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9460/9460KP & 9462/9462KP

Flat-Panel Industrial PCs

P/N 129398-001B

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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 European Users - WARNING

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

INSTALLATION: 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 electromagnetic interference and/or susceptibility levels which are in violation of regulations which apply to the legal operation of this device. It is the responsibility of the system integrator and/or user to apply the following directions which relate to installation and configuration:

1. All interface cables must include shielded cables. Braid/foil type shields are recommended. Communication cable connectors must be metal, ideally zinc die-cast backshell types, and provide 360 degree protection about the interface wires. The cable shield braid must be terminated directly to the metal connector shell, ground drain wires alone are not adequate.

2. In those cases where an external mouse is used, the snap-on ferrite bead provided (P/N 116046) must be installed on the mouse cable at the host end in order to comply with relevant EMI regulations.

3. Protective measures for power and interface cables as described within this manual must be applied. Do not leave cables connected to unused interfaces or disconnected at one end. Changes or modifications to this device not expressly approved by the manufacturer could void the user's authority to operate the equipment.

4. EMC compliance is, in part, a function of PCB design. Third party add-on AT/XT peripheral PCB assemblies installed within this apparatus may void EMC compliance. FCC/CE compliant PCB assemblies should always be used where possible. XYCOM can accept no responsibility for the EMC performance of this apparatus after system integrator/user installation of PCB assemblies not manufactured and/or expressly tested and approved for compliance by XYCOM. It is the responsibility of the system integrator/user to ensure that installation and operation of such devices does not void EMC compliance.

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Chapter 1 – Introduction

Product Overview

The 9460/9462 and 9460KP/9462KP Flat-Panel Industrial Computers combine a PC/AT™ computer with a flat-panel display to offer a powerful, compact package for the factory floor and other harsh environments. The 9460/9462 and keypad version features an open architecture to meet a wide variety of applications that require both a powerful PC and a durable industrial enclosure. The system integrates a computer card cage, mass storage, display, and power supply in a truly industrial form factor.

The front panels of the units are sealed to NEMA 4/4X/12 and IP65 (9460/9462 only), standards and is protected by an impact-resistant shield. The 9460KP and 9462KP versions are sealed to NEMA 4/4X/12.

The processor board combines all the functions of a complete IBM PC/AT compatible computer on a single industrially hardened circuit board. Refer to the Xycom CPU manual for more information on processor and hardware features.

The system's modular design allows easy access to expansion boards, switches, power supply, flat-panel display, and disk drives.

Standard Features

The 9460/9462 and the keypad versions offer the following standard features:

- AHIP4+ board high performance 133 MHz, AMD® Am5x86™ CPU
  - 72-pin EDO DRAM SIMM supports (4,8,16, 32, and 64 Mbytes)
  - 32-pin CMOS RAM site
  - PCI 64 bit video controller, 1 Mbyte video RAM
  - PCI local-bus IDE controller
  - Two serial COM ports with one as RS-232 and one configurable as RS-232, or RS-485
  - Parallel port
  - VGA port
- Flash BIOS
- 5.75-inch mounting depth (6.5-inch with external floppy option)
- External floppy connector
- Flat-panel display
  - 10.4-inch TFT or STN passive color(640x480) (9460)
  - 12.1-inch TFT or STN passive color (800x600) (9462)

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- Three AT bus ¾ length expansion slots
  - Two ISA
  - One ISA/PCI
- IR Port (IrDA, HPSIR, AND ASKIR compatible)
- Rear PS/2 keyboard port and mouse port (also front PS/2 keyboard port on 9460KP and 9462KP)
- Keypads (9460KP/9462KP only)
  - 32 relegendable function keys (64 with the F/A function)
  - Numeric, PC control, and Alpha keypads
- Status LEDs
  - Power
  - Disk
  - Com
  - Input
- 3.5inch external side access floppy option
- MS-DOS® (if Windows® 95 or Windows NT™ is ordered, MS-DOS is not included)
- Sealed front panels
  - 9460/9462 to NEMA 4/4X/12 and IP65 specifications when panel mounted
  - 9460KP/9462KP to NEMA 4/4X/12 specifications when panel mounted
- UL listed for use in Class I, Division 2 hazardous locations

Optional Features

Following are optional features available for the units:

- Touch screen - resistive technology with less than 1.5% linearity error
- 9460-DRVNT, Windows NT touch screen driver (included if Windows NT is ordered preinstalled)
- 9460-DRVOS/2 touch screen driver
- Large IDE hard drives and solid state drives
- Preinstalled Windows 95 or Windows NT
- AHIP5+ board which supports the latest Pentium® technology
  - Two 72 pin EDO DRAM SIMMs support (8, 16, 32, 64, and 128 Mbytes)
  - PCI 64 bit video controller, 2 Mbytes video RAM
  - PCI local bus IDE controller
  - Two serial COM ports: one RS-232 and one configurable as RS-232 or RS-485
- 24 VDC power supply
- Pre-installed PCI 10/100 Base-T Ethernet card
- 9000-EXF, hot installable external floppy drive
- 9000-FKA, NEMA 4 front access panel for floppy port and keyboard port
- 4100-KB2, External full-stroke keyboard

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- 4100 WIN, Microsoft® Windows version 3.11
- 8000-KBX, various sealed rack or panel mount keyboards
- 9000-RF1 19-inch Rack Mount Adapter Plate (9460, 9462)
- 9000-FFK Front Floppy Kit
- 9000-RFC 19-inch Floppy Door Plate
- 2000-RMA 190inch Rack Mount Adapter Plate (9460KP, 9462KP)

Unpacking the System

When you remove the system from its box, verify that you have the parts listed below. Save the box and inner wrapping in the event you need to reship the unit.

- 9460/9462 or keypad version
- Documentation kit, which includes:
  - Power connector
  - Diagnostic software disk
  - 14 10-32 hex nuts (2 spares)
  - Clip-on Ferrite for mouse cables
  - Cable clamp and screw (for strain relief of power cord)
  - 9460/9460KP/9462/9462KP manual
  - CPU manual
  - Utility disks
- Business reply card

If you ordered the system with a touch screen installed, you will also receive a touch screen driver disk and manual.

Quick Start-up

This section gives you the steps to get the systems up and running without explaining the capabilities and options of the system.

Warning

Turn off power to the unit and disconnect the power cord before making any adjustments to the inside or outside of the computer.

To prepare the system for use, perform the following steps.

1. Attach optional keyboard to the keyboard port.
2. Attach other optional equipment following the instructions in Chapter 3.
3. Attach the power cord from the power receptacle to a properly grounded 115/230 VAC, 50-60 Hz outlet, or 24 VDC outlet, whichever applies. (See Chapter 3, *Creating a Power Cable*.)

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4. Turn on the power to the unit. The system will boot up into the operating system.
5. Adjust the contrast on the unit by using the contrast adjust keys on the front panel. These keys are available on the STN passive color option only.

   On the 9460KP and 9462KP, hold the F/A key and press the left or right cursor control keys to adjust contrast.
6. Install application software via the external floppy, the network, or the IR port.

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Chapter 2 – Testing

On units with MS-DOS, Xycom provides diagnostic tests to verify the operation of the system hardware functions. If any of these tests fails, either you do not have the correct default setting or there is a failure. Check the default settings and run the tests again. If another failure occurs, contact Xycom's Product Repair & Customization Department (see Chapter 5).

> **Note**
>
> Remove device drivers and memory resident programs (TSRs) that are installed on your system before you run Xycom diagnostics. If you do not, unexpected failures may occur.

Make sure the BIOS setup menus are configured properly (factory-set configuration). To enter the BIOS setup menus,

- Press F2 after the POST RAM test has completed.
- Make the necessary changes by following directions on the screen.
- Press ESC.
- Press ENTER twice to save the settings and exit.

Refer to your CPU manual for more information on the Setup Menu.

