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Chapter 1 Introduction

Welcome to the I-Bus family of system enclosures. This manual provides information necessary to set up and maintain the 4820.

The **4820 system enclosure** features a 20-slot ISA or PCI/ISA dual bus passive backplane. The chassis is positively pressurized, circulating filtered cooling air through all 20 slots of the card cage. The front-access drive bay holds up to five half-height 5.25" drives or two full-height and one half-height drive. It is equipped with either a 275W or 375W AC power supply and is available in desktop, rack mount, tower or industrial model configurations.

Because of the variety of available options, your system may not contain all of the features described in this manual.

This chapter is divided into three sections:

- **About this manual**

explains how this manual is laid out and what you can expect to find in it.

- **Preparing the system**

defines the items included with your system and describes the procedure for unpacking and setting up your 4820.

- **Features**

provides a brief overview of the major components of the 4820.

About this Manual

This manual contains five chapters pertaining specifically to the 4820. The appendices contain technical reference material, a glossary of terms, and illustrations of the ISA and PCI/ISA backplanes.

- **Chapter 1 Introduction**

introduces you to this manual and to your 4820. It contains an illustration of the system and a brief description of its features.

- **Chapter 2 Hardware**

details hardware removal and installation for the rear I/O panel, fuse, hold-down bar, fan and fan plenum.

- **Chapter 3 Power Distribution**

contains removal and installation instructions for the power and reset switches, power supply and backplane.

- **Chapter 4 Drives**

describes drive orientations and how to remove and install drives.

- **Chapter 5 Specifications**

provides physical and electrical specifications, as well as environmental specifications.

- **Appendix 1 Technical Reference**

lists ISA and PCI connector pin assignments.

- **Appendix 2 Glossary of Terms**

provides a glossary of the terms used in this manual.

- **Appendix 3 Illustrations**

contains illustrations of the ISA and PCI/ISA backplanes.

- **Index**

provides easy access to page numbers of items discussed in this manual.

Chapter 1 Introduction

Preparing the System

CAUTION!

Electrostatic Discharge (ESD) may damage memory chips, programmed devices and other electrical components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

- **Unpacking your 4820**

Unpack your system at a static-free workstation while observing proper Electrostatic Discharge (ESD) practices.

I-Bus reserves the right to refuse warranty service on units improperly unpacked to protect against ESD damage.

Included with your 4820 is:

- *4820 20-Slot Enclosure User Manual*
- Power cord
- Optional equipment (e.g. power module; slides for 4820 rack mount, etc.)

If any of the items have been damaged in shipping, notify the transit company and initiate an insurance claim. If any items are missing, contact I-Bus. Refer to the Limited Warranty in the back of this manual for further instructions.

Features

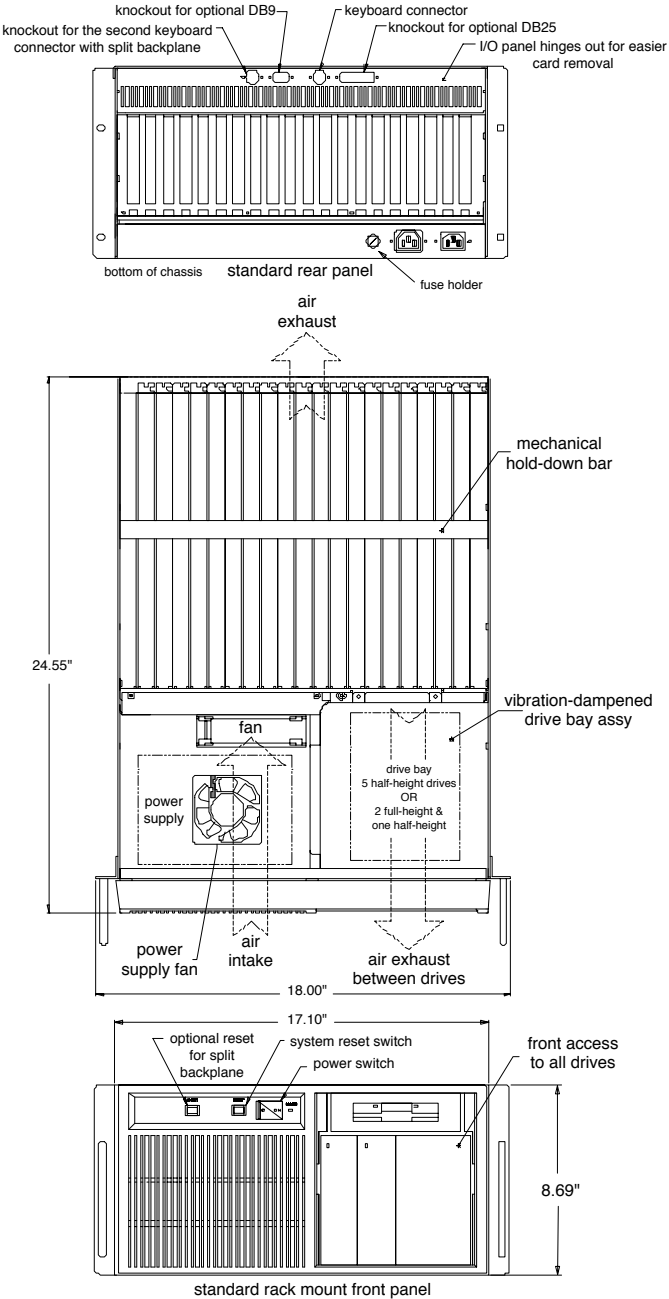


Figure 1-1: 4820 20-Slot Enclosure (Rack Mount)

Chapter 1 Introduction

Features

- **Backplane**

The 4820's six-layer passive backplane is offered in contiguous PCI/ISA or ISA-only configurations, with ISA backplanes segmentable into as many as ten two-slot systems.

Four LEDs located both on the contiguous and segmentable backplanes aid in diagnostic and troubleshooting. Each LED is labeled with the voltage it monitors.

- **Power supply**

The 4820 is equipped with a 115/230V AC power supply, in either 275W or 375W output. It is auto-sensing and auto-ranging for AC input.

- **Drive bay**

The 4820 drive bay uses eight isolation grommets for vibration dampening. The bay can mount a combination of five half-height drives or two full-height and one half-height drive, with all drives accessible from the front of the chassis.

- **Front control panel**

The power switch, reset switch and power ON/diagnostic LED are mounted on the front control panel. The panel can be customized to mount additional switches and a company logo.

Chapter 2 Hardware

This chapter describes the removal and installation of the I/O panel, the fuse, the I/O card hold-down bar, the fan plenum, and the chassis fan.

CAUTION!

Always turn OFF all power and disconnect the power cord before working on the system.

CAUTION!

Electrostatic Discharge (ESD) may damage memory chips, programmed devices and other electrical components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

Rear I/O Panel

The I/O panel is mounted on the rear of the chassis with the standard panel providing knockouts for an optional keyboard connector for a segmented backplane, and DB9 and DB25 connectors for serial and parallel ports respectively. Knockouts on optional I/O panels can provide for additional keyboard or SCSI connectors, as shown in Figure 2-1.

