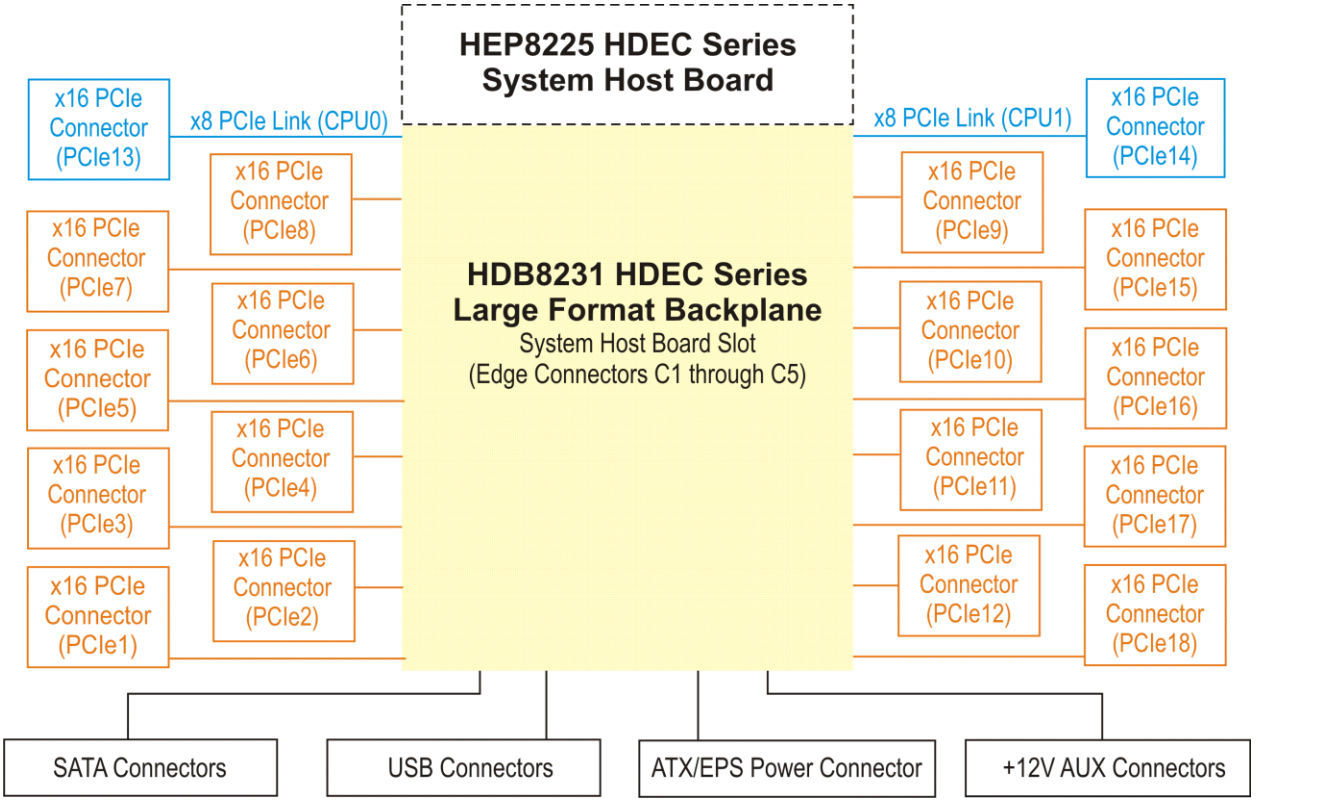
TRENTON Systems, Inc.
1725 MacLeod Drive, Lawrenceville, Georgia 30043
Sales (800) 875-6031 • Phone (770) 287-3100 • Fax (770) 287-3150

Technical Information –Jumpers, Connectors and Status LEDs
HDB8231 (8231) HDEC Series Large Format Backplane

