DQP-3100
IEQ11 Compatible Option Module
for NuVAX and NuPDPq
Owner's Manual

DQP-3100-OM
Revision C

Logical®

Owner's Manual for the

DQP-3100

IEQ11 Compatible Option Module for NuVAX and NuPDPq

Logical®

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1 Installation

This chapter lists the steps involved in installing the DQP-3100 hardware.

The DQP-3100 module is shown in Figure 1-1. Refer to this figure as you follow the steps outlined below.

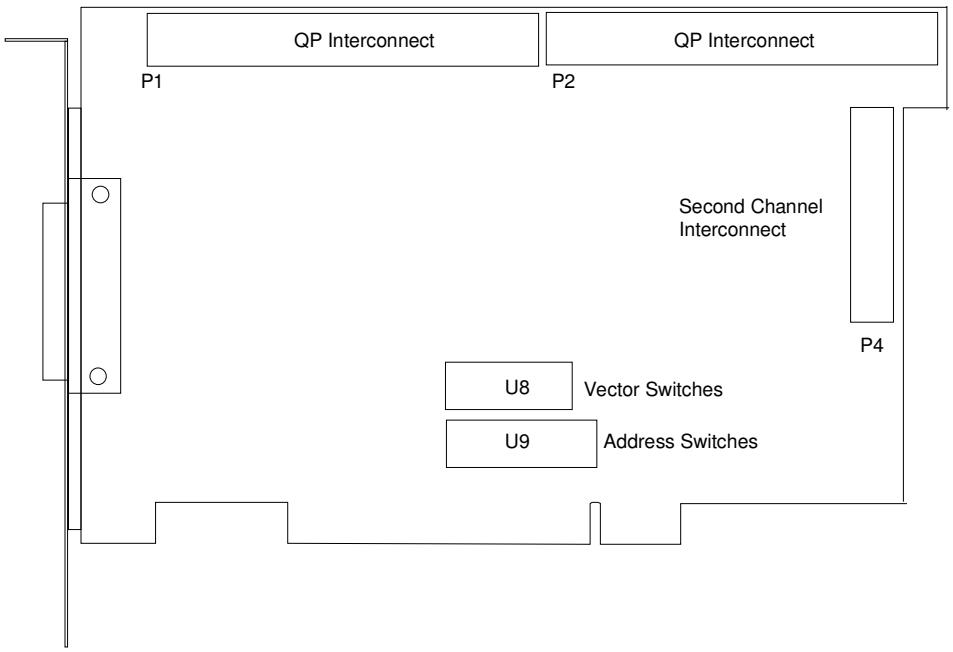


Figure 1-1: DQP-3100 Module

1. Set the switches on the DQP-3100 controller

The DQP-3100 contains two ten-pin DIP switch-packs that allow the user to select device and interrupt addresses.

Device Address Selection

Use switch-pack U9 to select the device address for the DQP-3100 as shown in Figure 1-2. Table 1-1 lists the registers and their Qbus address. For the standard address of 17764100, switch positions 1, 3, 4, 5, 6, 8, and 9 are set open and switch positions 2 and 7 are set closed. Switch position 10 is not used.

Register	Mnemonic	Octal Address
IEEE Status Register	ISR 1 and 2	764100
IEEE Interrupt Register	IIR 1 and 2	764102
IEEE Command Resister	ICR 1 and 2	764104
IEEE Data Register	IDR 1 and 2	764106
Control and Status	CSR 1 and 2	764110
Bus Address Register	BAR 1 and 2	764112
Byte Count Register	BCR 1 and 2	764114
Match Character Register	MCR 1 and 2	764116

Table 1-1: Register Qbus Addresses

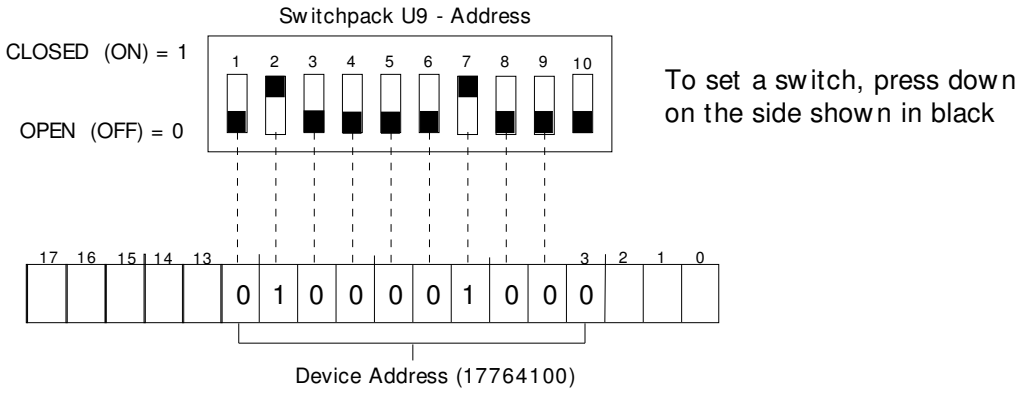


Figure 1-2: Device Address Switch Settings

Interrupt Vector Address Selection

Vector addresses 0-1774_8 are reserved for Q-bus system users. The DQP-3100 is assigned vector address 0300_8.

