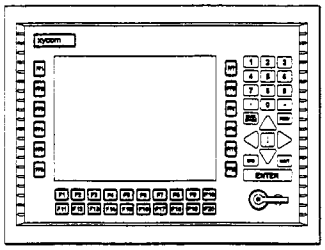
3200/3300



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United States FCC Part 15, Subpart B, Class A EMI Compliance Statement

Note: 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 can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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 own expense.

For Canadian Users

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n' émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Class A prescrites dans le Rèlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Electromagnetic Compatibility WARNING

The connection of non-shielded equipment interface cables to this equipment will invalidate FCC EMI and European Union EMC compliance and may result in interference and/or susceptibility levels which are in violation of relevant regulations. It is the responsibility of the system integrator and/or user to obtain and use shielded interface cables and equipment used with this device as described within this manual. If this equipment has more than one connector, do not leave cables connected to unused interfaces. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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Chapter 1–Introduction

Product Overview

Xycom's 3200/3300 Industrial Workstation System can be easily configured as a flexible operator interface for a variety of PLCs, incorporating a rugged enclosure and a 10.4" monochrome or color LCD flat panel display. The 3200 and 3300 are very similar in design. They differ only in the front panel keypad and keyboard connector features. The 3300 comes standard with touch screen only. The front display and keypad panel are sealed to NEMA 4/4X/12 standards, with an LCD display protected by an impact-resistant shield.

The powerful SoftScreen Windows Development System is used to build operator interface screens. The development system uses a fill-in-the-blank configuration which involves no programming. A Windows-based graphics builder and pull-down menus further simplify the creation of graphical interface screens and animation for download to the 3200/3300 products.

Three different expansion options make it easy to tailor the Industrial Computer to meet your application's hardware requirements:

1. *Memory and I/O cards* may be added via the Type I-and II-compatible PC Card (also known as PCMCIA) slot.
2. *Internal PC/104 cards* (two max) may be added to control peripherals and networks.
3. *A half-length PC/XT-compatible expansion card* can be mounted in the 3200/3300 using an optional adapter.

Standard Features

- Analog touch screen (resistive membrane) (standard on 3300)
- 640 x 480 LCD flat-panel display (10.4-inch diagonal)
- Two isolated serial ports–each configurable as RS-232 or RS-485.
- Parallel port
- PC Card 2.1 interface (Type I or Type II)
- AT keyboard interface (PS/2)
- 32 relegendable function keys (3200 only)
- Full numeric keypad with cursor control keys (3200 only)
- NEMA 4/4X/12 standards (Flat Panel is protected with an impact resistant shield)

Optional Features

- Color display
- Expansion kit for PC/XT or PC/104
- Additional memory (PC Card, also known as PCMCIA)
- Keyboard converter cable (MicroDin to Din PC/AT style)

Specifications

Hardware

Mechanical

Height	12.25" (311.15 mm) (3200) 11.0" (279 mm) (3300)
Width	16.50" (419.10 mm) 13.0" (330.2 mm) (3300)
Depth	4.25" (107.95 mm)
mounting	4.625" (117.5 mm) with PC Card
Weight	7.5 lbs. (3.4 kg)

Electrical

90-250 VAC, auto-sensing
47-63 Hz, .8 A maximum
46 Watts maximum
(157 BTU/HR)

Mounting

See panel cutout dimensions–Chapter 3, Figures 3-5 and 3-6; 12 (#10-32) nuts

Display

10.4" color TFT or mono

Agency Approvals

UL	1950, 1604
CUL	C22.2 No. 950 and 213
EN60950	

Regulatory Compliance

CE
FCC 47 CFR, Part 15, Class A

EMC

EMI	EN55022:1994 Class A
ESD	IEC 801-2:1991 8 kV CD, 15 kV AD
RFI	IEC 801-3:1984 27-500 MHz, 10 V/m
EFT/B	IEC 801-4:1988 1kV Signal, 2kV AC

Environmental

Temperature

Operating	0° to 45°C (32° to 113°F) mono 0° to 50°C (32° to 122°F) color
Non-operating	-20° to 60°C (-4° to 140°F) both

Humidity

Operating	20 to 80% RH, non-condensing
Non-operating	20 to 90% RH, non-condensing

Shock

Operating	15 g peak acceleration 11 msec duration
Non-operating	30 g peak acceleration 11 msec duration

Vibration

Operating	5 to 2000 Hz .006" peak-to-peak displacement 1.0 g maximum acceleration
Non-operating	5 to 2000 Hz .015" peak-to-peak displacement 2.5 g maximum acceleration

Altitude

Operating	Sea level to 10,000 ft. (3,048 m)
Non-operating	Sea level to 40,000 ft. (12,192 m)

Note

See Chemical Compatibility in Chapter 6.

Chapter 2–Unpacking the 3200/3300

Parts Verification

When you remove the 3200/3300 system from its shipping carton, verify that you have the parts listed below. It is a good idea to save the box and inner wrapping in case you need to reship the unit.

- 3200/3300 unit
- Documentation kit which includes:

  -Power connector

  -3200/3300 Hardware Manual

  -Mounting hardware (12 #10-32 mounting nuts)

  -Cable clamp and #6-32 screw

  -Business reply card

System Components

This section describes the 3200/3300's front and rear view components to familiarize you with Focal Point's features.

Front Panel

Display

The 10.4-inch display is protected from breakage by impact-resistant shield.

Function and User-Defined Keys (3200 only)

These 32 relegendable keys provide easy access to familiar routines. Twenty of these keys are prelabeled F1 through F20, and the remaining

12 keys are PF1 through PF12. Refer to Chapter 4 for more details on customizing your inserts.

Numeric/Cursor Control Keypad (3200 only)

Data entry keypads are for entering data and moving the cursor. The numeric keypad includes numbers 0-9, "." and "-", cursor keys, (up, down, left, right), back space, ESC, Prev, Next, ENTER and 'I,' which is equivalent to the right ALT key. The 3200 keypad remains operational up to three million touches (minimum). Refer to Figure 2-1.

Keyboard Ports (3200/3300)

This standard PS/2-compatible connector (located below the ENTER key on the 3200 only) is PC/AT compatible to access data entry functions. A second keyboard port, labeled KEYBD, is accessible on the bottom of both units. Refer to figures 2-1 and 2-2.

Logo Area

Refer to Chapter 3, Figure 3-5, for dimensions and recommended requirements for a customized label.

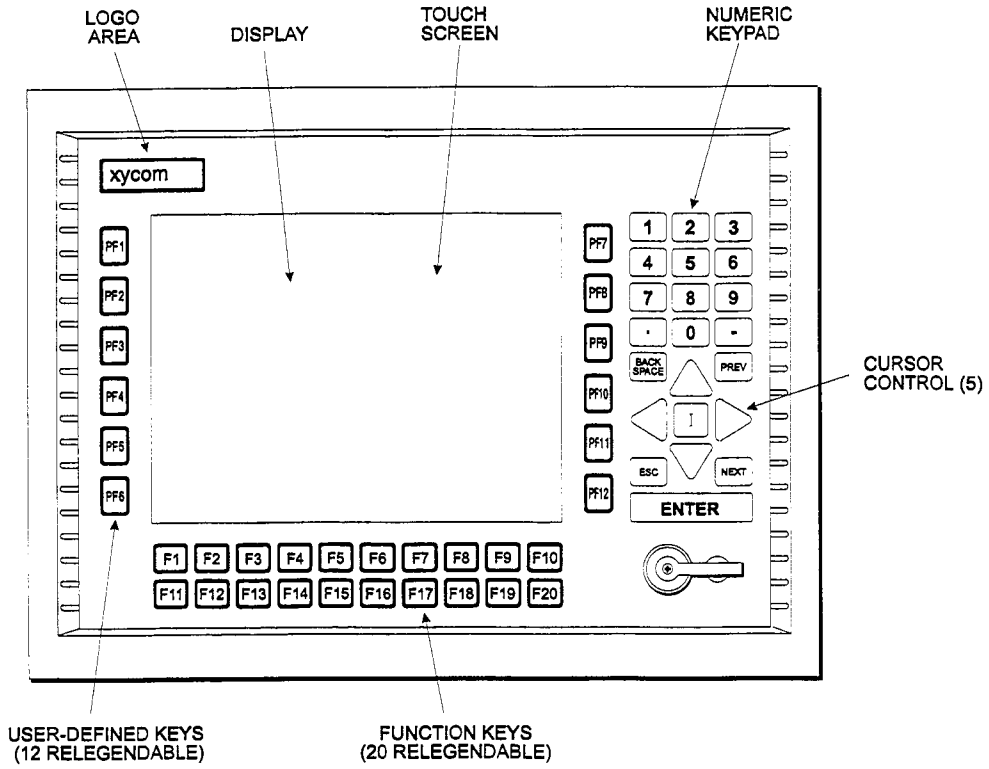


Figure 2-1. Front Panel (3200)