Preparing for the Tests

To test your system, you need the following equipment:

- Floppy disk drive
- IBM PC/AT or PS/2-compatible keyboard (Xycom part number 8000-KBX or equivalent)
- Xycom System Test Disk 3.5 inch, DS/DD disk (bootable), Xycom part number 99290-001
- Centronics-compatible printer cable
- Parallel printer (Centronics-style interface)
- Two serial loopback test connectors (refer to Figure 2- 1 for pinouts)
- Formatted 3.5-inch, DS/HD (1.44 Mbyte) disk

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Perform the following steps before starting the system tests:

1. Place the CPU board jumpers and switches to the factory set positions. Refer to your CPU manual for these settings.
2. Plug the female end of the AC power cable into the side of the unit and the male end into a properly grounded outlet.
3. Connect the serial loopback connector(s) and the printer cable to the appropriate connectors and connect a PC/AT or PS/2 keyboard. Figure 2-1, Serial Loopback Connections, illustrates the wiring necessary for the loopback connection.
4. Default the CMOS setup to the factory settings.

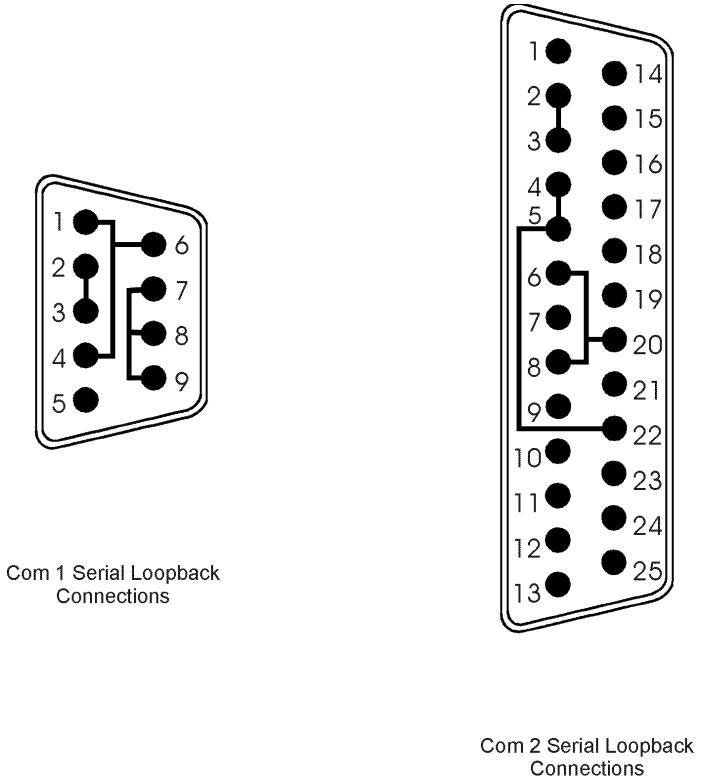


Figure 2- 1. Serial Loopback Connections

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Running the Tests

To run the test, insert the diagnostics disk into drive A. Turn on the computer (the diagnostics program will boot-up). Figure 2- 2 shows the Main Menu.

```
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                     Diagnostic Tests Sequence/Selection Menu (Rel. xx)

1.  WILL pause on error                  5.  Auto-select tests
2.  SINGLE PASS test mode                6.  Deselect all tests
3.  Save setup to file                   7.  Quit and exit to DOS
4.  Extract setup from a file            8.  Return to previous screen

A)   RAM Test                            K)  Video Interface Test
B)   Video RAM Test                      L)  Speaker Port Test
C)   Extended RAM Test                   M)  LPT1: Printer Port Test
D)   Real Time Clock Test                N)  LPT2: Printer Port Test
E)   COM1 Serial Port Test               O)  C: Hard Drive Interface Test
F)   COM2 Serial Port Test               P)  D: Hard Drive Interface Test
G)   COM3 Serial Port Test               Q)  A: Floppy Drive Interface Test
H)   COM4 Serial Port Test               R)  B: Floppy Drive Interface Test
I)   Math Coprocessor Test               S)  Keyboard, Keypad Tests
J)   Video Adjustments Test                  ≡ = Test Selected

                          [ENTER]=START TESTING

     Use the letters to move the cursor and select/deselect, or use the arrow keys to
     move, then use the [SPACE] key to select/deselect a test or function.
```

Figure 2- 2. Main Menu

Note

Please read the DIAG.TXT file on the diagnostics disk for detailed information about the tests.

Note

Avoid repeated running of any hard disk diagnostic utility, if you use the Solid State (Flash) drive option. The Flash drive has a limited number of writes to each logical sector. Repeated writes from a diagnostic utility will prematurely shorten the life of the drive.

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Chapter 3 – Installation

This chapter illustrates the installation of and the options for the 9460/9462. The figures on the next several pages show the internal and external components on the front and back panels of the unit to help you locate features relevant to installation.

Front Panel

The 9460/9462 comes with a NEMA 4/4X/12 and IP65 sealed front panel. The panel protects the system's interior when the system is properly panel mounted.

9460/9462 Front Panel

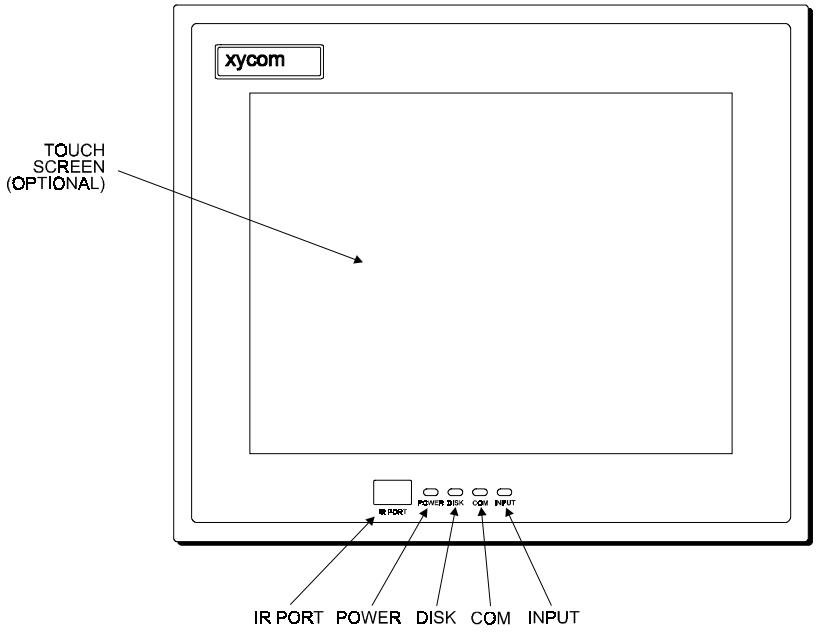


Figure Chapter 3 -1. 9460/9462 Front Panel

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Feature	Description
Display	The 9460 comes with a 10.4-inch TFT Active Matrix Color LCD flat panel or a 10.4-inch Passive Color STN LCD flat panel. Impact-resistant shields protect the displays from breakage. The 9462 comes with a 12.1” TFT Active Matrix Color LCD flat panel or a 12.1” Passive Color STN LCD flat panel. Impact-resistant shields protect the displays from breakage. If a touch screen is factory installed, the touch screen is backed by heat-annealed safety glass replacing the impact-resistant shield.
Diagnostic LEDs	Following is a description of the LEDs and what it means when they're lit: Power — Lit when the system has power Disk — Lit when the computer is accessing the disk drive COM — Lit when there is communication activity on one of the serial ports, including communication between the computer module and the touch screen (if on COM2) or a serial mouse. Input — Lit when the unit has a touch screen (LED gets brighter when a touch input is detected) or a key is pressed During power-up, firmware on the processor board checks the hardware configuration against the configuration stored in the CMOS memory.
IR (Infrared)	The IR port transceiver is located behind this window. The 9460/9462 IR port is IrDA and ASKIR compliant. You can connect the 9460/9462 to any IrDA compatible device. You must load special software (not included) to use this feature. The infrared (IR) link is designed to operate at a distance of 0 to 1 meter. Enable the interface through the BIOS setup menu. ***Note**: When the IR port is chosen in the system BIOS, COM2 is not available.*
Contrast Control	The 9460/9462 with the STN flat-panel display uses two Contrast Adjust keys on the front panel to control the contrast: the left contrast adjust key decreases the contrast; the right contrast adjust key increases the contrast.
Keyboard Port Access (Optional front access)	The 9460/9462 supports one PS/2 keyboard. Front access options are available with the use of the 9000-FKA Front floppy/keyboard access kit (not shown). The access is a PS/2 stacked mini-din located on the side of the unit. ***Warning**: To maintain a safe condition, do not use an external keyboard and/or mouse port when the unit is operating in a hazardous environment.*
Floppy Disk Drive (Optional)	The 9460/9462 has front access options available. (Refer to the External Floppy Option section within this chapter.)