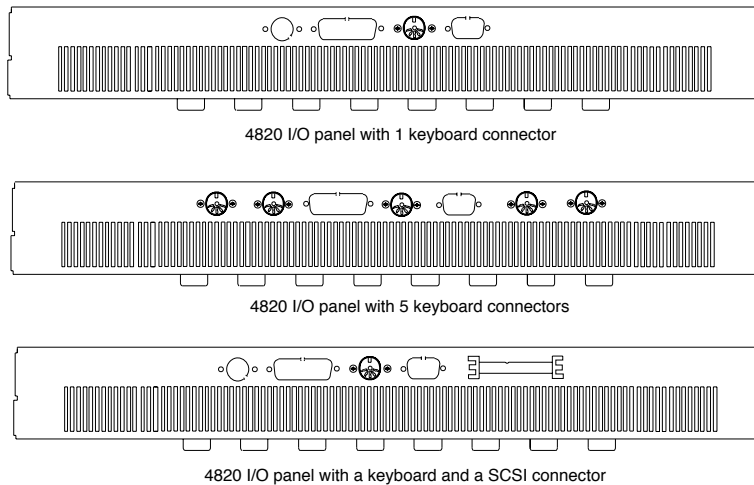


Figure 2-1: I/O Panel Configurations

Fuse

- **Removing rear panel knockouts**
 1. Place the chassis on a static free mat and remove the decorative cover (desktop and tower models) and the top cover. For industrial models, remove the front panel.
 2. Remove the hold-down bar (see page 2-3).
 3. While supporting the I/O panel, press the desired plug(s) toward the chassis interior with an appropriate tool. Do not let the plugs fall into the chassis.
 4. Re-install the hold-down bar. Replace the chassis top cover, then the decorative cover (desktop and tower models). For industrial models, replace the front panel.

Fuse

The 275W power supply uses an 8A slow-blow fuse. The 375W power supply uses a 10A slow-blow fuse.

CAUTION!

To ensure continued protection against fire, always use a fuse of the same type and rating as supplied with the chassis.

- **Replacing the fuse**
 1. Locate the fuse holder next to the AC convenience receptacle on the rear of the chassis.
 2. Remove the fuse cartridge out of the fuse holder.
 3. Remove the old fuse, then insert a new one into the fuse cartridge.
 4. Re-insert the fuse cartridge.

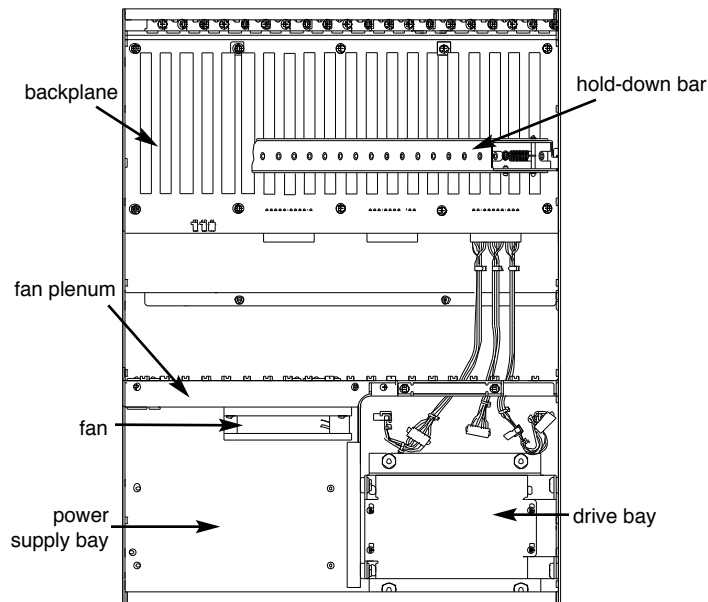


Figure 2-2: 4820 with ISA Backplane (Top View)

Hold-down Bar

To keep I/O cards secured in their slots in high shock and vibration environments, the 4820 is equipped with a mechanical hold-down bar.

The bar can be placed anywhere within the card cage in half inch increments. To replace I/O cards, the hold-down bar must be removed.

- **Moving the hold-down bar**

1. Place the chassis on a static free mat and remove the decorative cover (desktop and tower models) and the top cover. For industrial models, remove the front panel.
2. Loosen the locking screw closest to the center of the bar.
3. Wrap your hand around the bar, pull the inner bracket back, and lift the bar from the chassis.
4. Place the bar in a new location and tighten the locking screw.
5. Re-attach the top cover and the decorative cover (desktop and tower models). For industrial models, replace the front panel.

Fan Plenum and Chassis Fan

The fan plenum is positively pressurized to distribute cooling air to the I/O cards and drives. If the chassis fan needs to be replaced, the fan plenum will need to be removed.

- **Removing the fan plenum**
 1. Place the chassis on a static free mat and remove the decorative cover (desktop and tower models) and the top cover. For industrial models, remove the front panel.
 2. Remove the hold-down bar (see page 2-3).
 3. Disconnect all ribbon cables from the I/O cards, then remove one screw from the cable clamp on top of the fan plenum. Loosen the other screw and swing the cable clamp away.
 4. Remove all boards and I/O cards from the backplane.
 5. Remove the violet and black wire pair from the chassis fan, and then tip the chassis on its side to remove the two bottom screws securing the fan plenum to the chassis base.
 6. Put the chassis on its base. With the front of the chassis facing you, remove three screws from the left and two from the right that secure the fan plenum to the chassis.
 7. Remove the screw from the top of the fan plenum next to the ribbon cable clamp and lift the fan plenum from the chassis.
- **Removing the fan**
 1. Remove the two screws from the fan plenum, located directly above the fan.
 2. Separate the fan bracket from the plenum.
 3. Place the chassis fan bracket on a flat surface. Remove the four screws securing the fan to the chassis fan bracket and lift the fan from the bracket.
- **Installing the fan**
 1. Align the four holes in the fan with the four holes on the chassis fan bracket. Note the direction of the air flow arrow on the fan and the location of the fan contacts.
 2. Insert all screws into their holes and tighten.
 3. Reconnect the two wires to the fan.
 4. Insert and tighten the two screws to the fan plenum.

Chapter 2 Hardware

- Installing the fan plenum
 1. Tip the base of the fan plenum toward the power supply and slide it down onto the chassis base. The plenum slides under the drive bay housing.
 2. With the front of the chassis facing you, start the three screws on the left and the two on the right into their holes; DO NOT tighten them.
 3. Feed the ribbon cables through the cable clamp, re-insert the cable clamp screw and tighten it. Re-install the I/O cards and re-attach the ribbon cables to the cards.
 4. Tip the chassis on its side and thread the two bottom screws and tighten.
 5. Put the chassis on its base and tighten the screws on both chassis walls.
 6. Re-install the hold-down bar. Reconnect the violet and black fan wires, then replace the top cover and the decorative cover (desktop and tower models). For industrial models, replace the front panel.

This chapter is divided into three sections: front control panel, power supply and backplane.

The first section gives instructions for removing and installing the 4820 reset and power switches, the power ON/diagnostic LED, and the front control panel. The second section provides power supply removal and installation instructions. The third section details backplane connector pin-outs, power connectors, and backplane removal and installation.

