1 (ALPHA1) \$2\$DIA2 (ALPHA2) \$2\$DIA3 (ALPHA3) \$2\$DIA4 (ALPHA4) \$2\$DIA5 (ALPHA5) DVA0 MKA500 EWA0 PKA0 PAA0 PAB0</p>	<p>③ 08-00-2B-3B-42-FD SCSI Bus ID 7 DSSI Bus ID 7 DSSI Bus ID 6</p>	<p>④ RRD43 RF35 RF35 RF35 RF35 RF35 RF35 RX26 TLZ06 08-00-2B-3B-42-FD SCSI Bus ID 7 DSSI Bus ID 7 DSSI Bus ID 6</p>	<p>⑤ 2893        0435</p>
--	---	--	---	---

dka0.0.0.0.0

① **Console device name:**

Hose Number: 0 PCI\_0 (32-bit PCI); 1 EISA; 2 PCI\_1

Slot Number: For EISA options---Correspond to EISA card cage slot numbers (1--\*)  
For PCI options---Slot 0 = Ethernet adapter (EWA0) or reserved on AlphaServer 2000 systems.  
Slot 1 = SCSI controller on standard I/O or I/O backplane  
Slot 2 = EISA to PCI bridge chip  
Slots 3--5 = Reserved  
Slots 6--8 = Correspond to PCI card cage slots: PCI0, PCI1, and PCI2

Channel Number: Used for multi-channel devices.

Bus Node Number: Bus Node ID

Device Unit Number: Unique device unit number  
SCSI unit numbers are forced to 100 x Node ID

Adapter ID: One-letter adapter designator (A,B,C...)

Driver ID: Two-letter port or class driver designator:  
DR--RAID-set device  
DV--Floppy drive  
ER--Ethernet port (LANCE chip, DEC 4220)  
EW--Ethernet port (TULIP chip, DECchip 21040)  
PK--SCSI port, DK--SCSI disk, MK--SCSI tape  
PU--DSSI port, DU--DSSI disk, MU--DSSI tape

MA00369

## Setting and Examining Storage Device Parameters

- ② Operating system device name:
  - For an allocation class of zero: `NODENAME$DIAu`  
`NODENAME` is a unique node name and `u` is the unit number. For example, `R7BUCC$DIA0`.
  - For a nonzero allocation class:  
`$ALLCLASS$DIAu`  
`ALLCLASS` is the allocation class for the system and devices, and `u` is a unique unit number. For example, `$1$DIA0`.
- ③ Node name (alphanumeric, up to 6 characters)
- ④ Device type
- ⑤ Firmware version (if known)

### **set host -dup -dssi Command**

The `set host -dup -dssi device_name` command allows you to enter the DUP server utility for a specified device. Through the DUP server utility, you can set and examine DSSI parameters for the specified device. This command must be used in place of the `cdp` command for systems using HSD05/HSD30 array controllers.

### **Starting DUP: Example**

```
>>> set host -dup -dssi dub34
starting DIRECT on pub0.3.0.3.1 (HSD05A)
Copyright 1994 Digital
      HSD05   Serial No: 2033
      Firmware Rev. B1   (X36A)
DIRECT V1.0  D  Mar 21 1994 17:09:41
PARAMS V1.0  D  Mar 21 1994 17:09:41
UTILIT V1.0  D  Mar 21 1994 17:09:41
End of directory
Task? params
starting PARAMS on pub0.3.0.3.1 (HSD05A)
Copyright 1994 Digital
      HSD05   Serial No: 2033
      Firmware Rev. B1   (X36A)
PARAMS>
```

## Setting and Examining Storage Device Parameters

### Setting Allocation Class

After entering the DUP server utility for a specified device, you can examine and set the allocation class for the device as follows.

---

#### Note

---

Set the ALLCLASS parameter only through console mode, at the PARAMS> prompt. Setting the ALLCLASS parameter from the operating system is not recommended.

Devices connected through early versions of the HSD05 array controller use the parameter DISK\_ALCS for allocation class; all other DSSI devices use the parameter ALLCLASS.

