

Installation Manual for the DCQ-2400

Qbus IDV11-A Controller (M5026)



Document Number MNL_DCQ-2400_I1

Revision A, April 2016

The material in this manual is for informational purposes only and is subject to change without notice.

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Chapter 1: Installation

This chapter lists the steps involved in installing the DCQ-2400 hardware. The DCQ-2400 module is shown in Figure 1-1.



Figure 1-1: DCQ-2400 Controller

The DCQ-2400 controller is factory configured and ready to install. The Qbus address and vector are set to the following:

Device Address	771400 ₈
Interrupt Vector	400 ₈
Priority Level	4

1. Configure the DCQ-2400 controller

Device Address Switches

The standard base device address assigned for the DCQ-2400 is 771400. The module is configured at the factory for this address. If an additional module is used in a system, the second DCQ-2400 would be configured for 771410.

When selecting addresses other than the standard addresses, refer to the *Microcomputer Interfaces Handbook* from Digital to avoid possible I/O device address conflicts.

Switchpack E29 is used to establish a base device register address. Figure 1-2 shows the switch setting for the factory setting.

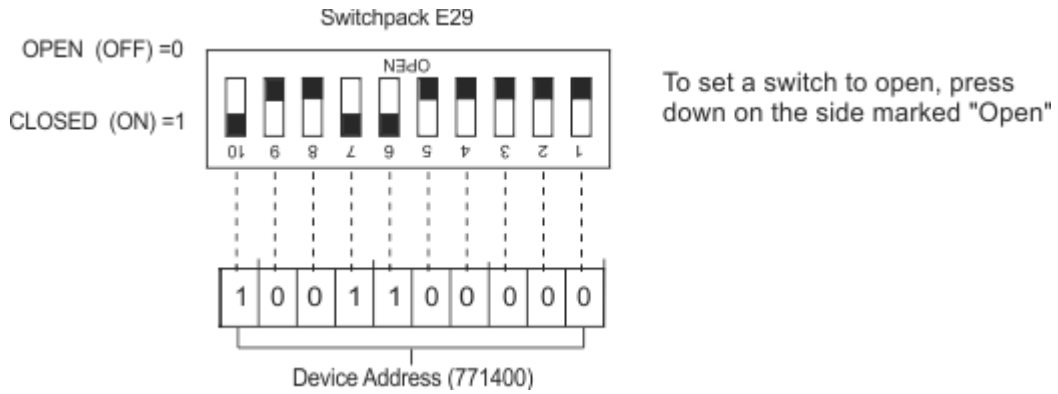


Figure 1-2: Device Address Switch Setting

Interrupt Vector Address Assignment

Vector addresses 0-1774₈ are reserved for Qbus system users. The DCQ-2400 is assigned vector address 0400₈. Use switchpack E24 to select the interrupt vector address for the DCQ-2400 as shown in Figure 1-3.

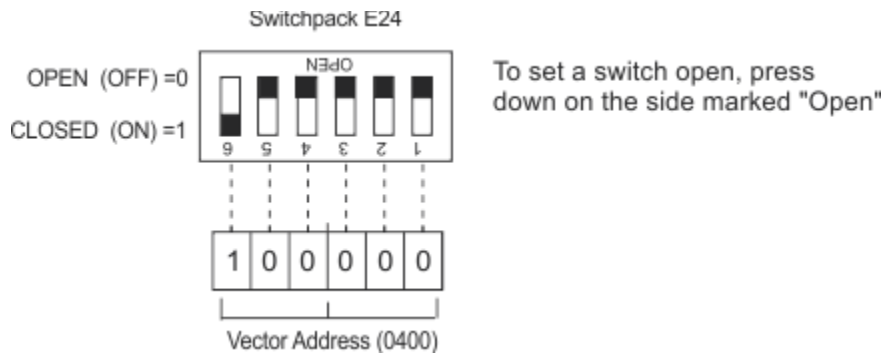


Figure 1-3: DCQ-2400 Vector Address Format

Priority Level

The standard priority level for the DCQ-1400 is BIRQ4. Jumper W1 or W2 can be used to change the priority level to BIRQ5 or BIRQ6.

Priority Level	Jumper Setting
BIRQ4	Jumpers out (factory setting)
BIRQ5	W1 Installed
BIRQ6	W2 Installed
BIRQ7	Not supported

Table 1-1: Priority Level Jumper Settings

2. Open the system enclosure and select a slot

- A. Shut down the system software as described in the instructions that came with your software.
- B. Remove power to the system unit.
- C. Open the enclosure as described in the manuals that came with the unit.
- D. Select a slot. The DCQ-2400 can be installed in any LSI-11 or MicroVAX backplane Qbus slot.

Note

Use the anti-static wrist strap supplied with your system unit to prevent damage to the equipment. Clip the free end of the strap to the metal frame of the enclosure.

3. Install and cable the DCQ-2400

This section describes how to install the DCQ-2400 controller into a Qbus BA23, BA123, or HD96XX cabinet or an expansion chassis.