CAUTION!

Always turn OFF all power and disconnect the power cords before working on the system.

Front Control Panel

The front control panel is removable, allowing the power switch, reset switch, and the power ON/diagnostic LED to be replaced.

The following drawing shows a front control panel with one additional reset switch corresponding to one additional backplane segment.

To remove or install the control panel or its parts, use the directions on the following page.

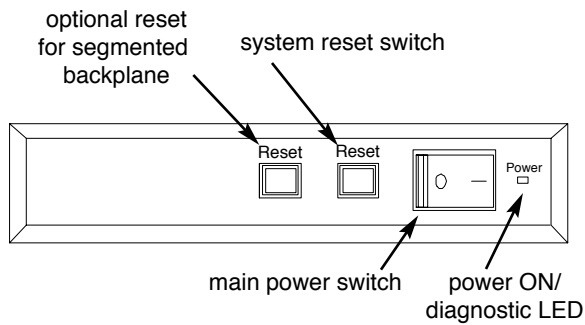


Figure 3-1: Front Control Panel

- Removing the front control panel

CAUTION!

Electrostatic Discharge (ESD) may damage memory chips, programmed devices and other electrical components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

1. Place the chassis on a static free mat and remove the decorative cover (desktop and tower models) and the top cover. Remove the front bezel. For industrial models, remove the front panel.
 2. Remove the two screws securing the control panel to the chassis.
 3. Slide the panel to the right and pull it away from the unit.
- Removing the power and reset switches
 1. Disconnect the leads from the backs of the power and reset switches.
 2. Squeeze the switch snap fittings together and push the switches out of the control panel.
 - Removing the power ON/diagnostic LED
 1. Cut the cable ties securing the LED wires to the chassis.
 2. Remove the wires from the cable clamps near the chassis fan.
 3. Remove plug P23 from header J23 at the lower left of the ISA or PCI/ISA backplane (see pages A3-1 and A3-2 for connector locations) and pull the LED and its wires free from the unit.
 4. Remove the LED's bracket.
 - Installing the power and reset switches
 1. Push each switch into its mounting hole until it snaps into place. When replacing the power switch, be sure the O is next to the reset switch (see Figure 3-1).
 2. For the power switch, connect the blue wires to the top two switch terminals, with the double blue wire to the left terminal.

Attach the brown wires to the bottom two terminals, with the double brown wires to the left terminal, as shown in Figure 3-2:

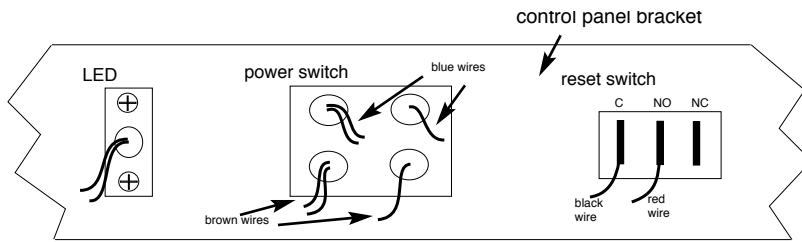


Figure 3-2: Rear of Control Panel

3. Connect the red wire to the reset switch's normally open (NO) terminal and the black wire to the common (C) terminal.
- **Installing the power ON/diagnostic LED**
 1. Slide the small bracket over the wires and push it toward the LED until it is snug.
 2. Attach the LED to the control panel.
 3. Thread the wires under the fan plenum and up around the chassis fan, replacing the wires in the cable clamps.
 4. Attach the wires to the cable tie bases on the floor of the chassis.
 5. Plug P23 from the new LED into connector J23 at the lower left of the ISA or PCI/ISA backplane (see pages A3-1 and A3-2 for connector locations).
 - **Installing the front control panel**
 1. Push the tabs (at the panel's upper edge) into their slots and slide the panel to the left.
 2. Install the two retaining screws on the bottom of the panel.
 3. Re-attach the front bezel, the top cover and the decorative cover (desktop and tower models). For industrial models, replace the front panel.

Power Supply

The auto-ranging power supply is available in a 275 W or 375W output.

- **Removing the power supply**

1. Turn the power OFF at the control panel and disconnect the incoming AC power line.
2. Remove the decorative cover (on the desktop and tower models) and the top cover. For industrial models, remove the front panel. Place the chassis on a static-free mat and turn the unit on its side so the drive bay sits at the top of the unit (tower orientation).

CAUTION!

After the power has been turned off allow the unit to sit idle for five minutes before removing the power supply. Failure to do so could result in electrical damage to the system and/or personal injury.

3. Remove the hold-down bar (see page 2-3). Disconnect the power supply AC input and unplug J24 and J25 at the backplane (see pages A3-1 and A3-2 for connector locations).
4. Separate the inline connectors between the power supply fan and the chassis fan, then remove the power supply fan wires from the cable clamps so they hang free.
5. Remove the screws securing the power supply to the chassis.
6. Remove the supply and the DC output harness from the chassis. Place the power supply, fan side down, on a static free mat.
7. Remove the three flathead screws securing the supply to the fan bracket and slide the supply out of the bracket. Transfer the DC output harness to the replacement power supply.

NOTE: Call I-Bus for proper packaging instructions if the power supply will be shipped back.

- Installing the power supply

In the following instructions, the fan bracket is oriented with the fan side up.

1. Place the fan bracket on a static free mat. Position it so the small semi-circle cut-out is on the lower left side.
2. Slide the power supply into the fan bracket so the I/O connectors and the DC output harness are on the right side (see Figure 3-3). Connect the red wires on the +5V and the black wires to GND and plug in the DC output connector.

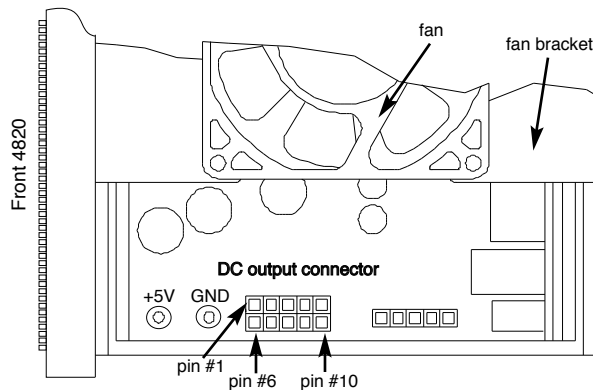


Figure 3-3: Power Supply (Top View)

CAUTION!

Use 1/4" screws to avoid shorting to the bottom of the power supply's printed circuit board.

3. Screw the supply to the fan bracket, then place the assembly into the chassis and thread the DC output harness under the fan plenum.
4. Align the bracket/supply assembly with the chassis and insert the top left and bottom right screws and start them. Insert and start the other two screws, then tighten all four screws.
5. Reconnect J24 and J25 to their respective backplane locations and plug the AC input connector back in (see pages A3-1 and A3-2 for connector locations).

Backplane

6. Reconnect the inline connector between the power supply fan and chassis fan. Insert the power supply's fan wires into the cable clamps.
7. Put the chassis on its base (desktop orientation), and re-attach the top cover and the decorative cover (desktop and tower models). For industrial models, replace the front panel.

