

CMD Technical Support

CQD200/203 Qbus Controller Installation Guide

The QBUS CONTROLLER is an intelligent high performance Q-Bus single-ended (async) SCSI Host Adapter. The QBUS CONTROLLER is fully compatible with the DEC Mass Storage Control Protocol (MSCP) and Tape Mass Storage Control protocol (TMSCP).

The QBUS CONTROLLER can be used with the LSI-11/23, PDP-11/23+, Micro-PDP-11/53, 11/73, 11/83, 11/93, MicroVAX II, and MicroVAX III, VAX 4000 and DECsystem 5400 systems. It supports RT-11, TSX, DSM-11, ISM-11, RSX, RSTS, VMS, UNIX, ULTRIX, and other operating systems which use DU/TU drivers.

Models:

CQD-200/M	Disk Only	(P22016A or P22016B in U40)
CQD-200/T	Tape Only	(P22017A in U40)
CQD-200/TM	Disk and Tape	(P22015A in U40)

CQD-203 has the MicroVAX-3 metal mounting bracket, otherwise is the same board.

Board Size	Dual Wide Q-bus
Emulation	MSCP (DU driver) / TMSCP (TU driver)
Bus Interface	Standard MicroVAX or LSI-11 Q-bus
Addressing	18- or 22-bit Addressing
Interrupt Priority	Level 4 or 5
Interrupt Vector	Software programmable
Transfer Mode	Normal or block mode DMA
Command Queuing	Commands with optimized seek
Data Buffer Capacity	Virtual data buffer (infinite size)
Bootstrap	Auto bootstrap or utility bootstrap
Defect Management	Dynamic defect management
Software Supported	All standard DEC operating systems
Formatting	On board format and bad block replacement (ISO standard for optical erasable disk format)
LED Indicators	Self test, error conditions
Peripheral Interface	Single Ended SCSI
SCSI Transfer Rate:	3.0-MB/sec in Async

SCSI Bus Parity	Odd parity
Devices Supported	7 SCSI devices disk or tape
System Performance	disconnect/reconnect
SCSI Cable Length	Single ended, up to 20-feet (6-meters)
Operating Temperature	5 to 50 degrees C
Relative Humidity	10% to 90% , Non-condensing
Power	5V DC 2.0 A

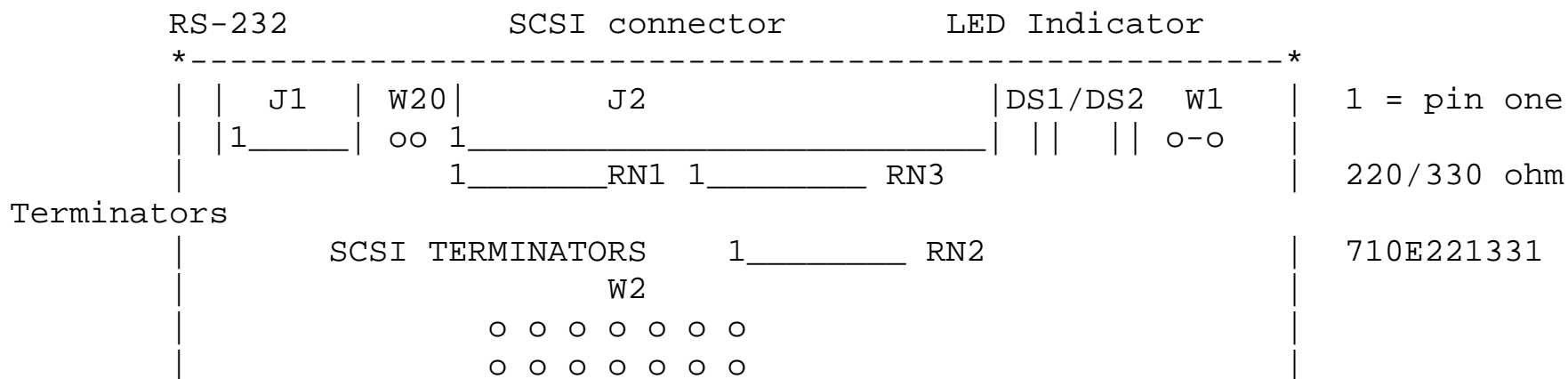
Selecting CSR Address

Before you install the QBUS SCSI host adapter under the VMS, Ultrix or Unix operating system you must select the Control and Status Register (CSR) address. If /T(tape only), then the appropriate tape csr is required. If /M(disk only), then the appropriate disk csr must be selected. If the dual function /TM controller is enabled so that both disk and tape are supported, two CSR addresses are required, one for disk and the other for tape. If /TM is being used as a tape only or disk only, then select the single appropriate CSR. Click here for [Help in CSR Address selection](#).

