



INDUSTRIAL COMPUTER SOURCE[®]

Model 8301 Product Manual

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INDUSTRIAL COMPUTER SOURCE[®]



<http://www.indcompsrc.com>

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FOREWARD

This product manual provides information to install, operate and or program the referenced product(s) manufactured or distributed by Industrial Computer Source. The following pages contain information regarding the warranty and repair policies.

Technical assistance is available at: **1-800-480-0044**.

Manual Errors, Omissions and Bugs: A "Bug Sheet" is included as the last page of this manual. Please use the "Bug Sheet" if you experience any problems with the manual that requires correction.

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Guarantee

A thirty day money-back guarantee is provided on all **standard** products sold. **Special order products** are covered by our Limited Warranty, *however they may not be returned for refund or credit. EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement only. Extended Warranty available. Consult factory.*

Refunds

In order to receive refund on a product purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods, and the product must be returned complete (meaning all manuals, software, cables, etc.) within 30 days of receipt and in as-new and resalable condition. The **Return Procedure** must be followed to assure prompt refund.

Restocking Charges

Product returned *after 30 days, and before 90 days*, of the purchase will be subject to a **minimum 20%** restocking charge and any charges for damaged or missing parts.

Products not returned within 90 days of purchase, or products which are not in as-new and resaleable condition, are not eligible for credit return and will be returned to the customer.

Limited Warranty

One-year limited warranty on all products sold with the exception of the "Performance Series" I/O products, which are warranted to the original purchaser for as long as they own the product, subject to all other conditions below, including those regarding neglect, misuse and acts of God. Within one year of purchase, Industrial Computer Source will repair or replace, at our option, any defective product. At any time after one year, we will repair or replace, at our option, any defective "Performance Series" I/O product sold. This does not include products damaged in shipment, or damaged through customer neglect or misuse. Industrial Computer Source will service the warranty for all standard catalog products for the first year from the date of shipment. After the first year, for products not manufactured by Industrial Computer Source, the remainder of the manufacturer's warranty, if any, will be serviced by the manufacturer directly.

The **Return Procedure** must be followed to assure repair or replacement. Industrial Computer Source will normally return your replacement or repaired item via UPS Blue. *Overnight delivery or delivery via other carriers is available at additional charge.*

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Industrial Computer Source or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Industrial Computer Source or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the owners' manual.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. Industrial Computer Source reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.



Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by Industrial Computer Source.

Return Procedure

For any Limited Warranty or Guarantee return, please contact Industrial Computer Source's Customer Service at **1-800-480-0044** and obtain a Return Material Authorization (RMA) Number. All product(s) returned to Industrial Computer Source for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing date of purchase.

To reduce risk of damage, returns of product must be in an Industrial Computer Source shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Industrial Computer Source Customer Service at a nominal cost.

Limitation of Liability

In no event shall Industrial Computer Source be liable for any defect in hardware or software or loss or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Industrial Computer Source liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Industrial Computer Source or its authorized agent.

Some *Sales Items* and *Customized Systems* are **not** subject to the guarantee and limited warranty. However, in these instances any deviations will be disclosed prior to sales and noted in the original invoice. ***Industrial Computer Source reserves the right to refuse returns or credits on software or special order items.***

Advisories

Three types of advisories are used throughout the manual to stress important points or warn of potential hazards to the user or the system. They are the Note, the Caution, and the Warning. Following is an example of each type of advisory:

Note: The note is used to present special instruction, or to provide extra information which may help to simplify the use of the product.



CAUTION!



A Caution is used to alert you to a situation which if ignored may cause injury or damage equipment.



WARNING!



A Warning is used to alert you of a situation which if ignored will cause serious injury.

Cautions and Warnings are accented with triangular symbols. The exclamation symbol is used in all cautions and warnings to help alert you to the important instructions. The lightning flash symbol is used on the left hand side of a caution or a warning if the advisory relates to the presence of voltage which may be of sufficient magnitude to cause electrical shock.

Use caution when servicing any electrical component. We have tried to identify the areas which may pose a Caution or Warning condition in this manual; however, Industrial Computer Source does not claim to have covered all situations which might require the use of a Caution or Warning.

You must refer to the documentation for any component you install into a computer system to insure proper precautions and procedures are followed.

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CE Declaration of Conformity

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Chapter 1: Introduction

Features

- Choice of TFT, STN, or Mono Transflective Flat Panel Displays
- Locking Front Access Door
- 8-Slot Passive Backplane
- Four 3.5 inch Drive Bays
- UL Recognized
- CE Compliant
- Made in U.S.A.!

General

The 8301 Series computer chassis from Industrial Computer Source has been designed to meet the most vigorous commercial and industrial applications. The incorporation of a flat panel display allows the chassis to be used in more extreme environments than a CRT type monitor. The chassis comes with a display controller card and the required inverter. The controller card has an optional connection for a SVGA CRT type monitor.

On the front panel are indicators for fan status, temperature status, disk drive access, and separate indicators for each power supply output. Behind the locking front panel door are the system power on/off switch, the backlight on/off switch, a system reset switch, speaker volume adjustment potentiometer, and a standard AT style DIN keyboard connector. On TFT display models there is also a backlight intensity adjustment potentiometer. Another keyboard connector is available at the side of the chassis.

The 8301 Series chassis uses a 45 CFM fan to pull air through the front and into the Card Cage area of the chassis. It is filtered through a 30ppi filter mounted in the front door. A fan in the power supply module provides additional cooling.

The standard power supply is 250W and is switch selectable between 115VAC and 230VAC input. A 48VDC model is available as an option at the time of order.

The chassis provides full front access for two half-height 3.5 inch devices. Two additional internal 3.5 inch devices may be mounted in the Card Cage area (See **Figure 1-1**). The front panel mounted drives are protected from the outside environment and from unauthorized access by the locking front panel door. The internal 3.5 inch devices are vibration dampened for protection against industrial vibration and shock.

The 8301 chassis includes an 8-slot, 4 layer backplane incorporating 16-bit AT slot connectors and the exclusive Bus Power Check™ circuitry. Hold down brackets are provided to insure that cards remain firmly seated, even under vibration caused by typical industrial equipment such as forklifts, motor controllers, etc.

Global Interference Reduction System (GIRSystem™)

The GIRSystem (Global Interference Reduction System) was developed and employed by Industrial Computer Source to eliminate EMI emission and static discharge sensitivity problems associated with today's ultrahigh speed computer systems. As processor and bus speeds are accelerated, it makes the task of containing radio frequency noise inside the system enclosure much more demanding. Processor speeds in industrial "PC" systems already are passing 166, 200 and even 300MHz with the bus speeds at 66MHz and climbing.

The GIRSystem incorporates many design features that were previously used only in high end workstations, not PC's. RFI gasketing is employed to seal the top, weldments are tightened to guarantee integrity, front panel access doors for disk drives are well grounded, and extra precautions taken throughout the fabrication process to reduce leakage paths.

Additionally, the GIRSystem employs an RFI *leakproof* design for the mounting of adapter cards. The original XT design card mounting bracket has never been altered nor has there been any significant changes in the way the brackets are grounded. As processor speeds have been increased, the typical long gap between the mounting bracket and the chassis has become a cavernous exit for RFI leakage. This leakage point is the weakest point in a chassis for EMI and RFI. The GIRSystem includes a gasketed bracket guide that seals this gap without interfering with the use of standard PC adapter cards. This bracket guide provides a full length RFI seal on every adapter card installed - no special adapter cards or modifications to your normal adapter cards are necessary.

With the use of the GIRSystem, Industrial Computer Source, has successfully satisfied the 89/336/EEC directives for CE mark now required in Europe. These requirements are even more stringent than FCC Class B requirements both for emissions and susceptibility. These requirements were met with a 233MHz Alpha Processor based system and 200MHz Pentium based systems!

Specifications

Note: Specifications are for the power supply, chassis, and backplane. Choice of CPUs or other user selected feature cards may reduce the maximum specifications. Operating altitude, temperature and power supply loading are interactive and affect the actual specifications according to application. Special backplanes and chassis paint colors are available on request. Consult with the factory for a quotation to meet your requirements.

Mounting

Rack

Backplanes, Passive Node

8 Slot, 4 Layer, Low Capacitance ISA Backplane

A/C Power Supplies

250W Supply, 115/230VAC Input, Switch Selectable, 50/60Hz

Input Current

5A @ 115VAC

3A @ 230VAC

Maximum Output

250W Supply

+5VDC @ 26A

+12VDC @ 9.5A/14A Peak

-5VDC @ 1A

-12VDC @ 1A

Note: -5VDC and -12VDC combined is not to exceed 13.5W total.

Overload Protection

In the event of a short circuit on the +5V or +12V output, the power supply will shutdown and latch off without damage to the supply. The supply will reset to normal operation after the short circuit has been removed and the power switch has been turned off for no less than 10 seconds.

Minimum Load

3.0A @ +5V

.5A @ +12V

Load Regulation

±5% @ +5V
±5% @ +12V
±10% @ -5V
±10% @ -12V

Inrush Current

40A @ 115 VAC Max.
80A @ 230 VAC Max.

Auxiliary Output Receptacle

1A @ 115VAC
.5A @ 230VAC

DC Power Supplies

300 Watt Supply, 40 - 60VDC (Nominal 48 VDC Input)

Maximum Output

+5VDC @ 35A
+12VDC @ 8A/10A Peak
-5VDC @ 0.5A
-12VDC @ 2A

Note: Power output cannot exceed listed Power Supply capacity.

Overload Protection

Short circuit protected with automatic recovery. Current limit is based on the total input power and is set at approximately 130% above maximum load.

Load Regulation

Measured by varying the load current from 20% to 80% of full load at nominal input voltage.

±3% @ +5V
±5% @ +12V
±5% @ -5V
±5% @ -12V

Inrush Current

20A

Cooling Fans

A 45 CFM Fan Filtered at 30ppi in Front Panel Assembly and a 24 CFM fan in Power Supply Module.

