DBK206 P4-to-P1/P2/P3 Adapter Board

For Analog I/O, Digital I/O, & Pulse/Frequency

Note: DBK206 provides: P1, P2, and P3 connectors and corresponding screw-terminal blocks for use with DaqBook/2000 Series Devices, DaqBoard/2000 Series Boards, and cPCI DaqBoard/2000c Series Boards.

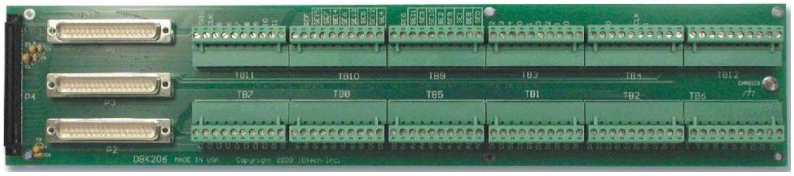
This product is not used for LogBook applications.

Reference Notes:

- Refer to the section *Power Requirements* in the document module *DBK Basics*, in regard to calculating system power requirements.
- The chapter *System Connections and Pinouts* includes pinouts for P1, P2, P3, and P4. Refer to the pinouts that are applicable to your system, as needed.
- For a quick comparison of all DBK200 Series boards, refer to the *DBK200 Series Matrix*. The matrix is located just before this DBK200 document module.
- Refer to the *DaqBoard/2000 Series and cPCI DaqBoard/2000c Series User's Manual* (p/n 1033-0901) or the *DaqBook/2000 Series User's Manual* (p/n 1103-0901) for information pertaining to those products, as needed.

Overview

DaqBoard/2000 Series and cPCI DaqBoard/2000c Series boards communicate [external from the host PC] through a 100-pin P4 connector. The DBK206 provides a P1, P2, and P3 connector and corresponding screw-terminal blocks. P1 is used for ANALOG I/O, P2 for DIGITAL I/O, and P3 for PULSE/FREQUENCY (Digital and Counter/Timer) I/O.



DBK206, P4-to-P1/P2/P3 Adapter with Screw-Terminals

Note: The P1, P2, and P3 connectors discussed in association with DaqBook/2000 Series devices DaqBoard/2000 Series boards and cPCI DaqBoard/2000c Series boards are subset connectors of the 100-pin P4 connector that is located on those boards. Chapter *System Connections and Pinouts*, includes pinouts for P1, P2, P3, and P4.

Connections

The DBK206 is suitable for both analog and digital expansion. Signal connection to a DaqBook/2000 Series device, DaqBoard/2000 Series board, or to a cPCI DaqBoard/2000c Series board can be made as follows:

- With cables connected to P1, P2, and P3 connectors, as applicable.
- With signal wires connected to the appropriate screw-terminal blocks (TB1 through TB12). Note that the DBK206 board's silkscreen clearly identifies all screw terminals.
- With a combination of the above two methods.

Regardless of which method is used, the DBK206 connects to the 100-pin P4 connector of a DaqBook/2000 Series device, DaqBoard/2000 Series board, or a cPCI DaqBoard/2000c Series board. The connection is made via a CA-195 cable. Note that DBK206 contains mounting holes that allow the board to be secured inside a user-provided enclosure (not shown).

CAUTION

Turn off power to the host PC and externally connected equipment prior to connecting cables or signal lines to the DBK. Electric shock or damage to equipment can result even under low-voltage conditions.

Take ESD precautions (packaging, proper handling, grounded wrist strap, etc.)