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9460KP/9462KP Front Panel

The 9460KP/9462KP comes with a NEMA/4/4X/12 sealed front panel. The panel protects the system's interior when the system is properly panel mounted. Figure Chapter 3 -2 illustrates the front panel with keypad.

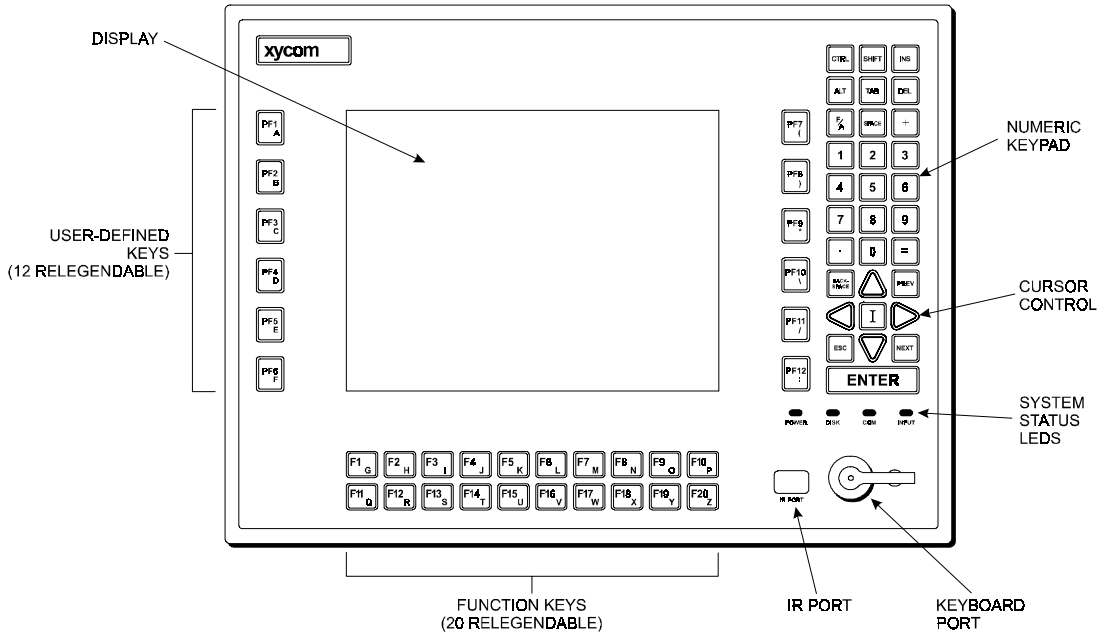


Figure Chapter 3 -2. 9460KP/9462KP Front Panel

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Feature	Description
Display	The 9460KP/9462KP comes with a 10.4-inch (640 x 420) STN or TFT flat-panel display or a 12.1-inch SVGA (800 x 600) STN or TFT flat-panel display.
Diagnostic LEDs	The 9460KP/9462KP features status LEDs on the front panel, which allow you to monitor system operation. Following is a description of the LEDs and what it means when they're lit: Power — Lit when the system has power Disk — Lit when the computer is accessing the disk drive COM — Lit when there is communication activity on one of the serial ports, including communication between the computer module and the touch screen (if on COM2) or a serial mouse. Input — Lit when the unit has a touch screen; the LED gets brighter when a touch input is detected or a key is pressed. F/A key — Indicates the keypads are in alpha mode
Function and User-Defined Keys	These 38 relegendable function keys (76 using the F/A keys) provide easy access to familiar routines. (F/A keys can be used for alpha and symbol entry). See the *Customizing Keypad Inserts* section in this chapter for details on customizing your keypad inserts.
Numeric/Cursor Control Keypad	The purpose of data entry keypads are for entering data and moving the cursor.
F/A Key (Contrast Control)	If the LED is lit, alpha characters are returned. While holding down the F/A key and pressing the cursor control keys, contrast can be adjusted (STN displays only).
PF10 Key (Keypad Configuration Key)	This key reconfigures your keypad.
Keyboard Port (9460KP/9462KP) (front access)	The 9460KP/9462KP provides both front and rear accessible PS/2 keyboard connectors. The front accessible connector is located on the lower right side of the front panel. The rear accessible connector is located on the side of the unit. ***Note**: Only one keyboard port on the 9460KP/9462KP can be used at a time.* ***Note**: The installation of the touch screen driver determines whether a second pointing device will function correctly. If you are using a mouse with a touch screen, please review the Touch Screen Driver Installation instructions.*

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I/O Panel

Figure Chapter 3 -3 illustrates the I/O Panel.