---

1. At the PARAMS> prompt, enter `show allclass` (or `show disk_alcs` for HSD05 devices) to check the allocation class of the device to which you are currently connected.
2. Enter `set allclass 1` (or enter the allocation class you desire).
3. Enter `show allclass` to verify the new allocation class.

The following example shows the steps for examining and changing the allocation class for a specified device. In the example, the allocation class is changed from class 0 to class 1 for a device connected through an HSD05.

```
PARAMS> show disk_alcs
DISK_ALCS          0          0          255    DecimalNum
PARAMS> set disk_alcs 1
PARAMS> show disk_alcs
DISK_ALCS          1          0          255    DecimalNum
```

### Setting Unit Number

After entering the DUP server utility for a specified device, you can examine and set the unit number for the device as follows.

---

#### Note

---

The HSD05 and HSD30 array controllers automatically provides unique unit numbers for its drives. Devices

## Setting and Examining Storage Device Parameters

connected through the HSD05/HSD30 do not usually need to change this parameter.

---

1. At the PARAMS> prompt, enter `show unitnum` to check the unit number of the device to which you are currently connected.
2. Enter `set unitnum 10` (or enter the unit number you desire).
3. Enter `set forceuni 0` to override the default unit number value supplied by the bus node ID plug.
4. Enter `show unitnum` to verify the new unit number.
5. Enter `show forceuni` to verify that the current value for the FORCEUNI parameter is 0.
6. Label the device with its unit number, using the unit number labels shipped with your system.

The following example shows the steps for changing the unit number of a specified device from number 0 to number 10.

```
PARAMS>show unitnum
```

Parameter	Current	Default	Type	Radix	
UNITNUM	0	0	Word	Dec	U

```
PARAMS>set unitnum 10  
PARAMS>set forceuni 0  
PARAMS>show unitnum
```

Parameter	Current	Default	Type	Radix	
UNITNUM	10	0	Word	Dec	U

```
PARAMS>show forceuni
```

Parameter	Current	Default	Type	Radix	
FORCEUNI	0	1	Boolean	0/1	U

## Setting and Examining Storage Device Parameters

### Setting Node Name

After entering the DUP server utility for a specified device, you can examine and set the node name for the device as follows.

1. At the PARAMS> prompt, enter `show nodename` to check the node name of the device to which you are currently connected.
2. Enter `set nodename sysdsk` (or enter the desired alphanumeric node name of up to eight characters).
3. Enter `show nodename` to verify the new node name.

The following example shows the steps for changing the node name of a specified device from the factory-supplied name to SYSDSK.

```
PARAMS>show nodename
```

Parameter	Current	Default	Type	Radix
NODENAME	R7CZZC	RF35	String	Ascii B

```
PARAMS>set nodename sysdsk  
PARAMS>show nodename
```

Parameter	Current	Default	Type	Radix
NODENAME	SYSDSK	RF35	String	Ascii B

### Exiting the DUP Server Utility

After you have finished setting and examining DSSI device parameters for a specified device, enter the `write` command at the PARAMS> prompt to save the device parameters you have changed using the SET command. The changes are recorded to nonvolatile memory.

---

#### Note

---

If you have set `host` to devices connected through the HSD05 array controller, you must enter the `restart` command, and then press the Reset button or enter the `init` command for the new parameters to take effect.

---

- If you have changed the allocation class or node name of a device, the DUP server utility will ask you to initialize the controller. Answer Yes (Y) to allow the changes to be recorded and to exit the DUP server utility.

## Setting and Examining Storage Device Parameters

```
PARAMS>write
Changes require controller initialization, ok? [Y/(N)] Y
Stopping DUP server...
>>>
```

- If you have not changed the allocation class or node name, enter the `exit` command at the `PARAMS>` prompt to exit the DUP server utility for the specified device.

---

### Note

---

You must repeat the procedures in this step for each device for which you want to change parameters.