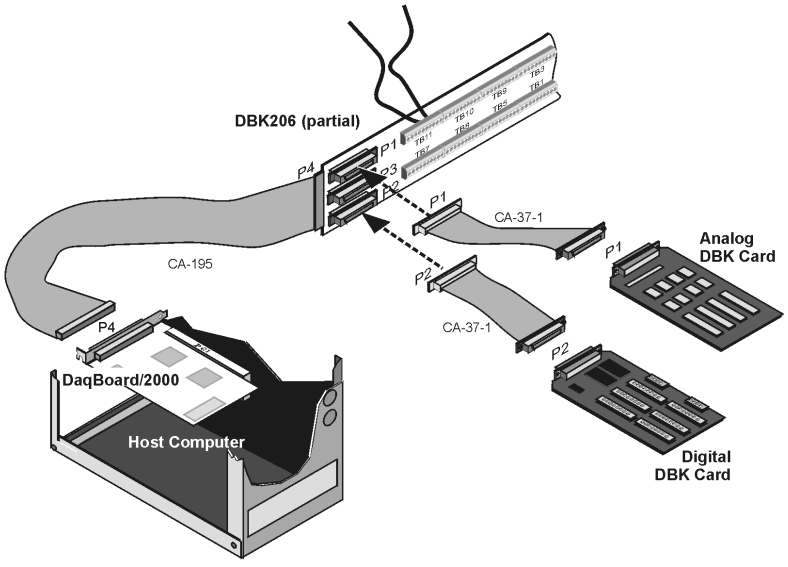
Use care to avoid touching board surfaces and onboard components. Only handle boards by their edges (or ORBs, if applicable). Ensure boards do not come into contact with foreign elements such as oils, water, and industrial particulate.

Do not confuse connectors. Ensure that you only connect P1 I/Os to P1, P2 I/Os to P2, and P3 I/Os to P3. Improper connection may result in equipment damage.

The illustrations and actual board silkscreen are the only references you should need to make proper connections.

A list of connection tips follows:

1. Ensure power is removed from the device(s) to be connected.
2. Observe ESD precautions when handling the board and making connections.
3. Do not make redundant connections. For example, for ANALOG IN you can use the P1 (DB37) connector or Terminal Blocks TB9 through TB12. You would not use both sets of ANALOG IN connectors.



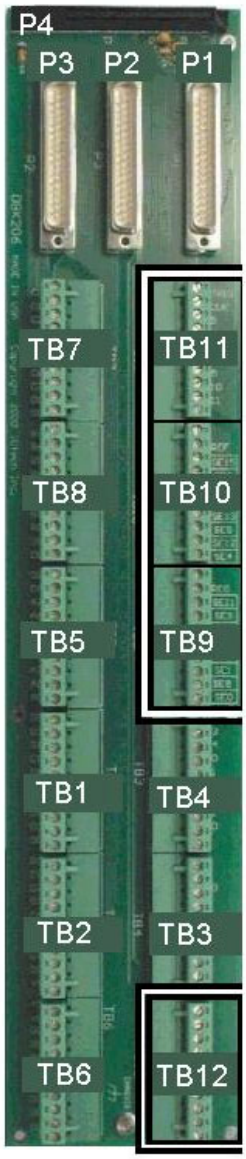
Example of a DBK206 Connected to Analog and Digital DBK Cards Through P1 and P2, Respectively

Be sure to align the P4 orientation indicators (▲) prior to mating the P4 connectors.

4. The DBK206 100-pin P4 connector connects to the DaqBoard/2000 Series P4 connector via a CA-195 Cable.

5. To obtain maximum protection from static, connect the CHASSIS terminal to earth ground.
6. For connections to DB37 connectors:
    - P1 connects to an analog DBK card or module's P1 connector via a CA-37 cable.
    - P2 connects to a Digital DBK card or module's P2 connector via a CA-37 cable.
    - P3 connects to a Pulse/Frequency DBK card or module's P3 connector via a CA-37 cable.
7. In regard to Screw-Terminal Block Connections:
    - When tightening terminal block screws, tighten them snug, but do not over-tighten.
    - The DBK206 includes 12 terminal blocks. Each block contains 10 screw-terminal connectors.
    - The DBK206 silkscreen provides labels for each terminal block (TB1 through TB12) and for each of the block's associated screw-terminals.
    - **TB9**, **TB10**, **TB11**, and **TB12** are used for **ANALOG IN** and provide a connection option to the **P1** (DB37) connector.
    - **TB5**, **TB6**, **TB7**, and **TB8** are used for **DIGITAL I/O** and provide a connection option to the **P2** (DB37) connector.
    - **TB1**, **TB2**, **TB3**, and **TB4** are used for **Pulse/Frequency/Digital I/O** and provide a connection to the **P3** (DB37) connector.
    - The following pages correlate the DBK206 terminal block connectors with the associated pins of the P1, P2, and P3 DB37 connectors. Note that the *System Connections and Pinouts* chapter contains additional pin-outs, and includes references to the 100-pin P4 connector.