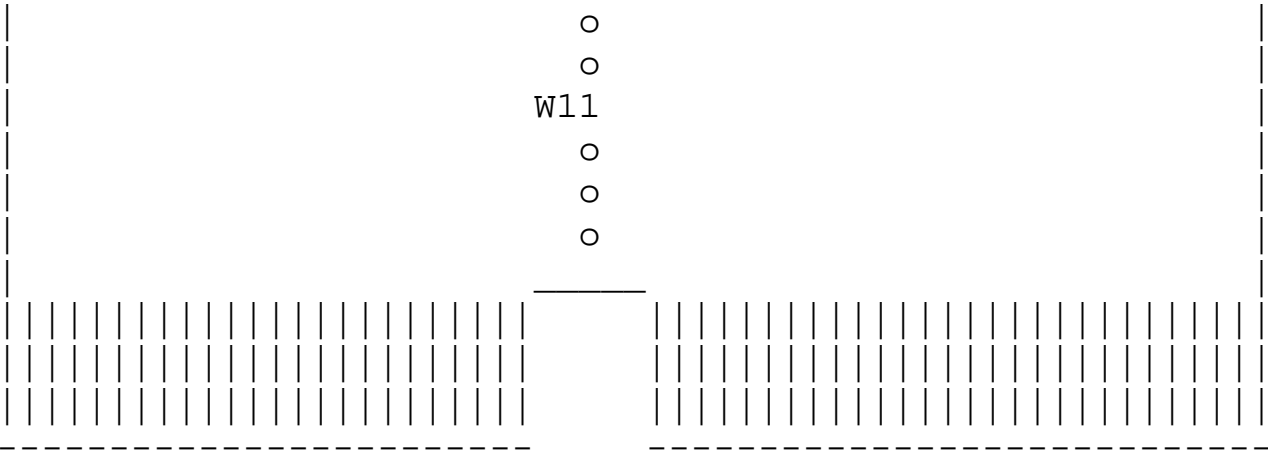
Quick Hits:

- [RS-232 Cable Connection](#)
- [On-Line Format Or Tape Monitor Utility](#)
- [Quick Switch Settings](#)
- [On-Board Test Utility](#)

CQD200/203 Board Layout



Even = F200x2xxx
Odd = F200x1xxx



Jumper settings for CQD200 Comtroller

Host Adapter ID Selections

W2-5	W2-4	W2-3	Initiator ID
IN	IN	IN	Host adapter ID = 7, highest priority (F)
IN	IN	OUT	Host adapter ID = 6
IN	OUT	IN	Host adapter ID = 5
IN	OUT	OUT	Host adapter ID = 4
OUT	IN	IN	Host adapter ID = 3
OUT	IN	OUT	Host adapter ID = 2
OUT	OUT	IN	Host adapter ID = 1
OUT	OUT	OUT	Host adapter ID = 0, lowest priority

Note that (F) means factory setting.

CQD-200 Pin Assignments

W1	IN	SCSI terminator power enabled (F)
W1	OUT	SCSI terminator power disabled
W2-1	IN, W2-2 IN *	ANSI Mode Selection (F)
W2-1	IN, W2-2 OUT *	MIX Mode Selection

W2-1	OUT,	W2-2	OUT *	CMD Mode Selection
W2-6		IN		Enable tape fast search option
W2-6		OUT		Normal operation (F)
W2-7		OUT		Reserved (F)
W3		OUT		All Reserved (F)
W4-1		IN		Bootstrap address = 773000 (F)
W4-1		OUT		Bootstrap address = 771000
W6		IN		Tape Monitor Utility enabled
W6		OUT		Tape Monitor Utility disabled (F)
W7	1-2	IN		Auto-Boot enabled
W7	2-3	IN		Auto-Boot disabled (F)
W8		IN		22-Bit addressing (F)
W8		OUT		18-Bit addressing
W10	1-2	IN		Block mode DMA enabled (F)
W10	2-3	IN		Block mode DMA disabled
W11	1-2	IN		Interrupt level 5
W11	2-3	IN		Interrupt level 4 (F)
W20		OUT		Reserved (Hardware Rev. C and up) (F)

Note that (F) means factory setting.

* These two jumpers are ignored by CQD-200/M; SCSI host adapter for disk only.