Use switch-pack U8 to select the interrupt vector address for the DQP-3100 as shown in Figure 1-3. For the standard vector of 300, switch positions 1, 4, 5, and 6 are set open; positions 2 and 3 are set closed. Switch position 8 is not used.

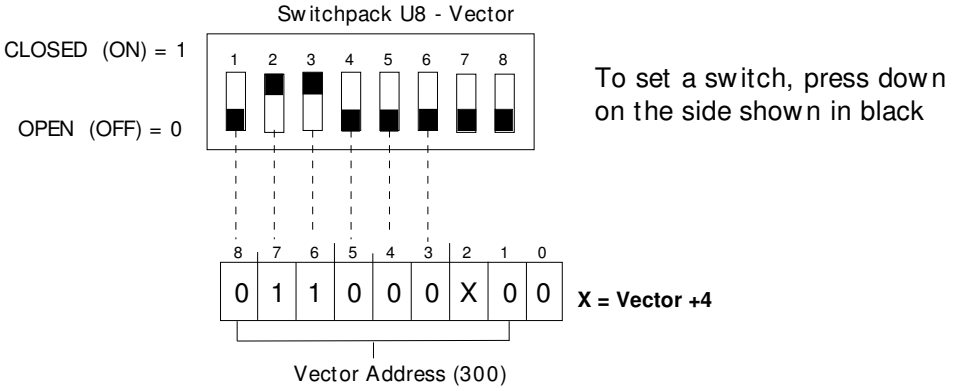


Figure 1-3: Vector Address Switch Settings

2. Install the CPX-3104

If you are planning to use only one IEC or IEEE port, skip this step and proceed to step 3. For two-line operation cable the CPX-3104 to the DQP-3100 controller as shown in Figure 1-4. The cable connects to P4 with the cable's red stripe toward the P4 designation on the board. We recommend that you install the CPX-3104 into the AGP slot space next to slot 6.

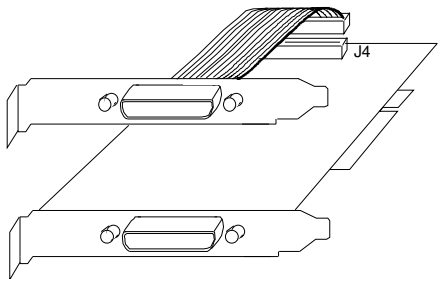


Figure 1-4: Cabling CPX-3104 to the DQP-3100

3. Open system enclosure

To open the NuVAX or NuPDPq system enclosure:

A. If the system is running, shut down the system software as described in the system manual.

B. Remove power to the system unit.

C. Open the enclosure by removing two thumb screws and sliding the cover towards the rear and lifting. Replace the two thumb screws into the chassis rear panel.

D. Remove the PCI card retainer rail by first lifting the black release knob and then lifting the rail up and out.

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.

4. Install the DQP-3100 option module

The DQP-3100 is installed in an option slot next to the bus adapter or other option module.

A. If the back of the expansion chassis or system unit has a metal cover plate over the opening of the slot you have selected, remove the anchor screw that holds the cover in place then slide the cover out of the slot.

B. Position the DQP-3100 with the gold fingers on the edge of the module next to the PCI connector of the selected slot. Gently rock the module into the PCI connector while you fit the metal bulkhead into the slot opening. Be sure that the connectors are firmly seated.

Note: If the enclosure contains RFI clips along the slot, take care when inserting the module not to push the clips out of alignment.

C. Secure the DQP-3100 using the anchor screw that you removed in Step A. Retain the cover plate for future use.

D. If two ports are required, install the CPX-3104 in like manner. We recommend that you install the CPX-3104 into the AGP slot space next to slot 6.