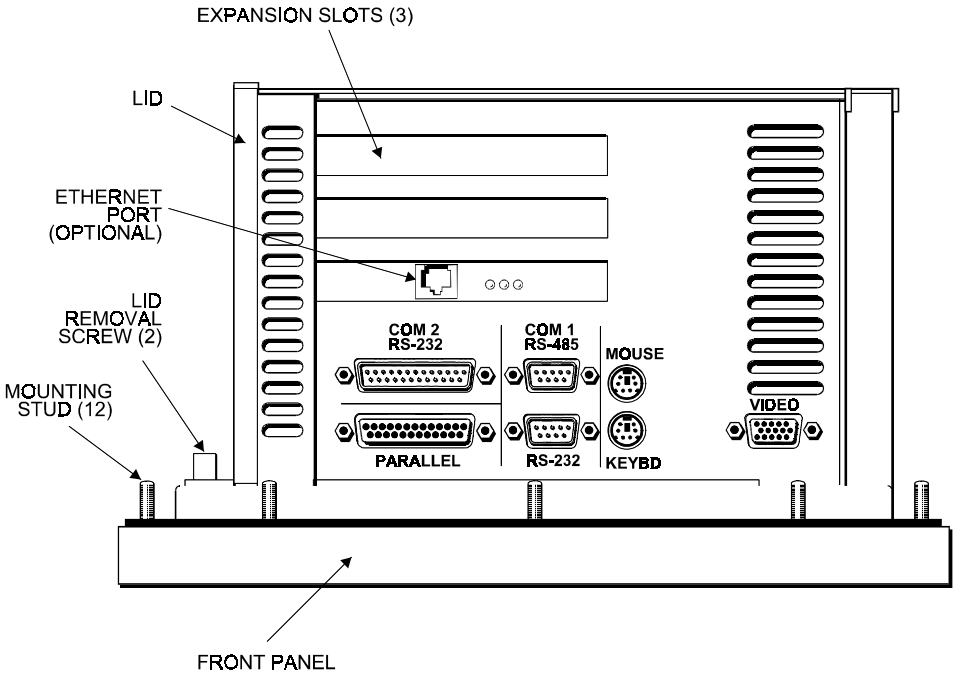


Figure Chapter 3 -3. System I/O Panel

Feature	Description
Parallel Port	The parallel printer port (LPT1) is a DB-25 pin female connector. This port provides a standard PC compatible printer interface. An external push-button reset option is available. Consult the CPU board manual for the jumper which controls this option.
COM Ports	COM1 is RS-232/485 compatible. RS/232 is connected to the lower nine-pin stacked DB connector. The top part of this stack is the RS/485 version of the same port. Since these connectors are attached to the same port, you can use only one at a time. COM2 is the male 25-pin DB connector. COM2 is dedicated to the IR port, the touch screen controller, or the 25-pin connector. Only one option can be used at a time. ***Note**: If you ordered Windows NT, the driver is on disk and a copy of the driver file is on the hard drive. This operating system only supports COM2. Therefore, the touch screen will be on COM2, and COM2 will not be available for other use.*
Keyboard Port	The keyboard port is a PS/2 stacked mini-din that allows you to attach a PC/AT keyboard either at the front or side of the unit. The keyboard port on the side of the unit is the lower connector. Do not use when in the presence of a hazardous environment. ***Note**: You cannot use both keyboard ports on the 9460KP/9462KP at the same time.*
Mouse Port	The mouse port is a PS/2 stacked mini-din that allows you to attach a mouse at the side of the unit. If you receive a unit with a touch screen, this port may be covered with a label stating that the port is not functional as shipped. This is dependent upon the operating system installed. ***Note**: If the unit has a touch screen and MS-DOS, Windows 3.x or Windows 95, the touch screen is configured for the mouse port, making the mouse port unavailable. Reconfigure the touch screen for use on COM2 to make mouse port functional.* ***Warning: To maintain a safe condition, do not use an external keyboard and/or mouse port when the unit is operating in a hazardous environment.***

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Feature	Description
Video Port	The video port is a 15-pin D-sub VGA connector at the side of the unit. This connector supports any standard VGA connection. The video port is shipped disabled. This port is active if an LCD flat panel is not connected. A jumper can be used to switch between the VGA port and the LCD flat panel. To use both a video display on the video port and the flat-panel display, you must enable “Simultaneous Video” on the Advanced Menu in the BIOS setup. Refer to the CPU manual for details. ***Note**: The 9460/9462 does not support simultaneous flat panel and CRT with an STN passive flat-panel display.*
Ethernet Port (optional)	This port provides a 10BASE-T/100BASE-TX autosensing Ethernet connection.

Back Panel

Figure Chapter 3 -4 illustrates the back panel features.

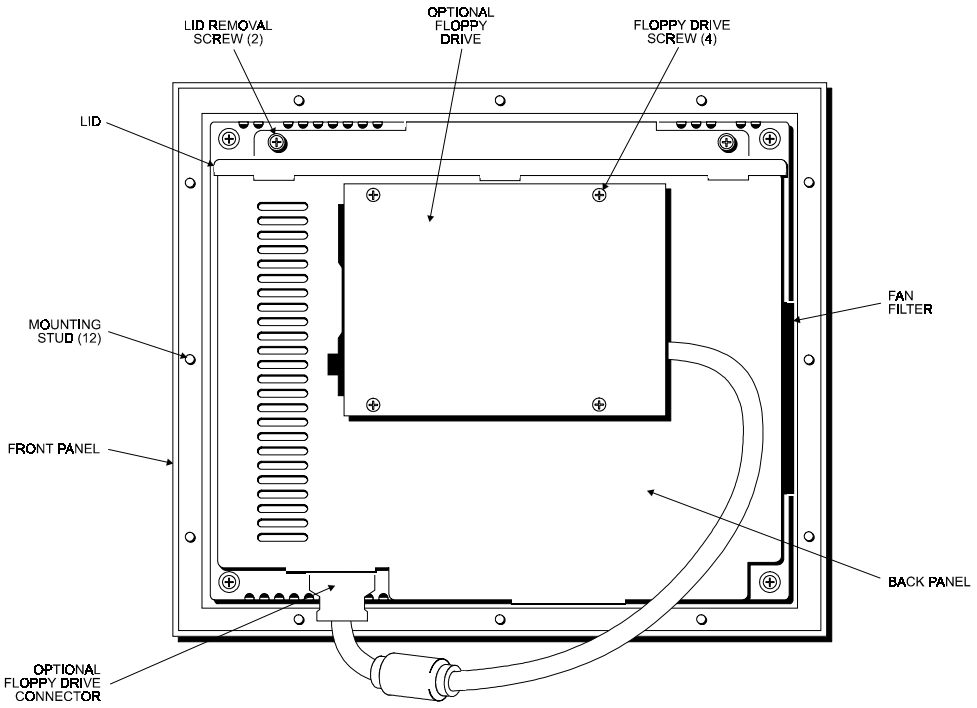


Figure Chapter 3 -4. System Back Panel

Feature	Description
Fasteners	There are two protruding captive screws (lid removal screws) along the top of the back panel. Loosen these screws to remove the lid. There are four flush captive screws located across the top and bottom of the back panel. Loosen these screws (using a Phillip-head screwdriver) to remove the front panel. ***Note**: If your system has a touch screen, disconnect the touch screen cable from the CPU board before removing the back of the system from the front bezel.*

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Feature	Description
External Floppy Disk Drive (Optional)	You can install an external floppy disk drive to the back of the system. Front access options are also available.

Power Panel

Figure Chapter 3 -5 illustrates the bottom panel.

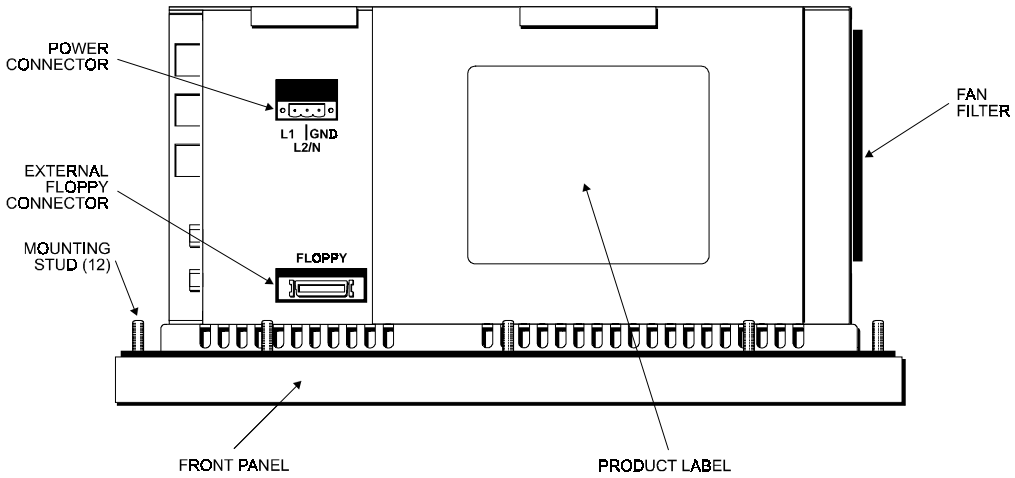


Figure Chapter 3 -5. Bottom Panel with Power Connector and External Floppy Connector

Feature	Description
Power Connector	This is a three-pin connector. Refer to the special hazardous location installation instructions later in this chapter.
External Floppy Drive Connector	This is a 26-pin connector.
Product ID Label	The product ID label is located on the bottom panel
Fan and Filter	Figure Chapter 3 -5 shows the position of the fan and filter assembly. The filter can be replaced or removed for cleaning. See Chapter 4 for details on the fan filter assembly.

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Preparing the System

Read this chapter first, comply with all the safety requirements, then mount the unit according to the following instructions.

1. Locate a position that meets the required specifications
2. Do a panel cutout. The dimensions are given in this chapter.
3. Install optional equipment following the instructions in *Installing Internal Hardware Options* and *Installing External Hardware Options* in this chapter.
4. Create the power cable. Refer to the *Creating a Power Cable* section later in this chapter.
5. Mount the system and properly secure the unit into the panel. See *Installing the System* section later in this chapter.
6. Attach one end of the power cord to the power receptacle and the other end to a properly grounded 115/230 VAC, 50-60 Hz outlet or a 24 VDC outlet, whichever applies (refer to the *Hazardous Location Installations* section later in this chapter).
7. Turn on power to the system. The system will boot up to the operating system installed.
8. Install the application software via a floppy drive.