Backplane

The 4820 supports ISA and PCI/ISA backplanes. The following charts provide connector information for the ISA and PCI/ISA backplanes.

- Backplane connectors

Connector	Function
J01-J20	ISA bus connectors
J21	RESET-IN
J22	PWR GOOD
J23	PWR LED
J24	DC input from power supply, +5V, GND
J25	DC input from power supply, +12V, -12V, -5V, +5V sense, GND
J26	Power for disk drives

Table 3-1: ISA Backplane Connectors

Connector	Function
J01-J15	ISA bus connectors
J16	ISA CPU
J17	PCI CPU
J18-J21	PCI bus connectors
J23	PWR LED
J24	DC input from power supply, +5V, GND
J25	DC input from power supply, +12V, -12V, -5V, +5V sense, GND
J26	Power for disk drives +5V, +12V, GND
J27	Provides 3.3V Pins 1 thru 3 = GND Pins 4 thru 6 = 3.3 V

Table 3-2: PCI/ISA Backplane Connectors

J24	J25	J26
Pin 1 +5V	Pin 1 GND	Pin 1 +12V
Pin 2 +5V	Pin 2 GND	Pin 2 GND
Pin 3 +5V	Pin 3 +12V	Pin 3 GND
Pin 4 +5V	Pin 4 +12V	Pin 4 +5V
Pin 5 +5V	Pin 5 GND	Pin 5 +12V
Pin 6 +5V	Pin 6 GND	Pin 6 GND
Pin 7 +5V	Pin 7 GND	Pin 7 GND
Pin 8 GND	Pin 8 +12V	Pin 8 +5V
Pin 9 GND	Pin 9 -5V	Pin 9 +12V
Pin 10 GND	Pin 10 +5V	Pin 10 GND
Pin 11 GND	Pin 11 GND	Pin 11 GND
Pin 12 GND	Pin 12 -12V	Pin 12 +5V

Table 3-3: Backplane Power Connector Voltages

- **Contiguous backplane reset and power good connectors**

ISA backplane. The reset switch from the front control panel connects to RESET-IN (J21, at the lower left of the backplane). The backplane reset cable connects from PWR GOOD (J22, at the lower left of the backplane), to the CPU board (see A3-1 for connector locations).

PCI/ISA backplane. The reset switch from the front control panel connects directly to the CPU (see A3-2 for connector locations).

- **Segmented backplane reset and power good connectors**

ISA backplane. The first reset switch (Reset "A") from the front control panel connects to RESET-IN (J21) on the backplane. The backplane reset cable connects from PWR GOOD (J22), to the first CPU board ("A"). Reset "B" from the front control panel connects directly to CPU board "B". Each additional CPU board uses its own reset switch directly from the front control panel (see page A3-1 for connector locations).

For CPU boards requiring power good, connect the red wire of the backplane reset cable to PWR GOOD on the CPU board and connect the black wire to GND on the CPU board.

For CPU boards with power good, connect the red wire of the backplane reset cable to reset on the CPU board and connect the black wire to GND on the CPU board.

For CPU boards with power good *and* reset, use the power good connections.

- **ISA Passive Backplane**

The ISA backplane has 20 slots, labeled J1 through J20, with a card spacing of 0.8". J21 is the reset switch connector, J22 is the connector for power good, and J23 connects to the power LED.

- **On-board Bus Terminations**

ISA backplane. Sockets are not provided on the backplane for optional on-board bus termination resistor networks (I-Bus Model No. 3457).

PCI/ISA backplane. Sockets are provided for on-board bus termination resistor networks.

The resistor networks plug into the five 16-pin sockets located on the backplane and provide additional immunity to backplane noise due to reflection. A 4.7K Ohm pull-down resistor is used for the reset line on the bus. The characteristic impedance of the backplane is between 50 and 100 Ohms. However, this value may vary from one application to another.

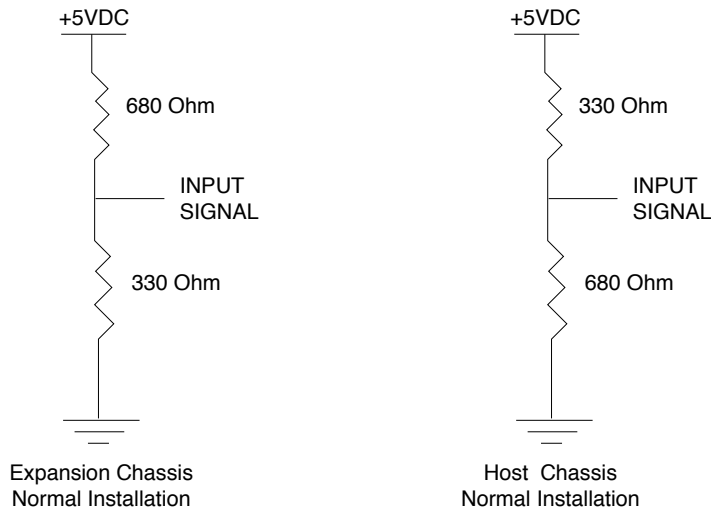


Figure 3-4: Resistor Network Installation

- **Power connectors for contiguous and segmented backplanes**

The power connectors for +5V, -5V, +12V, -12V and +5V sense remain the same for both backplanes. The ISA segmented backplane does not require a separate power supply.

- **Removing the backplane**

1. Place the chassis on a static free mat and remove the decorative cover (desktop and tower models) and the top cover. For industrial models, remove the front panel.

CAUTION!

Electrostatic Discharge (ESD) may damage memory chips, programmed devices and other electrical components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

2. Remove the hold-down bar (see page 2-3).
3. Remove all cables from the I/O cards, then remove all I/O cards and connectors from the backplane.
4. Remove the screws from the backplane. Tilt and lift the backplane free from the chassis.

NOTE: Call I-Bus for packaging instructions if the backplane will be returned.

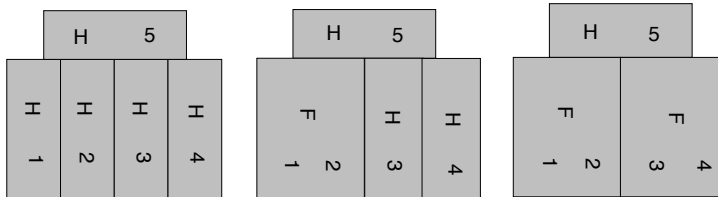
- **Installing the backplane**

1. Tilt the backplane and slide it into the chassis. Align the holes in the backplane with the standoffs in the chassis' base.
2. Insert and tighten the screws into the two holes outlined on the backplane silkscreen. All other screws can be inserted and tightened in random order.
3. Re-insert all I/O cards and connectors into the backplane.
4. Re-install the hold-down bar (see page 2-3).
5. Attach the top cover and the decorative cover (desktop and tower models). For industrial models, replace the front panel.


Chapter 4 Drives

This chapter describes the cable routing and orientation of the drives mounted in the drive bay.

The drive bay can mount up to five half-height drives or two full-height and one half-height drive. The following drawing details correct drive orientation.