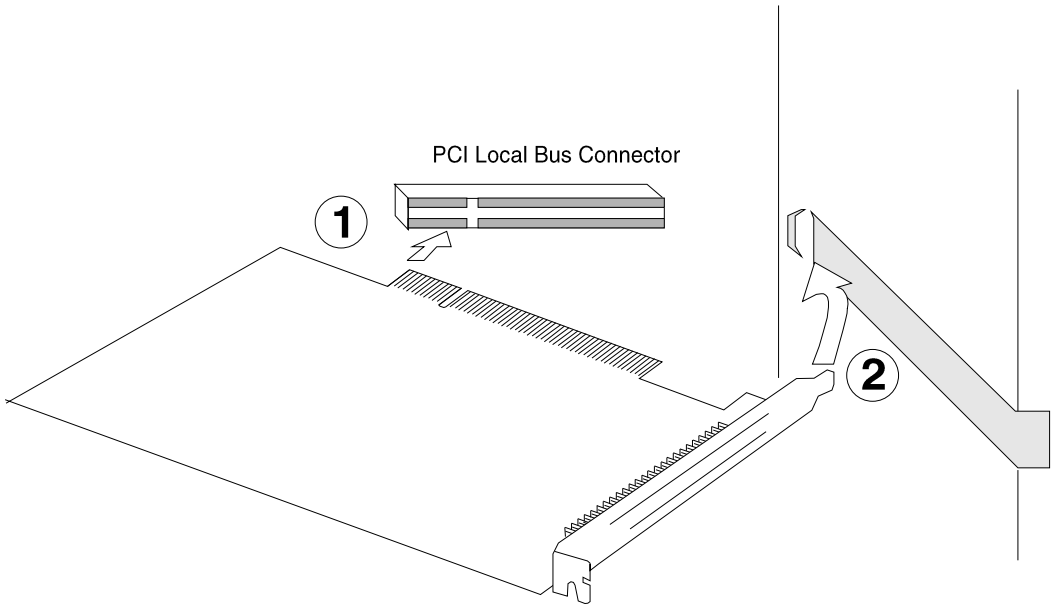


Figure 1-5: Inserting the Board into the PCI Slot

E. Remove the anti-static wrist strap, replace the cover on the enclosure and secure.

You are now ready to connect the data cables.

5. Cable the DQP-3100 to the bus adapter

Use the supplied CAB-5011-1 cable to connect the first DQP-3100 to the BQP-230x or BPQ-230x bus adapter as shown in Figure 1-6. Additional DQP-3100 controllers are added using the CAB-5011-1 as shown in the figure. Align the arrow on the connectors with the red line on the cable.

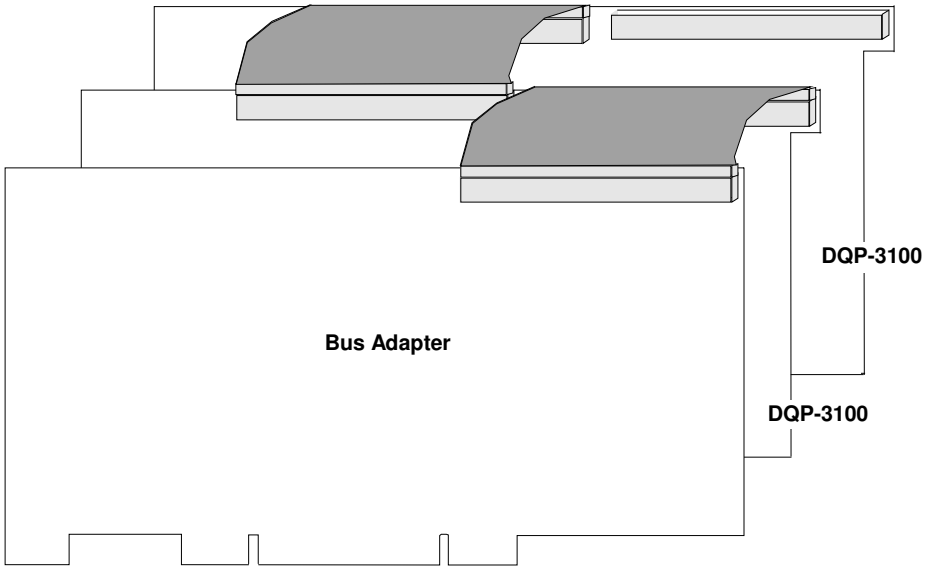
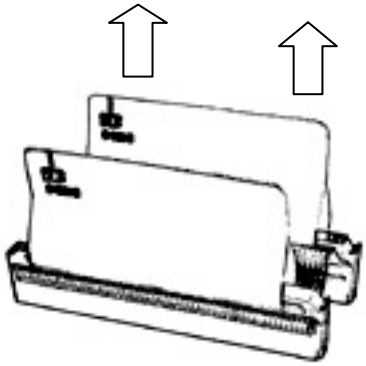


Figure 1-6: Cabling the DQP-3100 and the Bus Adapter

NOTE:
Use care when removing the 60-pin ribbon cable. Use the pull tab and pull the cable straight out from the connector to avoid damage to the connector.



6. Install CAB-3104 for IEEE488

For IEEE488 operation, use adapter cable CAB-3104 to connect to the IEEE488 data cables. The CAB-3104 is shown in Figure 1-7.

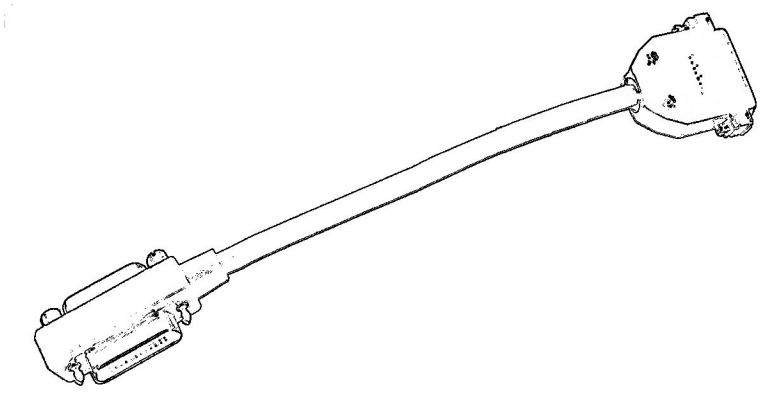


Figure 1-7: CAB-3104 IEEE488 Adapter Cable

7. Power up and verify the NuVAX system

For PDPq installations, skip to step 8.