If a touch screen has been factory installed along with MS-DOS, the mouse port is unavailable. The unit will arrive with a sticker placed over the port. If you would like to reconfigure the touch screen to use the COM2 port, follow the instructions in the *Using a Touch screen* section later in this chapter.

Installing Internal Hardware Options

Caution

Turn off the unit before installing internal hardware.

Remove the lid to install internal hardware options.

DRAM and Additional DRAM Single In-line Memory Modules (SIMMs)

You can order your system CPU factory-configured for many configurations of DRAM. You can reconfigure the DRAM capacity by changing the DRAM SIMMs on your board. For more information, refer to the CPU manual.

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PC/AT and PCI Boards

1. Check that the memory and I/O configuration of the board you want to install does not conflict with the CPU and I/O memory maps in your CPU board manual.
2. Remove the lid.
3. Remove the ORB screw in the desired track.
4. Slide the PC/AT expansion board into a corresponding rail.
5. Push the board into the backplane connectors.

> **Note**
>
> **Do not** force the boards or apply uneven pressure.

6. Secure the board by installing the screw through the hole in the board's metal ORB and into the top of the track.
7. Replace the lid.

Installing External Hardware Options

This section explains how to install the external hardware options available with the system.

> **Note**
>
> When using the external floppy drive, do NOT attach the drive with a diskette installed. You may corrupt the disk.

External Floppy

The external floppy (9000-EXF) can be mounted on the back of the unit. There are four screw holes on the back of the unit for the floppy mounting. A fifth screw hole is on the back for the cable clamp screw. See the figures of the back panel and the bottom panel (Figures 3-3 and 3-4).

Front mounting options are also available.

> **Note**
>
> Make sure the floppy drive cable will reach the external floppy connector on the system before making the cutout.

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If you wish to relocate the floppy drive to the front of the computer module, you must install the 9000-FFK Front Floppy Kit, which includes a front access keyboard port. The floppy drive access door is provided for installations using the 9000-RFC Rack Filler Plate with Cutout, or panel mount installations that provide a cutout for the front mounted floppy drive.

Figure Chapter 3 -6 provides the cutout dimensions for the 9000-FFK (optional front mounted floppy drive).

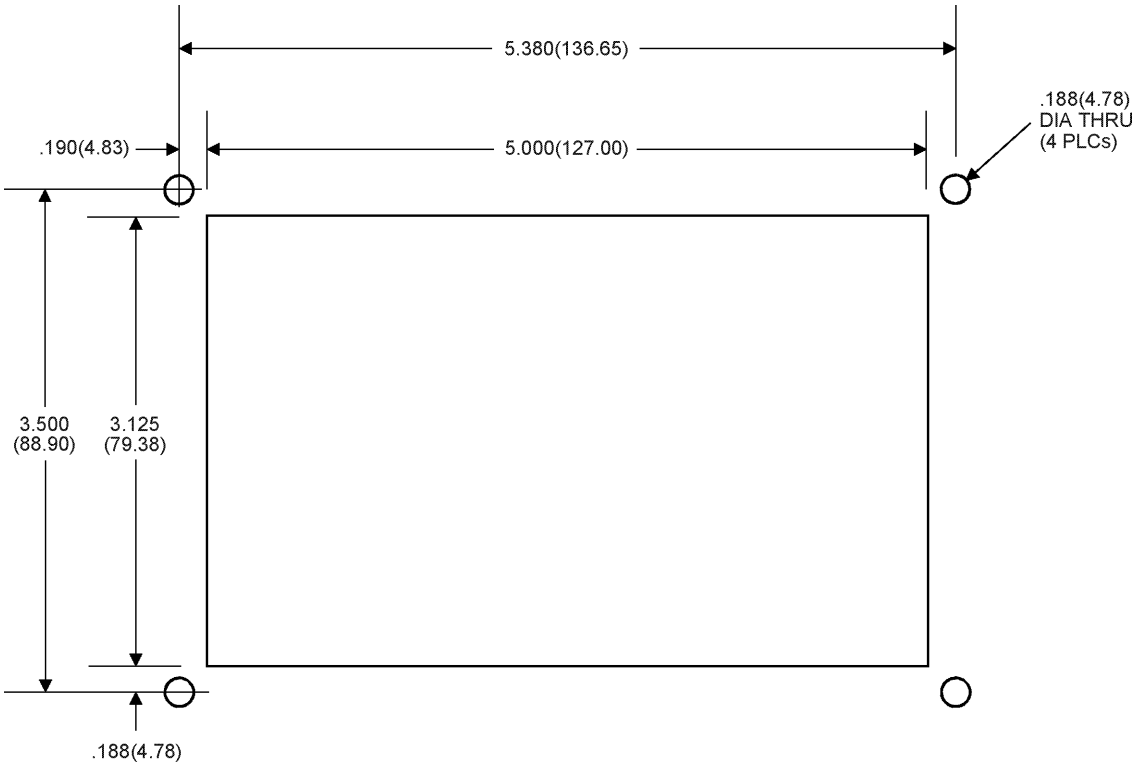


Figure Chapter 3 -6. Front Mounted Floppy Cutout Dimensions

Mount the floppy drive access door to the rack filler plate or the panel, using the four mounting nuts, as shown in Figure Chapter 3 -7. Torque the nuts to 35 in/lb. (3.95 NM).

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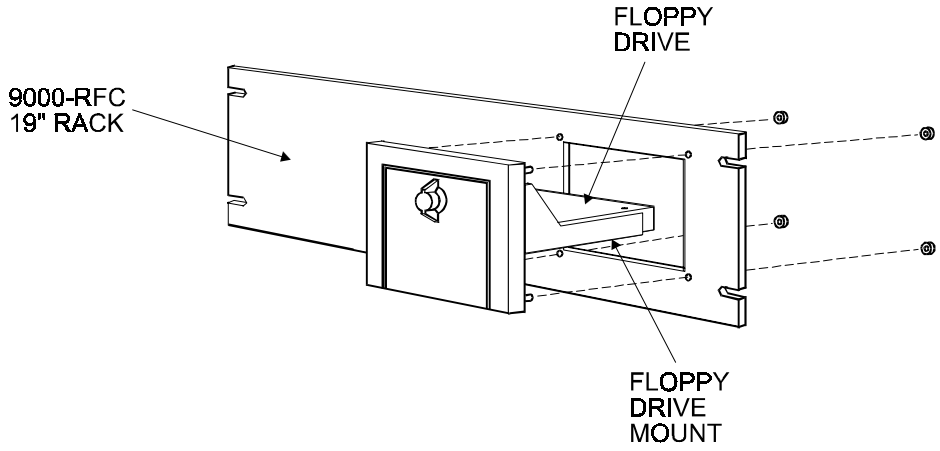


Figure Chapter 3 -7. Floppy Drive - Front Mounting Option

Figure Chapter 3 -8 shows an overhead view of the Front Floppy Kit with the floppy drive mounted.