---

---

## DSSI Device Parameters

### Principal Parameters

Five principal parameters are associated with each DSSI device:

- Bus node ID
- ALLCLASS (DISK\_ALCS for devices connected through the HSD05 controller)
- UNITNUM
- NODENAME
- SYSTEMID

### Parameter Descriptions

#### Bus Node ID

The bus node ID parameter for DSSI storage devices is provided by the bus node ID plug on the front panel of the storage compartment. Each DSSI bus can support up to eight nodes, bus nodes 0–7. Each DSSI adapter, HSD05/HSD30 array controller, and each DSSI storage device count as a node. Hence, in a single-system configuration, a DSSI bus can support up to seven devices, bus nodes 0–6 (with node 7 reserved for the adapter); in a two-system DSSI VMScluster configuration, up to six devices,



0–5 (with nodes 6 and 7 reserved for the adapters); in a three-system DSSI VMScLuster configuration, up to five devices, 0–4 (with nodes 5, 6, and 7 reserved for the adapters).

---

**Note**

Drives connected through the HSD05 and HSD30 array controllers do not count as DSSI nodes; thus, using multiple HSD05 or HSD30 controllers, up to 36 SCSI drives can be configured in a two-system DSSI VMScLuster.

---

The bus node ID for the KFESB host adapter is set using the EISA Configuration Utility (ECU). The bus node ID for the HSD05 array controller is set by switches on the HSD05 controller module board.

**ALLCLASS**

---

**Note**

For devices off the HSD05 array controller, this parameter is called DISK\_ALCS.

---

The ALLCLASS parameter determines the device allocation class. The allocation class is a numeric value from 0–255 that is used by the OpenVMS Alpha operating system to derive a path-independent name for multiple access paths to the same device. The ALLCLASS firmware parameter corresponds to the OpenVMS Alpha IOGEN parameter ALLOCLASS.

DSSI devices are shipped from the factory with a default allocation class of zero.

Use the `cdp` command to examine and modify the ALLCLASS parameter. Systems using the HSD05 array controller must use the `set host -dup -dssi device_name` command.

---

**Note**

Each device to be served to a cluster must have a nonzero allocation class that matches the allocation class of the system.

---

## DSSI Device Parameters

Refer to *VMCluster Systems for OpenVMS* for rules on specifying allocation class values.

### UNITNUM

The UNITNUM parameter determines the unit number of the device. By default, the device unit number is supplied by the bus node ID plug on the front panel of the storage compartment.

---

#### Note

---

Systems using multiple DSSI buses require that the default values be replaced with unique unit numbers. See the section “How OpenVMS Uses the DSSI Device Parameters .”

---

To set unit numbers and override the default values, use the `cdp` console command to supply values to the UNITNUM parameter.

---

#### Note

---

Devices connected through the HSD05 array controller are automatically assigned unique unit numbers.

---

### NODENAME

The NODENAME parameter allows each device to have an alphanumeric node name of up to six characters. DSSI devices are shipped from the factory with a unique identifier, such as R7CZZC, R7ALUC, and so on. You can provide your own node name, keep the factory-supplied node names, or use the `cdp` console command to supply node names that relate to the device name conventions for Alpha systems. Systems using the HSD05 array controller must use the `set host -dup -dssi device_name` command.

### SYSTEMID

The SYSTEMID parameter provides a number that uniquely identifies the device to the operating system. This parameter is modified when you replace a device using warm-swapping procedures. The SYSTEMID parameter is changed using the console command: `set host -dup -task -params device name.`

---

## How OpenVMS Uses the DSSI Device Parameters

### Allocation Class Zero

With an allocation class of zero, the operating system can use the default parameter values to provide each device with a unique device name. The operating system uses the node name along with the device logical name as follows:

`NODENAME$DIA $u$`

`NODENAME` is a unique node name and  $u$  is the unit number. For example, `R7BUCC$DIA0`.