This step describes how to verify installation in a NuVAX system.

The following conventions are used in this manual:

`output`	In examples, computer output is shown in this type.
`user input`	In examples, user input is shown in bold type.

A. The DQP-3100 is supplied with a CAB-3101-36 loop-back cable to allow you to run Digital's MDM diagnostics as described below. Connect loop-back cable CAB-3101-36 between the DQP-3100 port P0 and DQP-3100 port P1 when running the module and system level diagnostics.

B. NuPDP is shipped and configured to use a DEC standard, VT100-style terminal and requires CAB-2009-18 or CAB-2010-18 as an adapter cable between the NuPDP serial port and the DEC terminal cable. Terminal emulators or simple character terminals can plug directly into the NuPDP DE9 COM port using a standard cross-over cable and do not require an adapter cable.

C. Open the drive access door and ensure that the system drive cartridge is locked. Keys to the cartridge are supplied with the system.

D. Power up the system. The console displays:

```
Type y to boot XXDP else the OS boots in 4 seconds [Y,N]?Y

BOOTING UP XXDP-XM EXTENDED MONITOR

XXDP-XM EXTENDED MONITOR - XXDP V2.5
REVISION: F0
BOOTED FROM DL0
124KW OF MEMORY
NON-UNIBUS SYSTEM

RESTART ADDRESS: 152000
TYPE "H" FOR HELP !
.
```

E. Run an individual MDM device test

Using the Webserver, stop the emulator, select the MDM configuration, and restart the emulator.

After about 20 seconds the MDM start-up banner appears and then prompts for the date and time. It is not critical to set the date and time so just press the return key **[cr]**.

Next it will ask for the mode of operation, type: **1 [cr]** to select the 'Menu Mode.'

At the ‘Main Menu’ type: **4 [cr]** to enter the ‘Service Menu.’

At the ‘Service Menu’ type: **1 [cr]** to enter the ‘Set test and message Menu.’

At the ‘Set test and message Menu’ type: **3 [cr]** to enable ‘Stop testing on error.’
Next type **0 [cr]** to return to the ‘Service Menu.’

At the ‘Service Menu’ type: **3 [cr]** to enable the ‘Device Menu.’
After all device drivers are loaded enter a **[cr]** and a device list is displayed.

Review the list of devices to determine which you wish to test.
Type the number associated with the device and a return to enter the device test menu.

Type: **2[cr]** to run the device functional tests.
Install a loop-back test cable, if requested, and type [cr] to continue.
After all tests have run or an error occurs, type: 0[cr] to return to the test menu.

Type: **3[cr]** to run the device exerciser test.
Install a loop-back test cable, if requested, and type [cr] to continue.

Allow all devices to make 10 passes before stopping.
This exerciser runs until a **Ctrl C** is typed or an error occurs.
Type: **[cr]** to return to the test menu.

F. Run the MDM System Exerciser

Using the Webserver, stop the emulator, select the MDM configuration, and restart the emulator.

After about 20 seconds the MDM start-up banner appears and then it prompts for the date and time. It is not critical to set the date and time so just press the return key **[cr]**.

Next it will ask for the mode of operation, type: **1 [cr]** to select the ‘Menu Mode.’

At the ‘Main Menu’ type: **4 [cr]** to enter the ‘Service Menu.’

At the ‘Service Menu’ type: **1 [cr]** to enter the ‘Set test and message Menu.’

At the ‘Set test and message Menu’ type: **3 [cr]** to enable ‘Stop testing on error.’
Next type **0 [cr]**, to return to the ‘Service Menu’.

At the ‘Service Menu’ type: **3 [cr]** to enable the ‘Device Menu.’

After all device drivers are loaded enter a **[cr]** and a device list is displayed.

Review the list of devices to determine which you do not wish to include in the testing.

It is best to disable the testing of **all mass storage devices** preventing the accidental destruction of important files.

Type the number of a device to disable and a return, then type: **1 [cr]** to disable the testing.
Next type **0 [cr]**, to return to the 'Device Menu'.

When you have completed device disabling, type: **0 [cr]** this will return you to the 'Service Menu'.

At the 'Service Menu' type: **2 [cr]** to start the system exerciser. The program will pause and wait for confirmation for any device that requires that a loop-back be installed. Type **[cr]** to confirm the request or type a **Ctrl C** to stop the process and return to the 'Service Menu'. After loop-back confirmation completes, each device will perform a function test and then all devices will have their exercisers started and they will run concurrently until an error is encountered or testing is terminated by typing a **Ctrl C**.

8. Power up and verify the NuPDPq system

This step describes how to verify installation in a PDPq system.

