

[Overview 1](#)

[Connection Tips for DBK202, DBK203, DBK204, and DBK204c 3](#)

[Using the Screw-Terminal Block Connections 4](#)

[Adding Resistor/Capacitor Filter Networks 5](#)

Note: DBK202, DBK203, DBK204, and DBK204c provide: (a) P1, P2, and P3 connectors, (b) corresponding screw-terminal blocks, and (c) sockets for custom RC Filter networks for DaqBoard/2000 Series and for cPCI DaqBoard/2000c Series Boards. In addition, DBK204 and DBK204c include CE cable kits for conforming the device to CE standards.



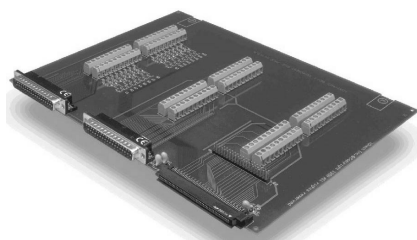
This product is not used for LogBook applications.



Reference Notes:

- Refer to [Chapter 2, Power Management](#), in regard to calculating system power requirements.
- [Chapter 3, 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 the DBK200 document module.
- Refer to the *DaqBoard/2000 Series and cPCI DaqBoard/2000c Series User's Manual* (p/n 1033-0901) for information pertaining to those products, as needed.

Overview



DBK202

P4-to-P1/P2/P3 Adapter with Screw-Terminals and Locators for RC Filter Setup



DBK203, with Cover Plate Removed¹

Chassis-Mounted P4-to-P1/P2/P3 Adapter with Screw-Terminals and Locators for RC Filter Setup

¹ **Note:** The DBK203, DBK204, and DBK204c modules are identical. The DBK204 designation indicates that the module includes a CE cable kit for use with DaqBoard/2000 Series boards that are of the standard PCI type. The DBK204c designation indicates that the module includes a CE cable kit for use with cPCI (compact PCI) /2000c Series boards.

DaqBoard/2000 Series and cPCI DaqBoard/2000c Series boards communicate [external from the host PC] through a 100-pin P4 connector. The DBK202, DBK203, DBK204, and DBK204c adapters each provide a DB37 P1 connector, DB37 P2 connector, and a 40-pin “on-board” P3 header. P1 is used for ANALOG I/O, P2 for DIGITAL I/O, and P3 for Pulse/Frequency (Digital and Counter/Timer) I/O.

In addition to the P1, P2, and P3 connectors, each of these adapters includes terminal blocks designated TB1 through TB12. The screw terminal blocks tie in to P1, P2, and P3 and provide for easy signal connection.

The three adapters connect to the DaqBoard/2000 Series or to the cPCI DaqBoard/2000c Series 100-pin P4 connector via a CA-195 cable. Note that the P1, P2, and P3 connectors discussed in association with DaqBoard/2000 Series and /2000c Series boards are subset connectors of the 100-pin P4 connector that is located on those boards. Chapter 3, *System Connections and Pinouts*, includes pinouts for P1, P2, P3, and P4.

DBK202 Screw-Terminal Adapter

Provides a means of connecting signals to a DaqBoard/2000 Series or a cPCI DaqBoard/2000c Series board through one of three methods:

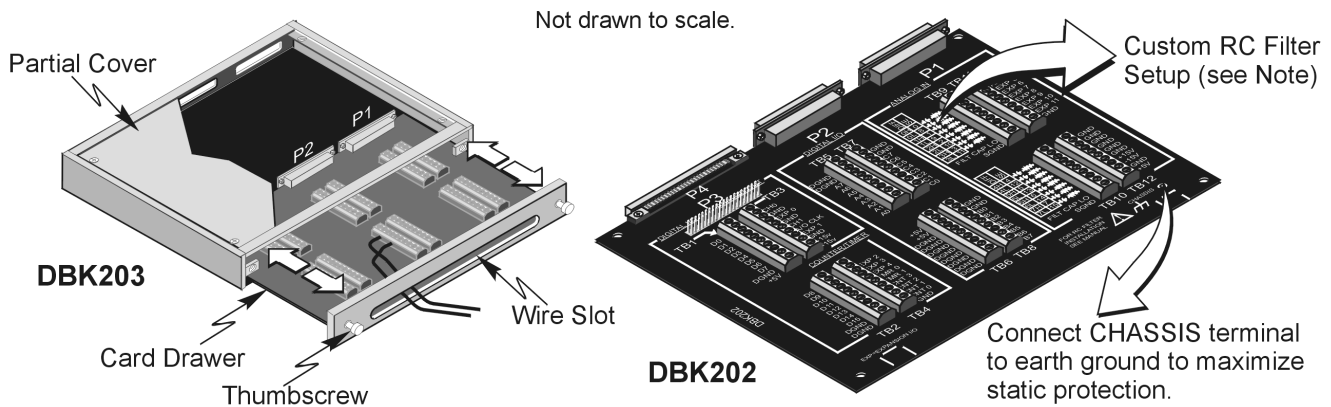
- With cables connected to P1, P2, and P3 connectors, as applicable.
- With signal wires connected to the appropriate screw-terminal blocks (TB1 through TB12). Note that the DBK202 board's silkscreen clearly identifies all screw terminals.
- With a combination of the above two methods.