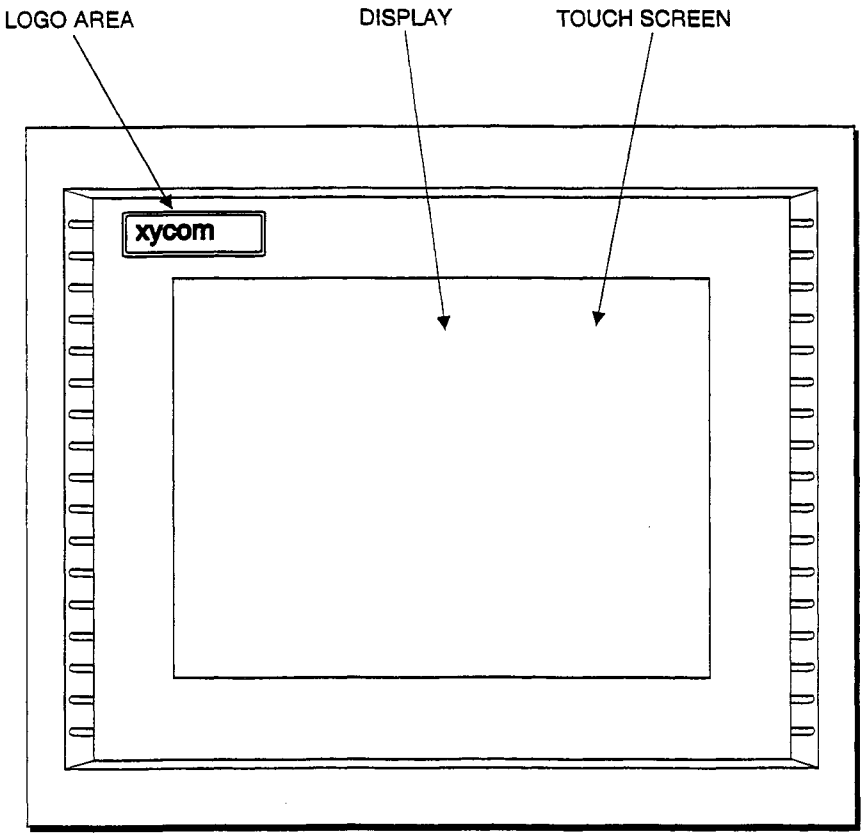


Figure 2-2. Front Panel (3300)

Rear/Bottom View

Power Connector

The power receptacle–located on the bottom of the unit–is labeled L1 L2/N GND. The power supply input range is 90-250 AC Volts, 47-63 Hz.

Power Cable

The unit does not come with standard with the unit. The power cable must meet electrical standards applicable to the point of installation or equivalent. See the *Creating a Power Cable* section in Chapter 3.

Keyboard Ports

This standard PS/2-compatible connector is PC/AT compatible to access data entry functions. This port–labeled KEYBD–is located on the bottom of the unit. The port is also accessible through the front panel on the 3200 (refer to figures 2-1 and 2-3).

COM1 and COM2 Isolated Ports

The 3200/3300 supports both COM1 and COM2 ports. These ports are isolated and jumper configurable. COM1 and COM2 can be configured as either RS-232 or RS-485 with on-board termination for RS-485. (Refer to Figure 2-3 for port locations, and Chapter 8 for pinouts.)

Parallel Port

This port provides a standard PC-compatible printer interface.

PC Card Slot

This memory expansion interface is compatible with PC card 2.1.

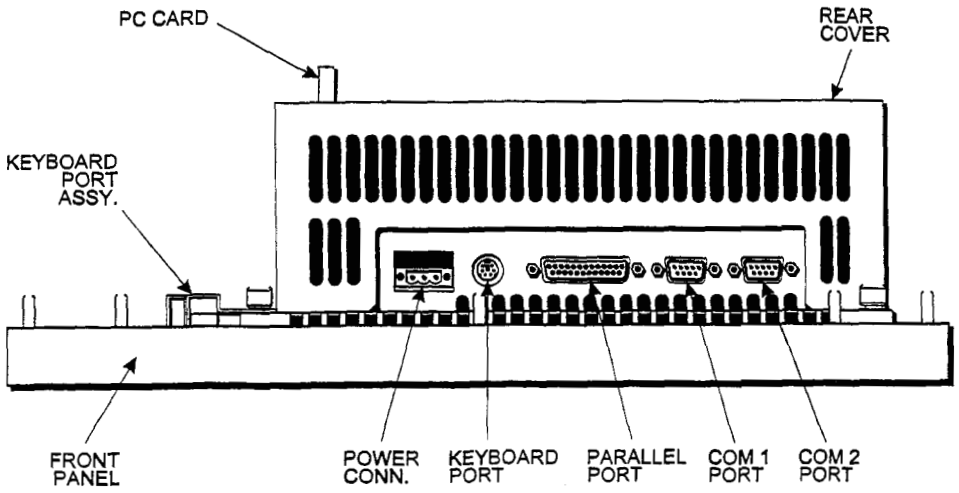


Figure 2-3. Rear/Bottom View

Chapter 3 – Installation in Non-Hazardous/Hazardous Locations

Warning

Disconnect power before performing any internal adjustments or modifications.

Introduction

This chapter explains how to prepare your system for use and how to install internal and external options on your 3200/3300. To help you locate features relevant to installation, refer to the figures listed below.

- *Figure 2-1, page 2-3 - Front Panel (3200)*
- *Figure 2-2, page 2-4 - Front Panel (3300)*
- *Figure 2-3, page 2-6 - Rear View 3200/3300*
- *Figure 3-1, page 3-14 - Front Panel Interior View of Keypad Slots (3200)*
- *Figure 3-2, page 3-15 - Internal System Components*
- *Figure 3-3, page 3-16 - 3200 System Dimensions*
- *Figure 3-4, page 3-17 - 3300 System Dimensions*
- *Figure 3-5, page 3-18 - 3200 Panel Cutout Dimensions*
- *Figure 3-6, page 3-19 - 3300 Panel Cutout Dimensions*
- *Figure 3-7, page 3-20 - Logo Label Dimensions*

Preparing the System for Use

1. Install any optional equipment by following the instructions in the next few sections.
2. Create a panel cutout. Refer to figure 3-5 or 3-6 for exact dimensions.
3. Mount the 3200/3300 and properly secure the unit into the panel. Tighten the twelve #10-32 nuts to 25-inch pounds (2.4 Newton-meters). *See Panel Mounting section in this chapter.*
4. Attach the input power cord to the power connector. See the *Creating a Power Cable* section in this chapter.

Installing Internal Hardware Options

PC Card Installation (also known as PCMCIA)

Caution

Power must be turned off.

Note

You do not have to remove the rear cover to install the PC card (Figure 2-3).

1. Pull back the PC card clip to gain access to the PC card slot.
2. Install the card, making sure it is pushed in all the way. The clip will automatically fit over the card once the card is installed correctly.

Jumper Settings

Certain jumpers must be set to configure the serial ports as RS-232C or RS-485. The following two tables show the jumper settings.

Serial Port Jumper Settings (COM1)

Jumper	RS-232C	RS-485
J7, J11, J12,J13,J14, J15, J16, J17, J18	A	B
J8, J9	-	A: No terminaiton B: RXD termination
J10, J19	-	A: No termination B: CTS termination C: TXD termination

Serial Port Jumper Settings (COM2)

Jumper	RS-232C	RS-485
J21, J22, J23, J24, J25, J26, J27, J28, J32	A	B
J29, J31	-	A: No terminaiton B: RXD termination
J20, J30	-	A: No termination B: CTS termination C: TXD termination

The following table shows jumper configurations from the PC/104 expansion.

Jumper Configurations

Jumper	From PC104
J5	A - Selects IRQ11 vs. IRQ6 B - Selects IRQ6 vs. IRQ11
J6	A - Selects IRQ10 vs. IRQ9 B - Selects IRQ9 vs. IRQ10

Installing External Hardware Options

Installing Keypad Inserts (3200)

Refer to Chapter 4 for keypad insert dimensions and ordering information.

1. Turn off the power source.
2. Unscrew the two rear cover thumb screws and remove the cover.
3. Disconnect the keypad cable (and touch screen cable, if present). Unscrew the four remaining thumb screws and gently pull the rear frame assembly away from the front panel.
4. Pull out the old keypad strips and replace with the new strips. There are two vertical insert locations and one horizontal insert location (Figure 4-3).
5. Reassemble the unit to proper working order.

Custom Logo Option

Refer to Figure 3-7 for the dimensions and recommended requirements for a customized label. Once a customized label is procured, it is placed over the "Xycom" in the upper left-hand corner of the keypad (inside the ring embossment).

Expansion Options

The 3200/3300 Focal Point holds either a single half-length PC/XT card with the optional adapter card or up to two PC/104 cards. Some drivers require an interface card (refer to the driver manual for details). Several precautions must be taken before installing expansion modules.

The PC/104 and PC/XT expansion options do *not* support the following items:

- DMA
- IRQ3, 4, 10, 11, 12, 15
- -5V DC

- IOCHCK
- REFRESH

Other precautions include the amount of current the expansion module(s) require. The 3200/3300 Focal Point has a limited amount of power available for expansion modules. The list below details the amount of current available.

+5V max. 1100 mA

+12V max. 1000 mA

-12V max. 200 mA

The total sum of power consumed from all voltages must not be greater than 11.9 watts.

PC/104

The PC/104 connector supports a 16-bit interface. The connectors are placed on the board so that the PC/104 stack-through interface boards can be used.

You will need the #4-40 locking screws and stand-offs contained in the expansion kit before installing this card.

Expansion kit contents:

- One #6-32 x 5/16-inch locking screw
- One PC/104 - PC/XT assembly
- One blank ORB
- Two #6-32 x 1/4-inch locking screws
- Four #4-40 x 1/4-inch locking screws
- Eight #4-40 x 5/8-inch male-female standoffs
- One ORB bracket

Note

Always use the locking screw to attach the PC/104 cards to prevent vibration failures.

Perform the following steps to install the PC/104 card.