Fan Intake Filter

5.45 x 4.90 x .25in (138.4 x 124.5 x 6.4mm)

30ppi

Part Number for Fan Filter: 41750-01 A

Disk Drive Capacity

Four half-height 3.5 inch Drive Bays, (The two in the Card Cage are vibration dampened)

Keyboard Connector Locations

Front Panel- Behind Locking Front Access Door

Side Panel

Front Panel Indicators

Fan Status LED

Overtemp Indicating LED

Disk Activity LED

Power Supply Status LEDs

Front Panel Controls (Behind Locking Front Access Door)

System Power On/Off

Backlight Power On/Off

System Reset

Speaker Volume Adjust

Backlight Intensity Adjust on TFT displays or Contrast Adjust on STN and Mono displays

Side Panel Controls

Power Supply 115/230V Input Selector Switch

Power On/Off Switch for DC models

Keyboard connector (simultaneously active with the front panel keyboard connector)

Note: For normal operation of DC models the power supply On/Off switch should be left in the "On" position and system power should be turned on and off with the computer power switch.

Rear Panel Connectors

Knockouts for two DB-9 and one DB-25 Shell Connectors

Dimensions (W x H x D)

19.0 x 8.72 x 13.1in
(483 x 221.5 x 333mm)

Weight

28.6 lbs (13kg)

Finish

Chassis- Gold Zinc Plated
Front Panel- Painted, Gray

Paint Color

Cardinal Paint, #8103-44705, Gray, Medium texture, Water based

Flat Panel Displays

Sharp LQ10D321, TFT

Sharp LM64C35P, Dual Scan STN

Sharp LM64K83, Mono Transflective

Size (WxHxD)

TFT

Physical: 9.70 x 7.06 x 0.37in (246.5 x 179.4 x 9.5mm)

Viewing: 8.32 x 6.24in (211.2 x 158.4 mm)

STN

Physical: 9.55 x 7.06 x .45in (242.5 x 179.4 x 11.5mm)

Viewing: 8.43 x 6.35in (214.1 x 161.3mm)

Mono

Physical: 10.24 x 6.85 x .28in (260 x 174 x 7mm)

Viewing: 7.56 x 5.67in (192 x 144mm)

Display Format and Dot Pitch (WxH)

TFT
640 x 480, .330 x .330mm Dot Pitch

STN
640 x 480, .085 x .305mm Dot Pitch

Mono
640 x 480, .30 x .30mm Dot Pitch

Colors and Gray Scales

TFT
256K Colors, 64 Gray Shades

STN
222K Colors, 64 Gray Shades

Mono
64 to 256 Gray Shades

Backlight

TFT
Cold Cathode Fluorescent Tube, Edge Lighting

STN
Cold Cathode Fluorescent Tube, Single Edge Lighting

Mono
Cold Cathode Fluorescent Tube

Brightness and Viewing Angle

TFT
70nits brightness, Viewing: horizontal $\pm 35^\circ$, vertical $-30^\circ +10^\circ$

STN
70nits brightness, Viewing: horizontal $\pm 30^\circ$, vertical $-25^\circ +15^\circ$

Mono
45nits brightness, Viewing: horizontal $-20^\circ +35^\circ$, vertical $\pm 25^\circ$

Operating Environment

Temperature

10° to +40°C

Humidity

8% to 90% RHNC

Vibration

1.0G, 3 Axis Vibration

Shock

5G, 3 Axis Shock

Storage Environment

Temperature

-25° to 60°C

Humidity

8% to 90% RHNC

Vibration

1.0G, 3 Axis Vibration

Shock

5G, 3 Axis Shock

Temperature LED Trigger Point

50°C (approximate average)

MTBF

- > 59,000 P.O.H. @ 30°C AC 250W Power Supply
- > 110,000 P.O.H. @ 30°C DC 300W Power Supply
- > 50,000 P.O.H. Mono LCD, 10,000 backlight
- > 50,000 P.O.H. STN LCD, 10,000 backlight
- > 50,000 P.O.H. TFT LCD, 15,000 backlight

Agency Approvals

FCC Conformity with:

Class A

CE Conformity with:

EU EMC Directive 89/336/EEC

EU Low Voltage Directive 72/23/EEC

UL Recognized to:

UL 1950, 2nd Ed: 1993

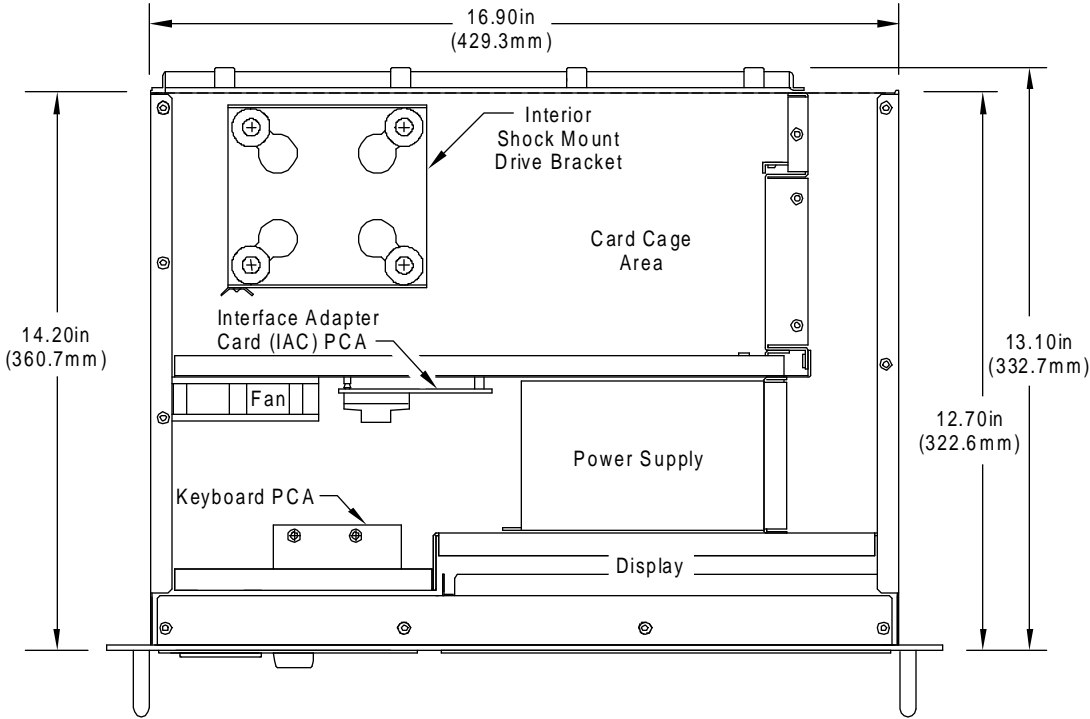


Figure 1-1: Top View

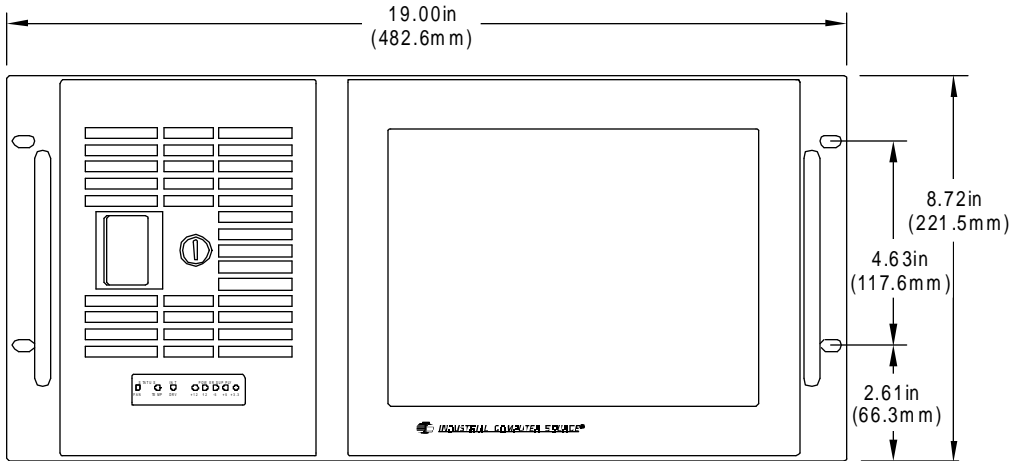


Figure 1-2: Front View

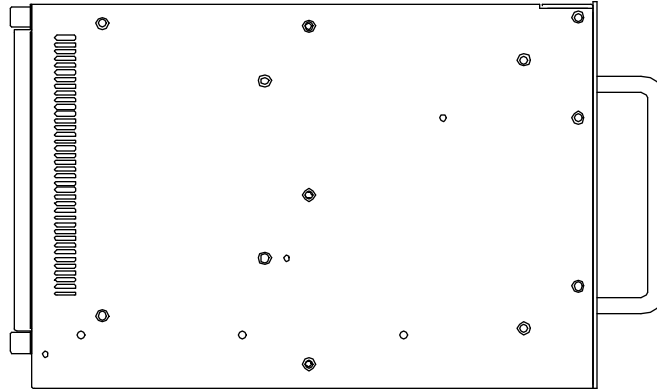


Figure 1-3: Left Side View

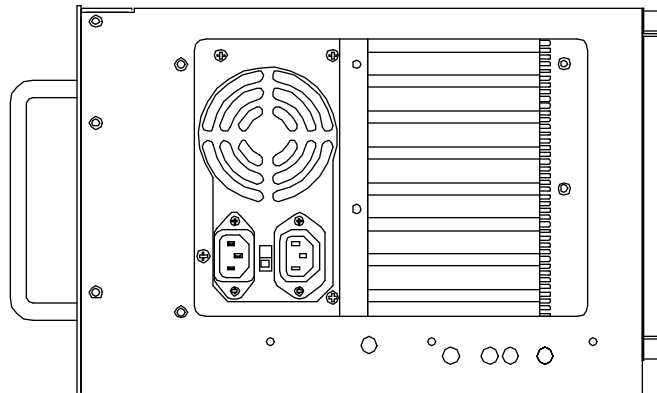


Figure 1-4: Right Side View

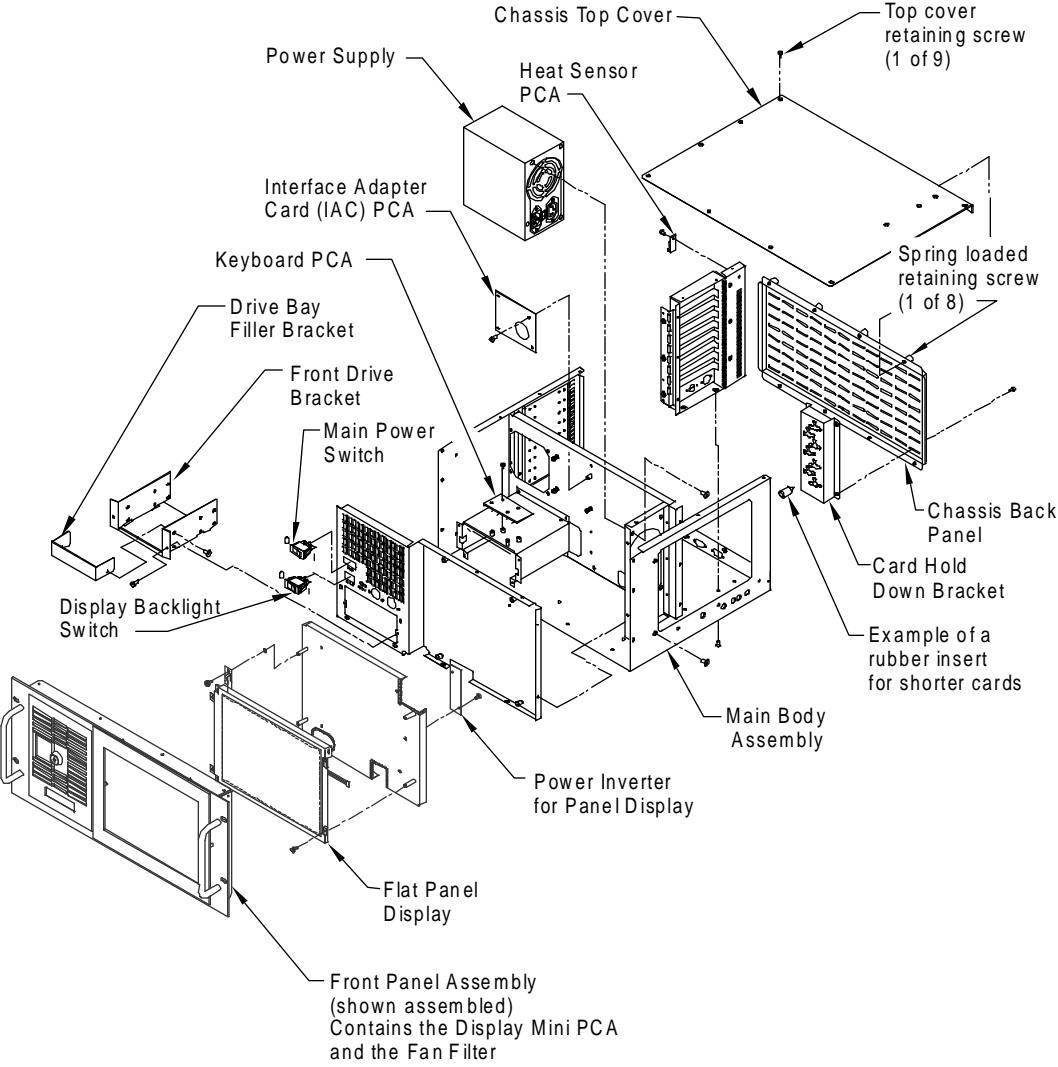


Figure 1-5: Top Assembly

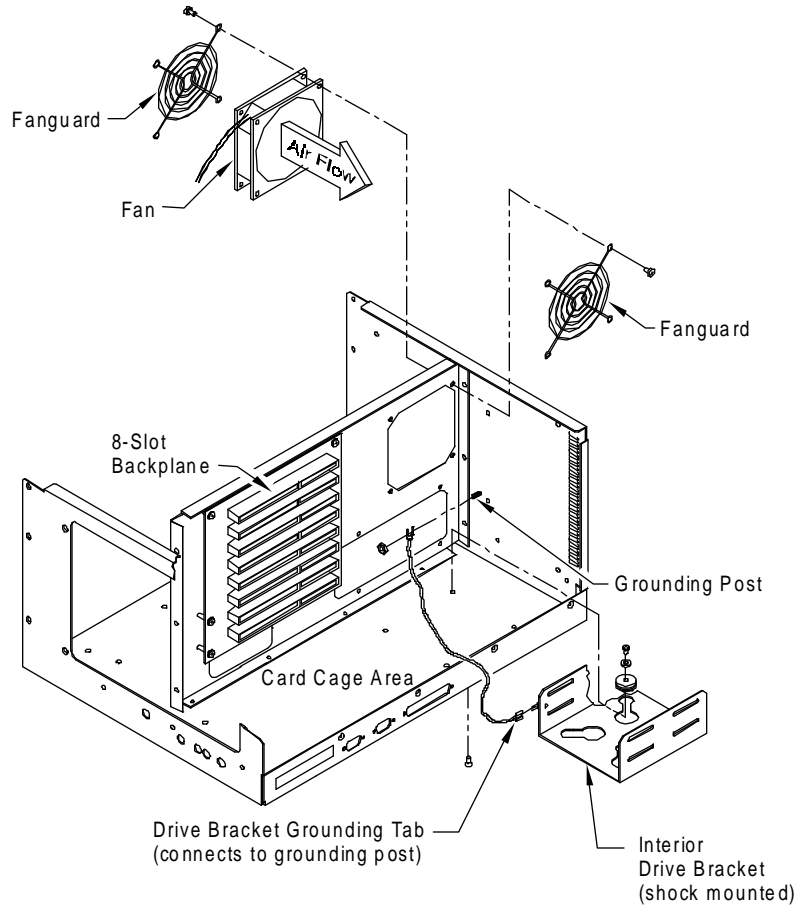


Figure 1-6: Main Body Assembly

Chapter 2: Installation

The 8301 Series Chassis is rack mountable. The mounting holes on the front panel are set to RTMA standard spacing and the chassis will fit into any standard equipment rack with 8.75 inches of vertical space available. Install by sliding the chassis into the rack and securing it into position with four retaining screws. Electrical power must be connected with a certified power cord for the country where the equipment is to be used.



CAUTION!



If the power cord is damaged or is not suitable for the country of use, replace with a 3-conductor, 18AWG (0.75mm² cross sectional area) cord, certified to the local electrical codes.

The 8301 chassis mounts an 8-slot backplane. The backplane is installed in the card cage area, which is designed to provide easy installation and maintenance of the backplane and any feature cards. The card cage area is discussed in more detail in the Card Cage section of this chapter. To access the backplane you must remove the Chassis Back Panel by loosening the eight spring loaded retaining screws (See **Figure 1-5**).

The chassis will accept up to four half-height 3.5 inch disk drives or other devices. Device mounting is explained in detail in the Installation of Disk Drives section beginning on page 2-3.

Note: Unit should be powered down before connecting any peripherals, such as keyboards or a mouse.

For more information on Printed Circuit Assemblies or other chassis hardware please refer to the appropriate section in this chapter.

Rack Mounting

Equipment slide rails make will permit easier access to the computer for maintenance and troubleshooting. For 24 to 30-inch deep cabinets use Model 7500-RMK slide rails, or for 18 to 24 inch deep cabinets use Model 7500-RMK18 slide rails. The mounting holes on the front panel are set to RTMA standard spacing and will fit into any standard equipment rack with 10.5-inches of available vertical space.

After you have installed the rack mount chassis slides kit, slide the chassis into the rack and secure it to the rack frame with four retaining screws. Failure to do so may cause the chassis to slide forward if the cabinet is tilted or vibrated, resulting in possible mechanical or electrical damage to your system or injury to personnel.



CAUTION!



The weight of the 8301 chassis, with its built-in display, exceeds 28 pounds (13kg). There is a real danger of toppling when extended on its slide rails from the rack. **Industrial Computer Source strongly recommends securely fastening the mounting rack of the 8301 to the floor or wall to eliminate this danger.**

Card Cage

The card cage provides all the necessary mounting hardware typically needed for installing and securing XT and AT sized feature cards. The side panel is outfitted with the GIRSystem (for more information see page 1-2) gasketing which holds the leading edge of feature cards. Unused expansion slots are filled by Slot Filler Brackets. Card hold-down brackets are provided to help keep feature cards seated (see the Top Assembly Drawing, page 1-11). The brackets may be placed as required to compensate for ribbon cable routing, or may be removed from the system if not needed. Rubber inserts may be installed for shorter cards.

The card cage is fitted with a 45 CFM cooling fan and a 30ppi filter. This fan brings air in through the front of the chassis and circulates it through the card cage area.

Installation of CPU

The installation of a plug-in CPU card is simply a matter of inserting the CPU card into the backplane and connecting the appropriate connectors. The CPU card installs into the backplane just like any other feature card would. Access the backplane by loosening the eight spring loaded retaining screws and removing the Chassis Back Panel. Then align the CPU card with a slot and firmly press it into the backplane. Do not force the board. If it does not slide into place, check the alignment and try again. When installing cards or CPU's into the chassis, make sure the card bracket is flat against the connector and slide directly down to insure proper fit. The bracket will be seated between the retaining bracket and the EMI gasket when correctly installed. For an illustration of proper slot filler bracket installation see **Figure 2-1**.

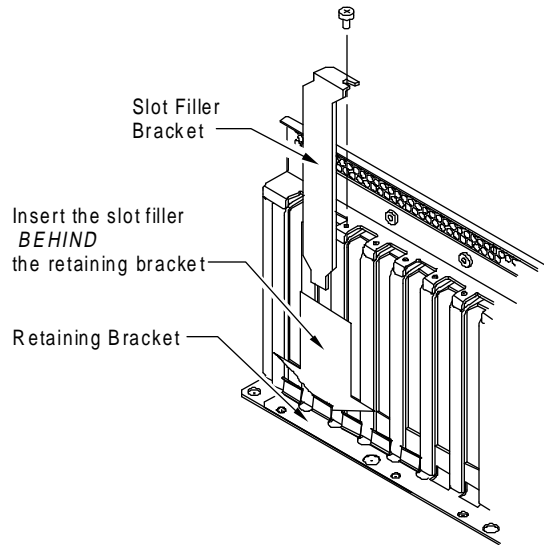


Figure 2-1: Seating the Slot Filler Bracket

Note: The chassis may require a load on the power supply to function. Industrial Computer Source offers an optional ISA plug-in Power Supply Load Board that provides the minimum loading requirements. For more information please see the Troubleshooting section on page 4-3.

