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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.

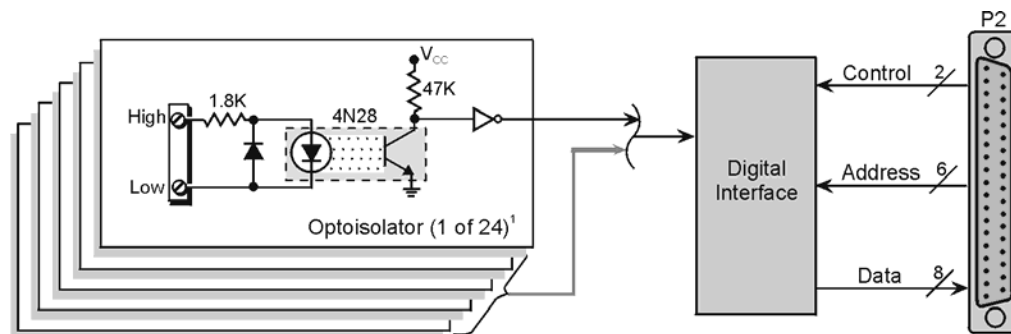
Overview

The DBK23 is a 3-port by 8-bit digital input chassis that connects to the LogBook's, DaqBook or DaqBoard[ISA type] P2 Digital I/O Port or, for the DaqBoard/2000 Series boards [except DaqBoard/2003], to an appropriate P4 adapter. These adapters are discussed in the DBK200 series document modules.

The DBK23 provides 500 V isolation from the DaqBook/DaqBoard or LogBook system and from channel-to-channel. Up to 8 DBK23s can attach to the LogBook or to the DaqBook/DaqBoard (not the Daq PC-Card), offering up to 192 bits of isolated digital input.

The DBK23 provides screw terminal access to each of its 24 isolated inputs. A slide-out PCB allows easy access to the controls and connectors. The input circuitry allows input voltages ranging from 0 to 30.0 V.

Note: The local digital I/O cannot be used while any DBK23s are attached.



The optoisolator illustrated is typical of the remaining 23 optoisolators.


DBK23 Block Diagram

Power Requirements

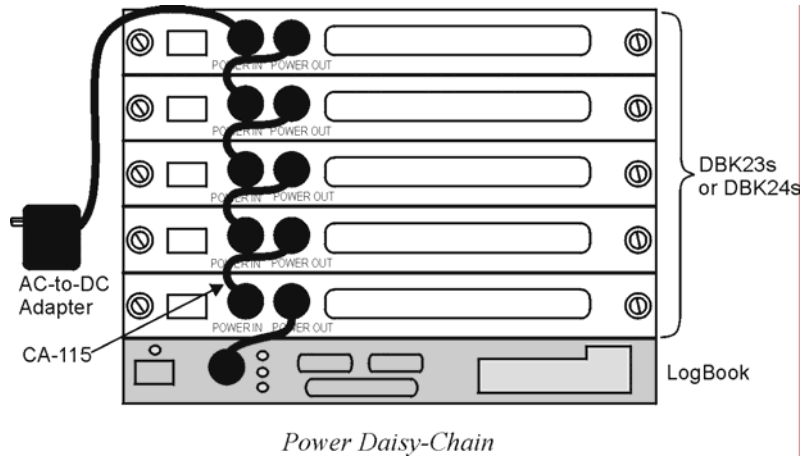
The DBK23 can be powered from a 9 to 24 VDC source such as an adapter, a standard 12 volt car battery, or an optional rechargeable nickel-cadmium battery module (DBK30A). This power flexibility makes the DBK23 ideal for field and remote data acquisition applications.

Power supplied to the DBK23 powers the on-board regulator. Connect the power supply (AC adapter) to the 5-pin DIN (labeled POWER IN) located on the front panel of the DBK23 chassis. Note the two power indicators on the rear panel of the DBK23. Check that both SYSTEM and LOCAL power LEDs are on at all times during operation. The second 5-pin DIN connector (labeled POWER OUT) can be cascaded to another accessory. A single power source can supply multiple DBK23 units.

CAUTION



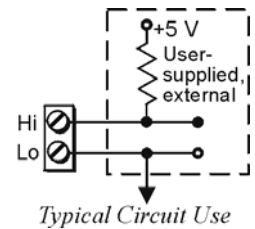
Excessive power consumption can cause equipment damage. Calculate system power requirements prior to daisy-chaining.