A. Install the controller

The DCQ-2400 can be installed in any available dual-width Qbus backplane slot. A dual-width Qbus controller must not be installed into a backplane C-D slot. Consult your computer system manual for the backplane Qbus slot layout.

- 1) If you have not already, bring the system down and remove ac power to the system or expansion chassis.

- 2) Verify that any vacant slots between the designated slot and other Qbus controllers have a Qbus bus grant module installed.
- 3) Insert the module into the slot as shown in Figure 1-4. Take care to ensure that the connectors are clear of any adjacent modules. Allow adequate room to connect and route the interconnect cables.

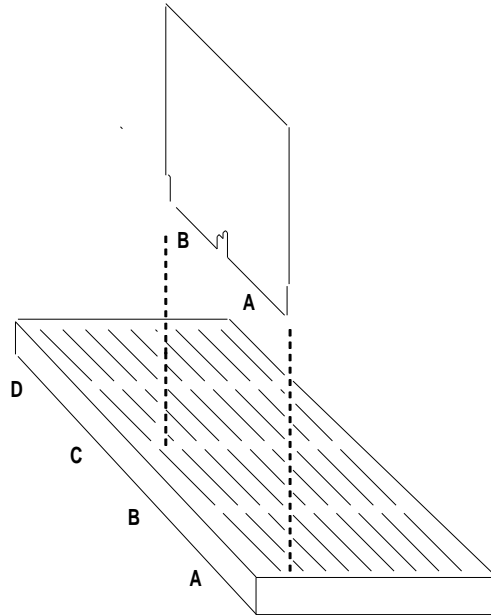


Figure 1-4: Installing the DCQ-2400 into an LSI-11 / MicroVAX II System

B. Install the panels into the system bulkhead

Remove a blank “A” size panel in the I/O bulkhead. Install the panel into the bulkhead as shown in Figure 1-5. Note: Logical does not supply I/O bulkhead panel and cabling.

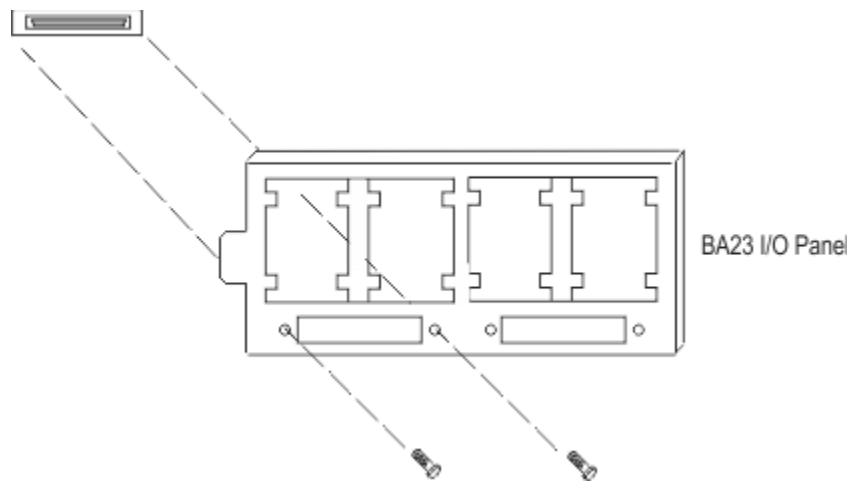


Figure 1-5: Mounting the Panel into the Qbus System Bulkhead

C. Install cables from the panels to the controller

Cable the DCQ-2400 controller to the panel. Align the triangle on the cable connector with the triangle of the panel connector. See Figure 1-6

Pin assignments for the connector are listed in Appendix A.

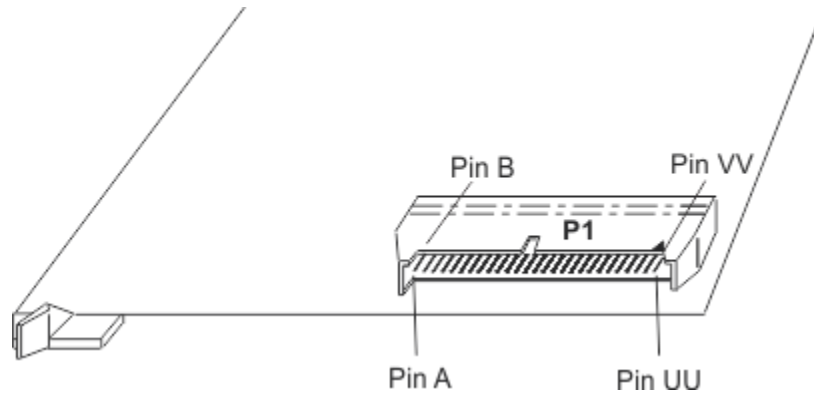


Figure 1-6: DCQ-2400 I/O Connector

Chapter 2: General Description

Product Description

The DCQ-2400 is a form, fit and function equivalent for the Digital IDV11-A (M5026). Like the IDV11-A, the DCQ-2400 is an isolated digital input module for the Qbus. It accepts up to 16 single optically isolated inputs used for monitoring voltages where noise immunity or common mode rejection is important. The 16 bit data are read by programs and transferred to the processor or memory.

