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**DBK20 – Provides Screw Terminals.**  
**DBK21 – Provides DB37 male connectors.**



**Reference Notes:**

- Chapter 2 includes pinouts for P1, P2, P3, and P4. Refer to pinouts applicable to your system, as needed.
- In regard to calculating system power requirements, refer to *DBK Basics* located near the front of this manual.

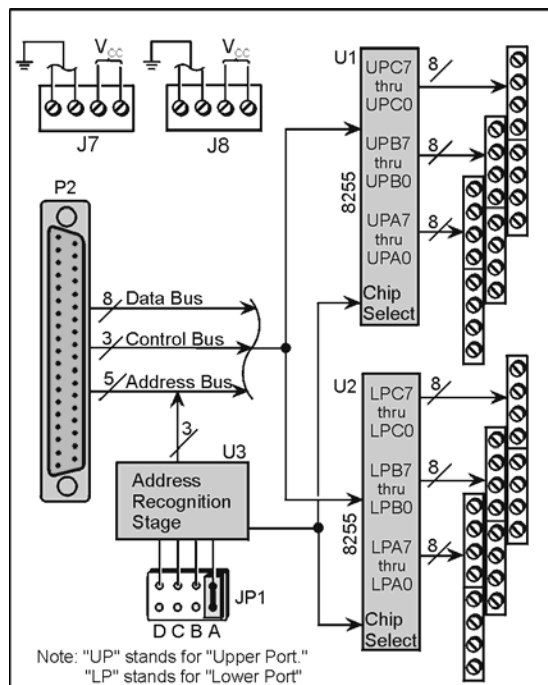
## Overview

The DBK20 and DBK21 are general purpose digital I/O cards that can increase available digital I/O lines by 48 per card. The DBK20 uses screw terminals; the DBK21 uses DB37 connectors. Both cards connect to the P2 digital I/O port via the interface cable (CA-37-x).

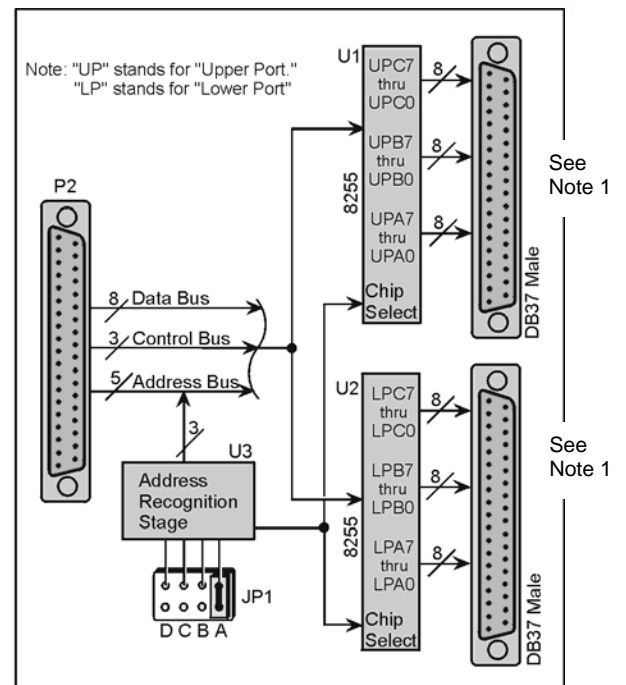
**Note:** DBK20 and DBK21 require a P2 interface and therefore, can not be used with Daq PC-Cards.

**Note:** For DaqBoard/2000 Series and /2000c Series board applications, the P2 interface is derived via use of an appropriate P4 adapter. P4 adapters are discussed in the DBK200 Series document modules.

Up to four DBK20s or DBK21s can be attached for a maximum of 192 lines (4×48). The local I/O lines cannot be used while expansion cards are attached. Thus, the first expansion card increases the number of usable digital I/O lines from 24 to 48, and subsequent cards each add 48 additional lines of programmable digital I/O.



*DBK20 Block Diagram*



*DBK21 Block Diagram*

**Note 1:** Page 3 of this document module includes a pinout of the DBK21's male DB37 connectors.

# Hardware Setup

## Card Connection

1. Connect wire leads to terminal blocks (if using a DBK20) or ribbon cable(s) terminated in 37-pin female connectors (if using a DBK21).
2. Once all connections are in place, secure wires to the board at captive areas at the end of the card. Nylon tie wraps (not included) work well for this purpose.

## Card Configuration

The header shunt must be set on the proper JP1 position for the intended address. The table shows the 4 choices available.

**Note:** In multiple card systems, only 1 card at a time can have any given setting.

Set JP1 header for the desired base address by placing the shunt jumper in one of the positions noted in the table (A to D). JP1 is labeled ADDRESS SELECT and is located at the card's lower left side.

Address Select	Hex Value	Bank
A	0x63 0x67	0
B	0x6B 0x6F	1
C	0x73 0x77	2
D	0x7B 0x7F	3

## LogBook Connection

The DBK20 or DBK21s attach to the LogBook's P2 digital I/O connector.



**P2 expansion cables must be kept short for proper operation. Do not exceed 14" per attached DBK card.**

A series of interface cables are available for connecting up to four DBK20 or DBK21 cards.

1. If using the optional DBK10 enclosure, slide the DB37 end of the board into a rear opening, and secure with hold-in screw-washer at rear panel.
2. Connect an accessory ribbon cable (with -x indicating the number of cards to be connected) from the digital I/O port (P2) of the LogBook to the DB37 connector at the end of the option card.