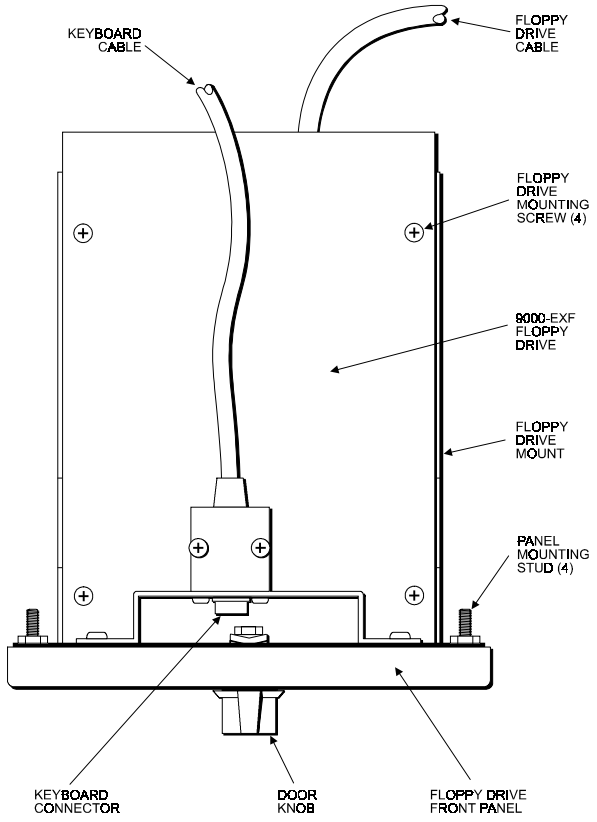


Figure Chapter 3 -8. Floppy Drive - Front Mounting Option (top view)

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Front Connector Access

If you wish to access the keyboard and external floppy connectors from the front of the computer module, you must install the 9000-FKA kit.

Figure Chapter 3 -9 provides cutout dimensions for the 9000-FKA (optional front connector option).

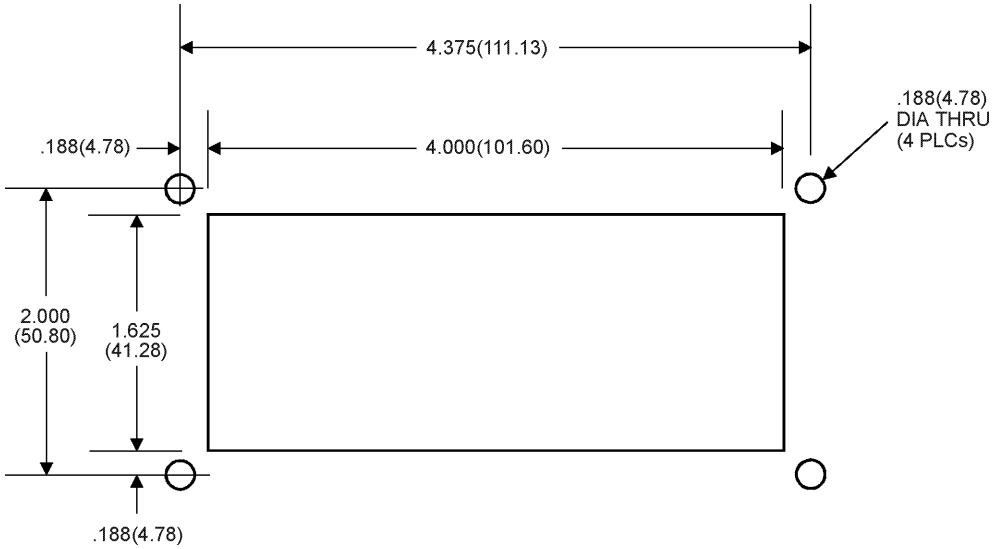


Figure Chapter 3 -9. Front Mounted Connectors Cutout Dimensions

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Figure Chapter 3 -10 illustrates the front floppy and keyboard access kit. Mount the kit to the plate or the panel as shown.

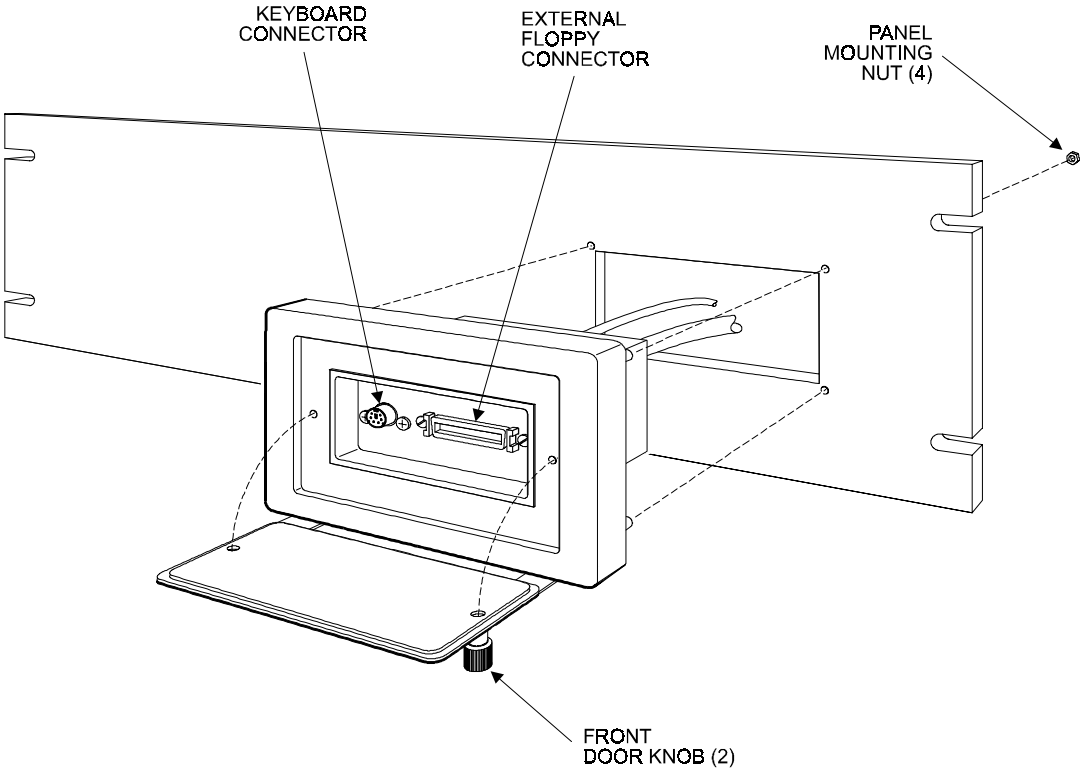


Figure Chapter 3 -10. Front Floppy and Keyboard Access Option

Warning

To maintain a safe condition, do not use an external keyboard and/or mouse port when the unit is operating in a hazardous environment.

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Keyboards

Four keyboards are available for the system: the 8000-KB5, 8000-KB6, 8000-KB7, and 8000-KB8. The following table lists the features of each keyboard.

Available Keyboards

Keyboard	Features
8000-KB5	Rack or panel-mounted NEMA 4 104-key QWERTY keyboard with PC/AT interface
8000-KB6	Rack-or panel-mounted NEMA 4 numeric keyboard with 52 function keys
8000-KB7	Stand-alone 104-key QWERTY NEMA 4 keyboard.
8000-KB8	Stand-alone numeric NEMA 4 keyboard with 52 function keys

Once you mount the keyboard, connect the cable to the keyboard port. Use the 9000-FKA for a NEMA 4-sealed panel mount door for front access to keyboard and external floppy port with mounting hardware

Note

These keyboards are not available in the E.U. (no CE mark).

Serial Mouse

To install Xycom's 4100-MS1 two-button serial mouse, attach the connector on the mouse cable to COM1 or COM2 on the side panel. If a mouse is used, the ferrite in the documentation kit must be installed to maintain CE compliance.

Note

If the touch screen is factory installed along with MS-DOS or Windows 3.x, the touch screen is set up on the mouse port (making the mouse port unavailable). A sticker will be covering the mouse port. If Windows 95 or Windows NT is factory installed, then the touch screen is set up on COM2 (making the COM2 port unavailable). No sticker will be covering the mouse port.

Warning

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

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Custom Logo

You have the option to place a custom label on the unit. Refer to the following figure for the dimensions and recommended requirements for a customized label. Once a customized label is procured, place the new label over the "Xycom" label (inside the recessed area).