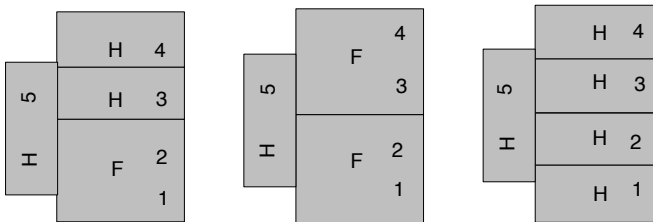


Front of desktop/rackmount 4820


 = occupied position H = half-height drive F = full-height drive

A full-height peripherals occupy two half-height positions.

Figure 4-1: Drive Orientation, Desktop/Rack Mount



Front of tower 4820

 = occupied position H = half-height drive F = full-height drive

A full-height peripherals occupy two half-height positions.

Figure 4-2: Drive Orientation, Tower

Drive Installation

- Installing drives in bays 1-4

Refer to Figures 4-1 and 4-2 for diagrams of these locations.

Mount drives from the bottom up, in groups of two for half-height drives. Once both half-height drives are installed, secure the top one first, then the bottom. For full-height drives install the bottom one first. When both are installed, secure the top drive first.

1. Remove the front bezel and the bezel cover, then remove the decorative cover (desktop and tower models) and the top cover. For industrial models, remove the front panel. Remove the hold-down bar (see page 2-3).
 2. Turn the chassis on its side so the bay is on top and facing you (desktop and rack mount models). Remove the screws securing the top drive bracket to the bay.
 3. Install the drives per their mounting specifications.
 4. Remove one screw from the drive bay's cable clamp, then loosen the other so the clamp rotates. Attach the data and control ribbon cables and the drive power connectors to the bottom drive and feed them into the bay.
 5. Fold* and secure each cable with the cable clamp. Lay each cable above the other to prevent them from being pinched. All cables must clear the clamp before tightening the retaining screws. Secure the top drive, then the bottom drive.
 6. Replace the decorative cover (desktop and tower models), the top cover, the bezel cover and the front bezel. Replace the front panel for industrial models.
- * Because of limited space, all drive cables are folded to 45° just after the cable's connector and then laid flat against the back of the bay.

Chapter 4 Drives

- Installing a drive in bay 5

Refer to Figures 4-1 and 4-2 for a diagram of this location.

This location is for a floppy drive if only one is installed. A half-height drive can be installed in location five by using the top drive bracket.

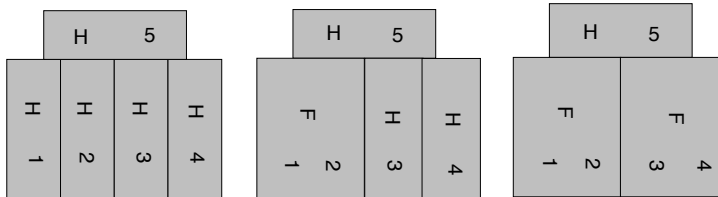
1. Remove the front bezel and the bezel cover. Remove the decorative cover (desktop and tower models) and the top cover. For industrial models, remove the front panel. Remove the hold-down bar (see page 2-3).
2. Turn the chassis on its side so the bay is up and facing forward (desktop and rack mount models), then remove the four screws securing the top drive bracket to the bay.
3. Using the screws supplied with the drive, attach the top drive bracket to the sides of the floppy drive, slots facing front.
4. Connect the ribbon cable to the floppy drive and fold* the cable. Insert the drive into the bay.
5. Attach the power connector to the drive and secure the drive to the drive bay with the screws provided.

* Because of limited space, all drive cables are folded to 45° just after the cable's connector and then laid flat against the back of the bay.


Chapter 4 Drives

This chapter describes the cable routing and orientation of the drives mounted in the drive bay.

The drive bay can mount up to five half-height drives or two full-height and one half-height drive. The following drawing details correct drive orientation.

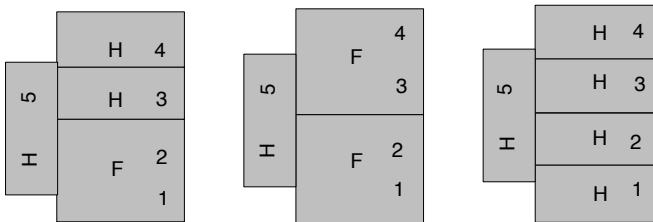


Front of desktop/rackmount 4820


 = occupied position H = half-height drive F = full-height drive

A full-height peripherals occupy two half-height positions.

Figure 4-1: Drive Orientation, Desktop/Rack Mount



Front of tower 4820

 = occupied position H = half-height drive F = full-height drive

A full-height peripherals occupy two half-height positions.

Figure 4-2: Drive Orientation, Tower

Drive Installation

- Installing drives in bays 1-4

Refer to Figures 4-1 and 4-2 for diagrams of these locations.

Mount drives from the bottom up, in groups of two for half-height drives. Once both half-height drives are installed, secure the top one first, then the bottom. For full-height drives install the bottom one first. When both are installed, secure the top drive first.

1. Remove the front bezel and the bezel cover, then remove the decorative cover (desktop and tower models) and the top cover. For industrial models, remove the front panel. Remove the hold-down bar (see page 2-3).
 2. Turn the chassis on its side so the bay is on top and facing you (desktop and rack mount models). Remove the screws securing the top drive bracket to the bay.
 3. Install the drives per their mounting specifications.
 4. Remove one screw from the drive bay's cable clamp, then loosen the other so the clamp rotates. Attach the data and control ribbon cables and the drive power connectors to the bottom drive and feed them into the bay.
 5. Fold* and secure each cable with the cable clamp. Lay each cable above the other to prevent them from being pinched. All cables must clear the clamp before tightening the retaining screws. Secure the top drive, then the bottom drive.
 6. Replace the decorative cover (desktop and tower models), the top cover, the bezel cover and the front bezel. Replace the front panel for industrial models.
- * Because of limited space, all drive cables are folded to 45° just after the cable's connector and then laid flat against the back of the bay.

Chapter 4 Drives

- Installing a drive in bay 5

Refer to Figures 4-1 and 4-2 for a diagram of this location.

This location is for a floppy drive if only one is installed. A half-height drive can be installed in location five by using the top drive bracket.

1. Remove the front bezel and the bezel cover. Remove the decorative cover (desktop and tower models) and the top cover. For industrial models, remove the front panel. Remove the hold-down bar (see page 2-3).
2. Turn the chassis on its side so the bay is up and facing forward (desktop and rack mount models), then remove the four screws securing the top drive bracket to the bay.
3. Using the screws supplied with the drive, attach the top drive bracket to the sides of the floppy drive, slots facing front.
4. Connect the ribbon cable to the floppy drive and fold* the cable. Insert the drive into the bay.
5. Attach the power connector to the drive and secure the drive to the drive bay with the screws provided.

* Because of limited space, all drive cables are folded to 45° just after the cable's connector and then laid flat against the back of the bay.