CSR Address Selection for CQD-200/M

Address	LSI-11	MicroVAX	W4-2	W4-3	W4-4	W4-5
Standard	17772150	20001468 (F)	IN	IN	OUT	OUT
Second	17760334	200000DC	IN	OUT	OUT	OUT
Third	17760354	200000EC	OUT	IN	OUT	OUT
Fourth	17760374	200000FC	OUT	OUT	OUT	OUT
Fifth	17760340	200000E0	IN	IN	IN	OUT
Sixth	17760344	200000E4	IN	OUT	IN	OUT
Seventh	17760350	200000E8	OUT	IN	IN	OUT
Eighth	17760360	200000F0	OUT	OUT	IN	OUT

Note that (F) means factory setting.

CQD-200/T CSR Address Selections (Rev C & higher)

Addr	LSI-11	MicroVAX	W4-1	W4-2	W4-3	W4-4	W4-5
1	17774500	20001940 (F)	IN	OUT	OUT	IN	IN
2	17760404	20000104	IN	OUT	OUT	IN	OUT
3	17760444	20000124	IN	OUT	OUT	OUT	IN
4	17760504	20000144	IN	OUT	OUT	OUT	OUT
5	17760544	20000164	IN	OUT	IN	IN	IN
6	17760410	20000108	IN	OUT	IN	IN	OUT
7	17760450	20000128	IN	OUT	IN	OUT	IN
8	17760454	2000012C	IN	OUT	IN	OUT	OUT
9	17760414	2000010C	IN	IN	OUT	IN	IN
10	17760420	20000110	IN	IN	OUT	IN	OUT
11	17760460	20000130	IN	IN	OUT	OUT	IN
12	17760510	20000148	IN	IN	OUT	OUT	OUT
13	17760514	2000014C	IN	IN	IN	IN	IN
14	17760520	20000150	IN	IN	IN	IN	OUT
15	17760550	20000168	IN	IN	IN	OUT	IN
16	17760554	2000016C	IN	IN	IN	OUT	OUT
17	17760560	20000170	OUT	OUT	OUT	IN	IN
18	17760604	20000184	OUT	OUT	OUT	IN	OUT
19	17760610	20000188	OUT	OUT	OUT	OUT	IN
20	17760614	2000018C	OUT	OUT	OUT	OUT	OUT
21	17760620	20000190	OUT	OUT	IN	IN	IN
22	17760644	200001A4	OUT	OUT	IN	IN	OUT
23	17760650	200001A8	OUT	OUT	IN	OUT	IN
24	17760654	200001AC	OUT	OUT	IN	OUT	OUT
25	17760660	200001B0	OUT	IN	OUT	IN	IN
26	17760704	200001C4	OUT	IN	OUT	IN	OUT
27	17760710	200001C8	OUT	IN	OUT	OUT	IN
28	17760714	200001CC	OUT	IN	OUT	OUT	OUT
29	17760744	200001E4	OUT	IN	IN	IN	IN
30	17760750	200001E8	OUT	IN	IN	IN	OUT

Note that (F) means factory setting.

CQD-200/TM CSR jumper settings for disk

Addr	LSI-11	MicroVAX	W4-2	W4-3
Standard	17772150	20001468 (F)	IN	IN
Second	17760334	200000DC	IN	OUT
Third	17760354	200000EC	OUT	IN
Disable disk			OUT	OUT

Note that (F) means factory setting.

CQD-200/TM CSR jumper settings for tape

Addr	LSI-11	MicroVAX	W4-4	W4-5
Standard	17774500	20001940 (F)	IN	IN
Second	17760404	20000104	IN	OUT
Third	17760444	20000124	OUT	IN
Disable tape			OUT	OUT

Note that (F) means factory setting.

The [On-Board Utility Program](#) can be accessed by means of an ODT command for LSI and VAX systems.

The above information can be changed without notice.

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CMD Technical Support

Selecting the Proper CSR Address

Determining CSR Address

Before you install the CMD SCSI host adapter under the VMS operating system you must determine the Control and Status Register (CSR) address for the controller. For the disk only controller or tape only controller, only one CSR address is required. For the disk and tape controller, two CSR addresses are required. The following procedure shows one method of determining the new CSR address for the Controller.

WARNING

Do not install the new Controller in the system at this time. Boot the VMS system and log into the system manager account.

- At the DCL \$ prompt, enter mc sysgen.
- At the prompt sysgen, enter show/config. The Sysgen Utility will display all the device controllers installed in the system and their corresponding CSR addresses and vectors. Make a note of this list.
- At the prompt sysgen, enter config. This will give you the device prompt.
- At the prompt device, enter the following for your controller.
For disk, enter UDA,, X (number of KDB50 type controllers)
For tape, enter TU81,, Y (number of TU81 type tape drives installed)
For disk and tape, enter UDA X number of KDB50 type controllers) and TU81 Y (number of TU81 type tape drives installed)

Where

X is the number of installed UDA type controllers plus 1 (for the new one being added).

