

CMD Technical Support

CQD220A/223A Qbus Controller Installation Guide

The QBUS CONTROLLER is an intelligent high performance Q-Bus single-ended (sync/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). This controller is the replacement for the CQD220.

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-220A/M/T	Disk or Tape	(P220A08A IN U30)
CQD-220A/TM	Disk and Tape	(P220A01A in U30)

CQD-223A has the MicroVAX-3 metal mounting bracket, otherwise it is identical to the CQD-220A.

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
Multiple-Hosting	Support multiple-hosting for disks, optical drives and tapes.
Formatting	On board format and bad block replacement (ISO standard for optical erasable disk format)
Partitioning	2 or 4 equally divided partitions for disk drives

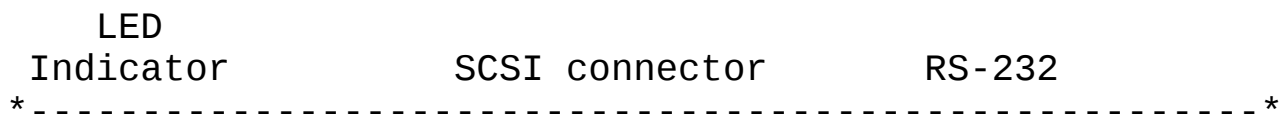
Optional Software	Tape Monitor Utility (TMU) SCSIformat ON-LINE (FMT) SCSI Library Manager (SLM for /TMJ only)
LED Indicators	Self test, error conditions
Peripheral Interface	Single Ended SCSI
SCSI Transfer Rate:	5-MB/sec in Sync 3-MB/sec in Async
SCSI Bus Parity	Odd parity
Devices Supported	7 SCSI devices disk or tape
System Performance	disconnect/reconnect, multiple-host
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

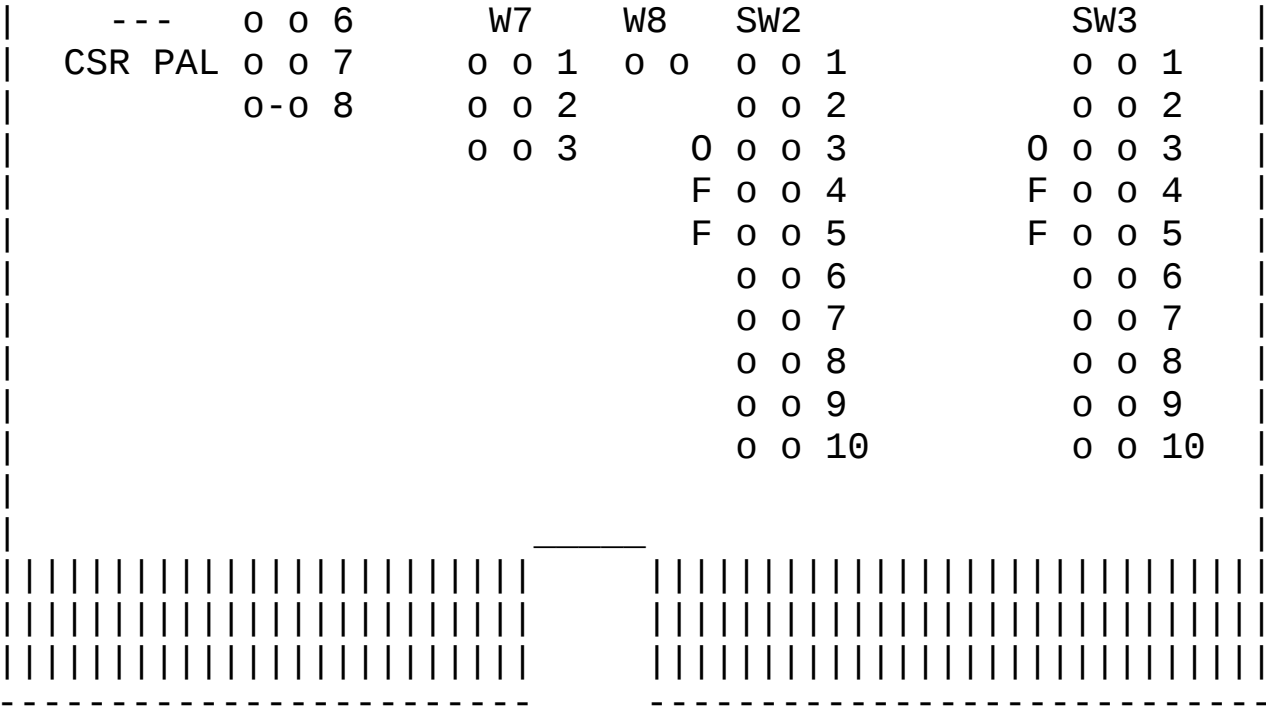
Selecting CSR Address

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](#).