The following conventions are used in this manual:

`output`	In examples, computer output is shown in this type.
`user input`	In examples, user input is shown in bold type.

A. The DQP-3100 is supplied with a CAB-3101-36 loop-back cable to allow you to run Digital's XXDP diagnostics as described below. Connect loop-back cable CAB-3101-36 between the DQP-3100 port P0 and DQP-3100 port P1 when running the module and system level diagnostics.

B. NuPDP is shipped and configured to use a DEC standard, VT100-style terminal and requires CAB-2009-18 or CAB-2010-18 as an adapter cable between the NuPDP serial port and the DEC terminal cable. Terminal emulators or simple character terminals can plug directly into the NuPDP DE9 COM port using a standard cross-over cable and do not require an adapter cable.

C. Open the drive access door and ensure that the system drive cartridge is locked. Keys to the cartridge are supplied with the system.

D. Power up the system. The console displays:

```
Type y to boot XXDP else the OS boots in 4 seconds [Y,N]?Y

BOOTING UP XXDP-XM EXTENDED MONITOR

XXDP-XM EXTENDED MONITOR - XXDP V2.5
REVISION: F0
BOOTED FROM DL0
124KW OF MEMORY
NON-UNIBUS SYSTEM

RESTART ADDRESS: 152000
TYPE "H" FOR HELP !
.
```

E. Run the diagnostic as follows.

The system boots and displays an XXDP MONITOR NOTICE.

Enter: **X <cr>** to load the Extended Monitor.
After the monitor loads, the system displays a "." prompt.

Enter: **R ZIEAD0 <cr>**
The diagnostic begins and displays the following:

DRSXM-B0

```
CZIEA-C-0
IEU11/IEQ11 DIAGNOSTIC
UNIT IS IEU11 FOR UNIBUS \IEQ11 FOR Q-BUS
RESTART ADDRESS 142060
DR>
```

Enter: **START/FLAGS:HOE<cr>**
The system responds with:

Change HW (L)

Enter **Y<cr>**

The system responds with:
UNITS (D)

Enter: **1<cr>**

The system responds with:

unit 0

DEVICE ADDRESS
(0) 164100?

-

Enter: **<cr>**

The system responds with:

VECTOR ADDRESS
(0) 270 ?

Enter: **<cr>** or actual vector **<CR>**

The system responds with:

PRIORITY LEVEL (FOR LSI WITH FIXED PRI. TYPE 4) (0) 6 ?

Enter: **4<cr>**

The system responds with:

DEVICE PRIMARY ADDRESS CH. 1 (0) 0 ?

Enter: **<cr>**

The system responds with:

DEVICE PRIMARY ADDRESS CH. 2 (0) 1 ?

Enter: **<cr>**

The system responds with:

IS TEST CABLE IN ? (L) ?

Enter: **Y<cr>**

The system responds with:

Change SW (L) ?

Enter: **N<cr>**

The system responds with:

MEMORY SIZE = 512 K

CZIEA EOP
0 Cumulative errors 1

Allow a minimum of 5 error free passes.

Halt the diagnostic by entering **CTRL C**.
The diagnostic should stop running and print:

DR>

2 General Description

Product Description

The DQP-3100 is a DMA controller that interfaces a NuVAX or PDPq system to two independent instrument buses, the IEC and IEEE. The instrument buses conform to both the European Standard IEC 625-1 and the U. S. Standard IEEE 488-1978. Each instrument bus can have up to fifteen devices, including the DQP-3100, in a sequential configuration. The DQP-3100 is software and diagnostic compatible with Digital's IEQ11-A controller.

Functional Description

The IEC/IEEE bus, a standardized instrumentation bus, transfers digital data between a group of instruments and a computer system. See Figure 2-1. The data is transmitted in bit-parallel/byte-serial format. The data can consist of either interface messages or device dependent messages.