Y is the number of installed TU81 type controllers plus 1 (for the new one being added).

Enter all devices on the Q-bus, not just the new device being added at present.

- At the prompt device, enter CTRL + Z

The Sysgen Utility will display the CSR addresses for all the controllers. Make sure that no other vectors or CSR addresses have changed. If they have, make the appropriate changes to the devices. The VMS mnemonic for MSCP disk controllers are PUA,

PUB, PUC, etc. The VMS mnemonic for TMSCP tape controllers are PTA, PTB, PTC, etc. For other mnemonics, refer to the VMS system manager's guide. Use the corresponding CSR address to configure the CSR jumper settings of the controller. At the prompt SYSGEN, enter CTRL + Z to exit the SYSGEN Utility.

VMS will automatically program the controller's interrupt vector register to match the vector assigned by the system. The vectors of DHV11 or other controllers might change when the controller is added to the system; see manufacturer's documentation to configure vectors and device CSR addresses if hardware selectable.

The following example illustrates the Sysgen Utility procedure for installing the controller in a VMS system. In this example, the CSR addresses of PUB and PTB should be used to configure the CSR jumpers of a disk/tape controller. In the example, notice the CSR and vector changes for the DHV11.

```
$MCR SYSGEN SYSGEN SHOW/CONFIG, System CSR and VECTOR on
2-JUN-1993 04:10:43.30, Name: PUA Units: 1, Nexus: 0 (UBA), CSR: 772150, Vector: 774,
Vector2: 0 Name: PTA Units: 1, Nexus: 0 (UBA), CSR: 774500, Vector: 260, Vector2: 0
Name: TXA Units: 16, Nexus: 0 (UBA), CSR: 760440, Vector: 300, Vector2: 304 SYSGEN
CONFIG, DEVICE UDA,2 DEVICE TU81,2, DEVICE DHV11,1, DEVICE ^Z, Device: UDA, Name: PUA,
CSR: 772150, Vector: 154, Support: Y Device: TU81, Name: PTA, CSR: 774500, Vector: 260,
Support: Y Device: UDA, Name: PUB, CSR: 760334*, Vector: 300*, Support: Y Device: TU81,
Name: PTB, CSR: 760404*, Vector: 304*, Support: Y Device: DHV11, Name: TXA, CSR:
760500, Vector: 310, Support: Y SYSGEN ^Z, $,
```

Normally, you do not need to change the factory jumper settings of the Controller except for the CSR address jumpers as shown in the following subsections.

The above information can be changed without notice.

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CMD Technical Support

RS-232 Cable

CMD Technology Inc.
1 Vanderbilt
Irvine, CA 92718
USA

E-mail: tech-support@cmd.com
FTP Site: FTP.CMD.COM
BBS: (714) 454-0795

The RS-232 cable is used on CMD's SCSI host adapters to access the On-Board Utility. This cable is the same type as the DEC DLV-11J RS-232 cable. Some of the LSI-11 and MicroVax CPU console port use the similiar cable. If you have a DEC cable, you may have to remove the Key-Pin in order to plug into the CMD SCSI host adapter.

Pin Assignments of the RS-232

Physical pin number assignments and functions of the RS-232 port for accessing the On-Board Utility. Connector J1 pin assignments are listed in the following table when you are facing the 10 pin connector from the controller's top edge.

NOTE

For CMD's On-Board RS-232 Utility, only pin 3, 8 and grounds are used.

	9	7	5	3	1	
	10	8	6	4	2	

Pin Assignments for Utility Interface

Pin 1	No connect
Pin 2	Ground
Pin 3	TXD, transmit data for RS-232 application
Pin 4	Ground
Pin 5	No connect

9-Pin RS-232 Cable

Pin 6	No connect
Pin 7	No connect
Pin 8	RXD, receive data for RS-232 application
Pin 9	Ground
Pin 10	No connect

NOTE

Only the Utility is operational when the RS-232 port connector is in place. Be sure to remove the cable when using normal operation.

- [On-Line Format or Tape Monitor Utility](#)
- [top of this page.](#)

The Tape Monitor Utility (TMU) is an application software that works exclusively with CMD SCSI host adapters as an optional feature for VAX/VMS systems. This Tape Monitor Utility displays the tape drive vendor identification, drive firmware revision, the remaining tape capacity, percentage/number of rewrites during writes or percentage/number of ECC retries during reads (see manufacturer's documentation for returns whether percentages or numbers), and current tape operations such as read, write, write file mark, space, rewind, etc. You can install multiple QBUS CONTROLLER's and tape drives in one site and observe all tape activity from any VAX terminal locally or across the network without any additional add-in hardware. You can also open a file to log all the information during unattended backup. To install the Tape Monitor Utility, follow the instructions given in the accompanying CMD Tape Monitor Utility User's Manual part number MAN-000TMU-000 and install jumper shunt as given in Chapter 3, subsection "Tape Monitor Utility and SCSIformat."