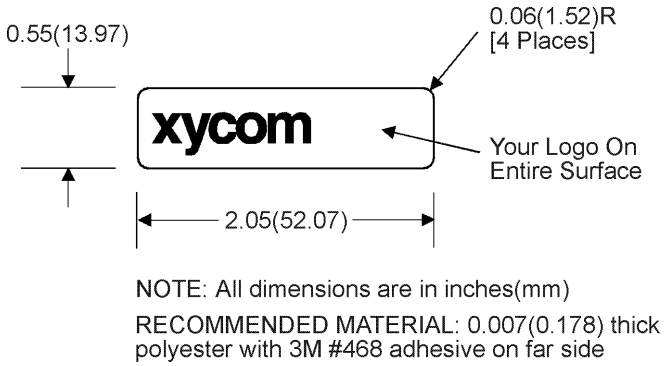


Figure Chapter 3 -11. Logo Label Dimensions

Customized Keypad Inserts (9460KP/9462KP only)

You can customize your keypad with keypad inserts. Refer to the following figures for insert dimensions and installation.

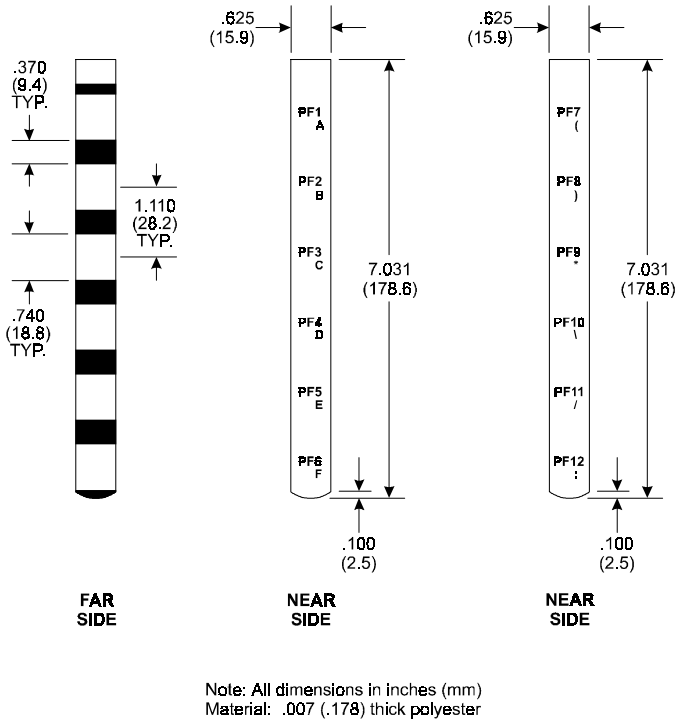


Figure Chapter 3 -12. 9460KP/9462KP Keypad Inserts with Dimensions (PF1 - PF20)

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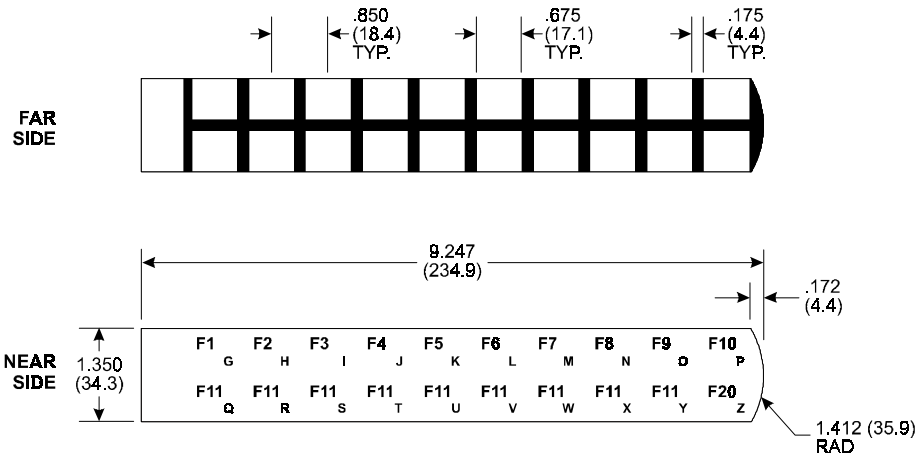


Figure Chapter 3 -13. 9460KP/9462KP Insert with Dimensions (F1 - F20)

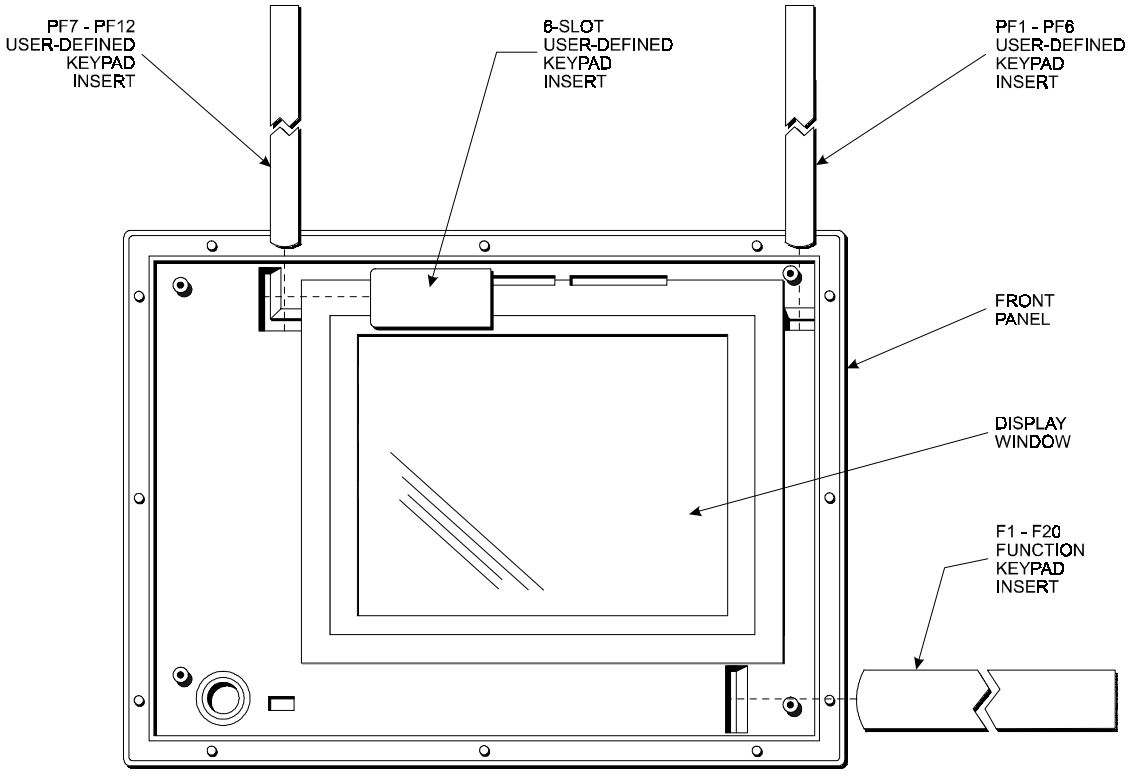


Figure Chapter 3 -14. 9460KP/9462KP Keypad Insert Position

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Installing Operating Systems

The system CPU comes with MS-DOS standard. The pre-installed operating systems are provided in the following format:

Operating Systems	Format
DOS and Windows 3.11	Disk
Windows 95	CD ROM or disk
Windows NT	CD ROM

If you want to install a new operating system or re-install a current operating system, refer to the operating system's manual for directions.

> **Note**
>
> If you ever need to reinstall Windows NT operating system, you must have an internal CD-ROM drive or an external parallel port CD-ROM drive since Windows NT *only* ships on a CD-ROM disk.

Installing Drivers

This section describes how to install the drivers associated with the system.

Ethernet Drivers

If Windows 95 or Windows NT 4.0 is pre-installed on your system and you ordered the Ethernet card option, Ethernet drivers are installed on your hard drive in the C:\netdrv directory.