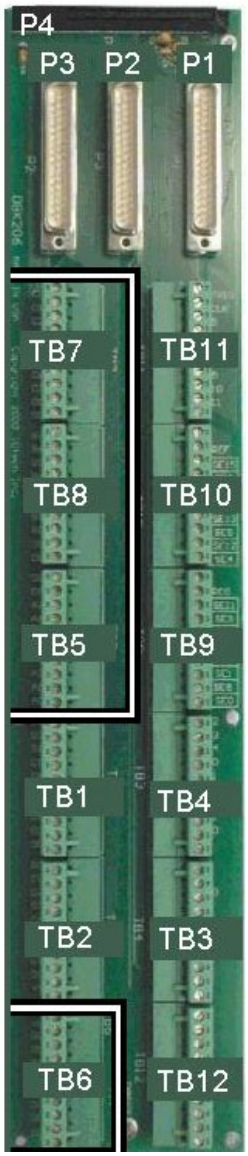
Correlation to P1 – TB11, TB10, TB9, and TB12 for Analog I/O.



TB11	**P1 Pin Number and Description**	
TTL TRIG	25	TTL Trigger, Digital IN, External TTL Trigger Input
A/I CLK	20	A/I Clock, External ADC Pacer Clock Input/ Internal ADC Pacer Clock Output
EXP 5	5	Expansion 5. Digital OUT, external GAIN select bit 1
EXP 6	6	Expansion 6. Digital OUT, external GAIN select bit 0
EXP 7	3	Expansion 7. Digital OUT, external ADDRESS, select bit 3
EXP 8	22	Expansion 8. Digital OUT, external ADDRESS, select bit 2
EXP 9	4	Expansion 9. Digital OUT, external ADDRESS, select bit 1
EXP 10	23	Expansion 10. Digital OUT, external ADDRESS, select bit 0
EXP 11	26	Expansion 11. Simultaneous Sample and Hold (SSH)
AGND	*	Analog Common
TB10	**P1 Pin Number and Description**	
SGND	19	Signal Ground, Sense Common
POSREF	9	Positive Reference, Analog +5 V reference
SE15	11	CH 15 IN (Single-Ended Mode) / CH 7 LO IN (Differential Mode)
SE7	30	CH 7 IN (Single-Ended Mode) / CH 7 HI IN (Differential Mode)
SE14	12	CH 14 IN (Single-Ended Mode) / CH 6 LO IN (Differential Mode)
SE6	31	CH 6 IN (Single-Ended Mode) / CH 6 HI IN (Differential Mode)
SE13	13	CH 13 IN (Single-Ended Mode) / CH 5 LO IN (Differential Mode)
SE5	32	CH 5 IN (Single-Ended Mode) / CH 5 HI IN (Differential Mode)
SE12	14	CH 12 IN (Single-Ended Mode) / CH 4 LO IN (Differential Mode)
SE4	33	CH 4 IN (Single-Ended Mode) / CH 4 HI IN (Differential Mode)
TB9	**P1 Pin Number and Description**	
SGND	19	Signal Ground, Sense Common
NEGREF	8	Negative Reference, Analog -5 V reference
SE11	15	CH 11 IN (Single-Ended Mode) / CH 3 LO IN (Differential Mode)
SE3	34	CH 3 IN (Single-Ended Mode) / CH 3 HI IN (Differential Mode)
SE10	16	CH 10 IN (Single-Ended Mode) / CH 2 LO IN (Differential Mode)
SE2	35	CH 2 IN (Single-Ended Mode) / CH 2 HI IN (Differential Mode)
SE9	17	CH 9 IN (Single-Ended Mode) / CH 1 LO IN (Differential Mode)
SE1	36	CH 1 IN (Single-Ended Mode) / CH 1 HI IN (Differential Mode)
SE8	18	CH 8 IN (Single-Ended Mode) / CH 0 LO IN (Differential Mode)
SE0	37	CH 0 IN (Single-Ended Mode) / CH 0 HI IN (Differential Mode)
TB12	**P1 Pin Number and Description**	
AGND	*	Analog Common
AGND	*	Analog Common
AGND	*	Analog Common
AGND	*	Analog Common
AGND	*	Analog Common
AGND	*	Analog Common
+ 15 V	21	Expansion, +15 V Power
- 15 V	2	Expansion, -15 V Power
AGND	*	Analog Common
+ 5 V	1	Expansion, +5 V Power

