

## **Technical Reference**

### **12-Slot Passive Backplanes**



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1641 McGaw Avenue  
Irvine, California 92614



## Features

- 1 Single Board Computer (SBC) connector for easy upgrades through the latest Pentium® and Pentium® Pro products. The SBC is compatible with any CSS Single Board Computer
- Basic connectors provided for speakers, hard disk LED, reset/turbo LED, keylock, PS/2 mouse and CMOS battery
- Power connectors for both 5 volt and 3 volt power source
- Auxiliary power connectors for flexibility in backplane-to-chassis mounting

## FCC Standards

The FCC (Federal Communications Commission) restricts the amount of radiation and radio frequency emissions coming from computing equipment.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CSS Labs is not responsible for any radio or television interference caused by unauthorized modifications to this equipment. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

To ensure compliance to FCC non-interference regulations, peripherals attached to this device require shielded I/O cables.

**NOTICE:** The use of a non-shielded I/O cable with this device is in violation of U.S. Federal law and will not allow the device to meet the maximum emission limits.

**CAUTION:** Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

**Note:** If you have purchased the miniature tower system, please note the following...

**WARNING:** The system is to be installed on desk or table tops only. The unit will become unstable if operated as a floor standing unit and unintentional force is applied to the top of the unit.

Turn the unit off and unplug the power cord before you open the cover to install any cards or peripheral devices.

## WARNING

CAUTION: THERE IS A DANGER OF EXPLOSION IF THE BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

ATTENTION: IL Y A DANGER D'EXPLOSION S'IL Y A REMPLACEMENT INCORRECT DE LA BATTERIE. REMPLACER UNIQUEMENT AVEC UNE BATTERIE DU MEME TYPE OU D'UN TYPE RECOMMENDE PAR LE CONSTRUCTEUR. ETTERAU REBUT LES BATTERIES USAGEES CONFORMEMANT AUX INSTRUCTIONS DU FABRICATANT.

# NOTICE

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# Section 1 - Introduction

## Document Overview

This document describes the technical features of CSS 12-slot passive backplanes. The topics include:

- **Connectors** - description of connectors and their functions
- **Illustrations** - illustrations of each 12-slot passive backplane
- **Jumpers** - descriptions and pin assignments of all 12-slot passive backplane jumpers (where ever applicable)

This document is divided into several sections. Section two describes backplane connectors in detail. Sections three through six provide backplane illustrations and board-specific feature descriptions. These sections also provide jumper descriptions for boards designed with jumpers.

## Basic Features

CSS passive backplanes provide a number of ISA and PCI bus slots. Bus configurations are discussed in sections of this document devoted to specific boards.

## **Connectors**

Hard disk activity indicator LED connectors are provided for either an add-in or single board computer (SBC) on-board controller. Front panel, reset/turbo, mouse, speaker and keylock connectors are also provided.

5 volt and 3.3 volt power connectors on the board supply power to the ISA and PCI busses, add-in boards and SBC. Auxiliary sets are provided in alternate locations.

Also provided is a connector for infrared-based peripheral devices. The connector attaches to an add-in transceiver.

## **Single Board Computer Bus**

To facilitate CSS SBCs, the backplanes use a basic ISA bus architecture with a PCI bus extension. CSS backplanes accept all CSS single board computers.

## **PCI Bus Bridge**

PCI bus architecture design imposes a four PCI bus limit per system. CSS's passive backplanes expand beyond this limitation by incorporating a PCI bridge onto the board.

On CSS passive backplanes with more than four PCI busses, the first two PCI busses communicate directly with the associated SBC. These two PCI busses operate at PCI level 0.

All subsequent PCI busses communicate with the SBC through the PCI bridge. These PCI busses operate at PCI level 1.