Regardless of which method is used, DBK202 connects to a DaqBoard/2000 Series or a cPCI DaqBoard/2000c Series board's P4 connector via a CA-195 cable. The CA-195 cable has a P4 connector located at each end. Note that DBK202 contains mounting holes that allow the board to be secured inside a user-provided enclosure (not shown).

DBK203, DBK204, and DBK204c Screw-Terminal Adapter Modules

Note: The DBK203, DBK204, and DBK204c modules are identical. The DBK204 designation indicates that the module includes a CE cable kit for use with DaqBoard/2000 Series boards that are of the standard PCI type. The DBK204c designation indicates that the module includes a CE cable kit for use with cPCI (compact PCI) /2000c Series boards.

The DBK203, DBK204, and DBK204c consist of a DBK202 board that is mounted to a card drawer. The card drawer is housed in a shielded metal enclosure; and can be slid free of the module. The sliding card drawer provides easy access to the board's twelve terminal blocks and to the 40-pin P3 header. Note that the DBK203, DBK204, and DBK204c modules can be easily mounted to other DBK modules via fastener panels that are included in splice plate kits.



DBK203 Includes a Slide-Out Draw with a DBK202 Board



Reference Note:

You can install resistors and capacitors to create RC networks for P1's Analog Input Channels. Refer to the upcoming section, [Adding Resistor/Capacitor Filter Networks](#), on page 5, for details.

Connection Tips for DBK202, DBK203, DBK204, and DBK204c

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.)

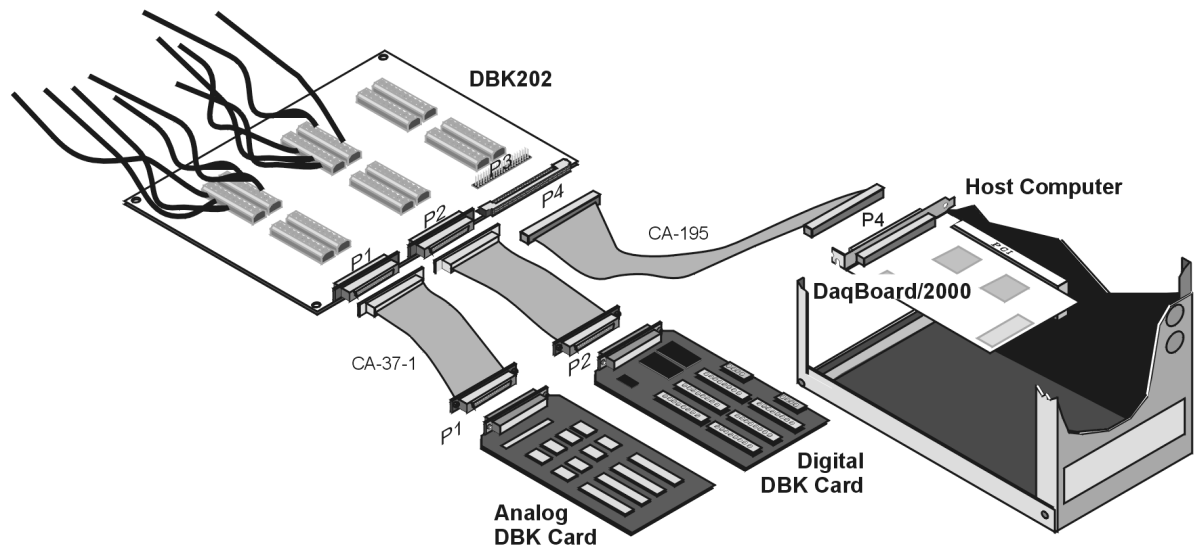


Use care to avoid touching board surfaces and onboard components. Only handle boards by their edges (or ORBs, if applicable). Ensure boards do not come into contact with foreign elements such as oils, water, and industrial particulate.

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.



