DBK215 16-Connector BNC Connection Module

With 68-Pin SCSI Adaptability for Analog I/O, Digital I/O, & Pulse/Frequency

DBK215 Front Panel
Upper Slot for Terminal Board Wiring Pass-Through
Lower section of 16 BNC Connectors

The DBK215 module is compatible with the following products:

- DaqBoard/500 Series
- DaqBoard/1000 Series

Overview

DBK215 Rear Panel
Includes a 68-pin SCSI connector designated as P5.

The DBK215 module includes:

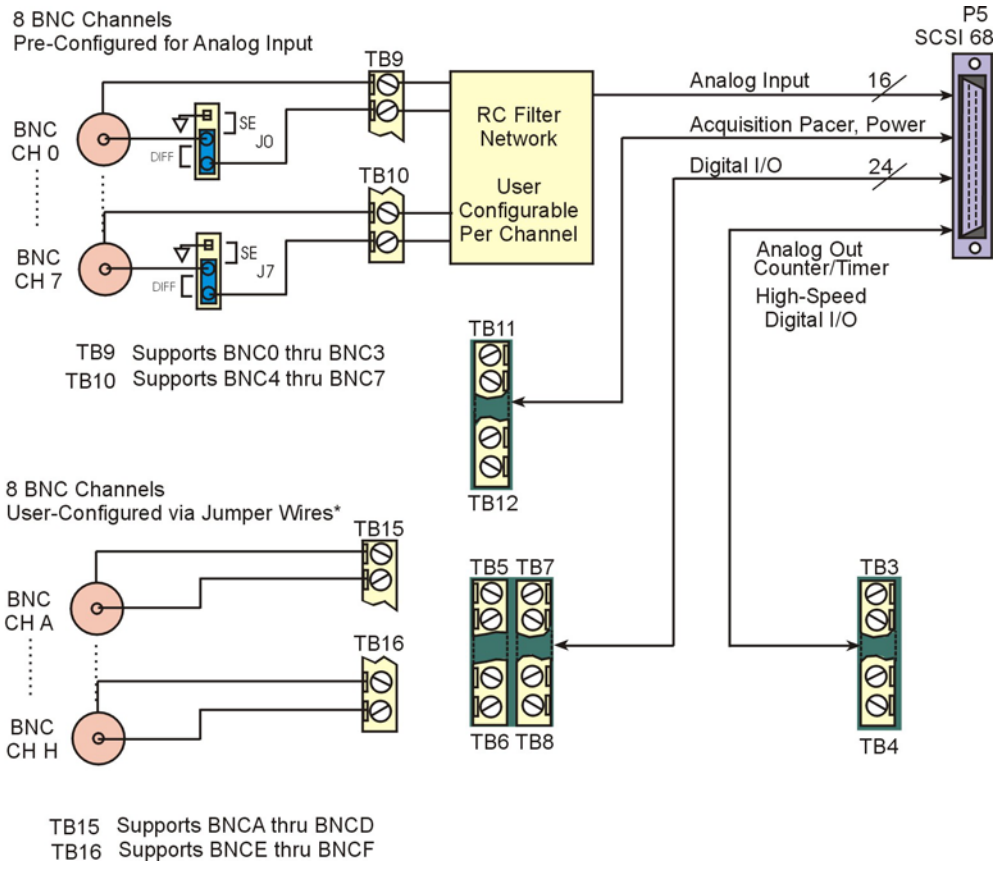
- BNC Access to 16 inputs or outputs (on front panel)
- on-board screw-terminal blocks*
- on-board socket locations for custom RC Filter networks*
- 68-pin SCSI connector (on rear panel)

* The top cover plate must be removed to access the terminal blocks and the RC filter network section of the board.

The 68-pin SCSI connector (P5) connects to a DaqBoard/500 Series or a DaqBoard/1000 Series 68-pin SCSI connector via a CA-G55, CA-G56, or CA-G56-6 cable. Cable descriptions are provided on page 2.