- [RS232 Cable Connection](#)
- [On-Line Format or Tape Monitor Utility](#)
- [Dualhosting for SCSI Clustering](#)
- [Quick Switch Settings](#)
- [On-Board Test Utility](#)

CQD220A/223A Board Layout





CQD-220A/CQD-223A Jumper Assignments

CQD-220A/TM CQD-223A/TM Q-Bus Disk and Tape
CQD-220A/M/T CQD-223A/M/T Q-Bus Disk only or Tape only

Host Adapter ID Selections

Note (F) means factory setting.

SW3-1	SW3-2	SW3-3	Initiator ID
ON	ON	ON	Host adapter ID = 7 highest priority (F)
ON	ON	OFF	Host adapter ID = 6
ON	OFF	ON	Host adapter ID = 5
ON	OFF	OFF	Host adapter ID = 4
OFF	ON	ON	Host adapter ID = 3
OFF	ON	OFF	Host adapter ID = 2

OFF	OFF	ON	Host adapter ID = 1
OFF	OFF	OFF	Host adapter ID = 0 lowest priority

SW3-4	ON	= Enable tape fast search option	(Normal=off)
SW3-5	ON	= Tape Monitor Utility enabled DU255	(Normal=off)
		Disk SCSIformat ON-LINE enabled DU254	
SW3-6	ON	= Async mode for Tape	(Normal=off)
SW3-7	ON	= Async mode for Disk	(Normal=off)
SW3-9	ON	= Enable Disk Truncate Mode (for VMS volume Shadow)	

Switch SW3-10 determine emulation for Single Function CQD-220A/M/T board.

SW3-10	OFF	CQD220A/M/T set for disk
SW3-10	ON	CQD220A/M/T set for tape

CQD-220A Jumper Pin Assignments

W1	OUT	Reserved (F)
W2	IN	SCSI terminator power enabled (F)
W3	OUT	Reserved (F)
W4	1-2 IN	Eprom Size 512-Kbit or 1-Mbit (F)
W5	OUT	0 Wait State for Eprom Cycles (F)
W6-1	OUT	Adaptive DMA enabled (F)
W6-2	OUT	Adaptive DMA Dwell Time enabled (F)
W6-3	W6-4	
IN	IN	0.8-ms DMA dwell time
OUT	IN	1.6-ms DMA dwell time
IN	OUT	3.2-ms DMA dwell time
OUT	OUT	6.4-ms DMA dwell time (F)
W6-5	OUT	Block mode DMA enabled (F)
W6-6	W6-7	Auto-Boot for LSI-11 systems without Boot Roms

OUT	IN	Auto-Bootstrap address = 773000
IN	IN	Auto-Bootstrap address = 771000
OUT	OUT	Auto-Bootstrap disabled (F)
IN	OUT	Auto-Bootstrap address = 775000
W6-8	IN	Reserved (F)
W7-1 to 7-3	OUT	Reserved (F)
W8	1-2	22-Bit addressing (F)
W8	Cut	18-Bit addressing: cut connection 1-2
W9	OUT	Reserved (F)
W10	OUT	Reserved (F)
W11	OUT	Reserved (F)
W12	OUT	Reserved (F)

Note (F) means factory setting.

CQD-220A/M/T (disk only) CSR Addresses

The 31 disk CSR addresses supported by the CQD-220A/M/T (disk only) with the IC P220A08A in U30.

