

Installation Manual for the DCQ-2500

Qbus IDV11-C Controller (M8005)



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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-2500 hardware. The DCQ-2500 module is shown in Figure 1-1.



Figure 1-1: DCQ-2500 Controller

1. Configure the DCQ-2500 controller

The DCQ-2500 controller is factory configured and ready to install. The Qbus address is factory set to the following:

Device Address 771000₈

The paragraphs below describe how to set the device address for multiple devices.

The standard base device address for the DCQ-2500 is 771000 octal. The module is configured at the factory for this address. If an additional module is used in a system, the second DCQ-2500 would be configured for 771010.

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 E33 is used to establish a base device register address. Figure 1-2 shows the switch settings as set at the factory.

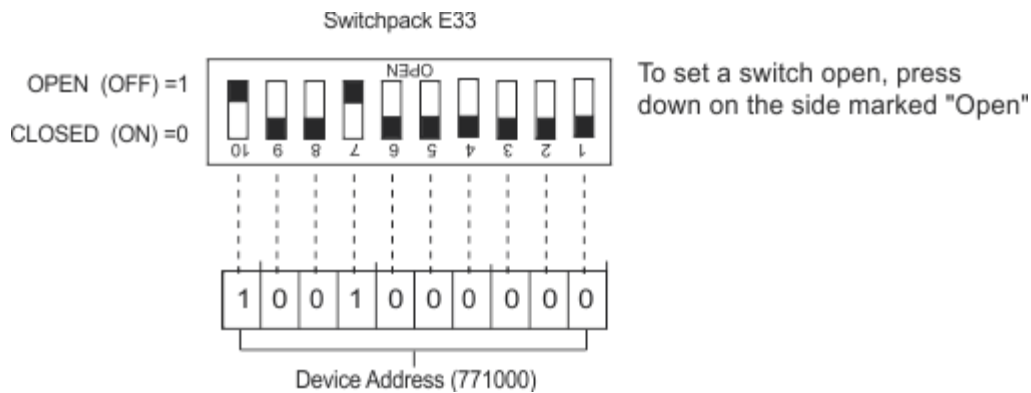


Figure 1-2: Device Address Switch Setting

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-2500 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-2500

This section describes how to install the DCQ-2500 controller into a MicroVAX II, BA23, BA123, or HD96XX cabinet or an expansion chassis.

A. Install the controller

The DCQ-2500 can be installed in any available dual-width slot of a Qbus backplane. 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 1-3. Take care to ensure that the connectors are clear of any adjacent modules. Allow adequate room to connect and route the interconnect cables.

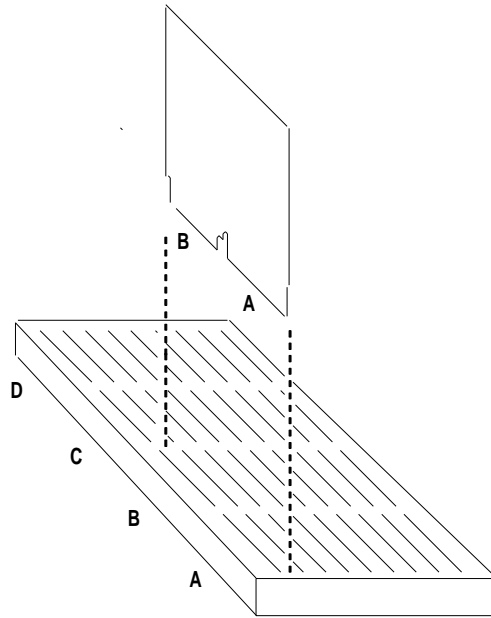


Figure 1-3: Installing the DCQ-2500 into an LSI-11 / MicroVAX II System

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 1-4. Note: Logical does not supply I/O bulkhead panel and cabling.

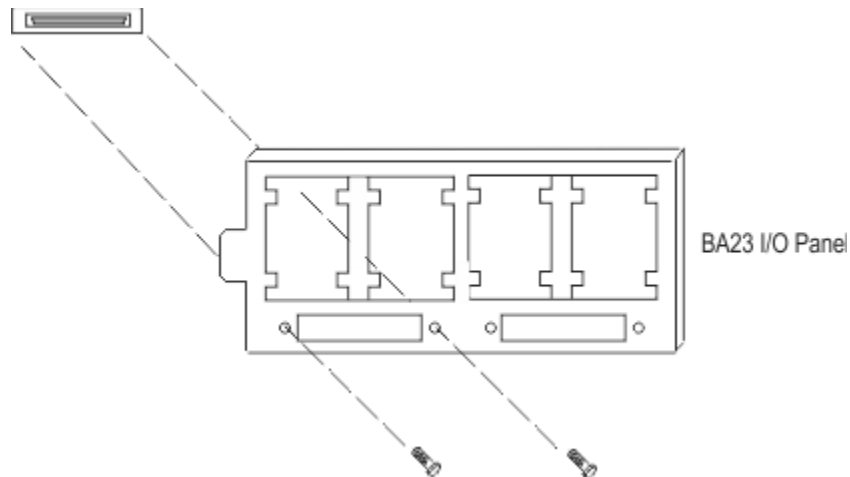


Figure 1-4: Mounting the Panel into the Qbus System Bulkhead

C. Install cables from the panel to the controller

Cable the DCQ-2500 controller to the panel. Align the triangle on the cable connector with the triangle of the panel connector. See Figure 1-5.

Pin assignments for the connector are listed in Appendix A.