Installation of Disk Drives

The chassis will accept four 3.5 inch devices. Disk drives may be mounted in two locations in the chassis: in the Front Drive Bracket behind the locking door, and in the Interior Drive Bracket located in the card cage (see the assembly drawings, **Figure 1-5** and **Figure 1-6**).

If you have purchased your disk drives from Industrial Computer Source with your chassis, the drives will be installed and tested for you prior to shipment. If you have purchased your drives separately, or purchased additional drives as an add-on, follow the instructions for mounting a drive in the Front Drive Bracket or in the Interior Drive Bracket.



CAUTION!



Before performing any maintenance on the computer ensure the computer is disconnected from the power source. Failure to do so could cause injury or damage equipment.

Instructions for Mounting a Drive in the Front Drive Bracket

1. Loosen the eight spring loaded retaining screws and remove the Chassis Back Panel (see **Figure 1-5**). This will enable you to reach the rear of the Drive Bracket and better position the new drive in the chassis.
2. Open the locking front door and remove Front Drive Bracket by loosening the two retaining screws. Slide the bracket forward and lift out. If necessary, remove connectors from existing drive to allow easy access for drive installation.
3. Place the drive(s) into position in the drive bracket and attach with four screws (see **Figure 2-2**). Be sure to use the proper thread (SAE or Metric) and length screws for your drive(s). Using a screw that is too long may cause damage to your drive electronics, CPU, or both.

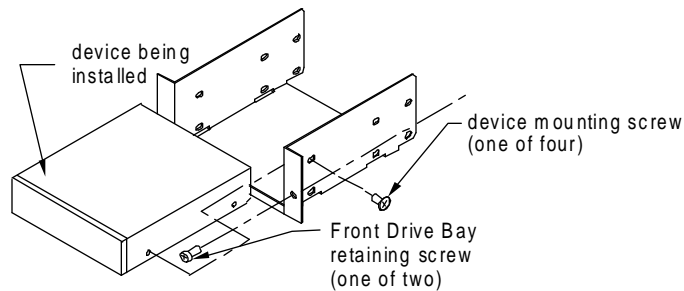


Figure 2-2: Front Drive Bracket Disk Installation

Note: Select a position for your drive(s) that will not interfere with the door latch of the chassis and that will permit easy insertion/removal of your disk media.

4. Attach a power connector to the drive(s). The power connector is keyed and can only be inserted in the correct orientation. You may easily access the rear of the drive through the open back chassis panel.
5. Attach the hard disk or floppy disk cables between the appropriate connectors on the drives and the drive controller you have purchased. IDE fixed disk drives require one cable for up to two drives and floppy disk drives require one cable for up to two devices.
6. Install the drive cage back into the chassis by sliding the drive cage into place and replacing the two retaining screws. Ensure that the front access door will close and that drive media can be inserted and withdrawn without interference.
7. Reinstall the Chassis Rear Panel.

Instructions for Mounting a Drive in the Interior (Card Cage) Drive Bracket

1. Loosen the eight spring loaded retaining screws and remove the Chassis Back Panel (See **Figure 1-5**).
2. Disconnect the Drive Bracket Grounding Cable from the Grounding Post (See **Figure 2-3**) and disconnect any existing drives.

3. Unscrew the four mounting screws holding the drive bracket to the chassis bottom from *underneath* the chassis.

Note: The drive bracket is held in place by screws coming up from the underside of the chassis through the bottom. The shock mounts are not removed from the Drive Bracket. Remove the Drive Bracket from the chassis.

4. Place the drive into position in the drive bracket and attach the drive with the provided hardware. Be sure to use the proper thread (SAE or Metric) and length screws for your drive. Using a screw that is too long may cause damage to your drive electronics, CPU, or both.

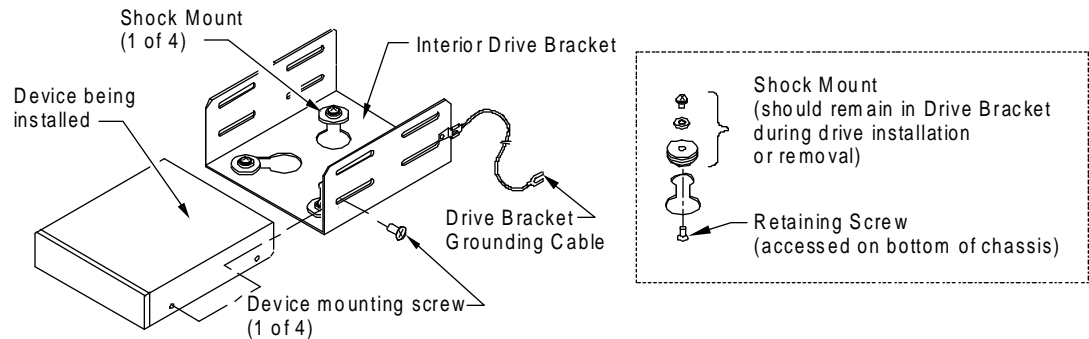


Figure 2-3: Interior (Card Cage) Disk Installation

5. Attach a power connector to the drive. The power connector is keyed and can only be inserted in the correct orientation. You may easily access the rear of the drive through the open back chassis panel.
6. Attach the hard disk cable between the appropriate connectors on the drive and the drive controller you have purchased.
7. Reinstall the drive bracket using the four mounting screws through the chassis bottom from underneath the chassis.
8. Reinstall the Chassis Top Cover.

Note: If you install two devices in the interior drive brackets, you will not be able to use the two slots just above where the brackets are located.

Interface Adapter Card PCA

The chassis has circuitry that allows the CPU to interface with the chassis components. The Interface Adapter Card (IAC) connects the chassis speaker, reset button, keyboard connectors, and disk access LED signals to the connections on the CPU. Additionally, power supply LEDs on the front panel, an adjustable gain amplifier for the chassis speaker, and indicators for overheat and fan operation are connected through the IAC.

The IAC is connected to the passive backplane via a harnessed cable from J2 to P3 and P5 on the backplane. The layout of the IAC board is shown in **Figure 2-4** and the schematics and chassis wiring diagram will be found in Appendix A.

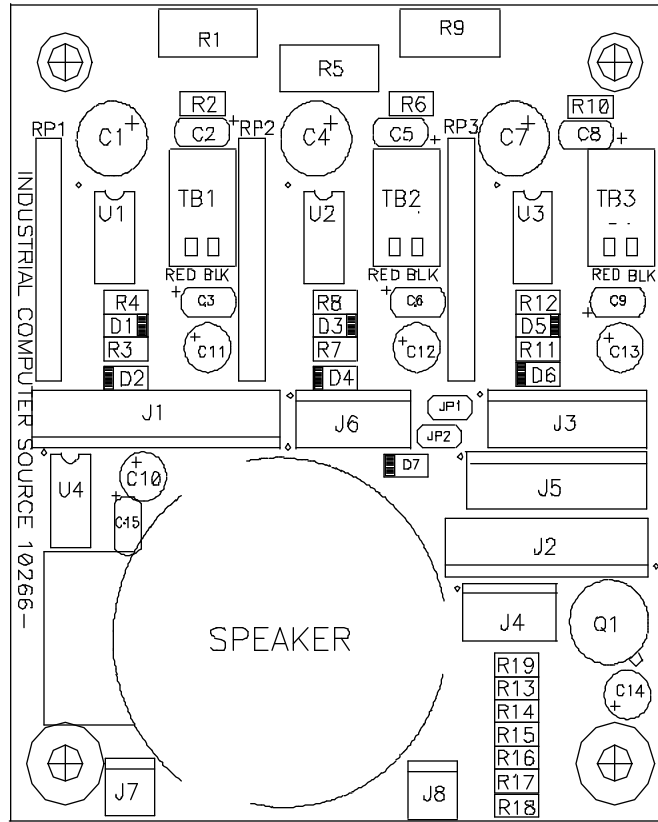


Figure 2-4: IAC Board Layout

Display Mini PCA

The Display Mini PCA works off of the Interface Adapter Card (IAC) to display the overheat, fan status, hard drive access, and power supply status LEDs. The layout of the board is shown in **Figure 2-5**. Note that two LEDs (DS9 & DS10) are not used in the 8301 chassis configuration and will remain unlit.

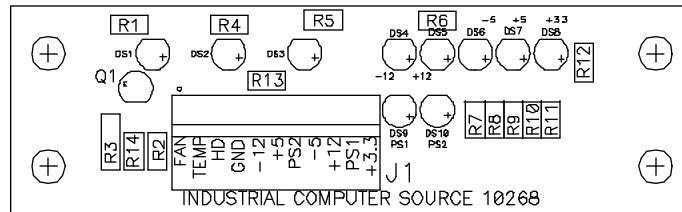


Figure 2-5: Display Mini PCA Board Layout

Overheat LED

The overheat LED is provided to give you a visual indication of the chassis temperature (See **Figure 2-6**). If the LED is green, the chassis is within its operating range. If the LED is red, the chassis is beyond its temperature limits (50° C approximate average). If this situation occurs and if possible, physically check the chassis to verify that it is hot, this will eliminate the possibility of a malfunctioning heat sensor. If the chassis is overheating, close all software applications and turn off chassis power. Refer to Chapter 4 for troubleshooting procedures.

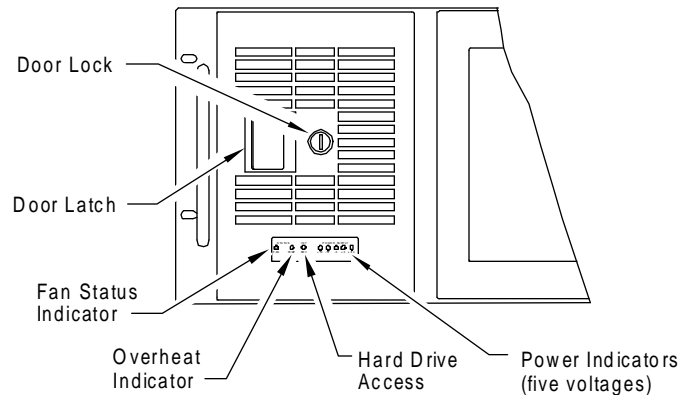


Figure 2-6: Front Door Indicators and Controls (Chassis Door Closed)

Fan Status LED

The fan status LED provides a visual indication of the cooling fans operation (See **Figure 2-6**). Under normal conditions, the fan status LED is green, indicating proper operation. If a malfunction should occur with either fan, the LED is red. If the fan status LED should turn red, close all software applications and turn off chassis power. Refer to Chapter 4 for troubleshooting procedures.