Note

Please check the installation guide for the jumper or switch setting for your particular controller.

The SCSIformat ON-LINE (FMT) is an application software that works exclusively with CMD SCSI host adapters as an optional feature for VAX/VMS systems. This SCSIformat ON-LINE allows you to format the disk drives without interfering with the other devices on the SCSI bus. To install SCSIformat ON-LINE follow the instructions given in the accompanying SCSIformat ON-LINE User's Manual and install jumper shunt as given in Chapter 3, subsection "Tape Monitor Utility and SCSIformat ON-LINE."

Note

Please check the installation guide for the jumper or switch setting for your particular controller.

Error Occurred While Processing Request

Error Diagnostic Information

An error has occurred.

HTTP/1.0 404 Object Not Found

Please inform the [site administrator](#) that this error has occurred (be sure to include the contents of this page in your message to the administrator).

CMD Technical Support

Utility Settings for Asynchronous SCSI Controller

If you encounter any problems or have any questions regarding the information contained here, contact CMD's Technical Support Department directly at the following address and phone number.

CMD Technology Inc.	E-mail:	tech-support@cmd.com
1 Vanderbilt	FTP Site:	FTP.CMD.COM
Irvine, CA 92718	BBS:	(714) 454-0795
USA		

Pin Assignments

Physical pin number assignments and functions of the RS-232 port for accessing the On-Board Utility. Connector J1 pin assignments are listed in the following table when you are facing the 10 pin connector from the controller's top edge.

NOTE

For CMD's On-Board RS-232 Utility, only pin 3, 8 and grounds are used.

9	7	5	3	1
10	8	6	4	2

Connector J6 for the CQD-440 and J5 for the CQD-443 pin assignments are listed in the following table shown when you are facing the connector from the controller's top edge.

Pin Assignments for RS-232 Utility Interface

J6 (CQD-XX0)	J5 (CQD-XX3)	Pin Assignments
Pin 1	Pin 1	No connect

Pin 2		Ground
Pin 3	Pin 5	TXD, transmit data for RS-232 application.
Pin 4	Pin 3	Ground
Pin 5	Pin 4	No connect
Pin 6		No connect
Pin 7		No connect
Pin 8	Pin 2	RXD, receive data for RS-232 application.
Pin 9		Ground
Pin 10	Pin 6	No connect

NOTE

You cannot use the Controller when the RS-232 port connector is in place. Be sure to remove the connector in J1 before using the board.

On-Board Utility

The CQD SCSI host adapter comes with a general purpose On- Board Utility for all systems. The On-Board Utility can test the system slot, SCSI cable, and SCSI devices connected to the controller.

Accessing the Utility can be done through LSI or VAX system or the RS-232 Port. Be sure to complete utility functions, explained at the end of this chapter. Accessing the Utility Through the LSI or VAX System The On-Board Utility Program can be accessed by means of an ODT command for LSI and VAX systems. One example is shown with the SCSI host adapter set to the first disk CSR address. Because the formats and features of the On-Board Utilities for LSI-11 systems and MicroVAX systems are similar (except different start up procedures), the MicroVAX utility will be described. Instructions for using the Disk Utility with LSI-11 Systems are listed below:

- Halt the processor.
- Hit the Boot Switch.
- Enter the CSR address plus 2 (in Octal), a slash, and 123456. For example, for CSR address 17772150 enter: 17772152/005400 123456.
- Enter CSR address plus 2 (in Octal), a slash, and 100 to load the utility to the system memory. For example, for CSR address 17772150 enter: 17772152/001000 100.
- Enter 5000G. The Utility program will begin executing.

Example

For steps 3 to 5 with CSR 17772150, enter the following: 772152/005400 123456 [ENTER] 772152/ 100 [ENTER] 5000G [ENTER]

Instructions for using this utility with VAX Systems are listed below:

1. Halt the CPU.
2. At the prompt >>>>> enter U to unlock the CPU.
3. At the prompt >>>>> enter I to initialize the CPU.
4. At the prompt >>>>> enter D/P/W 20001F40 20 to enable Q-bus memory access.
5. At the prompt >>>>> enter D/L 20088008 80000002 to set up Q-bus map.
6. At the prompt >>>>> enter D/W YYYYYYYYYY A72E to deposit to the base CSR address plus 2 (in Hex).
CSR addresses can be found in Chapter 3 or Appendix C of the manual. Where YYYYYYYYYY the CSR address plus 2 (in Hex).