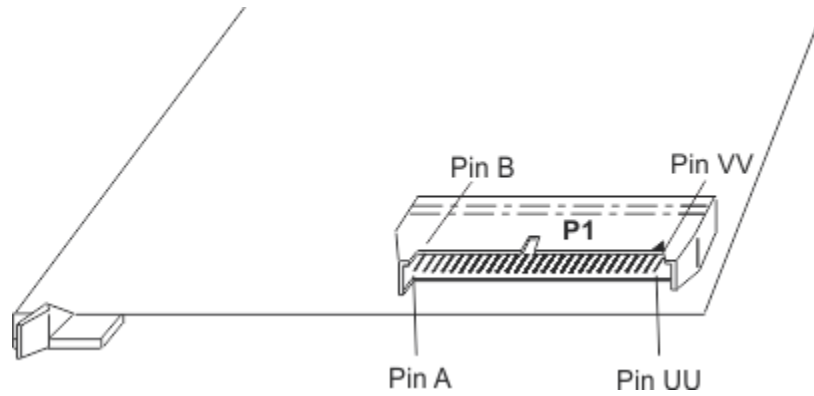


Figure 1-5: DCQ-2500 I/O Connector

Chapter 2: General Description

Product Description

The DCQ-2500 is a form, fit and function equivalent for the Digital IDV11-C (M8005). Like the IDV11-C, the DCQ-2500 is a relay output module for the Qbus. It provides 16 latched-reed contact outputs. The outputs are two-wire normally open contacts, used for controlling solenoids, relays, indicators, etc., where isolation from the controlled process must be maintained. The 16-bit output data are written by programs and the output data register can be read back.

Key Features

- 16 normally open reed contact outputs
- Two-wire connection per output
- Capable of driving up to 60 volt dc (or peak ac) 1A; Pmax. 30W/60VA
- Contact protection
- Read/write output data register
- Module identification code readable by program

Compatibility

- Connector, signal and diagnostic compatible with Digital I/O test connector module
- MDM diagnostic NAIDAC compatible
- XXDP diagnostic CZIXVxx Compatible
- Qbus standard interface circuits (DS8641)
- User interface components are identical to the original design or electrical equivalent
- The internal circuitry is identical 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 address switch compatible including switch location and settings

Specifications

| Physical | |
|---|---|
| DCQ-2500 Controller | Dual-width Qbus card measuring 13.3 cm by 21.3 cm |
| User Connector (J1) | 40-pin Berg header with retainer latches or equivalent |
| Module Extractors | Single extractor, identical location to IDV11-C |
| Maintenance LEDs (D1) Two LEDs, one green and one red | Green - Software controlled Red - Indicates module error |
| Electrical | |
| DCQ-2500 | 340 mA @ 5.0 volts DC, ±12 volts DC not used |
| Bus Loading | 1 DC load, 2.1 AC loads |
| Qbus | |
| MODE Register ID | 042 octal |
| Device Address (E33) | Switch selectable over the 4KW address range. Occupies a 4 word address with two words unused. |
| Interrupt Vector | Not applicable |
| Output Circuits | |
| Number of Outputs | 16 two-wire reed relay contacts |
| Contact Form | SPST normally open contact with contact protection |
| Contact Resistance | Typically 0.2 ohm across the output pins |
| Switching Voltage | 60 Vdc (or peak ac) maximum |
| Switching Current | 1A maximum; Note: above 0.2A life expectancy is de-rated |
| Maximum Wattage | 30W dc or 60VA ac |
| Response Time | Typically 1 millisec |
| Life Expectancy | >100,000,000 operating at 0.2A/12V |
| Isolation Voltage | Inputs to Computer GND 1000Vdc or peak ac |
| Interchannel Isolation | 250Vdc or peak ac |
| Switching Rate | 400 Hz maximum |
| Logic '1' output | Contact closed |
| 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 header, 3M part number N3432-5302RB.

IDV11-C Connector P1 (OUTPUT)

| Berg Pin | 3M Pin | Signal | Berg Pin | 3M Pin | Signal |
|----------|--------|------------------|----------|--------|------------------|
| A | 40 | GND | B | 39 | Key (no pin) |
| C | 38 | | D | 37 | OUT0/1 (Bit 0) |
| E | 36 | OUT0/2 (Bit 0) | F | 35 | OUT1/1 |
| H | 34 | OUT1/2 | J | 33 | OUT2/1 |
| K | 32 | OUT2/2 | L | 31 | OUT3/1 |
| M | 30 | OUT3/2 | N | 29 | OUT4/1 |
| P | 28 | OUT4/2 | R | 27 | OUT5/1 |
| S | 26 | OUT5/2 | T | 25 | OUT6/1 |
| U | 24 | OUT6/2 | V | 223 | OUT7/1 |
| W | 22 | OUT7/2 | X | 21 | OUT8/1 |
| Y | 20 | OUT8/2 | Z | 19 | OUT9/1 |
| AA | 18 | OUT9/2 | BB | 17 | OUT10/1 |
| CC | 16 | OUT10/2 | DD | 15 | OUT11/1 |
| EE | 14 | OUT11/2 | FF | 13 | OUT12/1 |
| HH | 12 | OUT12/2 | JJ | 11 | OUT13/1 |
| KK | 10 | OUT13/2 | LL | 9 | OUT14/1 |
| MM | 8 | OUT14/2 | NN | 7 | OUT15/1 (Bit 15) |
| PP | 6 | OUT15/2 (Bit 15) | RR | 5 | |
| SS | 4 | | TT | 3 | +5VDC_OUT |
| UU | 2 | | VV | 1 | GND |



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