The DBK215 provides BNC and screw-terminal access to all analog and digital I/O from the host data acquisition device. Related to the screw-terminals is a front panel slot for routing all I/O wiring.

Reference Note:
DBK215 is intended for DaqBoard/500 Series and DaqBoard/1000 Series applications. Refer to the DaqBoard/500 Series and DaqBoard/1000 Series documentation for detailed information on those devices. For information concerning similar16 channel BNC connectivity/interface boards, designed for use with other products, refer to the DBK213 and DBK214 sections of the DBK Options manual (p/n 457-0905).



DBK215 Block Diagram

* Accessory Kit p/n 1139-0800 includes jumper wires and a screw driver.

Note that the 68-pin SCSI (P5) connector typically connects to a DaqBoard/500 Series or DaqBoard/1000 Series board's SCSI connector via a CA-G55, CA-G56, or CA-G56-6 cable.

- CA-G55 is a 3-foot long cable.
- CA-G56 is a 3-foot long shielded cable.
- CA-G56-6 is a 6-foot long shielded cable.

Connection Tips

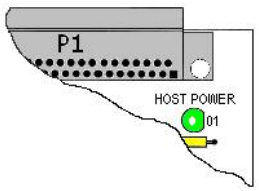
CAUTION

Turn off power to the host PC and externally connected equipment prior to connecting cables or signal lines to DBKs. 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.

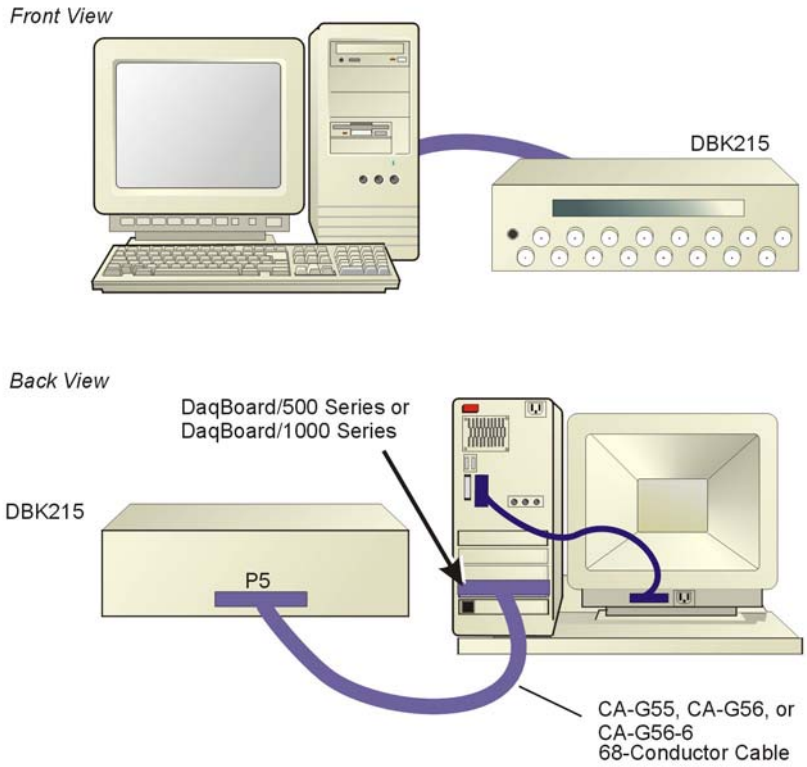
1. Ensure power is removed from all device(s) to be connected.
2. As soon as the DBK215 cover is removed, verify that the Host Power LED is "Off." See figure at right for location.
3. Observe ESD precautions when handling the board and making connections.
4. You do not need to remove the cover unless you need to access a terminal block, customize an RC filter network, or set a BNC channel to Single-Ended mode or to Differential mode (via Jumpers J0 through J7). Information regarding these tasks follows shortly.