Disk CSR Addresses Plus 2 Configurations

CSR Reference YYYYYYYYYY	CSR Addresses	CSR Addresses Plus 2:
772150	20001468	2000146A
760334	200000DC	200000DE
760354	200000EC	200000EE
760374	200000FC	200000FE
760340	200000E0	200000E2
760344	200000E4	200000E6
760350	200000E8	200000EA
760360	200000F0	200000F2

Tape CSR Addresses Plus 2 Configurations

CSR Reference YYYYYYYYYY	CSR Addresses	CSR Addresses Plus 2:
774500	20001940	20001942
760404	20000104	20000106
760444	20000124	20000126

760504	20000144	20000146
760544	20000164	20000166
760410	20000108	2000010A
760450	20000128	2000012A
760454	2000012C	2000012E

7. At the prompt >>>>> enter D * 100 to load the utility to system memory. This command deposits 100 to current address.
8. At the prompt >>>>> enter S 400 to start the utility.

Example

For steps 2 and 8, enter: U [ENTER] I [ENTER] D/P/W 20001F40 20 [ENTER] D/L 20088008 80000002 [ENTER] D/W YYYYYYYY A72E [ENTER] (YYYYYYYY = CSR +2) D * 100 [ENTER] S 400

9. Enter the corresponding CSR address for the controller. The Main Menu will appear as shown.

DISK	TAPE
1=772150	A=774500
2=760334	B=760404
3=760354	C=760444
4=760374	D=760504
5=760340	E=760544
6=760344	F=760410
7=760350	G=760450
8=760360	H=760450

NOTE

LSI systems will display this Main Menu differently.

```
MAIN MENU                CSR=772150
  1 = Boot Drive
  2 = ADDITIONAL SCSI COMMANDS
SELECT OPTION:
```

If the message appears CONTROLLER NOT PRESENT, make sure CSR address is correct.

10. From the Main Menu only select option 1 or 2. 1 will halt the system and 7 will bring you to the SCSI Host Adapter Utility.

Accessing the Utility Through the RS-232 Port

To access the utility from the RS-232 port, follow the instructions below.

1. Connect a terminal to the Controller's RS-232 port (10 pin connector) or to the controller's RS-232 port (DEC compatible RJ-11/Modified Module 423 Jack connector).
2. Set the terminal baud rate to 9600 (8-bit data, 1-stop bit,no parity) jump scroll.
3. Halt the system's CPU, reset the system, and hit carriage return on the terminal. The SCSI Host Adapter Utility will display as shown.

```
SCSI HOST ADAPTER UTILITY
```

```
[ DISK ]
```

```
1 = LOGICAL UNIT NUMBER OFFSET
2 = FORMAT DRIVE
3 = QUALIFY DRIVE
4 = MANUALLY REPLACE BAD BLOCKS
5 = ADDITIONAL UTILITIES
```

```
[ TAPE ]
```

```
6 = LOGICAL UNIT NUMBER OFFSET
7 = ADDITIONAL UTILITIES
```

```
SELECT OPTION:
```

Once the SCSI Host Adapter Utility shows up, you can key in the number to select the desired option. Press [CTRL] + C at any time to return to the main menu.

4. Refer the next subsections for configurations. When completed, unplug the terminal, reset the system, and boot. DO NOT use the On-Board Utility while the system is running.

NOTE

The following sections will illustrate the On-Board Utility from the RS-232 Port. There may be some variation in the Main Menu and the SCSI Host Adapter Utility Menu. If you are paccessing from the Main Menu, simply chose the correct number for each option.

Setup

This section will assist you in setting up the Controller and your system for use.

On-Board Utility

The CBI-1010 SCSI host adapter comes with the general purpose RS-232 utility for all DEC VAXBI systems. The On-Board utility can test the VAXBI slot, SCSI cable, and SCSI devices connected to the CBI-1010. Be sure to complete utility functions, explained at the end of this section.

Accessing the Utility

To access the RS-232 utility, follow the instructions below. Connect a terminal to the CBI-1010's RS-232 port (DB-25 connector or DEC compatible RJ-11/Modified Module 423 Jack connector of the back panel adapter kit).