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



Example of a DBK202 Connected to Analog and Digital DBK Cards via P1 and P2, Respectively

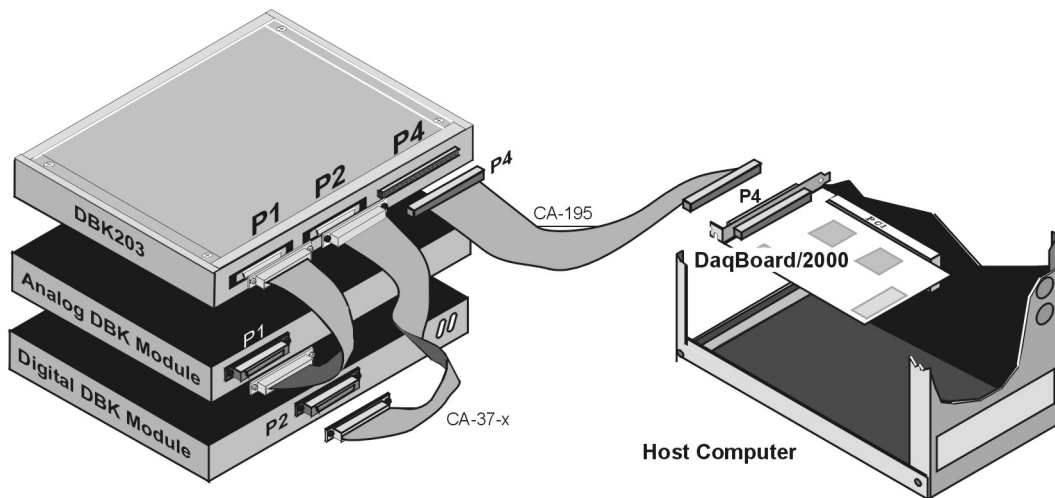
The illustrations and actual board silkscreen are the only references you should need to make proper connections.

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.
4. For DBK203, DBK204, and DBK204c, you do not need to slide out the card drawer unless you are making connections to P3, or to a terminal block.
5. The board's 100-pin P4 connector connects to the DaqBoard/2000 P4 connector via a CA-195 Cable.
6. To obtain maximum protection from static, connect the CHASSIS terminal to earth ground.

7. For connections to DB37 connectors and the P3 (40-pin) header:
 - (a) P1 connects to an analog DBK card or module's P1 connector via a CA-37 cable.
 - (b) P2 connects to a Digital DBK card or module's P2 connector via a CA-37 cable.
 - (c) The 40-pin header (P3) connects to a Pulse/Frequency DBK card, or to a module's P3 connector via a CA-60 cable. Note that CA-60 cables have a 40-pin female connector at one end and a DB37 (37-pin) male connector at the other end.
 - (d) To access the P3 header in a DBK203, loosen the two thumbscrews and slide the card drawer free of the unit.

Note that P3 is located between TB1 and P4.
8. For DBK204 and DBK204c, refer to the separate CE Cable Kit instructions that are included with the associated CE cable kit.



Example of a DaqBoard/2000 System using a DBK203

Using the Screw-Terminal Block Connections

1. Loosen the two thumbscrews and slide the card drawer free of the unit to access the terminal blocks. See previous figures.
2. Refer to the board's silkscreen for identification of screw terminals. The following *terminal block-to-signal* relationships apply:
 - **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 40-pin header (**P3**).
3. Tighten the terminal block screws snug. Do not over-tighten.

Adding Resistor/Capacitor Filter Networks

WARNING



Disconnect the DBK202, DBK203, DBK204, or DBK204c from all sources prior to installing capacitors or resistors.

CAUTION



Ensure wire strands do not short power supply connections (+15 V, -15 V, +5 V, etc.) to any terminal potential. Failure to do so could result in damage to the DaqBoard/2000 Series, or /2000c Series board.

Do not exceed maximum allowable inputs (as listed in product specifications). There should never be more than 30 V with reference to analog ground (AGND) or earth ground.

Do not operate DBK202 on an exposed metal surface.

You must provide strain-relief (lead slack) to all leads leaving DBK202, DBK203, DBK204, or DBK204c. Use tie-wraps [not included] to secure strain-relief.

Always connect the CHASSIS terminal to earth ground. This will maximize static protection.

You can install customized RC filter networks to improve the signal-to noise ratio when an unacceptable level of noise exists. DBK202, DBK203, DBK204, and DBK204c include sockets for installing RC filter networks directly on the board.