Block Diagram



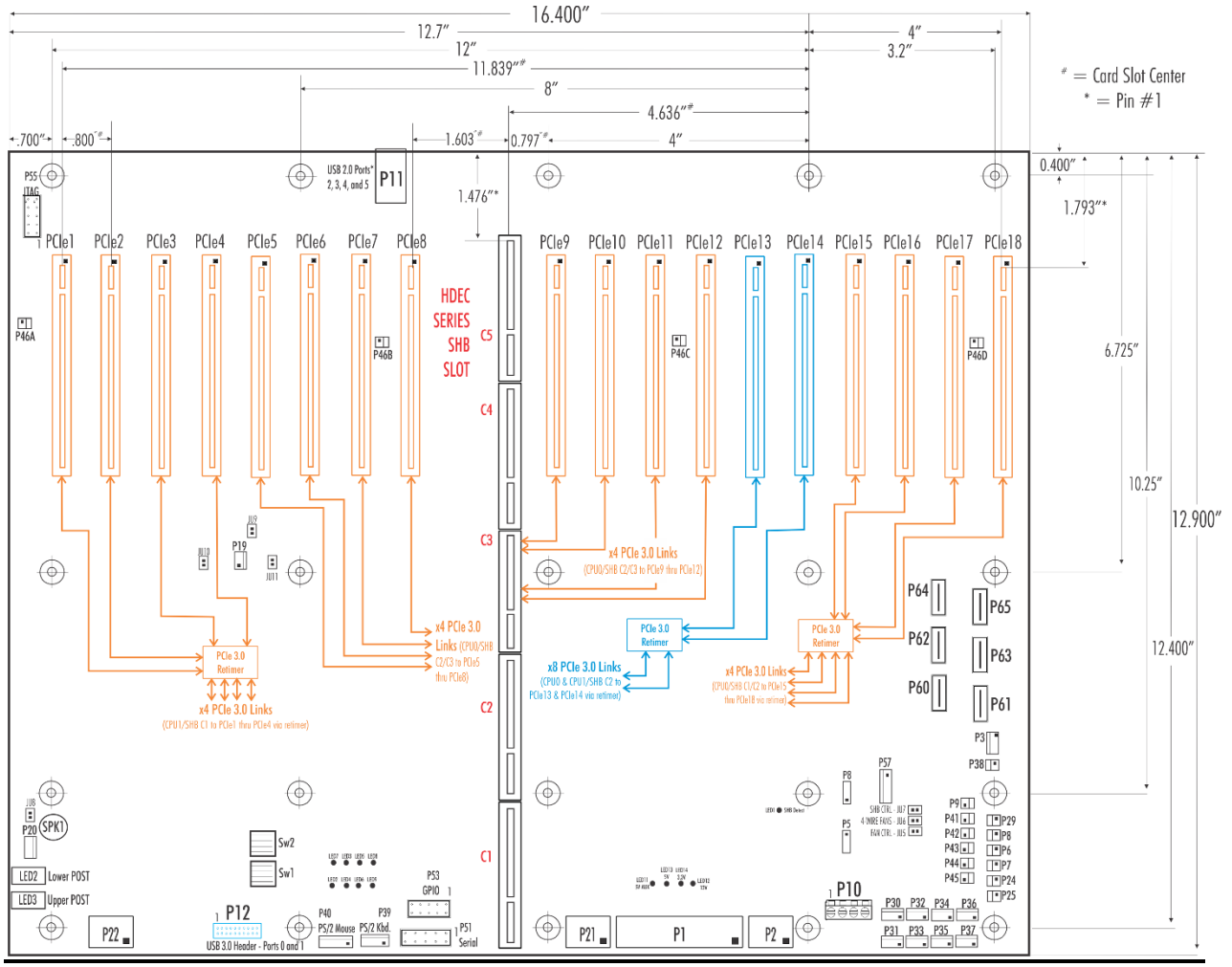
HDB8231 Block Diagram Key
Blue = x8 PCIe Gen3 Link
Orange = x4 PCIe Gen3 Link

NOTE: The HDB8231 backplane is optimized for use with HDEC Series SHBs such as the Trenton HEP8225. Native PCI Express 3.0 root links from the HEP8225 processors drive the backplane's 18 PCIe option card slots. PCI Express 3.0 link retimers between the processors and the card slots ensure that reliable link communications are established between the CPUs and plug-in cards when necessary.

The backplane supports industry standard PCI Express 3.0, 2.0, and 1.1 plug-in cards having x1, x4, x8 or x16 link widths. Plug-in cards having a x8 PCIe electrical link width are only supported at the x8 data throughput rate in backplane slots PCIe13 and PCIe14. Plug-in cards that operate with a x16 or x8 electrical link will automatically negotiate down to the x8 or x4 electrical link width, depending on the card slot selected. The HEP8225 processors will auto-negotiate link communication between the CPUs and the plug-in cards to establish a communication link that best matches the plug-in card's specific interface type and link width.