* Refer to Ground Correlation Tables in the *System Connections and Pinouts* chapter.

Correlation to P2 – TB5, TB6, TB7, and TB8 for Digital I/O.



TB7	**P2 Pin Number and Description**	
C0	29	Digital I/O: P2, Digital Port C, Bit 0; or P2 Expansion Data Bit 0
C1	28	Digital I/O: P2, Digital Port C, Bit 1; or P2 Expansion Data Bit 1
C2	27	Digital I/O: P2, Digital Port C, Bit 2; or P2 Expansion Data Bit 2
C3	26	Digital I/O: P2, Digital Port C, Bit 3; or P2 Expansion Data Bit 3
C4	25	Digital I/O: P2, Digital Port C, Bit 4; or P2 Expansion Data Bit 4
C5	24	Digital I/O: P2, Digital Port C, Bit 5; or P2 Expansion Data Bit 5
C6	23	Digital I/O: P2, Digital Port C, Bit 6; or P2 Expansion Data Bit 6
C7	22	Digital I/O: P2, Digital Port C, Bit 7; or P2 Expansion Data Bit 7
DGND	*	Digital Common
DGND	*	Digital Common
TB8	**P2 Pin Number and Description**	
B7	3	Digital I/O: P2, Digital Port B, Bit 7; or P2 Expansion Address Bit 0 Out
B6	4	Digital I/O: P2, Digital Port B, Bit 6; or P2 Expansion Address Bit 1 Out
B5	5	Digital I/O: P2, Digital Port B, Bit 5; or P2 Expansion Address Bit 2 Out
B4	6	Digital I/O: P2, Digital Port B, Bit 4; or P2 Expansion Address Bit 3 Out
B3	7	Digital I/O: P2, Digital Port B, Bit 3; or P2 Expansion Address Bit 4 Out
B2	8	Digital I/O: P2, Digital Port B, Bit 2; or P2 Expansion RESET Output
B1	9	Digital I/O: P2, Digital Port B, Bit 1; or P2 Expansion WRITE Output
B0	10	Digital I/O: P2, Digital Port B, Bit 0; or P2 Expansion READ Output
DGND	*	Digital Common
DGND	*	Digital Common
TB5	**P2 Pin Number and Description**	
DGND	*	Digital Common
DGND	*	Digital Common
A7	30	Digital I/O: P2, Digital Port A, Bit 7; or P2 Expansion Data Bit 15
A6	31	Digital I/O: P2, Digital Port A, Bit 6; or P2 Expansion Data Bit 14
A5	32	Digital I/O: P2, Digital Port A, Bit 5; or P2 Expansion Data Bit 13
A4	33	Digital I/O: P2, Digital Port A, Bit 4; or P2 Expansion Data Bit 12
A3	34	Digital I/O: P2, Digital Port A, Bit 3; or P2 Expansion Data Bit 11
A2	35	Digital I/O: P2, Digital Port A, Bit 2; or P2 Expansion Data Bit 10
A1	36	Digital I/O: P2, Digital Port A, Bit 1; or P2 Expansion Data Bit 9
A0	37	Digital I/O: P2, Digital Port A, Bit 0; or P2 Expansion Data Bit 8
TB6	**P2 Pin Number and Description**	
+5 V	18	Expansion +5 V Power
+5 V	20	Expansion +5 V Power
DGND	*	Digital Common
DGND	*	Digital Common
DGND	*	Digital Common
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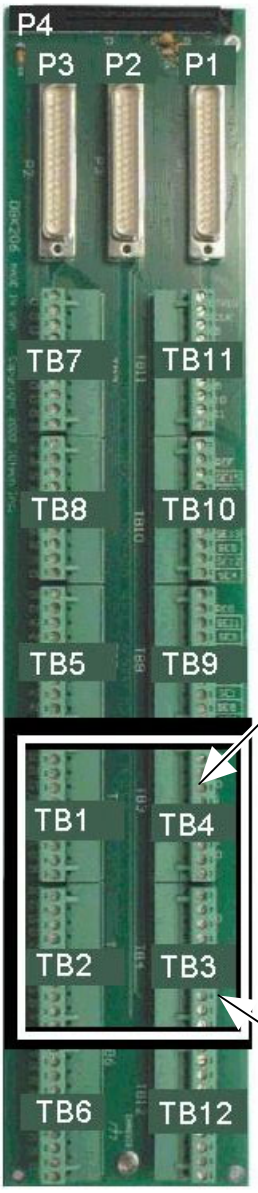
DGND	*	Digital Common
DGND	*	Digital Common
DGND	*	Digital Common
DGND	*	Digital Common