Set the terminal baud rate to 9600 (8-bit data, 1-stop bit, no parity). Halt the system's CPU, reset the system, and hit carriage return on the terminal. The main menu will appear as follows.

```
SCSI HOST ADAPTER UTILITY (REV. YYYxZZ) , +
```

```
[DISK] ,
```

```
1 = LOGICAL UNIT NUMBER OFFSET ,
```

```
2 = FORMAT DRIVE ,
```

```
3 = QUALIFY DRIVE ,
```

```
4 = MANUALLY REPLACE BAD BLOCKS ,
```

```
5 = ADDITIONAL UTILITIES ,
```

```
,
```

```
SELECT OPTION ? ,
```

```
[TAPE]
```

```
6 = LOGICAL UNIT NUMBER OFFSET
```

```
7 = ADDITIONAL UTILITIES
```

Once the main utility menu shows up, you can key in the number to select the desired option. Press at any time to return to the main menu. Refer the the next subsections for configurations. When completed, unplug the terminal, reset the system, and boot. DO NOT use the On-Board Utility while the system is running.

Changing LUN Offset

When a system has a HSC or in a VAX cluster it will be necessary to change the LUN Logical Unit Number) offset. Each MSCP drive requires a different Unit Number so that the unit numbers are not duplicated. If there are no other MSCP controllers in the system, the LUN offset can be 0. If there exists another MSCP controller with four drives (0 to 3), then the LUN offset should be four or above. In the case that LUN offset is equal to 10, SCSI ID 0 will be DUB10 and SCSI ID 1 will be DUB11. The drives will show up as such DUA0, DUA1, DUA2, DUA3, DUB10, DUB11 Select option 1 from the main menu for disk drives; 6 for tape drives. Enter the new value for LUN offset at

the statement: PRESENT LUN OFFSET = 0, ENTER NEW VALUE: At the statement SAVE NEW CONFIGURATION (Y or N)? enter Y. The monitor will display COMPLETE when finished executing.

Formatting the Drive

This section details formatting a drive. The CBI-1010 issues Format Unit Command to the selected SCSI disk drive and requests it to map out the defects on the Manufacture Defect List (MDL). Remember formatting a drive will rewrite all the sectors of that drive. CMD recommends that you format all new drives. To format a drive, follow the steps below: Select option 2 from the main menu. Enter the device number from 0 to 6 in the statement: ENTER DEVICE NUMBER 0 TO 6 : At the statement: *** WILL DESTROY DATA ON DEVICE X, ARE YOU SURE? enter Y if you want to continue. The monitor displays WAIT while the drive is executing the format process. The monitor will display COMPLETE when finished executing.

Qualifying the Drive

After formatting the device, CMD recommends you qualify devices by running this procedure at least once without errors detected. The qualify program writes different patterns to the drive and then verifies the data. If there are any bad sectors, the sectors will automatically be replaced and the statement XX XXXXXXXX BAD BLOCK REPLACED will appear. Follow the instructions below for qualifying a drive.

1. Select option 3 from the main menu.
2. Enter the device number at the statement: QUALIFY DEVICE NUMBER <<0 TO 6>>:
3. At the statement: *** WILL DESTROY DATA ON THIS DEVICE, ARE YOU SURE? enter Y if you want to continue.

The monitor will display... QUALIFY STARTED <<SEQUENTIAL WRITE AND READ>>! HIT <<BREAK>> TO ABORT

The monitor will display... TESTING LOOP COUNT AND BLOCK NUMBER:

4. Hit <<BREAK>> to exit back to the main menu after you are satisfied with the qualifying process.

Manually Replacing Bad Sectors

This option allows you to replace bad sectors manually. The controller supports dynamic defect management which replaces defective sectors on-line so there is no need to manually replace bad sectors. However, if you wish to replace bad sectors manually follow these instructions; remember that any data in the sector will be lost:

1. Select option 4 from the main menu.
2. Enter the device number at the statement DEVICE NUMBER ? DEV <<0 TO 6>>:
3. Enter the logical block number in HEX at the statement: ENTER THE BAD BLOCK NUMBER IN <<HEX>>:

The monitor will display BAD BLOCK REPLACED when finished executing.

Additional Utilities

To access additional utilities for disk drives, select option 5 from the main menu. To access additional utilities for tape drives, select option 7 from the main menu. The additional utilities menu will appear as follows.

ADDITIONAL UTILITIES (REV. YYXZZ) SN = 1278

D = DISPLAY SCSI DEVICE AND SET UP CONFIGURATION

S = SEND SCSI COMMAND TO THE DEVICE

T = TEST SCSI DEVICE

R = FORMAT RCT BLOCK

Key in "D."

```
DEV0      DU0, SCSI ID 0, LUN 0,  SEAGATE ST1200N
DEV1      DU1, SCSI ID 1, LUN 0   OFFLINE
DEV2      DU2, SCSI ID 1, LUN 0   OFFLINE
DEV3      DU3, SCSI ID 1, LUN 0   OFFLINE
DEV4      MU0, SCSI ID 1, LUN 0   OFFLINE
DEV5      MU1, SCSI ID 1, LUN 0   OFFLINE
DEV5      MU2, SCSI ID 1, LUN 0   OFFLINE
DEV7      SCSI ID 7, HOST ADAPTER
```

This LUN is SCSI LUN; it is normally 0. This is used only for devices that support multiple LUN's. When you have completed these instructions the display will show your current configuration and prompt you again with the question CHANGE CONFIGURATION ? (Y/N). Enter N; this will cause the controller to scan the SCSI bus. The utility will display your current configuration with manufacturer's name, model number, and firmware revisions for each device.