Location of DBK215's Host Power LED

5. DBK215's 68-pin SCSI (P5) connector typically connects to a DaqBoard/500 Series or DaqBoard/1000 Series board's SCSI connector via a CA-G55, CA-G56, or CA-G56-6 cable.
   - CA-G55 is a 3-foot long cable.
   - CA-G56 is a 3-foot long shielded cable.
   - CA-G56-6 is a 6-foot long shielded cable.
6. Refer to the separate CE Cable Kit instructions that are included with the associated CE cable kit. Refer to the Declaration of Conformity in regard to meeting CE requirements.

System Example



DBK215 Connection to a DaqBoard/500 Series or DaqBoard/1000 Series Board

Notes regarding the above system example:

1) Any of three 68-conductor SCSI ribbon cables can be used.
   - o CA-G55 is a 3-foot long cable.
   - o CA-G56 is a 3-foot long shielded cable.
   - o CA-G56-6 is a 6-foot long shielded cable.

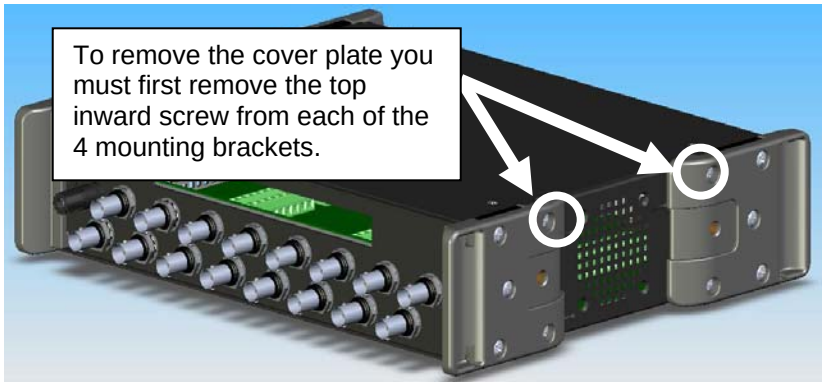
2) Signal lines connect to front panel BNC connectors or to the internal screw-terminal board.

3) When signal lines are connected to terminal blocks (instead of the BNC connectors) the wires are routed out through the upper slot of the front panel.

Using the Screw-Terminal Blocks

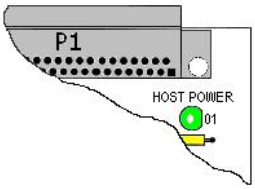
You must remove the DBK215 module's cover plate to access the screw terminal blocks. This is described in steps 1 and 2 below.

1. Remove the top inward screws from each of the 4 mounting brackets. See following figure.



The Cover Plate is Secured by 4 Srews [2 Screws per-side]

2. After the 4 screws have been removed, carefully remove the cover plate.
3. As soon as the DBK215 cover is removed, verify that the Host Power LED is "Off." See following figure for location.

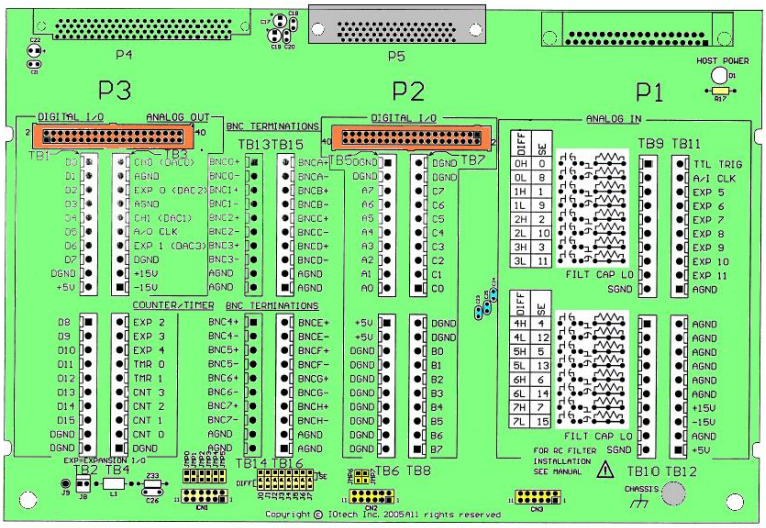


Host Power LED Location

4. Make the wiring connections to the terminals. Refer to the board's silkscreen and to the pin correlations on the next few pages.
5. Tighten the terminal block screws snug; but do not over-tighten.
6. After all terminal connections are made and verified correct, return the cover to the unit and secure in place with the 4 screws removed earlier. Tighten snug, but do not over-tighten.