Chapter 5 Specifications

- **Number of backplane slots**

ISA: 20 ISA on 0.80" centers (full length 13.41" cards)

PCI/ISA: 15 ISA, 4 PCI, 1 CPU slot on 0.80" centers

- **Cooling**

130 CFM fan for the card cage, 26 CFM fan for the power supply

- **Dimensions**

Rack mount: 24.55" D x 8.69" H x 17.10" W

Desktop: 24.55" D x 8.69" H x 17.10" W

Tower: 24.55" D x 17.10" H x 8.69" W

- **Input voltage**

90-132/180-264V AC (auto-ranging) 47-63Hz

- **Output voltages**

Output Voltage	275 Watt Power Supply			375 Watt Power Supply		
	Min	Typ	Max	Min	Typ	Max
+5V	3.0A	30A	38A*	4.2A	42A	46A*
+12V	0A	10A	11A*	0A	13A	14A*
-12V	0A	0.5A	1.5A*	0A	0.5A	1.5A*
-5V	0A	0.5A	1.5A*	0A	0.5A	1.5A*

Table 5-1: Power Supply Output

* Provided that the maximum output power does not exceed power supply ratings.

Environmental Specifications

Environmental	Operating	Non-operating
Temperature:	0° to +55° C	-40° to +65° C
Humidity:	5% to 95%, @ 40° C (non-condensing)	5% to 95%, @ 40° C (non-condensing)
Shock:	2.5G max @ 10ms	10G max @ 10ms
Vibration:	0.25G @ 5-100Hz	3.5G @ 5-100Hz

Figure 5-2: Environmental Specifications

Agency Approval

All I-Bus CPU boards meet UL 1950, CSA 22.2 No. 950, TUV and IEC 950, and FCC Part 15 Class A in I-Bus enclosures. Customer requested FCC, VDE and CISPR Class B certifications available.

Appendix 1 Technical Reference

- ISA connector pin assignments

PIN#	ASSIGN.	PIN#	ASSIGN.	PIN#	ASSIGN.	PIN#	ASSIGN.
A01	-IOCHECK	B01	GND	C01	SBHE	D01	-MEMCS16
A02	SD7	B02	RSTDRV	C02	LA23	D02	-IOCS16
A03	SD6	B03	+5V DC	C03	LA22	D03	IRQ10
A04	SD5	B04	IRQ9	C04	LA21	D04	IRQ11
A05	SD4	B05	-5V DC	C05	LA20	D05	IRQ12
A06	SD3	B06	DRQ2	C06	LA19	D06	IRQ15
A07	SD2	B07	-12V DC	C07	LA18	D07	IRQ14
A08	SD1	B08	-OWS	C08	LA17	D08	-DACK0
A09	SD0	B09	+12V DC	C09	-MEMR	D09	DRQ0
A10	-IOCHRDY	B10	GND	C10	-MEMW	D10	-DACK5
A11	AEN	B11	-SMEMW	C11	SD08	D11	DRQ5
A12	SA19	B12	-SMEMR	C12	SD09	D12	-DACK6
A13	SA18	B13	-IOW	C13	SD10	D13	DRQ6
A14	SA17	B14	-IOR	C14	SD11	D14	-DACK7
A15	SA16	B15	-DACK3	C15	SD12	D15	DRQ7
A16	SA15	B16	DRQ3	C16	SD13	D16	+5V DC
A17	SA14	B17	-DACK1	C17	SD14	D17	-MASTER
A18	SA13	B18	DRQ1	C18	SD15	D18	GND
A19	SA12	B19	-RFSH				
A20	SA11	B20	CLK				
A21	SA10	B21	IRQ7				
A22	SA9	B22	IRQ6				
A23	SA8	B23	IRQ5				
A24	SA7	B24	IRQ4				
A25	SA6	B25	IRQ3				
A26	SA5	B26	-DACK2				
A27	SA4	B27	T/C				
A28	SA3	B28	BALE				
A29	SA2	B29	+5V DC				
A30	SA1	B30	OSC				
A31	SA0	B31	GND				

Table A1-1: ISA Connector Pin Assignments

CPU PCI Connector Pin Assignments

PIN#	ASSIGN.	PIN#	ASSIGN.	PIN#	ASSIGN.	PIN#	ASSIGN.
A01	TRST#	A32	AD16	B01	-12V	B32	AD17
A02	+12V	A33	+3.3V	B02	TCK	B33	C/BE2#
A03	TMS	A34	FRAME#	B03	GND	B34	GND
A04	TDI	A35	GND	B04	TDO	B35	IRDY#
A05	+5v	A36	TRDY#	B05	+5V	B36	+3.3V
A06	NTA#	A37	GND	B06	+5V	B37	DEVSEL#
A07	NTC#	A38	STOP#	B07	NTB#	B38	GND
A08	+5V	A39	+3.3V	B08	NTD#	B39	LOCK#
A09	CLKC	A40	SDONE	B09	REQ3#	B40	PERR#
A10	+5V (I/O)	A41	SBO#	B10	REQ1#	B41	+3.3v
A11	CLKD	A42	GND	B11	GNT3#	B42	SERR#
A12	GND	A43	PAR	B12	GND	B43	+3.3V
A13	GND	A44	AD15	B13	GND	B44	C/BE1#
A14	GNT1#	A45	+3.3V	B14	CLKA	B45	AD14
A15	RST#	A46	AD13	B15	GND	B46	GND
A16	+5V (I/O)	A47	AD11	B16	CLKB	B47	AD12
A17	GNT0#	A48	GND	B17	GND	B48	AD10
A18	GND	A49	AD09	B18	REQ0#	B49	GND
A19	REQ2#	A50	KEY	B19	+5 (I/O)	B50	KEY
A20	AD30	A51	KEY	B20	AD31	B51	KEY
A21	+3.3V	A52	C/BB0#	B21	AD29	B52	AD08
A22	AD28	A53	+3.3V	B22	GND	B53	AD07
A23	AD26	A54	AD06	B23	AD27	B54	+3.3V
A24	GND	A55	AD04	B24	AD25	B55	AD05
A25	AD24	A56	GND	B25	+3.3V	B56	AD03
A26	GNT2#	A57	AD02	B26	C/BE3#	B57	GND
A27	+3.3V	A58	AD00	B27	AD23	B58	AD01
A28	AD22	A59	+5V (I/O)	B28	GND	B59	+5V (I/O)
A29	AD20	A60	REQ64#	B29	AD21	B60	ACK64#
A30	GND	A61	+5V	B30	AD19	B61	+5V
A31	AD18	A62	+5V	B31	+3.3V	B62	+5V