### Nonzero Allocation Class

With a nonzero allocation class, the operating system relies on unit number values to create a unique device name. The operating system uses the allocation class along with the device logical name as follows:

`$ALLCLASS$DIA $u$`

`ALLCLASS` is the allocation class for the system and devices, and  $u$  is a unique unit number. For example, `$1$DIA0`.

### Multiple and Shared Buses

Using `KFESB` modules, you can have multiple DSSI buses: buses A, B, C, and so on. Each bus can have up to seven DSSI drives (bus nodes 0–6). When a bus is shared between two systems in a DSSI VMScluster, six DSSI drives can be shared; in a three-system DSSI VMScluster, five DSSI drives can be shared.

When more than one bus is being used, and your system is using a nonzero allocation class, you need to assign new unit numbers for devices on all but one of the DSSI buses, since the unit numbers for all DSSI storage devices connected to a system's associated DSSI buses must be unique.

### Example of Duplicate Device Names

Figure 2–1 illustrates the problem of duplicate operating system device names for a system that is using more than one DSSI bus and a nonzero allocation class. In the case of the nonzero allocation class, the operating system sees four of the devices as having duplicate device names. This is an error, as all unit numbers must be unique. The unit numbers for one of the two DSSI buses in this example need to be reprogrammed.

## How OpenVMS Uses the DSSI Device Parameters

**Figure 2-1 How OpenVMS Sees Unit Numbers for DSSI Devices**

Allocation Class=0	Nonzero Allocation Class (Example: ALLCLASS=1)
R7BUCC\$DIA0	\$1\$DIA0 ← * Duplicate 0
R7CZZC\$DIA1	\$1\$DIA1 ← * Duplicate 1
R7ALUC\$DIA2	\$1\$DIA2 ← * Duplicate 2
R7EB3C\$DIA3	\$1\$DIA3 ← * Duplicate 3
R7IDFC\$DIA0	\$1\$DIA0 ←
R7IBZC\$DIA1	\$1\$DIA1 ←
R7IKJC\$DIA2	\$1\$DIA2 ←
R7ID3C\$DIA3	\$1\$DIA3 ←
R7XA4C\$DIA4	\$1\$DIA4
R7QIYC\$DIA5	\$1\$DIA5
R7DA4C\$DIA6	\$1\$DIA6

\* Nonzero allocation class examples with an asterisk indicate duplicate device names.  
For one of the DSSI buses, the unit numbers need to be reprogrammed to avoid this error.

LJ-02063-T10

# 3

---

## Troubleshooting

---

### Troubleshooting Procedure

#### **In This Chapter**

This chapter provides troubleshooting tips for solving DSSI-related hardware problems.

#### **Common Problems**

If hardware failures occur, check the following common problem sources first:

- Loose or missing terminators
- Incorrect bus node ID plugs (duplicate device names)
- Loose or damaged cables or connectors

**Symptoms and Corrective Action**

Table 3-1 lists symptoms and corrective action for possible problems.

**Table 3-1 DSSI Hardware Installation Troubleshooting**

<b>Problem</b>	<b>Symptom</b>	<b>Corrective Action</b>
Drive failure	Fault LED for drive is on (steady).	Replace drive.
Duplicate bus node IDs	Drives with duplicate bus node IDs are missing from the <code>show config</code> display.	Correct bus node IDs.
Drive bus node ID set to 7 (reserved for host adapter ID)	Valid drives are missing from the <code>show config</code> display. One drive may appear seven times on the display.	Correct bus node IDs. KFESB bus node ID for host adapter is set using the EISA Configuration Utility (ECU).
Missing or loose cables	Drive activity LEDs do not come on. Drive missing from the <code>show config</code> display.	Remove device and inspect cable connections.
Terminator missing	Read/write errors in console event log; storage adapter port may fail.	Attach terminators as needed.
KFESB module failure	Problems persist after eliminating the above problem sources.	Replace KFESB module.

# A

---

## KFESB Specifications

---

### KFESB DSSI Adapter Specifications

#### Lengths of Interconnects

Table A-1 gives the maximum electrical lengths of KFESB-based DSSI interconnects with single and dual connectors.