Hard Drive Access LED

The hard drive access LED gives a visual indication of system hard drive use (See **Figure 2-6**). When a hard drive is accessed, the LED is lit.

Power Supply LEDs

The power supply LEDs provide a visual check of +5V, +12V, -5V, and -12V coming from the power supply (See **Figure 2-6**). If the LED is lit, the equivalent voltage is present. This does not, however, confirm that the voltage is within specified tolerances.

Note: The LED for 3.3V will only be lit with power supplies providing a 3.3V output.

Keyboard PCA

The Keyboard PCA provides speaker volume adjustment, system reset, and an alternate keyboard DIN connection. It is connected to the Interface Adapter Card at J1 and to the chassis side keyboard connector at J2.

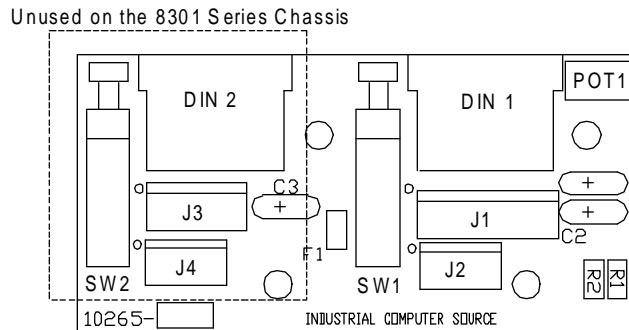


Figure 2-7: Keyboard PCA Board Layout

Speaker Gain

The 8301 Series chassis comes standard with a speaker which is mounted on the IAC. The speaker's output may be adjusted via the access hole on the front panel to the right of the LED indicator label. Adjustments are made through the Speaker Volume Adjust access hole (See **Figure 2-7**) on the variable resistor POT1 with a jewelers screwdriver to attain the desired audio level.

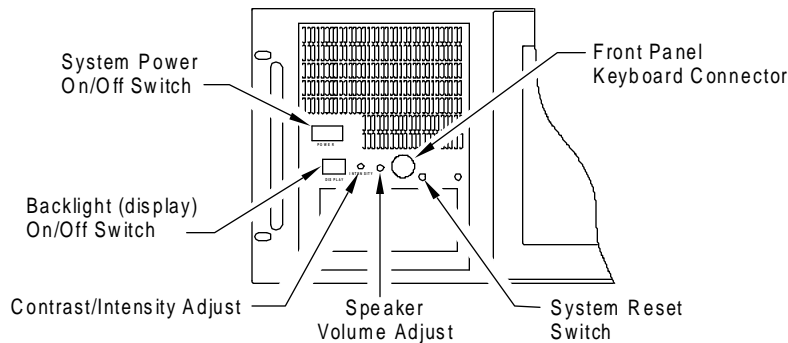


Figure 2-8: Front Panel Indicators and Controls (Chassis Door Open)

System Reset

The Keyboard PCA mounts a momentary-type switch (SW1) that allows the system to be reset from the front panel. Briefly depress SW1 through the System Reset Switch access hole on the front panel and the system will reset (See **Figure 2-8**).

Front Panel Keyboard Connection

The keyboard may be connected into the Front Panel Keyboard Connector (See **Figure 2-8**) which is DIN1 on the Keyboard PCA. This connector is simultaneously active with the Side Panel Keyboard Connector.

Side Panel Keyboard Connection

The Keyboard PCB provides a connection at J2 to the chassis side DIN connector from the Interface Adapter Card PCA. This allows the alternative connection of the keyboard into the side connector. This connector is simultaneously active with the Front Panel Keyboard Connector.

Flat Panel Display

The 8301 Series chassis is delivered with the Flat Panel Display installed and completely tested. There are no user serviceable parts in the display module. The displays that are offered with this chassis should not be disassembled by the user. Disassembling the module itself can cause permanent damage and should be strictly avoided. **User modifications or repair attempts on the display module will void the warranty.**

Backlight On/Off Switch

The flat panel display backlight does not have a long working life compared to the rest to the chassis components. The life of the backlight can be significantly extended by turning it off at the front panel if the display is not needed for a couple of hours or more (see **Figure 2-8**).

Controller Card

The 8301 Series chassis is delivered with the display controller card installed and completely tested. The controller card has a SVGA CRT monitor connection and allows simultaneous CRT display.

Note: You may not have more than one Display card in the system.

Controller Card Adjustment Potentiometer

For STN and Mono displays, a controller card adjustment potentiometer is mounted on the front panel inside the locking door. This potentiometer is a part of the controller card cable and is preset to optimize backlight contrast.

Note: On the chassis with TFT displays a power inverter adjustment potentiometer is located on the front panel instead of the controller card adjustment potentiometer. This potentiometer adjusts the backlight intensity (see page 2-10 for more information).

Power Inverter

The Power Inverter interfaces with the power supply to provide the appropriate voltages to the display module. On TFT model chassis it also provides for backlight intensity adjustment by an attached potentiometer (see Wiring Diagram in Appendix A) located on the front panel (see **Figure 2-8**).

**CAUTION!**

Use caution around the Power Inverter because it is high voltage and runs at a very high temperature. The Power Inverter is not user serviceable and user modifications or repair attempts will void the warranty.

Backlight Intensity Adjustment

For TFT displays an intensity adjustment is located on the front panel behind the locking front door (see **Figure 2-8**). The adjustment potentiometer is wired-in off of the inverter (see Wiring Diagram in Appendix A). The potentiometer allows some adjustment of backlight intensity and therefore affects contrast.

Note: On the chassis with STN and Mono displays, a controller card adjustment potentiometer is located on the front panel instead of the power inverter adjustment potentiometer used with TFT displays. This potentiometer adjusts the backlight contrast and is preset at the factory for the best optimization.

Door Latch

The door latch is opened by gently sliding it toward the door lock in the center of the door. It will latch whenever the door is closed. When the lock is engaged the door will close, but the door latch will not move to allow the door to open. If the latch does not seem to be working, the lock is probably engaged. Use the key to unlock the latch.

Card Hold-down Bracket

A card hold-down bracket is mounted on the rear panel of the chassis to secure feature cards installed in a passive backplane or mother board. The bracket can be mounted anywhere on the rear panel to provide maximum flexibility with the CPU and other feature cards, this allows the ribbon cables to be routed over them as required. The bracket also accepts rubber inserts to provide support for shorter cards.

To adjust the bracket, loosen the two screws securing the bracket and slide it to the desired position. To avoid cables or other protrusions, remove the two screws and move the bracket to another location.

Chapter 3: BUS Architecture

Industrial Computer Source passive backplanes are manufactured to the highest standards. These backplanes are available in size configurations of 4-, 6-, 8-, 10-, 15-, and 20-slot. All connectors are AT 16-bit connectors.

The Industrial Computer Source passive backplanes have been tested with a variety of plug-in CPU cards, from 8088 XT through Pentium AT and Alpha versions to ensure compatibility. For severe applications involving option cards that are sensitive to bus impedance, termination SIP (Single Inline Pin) resistors are available to terminate bus signals.

Each backplane is of a low capacitance design. This design minimizes signal crosstalk while keeping trace capacitance low which improves signal edges and rise and fall times. Ground and power are on separate layers from the signal. The power plane is predominantly +5VDC.

Each power supply output is monitored by the exclusive Industrial Computer Source Bus Power Check™ circuitry. A separate LED is lit by each supply voltage for a visible check of power supply operation. This is not, however, a tolerance verification. These LEDs provide a quick check of power supply operation without the need of a multimeter.

Features

- 4 or 6 layer printed circuit board
- Extremely high EMI and RFI noise immunity
- Accept power connectors from standard PC bus power supplies
- Bus Power Check™ LED indicators for +5, -5, +12 and -12 VDC supplies
- Bus terminating resistors available on 8-slot and larger backplanes
- Split bus designs available on special request
- Special configuration backplanes available on special order

8-Slot Backplane Construction

The 8-slot backplane is constructed of four layers, with internal ground and power planes for RFI and EMI noise immunity and low trace capacitance. The signal traces are located on layers 1 and 4 (the outer layers). Layer 2 is the Ground plane and layer 3 is the Power plane. For backplane layout and dimensioning see **Figure 3-2**.

Overshielding can distort signals by lengthening rise and fall times of the signal edges. Some option cards can have problems driving high-capacitance lines. The 8-slot backplane is constructed with ground dipoles between signal traces to minimize crosstalk while keeping trace capacitance to the lowest practical value.

Connectors

The 8-slot backplane provides for 16-pin Molex-type connectors in addition to other input connectors for solid, noise free input power and minimum voltage drop across the connectors, regardless of backplane power load.

There are termination sockets at the left end of the bus on 8-slot backplanes. These sockets accept standard 10-position SIPs manufactured by Bournes and others. Not all signal lines are available for termination. Refer to the Bus Termination section of this chapter for more information.

Input Power

Each input is filtered by one or more large electrolytic capacitors for low frequency line noise rejection. Ceramic bypass filter capacitors of 0.1µF improve noise immunity. All four input voltages have bypass capacitors. See **Figure 3-1** for connection voltages from the power supply.