In general, the following *terminal block-to-signal* relationships apply:

DBK215 Terminal Blocks	Used for . . .	Alternative
TB9 TB10	ANALOG INPUT	BNC 0 thru 7
TB11 TB12	ANALOG INPUT	N/A
TB5 TB6 TB7 TB8	DIGITAL I/O	N/A
TB13** TB14**	ANALOG INPUT BNC Channels 0 thru 7**	TB9,TB10
TB15 TB16 (Note 1)	USER CONFIGURABLEB NC Channels A thru H	(See Note 1)
TB1 TB2	-- Not Used---	N/A
TB3 TB4	PULSE/ FREQUENCY ANALOG OUTPUT	N/A



DBK215 Board

* P4 is used for connecting to DaqBoard/2000 Series devices.

** TB13 and TB14 are "virtual" terminal blocks which are routed in the printed circuit board to TB9 and TB10. The TB13 and TB14 silk-screened locations on the DBK215 board do not have physical screw terminal blocks.

Note 1: TB15 and TB16 are used for optional user-configured BNC connectors A through H. These connectors can be configured on a per-channel basis as Analog [Input or Output], Digital I/O, or Counter/Timer. When BNC A through H are used, the user must route wires from the "BNC routing terminal blocks" (TB15 and TB16) to the appropriate functional TB termination points.

Accessory Wire Kit, p/n 1139-0800 includes jumper wires and a screwdriver.

The following pages correlate the DBK215 terminal block connectors with the 68-pin SCSI connector.

Analog I/O Correlation to 68-pin SCSI

Also see “Correlation to BNC Terminations (TB13 and TB14) on page DBK215-10.”

TB9		Pin Number and Description	
DIFF	**SE**		
0H	0	68	CH 0 IN (Single-Ended Mode) / CH 0 HI IN (Differential Mode)
0L	8	34	CH 8 IN (Single-Ended Mode) / CH 0 LO IN (Differential Mode)
1H	1	33	CH 1 IN (Single-Ended Mode) / CH 1 HI IN (Differential Mode)
1L	9	66	CH 9 IN (Single-Ended Mode) / CH 1 LO IN (Differential Mode)
2H	2	65	CH 2 IN (Single-Ended Mode) / CH 2 HI IN (Differential Mode)
2L	10	31	CH 10 IN (Single-Ended Mode) / CH 2 LO IN (Differential Mode)
3H	3	30	CH 3 IN (Single-Ended Mode) / CH 3 HI IN (Differential Mode)
3L	11	63	CH 11 IN (Single-Ended Mode) / CH 3 LO IN (Differential Mode)
FILT CAP LO		**N/A**	For RC filter networks install a wire jumper between the relevant FILT CAP LO and AGND. Note that there is no association between FILT CAP LO and P4.
SGND		62	Signal Ground, Sense Common; reference ground, not for general use.

P1 – TB9
(Note 2)

TB10		Pin Number and Description	
DIFF	**SE**		
4H	4	28	CH 4 IN (Single-Ended Mode) / CH 4 HI IN (Differential Mode)
4L	12	61	CH 12 IN (Single-Ended Mode) / CH 4 LO IN (Differential Mode)
5H	5	60	CH 5 IN (Single-Ended Mode) / CH 5 HI IN (Differential Mode)
5L	13	26	CH 13 IN (Single-Ended Mode) / CH 5 LO IN (Differential Mode)
6H	6	25	CH 6 IN (Single-Ended Mode) / CH 6 HI IN (Differential Mode)
6L	14	58	CH 14 IN (Single-Ended Mode) / CH 6 LO IN (Differential Mode)
7H	7	57	CH 7 IN (Single-Ended Mode) / CH 7 HI IN (Differential Mode)
7L	15	23	CH 15 IN (Single-Ended Mode) / CH 7 LO IN (Differential Mode)
FILT CAP LO		**N/A**	For RC filter networks install a wire jumper between the relevant FILT CAP LO and AGND.
SGND		62	Signal Ground, Sense Common; reference ground, not for general use.