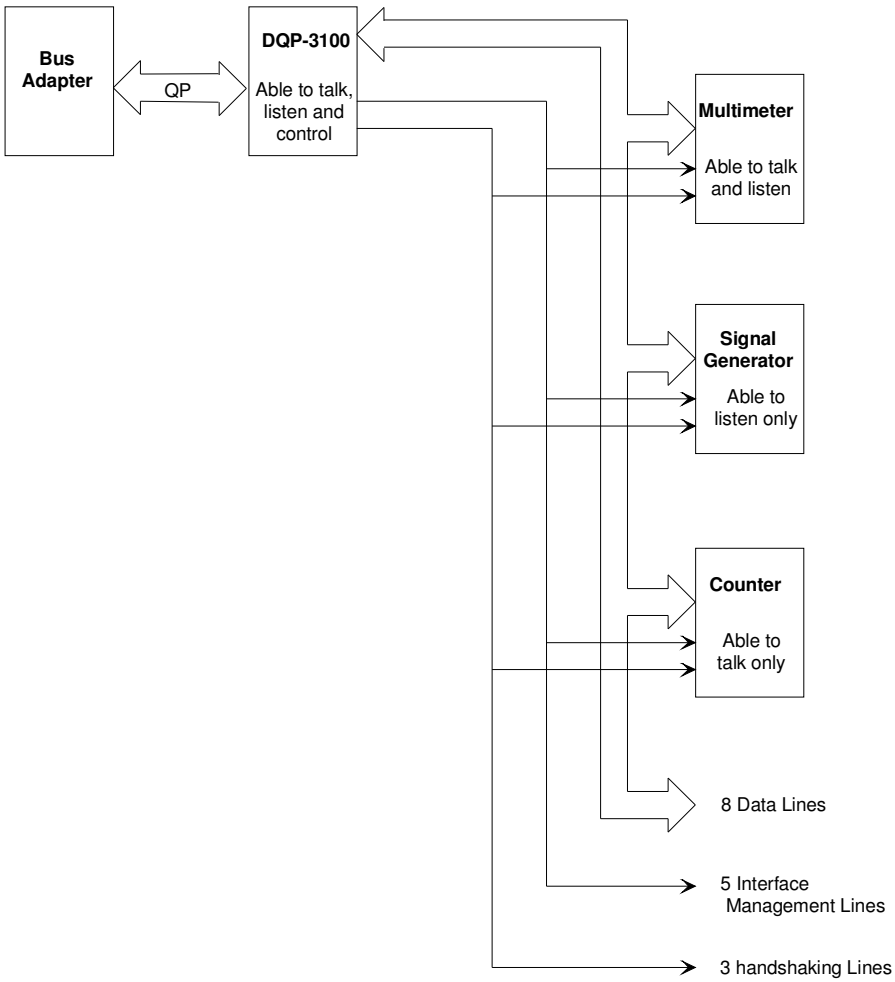


Figure 2-1: Example Devices on an IEC/IEEE Bus

There are sixteen lines that are used to control and transmit messages between the devices: eight data lines, five interface management lines, and three handshaking lines. All data is transferred by means of the data lines (DIO8-DIO1). The interface management signal lines control the overall bus operations. The three handshaking lines operate in a three-wire interlocked handshake process to transfer each data byte by means of the DIO data lines. Table 2-1 describes the function of the DQP-3100 data, interface management, and handshaking lines.

Type	Signal Name	Mnemonic	Function
Data Lines	Data Input/Output	DIA <8:1>	DIO <8:1> lines are the data input/output lines to the IEC/IEEE bus. These data lines are connected to the IEC/IEEE bus by means of non-inverting transceivers.
Interface Management Signals	Attention	ATN	Sent by the controller-in-charge. When true (low), interface commands are being sent over the DIO lines. When false (high), these lines carry data.
	Interface Clear	IFC	Sent by the system controller to set the interface system into a known quiescent state. The system controller becomes the controller-in-charge.
	Service Request	SRQ	Set true (low) by a device to indicate a need for service.
	Remote Enable	REN	Sent by system controller to select control either from the front panel or from the IEC/IEEE bus.
	End Or Identify	EOI	If ATN is false (high), this indicates the end of a message block. If ATN is true (low), the controller is requesting a parallel poll.
Handshaking Lines	Data Valid	DAV	Controller by source to show acceptors when valid data is presented to the bus.
	Not Ready for Data	NRFD	Sent by acceptor to indicate readiness for next byte.
	Not Data Accepted	NDAC	Acceptor sets this false (high) when it has latched the data from the I/O lines.

Table 2-1: DQP-3100 Signal Descriptions

IEC/IEEE Interface Messages

This section describes the messages that may be sent by means of the IEC/IEEE Bus by a controller-in-charge. A controller-in-charge is a DQP-3100 that is active (CACS). The messages can be divided into five groups.

1. Address Command Group (ACG)
2. Universal Command Group (UCG)
3 Listener Address Group (LAG)
4. Talker Address Group (TAG)
5. Secondary Command Group (SCG)
6.

The five groups are described in the following sections.

Address Command Group (ACG)

These commands are effective only in devices which have been addressed as a Listener or a Talker. Table 2-2 lists the ACG commands.

Mnemonic	Octal	ASCII	Function	Command	Description
GTL	001	SOH	Listener	Go To Local	Causes addressed listeners to go from Remote mode to Local mode. When local is true, a device is controlled by its front or back panel controls.
SDC	004	EOT	Listeners	Selected Device Clear	Causes the addressed listeners to be reset (initialization).
PPC	005	EMQ	Listener	Parallel Poll Configuration	Causes the addressed listeners to enter the Parallel Poll configuration mode so that the addressed listeners are able to participate in a parallel poll. The next command must be PPE from the Secondary Command Group to allow the listener to respond to ATN or EDI becoming true.
GET	010	BS	Listener	Group Execute Trigger	Causes the addressed listeners to start basic operation of the device of which the listener is a part.
TCT	011	HT	Talker	Take Control	Causes a device which has been addressed as the talker to enable its controller to become the controller-in-charge after the current controller-in-charge unasserts ATN.

Table 2-2: Address Command Group

Universal Command Group (UCG)

These commands affect all devices which are able to respond without having to be previously addressed. The UCG commands are listed in Table 2-3.