The following diagrams illustrate bus arrangements for six PCI slot and nine PCI slot passive backplanes:

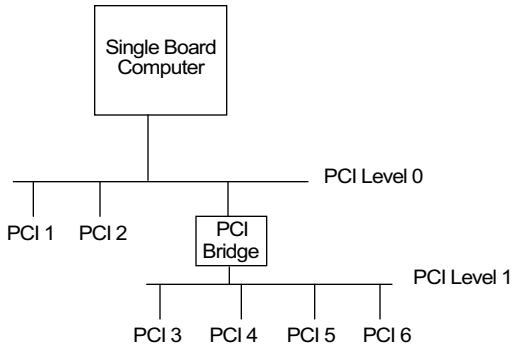


Figure 1-1: Six PCI Bus Passive Backplanes

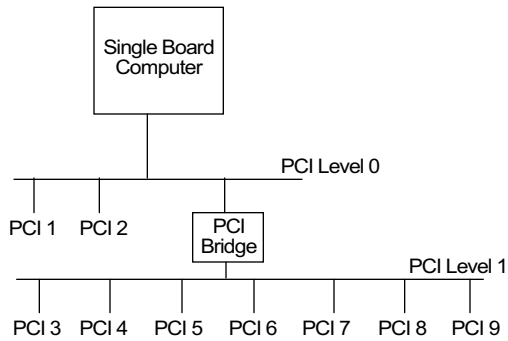


Figure 1-2: Nine PCI Bus Passive Backplanes

## PCI Bus Shared Interrupts

Because of the PCI bus design limitation, passive backplanes with more than four PCI busses are required to share some interrupts. The following information outlines the shared interrupt arrangement.

### *Six PCI Backplane*

A	B	C	D
PCI 4	PCI 1 PCI 5	PCI 2 PCI 6	PCI 3

### *Nine PCI Backplane*

A	B	C	D
PCI 4	PCI 1	PCI 2	PCI 3
PCI 8	PCI 5 PCI 9	PCI 6	PCI 7

# Section 2 - The Connectors

## Overview

This section describes the connectors and their functions. These descriptions apply to all CSS 12-slot passive backplanes.

## Basic Features

Hard disk activity indicator LED connectors are provided for either an add-in or SBC on-board controller. Front panel, reset/turbo, mouse, speaker and keylock connectors are also provided.

5 volt and 3 volt power connectors on the board supply power to both the ISA and PCI busses, add-in boards and SBC. Auxiliary sets are available in alternate locations.

# Connectors

All CSS Laboratories' 12-slot passive backplane provide the following connectors:

- 5 volt power
- 3 volt power
- Auxiliary 5 volt
- Auxiliary 3 volt
- Keyboard
- PS/2 Mouse
- Speaker
- Hard drive LED
- Reset/Turbo LED
- Front Panel
- Infrared
- Keylock
- Battery

## 5 Volt Power Connector; Auxiliary Connector

The connectors attach the board to the power via the 5 volt regulator. Orient the plugs' black wires to sit side-by-side.

Pin	Assignment	Pin	Assignment
1	Power good	7	Ground
2	+5Vdc	8	Ground
3	+12 Vdc	9	-5 Vdc
4	-12 Vdc	10	+5 Vdc
5	Ground	11	+5 Vdc
6	Ground	12	+5 Vdc



### 3 Volt Power Supply Connector; Auxiliary Connector

The connectors attach the board to the power via the 3 volt regulator. Orient the plugs' black wires to sit side-by-side.

Pin	Assignment	Pin	Assignment
1	Ground	7	+3.3 Vdc
2	Ground	8	+3.3 Vdc
3	Ground	9	+3.3 Vdc
4	3.3 Vdc	10	Ground
5	3.3 Vdc	11	Ground
6	+3.3 Vdc	12	Ground

### Keyboard Connector

Keyboard plugs are keyed for proper installation.

Pin	Assignment	Pin	Assignment
1	Clock	4	Ground
2	Data	5	+5 Vdc
3	Not used		

### Speaker Connector

The speaker connector attaches to a standard chassis speaker.

Pin	Assignment
1	Speaker (-)
2	Not Used
3	Ground
4	Speaker (+)

## PS/2 Mouse Connector

The connector provides IBM PS/2 mouse support, leaving the serial port open for options. Pin 1 is marked.