P1 – TB10
(Note 2)

TB11		
Pin Number and Description		
TTL TRIG	6	TTL Trigger, Digital IN, External TTL Trigger Input
A/I CLK	2	A/I Clock, External ADC Pacer Clock Input/ Internal ADC Pacer Clock Output
EXP 5	**N/A**	Expansion 5. Digital OUT, external GAIN select bit 1
EXP 6	**N/A**	Expansion 6. Digital OUT, external GAIN select bit 0
EXP 7	**N/A**	Expansion 7. Digital OUT, external ADDRESS, select bit 3
EXP 8	**N/A**	Expansion 8. Digital OUT, external ADDRESS, select bit 2
EXP 9	**N/A**	Expansion 9. Digital OUT, external ADDRESS, select bit 1
EXP 10	**N/A**	Expansion 10. Digital OUT, external ADDRESS, select bit 0
EXP 11	**N/A**	Expansion 11. Simultaneous Sample and Hold (SSH)
AGND	*	Analog Ground, Common

P1 – TB11

TB12		
Pin Number and Description		
AGND	*	Analog Ground, Common
AGND	*	Analog Ground, Common
AGND	*	Analog Ground, Common
AGND	*	Analog Ground, Common
AGND	*	Analog Ground, Common
AGND	*	Analog Ground, Common
+ 15 V	**N/A**	Expansion, +15 V Power
- 15 V	**N/A**	Expansion, -15 V Power
AGND	*	Common Ground
+ 5 V	19	Expansion, +5 V Power

P1 – TB12

*The following SCSI Pins connect to Analog Common: 24, 27, 29, 32, 55, 56, 59, 64, and 67.

Note 2: For TB9 and TB10, the filter network portion of the silkscreen is not shown. Instead, the DIFF and SE channel identifiers have been moved next to the screws for ease in identification.

Digital I/O Correlation to 68-pin SCSI

TB5	Pin Number and Description	
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
A7	49	Digital I/O: Port A, Bit 7
A6	15	Digital I/O: Port A, Bit 6
A5	50	Digital I/O: Port A, Bit 5
A4	16	Digital I/O: Port A, Bit 4
A3	51	Digital I/O: Port A, Bit 3
A2	17	Digital I/O: Port A, Bit 2
A1	52	Digital I/O: Port A, Bit 1
A0	18	Digital I/O: Port A, Bit 0

P2 – TB5

TB6	Pin Number and Description	
+5 V	19	Expansion +5 V Power
+5 V	19	Expansion +5 V Power
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common

P2 – TB6

TB7	Pin Number and Description	
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
C7	41	Digital I/O: Port C, Bit 7
C6	7	Digital I/O: Port C, Bit 6
C5	42	Digital I/O: Port C, Bit 5
C4	8	Digital I/O: Port C, Bit 4
C3	43	Digital I/O: Port C, Bit 3
C2	9	Digital I/O: Port C, Bit 2
C1	44	Digital I/O: Port C, Bit 1
C0	10	Digital I/O: Port C, Bit 0

P2 – TB7

TB8	Pin Number and Description	
DGND	**	Digital Ground, Common
DGND	**	Digital Ground, Common
B0	14	Digital I/O: Port B, Bit 0
B1	48	Digital I/O: Port B, Bit 1
B2	13	Digital I/O: Port B, Bit 2
B3	47	Digital I/O: Port B, Bit 3
B4	12	Digital I/O: Port B, Bit 4
B5	46	Digital I/O: Port B, Bit 5
B6	11	Digital I/O: Port B, Bit 6
B7	45	Digital I/O: Port B, Bit 7

P2 – TB8

* The following SCSI Pins connect to Analog Common: 24, 27, 29, 32, 55, 56, 59, 64, and 67.
** The following SCSI Pins connect to Digital Common: 35, 36, 40, and 53.