1. Turn off the power.
2. Unscrew the power cable clamp and disconnect the power connector.
3. Unscrew the rear cover using the two smaller thumb screws and remove the cover.
4. The PC/104 connectors are to the right of the power supply (see Figure 3-2 for location). The contents of the expansion kit should be used to attach one or two PC/104 cards.
5. If the cards need to connect to something outside the unit, remove the breakaway area (located on the right side of the rear cover). Pry the break-away hole with screwdriver (the area should loosen and be removed).

Note

Use care not to distort the metal on the rear cover.

6. Pass cables through this area or use the blank ORB and ORB bracket supplied in the expansion kit to mount connectors.
7. Reassemble the unit to proper working order.

ORB mounting is a mechanical mounting option for the PC/104. To orb mount the PC/104,

1. Turn off the power source.
2. Unscrew the power cable clamp and disconnect the power connector.
3. Unscrew the rear cover thumb screws and remove the cover.
4. Place the ORB in ORB mounting area (Figure 3-2)
5. Use the two #6-36 locking screws (supplied with the expansion kit) to connect the ORB to the ground bracket.
6. Reassemble the unit to proper working order.

PC/XT

You will need the optional expansion kit before installing this card.

Expansion kit contents:

- Two #6-32 locking screw
- One PC/104 - PC/XT assembly
- One blank ORB
- One ORB mounting bracket
- Four #4-40 locking screws
- Eight #4-40 x .625-inch male-female standoffs

Follow the steps listed below to install the PC/XT card.

1. Remove the power cord and cable clamp. If a PC Card is installed, you must remove it at this time.
2. Unscrew the rear cover thumb screws and remove the cover.
3. Install two standoffs to support the PC/XT adapter.
4. Plug the adapter card into the PC/104 connectors on the CPU. Make sure that the pins are properly aligned and insert into the PC/104 connectors (Figure 3-2).
5. Screw the adapter card down using the four #4-40 locking screws supplied in the expansion kit.
6. If the cards need to connect to something outside the unit, the break-away area (located on the right side of the rear cover) will need to be removed. Pry break-away hole with screwdriver (area should loosen and be removed).

Note

Use care not to distort the metal on the rear cover.

7. Pass cables through this area or use the blank ORB and ORB bracket supplied in the expansion kit to mount connectors.
8. Reassemble the unit to proper working order.

Installing the 3200/3300 into a Panel

The 3200/3300's rugged design allows it to be installed in most industrial environments. The 3200/3300 is placed in a NEMA 4/4X/12 enclosure to protect against contaminants such as dust, moisture, etc. Metal enclosures also help minimize the effects of electromagnetic radiation that may be generated by nearby equipment.

Follow the guidelines in the next few paragraphs for installing your 3200/3300.

Once you have established a location for the 3200/3300, install it in the enclosure according to the instructions that follow these next few sections. Consider the following points and precautions before placing the 3200/3300 inside an enclosure:

Points and Precautions

- Select an enclosure that allows access to the 3200/3300 I/O ports.
- Account for the unit's depth as well as the PC Card expansion when choosing the depth of the enclosure.
- Mount the 3200/3300 to allow for maximum cooling (avoid obstructing the air flow).
- Place the 3200/3300 at a comfortable working level (usually at shoulder height).
- Consider locations of accessories such as AC power outlets and lighting (interior lighting and windows) for installation and maintenance convenience.
- Place fans or blowers close to the heat-generating devices. If using a fan, make sure that outside air is not brought inside the enclosure unless a fabric or other reliable filter is also used. This filtration prevents conductive particles or other harmful contaminants from entering the enclosure.
- To provide a NEMA 4 seal, you must mount the unit in an approved enclosure with a 14 gage (.075"/1.9mm thick) steel or (.125"/3.2 mm thick) aluminum front face.
- Do not select a location near equipment that generates excessive electromagnetic interference (EMI) or radio frequency interface

(RFI) (equipment such as high-power welding machines, induction heating equipment, and large motor starters)

- Do not place incoming power devices (such as isolation or constant voltage transformers, local power disconnects, and surge suppressors) near the 3200/3300.
- The proper cable routing of incoming power lines keeps power wire runs as short as possible, and minimizes electrical noise transmitted to the 3200/3300.
- Make sure the location does not exceed the 3200/3300's temperature specifications.

System Power

It is a good idea to use isolation transformers on the incoming AC power line to the 3200/3300. An isolation transformer is especially desirable in cases in which heavy equipment is likely to introduce noise onto the AC line. The isolation transformer can also serve as a step-down transformer to reduce the incoming line voltage to a desired level. The transformer should have a sufficient power rating (units of volt-amperes) to supply the load adequately.

Proper grounding is essential to all safe electrical installations. Refer to the relevant federal, state/provincial and local electric codes which provide data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. The code specifies that a grounding path must be permanent (no solder), continuous, and able to safely conduct the ground-fault current in the system with minimal impedance (minimum wire required is 18 Awg, 1 mm). The following practices should be observed:

- Separate ground wires from power wires at the point of entry to the enclosure. To minimize the ground wire length within the enclosure, locate the ground reference point near the point of entry for the plant power supply.
- All electrical racks or chassis and machine elements should be Earth Grounded in installations where high levels of electrical noise can be expected. The rack/chassis should be grounded with a ground rod or attached to nearby Earth structure such as a steel support beam. Each different apparatus should be connected to a single Earth Ground point in a "star" configuration with low impedance cable.

Excessive Heat

To keep the temperature in the specified range, the cooling air at the base of the system must not exceed 50° C for color, and 45° C for monochrome. Proper spacing must also be allocated between internal components installed in the enclosure.

When the air temperature is higher than 50° C (color) and 45° C (monochrome) in the enclosure, use a fan or air conditioner.

Electrical Noise

Electrical noise is seldom responsible for damaging components, unless extremely high energy or high voltage levels are present. However, noise can cause temporary malfunctions which can result in hazardous machine operation in certain applications. Noise may be present only at certain times, may appear at widely-spread intervals, or in some cases may exist continuously.

Noise commonly enters through input, output, and power supply lines and may also be coupled through the capacitance between these lines and the noise signal carrier lines. This usually results from the presence of high voltage or long, close-spaced conductors. When control lines are closely spaced with lines carrying large currents, the coupling of magnetic fields can also occur. Use shielded cables to help minimize noise. Potential noise generators include switching components relays, solenoids, motors, and motor starters. Refer to the relevant Federal State/Provincial and local electric codes which provides data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. It is recommended that the high voltage and low voltage cabling be separated and dressed apart. In particular, the AC cables and switch wiring should not be in the same conduit with all communication cables.

Line Voltage Considerations

The power supply section of the 3200/3300 is built to operate within the range of 90-250 VAC.

In cases where the installation is subject to unusual AC line variations, a constant voltage transformer can be used to avoid malfunction. However, a first step toward the solution of the line variations is to correct any possible feed problem in the distribution system. If this correction does not solve the problem, a constant voltage transformer must be used.

The constant voltage transformer stabilizes the input voltage to the 3200/3300 by compensating for voltage changes at the primary in order to maintain a steady voltage at the secondary. When using a constant voltage transformer, check that the power rating is sufficient to supply the 3200/3300. See Specifications in Chapter 1.

Panel Mounting

Once the considerations in the preceding paragraphs have been met, mount the 3200/3300 following the instructions below:

1. Locate a position for your 3200/3300 that meets the required specifications.
2. Cut the hole according to the cutout dimensions in Figure 3-5 or 3-6.
3. Make sure the area around the cutout is clean and free from metal burrs.
4. Attach the power cord, making sure that the 3200/3300 enclosure is grounded through the power cord.
5. Insert the workstation into the hole created in Step 2 from the front of the panel.
6. Hold the workstation against the panel and secure it with the mounting nuts.

7. Tighten the 12 #10-32 nuts to 25-inch pounds (2.8 Newton-meters).

> **Warning**
>
> Do not exceed 25-inch pounds (2.8 Newton-meters) when tightening #10-32 mounting nuts.

Creating a Power Cable

You must create a power cable to supply power to the 3200/3300. You need the following materials:

- Three-position power connector (supplied)
- A braid/foil shielded power cable, terminated at power source end, with three 18 (1.0 mm), 16 (1.3 mm), or 14 (1.6 mm) Awg solid or stranded copper wire, rated 80° C or better.

Perform the following steps to create the cable:

1. Cut the wire cable to the desired length.
2. Strip .25-inch (6 mm) of insulation from the end of the conductor wire. No bare wire should be exposed when the cable is connected to the workstation.
3. Tin the wire ends with solder if using stranded wire. This will keep the wire from fraying.

> **Warning**
>
> When inserting the wire ends of the power cable into the block plug, be sure that no bare wire is exposed. Trim the wire ends of the cable or cut a new cable if necessary.

4. Insert the three wire ends of the power cable into the three holes of the block plug, as shown in Chapter 2, Figure 2-3. The Protective Earth GND ground, L1 and L2/N wires should be inserted into the corresponding holes, as indicated in Figure 2-3. Be sure that no bare wires are exposed.

5. Tighten the three screws above the wires to hold them firmly in place.

Warning

Never tighten the three screws of the block plug when the cable is connected to a power source. The screws are conductive and have full contact with the cable wire.

6. Use a cable clamp and #6-32 screw (provided) to secure and strain-relief the power cable. When installing the power cable to the unit, use the securing screws on each side of the plug.
7. Once you have installed the power and other optional interface cables, installation is complete.

Warning

When disconnecting the power cord from the unit, be sure to completely loosen the two securing screws on the plug.