Table A1-2: CPU PCI Connector Pin Assignments

Appendix 1 Technical Reference

- Expansion Slot PCI Connector Pin Assignments

PIN#	ASSIGN.	PIN#	ASSIGN.	PIN#	ASSIGN.	PIN#	ASSIGN.
A01	TRST#	A32	AD16	B01	-12V	B32	AD17
A02	+12V	A33	+3.3V	B02	TCK	B33	C/BE2#
A03	TMS	A34	FRAME#	B03	GND	B34	GND
A04	TDI	A35	GND	B04	TDO	B35	IRDY#
A05	+5v	A36	TRDY#	B05	+5V	B36	+3.3V
A06	INTA#	A37	GND	B06	+5V	B37	DEVSEL#
A07	INTC#	A38	STOP#	B07	INTB#	B38	GND
A08	+5V	A39	+3.3V	B08	INTD#	B39	LOCK#
A09	Reserved	A40	SDONE	B09	PRSENT1#	B40	PERR#
A10	+5V	A41	SBO#	B10	Reserved	B41	+3.3V
A11	Reserved	A42	GND	B11	PRSENT2#	B42	SERR#
A12	GND	A43	PAR	B12	GND	B43	+3.3V
A13	GND	A44	AD15	B13	GND	B44	C/BE1#
A14	Reserved	A45	+3.3V	B14	Reserved	B45	AD14
A15	RST#	A46	AD13	B15	GND	B46	GND
A16	+5V	A47	AD11	B16	CLK	B47	AD12
A17	GNT#	A48	GND	B17	GND	B48	AD10
A18	GND	A49	AD09	B18	REQ#	B49	GND
A19	Reserved	A50	KEYWAY	B19	+5V	B50	KEYWAY
A20	AD30	A51	KEYWAY	B20	AD31	B51	KEYWAY
A21	+3.3V	A52	C/BE0#	B21	AD29	B52	AD08
A22	AD28	A53	+3.3V	B22	GND	B53	AD07
A23	AD26	A54	AD06	B23	AD27	B54	+3.3V
A24	GND	A55	AD04	B24	AD25	B55	AD05
A25	AD24	A56	GND	B25	+3.3V	B56	AD03
A26	IDSEL	A57	AD02	B26	C/BE3#	B57	GND
A27	+3.3V	A58	AD00	B27	AD23	B58	AD01
A28	AD22	A59	+5V	B28	GND	B59	+5V
A29	AD20	A60	REQ64#	B29	AD21	B60	ACK64#
A30	GND	A61	+5V	B30	AD19	B61	+5V
A31	AD18	A62	+5V	B31	+3.3V	B62	+5V

Table A1-3: Expansion Slot PCI Connector Pin Assignments

Appendix 2 Glossary of Terms

B

backplane: A device inside the chassis that contains slots, or sockets, for plugging in I/O cards or cables.

bidirectional parallel port: An eight-bit port that can be used for an input as well as an output device.

bus: One or more electrical conductors that transmit power or binary data to the various sections of a computer or any common pathway between hardware devices. A computer bus connects the CPU to its main memory and the memory banks that reside on the control units of the peripheral devices. It is made up of two parts. Addresses are sent over the address bus to signal a memory location, and the data is transferred over the data bus to that location.

C

card cage: A cabinet or metal frame that holds printed circuit cards.

CMOS (Complementary Metal Oxide Semiconductor): A technique of arranging transistors which uses very low power.

D

disk access LED: The LED located on the front control panel that indicates when the hard disk drive is active.

DRAM (Dynamic Random Access Memory): The main memory in your computer. It needs to be refreshed by a memory controller or it loses its information.

drive bay: Area in the chassis where drives are mounted.

Appendix 2 Glossary of Terms

E

electrostatic discharge (ESD): Stationary electrical charges in which no current flows. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

EMI (ElectroMagnetic Interference): Noise generated by the switching action of the power supply and other system components. Conducted EMI is interference generally conducted into the power line, and is normally controlled with a line filter. Radiated EMI is that portion that radiates into free space, one way to suppress it is by enclosing circuitry in a metal case.

EPROM (Erasable Programmable Read Only Memory): A programmable device which stores information regardless of power.

expansion card: A printed circuit board that plugs into an expansion slot.

F

floppy drive: A device for reading the information contained on external, portable computer disks called floppy disks.

front control panel: The small panel on the front of the computer that contains the power switch, reset switch, Power ON LED, the disk access LED, and the keyboard connector.

H

hard drive: Data storage devices. Hard drives magnetically store computer data on spinning internal disks.

hold-down bar: A metal bar located in the I/O bay of the chassis. It is used to keep I/O cards firmly seated in their slots.

Appendix 2 Glossary of Terms

I

IDE (Integrated Drive Electronics): A standard of signalling and communicating with a device.

I/O card: A printed circuit board that plugs into an I/O slot.

I/O slot: A slot for plugging in additional I/O cards to expand the capability of a computer.

ISA: The original IBM/PC clone plug-in board standard.

K

keyboard connector: The five-pin connector located on the front control panel.

kilobyte (KB): 1,024 bytes.

L

LED: Light Emitting Diode. Long-lasting light emitters usually used as indicators.

load board: A board having specific resistance to current flow.

P

parallel port: I/O connector used to hook up a printer or other parallel interface device. The parallel port is usually a 25-pin female DB25 connector.

PCI (Peripheral Component Interconnect): An optional slot standard for plug-in boards

Appendix 2 Glossary of Terms

port: Ports are used to connect peripheral devices such as external drives and printers to your computer.

power good: Signal used to prevent the computer from starting until the power has stabilized. The power good line switches from 0 to +5 volts within one tenth to one half second after the power supply reaches normal voltage levels. Whenever low input voltage causes the output voltage to fall below operating levels, the power good signal goes back to zero.

power ON/diagnostic LED: The LED located on the front control panel that indicates that power is present in the computer.

power supply: Electrical system that converts AC current from the wall outlet into the DC currents required by the computer circuitry. In a personal computer, +5, -5, +12 and -12 voltages are generated.

power switch: Located on the front control panel, the power switch turns power ON to the computer.

R

RAID (Redundant Arrays of Independent Disks): A storage technology using an array of two or more disks to redundantly store information. If one disk fails in a RAID array, the unit continues to function without loss of data.

RAM (Random Access Memory): The memory used to execute applications while your computer is turned ON. When you turn your computer OFF, all data stored in RAM is lost.

real-time clock (RTC): A periodic interrupt used to derive local time.

reset switch: Button or key that reboots the computer. All current activities are stopped cold and any data in memory is lost.

Appendix 2 Glossary of Terms

retaining bracket: The bracket on the back of the chassis that holds connectors from the board, usually a DB9 for serial port, a DB25 for parallel port, and mini-DIN connectors for keyboard and mouse.