Pulse/Frequency Correlation to 68-pin SCSI

TB1	Pin Number and Description		
D0	N/A	P3 Digital Port Bit 0	
D1	N/A	P3 Digital Port Bit 1	
D2	N/A	P3 Digital Port Bit 2	
D3	N/A	P3 Digital Port Bit 3	**TB1 is NOT USED**
D4	N/A	P3 Digital Port Bit 4	
D5	N/A	P3 Digital Port Bit 5	
D6	N/A	P3 Digital Port Bit 6	
D7	N/A	P3 Digital Port Bit 7	
DGND	N/A	Digital Ground, Common	
+5V	N/A	Expansion, +5 Volt Power	

P3 – TB1 (not used)

TB2	Pin Number and Description		
D8	N/A	P3 Digital Port Bit 8	
D9	N/A	P3 Digital Port Bit 9	
D10	N/A	P3 Digital Port Bit 10	
D11	N/A	P3 Digital Port Bit 11	**TB2 is NOT USED**
D12	N/A	P3 Digital Port Bit 12	
D13	N/A	P3 Digital Port Bit 13	
D14	N/A	P3 Digital Port Bit 14	
D15	N/A	P3 Digital Port Bit 15	
DGND	N/A	Digital Ground, Common	
DGND	N/A	Digital Ground, Common	

P3 – TB2 (not used)

TB3	Pin Number and Description	
CH0 (DAC0)	22	Analog Out; Analog DAC 0 Output
AGND	*	Analog Ground, Common; intended for use with DACs
EXP 0 (DAC2)	N/A	Analog Out; Analog DAC 2 Output
AGND	*	Analog Ground, Common; intended for use with DACs
CH1 (DAC1)	21	Analog Out; Analog DAC 1 Output
A/O CLK	1	Analog Out Clock; External DAC Pacer Clock Input/ Internal DAC Pacer Clock Output
EXP 1 (DAC3)	N/A	Analog Out; Analog DAC 3 Output
DGND	**	Digital Ground, Common
+15 V	N/A	Expansion, + 15 VDC
-15 V	N/A	Expansion, -15 VDC

P3 – TB3

TB4	Pin Number and Description	
EXP 2	N/A	Reserved
EXP 3	N/A	Reserved
EXP 4	N/A	Reserved
TMR 0	3	P3 Timer 0 Output
TMR 1	37	P3, Timer 1 Output
CNT 3	38	P3 Counter 3 Input
CNT 2	4	P3 Counter 2 Input
CNT 1	39	P3 Counter 1 Input
CNT0	5	P3 Counter 0 Input
DGND	**	Digital Ground, Common

P3 – TB4

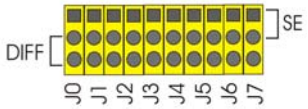
* The following SCSI Pins connect to Analog Common: 24, 27, 29, 32, 55, 56, 59, 64, and 67.
** The following SCSI Pins connect to Digital Common: 35, 36, 40, and 53.

Correlation to Analog Input BNC Terminations – BNC 0 through BNC 7

"Virtual" Terminal Blocks TB13 and TB14 for ANALOG INPUT connect to TB9 and TB10 through the printed circuit board.