TRENTON Systems, Inc.
1725 MacLeod Drive, Lawrenceville, Georgia 30043
Sales (800) 875-6031 • Phone (770) 287-3100 • Fax (770) 287-3150

Layout Diagram – 8231-037



Notes:

1. Backplane layout diagram dimensions are in inches.
2. The right-angle power connectors shown in the layout diagram represents backplane model number 8231-037.
3. The option card slot connector spacing is 0.800 inches.
4. The nominal backplane thickness is 0.080 inches.
5. Mounting holes have a .156” diameter.
6. USB, SATA, Ethernet connectivity, POST code status and system diagnostics provided by the HEP8225 SHB.
7. Refer to the status LED section for functional definition.

TRENTON Systems, Inc.
1725 MacLeod Drive, Lawrenceville, Georgia 30043
Sales (800) 875-6031 • Phone (770) 287-3100 • Fax (770) 287-3150

8231-037 Configuration Jumpers

The setup of the configuration jumpers on the backplane is described below.

Note: Refer to the backplane layout drawing for the pin 1 position of the jumpers as indicated by the black square. (■)

Jumper	Description
JU1	**Microcontroller Enable** (Factory Use Only) 3-pin Jumper, Molex #22-03-2031 Jumper default position is unpopulated Pin Signal 1 PERSET# 2 MCLR 3 Vpp
JU2	**PIC Power Select Enable** (Factory Use Only) 3-pin Jumper, Molex #22-03-2031 Jumper default position is unpopulated Pin Signal 1 +3.3V 2 PICPOWER 3 Vdd
JU5	**System Fan Control Enable** 2-pin Jumper, Tyco (AMP) #5-146280-2 Jumper default position is populated. Remove jumper to have system fans run continuously at full speed. Pin Signal 1 +3.3V 2 PICPOWER
JU6	**4-Wire System Fan Enable** 2-pin Jumper, Tyco (AMP) #5-146280-2 Jumper default position is populated. Remove jumper for systems that use two or three-wire fans. Pin Signal 1 4-wire system fan IN 2 Gnd
JU7	**SHB Control of System Fans** 2-pin Jumper, Tyco (AMP) #5-146280-2 Jumper default position is populated. Remove jumper for systems where system fan control is from non SHB signal sources. Pin Signal 1 SHB system fan control IN 2 Gnd

TRENTON Systems, Inc.
1725 MacLeod Drive, Lawrenceville, Georgia 30043
Sales (800) 875-6031 • Phone (770) 287-3100 • Fax (770) 287-3150

8231-037 Configuration Jumpers (Continued)

JU8 **Backplane Speaker (SPK1) Enable**

2-pin Jumper, Tyco (AMP) #5-146280-2

Jumper default position is populated. Remove jumper to disable backplane speaker SPK1. Most systems will use a system speaker connected to P20.

Pin	Signal
1	+5V
2	SPK1, Pin2

JU9 - I2C Retimer Disable Connector

2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	I2C Enable
2	Gnd

Installing jumper P49 disables the I2C signals to the backplane retimers

JU10 - I2C Retimer Disable Connector

2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	I2C Enable
2	Gnd

Installing jumper P49 disables the I2C signals to the backplane retimers

JU11 - I2C Retimer Disable Connector

2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	I2C Enable
2	Gnd

Installing jumper P49 disables the I2C signals to the backplane retimers

TRENTON Systems, Inc.
1725 MacLeod Drive, Lawrenceville, Georgia 30043
Sales (800) 875-6031 • Phone (770) 287-3100 • Fax (770) 287-3150

8231-037 Connectors

Note: Pin 1 on the connectors is indicated by the square pad on the PCB.

P1 - ATX/EPS Power Connector

24 pin right angle dual row, Molex #39-30-1240

Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	NC
3	Gnd	15	Gnd
4	+5V	16	PSON#
5	Gnd	17	Gnd
6	+5V	18	Gnd
7	Gnd	19	Gnd
8	PWRGD	20	NC
9	+5VAUX	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Gnd

P2 - +12V Power Connector

8 pin right angle dual row, Molex #39-30-0080

Pin	Signal	Pin	Signal
1	Gnd	8	+12V
2	Gnd	7	+12V
3	Gnd	6	+12V
4	Gnd	5	+12V

P3 - LED Dimmer Connector

4 pin vertical single row header, Molex #47053-1000

Pin	Signal
1	PWM LED
2	PWM LED
3	+12V
4	+12V

P4 - USB 2.0 Redirect Connector (Factory Use Only)

4 pin vertical single row header, Tyco (AMP) #5-146280-4

Pin	Signal
1	VBUS1
2	NC
3	NC
4	Gnd

P5 - SPI Microcontroller Connector (Factory Use Only)