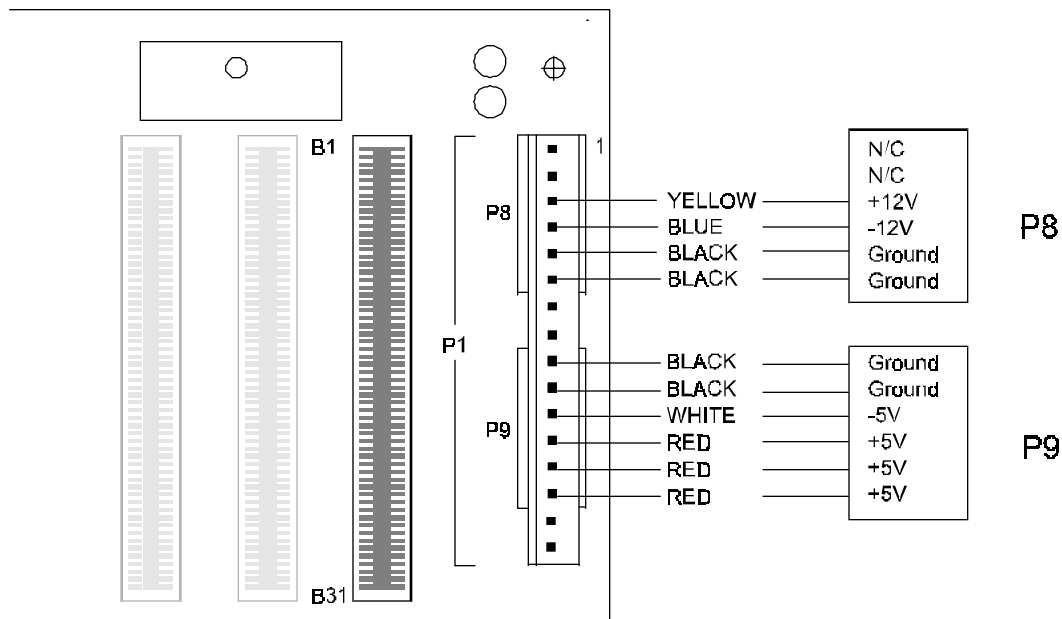


Figure 3-1: Connection Voltages

Each backplane has a bank of LEDs to indicate the presence of the various power supply levels of the standard PC bus - $\pm 5\text{VDC}$ and $\pm 12\text{VDC}$. A separate LED is lit by each supply voltage for a quick visible check of power supply operation without the need of a multimeter. This is not, however, a tolerance verification. Troubleshooting requirements may require actual measurement of the power supply values to ensure operation to specified limits.

Note that troubleshooting a chassis may require a load on the power supply. Industrial Computer Source offers an optional ISA plug-in Power Supply Load Board that provides the minimum loading requirements. For more information please see the Troubleshooting section on page 4-3.

The backplane is provided with a location for an optional -5V regulator (LM7905) and filter capacitors. The LM7905 uses the -12V input to generate -5V, allowing the use of a three-output power supply in custom applications.

Split Backplane

The 8-slot backplanes have the option of being “split” to allow several different CPU’s to operate in the same chassis. Please note that it is not recommended for the 8-slot backplane because of the relatively small number of slots.

8-Slot Backplane Connectors

Drive Power Output		Connection from Power Supply	
P3 - 1	+12VDC	P8-1	No Connection
P3 - 2	Ground	P8-2	No Connection
P3 - 3	Ground	P8-3	+12VDC
P3 - 4	+5VDC	P8-4	-12VDC
		P8-5	Ground
		P8-6	Ground
Remote Sense			
P4 - 1	+5VDC	P9-1	Ground
P4 - 2	Ground	P9-2	Ground
I/O Power Output		P9-3	-5VDC
P5 - 1	+5VDC	P9-4	+5VDC
P5 - 2	+12VDC	P9-5	+5VDC
P5 - 3	Ground	P9-6	+5VDC
P6	Not Used		
P7	Not Used		

8-Slot Backplane Dimensional Drawing

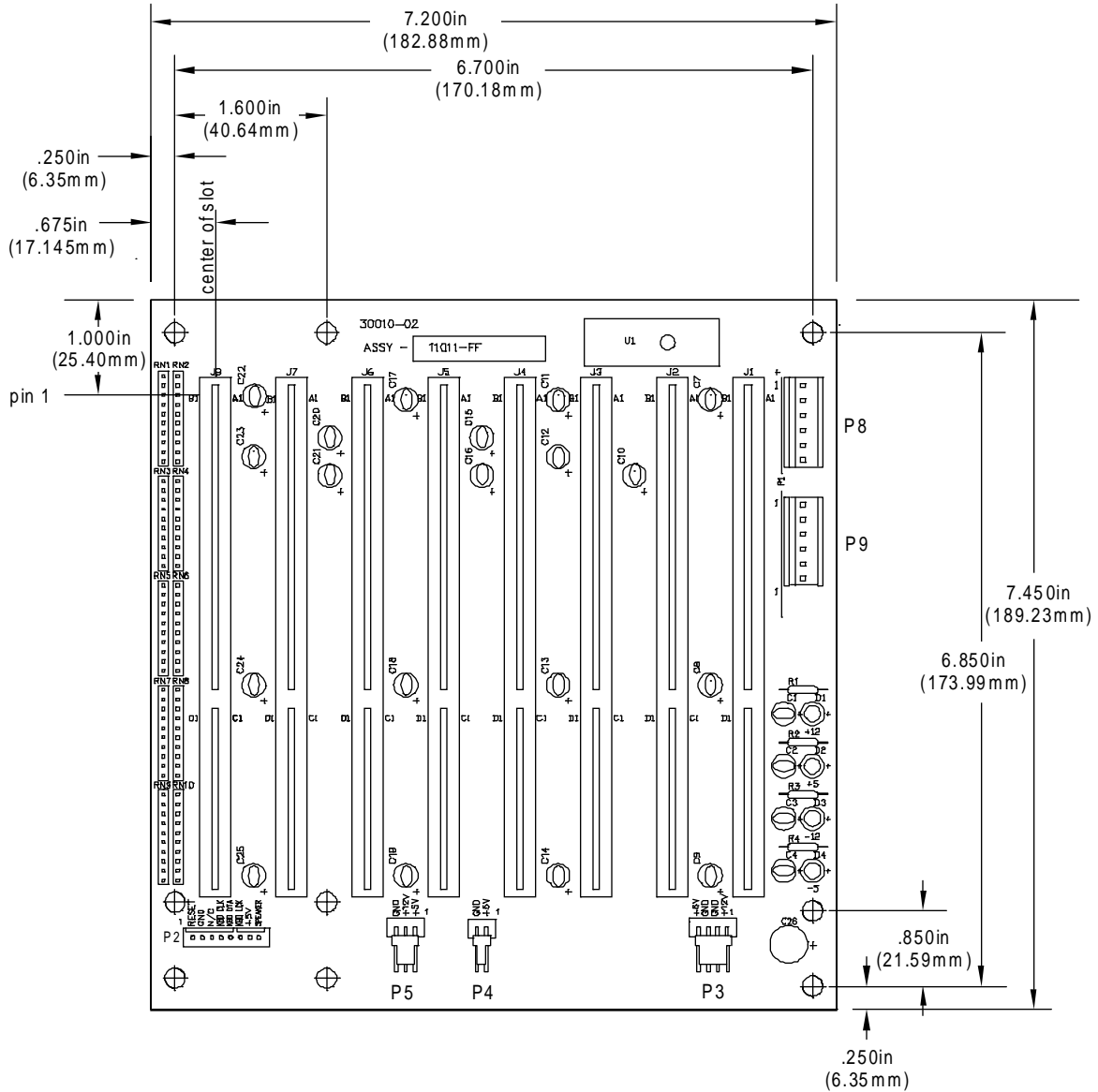


Figure 3-2: 8-Slot Backplane

Bus Termination

Termination works as an impedance mismatch at the end of the bus, minimizing or preventing reflections and interference. If there is no termination, signals reach the end of the bus and reflect back down the bus. In extreme cases, the reflected signals can interfere with the real bus information, leading to spurious operation or lockups. This can become a significant factor as bus lengths and speeds increase. The applications most likely to be affected are telephony or other applications with many I/O boards drawing high current values off the +12V or -12V power connections. Industrial Computer Source backplanes have supported 166MHz systems without bus termination and without problem. However, provision is made for installing terminations that might be required for your application.

Terminations connect the bus to +5VDC and ground, providing a path for the bus signals to dissipate. A terminated bus provides signals with less noise, although rise and fall times are slower. However, results are dependent on the CPU and option cards being used, and must be evaluated on a case-by-case basis.

There are three types of terminations that may be used: A Resistor Network; an RC Network; or a Diode Termination. A Resistor Network will provide the required impedance mismatch, but does result in loading. A RC Network does not impose a static load as a Resistor Network will, but it will affect the timing factors of the line to some degree. A Diode Termination is generally used in conjunction with a Resistor Network to reduce over and under shoot of the signal.

Backplane termination sockets are found at the left end of the bus. These sockets accept standard 10-position SIPs manufactured by Bournes and others. Not all signal lines are available for termination. Refer to the appropriate section for Terminated BUS signal information.

All Pentium and 486 vesa local or PCI CPU control signals that should never be terminated are as follows:

A-1 (RES 2-2)	I/OCHCK
B-8 (RES 1-7)	0WS
D-1 (RES 7-4)	MEMCS16
D-2 (RES 7-5)	I/OCS16
D-17(RES 9-9)	MASTER

To end termination of a signal, simply cut the wire on the terminating resistor for the appropriate signal.

Resistor Termination

The goal of termination resistors is to provide an impedance mismatch at the end of the bus to prevent signal reflections. This mismatch has to be balanced by the electrical capability of the CPU and option cards to drive the load imposed by the resistors.

Generally, terminations that connect to both +5V and ground work best, although terminations to +5V only are allowable.

One way to provide terminations in digital systems is a resistor network connected to both +5V and ground. The following two examples represent such a resistor network. Note that in both examples, the SIPs are inserted with pin 1 of the SIP toward the back of the chassis. While the following examples specify Bourns part numbers, equivalent values from other manufacturers may be used. The following provides 330 ohms to +5V and 220 ohms to ground. See **Figure 3-3**.

- Bourns part # 4610X-104-221/331 (Low profile)
- Bourns part # 4610M-104-221/331 (Medium profile)

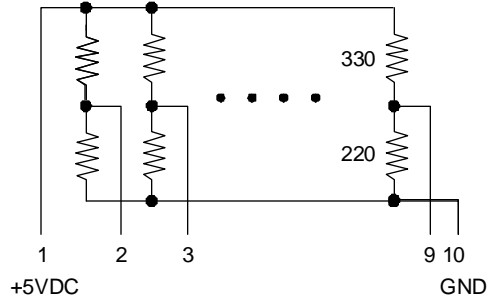


Figure 3-3: Resistor SIP Network

Reading the resistance from the signal pin of the SIP to either pin 1 or pin 10 will not provide the expected resistance of, for example, 220 or 330 ohms. This is because of the parallel resistance of the other paths. For example, the 220 ohms side will read 143 ohms (pin 10), and the 330 ohms side will read 156 ohms (pin 1). The actual values will change slightly because of allowed tolerance.