Sending SCSI Commands To The Device

Selection “S” can be used to send SCSI commands to the selected disk/tape drives directly. This option is used to send a 6-, 10-, or 12-byte command to a SCSI device. Follow these procedures to send SCSI commands to the device: Enter S from the “Additional Utilities” Menu. (Be sure you have correctly selected either 5 from the Main Menu for disk drives, or 7 for tape drives.)

At the question DEVICE NUMBER ? DEV <<0-6>> enter the device number. Enter the command sequence at the statement:

```
READY TO TEST DEVICE X
      EDIT CDB <<HEX>>   ***<<ESC>> TO TERMINATE EDITING***
      BYTE      0000= 00
```

If a 6- or 10-byte command is used, press to terminate command editing. If a 12-byte command is used, command editing is terminated automatically. At the statement WRITE DATA TO THE DEVICE ? <<Y OR N>> enter N to immediately send the command if SCSI command does not require a data out phase. Or enter Y to send data to the device after the command phase if SCSI command requires a data out phase. Enter the data and enter to terminate editing. The statement SAVE EDITED DATA IN BUFFER ? <<Y OR N>> will appear. Enter Y to save data in the buffer; or enter N to erase edited data after the command is sent.

Testing SCSI Device

Selection “T” can be used to read only, write and read selected disk drive, and/or write and read selected tape drive continuously. This is a diagnostic tool to help with installation and testing. Follow the procedures below to test the SCSI device. Enter T from the “Additional Utilities” menu. (Be sure you have correctly selected either 5 from the main menu for disk drives, or 7 for tape drives.) At the question DEVICE NUMBER ? DEV <<0-6>> enter the device number. When testing for disk devices, at the statement READY TO TEST THE DEVICE DO YOU WANT TO READ ONLY ? <<Y OR N>> enter Y to read only or N to read and write. If you selected N, the question ARE YOU SURE? will display. Enter Y to read and write to the device.

WARNING

N will destroy all data on the device.

When testing for tape devices, the statement ARE YOU SURE? will display. Enter Y to test the device. The test will continue until you abort. Allow the test to continue for a few minutes for new devices and ten minutes for suspected bad devices. Press CTRL + C to abort and exit back to the main menu.

Formatting RCT Block

Selection “R” can be used to format the RCT blocks of the disk drive selected. This command writes zeros in the last logical block of the device. If you try to skip the formatting process and directly use the drive, you must use this option to eliminate “unrecoverable bad RCT block.” However, CMD recommends you format the drive. To format the RCT block follow these instructions: Select R from the “Additional Utilities” menu. (Be sure you have correctly selected either 5 from the main menu for disk drives, or 7 for tape drives.) Select the device number at the statement: DEVICE NUMBER DEV <<0-6>>. FORMAT COMPLETE will display when RCT block has been formatted.

Completing Utility Functions

If the terminal is connected, this may cause the On-Board Utility to be invoked during system operation and will take control of the Host Adapter from VMS.

Unit Numbering

This section explains configuring unit numbers. Unit numbers may be changed by using the “Configure LUN Offset” from the main menu. If you used the D option from the “Additional Utilities” menu, the terminal will display the MU and/or DU numbers as shown in the following table, factory default settings for unit numbers.

Default for Unit Numbers

Tape controller

SCSI ID	On-Board Utility	OS Unit Number
0	MU0	0
1	MU1	1
2	MU2	2
3	MU3	3
4	MU4	4
5	MU5	5
6	MU6	6

Disk controller

SCSI ID	On-Board Utility	OS Unit Number
1	DU1	1
2	DU2	2
3	DU3	3

4	DU4	4
5	DU5	5
6	DU6	6

Tape and disk controller

SCSI ID	On-Board Utility	OS Unit Number
0	DU0	0
1	DU1	1
2	DU2	2
3	DU3	3
4	MU0	0
5	MU1	1
6	MU2	2

VMS version 5.3 or above

VAX cluster software must be running on both systems with at least one of the DEC's interconnects operational Tape drives can only be mounted to one system at a time Allocation classes must be the same for all systems when installing disk drives (value must not equal 0).

The above information can be changed without notice.

Rev. Date: A = 04-15-96

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