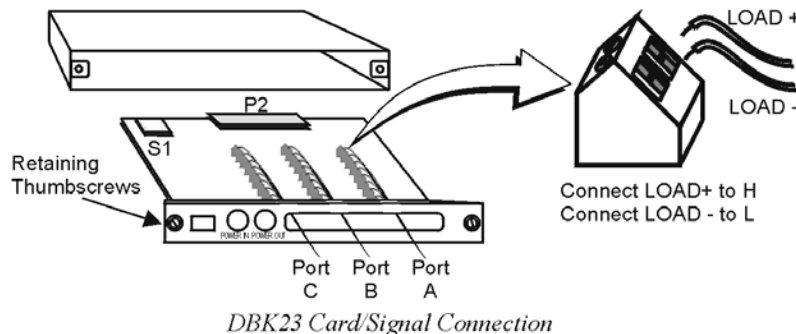
Hardware Setup

Card Connection

Open the DBK23 case by loosening the two retaining screws on the chassis front panel. Slide out the DBK23 board in order to connect wires to terminal blocks. Each input channel (or bit) is equipped with a discrete two-pole screw terminal block for isolated HI and LOW termination. The terminals accept 12 AWG to 22 AWG wire. Insulated wire types selected should meet or exceed 500 V isolation specifications.



Strip insulation from the ends of wires (no more than 1/4"). Insert wire into the screw terminal receptacle so that only the bare portion of wire extends into the opening. Bare wire should not extend more than 1/16" beyond the receptacle. These steps are essential to maintaining proper voltage isolation. Once the wire ends are in place, turn the slot head screw at the top of the block until the receptacle grips the wire firmly. Do not over tighten. Captive holes have been placed in appropriate locations to secure groups of wires to the board. Nylon lock ties (not included) work well for this purpose.

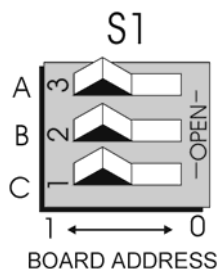


Card Configuration

The LogBook, DaqBook, and DaqBoard can each support up to eight DBK23s in a daisy-chain configuration using an accessory cable (see figure). Each unit is then configured via the on-board DIP switch (S1) for its unique base address. No more than one unit in a common chain may have the same S1 setting. The table shows possible switch settings and addresses. The XI/O addresses can be used by programmers to access specific ports on specific cards.



Software constants have been predefined in the API as follows: **DdpExpnA**; **DdpExpnB**; **DdpExpnC**. Where “n” is replaced by the card number shown in the address table; and A, B, or C is the port for that card.



Bank	Card No.	S1 Configuration			XI/O Address Value (Hex)		
		C	B	A	Port C	Port B	Port A
0	0	0	0	0	0x62	0x61	0x60
	1	0	0	1	0x66	0x65	0x64
1	2	0	1	0	0x6A	0x69	0x68
	3	0	1	1	0x6E	0x6D	0x6C
2	4	1	0	0	0x72	0x71	0x70
	5	1	0	1	0x76	0x75	0x74
3	6	1	1	0	0x7A	0x79	0x78
	7	1	1	1	0x7E	0x7D	0x7C

DaqBook and DaqBoard Connection

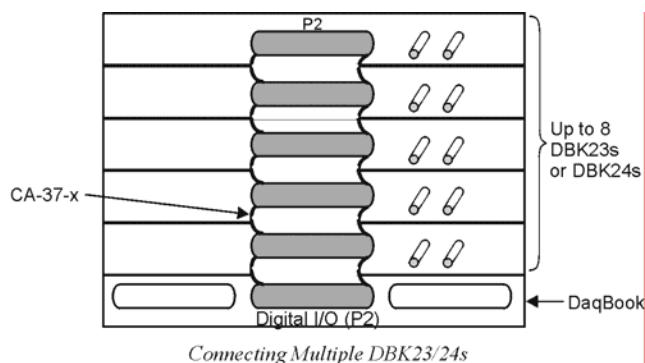
Connect the P2 digital I/O port of the DaqBook or DaqBoard [ISA type] or, for a DaqBoard/2000 Series board [except DaqBoard/2003] to an appropriate P4 adapter, to the P2 connector of the DBK23 using an accessory cable. Select up to 8 positions for a total of 192 programmable isolated inputs.

Note that P4 adapters are discussed in the DBK200 Series document modules.

DaqBoard/2000 Series Board Connection

Use a 37 pin accessory cable to connect the P2 digital I/O port of an appropriated DaqBoard/2000 Series P4 adapter to DBK23's P2. Note that you can select up to eight positions for a total of 192 programmable isolated inputs.

P4 adapters are discussed in the DBK200 Series document modules.