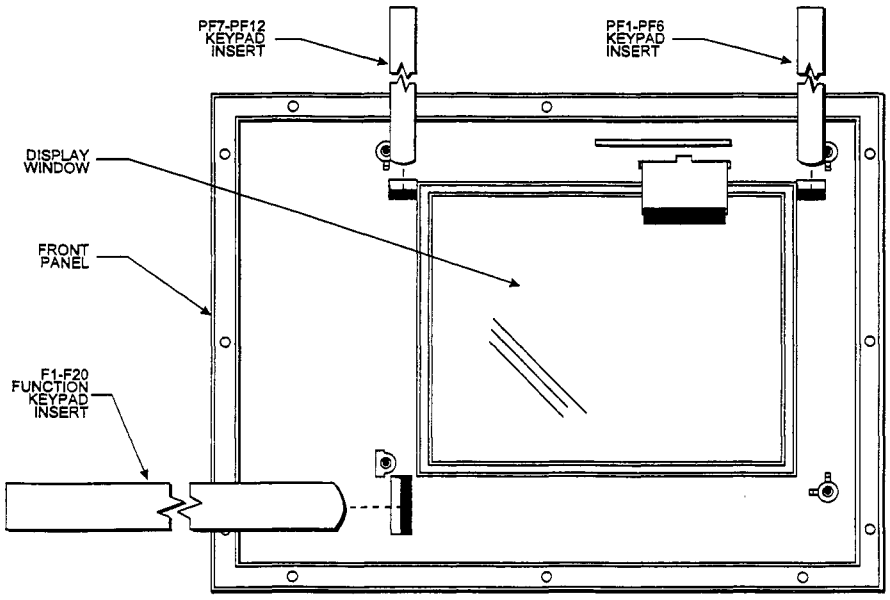


Figure 3-1. Front Panel Interior View of Keypad Slots (3200)