4 pin vertical single row header, Tyco (AMP) #5-146280-4

Pin	Signal
1	SPI_DO
2	SPI_DI
3	SPI_CLK
4	SPI_SS

‘

8231-037 Connectors (continued)

P6 - Power-On Connector (PSON)
2 pin vertical single row header, Tyco (AMP) #640456-2

Pin	Signal
1	Gnd
2	PSON#

P7 - Power Button Connector
2 pin vertical single row header, Tyco (AMP) #640456-2

Pin	Signal
1	Gnd
2	PWRBT#

P8 - Reset Connector
2 pin vertical single row header, Tyco (AMP) #640456-2

Pin	Signal
1	Gnd
2	SHB_RST#

P9 - Power Good Connector
2 pin vertical single row header, Tyco (AMP) #640456-2

Pin	Signal
1	PWRGD
2	+5V

P10 - Terminal Block Connector
4 position terminal block, Tyco (AMP) #796949-4
20 amps per circuit

Pin	Signal
1	+12V
2	Gnd
3	+3.3V
4	Gnd

P12 - Universal Serial Bus 3.0 (USB) Connector
19 pin dual row header, LOTES #ABA-USB-050-K04

Pin	Signal	Pin	Signal
1	+5V-USB4 (VBUS1)	11	USB5-DP
2	USB4-SRXN	12	USB5-DN
3	USB4-SRXP	13	Gnd-USB5
4	Gnd-USB4	14	USB5-STXP
5	USB4-STXN	15	USB5-STXN
6	USB4-STXP	16	Gnd-USB5
7	Gnd-USB4	17	USB5-SRXP
8	USB4-DN	18	USB5-SRXN
9	USB4-DP	19	+5V-USB5 (VBUS19)
10	NC		

P15 - GPIO Debug Header (Factory Use Only)
4 pin vertical single row header, Tyco (AMP) #5-146280-4

Pin	Signal
1	GPIO_1
2	GPIO_2
3	GPIO_3
4	GPIO_4

8231-037 Connectors (continued)

P19 - I2C Slot Header (Factory Use Only)
3 pin single row header, Molex #22-23-2031

Pin	Signal
1	I2C_Header_SDA
2	I2C_Header_SCL
3	Gnd

P20 - System Speaker Connector
4 pin single row header, Molex #47053-1000

Pin	Signal
1	SPKR_n
2	NC
3	Gnd
4	+5V

P21 - +12V Power Connector
8 pin right angle dual row, Molex #39-30-0080

Pin	Signal	Pin	Signal
1	Gnd	8	+12V
2	Gnd	7	+12V
3	Gnd	6	+12V
4	Gnd	5	+12V

P22 - +12V Power Connector
8 pin right angle dual row, Molex #39-30-0080

Pin	Signal	Pin	Signal
1	Gnd	8	+12V
2	Gnd	7	+12V
3	Gnd	6	+12V
4	Gnd	5	+12V

P24 - Temperature Sensor 0 Connector
2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	Gnd
2	TEMPSENSE0

P25 - Temperature Sensor 1 Connector
2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	Gnd
2	TEMPSENSE1

8231-037 Connectors (continued)

P29 - Clear CMOS Connector

2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	Gnd
2	CMOSCLR#

NOTE: To clear the system host board's CMOS using backplane connector P29, power down the system and install the P29 jumper. Wait for at least two seconds, remove the jumper and turn the power on. Clearing CMOS on the System host board will not result in a checksum error on the following boot. If you want to change a BIOS setting, you must press DEL or the F2 key during POST to enter the SHB's BIOS setup after clearing CMOS. P29 will also accept a connection to a front-panel CMOS clear button from the chassis.

NOTE 2: Backplane Clear CMOS capability is a planned capability for the HDEC specification, to be implemented on future SHB products. The HEP8225 SHB does not support this capability.
For full P29 connector support information, contact Trenton.

P30, P31, P32, P33 P34 P35 P36 P37 12V Chassis Fan Connectors (8)

4 pin right-angle header, Molex #47053-1000

Pin	Signal
1	PWMn_3W (n=0,1,2,or 3)
2	+12V
3	TACHn
4	PWMn_4W
	Note: 0=P30, 1=P31, 2=P32, 3=P33

P38 - Intruder Alert Connector

2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	Gnd
2	INTRUDER#

P39 - PS/2 Keyboard Connector

5 pin single row header, Tyco (AMP) #640456-5

Pin	Signal
1	PS2KBDCLK
2	PS2KBDDAT
3	NC
4	Gnd
5	+5V

P40 - PS/2 Mouse Connector

6 pin single row header, Tyco (AMP) #640456-6

Pin	Signal
1	PS2MSDAT
2	NC
3	Gnd
4	+5V
5	PS2MSCLK
6	NC

8231-037 Connectors (continued)