Pin	Assignment	Pin	Assignment
1	Clock	6	Vcc
2	Not used	7	Ground
3	Not used	8	Data
4	Not used	9	Ground
5	Not used	10	Not Used

## Hard Drive LED

These connectors attach hard drive access LEDs to the front panel for either the on-board SBC controller or add-in controller board, respectively. The LED lights when the drive is accessed.

### On-Board SBC IDE LED

Pin	Assignment	Pin	Assignment
1	HD LED	3	HD LED
2	Power	4	Power

### Add-In Board IDE LED

Pin	Assignment
1	HD LED
2	Power

## Reset/Turbo Connector

The reset button lets you perform a “warm boot” without turning the system off. The turbo LED indicates the system is running at the higher clock speed when it lights.

Pin	Assignment	Pin	Assignment
1	Reset	3	Turbo LED
2	Ground	4	Ground

## Front Panel Connector

This 10-pin connector is the interface between the system board and the control panel on the front of the system case.

Pin	Assignment	Pin	Assignment
1	Ground	6	Ground
2	Power LED	7	LED on
3	HD LED	8	Keylock
4	Not used	9	Power LED
5	Power LED	10	Reset

## Infrared Connector

This connector attaches to an optional infrared add-in controller. Infrared controllers can act as ports for a number of peripheral devices including mouse, printer and keyboard.

Pin	Assignment
1	Receiving
2	Ground
3	Transmitting

## Power LED/Keylock

The power LED lights while the system is powered up. The keylock disables the keyboard.

Pin	Assignment
1	Power LED
2	Not used
3	Ground
4	Keylock
5	Ground

## Battery Connector

The connector attaches the 3.3 volt lithium battery to the board. The battery provides constant power to the single board computer's CMOS and has a typical life-span of five years.

Pin	Assignment
1	Battery Power
2	Not Used
3	Not used
4	Ground

# Section 3 - PB-10309

## Features

The four-layer PB-10309 provides three ISA expansion bus slots and nine PCI expansion bus slots. Built in logic bypasses the traditional four-slot PCI bus limitation, allowing you to configure the backplane with up to nine PCI expansion boards that can be used at the same time.

### PCI Slots

PCI slots one through two communicate directly with the single board computer. PCI slots three through nine utilize an on-board chip to pass communications to the single board computer. Please read **Section 1**, *PCI Bus Bridge*, for a more thorough description.

### Single Board Computer Bus Slot

The SBC slot is a combination of one EISA-style connector and one PCI-style connector. The slot is proprietary and can be configured with any CSS single board computer.

### Power Connectors

The PB-10309 provides a 3.3 volt power connector and a 5 volt power connector. The board also provides two sets of auxiliary 3.3 volt and 5 volt power connectors.

## PCI Bus Shared Interrupts

Due to design limitations on PCI busses, the following slots share interrupts: PCI 4/PCI 8; PCI 1/PCI 5/PCI 9; PCI 2/PCI 6; PCI 3/PCI 7. Boards configured on these busses are capable of sharing interrupts.

Please read **Section 1**, *PCI Bus Shared Interrupts*, for a more thorough explanation.

## Terminating Resistors

A row of terminating resistors placed between bus slots prevent bus signal reflections and interference.