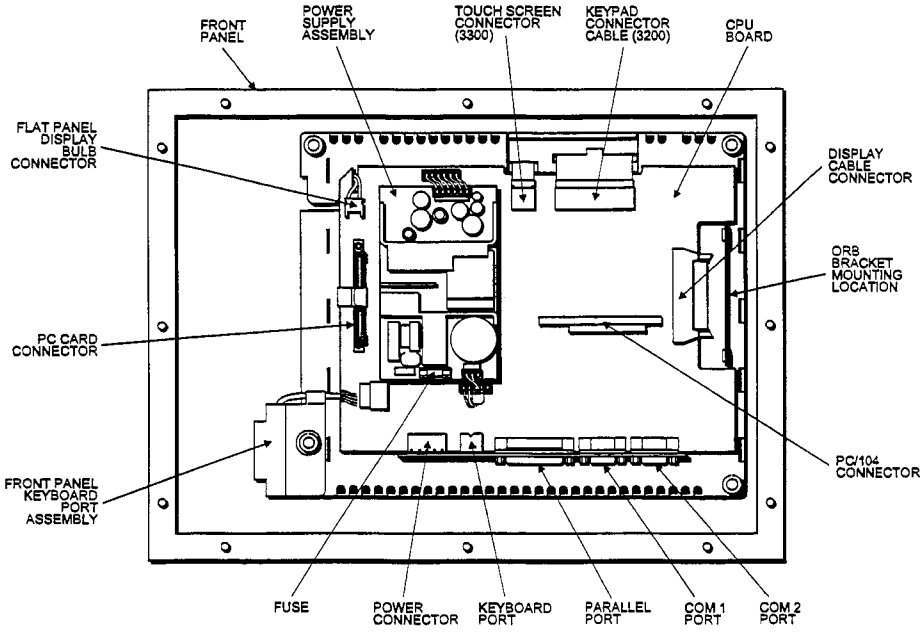


Figure 3-2. Internal System Components

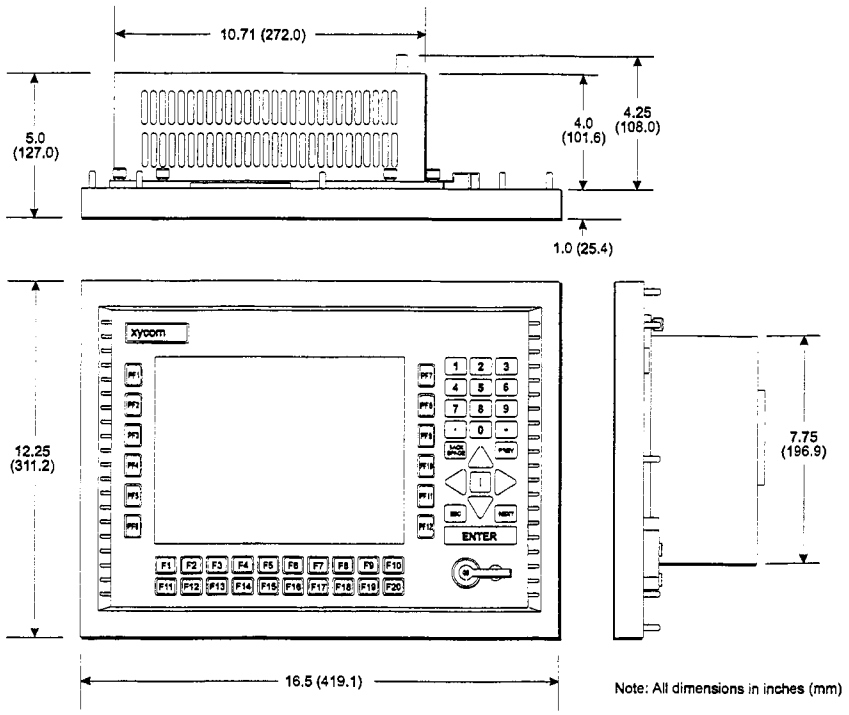


Figure 3-3. 3200 System Dimensions

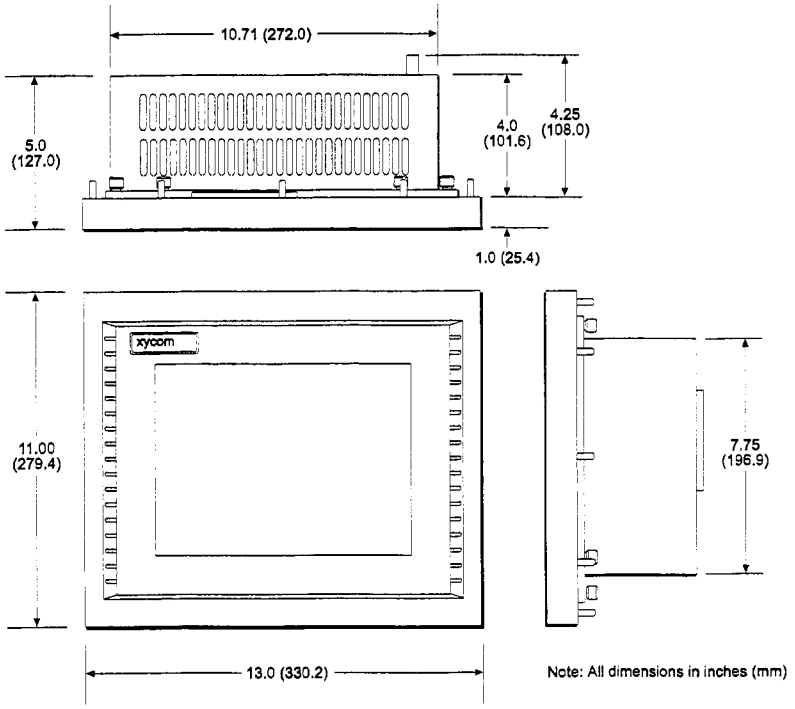


Figure 3-4. 3300 System Dimensions

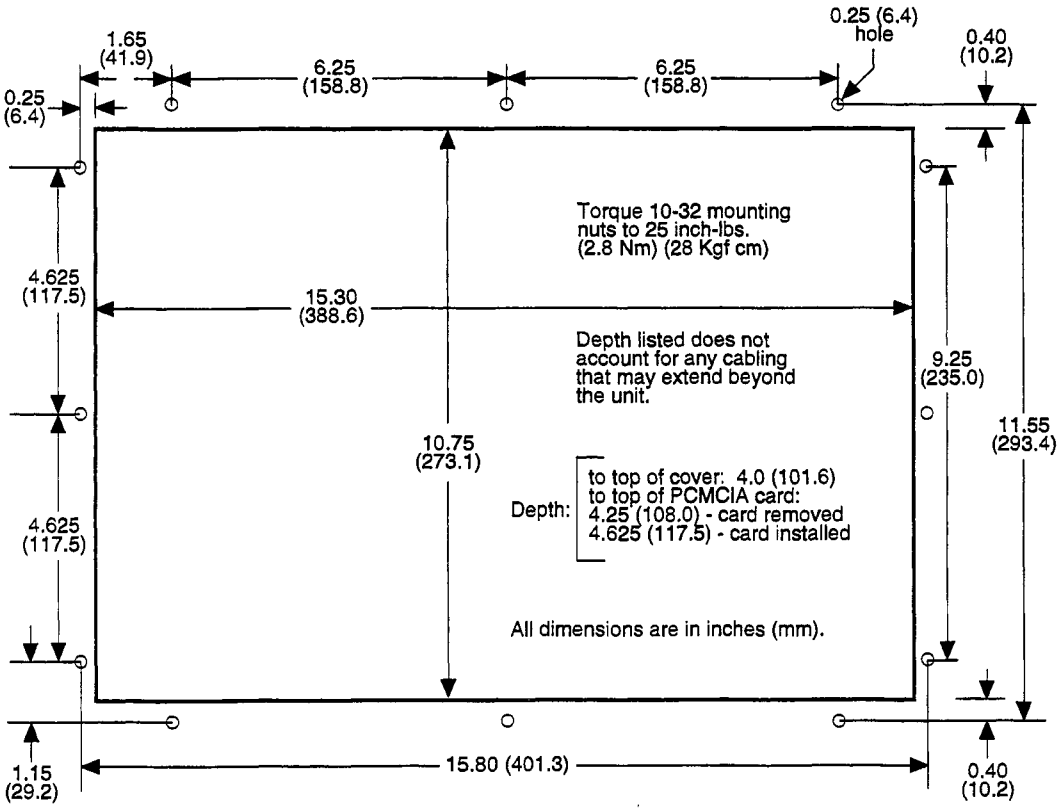


Figure 3-5. 3200 Panel Cutout Dimensions

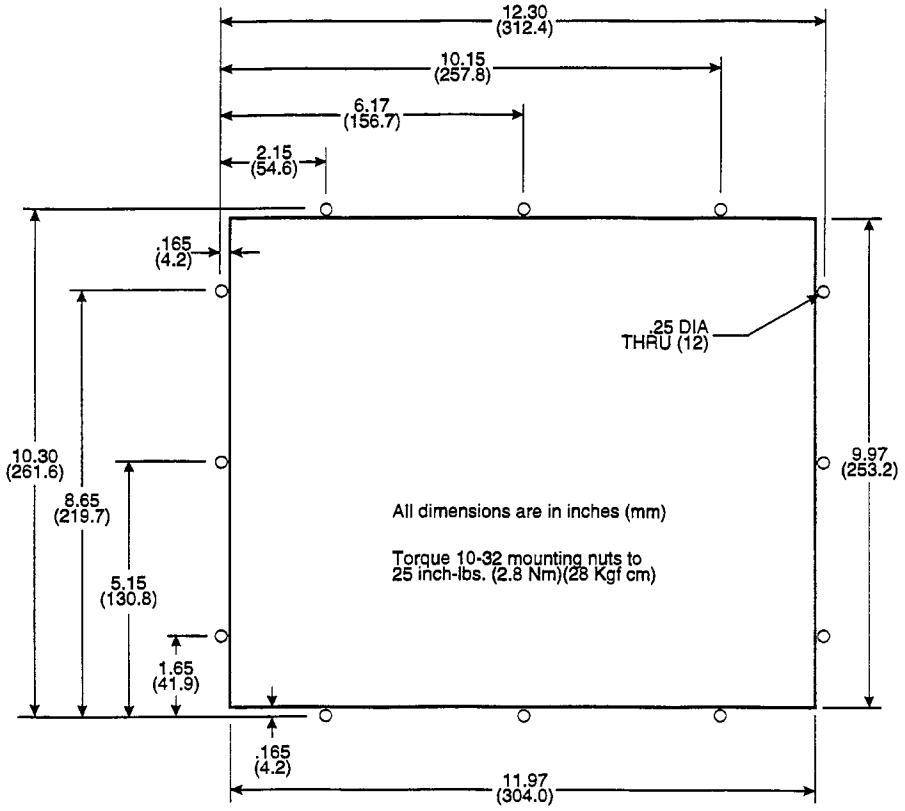


Figure 3-6. 3300 Panel Cutout Dimensions

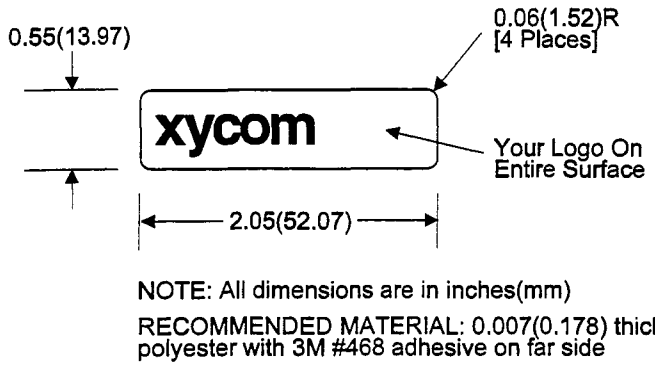


Figure 3-7. Logo Label Dimensions

Hazardous Locations Installations

Xycom designed the 3200/3300 system with the intention of meeting the requirements of Class I, Division 2 Hazardous Locations applications. Class II, Division 2 requirements can also be met when the system is installed in an approved Type 4 enclosure. Division 2 locations are locations that are normally non-hazardous, but could become hazardous due to accidents which may expose the area to flammable vapors, gases, or combustible dusts.

These systems have been UL and CUL listed as non-incendiary devices. They are not intrinsically safe and should never be operated within a Division 1 (normally hazardous) location when installed as described here. Nor should any peripheral interface device attached to these systems be located within Division 1 locations unless approved and/or certified diode barriers are placed in series with each individual signal and DC power line. Any such installations are beyond the bounds of Xycom design intent. Xycom accepts no responsibility for installations of this equipment or any devices attached to this equipment in Division 1 locations.

It is the responsibility of the customer to ensure that the product is properly rated for the location. If the intended location does not have a Class, Division, and Group rating, users should consult the appropriate authorities having jurisdiction in order to determine what the correct rating for that Hazardous Location should be.

In accordance with federal, state/provincial, and local regulations, all hazardous locations installations should be inspected by the appropriate authority having jurisdiction prior to use. These systems are to be installed, serviced, and inspected only by technically qualified personnel.

Safety Agency Approval

The Xycom 3200/3300 is UL and CUL listed and has also been investigated for compliance with the following standards:

- *Underwriters Laboratories Inc., UL 1604* Standard for Safety Electrical equipment for use in Class I and Class II, Division 2, and Class III hazardous (classified) locations.
- *Underwriters Laboratories Inc., UL 1950* Information Technology Equipment.
- *Canadian Standard Association, Specification C22.2 No. 213-M1987.* Non-incendiary electrical equipment for use in Class I, Division 2 hazardous locations
- *Canadian Standards Association, Specification C22.2 No. 1950* Information Technology Equipment
- *UL File No. E180970* Suitable for use in Class I, Division 2 Groups A, B, C, and D, and Class II, Division 2, Groups F and G hazardous locations or non-hazardous locations only

Warning - Explosion Hazard

Substitution of components may impair suitability for Class I, Class II, Division 2.

Advertissment Risque D' Explosion

La substitution de composants peut rendre ce materiel inacceptable pour les emplamements de classe I, II, Division 2.

Warning - Explosion Hazard

Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Advertissment Risque D' Explosion

Avant de deconnecter l'equipment, coupler le courant ou s'assurer que l'emplacement est designe non dangereux.

Warning - Explosion Hazard

When in hazardous locations, turn off power before replacing or wiring modules.

Advertissment Risque D' Explosion

Dans les situations hasardees, couper la courant avant de remplacer ou de cabler les modules.

Warning

In order to maintain a safe condition, an external keyboard must not be used when the unit is operating in a hazardous environment.

Definitions

The following Class and Division explanations are derived from Article 500 (Sections 5 and 6) of the United States National Fire Protection Agency National Electric Code (NFPA 70, 1990).They are not complete and are included here only for a general description for those not familiar with generic hazardous locations requirements.

Persons responsible for the installation of this equipment in Hazardous Locations are responsible for ensuring that all relevant codes and regulations related to location rating, enclosure, and wiring are met.

Class I Locations

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class II Locations

Class II locations are those that are, or may become, hazardous because of the presence of combustible dust.

Division 1 Locations

A Division 1 location is one in which flammable or ignitable gasses, vapors, or combustible dusts and particles can exist due the following conditions:

- Normal operating conditions.
- Because of repair, maintenance conditions, leakage, or where mechanical failure or abnormal operation of machinery or equipment might release or cause explosive or ignitable mixtures to be released or produced.
- Combustible dusts of an electrically conductive nature may be present in hazardous quantities.

Note

Xycom 3200/3300 systems are not suitable for installation within Division 1 locations.

Note

Electrical equipment cannot be installed in Division 1 locations unless it is intrinsically safe, installed inside approved explosion-proof enclosures, or inside of approved purged and pressurized enclosures.

Division 2 Locations

Division 2 locations are listed below:

- Class I volatile flammable liquids or flammable gasses are handled, processed, or used, but confined within closed containers or closed systems from which they can escape only in cases of accidental rupture or breakdown of such enclosures or systems, or in case of abnormal operation of equipment.
- Ignitable concentrations of Class I vapors or gasses are normally prevented by positive mechanical ventilation, but which may become hazardous due to mechanical failure of those ventilation systems.
- Location is adjacent to a Division 1 location.
- Class II combustible dust is not normally in the air in quantities sufficient to produce explosive or ignitable mixtures. Dust accumulations are normally insufficient to interfere with normal operation of electrical equipment or other apparatus. Combustible dust may be in suspension in the air as a result of the following: infrequent malfunctioning of handling or processing equipment; combustible dust accumulations on, or in the vicinity of electrical equipment; may be ignitable by abnormal operation or failure of electrical equipment.

Groups

All electrical equipment which is approved for use in hazardous locations must include a group rating. Various flammable and combustible substances are divided into these groups as a function of their individual maximum experimental safe gap (MESG), explosion pressure, and ignition temperature.

Component temperatures and the potential for spark based upon voltage, current, and circuit characteristics, within electrical equipment, will determine what the equipment group rating will be. A device approved for installation within Class I, Group A locations may also be used in Groups B, C, or D.