TB13 ("Virtual" Terminal Block)			68-Pin SCSI Connector, Pin Number and Description		
BNC CH	**DIFF**	**SE**	**Pin**	**SE** = Single Ended ; **DIFF** = Differential	**Jumper Used**
BNC0+	0H	0	68	CH 0 IN (SE) / CH 0 HI IN (DIFF)	J0
BNC0-	0L	8	34	CH 8 IN (SE) / CH 0 LO IN (DIFF)	
BNC1+	1H	1	33	CH 1 IN (SE) / CH 1 HI IN (DIFF)	J1
BNC1-	1L	9	66	CH 9 IN (SE) / CH 1 LO IN (DIFF)	
BNC2+	2H	2	65	CH 2 IN (SE) / CH 2 HI IN (DIFF)	J2
BNC2-	2L	10	31	CH 10 IN (SE) / CH 2 LO IN (DIFF)	
BNC3+	3H	3	30	CH 3 IN (SE) / CH 3 HI IN (DIFF)	J3
BNC0+	3L	11	63	CH 11 IN (SE) / CH 3 LO IN (D DIFF)	
AGND	N/A	N/A	*	Analog Ground	N/A
AGND	N/A	N/A	*	Analog Ground	N/A

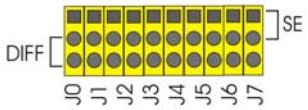
TB13 does not physically exist on DBK215. A silkscreen of TB13 is present as a visual aid to signal routing and configuration.



A header located beneath TB14 and TB16 is used to set the BNC channels to Single-Ended or to Differential. Simply place channel's 2-pin jumper in the appropriate position (SE or DIFF).

TB14 ("Virtual" Terminal Block)			68-Pin SCSI Connector, Pin Number and Description		
BNC CH	**DIFF**	**SE**	**Pin**	**SE** = Single Ended ; **DIFF** = Differential	**Jumper Used**
BNC4+	4H	4	28	CH 4 IN (SE) / CH 4 HI IN (DIFF)	J4
BNC4-	4L	12	61	CH 12 IN (SE) / CH 4 LO IN (DIFF)	
BNC5+	5H	5	60	CH 5 IN (SE) / CH 5 HI IN (DIFF)	J5
BNC5-	5L	13	26	CH 13 IN (SE) / CH 5 LO IN (DIFF)	
BNC6+	6H	6	25	CH 6 IN (SE) / CH 6 HI IN (DIFF)	J6
BNC6-	6L	14	58	CH 14 IN (SE) / CH 6 LO IN (DIFF)	
BNC7+	7H	7	57	CH 7 IN (SE) / CH 7 HI IN (DIFF)	J7
BNC7+	7L	15	23	CH 15 IN (SE) / CH 7 LO IN (DIFF)	
AGND	N/A	N/A	*	Analog Ground	N/A
AGND	N/A	N/A	*	Analog Ground	N/A

TB14 does not physically exist on DBK215. A silkscreen of TB14 is present as a visual aid to signal routing and configuration.



A header located beneath TB14 and TB16 is used to set the BNC channels to Single-Ended or to Differential. Simply place channel's 2-pin jumper in the appropriate position (SE or DIFF).

Correlation to Custom BNC Terminations – BNC A through BNC H

Pertains to Terminal Blocks TB15 and TB16 for Custom Configuration on a per-channel basis.

TB15 ("Routing" Terminal Block)	
BNC CH	**Description**
BNCA+	BNC channels A through D are configured on a per-channel basis by the user. TB15 is a routing terminal block used to connect BNCs (A thru D) to the desired signals, which are selected via a second DBK215 terminal block. For example: a user could run a wire from BNCA+ to TB4 screw terminal "TMR0" and BNCA- to TB4 DGND to create a BNC timer connection. Accessory Wire Kit, p/n 1139-0800 includes jumper wires and a screwdriver.
BNCA-	
BNCB+	
BNCB-	
BNCC+	
BNCC-	
BNCD+	
BNCD+	
AGND	Analog Ground *
AGND	Analog Ground *

TB15

TB16 ("Routing" Terminal Block)	
BNC CH	**Description**
BNCA+	BNC channels E through H are configured on a per-channel basis by the user. TB16 is a routing terminal block used to connect BNCs (E thru H) to the desired signals, which are selected via a second DBK215 terminal block. Customizing is as described for BNCA through BNCD above. Accessory Wire Kit, p/n 1139-0800 includes jumper wires and a screwdriver.
BNCA-	
BNCB+	
BNCB-	
BNCC+	
BNCC-	
BNCD+	
BNCD+	
AGND	Analog Ground *
AGND	Analog Ground *

TB16

* The following SCSI Pins connect to Analog Common: 24, 27, 29, 32, 55, 56, 59, 64, and 67.