## DaqBook and DaqBoard Connection

The DBK20 or DBK21s attach to the DaqBook, DaqBoard [ISA type] P2 digital I/O connector or, for a DaqBoard/2000 Series or /2000/c Series board, to the P2 connector of an appropriate P4 adapter. P4 adapters are discussed in DBK200 Series document modules.



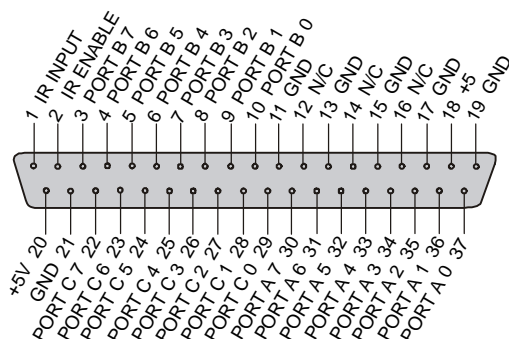
**P2 expansion cables must be kept short for proper operation. Do not exceed 14" per attached DBK card.**

A series of interface cables are available for connecting up to four DBK20 or DBK21 cards.

1. If using the optional DBK10 enclosure, slide the DB37 end of the board into a rear opening, and secure with hold-in screw-washer at rear panel.
2. Connect an accessory ribbon cable (with -x indicating the number of cards to be connected) from the digital I/O port (P2) of the Daq devices or adapter to the DB37 connector at the end of the option card.

### DaqBook and DaqBoard Configuration

There are no hardware configuration setups internal to DaqBooks and DaqBoards to allow expanded TTL I/O usage.



**Note:** There are two male DB37 connectors per DBK21 card.

Pin	Signal Name	Description for P2 Pin Use
1	IR INPUT	Interrupt line input (no functions to access this)
2	IR ENABLE	Interrupt line enable (no functions to access this)
3	PORT B 7	Digital input/output - port B bit 7
4	PORT B 6	Digital input/output - port B bit 6
5	PORT B 5	Digital input/output - port B bit 5
6	PORT B 4	Digital input/output - port B bit 4
7	PORT B 3	Digital input/output - port B bit 3
8	PORT B 2	Digital input/output - port B bit 2
9	PORT B 1	Digital input/output - port B bit 1
10	PORT B 0	Digital input/output - port B bit 0
11	GND	Digital ground
12	N/C	Pin not connected/not used
13	GND	Digital ground
14	N/C	Pin not connected/not used
15	GND	Digital ground
16	N/C	Pin not connected/not used
17	GND	Digital ground
18	+5 V	+5 V supply (Refer to <i>Power Requirements, DBK Basics pg. 13</i> )
19	GND	Digital ground
20	+5 V	+5 V supply (Refer to <i>Power Requirements, DBK Basics pg. 13</i> )
21	GND	Digital ground
22	PORT C 7	Digital input/output - port C bit 7
23	PORT C 6	Digital input/output - port C bit 6
24	PORT C 5	Digital input/output - port C bit 5
25	PORT C 4	Digital input/output - port C bit 4
26	PORT C 3	Digital input/output - port C bit 3
27	PORT C 2	Digital input/output - port C bit 2
28	PORT C 1	Digital input/output - port C bit 1
29	PORT C 0	Digital input/output - port C bit 0
30	PORT A 7	Digital input/output - port A bit 7
31	PORT A 6	Digital input/output - port A bit 6
32	PORT A 5	Digital input/output - port A bit 5
33	PORT A 4	Digital input/output - port A bit 4
34	PORT A 3	Digital input/output - port A bit 3
35	PORT A 2	Digital input/output - port A bit 2
36	PORT A 1	Digital input/output - port A bit 1
37	PORT A 0	Digital input/output - port A bit 0

## Software Setup

### Reference Notes:



- **DaqView users** - Refer to chapter 3, *DBK Setup in DaqView*.
- **LogView users** - Refer to chapter 4, *DBK Setup in LogView*.

**Note:** Refer to the full-page table on the next page for valid hex codes.



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## **DBK20 - Specifications**

**Name/Function:** General Purpose Digital I/O Card

**Number of Channels:** 48 I/O channels

**Connector:** Screw terminals

**Device:** 82C55 x 2

**Output Voltage Levels:**

Minimum "1" Voltage: 3.0 @ 2.5 mA sourcing

Maximum "0" Voltage: 0.4 @ 2.5 mA sinking

**Output Currents:**

Maximum Source Current: 2.5 mA

Maximum Sink Current: -2.5 mA

**Input Voltage Levels:**

Minimum Required "1" Voltage Level: 2.0 V

Maximum Allowed "0" Voltage Level: 0.8 V

Output Float Leakage Current: 10  $\mu$ A

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## **DBK21 – Specifications**

**Name/Function:** General Purpose Digital I/O Card

**Number of Channels:** 48 I/O channels

**Connector:** DB37 male, corresponds to P2 pinout

**Device:** 82C55 x 2

**Output Voltage Levels:**

Minimum "1" Voltage: 3.0 @ 2.5 mA sourcing

Maximum "0" Voltage: 0.4 @ 2.5 mA sinking

**Output Currents:**

Maximum Source Current: 2.5 mA

Maximum Sink Current: -2.5 mA

**Input Voltage Levels:**

Minimum Required "1" Voltage Level: 2.0 V

Maximum Allowed "0" Voltage Level: 0.8 V

Output Float Leakage Current: 10  $\mu$ A



Notes