Adr	LSI-11	Micro VAX	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5
1	17772150	200001468	ON	ON	ON	ON	ON
2	17760334	200000DC	ON	ON	ON	ON	OFF
3	17760354	200000EC	ON	ON	ON	OFF	ON
4	17760374	200000FC	ON	ON	ON	OFF	OFF
5	17760340	200000E0	ON	ON	OFF	ON	ON
6	17760344	200000E4	ON	ON	OFF	ON	OFF
7	17760350	200000E8	ON	ON	OFF	OFF	ON
8	17760360	200000F0	ON	ON	OFF	OFF	OFF
9	17760364	200000F4	ON	OFF	ON	ON	ON
10	17760370	200000F8	ON	OFF	ON	ON	OFF
11	17760400	20000100	ON	OFF	ON	OFF	ON
12	17760404	20000104	ON	OFF	ON	OFF	OFF

13	17760410	20000108	ON	OFF	OFF	ON	ON
14	17760414	2000010C	ON	OFF	OFF	ON	OFF
15	17760420	20000110	ON	OFF	OFF	OFF	ON
16	17760424	20000114	ON	OFF	OFF	OFF	OFF
17	17760430	20000118	OFF	ON	ON	ON	ON
18	17760434	2000011C	OFF	ON	ON	ON	OFF
19	17760440	20000120	OFF	ON	ON	OFF	ON
20	17760444	20000124	OFF	ON	ON	OFF	OFF
21	17760450	20000128	OFF	ON	OFF	ON	ON
22	17760454	2000012C	OFF	ON	OFF	ON	OFF
23	17760460	20000130	OFF	ON	OFF	OFF	ON
24	17760464	20000134	OFF	ON	OFF	OFF	OFF
25	17760470	20000138	OFF	OFF	ON	ON	ON
26	17760474	2000013C	OFF	OFF	ON	ON	OFF
27	17760500	20000140	OFF	OFF	ON	OFF	ON
28	17760504	20000144	OFF	OFF	ON	OFF	OFF
29	17760510	20000148	OFF	OFF	OFF	ON	ON
30	17760514	2000014C	OFF	OFF	OFF	ON	OFF
31	*special disk mode	OFF	OFF	OFF	OFF	OFF	ON
32	disable disk	OFF	OFF	OFF	OFF	OFF	OFF

*temporarily set at CSR=17760520

SW3-10 must be set to OFF when the CQD220A/M/T is in disk-only mode

CQD-220A/M/T (tape only) CSR Address Selections

The tape CSR addresses supported by the CQD-220A/M/T (tape only) with the IC P220A08A in U30.

Adr	LSI-11	MicroVAX	SW2-6	SW2-7	SW2-8	SW2-9	SW2-10
1	17774500	20001940	ON	ON	ON	ON	ON
2	17760404	20000104	ON	ON	ON	ON	OFF
3	17760444	20000124	ON	ON	ON	OFF	ON
4	17760504	20000144	ON	ON	ON	OFF	OFF
5	17760544	20000164	ON	ON	OFF	ON	ON
6	17760410	20000108	ON	ON	OFF	ON	OFF
7	17760450	20000128	ON	ON	OFF	OFF	ON

8	17760454	2000012C	ON	ON	OFF	OFF	OFF
9	17760414	2000010C	ON	OFF	ON	ON	ON
10	17760420	20000110	ON	OFF	ON	ON	OFF
11	17760460	20000130	ON	OFF	ON	OFF	ON
12	17760510	20000148	ON	OFF	ON	OFF	OFF
13	17760514	2000014C	ON	OFF	OFF	ON	ON
14	17760520	20000150	ON	OFF	OFF	ON	OFF
15	*special tape select mode		OFF	OFF	OFF	OFF	ON
16	disable tape		OFF	OFF	OFF	OFF	OFF

*temporarily set at CSR=17760760

SW3-10 must be set to ON when the CQD220A/M/T is in tape-only mode

CQD-220A/TM CSR Addresses (Disk)