Adding Resistor/Capacitor Filter Networks

WARNING

Disconnect the DBK215 from power and signal sources prior to installing capacitors or resistors.

CAUTION

Ensure wire strands do not short power supply connections to any terminal potential. Failure to do so could result in damage to equipment.

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.

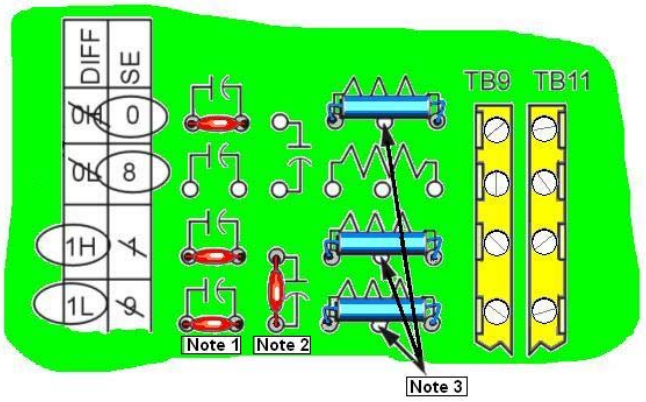
You must provide strain-relief (lead slack) to all leads leaving the module. Use tie-wraps [not included] to secure strain-relief.

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

If a channel is not associated with a DBK expansion option you can install a customized RC filter network to improve the signal-to noise ratio, assuming that an unacceptable level of noise exists. DBK215's internal board includes silk-screened sockets for installing RC filter networks. The following table contains values that are typical for RC filter network components.

Typical One-Pole Low Pass Filter Values for DBK215			
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

Do not use RC filters in conjunction with additional DBK expansion accessories.



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

In this example Channels 0 and 8 are shown as *Single-Ended*. Channel 1 is *Differential*, i.e., using 1H and 1L (channel High and Low).

The following three notes pertain to the above figure.

Note 1: The 3 horizontal capacitors [as oriented in the illustration] are optional filter capacitors.

Note 2: The vertical capacitor [as oriented in the illustration] is an optional isolation capacitor used for the reduction of *Differential* noise. Such capacitor placement is <u>not</u> used in *Single-Ended* applications.

Note 3: If installing filter resistors, carefully drill out the indicated centers with a 1/16 inch drill-bit. Otherwise the resistor will be short-circuited.

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 pinhole [beneath the board's silkscreen resistor symbol] as indicated in the preceding figure. Failure to do so will short-circuit the resistor.**
- **Do not drill holes on the board for channels, unless those channels are to receive a filter network (see preceding statement).**
- **Resistors should be ¼ 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.**

Specifications for DBK215

Operating Environment:

Temperature: -30°C to 70°C
Relative Humidity: 95% RH, non-condensing

Connectors:

P5: 68-Pin SCSI
Screw Terminals: 14 banks of 10-connector blocks
Wire Size: 12 TO 28 AWG

Dimensions:

285 mm W x 220 mm D x 45 mm H (11" x 8.5" x 2.7")

Weight:

1.36 kg (3 lbs)

Cables and Accessories:

Item Description	Part Number
Rack Mount Kit, p/n	RackDBK4
68-conductor expansion cables; mate with P5 (SCSI, 68-pin) connectors:	
3 ft., non-shielded	CA-G55
3 ft., shielded	CA-G56
6 ft., shielded	CA-G56-6
Accessory Wire Kit Includes jumper wires and a screwdriver.	1139-0800

Specifications subject to change without notice.


Notes