P41 - Fan Alarm LED Connector
2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	FF_LED
2	+5V

P42 - Temp Alarm LED Connector
2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	TEMP_LED
2	+5V

P43 - Voltage Alarm LED Connector
2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	VOLT_LED
2	+5V

P44 - Error Alarm LED Connector
2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	ERROR_LED
2	+5V

P45 - HDD LED Connector
2 pin single row header, Tyco (AMP) #640456-2

Pin	Signal
1	HDD_LED
2	+5V

P46 A
P46 B **3.3V AUX Card Slot Enable Connector**
P46 C 2 pin single row header, Tyco (AMP) #640456-2
P46 D

Pin	Signal
1	3.3V_AUX
2	+3.3V

Installing jumper P46 enables +3.3V AUX on all the PCIe card slots

P50 - Micro-Controller Programing Port (Factory Use Only)
5 pin single row header, Tyco (AMP) #87224-5

Pin	Signal
1	Vpp
2	Vdd
3	Gnd
4	ICSPDAT
5	ICSPCLK

8231-037 Connectors (continued)

P51 - RS232 Serial Port Connector

10 pin dual row connector, 3M #N2510-6003-RB

Pin	Signal	Pin	Signal
1	Carrier Detect (DCD)	2	Data Set Ready-I (DSR)
3	Receive Data-I (RX)	4	Request to Sent-O (RTS)
5	Transmit Data-O (TX)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator-I (RI)
9	Gnd	10	NC

P53 - GPIO Connector

8 pin dual row connector, 3M #N2508-6003-RB

Pin	Signal	Pin	Signal
1	GPIO2	2	GPIO3
3	GPIO4	4	GPIO5
5	GPIO6	6	GPIO7
7	GPIO1	8	Gnd

P55 - JTAG Connector

10 pin dual row connector, 3M #N2510-6003-RB

Pin	Signal	Pin	Signal
1	TCK	2	Gnd
3	TDOHDR	4	+3.3V
5	TMS	6	RESET#
7	EVTO	8	TRST#
9	TDOPCIE8	10	NC

P57 - Front or Rear Panel LED/Button Connector (Factory Use Only)

7 pin single row header, Tyco (AMP) #640456-7

Pin	Signal
1	Common from panel
2	Button position 1
3	Button position 2
4	Button position 3
5	Button position 4
6	Button position 5
7	Button position 6

P60, P61, P62, P63, P64, P65 SATA Connectors (6)

7 pin vertical connector with latch, Molex # 67800-8005

P60 = Backplane SATA0, P61 = Backplane SATA1
P62 = Backplane SATA2, P63 = Backplane SATA3
P64 = Backplane SATA4, P65 = Backplane SATA5

Pin	Signal
1	Gnd
2	TXn_p
3	TXn_n
4	Gnd
5	RXn_p
6	RXn_n
7	Gnd

n = 0, 1, 2, 3, or 4

8231-037 Diagnostic LED Status Indicators

LED Reference Designation	Backplane Silkscreen Wording	LED On	LED Off
LED1 (Red)	SHB Detect	SHB is not properly seated in its socket	Normal operation – SHB Detected
LEDs 2, 3 4, 5, 6 7 8 &9 (Green)	FAN0, FAN1, FAN2, FAN3 FAN 4 FAN 5 FAN6 and FAN7	System fan present	System fan not present
LED11 (Green)	5V AUX	Acceptable voltage level	Voltage level not acceptable
LED12 (Green)	12V	Acceptable voltage level	Voltage level not acceptable
LED13 (Green)	5V	Acceptable voltage level	Voltage level not acceptable
LED14 (Green)	3.3V	Acceptable voltage level	Voltage level not acceptable
LED18 (7-segment display)	Lower Post Code	SHB Post Code Error*	SHB Boot Complete
LED19 (7-segment display)	Upper Post Code	SHB Post Code Error*	SHB Boot Complete

*See the HEP8225 hardware reference manual for a description of the SHB's post code error code numbers

8231-037 Switches

HDB8231 Switch	Function
SW2	Fan 0 Fan Control On/Off Fan 1 Fan Control On/Off Fan 2 Fan Control On/Off Fan 3 Fan Control On/Off
SW1	Fan 4 Fan Control On/Off Fan 5 Fan Control On/Off Fan 6 Fan Control On/Off Fan 7 Fan Control On/Off