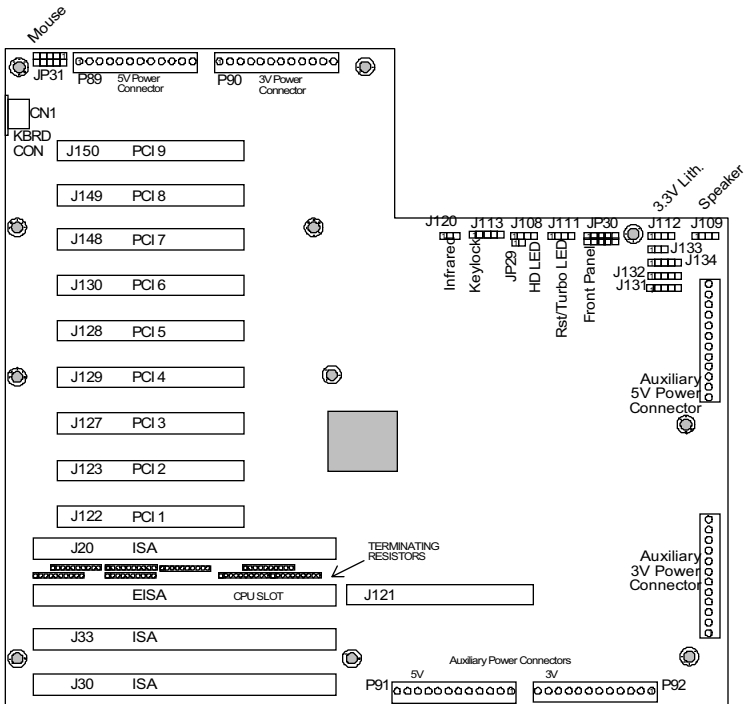


Figure 3-1: PB-10309 Passive Backplane

## Connectors

<b>Connector</b>	<b>Description</b>
P89	5 volt power
P90	3.3 volt power connector
P91	Auxiliary 5 volt connectors
P92	Auxiliary 3.3 volt connectors
CN1	Keyboard connector
JP31	PS/2 Mouse connector
J109	Speaker
J108, JP29	IDE hard drive LEDs
J111	Reset/Turbo LED
JP30	Front Panel connector
J120	Infrared connector
J113	Power LED/Keylock
J112	Battery connector





# Section 4 - PB-10606

## Features

The four-layer PB-10606 provides six ISA expansion bus slots and six PCI expansion bus slots. Built in logic bypasses the traditional four-slot PCI bus limitation, allowing you to configure the backplane with up to six PCI expansion boards that can be used at the same time.

### PCI Slots

PCI slots one through two communicate directly with the single board computer. PCI slots three through six utilize an on-board chip to pass communications to the single board computer. Please read **Section 1**, *PCI Bus Bridge*, for a more thorough description.

### Single Board Computer Bus Slot

The SBC slot is a combination of one EISA-style connector and one PCI-style connector. The slot is proprietary and can be configured with any CSS single board computer.

### Power Connectors

The PB-10606 provides a 3.3 volt power connector and a 5 volt power connector. The board also provides two sets of auxiliary 3.3 volt and 5 volt power connectors.

## PCI Bus Shared Interrupts

Due to design limitations on PCI busses, the following slots share interrupts: PCI 1/PCI 5; PCI 2/PCI 6. Boards configured on these busses be capable of sharing interrupts.

Please read **Section 1**, *PCI Bus Shared Interrupts*, for a more thorough explanation.

## Terminating Resistors

Five rows of terminating resistors placed between bus slots prevent bus signal reflections and interference.