**Table A-1 Electrical Lengths of DSSI Interconnects**

Enclosure	Connector Type	Internal DSSI Length
KFESB adapter using 1 connector (end-node)	1 external MR <sup>1</sup>	0.15 m (6.0 in)
KFESB adapter using 2 connectors (middle-node)	2 external MR <sup>1</sup>	0.6 m (24.0 in)

---

<sup>1</sup>MR is a midrange or micro ribbon style shielded connector used for bulkhead mounting. This connector mates with MR only.

---

#### DSSI Adapter Characteristics

Table A-2 provides adapter information for Alpha supported adapters.

KFESB DSSI Adapter Specifications

**Table A-2 DSSI Adapter Characteristics for Alpha Supported Adapters**

Adapters	Cluster Traffic Support	Middle-Node <sup>1</sup> Support	I/Os per Second <sup>2</sup>	Type	Cluster Serviceability <sup>3</sup>
KFESB (EISA-to-DSSI)	Yes	Yes	1000 x 1	EISA-bus	Yes
N710 (DEC 4000 AXP)	Yes	No	1200 x 4	Embedded	Yes
SHAC (KA676, KA681, KA691, KA692)	Yes	Bus 0—No Bus 1—Yes	1200 x 2	Embedded	Yes
SHAC (KA670)	Yes	Bus 0—No Bus 1—Yes	800 x 2	Embedded	Yes
SHAC (KA52, KA53)	Yes	With IN/OUT connectors—Yes Without IN/OUT connectors—No	1200 x 2	Embedded	Yes
SHAC (KA660)	Yes	No	800	Embedded	No
EDA640	Yes	No	340	Embedded	No
KFMSA	Yes	Yes, BA variant No, AA variant	800 x 2	XMI	Yes
KFQSA <sup>4</sup>	No	With IN/OUT connectors—Yes Without IN/OUT connectors—No	170	Q-bus	With IN/OUT connectors—Yes Without IN/OUT connectors—No

<sup>1</sup>Middle nodes do not contain embedded DSSI termination, and thus support more than two hosts on their DSSI bus.

<sup>2</sup>Throughput is per DSSI bus. Total throughput may be less than the sum.

<sup>3</sup>Cluster serviceability refers to the ability to service the adapter without violating DSSI bus termination.

<sup>4</sup>DEC 4000 CPUs cannot coexist on a DSSI with the KFQSA adapter.



## KFESB DSSI Adapter Specifications

### Power Requirements

Table A-3 provides the power requirements for the KFESB module.

**Table A-3 KFESB Power Requirements**

Module	3.3V	5.1V	+12V	-12V	Watts
KFESB (EISA-to-DSSI)	0	2.0	0	0	10.2



---

# Index

## A

---

ALLCLASS parameter, 2-11  
Allocation class, using set host, 2-7

## C

---

cdp command, 2-2  
Console commands  
  cdp, 2-2  
  set host -dup, 2-12  
  set host -dup -dssi, 2-6  
  show device, 2-4  
Console device name, 2-5

## D

---

DISK\_ALCS parameter, 2-11  
DSSI adapter characteristics, A-1  
DSSI bus  
  electrical lengths by enclosure, A-1  
DSSI device name  
  example of duplicate names, 2-13  
DSSI device parameters  
  defined, 2-10  
  function of, 2-10  
  list of, 2-10  
  modifying, 2-2  
  reprogramming, 2-13  
  use by OpenVMS, 2-13  
DSSI nodes, 1-1  
DUP server utility, 2-12  
  exiting, 2-9

## E

---

Enclosures  
  bus lengths, A-1

## H

---

HSD05 array controller, 2-2  
HSD30 array controller, 2-2

## K

---

KFESB power requirements, A-3

## N

---

Node name, setting with set host, 2-9  
NODENAME parameter, 2-12

## S

---

set host -dup command, 2-6, 2-12  
show device command, 2-4  
Storage parameters  
  described, 2-10  
  examining, 2-4  
  examining with set host, 2-6  
  use by OpenVMS, 2-13  
SYSTEMID parameter, 2-12

## **T**

---

Troubleshooting, 3-1

## **U**

---

Unit number labels, 2-8

Unit number, setting with set host, 2-7

UNITNUM parameter, 2-12

## How to Order Additional Documentation

---

### Technical Support

If you need help deciding which documentation best meets your needs, call 800-DIGITAL (800-344-4825) and press 2 for technical assistance.