Mnemonic	Octal	ASCII	Command	Description
LLO	021	OC1	Local Lockout	Causes all devices to ignore their local message RTL (Return to Local).
DCL	024	OC4	Device Clear	Causes all devices to be reset (initialization).
PPU	025	NAK	Parallel Poll Unconfigure	Causes all parallel poll configurations to be come unconfigured.
SPE	030	CAN	Serial Poll Enable	Causes all talkers to enter the serial poll mode to allow a talker to send a status byte after being addressed by the controller-in-charge.
SPD	031	EM	Serial Poll Disable	Causes all talkers to exit the serial poll mode and return to the normal data mode.

Table 2-3: Universal Command Group

Listener Address Group (LAG)

These commands may be used to address one or more listeners or to address all listeners at once. Addressed listeners become active when the controller-in-charge unasserts ATN. The LAG commands may be followed by a secondary address (MDA) to address an extended listener. The LAG commands are listed in Table 2-4.

Mnemonic	Octal	ASCII	Command	Description
MLA 00	040	SP	My Listen Address 0	Any listener that recognizes its own address becomes an addressed listener, and is able to receive data bytes from a talker as soon as the controller-in-charge unasserts ATN.
MLA 01	041	!	My Listen Address 1	Any listener that recognizes its own address becomes an addressed listener, and is able to receive data bytes from a talker as soon as the controller-in-charge unasserts ATN.
MLA 30	076	>	My Listen Address 30	Any listener that recognizes its own address becomes an addressed listener, and is able to receive data bytes from a talker as soon as the controller-in-charge unasserts ATN.
UNL	077	?	Unlisten	Causes all listeners to become unaddressed.

Table 2-4: Listener Address Group

Talker Address Group (TAG)

These commands may be used to address or unaddress one talker. An addressed talker becomes active when the controller-in-charge unasserts ATN. The commands in the TAG may be followed by a secondary address (MSA) to address an extended talker. The TAG commands are listed in Table 2-5.

Mnemonic	Octal	ASCII	Command	Description
MTA 00	100	@	My Talk Address 0	Any talker that recognizes its own address becomes an addressed talker, whereas all other talkers become unaddressed. Only one talker is able to send data via the IEC/IEEE Bus.
MTA 01	101	A	My Talk Address 1	Any talker that recognizes its own address becomes an addressed talker, whereas all other talkers become unaddressed. Only one talker is able to send data via the IEC/IEEE Bus.
MTA 30	136	^	Untalk	Causes the addressed talker to become unaddressed.

Table 2-5: Talker Address Group

Secondary Command Group (SCG)

The meaning of these command is defined by the preceding primary command of the Primary Command Group (PCG= ACG UCG LAG TAG). Table 2-6 lists the SCG commands.

Mnemonic	Octal	ASCII	Command	Description
PPE	140	@	Parallel Poll Enable 01	Each PPE command must follow a PPC (Parallel Poll Configure) command which forces currently addressed listeners into their Parallel Poll configuration state. The PPE command indicates to a device how to respond to a parallel poll request from the controller-in-charge. A device responds by sending one status bit on one of the either DIO lines. The second digit of the PPE command mnemonic specifies that line, whereas the first digit specifies which state of the device's status bit should activate the DIO line. For example, PPE 12 instructs the device to activate that line if the status bit is zero. A Parallel Poll Request is issued by the controller-in-charge by activating the EDI line together with the ATN line.
PPE 02	141	a	Parallel Poll Enable 02	"
PPE 07	146	f	Parallel Poll Enable 07	"
PPE 08	147	g´	Parallel Poll Enable 08	"
PPE 11	150	h	Parallel Poll Enable 11	"
PPE 12	151	I	Parallel Poll Enable 12	"
PPE 17	156	n	Parallel Poll Enable 17	"
PPE 18	157	o	Parallel Poll Enable 18	"
PPD	160	p	Parallel Poll Disable	This command must follow its associated PPC command and inhibits devices from responding to the Parallel Poll Request.
MSA 00	140		My Secondary Address 0	An MSA Command must follow a Talker or Listener Address. Devices that us extended addressing will not become addressed as long as the associated Secondary Address follows the Primary Address.
MSA 01	141	a	My Secondary Address 1	"
MSA 29	175	}	My Secondary Address 29	"
MSA 30	176	~	My Secondary Address 30	"

Table 2-6: Secondary Address Groups

Type of Functional Devices

There are four functional device types that can be used on the IEC/IEEE bus. They are:

- Talk only devices
- Listen only devices
- Talk and listen devices
- Talk, listen, and control devices

Table 2-7 lists the device types and their functions.