The 31 disk CSR addresses supported by the CQD-220A/TM with the IC P220A01A in U30. Adr LSI-11 Micro VAX SW2-1 SW2-2 SW2-3 SW2-4 SW2-5 1 17772150 200001468 ON ON ON ON ON 2 17760334 200000DC ON ON ON ON OFF 3 17760354 200000EC ON ON ON OFF ON 4 17760374 200000FC ON ON ON OFF OFF 5 17760340 200000E0 ON ON OFF ON ON 6 17760344 200000E4 ON ON OFF ON OFF 7 17760350 200000E8 ON ON OFF OFF ON 8 17760360 200000F0 ON ON OFF OFF OFF 9 17760364 200000F4 ON OFF ON ON ON 10 17760370 200000F8 ON OFF ON ON OFF 11 17760400 20000100 ON OFF ON OFF ON 12 17760404 20000104 ON OFF ON OFF OFF 13 17760410 20000108 ON OFF OFF ON ON 14 17760414 2000010C ON OFF OFF ON OFF 15 17760420 20000110 ON OFF OFF OFF ON 16 17760424 20000114 ON OFF OFF OFF OFF 17 17760430 20000118 OFF ON ON ON ON 18 17760434 2000011C OFF ON ON ON OFF 19 17760440 20000120 OFF ON ON OFF ON 20 17760444 20000124 OFF ON ON OFF OFF 21 17760450 20000128 OFF ON OFF ON ON 22 17760454 2000012C OFF ON OFF ON OFF 23 17760460 20000130 OFF ON OFF OFF ON 24 17760464 20000134 OFF ON OFF OFF OFF 25 17760470 20000138 OFF OFF ON ON ON 26 17760474 2000013C OFF OFF ON ON OFF 27 17760500 20000140 OFF OFF ON OFF ON 28 17760504 20000144 OFF OFF ON OFF OFF 29 17760510 20000148 OFF OFF OFF ON ON 30 17760514 2000014C OFF OFF OFF ON OFF 31 *special disk mode OFF OFF OFF OFF ON 32 disable disk OFF OFF OFF OFF OFF *temporarily set at CSR=17760520

CQD-220A/TM CSR Address Selections (Tape)

Tape CSR addresses supported by the CQD-220A/TM with the IC P220A01A in U30.

Adr	LSI -11	MicroVAX	SW2 -6	SW2 -7	SW2 -8	SW2 -9	SW2 -10
1	17774500	20001940	ON	ON	ON	ON	ON
2	17760404	20000104	ON	ON	ON	ON	OFF
3	17760444	20000124	ON	ON	ON	OFF	ON
4	17760504	20000144	ON	ON	ON	OFF	OFF
5	17760544	20000164	ON	ON	OFF	ON	ON
6	17760410	20000108	ON	ON	OFF	ON	OFF
7	17760450	20000128	ON	ON	OFF	OFF	ON
8	17760454	2000012C	ON	ON	OFF	OFF	OFF
9	17760414	2000010C	ON	OFF	ON	ON	ON
10	17760420	20000110	ON	OFF	ON	ON	OFF
11	17760460	20000130	ON	OFF	ON	OFF	ON
12	17760510	20000148	ON	OFF	ON	OFF	OFF
13	17760514	2000014C	ON	OFF	OFF	ON	ON
14	17760520	20000150	ON	OFF	OFF	ON	OFF
15	17760550	20000168	ON	OFF	OFF	OFF	ON
16	17760554	2000016C	ON	OFF	OFF	OFF	OFF
17	17760560	20000170	OFF	ON	ON	ON	ON
18	17760604	20000184	OFF	ON	ON	ON	OFF
19	17760610	20000188	OFF	ON	ON	OFF	ON
20	17760614	2000018C	OFF	ON	ON	OFF	OFF
21	17760620	20000190	OFF	ON	OFF	ON	ON
22	17760644	200001A4	OFF	ON	OFF	ON	OFF
23	17760650	200001A8	OFF	ON	OFF	OFF	ON
24	17760654	200001AC	OFF	ON	OFF	OFF	OFF
25	17760660	200001B0	OFF	OFF	ON	ON	ON
26	17760704	200001C4	OFF	OFF	ON	ON	OFF
27	17760710	200001C8	OFF	OFF	ON	OFF	ON
28	17760714	200001CC	OFF	OFF	ON	OFF	OFF
29	17760744	200001E4	OFF	OFF	OFF	ON	ON
30	17760750	200001E8	OFF	OFF	OFF	ON	OFF
31	*special tape		OFF	OFF	OFF	OFF	ON

	select mode					
32	disable tape	OFF	OFF	OFF	OFF	OFF

*temporarily set at CSR=17760760

On-Board Utility

The [Utility](#) can be accessed through the system console or the RS-232 Port on the CQD-220A or CQD-223A. The CQD-220A uses a [10-pin RS-232 cable](#). The CQD-223A uses the same RS-232 MMJ cable used on the MicroVAX-3.

To access the On-Board Utility through the RS-232 port, plug in the cable and power-on or Restart the computer. The On-Board Utility will display on the screen. Be sure to set the terminal to 9600 baud, 8 bit data, and no parity.

The above information can be changed without notice.

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