Note

Approved Class I equipment may not be suitable for Class II installations. Class I includes Groups A, B, C, and D. Class II includes Groups F, and G.

Enclosures

The 3200/3300 system is designed for installation within a clean and dry enclosure for both ordinary and hazardous locations. The front panel meets the requirements of UL and CSA Type 4, 4X, and 12 enclosures. The enclosure used for Class I hazardous locations should have a minimum rating of Type 12 (NEMA 12, IP 5X). However, Type 4 (IP 6X) enclosures are strongly recommended.

Warning

The keyboard connector cap must be installed securely at all times to maintain a proper seal against water and dust.

Panel flatness and rigidity are important if a proper panel seal is to be maintained. If using non-metal type enclosures, such as plastic or fiberglass, install a rigid metal stiffener behind the front panel. Failure to do so may result in an inadequate panel seal due to flexure of the front panel material between the stud mounts. The nuts on the mounting studs must be tightened to 25 inch pounds.

These systems are UL listed for installation within Class II locations only when installed within UL approved Type 4 enclosures. Failure to do so voids that UL listing.

The requirements for enclosure fittings, conduit, and wiring vary according to the specific rating of the location and the type of flammable or combustible material involved. Those requirements are beyond the scope of this document and it is the responsibility of the customer to ensure that their installation is compliant with codes and regulations which apply to their specific location. Reference NFPA 70, Article 500 for specific regulations in the United States.

Power Switch

The 3200/3300 system does not come with a power switch. The amount of input power required by these systems classifies the power switch as an incendiary device. That is, the voltage and current across the make/break device is capable of creating a spark.

Hazardous locations regulations require that a power switch rated for ordinary locations may be used if it is located in an area specified as non-hazardous. However, limits in cable length between the workstation and the power switch may apply. Otherwise the switch must be compliant with Class I, Division 1 requirements (intrinsically safe). These switches are built in a manner that prevents the possibility of a spark when contacts are made or broken.

Suitable UL listed and/or CSA Certified Class I, Division 1 switches must be used in hazardous locations. These switches are available from a wide number of sources. It is the responsibility of the customer to ensure that the power switch selected for their installation has the correct hazardous locations rating for the location in which it is installed.

Cable Connections

Division 2 hazardous locations regulations require that all cable connections be provided with adequate strain relief and positive interlock. A cable should never be connected or disconnected while power is applied at either end of the cable.

Power Cable Connection

The 3200/3300 system is provided with a plastic strain relief on the rear of the chassis for the power cable. The power cable should have an external diameter no less than 0.25" (6 mm) and must be installed within the strain relief. The strain relief must be tight enough so as to ensure that no less than 35 lbs (16 kg) of force can be tolerated. A small amount of excess wire should be maintained between the strain relief and the input power terminal block in order to avoid excessive tension on the terminal block connections.

The power cable must always include a third wire for Protective Earth ground (green or green/yellow).

Warning

Failure to connect the Protective Earth (PE) ground wire may result in operator exposure to dangerous voltages in the event of an abnormal failure condition. Failure to connect the PE wire will also result in a significant reduction in immunity to electromagnetic transients which can cause unreliable operation or permanent damage to the system.

You must connect this PE wire to the terminal labeled GND. There is a special hole on the chassis for the Earth ground wire (see international ground symbol). The PE wire should be at least 0.25" (6 mm) longer than the L1 and L2 wires. This is done to ensure that a Protective Earth ground connection is the last connection broken in the event that the wires are accidentally pulled loose from the terminal block.

The three power interconnect wires, L1, L2 (Neutral), and PE should be stripped to expose 0.25" (6 mm) of wire. If the exposed wire is stranded, apply a small amount of solder to the ends to prevent loose strands of wire from being bent back and subsequently not secured by the terminal block.

Communication Cable Interface

All communication cables should include a chassis ground shield. This shield should include both copper braid and aluminum foil. The D-sub style connector housing should be a metal conductive type (e.g. molded zinc) and the ground shield braid should be well terminated directly to the connector housing. Do not use a shield drain wire.

The outer diameter of the cable must be suited to the inner diameter of the cable connector strain relief in order to ensure that a reliable degree of strain relief is maintained. The D-Sub connectors must always be secured to the 3200/3300 workstation mating connectors via the two screws located on both sides.

Warning

The communication cables should never be connected or disconnected while power is applied at either end of the cable. This may result in an incendiary spark. Furthermore, permanent damage to the workstation communication components may occur.

Operation and Maintenance

3200/3300 systems have been investigated for compliance with relevant spark ignition tests by UL. However, please note that the workstation front panel membrane keyboard keys and keyboard connector are the only make/break components intended to be exercised by the operator in the course of normal operation.

Warning

To maintain a safe condition, an external keyboard must not be used when the unit is operating in the presence of a hazardous environment.

Connections and the PCMCIA card interface located at the rear of the workstation should not be operator accessible and should never be adjusted while power is applied in a hazardous location.

With respect to hazardous locations installations, the following rules must always be observed:

1. Always install the workstations within an enclosure suitable for the specific application. General purpose enclosures may be acceptable for Class I applications but are never acceptable for Class II applications. Type 4 (IP 65) enclosures are recommended even when not required by regulations.
2. If present, keep enclosure doors or openings closed at all times to avoid the accumulation of foreign matter inside the workstation.
3. Never subject the unit to any installation or service procedures unless power is removed and the area is non-hazardous. This includes the installation or removal of power cables, communication cables, or removal of the rear cover of the unit.

Installation and service must be performed only by technically qualified service personnel. These workstations are designed to require no service in the course of normal operation by an operator.

Chapter 4 – Keypad (3200)

3200 Keypad Features

The 3200 features 32 relegendable keys, F1 through F20 and PF1 through PF12. You may also use graphic displays (via labels or preprinted designs) to customize your keypad inserts. All inserts are textured on the back side so you can write on them. Refer to Figures 4-1 and 4-2.

The numeric keypad includes numbers 0-9, "." and "-", cursor keys (up, down, left, right), back space, ESC, Prev, Next, Enter and 'I,' which is equivalent to the right ALT key. The 3200 keypad remains operational up to three million touches (minimum). Refer to Chapter 2, Figure 2-1.

> **Note**
>
> Keyboard controller firmware (versions 1.4 and higher) only allows one keypad keypress at a time.

Keypad Key	Scan Code Returned by Controller	Scan Code Returned by Handler
F1-F10	Keyboard F1-F10	
F11	Shift F1	Shift F1 (54h)
F12	Shift F2	Shift F2 (55h)
F13-F20	Shift F3-F10	
PF1-PF10	Ctrl F1-F10	
PF11-PF12	Alt F1-F2	
0-9	Keyboard 0-9	
BACKSPACE	Keyboard Backspace	
ESC	Keyboard Esc	
PREV	Keyboard Page Up	
NEXT	Keyboard Page Down	
Arrow key	Keyboard Arrows	
I	Keyboard right Alt	
ENTER	Keyboard Enter	

Keypad Inserts

You can use keypad inserts to customize your 3200 keypad. You can order the inserts through Xycom or a company of your choice. If ordering through another company, refer to figures 4-1 and 4-2 for the insert dimensions, and Chapter 3 for installing the keypad inserts.

When ordering standard keypad inserts through Xycom, use the following part numbers:

Part Number	Description
101902	Keypad Insert F1 through F20
101928	Keypad Insert PF1 through PF6
101943	Keypad Insert PF7 through PF12

Contrast Control

Contrast adjustment is for monochrome units using the SoftScreen Runtime to control the contrast setting. An application can be created which would utilize a function key or a touch zone to adjust the contrast setting.

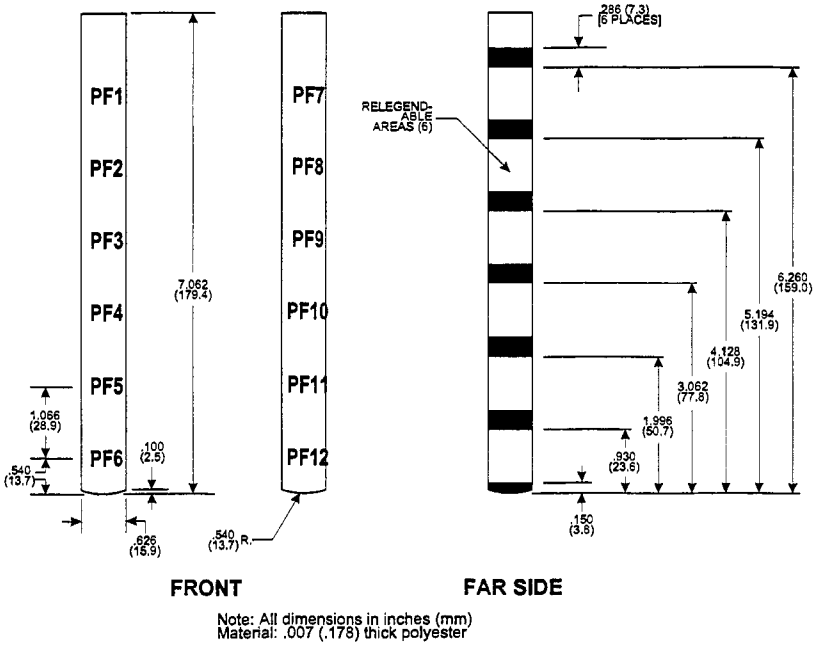
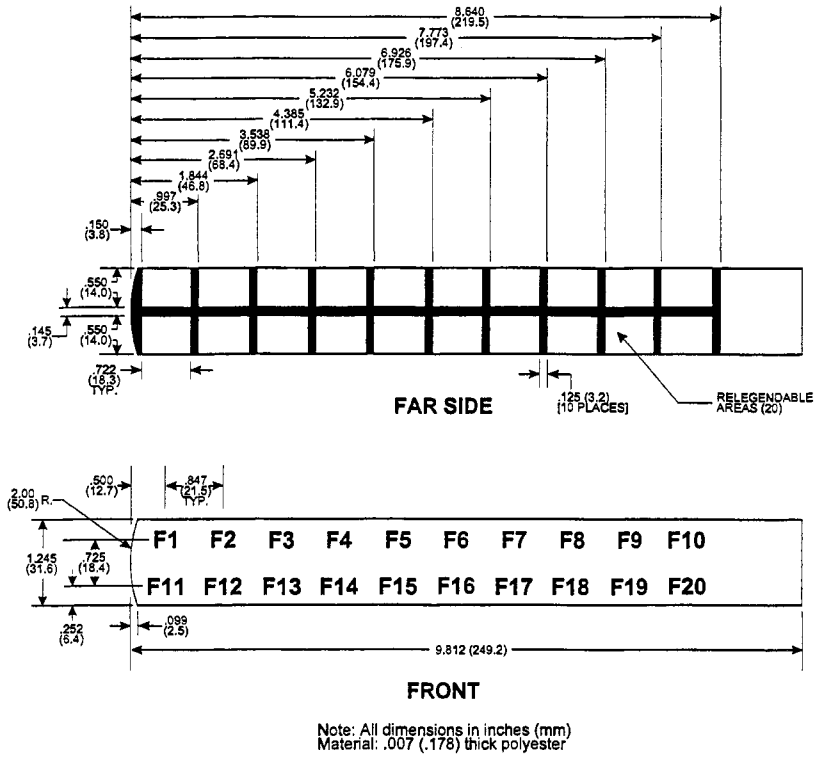