The input line bit 15 is selectable by program and generates an interrupt at the leading edge (ON-going signal) and/or at the trailing edge (OFF-going signal).

The standard input range is 24 to 48 Vdc. In this range, the input switching delay can be changed by a programmable contact bounce eliminator to three different values.

In addition, a programmable low level input range for low frequency, low power 5 Vdc signals and usable for TTL or MOS inputs is selectable.

Key Features

- 16 single, optically isolated inputs
- Interrupt capability on input line bit 15
- Interrupt generating signal edge is programmable
- Programmable contact bounce eliminator
- Standard input range from 24 to 48 Vdc
- Programmable low level range for 5 Vdc signals
- Module identification code readable by program

Compatibility

- Connector, signal and diagnostic compatible with Digital I/O test connector module
- MDM diagnostic NAIDAA compatible
- XXDP diagnostic CZIXVxx compatible
- Qbus standard interface circuits (DS8641)
- User interface components are identical to the original design or electrical equivalents
- The internal circuitry is equivalent to the original Digital design but uses an FPGA to replace the individual gate-level components
- Follows all Qbus rules and specifications as outlined in Digital's *LSI-11 Bus Spec*, DEC Std 160 17-SEP-81.
- Qbus interrupt priority level jumper compatible (W1, W2)
- Qbus address and vector switch compatible including switch location and settings

Specifications

Physical	
DCQ-2400 Controller	Dual-width Qbus card measuring 13.3 cm by 21.3 cm
User Connector (J1)	40-pin 3M header with retainer latches
Module Extractors	Single extractor, identical location to IDV11-A
Maintenance LEDs (D1) Two LEDs, one green and one red	Green - Software controlled Red - Indicates module error
Electrical	
DCQ-2400	350 mA @ 5.0 volts DC, ±12 volts DC not used
Bus Loading	1 DC load, 2 AC loads
Qbus	
MODE Register ID	004 octal
Device Address (E29)	Switch selectable over the 4KW address range. Occupies a 4 word address with one word unused. Identical to the IDV11-A.
Interrupt Vector (E24)	Switch selectable from 000 to 770 octal. Identical to the IDV11-A.
Priority Level Select (W1, W2)	BR4, Jumper selectable to BR5 or BR6. Identical to the IDV11-A.
Input Circuits	
Number of Inputs	16, two-wire optocoupler
Standard Input Range	24 to 48 Vdc at 2.6 to 5.2mA
ON Voltage	11v minimum
OFF Voltage	4.2V maximum
Input Voltage	60V maximum
Contact Bounce Eliminator	
Default Delay	5 millisec ±30%
Programmable Delays	500 usec ±60% or 10 msec ±20%
Low Level Input – Program Selectable	
ON Voltage	4.2v minimum @ 0.46mA
Frequency	50Hz on 50% duty cycle
Input Voltage	60V maximum
Hysteresis	Approximately 0.55V for both input ranges
Isolation Voltage	Inputs to Computer GND 1000Vdc or peak ac
Interchannel Isolation	250Vdc or peak ac
Environmental	
Operating Conditions	
Temperature	10° to 32° C
Relative Humidity	20% to 95% non-condensing
Storage Conditions	
Temperature	-40° to 66° C
Relative Humidity	10% to 90% non-condensing

Appendix A: User Connector

This appendix lists the pin assignments for the interface connector located at P1 on the board. The connector is a 40-pin male box header, 3M part number N3432-5302RB.

IDV11-A Connector P1 (INPUT)

Berg Pin	3M Pin	Signal	Berg Pin	3M Pin	Signal
A	40		B	39	+5V_MAINT
C	38		D	37	IN0/1 (Bit 0)
E	36	IN0/2 (Bit 0)	F	35	IN1/1
H	34	IN1/2	J	33	IN2/1
K	32	IN2/2	L	31	IN3/1
M	30	IN3/2	N	29	IN4/1
P	28	IN4/2	R	27	IN5/1
S	26	IN5/2	T	25	IN6/1
U	24	IN6/2	V	223	IN7/1
W	22	IN7/2	X	21	IN8/1
Y	20	IN8/2	Z	19	IN9/1
AA	18	IN9/2	BB	17	IN10/1
CC	16	IN10/2	DD	15	IN11/1
EE	14	IN11/2	FF	13	IN12/1
HH	12	IN12/2	JJ	11	IN13/1
KK	10	IN13/2	LL	9	IN14/1
MM	8	IN14/2	NN	7	IN15/1 (Bit 15)
PP	6	IN15/2 (Bit 15)	RR	5	
SS	4	Key (no pin)	TT	3	+5VDC_OUT
UU	2		VV	1	GND



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