Device Type	Function	Example Device
Talk Only	When signaled, this device applies its output to the DIO lines in a fixed configuration. The configuration may be altered by a front panel control.	Counter
Listen Only	Responds to data from the DIO liens.	Printer, signal generator
Listens and Talks	This device is configured by signals from the controller, receives the requested reading, and returns the results to the IEC/IEEE bus.	Digital multimeter
Talks, Listens, and Controls	Not only can talk and listen, but also controls all operations on the IEC/IEEE bus.	IEQ11-A, DQP-3100

Table 2-7: Functional Types of Devices

IEC/IEEE Bus System

Each IEC/IEEE Bus system must have three basic functional elements to be able to organize and manage the information exchanged between devices. They are:

- Controller device
- Listener device
- Talker device

When acting as a controller, the DQP-3100 can be the controller-in-charge, as well as the system controller.

A DQP-3100 becomes a listener when the controller-in-charge sends its listen address over the IEC/IEEE bus, or by loading its own Auxiliary Command Register with the Listen Only command (LON). When active, the listener receives data bytes from the IEC/IEEE bus to the DQP-3100. Multiple listeners may be configured simultaneously.

A DQP-3100 becomes a talker when the controller-in-charge applies its talk address by means of the IEC/IEEEE bus, or by loading its own Auxiliary command Register with the Talk Only command (TON). When active the talker sends data bytes from the DQP-3100 to the IEC/IEEE bus. Only one device at a time acts as a talker.

IEEE 488-1978 Interface Functions

The DQP-3100 provides the IEEE 488-1978 interface functions listed in Table 2-8.

Function Name	Mnemonic
Automatic Source Handshake	SH1
Automatic Acceptor Handshake	AH1
Talker and Extended Talker (includes serial poll capability)	T5, TE5
Listener and Extended Listener	L3, LE3
Service Request	SR1
Remote Local	RL1
Parallel Poll	PP1, PP2
Device Clear	DC1
Device Trigger	DT1
Controller	C1,2,3,4,5

Table 2-8: IEEE-1978 Interface Functions

Specifications

Physical Dimensions

DQP-3100 Option Module — Standard short card measuring 6.875 inches by 4.2 inches (17.46 cm by 10.67 cm).

Connectors

IEEE — IEEE-488 standard 24-pin connector
IEC — IEC-625 standard 25-pin connector

Compatibility

Equivalent to Digital's

Qbus interfaces: IEQ11-SA, IEQ11-SF
IEQ11-AA, IEQ11-AB
IEQ11-AC, IEQ11-AD
IEQ11-AF

Unibus interfaces: IEU11-AA, IEU11-AB

Electrical

Power Required:	0.5 amps @ 5.0 volts 0.3 amps @3.3 volts
Logic Levels	TTL
IEC/IEEE Bus Load	1 on each bus

Performance Parameters

Operating Modes:	1. Programmed I/O transfers with interrupt. 2. DMA data transfer, byte addressing, and interrupt.
Transfer Rate:	Up to 6 megabytes per second (DMA transfer). Transfer rates depend on hardware configuration.
Block Length	64K bytes, maximum
Address	4MB (Q22)

IEC/IEEE Bus Parameters

Communication Channel	Two independent IEC/IEEE buses
Number of Devices	Up to 15 devices on each bus including DQP-3100
Maximum Cable Length	Two meters (6.56 ft) times the number of devices, or 20 meters (65.6 ft), whichever is less

Note

Individual cable length should not exceed four meters between devices.

Environmental

Operating Conditions:	
Temperature	5° to 50° C (41° to 122° F)
Relative Humidity	20% to 80% non-condensing
Storage Conditions:	
Temperature	-40° to 66° C (-40° to 150° F)
Relative Humidity	10% to 95% non-condensing

Appendix A

IEEE488 & IEC625 Connector Pin Assignments

The IEEE-488 standard connector and pin assignments are shown in Figure A-1.

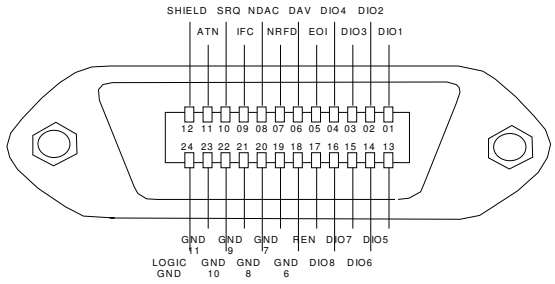


Figure A-1: IEEE-488 Standard Connector

The IEC-625 standard connector and pin assignments are shown in Figure A-2.

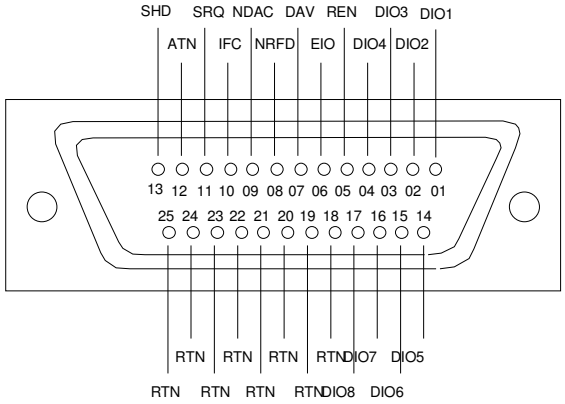


Figure A-2: IEC-625 Standard Connector

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