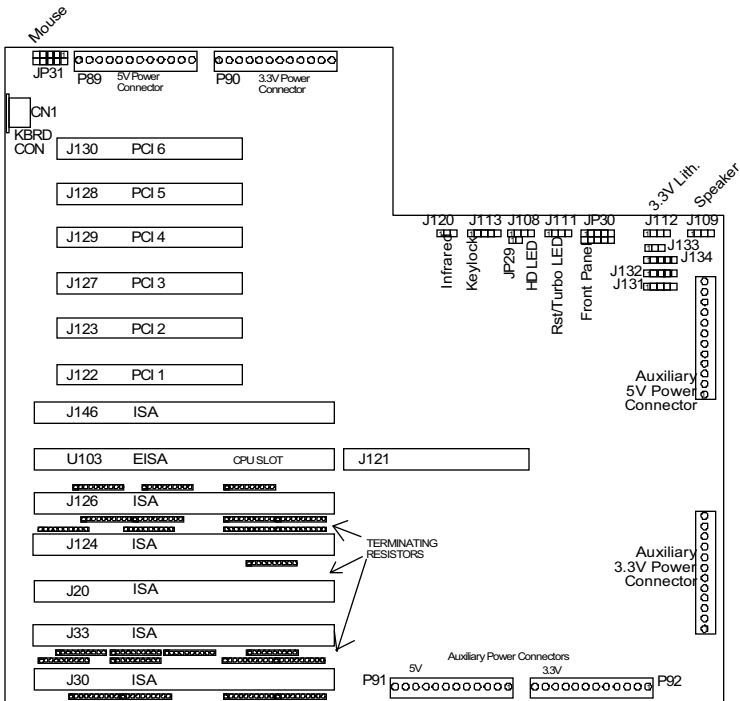


Figure 5-1: The PB-10606

## Connectors

<b>Connector</b>	<b>Description</b>
P89	5 volt power
P90	3.3 volt power connector
P91	Auxiliary 5 volt connectors
P92	Auxiliary 3.3 volt connectors
CN1	Keyboard connector
JP31	PS/2 Mouse connector
J109	Speaker
J108, JP29	IDE hard drive LEDs
J111	Reset/Turbo LED
JP30	Front Panel connector
J120	Infrared connector
J113	Power LED/Keylock
J112	Battery connector



# Section 5 - PB-10804

## Features

The four-layer PB-10804 provides three ISA expansion bus slots and nine PCI expansion bus slots. Built in logic bypasses the traditional four-slot PCI bus limitation, allowing you to configure the backplane with up to nine PCI expansion boards that can be used at the same time.

### PCI Slots

PCI slots one through four communicate directly with the single board computer. All four PCI busses can be concurrently configured with PCI boards.

### Single Board Computer Bus Slot

The SBC slot is a combination of one EISA-style connector and one PCI-style connector. The slot is proprietary and can be configured with any CSS single board computer.

### Power Connectors

The PB-10804 provides a 3.3 volt power connector and a 5 volt power connector. The board also provides two sets of auxiliary 3.3 volt and 5 volt power connectors.

## Terminating Resistors

A row of terminating resistors placed between bus slots prevent bus signal reflections and interference.

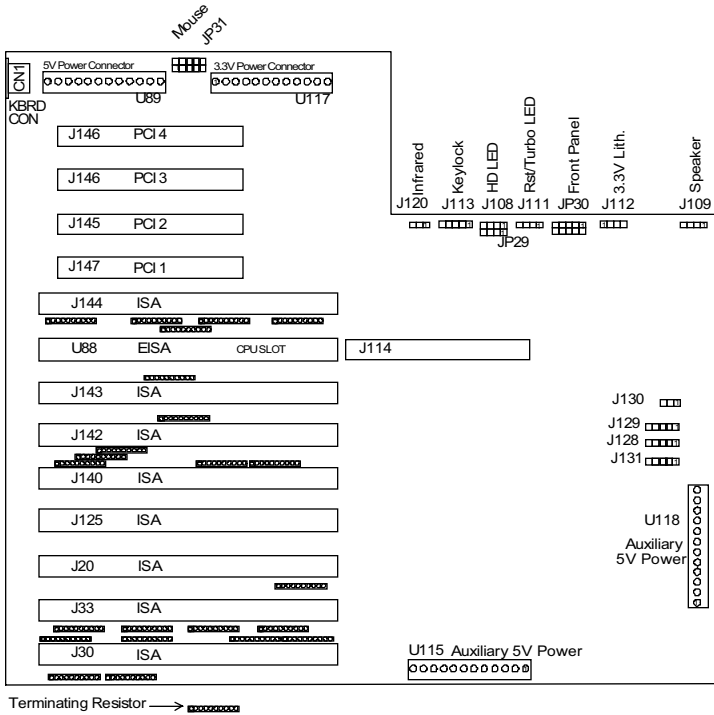


Figure 6-1: The PB-10804

## Connectors

<b>Connector</b>	<b>Description</b>
P89	5 volt power
P90	3.3 volt power connector
P115	Auxiliary 5 volt connectors
P116	Auxiliary 3.3 volt connectors
CN1	Keyboard connector
JP31	PS/2 Mouse connector
J109	Speaker
J108, JP29	IDE hard drive LEDs
J111	Reset/Turbo LED
JP30	Front Panel connector
J120	Infrared connector
J113	Keylock
J112	Battery connector