The following combination provides less bus loading than the first example and provides 330 ohms to +5 and 470 ohms to ground:

- Bourns part # 4610X-104-331/471 (Low profile)
- Bourns part # 4610M-104-331/471 (Medium profile)

Other values are manufactured and can certainly be used if a problem persists on the bus. Not all cards behave well on large buses or in combination with other cards and may require some experimentation to completely isolate all intermittent operation. Turning the SIP around is also allowed, even recommended occasionally, to better shape the signal being pulled high.

RC Network Termination

An alternative to a resistor network is an RC network. An RC network connects the signal lines, through a resistor in series with a capacitor, to either +5V or ground. An advantage of an RC Network is that no static load is imposed on the bus, but increased capacitance on the line will affect timing factors. RC Networks are also slightly more expensive than Resistor Networks. For an example schematic of an RC Network SIP see **Figure 3-4**.

DIODE Termination

In some cases, diodes can be connected between the signal lines and both +5V and ground. Any spikes greater than the +5V rail are shunted and limited to +5V. Any negative spikes are shunted to ground. Thus, the bus sees only signals in the range of 0-5V. Diode termination reduces over and under shoot, but doesn't improve signal shape or edge times. Diode termination is generally used in conjunction with resistor termination. For an example schematic of an Diode Network SIP see **Figure 3-5**.

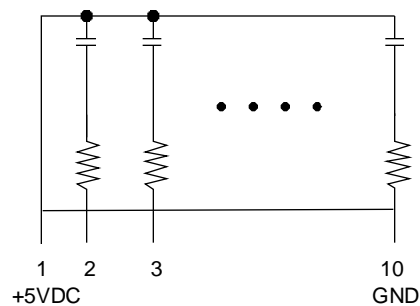


Figure 3-4: RC SIP Network

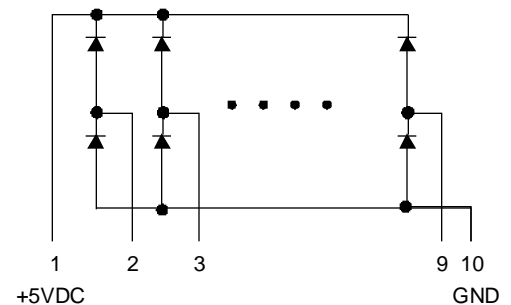


Figure 3-5: Diode SIP Network

XT (8 BIT) Bus Pin Assignments

Solder Side of Option Board			
Description	Res	Pin	Side
Ground	NC	1	B
+Reset	4.7K	2	B
+5 Volts	NC	3	B
+IRQ2 or 9	NC	4	B
-5 Volts	NC	5	B
+DRQ2	NC	6	B
-12 Volts	NC	7	B
-OWS	1-7	8	B
+12 Volts	NC	9	B
Ground	NC	10	B
-SMEMW	1-9	11	B
-SMEMR	4-2	12	B
-IOW	3-3	13	B
-IOR	3-4	14	B
-DACK3	3-5	15	B
+DRQ3	NC	16	B
-DACK1	3-7	17	B
+DRQ1	NC	18	B
-REFRESH	3-9	19	B
CLK	5-2	20	B
+IRQ7	NC	21	B
+IRQ6	NC	22	B
+IRQ5	NC	23	B
+IRQ4	NC	24	B
+IRQ3	NC	25	B
-DACK2	5-5	26	B
+T/C	5-6	27	B
+BALE	5-7	28	B
+5 Volts	NC	29	B
OSC	5-9	30	B
Ground	NC	31	B

Component side of Option Board			
Side	Pin	Res	Description
A	1	2-2	-I/O Chck
A	2	2-3	SD7
A	3	2-4	SD6
A	4	2-5	SD5
A	5	1-5	SD4
A	6	2-6	SD3
A	7	2-7	SD2
A	8	2-8	SD1
A	9	2-9	SD0
A	10	NC	I/O Chck Rdy
A	11	3-2	AEN
A	12	4-3	SA19
A	13	4-4	SA18
A	14	4-5	SA17
A	15	4-6	SA16
A	16	3-6	SA15
A	17	4-7	SA14
A	18	4-8	SA13
A	19	3-8	SA12
A	20	4-9	SA11
A	21	6-2	SA10
A	22	6-3	SA9
A	23	5-3	SA8
A	24	6-4	SA7
A	25	5-4	SA6
A	26	6-5	SA5
A	27	6-6	SA4
A	28	6-7	SA3
A	29	6-8	SA2
A	30	6-9	SA1
A	31	8-2	SA0

Note: Pin B4 is IRQ2 for an XT
Pin B4 is IRQ9 for an AT which is redirected as IRQ2
* -REFRESH is -DACK0 on an XT 8-bit system.

AT (16 BIT) Bus Extension Pin Assignments

Solder Side of Option Board			
Description	Res	Pin	Side
-MEMCS16	7-4	1	D
-I/OCS16	7-5	2	D
+IRQ10	NC	3	D
+IRQ11	NC	4	D
+IRQ12	NC	5	D
+IRQ15	NC	6	D
+IRQ14	NC	7	D
-DACK0	7-9	8	D
+DRQ0	NC	9	D
-DACK5	9-3	10	D
+DRQ5	NC	11	D
-DACK6	9-5	12	D
+DRQ6	NC	13	D
-DACK7	9-6	14	D
+DRQ7	NC	15	D
+5VDC	NC	16	D
-MASTER	9-9	17	D
GROUND	NC	18	D

Component Side of Option Board			
Side	Pin	Res	Description
C	1	7-3	SBHE
C	2	8-3	LA23
C	3	8-4	LA22
C	4	8-5	LA21
C	5	8-6	LA20
C	6	8-7	LA19
C	7	8-8	LA18
C	8	8-9	LA17
C	9	10-2	-MRMR
C	10	10-3	-MEMW
C	11	9-4	SD08
C	12	10-4	SD09
C	13	10-5	SD10
C	14	10-6	SD11
C	15	10-7	SD12
C	16	9-8	SD13
C	17	10-8	SD14
C	18	10-9	SD15

BUS Signals sorted by SIP Resistors

Side	Pin	Res	Description
A	5	1-5	SD4
B	8	1-7	-OWS
B	11	1-9	-SMEMW
A	1	2-2	-I/O CHCK
A	2	2-3	SD7
A	3	2-4	SD6
A	4	2-5	SD5
A	6	2-6	SD3
A	7	2-7	SD2
A	8	2-8	SD1
A	9	2-9	SD0
A	11	3-2	AEN
B	13	3-3	-IOW
B	14	3-4	-IOR
B	15	3-5	-DACK3
A	16	3-6	SA15
B	17	3-7	-DACK1
A	19	3-8	SA12
B	19	3-9	-REFRESH
B	12	4-2	-SMEMR
A	12	4-3	SA19
A	13	4-4	SA18

Side	Pin	Res	Description
A	14	4-5	SA17
A	15	4-6	SA16
A	17	4-7	SA14
A	18	4-8	SA13
A	20	4-9	SA11
B	20	5-2	CLK
A	23	5-3	SA8
A	25	5-4	SA6
B	26	5-5	-DACK2
B	27	5-6	+T/C
B	28	5-7	+BALE
B	30	5-9	OSC
A	21	6-2	SA10
A	22	6-3	SA9
A	24	6-4	SA7
A	26	6-5	SA5
A	27	6-6	SA4
A	28	6-7	SA3
A	29	6-8	SA2
A	30	6-9	SA1
C	1	7-3	SBHE
D	1	7-4	-MEMCS16
D	2	7-5	-I/OCS16
D	8	7-9	-DACK0

BUS Signals sorted by SIP Resistors (Continued)

Side	Pin	Res	Description
A	31	8-2	SA0
C	2	8-3	LA23
C	3	8-4	LA22
C	4	8-5	LA21
C	5	8-6	LA20
C	6	8-7	LA19
C	7	8-8	LA18
C	8	8-9	LA17
D	10	9-3	-DACK5
C	11	9-4	SD08
D	12	9-5	-DACK6
D	14	9-6	-DACK7
C	16	9-8	SD13
D	17	9-9	-MASTER
C	9	10-2	-MRMR
C	10	10-3	-MEMW
C	12	10-4	SD09
C	13	10-5	SD10
C	14	10-6	SD11
C	15	10-7	SD12
C	17	10-8	SD14
C	18	10-9	SD15
A	10	NC	I/O CH RDY
B	1	NC	GND
B	3	NC	+5 VOLTS

Side	Pin	Res	Description
B	4	NC	+IRQ 2 OR 9
B	5	NC	-5 VOLTS
B	6	NC	+DRQ2
B	7	NC	-12 VOLTS
B	9	NC	+12 VOLTS
B	10	NC	GND
B	16	NC	+DRQ3
B	18	NC	+DRQ1
B	21	NC	+IRQ7
B	22	NC	+IRQ6
B	23	NC	+IRQ5
B	24	NC	+IRQ4
B	25	NC	+IRQ3
B	29	NC	+5 VOLTS
B	31	NC	GND
D	3	NC	+IRQ10
D	4	NC	+IRQ11
D	5	NC	+IRQ12
D	6	NC	+IRQ15
D	7	NC	+IRQ14
D	9	NC	+DRQ0
D	11	NC	+DRQ5
D	13	NC	+DRQ6
D	15	NC	+DRQ7
D	16	NC	+5VDC
D	18	NC	GND
B	2	4.7K	+RESET TO GROUND

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Chapter 4: Maintenance

Your chassis should provide many years of trouble free service. However, should a failure occur, the following troubleshooting guide should provide some assistance. A generalized repair guide covering all possible computer problems is beyond the scope of this manual. Only problems directly related to the chassis will be covered. If you would like assistance with these procedures, please call Customer Service at **1-800-480-0044**. We will be happy to help.