Figure 4-1. 3200 Keypad Inserts with Dimensions (PF1 - PF12)



Note: All dimensions in inches (mm)
Material: .007 (.178) thick polyester

Figure 4-2. 3200 Keypad Insert with Dimensions (F1 - F20)

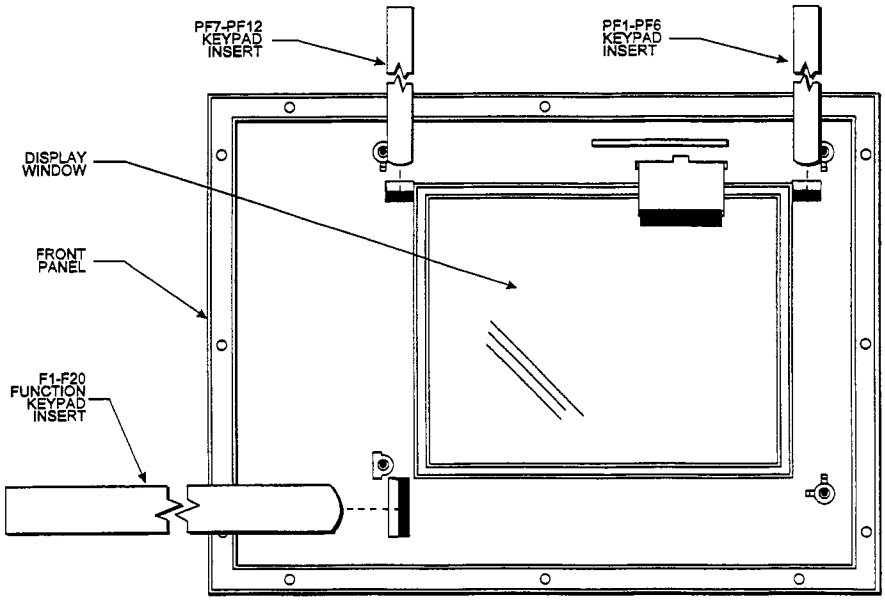


Figure 4-3. 3200 Keypad Insert Position

Chapter 5 – Maintenance

Preventive Maintenance

> **Note**
>
> This product contains a *lithium battery component device*. Dispose of this device in accordance with local law.

Although the 3200/3300 Focal Point was designed to withstand the harsh environment of the factory floor, it is important to schedule routine, as well as preventive maintenance to keep your 3200/3300 in good operating condition.

Preventive maintenance consists of several basic procedures and checks to greatly reduce the chances of system malfunction.

Some preventive measures are listed below:

- Remove dust and dirt from PC components. If dust builds up on heat sinks and circuitry, an obstruction of heat dissipation could cause the unit to malfunction. If dust reaches the electronic boards, a short circuit could occur.
- Check the connections to I/O modules, especially in environments where shock could loosen the connections. Check to see that all plugs, sockets, terminal strips, and module connections are solid.
- Remove unnecessary articles, like drawings or manuals, from the unit. They could obstruct air flow, creating hot spots that may cause the system to malfunction.
- Do not move electrical noise generating equipment too near the 3200/3300.

Chemical Compatibility

Certain combinations of chemical environments, temperature, and stress can adversely affect parts made from thermoplastic resin. For this reason, material which may come in contact with the 3200/3300 unit should be carefully evaluated under end-use conditions for compatibility. You should also follow the use and compatibility recommendations of the material manufacturer.

The following table lists general chemical compatibility guidelines for the 3200/3300.

Chemical Class	**Effects**
Acids	No effect under most common conditions of concentration and temperature.
Alcohols	Generally compatible at low concentration and room temperature. Higher concentrations and elevated temperatures result in etching and attack evidenced by decomposition.
Alkalis	Generally compatible at low concentration and room temperature. Higher concentrations and elevated temperatures result in etching and attack evidenced by decomposition.
Aliphatic Hydrocarbons	Generally compatible
Amines	Surface crystallization and chemical attack. Avoid.
Aromatic Hydrocarbons	Partial solvents and severe stress cracking agents. Avoid.
Detergents and Cleaners	Mild soap solutions are compatible. Strong alkaline materials should be avoided.
Esters	Causes severe crystallization. Partial solvents. Avoid.
Greases and Oils	Pure petroleum types generally compatible. Many additives used with them are not compatible.
Halogenated Hydrocarbons	Solvents. Avoid.
Ketones	Causes severe crystallization and stress cracking. Partial solvents. Avoid.
Silicone Oil and Greases	Generally compatible up to 185°F. Some contain aromatic hydrocarbons which should be avoided.

Compatible Lubricants

The following table lists known compatible lubricants and the manufacturer's names. If you want to use a lubricant that is not listed below, contact the appropriate manufacturer for compatibility.

Lubricants	Manufacturer
DC® 230 Molykote® 33	Dow Corning Midland, MI 48640 (800) 248-2345
Harmony® 68 Security® 68	Gulf Oil Petroleum Prod. Dept. Pittsburgh, PA 15230 (412) 655-6247
Lubriplate® Aero	Fisher Bros. Refinery 129 Lockwood Street Newark, NJ 07105
Martemp® 2500	E.F. Houghton & Co. 303 W. Lehigh Ave. Philadelphia, PA 19133 (215) 666-4000
Nyogel® 795A Rheolube® 368 Rheolube® 723G Rheolube® 788 Synthetic Oil® 181	Wm. J Nye P.O. Box G-927 New Bedford, MA 02742 (617) 966-6721
SF® 1147 Versilube® F-50	GE Silicone Products Waterford, NY 12188 (518) 237-3330
Terrestic ® 77	Exxon P.O. Box 2180 Houston, TX 77092 (713) 680-5712

Compatible Cleaning Agents

The following table lists known compatible cleaning agents. If you want to use a cleaning agent that is not listed below, contact the appropriate manufacturer for compatibility.

Type	Agents
Aliphatics	Hexane, Heptane, White Kerosene Mineral Spirits, Petroleum Ethers (65° C boiling point).
Alcohols	Methyl, Isopropyl and Isobutyl, 1 + 3 Denatured Alcohol.
Halogenated Hydrocarbons	Freons TF & TE
Detergents and Cleaners	Mild Soap and Water Solution, VM&P Naphtha Fantastik®, Windex®, Joy®, Top Job®, Mr. Clean®, Formula 409®.

The above aliphatics, alcohols, and halogenated hydrocarbons should be used only for wiping or short-term immersion (less than 10 minutes). If parts are in complete immersion, care should be taken to remove last traces of solvent by forced-air drying or rinsing in hot water.

Non-compatible Cleaning Agents

The following list of agents are known to be detrimental to the 3200/3300 unit.

Type	Agents
Bases	25% Ammonium Hydroxide, 10% Potassium Hydroxide, Sodium Hydroxide
Organic Solvents	Laquer Thinner, Toluene, Methyl Cellosolve, Methylethylketone

Fuse Replacement

Caution

This operation should be performed by authorized service personnel only.

Note

Replace only with same type and rating of fuse.

Note

Remove the power connector before replacing the fuse.

1. Turn off the power.
2. Unscrew the power cable clamp and disconnect power connector.
3. Unscrew the rear cover thumb screws and remove rear cover (Figure 2-3).
4. Carefully remove the fuse (located on the lower end of the power supply; see Figure 3-2).
5. Insert the new fuse.
6. Reinstall the power cable, cable clamp, and rear cover. The unit is ready for to operate again.

Chapter 6 – Product Repair

Xycom's Product Repair and Customization (PR&C) department restores equipment to normal operating condition and implements engineering changes that enhance operating specifications. Products returned to Xycom will be tested with standard Xycom test diagnostics. Contact the PR&C for information on your particular turnaround time.