* Refer to Ground Correlation Tables in the *System Connections and Pinouts* chapter.

Correlation to P3 – TB1, TB2, TB3, and TB4 for Pulse/Frequency/Digital I/O.



TB1	P3 Pin Number and Description	
D8	29	P3 Digital Port Bit 8
D9	28	P3 Digital Port Bit 9
D10	27	P3 Digital Port Bit 10
D11	26	P3 Digital Port Bit 11
D12	25	P3 Digital Port Bit 12
D13	24	P3 Digital Port Bit 13
D14	23	P3 Digital Port Bit 14
D15	22	P3 Digital Port Bit 15
DGND	*	Digital Common
DGND	*	Digital Common
TB2	**P3 Pin Number and Description**	
D0	10	P3 Digital Port Bit 0
D1	9	P3 Digital Port Bit 1
D2	8	P3 Digital Port Bit 2
D3	7	P3 Digital Port Bit 3
D4	6	P3 Digital Port Bit 4
D5	5	P3 Digital Port Bit 5
D6	4	P3 Digital Port Bit 6
D7	3	P3 Digital Port Bit 7
DGND	*	Digital Common
+5V	20	Expansion, +5 Volt Power
TB4	**P3 Pin Number and Description**	
EXP 2	12	Reserved
EXP 3	13	Reserved
EXP 4	14	Reserved
TMR 0	15	P3 Timer 0 Output
TMR 1	16	P3, Timer 1 Output
CNT 3	35	P3 Counter 3 Input
CNT 2	17	P3 Counter 2 Input
CNT 1	36	P3 Counter 1 Input
CNT0	18	P3 Counter 0 Input
DGND	*	Digital Common
TB3	**P3 Pin Number and Description**	
DAC0	34	Analog Out; Analog DAC 0 Output
AGND	*	Analog Common
DAC2	32	Analog Out; Analog DAC 2 Output
AGND	*	Analog Common
DAC1	33	Analog Out; Analog DAC 1 Output
A/O CLK	21	Analog Out Clock; External DAC Pacer Clock Input/ Internal DAC Pacer Clock Output
DAC3	31	Analog Out; Analog DAC 3 Output
DGND	*	Digital Common
+15 V	19	Expansion, + 15 VDC
-15 V	37	Expansion, -15 VDC

* Refer to Ground Correlation Tables in the *System Connections and Pinouts* chapter.