Air Filters

Industrial Computer Source provides one front mounted fan to cool the inside of the chassis. The fan is provided with a filter to remove most large dust particles from the air. This filter should be cleaned as often as necessary to prevent overheating due to reduced air movement. The filter can be blown out or washed in soapy water. Remove the filter from the chassis before cleaning and insure it is dry before reinstalling.

The filter is easily accessible in the rear of the locking door assembly. To remove the filter open the door and gently pull out the filter.

In particularly dirty environments, a filter enhancement spray may be used to improve dirt retention. These sprays are available from a wide variety of sources. High efficiency filter material is also available and can be cut to shape. Be careful not to reduce the cooling airflow with various filter media to the point where chassis overheating becomes a problem.

Note: Filters do not remove fumes or gases. Do not use the chassis in environments where airborne contaminants which may damage the system are present.

For the most part, dust poses no danger to a computer except for disk drives. The exception is dust that is conductive such as metal or carbon particles. For particularly dirty environments, floppy drive lifetimes will be significantly reduced. For such environments, you should consider solid state “disks” such as the Industrial Computer Source EPROM, SRAM, or FLASH disk emulators or hard disks. Solid state PCMCIA/JEIDA data cards can be used in place of floppy diskettes for portability. Networks can also be used in dirty environments to replace floppy drives.

Special care for LCD display

- The flat panel display backlight does not have a long working life compared to the rest to the chassis components. The life of the backlight can be significantly extended by turning it off at the front panel if it is not needed for a couple of hours or more (see **Figure 2-5**).
- Disassembling the LCD unit can cause permanent damage and should be strictly avoided. The display and the inverter are not user serviceable and user modifications or repair attempts will void the warranty.

Monitor Impact Shield

The monitor impact shield is provided to protect the LCD display. It is manufactured from LEXAN or equivalent Polycarbonate plastic. Compared to glass or Plexiglas, LEXAN is virtually impossible to shatter. The trade-off is it is a relatively soft material and is, although treated with a scratch resistant finish, easily scratched if not properly cleaned.

- 1) **DO NOT** wipe dust off with a dry rag or towel. This will leave small scratches in the surface which will eventually make the monitor image fuzzy.
- 2) **DO NOT** use solvents to clean the surface. They may melt the LEXAN or cause crazing (small internal cracks) over time.
- 3) **DO** 'float' dust and dirt off the surface with a wet towel. The towel shouldn't be so wet as to drip water onto the chassis.
- 4) **DO** use Windex, Glass Plus, plastic cleaner, Pledge, etc., to clean and polish the surface.

FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be non-compliant with the appropriate standards for its intended use.

How to remain CE Compliant

This device complies with CE Directives 72/23/EEC and EMC 89/336/EEC. CE compliance is based on the interaction of all the components of a system. Any modifications made to the equipment may affect the CE compliance and must be approved in writing by Industrial Computer Source. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to claim CE compliance.

Troubleshooting

The components of a computer are all interrelated. That is, a “video” problem may be caused by the disk controller. The simplest diagnostic technique involves replacing the suspect card with a new one. If that doesn’t fix the problem, remove all cards except for the minimum required by the system. Then run the system, replacing each card until the problem shows itself.

Note: When troubleshooting a chassis a minimum load on the power supply is required. There are times when troubleshooting you may need to have all cards removed. Industrial Computer Source offers an optional ISA plug-in Power Supply Load Board that provides the minimum loading requirements of 0.96A load on +12VDC and 4A load on +5VDC. Please mention Model 10273-01B when ordering.



CAUTION!



The following procedures involve working with high voltage. Contact with this voltage can cause injury. Accidental shorting of the circuits can damage the computer.



CAUTION!



The following procedure involves working with a device that is sensitive to static electricity. Electro-Static Discharge (ESD) precautions must be taken. Only qualified personnel should attempt this procedure.

Unit doesn’t power up when switched on.

- A) Check front panel switch to make sure that it is switched on.
- B) Check that the power cord is completely plugged in and power is available at the source.
- C) Check the LEDs on front panel and on the backplane. If they are flickering there is insufficient load on the power supply.
- D) Check if the power supply cables in the chassis may have been crimped or pinched. In the case of a short the power supply will sense the short and shut off. It will also automatically sense the removal of the short and restore operation.

The computer's power is on but nothing is displayed on the LCD display.

- A) Turn off the power to the computer and remove the power cord.
- B) Remove the rear panel, using ESD protection, and check that the cable(s) on the LCD controller board are properly seated.
- C) Reinstall the rear panel and power cord and activate the system.

Power Supply LED's on Front Panel don't light.

The power supply may be shorted or the supply wires may be open. The power supply “chirps” if the +5V output is shorted. If chirping is not evident, the problem is probably an open circuit in the supply wiring. Check the I/O connectors on the backplane to be sure they are not shorted with a piece of solder or wire and not damaged.

Note: There is no user service access to the power supply—it is a sealed unit. If the seal on the power supply is broken, the warranty is void.

One Power Supply LED on Front Panel doesn't light.

- A) The LED may be faulty. Check LED on backplane. If lit, the LED on front panel is most likely faulty. Otherwise, ensure the proper voltage is being supplied to the LED.
- B) If the backplane LED does not show voltage present, then test for voltage at the power supply connector using a multimeter (see **Figure 3-1**). If voltage is not present then check the connector for correct pin placement, open connections, bad wire crimps, etc.

Note: Be careful when probing the connectors. Do not short across the connector pins because damage will occur if the supply pins are shorted to a signal pin. This damage is not covered by warranty. Do not bend the pin in the connector with your probe tip.

System gets power, but computer doesn't run. No disk activity or beeps.

- A) Check the backplane LEDs for power. Remove all cards except the CPU and video card. Turn on system and watch for a picture and listen for beeps. If no activity, remove video card and turn on the system. Listen for beeps. If no beeps, replace CPU or test CPU in another chassis. If beeps heard, replace video card.
- B) If a picture comes up from A) above, replace each card one at a time. A faulty card will prevent system from booting.

Overheat LED changes color from green to red.

- A) Physically check to verify that the unit is in a overheat condition. If so, proceed to step B). If unit is not in overheat condition (above 50°C), ensure the Temperature Sensor connector is connected to J4 of the Interface Adapter Card.
- B) Most likely there was a fan failure. All provided fans must be running. Remove cover and check if all of the chassis and power supply fans are turning. Ensure front intake vent is not blocked and the intake filter is clean. Ensure that the airflow direction is into the chassis (see **Figure 1-6**).

- C) If any fan is not turning, check for faulty power connections to the fan.
- D) If the power to the fan is correct, but the fan is not working; replace the fan. If there is no power to the fan, check the Interface Adapter Card (IAC) PCA for signs of damaged fan interface wiring. See Schematic Appendix A. Replace the IAC PCA, if necessary.

Fan Status LED changes color from green to red.

- A) Check to see if the fan are operating. If it is, a malfunction may have occurred with the fan status circuitry on the Interface Adapter Card. Note that anything impeding the free turning of the fan will report as a fault.
- B) If fan are not operating, check wiring and power between fan and the Interface Adapter Card (IAC). The cooling fan operated off +12VDC. The fan wires are connected to the IAC with push down bare wire clamp connectors. If voltage is present at the IAC, insure that the wires are firmly connected. If so, a fan may have malfunctioned.

Returns

If you need to return a product to Industrial Computer Source for any reason, the following applies:

First you must call Customer Service for an Return Authorization (RA) number. The RA number must be visible on the outside of the box you pack the product into for return shipment. Shipments without an RA number will not be accepted by Customer Service Receiving.

When shipping the product to Industrial Computer Source, the product must be properly packed:

- Remove any protruding keys, light pens, keyboards, cables, etc.
- Secure all plug-in cards with screws. Screw down the lid. Be sure the drive cage is screwed down as applicable and that access doors are closed.
- Put the computer in a bag to prevent moisture and dirt from entering the drive and card areas.
- Provide adequate packaging and use standard Electrostatic Discharge (ESD) precautions. If possible, use the original box and packing the system arrived in. The chassis weight is 30 to 45 pounds. A minimum of 4 inches of proper packing material is required around all sides of computer systems. Double thick cardboard is preferred. **Do not use styrofoam peanuts or loose fill to pack.** Assume the box will be dropped several feet during shipping.
- Do not ship by motor freight. Use a carrier such as Burlington, Airborne, or Federal Express.

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Appendix A: Schematics and Chassis Wiring Diagrams

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Insert
Schematic 20017-00 Rev D
FAN/SPKR/TEMP INTERFACE
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Schematic 20019-00 Rev B
PCA DISPLAY MINI
Then discard this page

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Insert
Schematic 20016-00 Rev C
KEYBOARD INTERFACE DUAL
Then discard this page

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Insert
Wiring Diagram 80016-00D Rev D
WIRING DIAGRAM 8301
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Declaration of Conformity



6260 Sequence Drive
San Diego, CA 92121-4371
(800) 523-2320
<http://www.indcompsrc.com>

Industrial Computer Source declares under its own and full responsibility that the following products are compliant with the protection requirements of the 89/336/EEC and 73/23/EEC EU Directives.

Only specific models listed on this declaration and labeled with the applicable logo are compliant.

8301-MC 8301-SC 8301-TC
8301-MC-D4 8301-TC-D4 8301-SC-D4

Conformity is accomplished by meeting the requirements of the following standards:

EN 50081-1:1992 Emissions, Generic Requirements.

-EN 55022 Measurement of radio interference characteristics of information technology equipment.

EN 50082-1:1992 Immunity, Generic Requirements.

-IEC 1000-4-2:1995 Immunity for radiated electromagnetic fields.

-IEC 1000-4-3:1995 Immunity for radiated RF electromagnetic fields.

-IEC 1000-4-4:1995 Immunity for AC and I/O lines, fast transients common mode.

EN 60950:1992 Safety of Information Technology Equipment.

Information supporting this declaration is contained in the applicable Technical Construction file available from:



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Mr. Steven R. Peltier
President & Chief Executive Officer

September 11, 1997
San Diego, CA

BUG REPORT

While we have tried to assure this manual is error free, it is a fact of life that works of man have errors. We request you to detail any errors you find on this BUG REPORT and return it to us. We will correct the errors/problems and send you a new manual as soon as available. Please return to:



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