Preparing the Unit for Shipment

1. Obtain a RMA number for your unit by calling the nearest Xycom Repair Center. Provide the following information when you call:
    - Company name, and shipping and billing address
    - Type of service desired–repair or exchange
    - Product model number, part number, quantity, serial number(s), and warranty status
    - Failure mode information
    - Purchase order number or repair order number
2. To prepare the unit for shipment, make sure the panels are secured by all screws.
3. To speed processing, attach failure information to the unit.
4. Place the unit securely in original packaging or equivalent.
5. Mark the RMA number on the outside of the box, as well as on your purchase order.
6. Send the unit to the nearest Xycom repair center.

Spare Parts List

3200/3300 Replacement Parts

Item Number	Description	Part Number
1	3200 Front Panel Assembly (mounting gasket not included) Non-touch 3300 Front Panel Assembly (mounting gasket not included) Non-touch Touch	 106082-001 106067-001 106070-001
2	Color Display Monochrome Display	106137-001 106111-001
3	Replacement Bulb Assembly (color) Replacement Bulb Assembly (monochrome)	106165-001 106140-001
4	Color CPU Assembly 2M Flash Monochrome CPU Assembly 2M Flash	107440-002 107440-001
5	Keyboard Port Assembly	102867-001
6	Color Display Cable Monochrome Display Cable	101860 102312
7*	Input Power Connector	99711-001
8*	Expansion Kit	105169-001
9*	Cable Kit	106917-001
10*	Rack Mount Adapter	104286-001
11*	Power Supply	106109-001

*Not Shown

Chapter 7 – Quick Reference

Keyboard Connectors

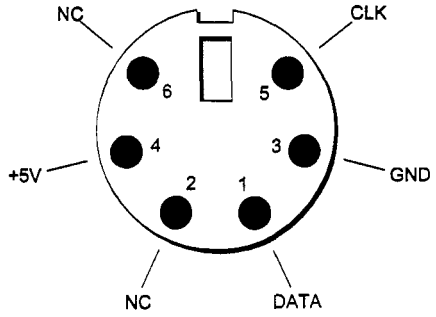


Figure 7-1. Keyboard Connector Pin Locations

Keyboard Connector Pinout

Pin	Signal
1	Data
2	NC
3	GND
4	+5V
5	CLK
6	NC

Serial Ports

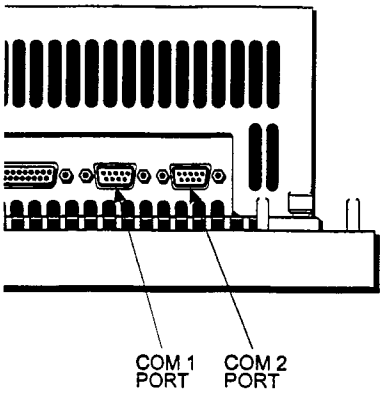


Figure 7-2. RS-232 and RS-485 Serial Ports

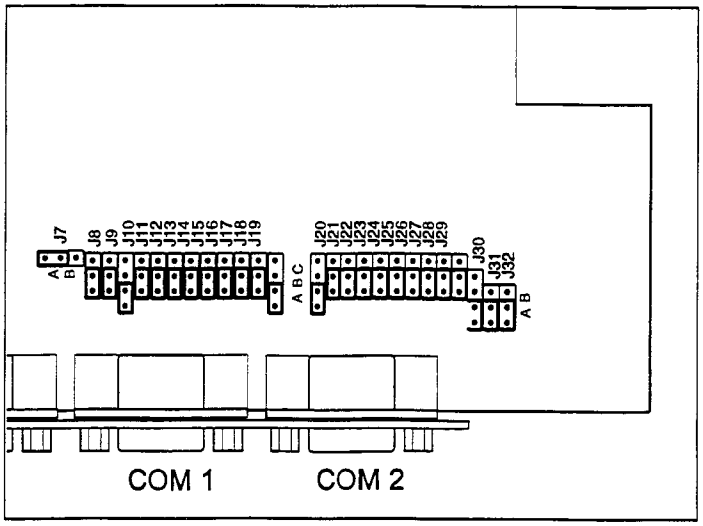


Figure 7-3. RS-232 and RS-485 Jumper Layout

RS-232 Pinout

RS-232 Serial Port Pinout

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

See Warning for Electromagnetic Compatibility page (located before the Table of Contents) for cable construction.

RS-485 Pinout

RS-485 Serial Port Pinout

Pin	Signal	Pin	Signal
1	TXD1-	2	TXD1+
3	330ohm to GND	4	330ohm to VCC
5	GND	6	RXD-
7	RXD+	8	330ohm to VCC
9	330ohm to GND		

See Warning for Electromagnetic Compatibility page (located before the Table of Contents) for cable construction.

Power Connector

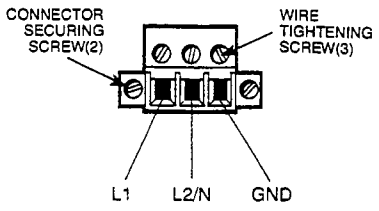


Figure 7-4. Power Connector

Power Connector Pinout

Pin	Signal
L1	Line
L2/N	Line/Neutral
GND	Ground

See Warning for Electromagnetic Compatibility page (located before the Table of Contents) for cable construction.

PC/104

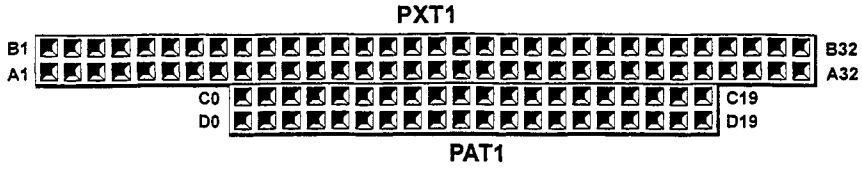


Figure 7-5. PC/104 Pinout

PC/104 Connector Pinout

Pin	J1/P1 Row A	J1/P1 Row B	J2/P2 Row C	J2/P2 Row D
0	-	-	GND	GND
1	NC	GND	SBHE*	MEMCS16*
2	SD7	RESERDRV	LA23	IOCS16*
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	NC	LA20	NC
6	SD3	NC	LA19	NC
7	SD2	-12V	LA18	IRQ14
8	SD1	NC	LA17	Reserved
9	SD0	+12V	MEMR*	NC
10	IOCHRDY	(KEY)	MEMW*	Reserved
11	AEN	SMEMW*	SD8	NC
12	SA19	SMEMR*	SD9	Reserved
13	SA18	IOW*	SD10	NC

Pin	J1/P1 Row A	J1/P1 Row B	J2/P2 Row C	J2/P2 Row D
14	SA17	IOR*	SD11	Reserved
15	SA16	NC	SD12	NC
16	SA15	NC	SD13	+5V
17	SA14	NC	SD14	NC
18	SA13	NC	SD15	GND
19	SA12	NC	(KEY)	GND
20	SA11	SYSCLK	-	-
21	SA10	IRQ7	-	-
22	SA9	IRQ6	-	-
23	SA8	IRQ5	-	-
24	SA7	NC	-	-
25	SA6	NC	-	-
26	SA5	NC	-	-
27	SA4	NC	-	-
28	SA3	BALE	-	-
29	SA2	+5V	-	-
30	SA1	OSC	-	-
31	SA0	GND	-	-
32	GND	GND	-	-

Notes:

1. 1. Rows C and D are not used on 8-bit modules.
2. 2. DMA not supported.
3. 3. -5V not supported.
4. 4. IRQ3, 4, 10, 11, 12, 15 not supported.
5. 5. NC = no connect.
6. 6. REF* not supported

Chapter 8 – Block Diagram

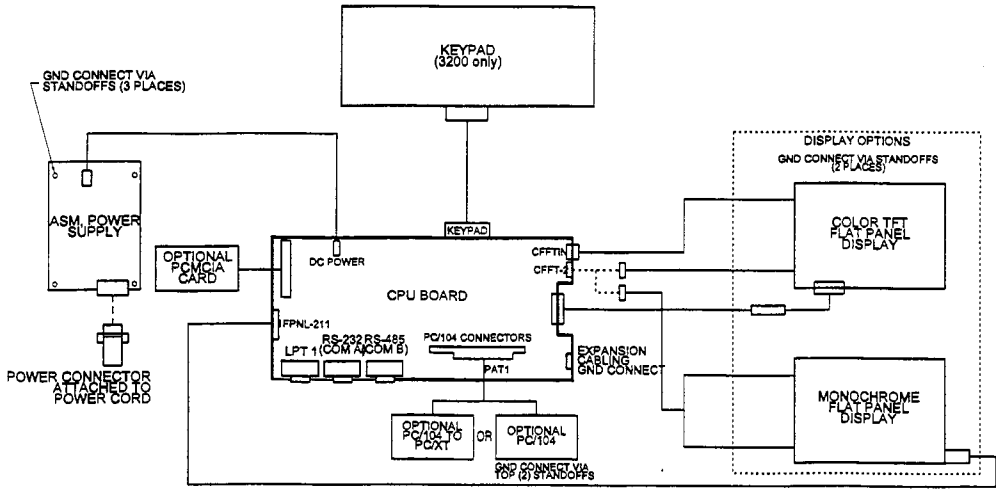


Figure 8-1. 3200/3300 System Block Diagram

Chapter 9 – Notes

Notes

This chapter provides blank pages for miscellaneous information you may want to note regarding the product, etc.

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