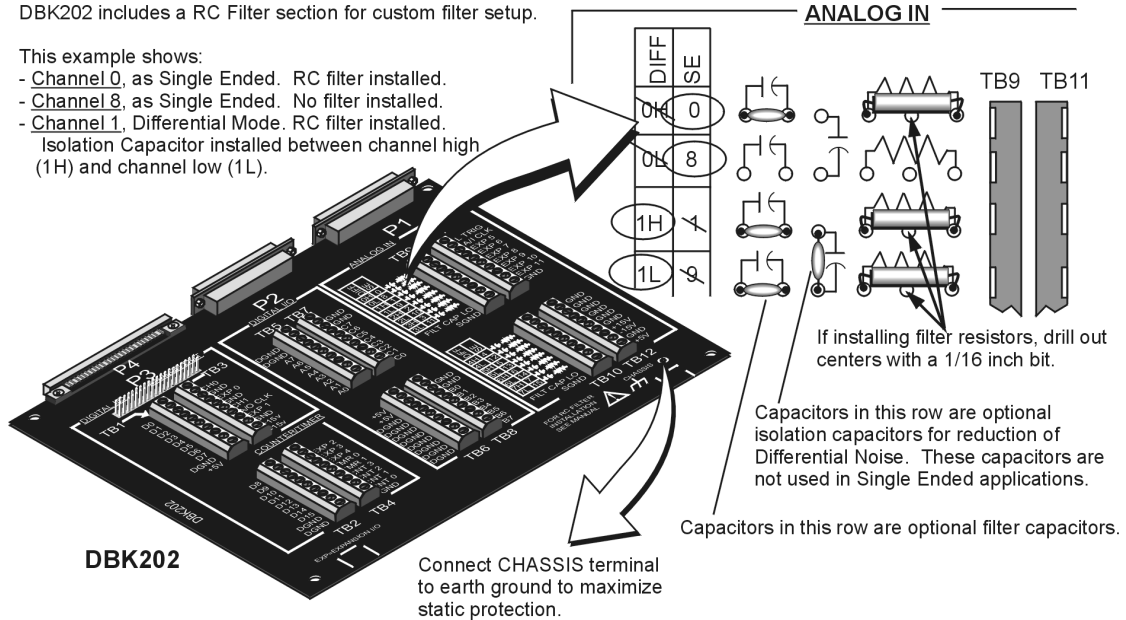
The following table contains values that are typical for RC filter network components.

Typical One-Pole Low Pass Filter Values for DBK202, DBK203, DBK204, and DBK204c			
R	C	f	f
Ohms	μF	Hertz (-3dB)	kHz (-3dB)
510	1	312	0.31
510	0.47	664	0.66
510	0.22	1419	1.42
510	0.1	3122	3.12
510	0.047	6643	6.64
510	0.022	14192	14.19
510	0.01	31223	31.22
510	0.0047	66431	66.43
470	0.0033	102666	102.67

DBK202 includes a RC Filter section for custom filter setup.

This example shows:

- Channel 0, as Single Ended. RC filter installed.
 - Channel 8, as Single Ended. No filter installed.
 - Channel 1, Differential Mode. RC filter installed.
- Isolation Capacitor installed between channel high (1H) and channel low (1L).



An Example of Customer-Installed Capacitors and Filters for RC Networks on a DBK202

Prior to installing RC components, review the previous Warning and Caution statements, then read over the following information regarding resistors and capacitors.



- Do not use RC filters in conjunction with additional DBK expansion accessories.
- Prior to installing a resistor to the filter network, you must drill a 1/16" hole through the center circle (beneath the board's silkscreen resistor symbol).
- Do not drill holes on the board for channels, unless those channels are to receive a filter network (see preceding statement).
- Resistors should be 1/4 watt, film-type with up to 5% tolerance. Do not use wire-wound resistor types.
- A resistor value of 510 Ω is recommended. Do not exceed 510 Ω .
- Capacitors used are to be of the film dielectric type (e.g., polycarbonate or NPO ceramic), above 0.001 μF .
- **RECOMMENDED:** For reduction of both *Common Mode Noise* and *Differential Mode Noise*, use one capacitor between Channel High and AGND; and use a second capacitor between Channel Low and AGND.
- For reduction of *Differential Noise* [when no reduction of *Common Mode Noise* is needed] position a capacitor across the respective Channel High and Channel Low.
- When in Differential Mode, using capacitors between Channel High, Channel Low, and AGND may cause a slight degradation of *wideband Common Mode rejection*.
- When making a RC filter network, always install a wire jumper between the relevant FILT CAP LO and AGND. FILT CAP LO terminals are located on TB9 and TB10.