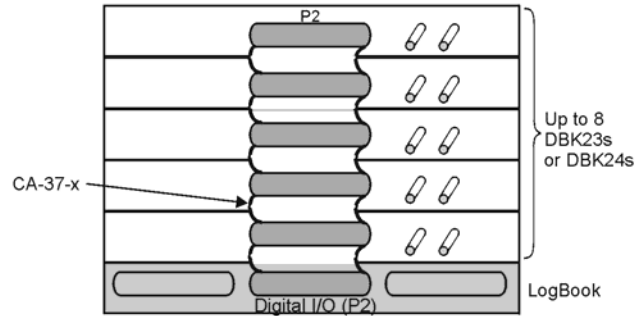
P2 expansion cables must be kept short for proper operation. Do not exceed 14" per attached DBK card.

DaqBook and DaqBoard Configuration

There are no hardware configuration setups internal to the DaqBook or DaqBoard required for the DBK23.

LogBook Connection

Connect the P2 digital I/O port of the LogBook to the P2 connector of the DBK23 using an accessory cable. Select up to 8 positions for a total of 192 programmable isolated inputs.



Connecting Multiple DBK23 or DBK24s

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.

Binary 00000000	LR8 OFF	LR7 OFF	LR6 OFF	LR5 OFF	LR4 OFF	LR3 OFF	LR2 OFF	LR1 OFF	HEX 00	Binary 11000000	LR8 ON	LR7 ON	LR6 ON	LR5 ON	LR4 ON	LR3 ON	LR2 ON	LR1 ON	HEX 80
00000001	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	01	11000001	ON	ON	ON	ON	ON	ON	ON	ON	81
00000010	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	02	11000010	ON	ON	ON	ON	ON	ON	ON	ON	82
00000011	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	03	11000011	ON	ON	ON	ON	ON	ON	ON	ON	83
00000100	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	04	11000100	ON	ON	ON	ON	ON	ON	ON	ON	84
00000101	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	05	11000101	ON	ON	ON	ON	ON	ON	ON	ON	85
00000110	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	06	11000110	ON	ON	ON	ON	ON	ON	ON	ON	86
00000111	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	07	11000111	ON	ON	ON	ON	ON	ON	ON	ON	87
00001000	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	08	11001000	ON	ON	ON	ON	ON	ON	ON	ON	88
00001001	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	09	11001001	ON	ON	ON	ON	ON	ON	ON	ON	89
00001010	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0A	11001010	ON	ON	ON	ON	ON	ON	ON	ON	8A
00001011	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0B	11001011	ON	ON	ON	ON	ON	ON	ON	ON	8B
00001100	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0C	11001100	ON	ON	ON	ON	ON	ON	ON	ON	8C
00001101	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0D	11001101	ON	ON	ON	ON	ON	ON	ON	ON	8D
00001110	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0E	11001110	ON	ON	ON	ON	ON	ON	ON	ON	8E
00001111	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0F	11001111	ON	ON	ON	ON	ON	ON	ON	ON	8F
Binary 00010000	LR8 OFF	LR7 OFF	LR6 OFF	LR5 OFF	LR4 OFF	LR3 OFF	LR2 OFF	LR1 OFF	HEX 10	Binary 11010000	LR8 ON	LR7 ON	LR6 ON	LR5 ON	LR4 ON	LR3 ON	LR2 ON	LR1 ON	HEX 90
00010001	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	11	11010001	ON	ON	ON	ON	ON	ON	ON	ON	91
00010010	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	12	11010010	ON	ON	ON	ON	ON	ON	ON	ON	92
00010011	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	13	11010011	ON	ON	ON	ON	ON	ON	ON	ON	93
00010100	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	14	11010100	ON	ON	ON	ON	ON	ON	ON	ON	94
00010101	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	15	11010101	ON	ON	ON	ON	ON	ON	ON	ON	95
00010110	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	16	11010110	ON	ON	ON	ON	ON	ON	ON	ON	96
00010111	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	17	11010111	ON	ON	ON	ON	ON	ON	ON	ON	97
00011000	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	18	11011000	ON	ON	ON	ON	ON	ON	ON	ON	98
00011001	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	19	11011001	ON	ON	ON	ON	ON	ON	ON	ON	99
00011010	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1A	11011010	ON	ON	ON	ON	ON	ON	ON	ON	9A
00011011	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1B	11011011	ON	ON	ON	ON	ON	ON	ON	ON	9B
00011100	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1C	11011100	ON	ON	ON	ON	ON	ON	ON	ON	9C
00011101	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1D	11011101	ON	ON	ON	ON	ON	ON	ON	ON	9D
00011110	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1E	11011110	ON	ON	ON	ON	ON	ON	ON	ON	9E
00011111	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1F	11011111	ON	ON	ON	ON	ON	ON	ON	ON	9F