### Electronic Orders

If you wish to place an order through your account at the Electronic Store, dial 800-234-1998, using a modem set to 2400- or 9600-baud. You must be using a VT terminal or terminal emulator set at 8 bits, no parity. If you need assistance using the Electronic Store, call 800-DIGITAL (800-344-4825) and ask for an Electronic Store specialist.

### Telephone and Direct Mail Orders

<b>From</b>	<b>Call</b>	<b>Write</b>
U.S.A.	DECdirect Phone: 800-DIGITAL (800-344-4825) Fax: (603) 884-5597	Digital Equipment Corporation P.O. Box CS2008 Nashua, NH 03061
Puerto Rico	Phone: (809) 781-0505 Fax: (809) 749-8377	Digital Equipment Caribbean, Inc. 3 Digital Plaza, 1st Street Suite 200 Metro Office Park San Juan, Puerto Rico 00920
Canada	Phone: 800-267-6215 Fax: (613) 592-1946	Digital Equipment of Canada Ltd. 100 Herzberg Road Kanata, Ontario, Canada K2K 2A6 Attn: DECdirect Sales
International	-----	Local Digital subsidiary or approved distributor
Internal Orders <sup>1</sup> (for software documentation)	DTN: 264-3030 (603) 884-3030 Fax: (603) 884-3960	U.S. Software Supply Business Digital Equipment Corporation 10 Cotton Road Nashua, NH 03063-1260
Internal Orders (for hardware documentation)	DTN: 264-3030 (603) 884-3030 Fax: (603) 884-3960	U.S. Software Supply Business Digital Equipment Corporation 10 Cotton Road Nashua, NH 03063-1260

---

<sup>1</sup>Call to request an Internal Software Order Form (EN-01740-07).



## Reader's Comments

KFESB DSSI Adapter  
Installation and User's Guide  
EK-KFESB-OP. A01

---

Your comments and suggestions help us improve the quality of our publications.

Thank you for your assistance.

<b>I rate this manual's:</b>	Excellent	Good	Fair	Poor
Accuracy (product works as manual says)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Completeness (enough information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clarity (easy to understand)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organization (structure of subject matter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Figures (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Index (ability to find topic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Page layout (easy to find information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I would like to see more/less \_\_\_\_\_

What I like best about this manual is \_\_\_\_\_

What I like least about this manual is \_\_\_\_\_

I found the following errors in this manual:

Page	Description
_____	_____
_____	_____
_____	_____

Additional comments or suggestions to improve this manual:

For software manuals, please indicate which version of the software you are using: \_\_\_\_\_

Name/Title \_\_\_\_\_ Dept. \_\_\_\_\_

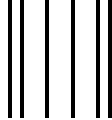
Company \_\_\_\_\_ Date \_\_\_\_\_

Mailing Address \_\_\_\_\_

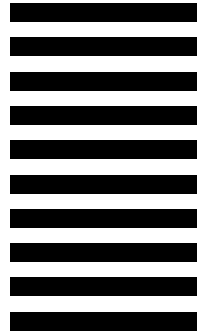
Phone \_\_\_\_\_

Do Not Tear - Fold Here and Tape

**digital**™



No Postage  
Necessary  
If Mailed  
in the  
United States



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 33 MAYNARD MASS.

POSTAGE WILL BE PAID BY ADDRESSEE

DIGITAL EQUIPMENT CORPORATION  
Shared Engineering Services  
MLO5-5/E76  
2 THOMPSON STREET  
MAYNARD, MA 01754-1716



Do Not Tear - Fold Here