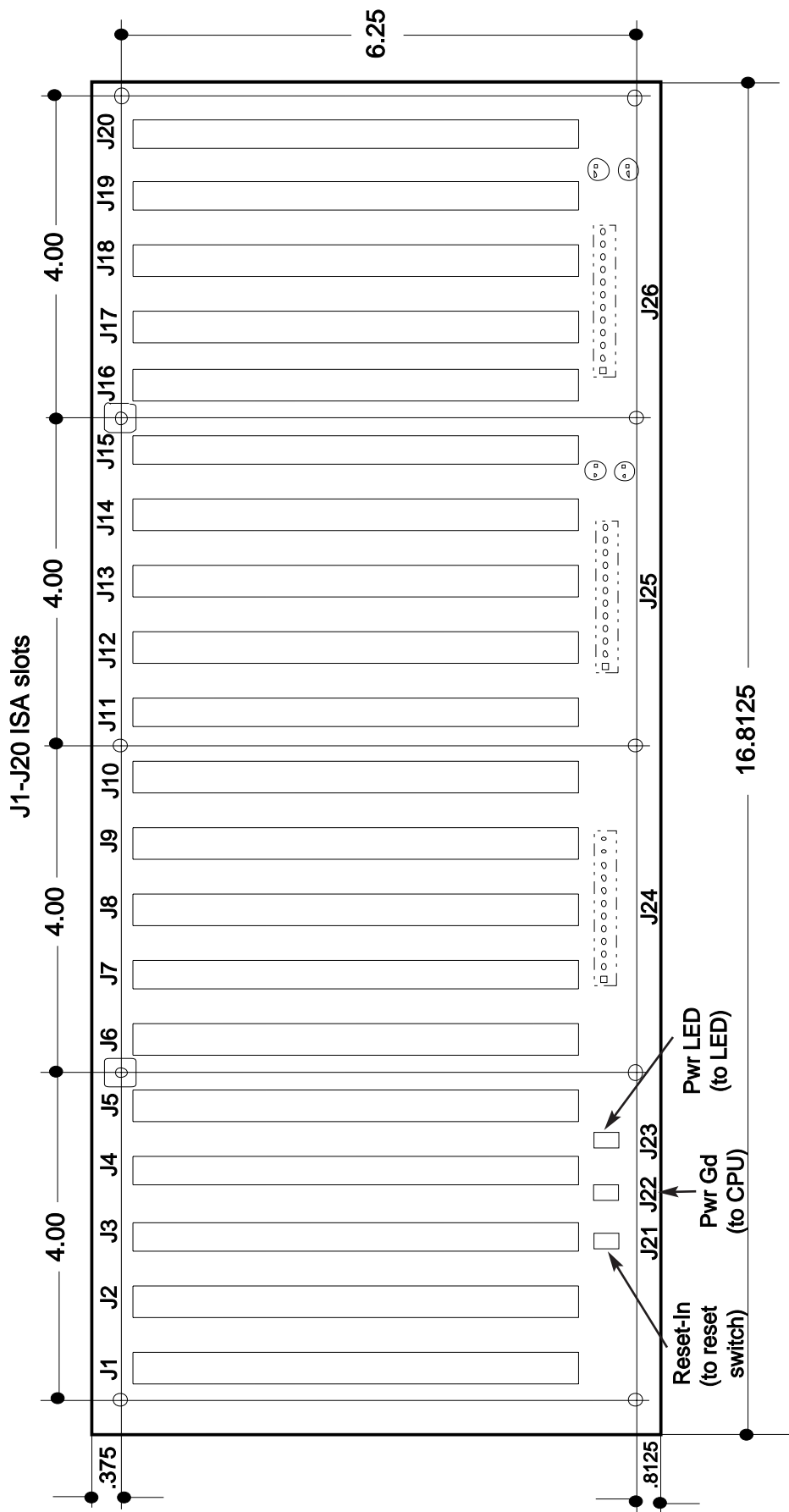
S

SCSI (Small Computer System Interface): A high speed, general purpose interface to storage devices.

serial port: A two-channel port, one channel used for "In" transmissions and one for "Out" transmissions.

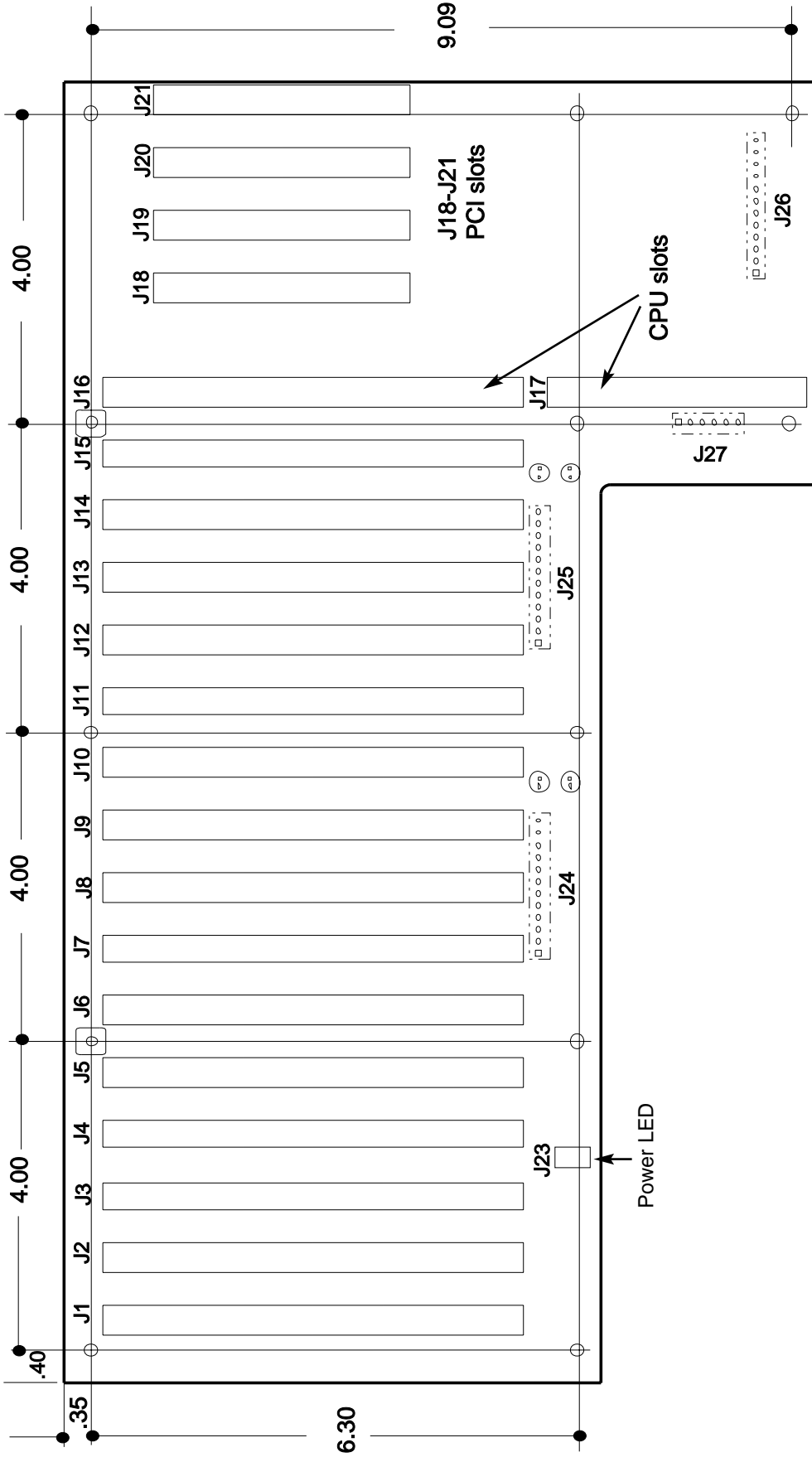
W

watchdog timer: A device that watches for CPU inactivity and then resets the CPU after a specified duration of inactivity.



ISA 20-Slot Passive Backplane

J1-J15 ISA slots



PCI/ISA 20-Slot Passive Backplane

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