Binary 00100000	LR8 OFF	LR7 OFF	LR6 OFF	LR5 OFF	LR4 OFF	LR3 OFF	LR2 OFF	LR1 OFF	HEX 20	Binary 11100000	LR8 ON	LR7 ON	LR6 ON	LR5 ON	LR4 ON	LR3 ON	LR2 ON	LR1 ON	HEX A0
00100001	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	21	11100001	ON	ON	ON	ON	ON	ON	ON	ON	A1
00100010	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	22	11100010	ON	ON	ON	ON	ON	ON	ON	ON	A2
00100011	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	23	11100011	ON	ON	ON	ON	ON	ON	ON	ON	A3
00100100	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	24	11100100	ON	ON	ON	ON	ON	ON	ON	ON	A4
00100101	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	25	11100101	ON	ON	ON	ON	ON	ON	ON	ON	A5
00100110	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	26	11100110	ON	ON	ON	ON	ON	ON	ON	ON	A6
00100111	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	27	11100111	ON	ON	ON	ON	ON	ON	ON	ON	A7
00101000	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	28	11101000	ON	ON	ON	ON	ON	ON	ON	ON	A8
00101001	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	2A	11101001	ON	ON	ON	ON	ON	ON	ON	ON	AA
00101010	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	2B	11101010	ON	ON	ON	ON	ON	ON	ON	ON	AB
00101011	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	2C	11101011	ON	ON	ON	ON	ON	ON	ON	ON	AC
00101100	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	2D	11101100	ON	ON	ON	ON	ON	ON	ON	ON	AD
00101101	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	2E	11101101	ON	ON	ON	ON	ON	ON	ON	ON	AE
00101110	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	2F	11101110	ON	ON	ON	ON	ON	ON	ON	ON	AF
00101111	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF		11101111	ON	ON	ON	ON	ON	ON	ON	ON	
Binary 00110000	LR8 OFF	LR7 OFF	LR6 OFF	LR5 OFF	LR4 OFF	LR3 OFF	LR2 OFF	LR1 OFF	HEX 30	Binary 11110000	LR8 ON	LR7 ON	LR6 ON	LR5 ON	LR4 ON	LR3 ON	LR2 ON	LR1 ON	HEX B0
00110001	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	31	11110001	ON	ON	ON	ON	ON	ON	ON	ON	B1
00110010	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	32	11110010	ON	ON	ON	ON	ON	ON	ON	ON	B2
00110011	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	33	11110011	ON	ON	ON	ON	ON	ON	ON	ON	B3
00110100	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	34	11110100	ON	ON	ON	ON	ON	ON	ON	ON	B4
00110101	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	35	11110101	ON	ON	ON	ON	ON	ON	ON	ON	B5
00110110	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	36	11110110	ON	ON	ON	ON	ON	ON	ON	ON	B6
00110111	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	37	11110111	ON	ON	ON	ON	ON	ON	ON	ON	B7
00111000	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	38	11111000	ON	ON	ON	ON	ON	ON	ON	ON	B8
00111001	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	39	11111001	ON	ON	ON	ON	ON	ON	ON	ON	B9
00111010	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	3A	11111010	ON	ON	ON	ON	ON	ON	ON	ON	BA
00111011	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	3B	11111011	ON	ON	ON	ON	ON	ON	ON	ON	BB
00111100	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	3C	11111100	ON	ON	ON	ON	ON	ON	ON	ON	BC
00111101	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	3D	11111101	ON	ON	ON	ON	ON	ON	ON	ON	BD
00111110	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	3E	11111110	ON	ON	ON	ON	ON	ON	ON	ON	BE
00111111	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	3F	11111111	ON	ON	ON	ON	ON	ON	ON	ON	BF

DBK23 – Specifications

Name/Function: General Purpose Optically Isolated Digital Input Module

Channels: 24 I/O channels

Connector: Screw terminals for signal outputs

Input Voltage Levels:

Range: 3 to 30 VDC

Input Current: 1.5 to 15 mA

Operating Voltage Range: 9 to 24 VDC

Module Power Requirements: 0.25 W; AC adapter included

120 VAC Adapter Supplied: 15 VDC @ 0.9 A

Isolation Voltage:

Channel-to-channel: 500 V

Channel-to-system: 500 V

Channel Address: Set by DIP switch