> **Note**
>
> If you want to use Ethernet capabilities with Windows 95, your system must have BIOS revision level 1.1 or higher. If the AHIP4+ board is installed, your system must have BIOS revision level 1.7 or higher.

If MS-DOS is installed on your system, the Ethernet drivers are supplied on your hard drive in the C:\netdrv directory, but they are not installed.

To install the MS-DOS Ethernet drivers,

1. At the C: prompt, type "cd netdrv".
2. Once the C:\netdrv path is specified, type "install".
3. Follow the on-screen instructions to complete installation.

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If you install Windows 3.1 on your system, Xycom provides the Ethernet drivers on the Ethernet Drivers disk that ships with your system.

Note

If you install Windows NT 4.0 or Windows 95 on your system, the Ethernet drivers that are provided do not work with the Ethernet controller installed. You must use the drivers provided by Xycom. These drivers can be found on the Ethernet Drivers disk that ships with your system.

Consult the Info directory on the drivers disk for additional installation information.

Video Drivers

Video drivers and the expansion utilities are on the diskette included with the documentation kit as well as on the hard drive.

For the AHIP5+ system, the video drivers are in the following directories:

C:\VGA\C&T554\WIN31
C:\VGA\C&T554\WIN95
C:\VGA\C&T554\WINNT
C:\VGA\C&T\DOS\UTILITIES

For the AHIP4+ system, the video drivers are in the following directories:

C:\VGA\C&T550\WIN31
C:\VGA\C&T550\WIN95
C:\VGA\C&T550\WINNT
C:\VGA\C&T\DOS\UTILITIES

Video Expansion

This section deals with the hardware expansion capability of the video controller chip in DOS applications.

Note

It is not necessary to read this section if you are a Windows or OS/2 user and do not plan to run DOS applications and have not modified the default expansion mode in the BIOS setup,

Unlike a CRT, a flat panel display has a fixed horizontal and vertical resolution. There are many DOS video modes whose resolution is less than that of a flat panel display. In order to more efficiently make use of the flat panel display's active area, it is necessary to employ an expansion technique which stretches the lower resolution information to fill the higher resolution of the display. For example, DOS defaults to VGA video mode 3+. This is an 80 column, 25 row text only screen whose effective resolution is 640 dots x 400 scan lines. Because of this, the 800 x 600 display of the system will be partially

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filled by the 640 x 400 resolution of this particular mode. By enabling the expansion function, these lower resolutions will better utilize the display by stretching the information in an attempt to fill the display. Operating systems such as Microsoft Windows 3.X, Windows 95, and Windows NT use display drivers to handle the different flat panel displays. Here expansion is not necessary since there is a specific driver for each resolution display.

Expansion does not add any resolution to the existing information; it simply stretches the information to better fit the display. Text and graphic screens can look somewhat grainy from the process of expansion. If the effect of expansion is undesirable, it can be turned off either in the BIOS setup, or by executing an included utility program. See the table below for the three utility programs included to allow expansion to be turned on, turned off, and set back to the BIOS default state and what effect they have on the display.

Video Expansion Options

Utility	Mode	Panel Type/Size	
		12.1" STN	12.1" TFT
EXP_ON.EXE	Text	Vert/Hor	Vert/Hor
Expansion On	Graphics	Vert/Hor	Vert/Hor
EXP_DEF.EXE	Text	Off	Vert/Hor
Expansion Default	Graphics	Off	Off
EXP_OFF.EXE	Text	Off	Vert/Hor*
Expansion Off	Graphics	Off	Off
Definitions: Vert - Vertical only expansion is invoked Vert/Hor - Vertical and Horizontal expansion is invoked Expansion Default - The video BIOS default on power up			

* Text expansion cannot be turned off

With a 800 x 600 display, the stretching algorithm does not completely fill the display horizontally or vertically. A greater vertical text expansion can be achieved by changing to VGA mode 3* (see Note below). This is also an 80 column, 25 row text mode but with an effective resolution of 640 x 350. The 350 lines stretch better to fill the 768 line display than does the default DOS mode 3+.

Note

The utility disk includes a program titled MOD3_350.EXE, to allow switching to the VGA mode 3*. Another utility program, MOD3_400.EXE, is provided to put the mode back to the DOS default of 3+.

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Windows may come up with a blank screen when using Windows 3.X with expansion turned on either through the BIOS setup or the EXP_ON.EXE utility. The two options (second option being the best) for this situation are listed below:

- Option 1 – Pressing the CTRL-ALT-DEL keys simultaneously. A blue screen displays, letting you know that pressing CTRL-ALT-DEL again will reboot the system or pressing any key will return you to Windows. At this point, press any key and the normal Windows screen should appear.
- Second Option – Turn off the expansion , set the BIOS default in the BIOS setup menus using the appropriate utility as shown in the *Video Expansion Options* table.

Note

A STN flat-panel display and a CRT cannot be used simultaneously.

Note

For further assistance, call Xycom technical support at 1-800-289-9266.

Touch Screen Drivers

If you have a touch screen factory-installed, you will also receive at no charge: MS-DOS, Windows 3.x, and Windows 95 touch screen drivers on diskette. Touch screen drivers for Windows NT (9460-DRVNT) and OS/2 (9460-DRVOS/2) must be purchased separately.

The Windows 95 touch screen driver is available in a COM2 and a mouse port version. Windows NT touch screen driver is *only* available in a version for COM2

Note

If you order Windows NT pre-loaded on a system, the Windows NT touch screen drivers are provided.

You must install the corresponding touch screen driver software if you change the operating system. Refer to the touch screen manual for instructions.

Note

If you ordered Windows 95 and a touch screen on your system, the touch screen driver has been installed. If you ordered Windows NT, the driver is on a disk and a copy of the driver file is on the hard drive. Windows NT only supports COM2. Therefore, the touch screen will use the COM2, so COM2 will not be available for other use.

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Miscellaneous Drivers

Refer to your operating system and peripheral manuals for information on installing drivers related to these items.

> **Note**
>
> If Windows NT is installed on your system, you may have to purchase and install an external parallel port CD-ROM drive to install Windows NT drivers. The Windows NT operating system only ships on CD-ROM.

Using a Touch Screen

Xycom's touch screen complies with environmental specifications and maintains a NEMA 4 seal when panel mounted. It remains operational even after 30 million touches. The touch screen Monitor Mouse driver emulates a Microsoft mouse.

> **Note**
>
> If MS-DOS, Windows 3.x, or Windows 95 is installed on your system, the touch screen is configured for the mouse port and the mouse port is unavailable.
>
> If Windows NT is installed on your system, the touch screen is set up on COM2 and the COM2 port is unavailable for other use.

To reconfigure the touch screen to use the COM2 port, perform the following steps:

1. Disconnect the power.
2. Remove the lid.
3. Remove the touch screen controller card. Figure Chapter 3 -15 shows the touch screen controller card and the jumper set.

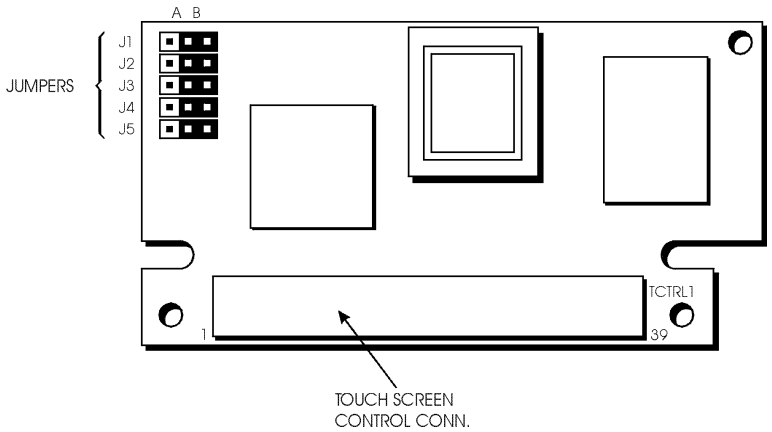


Figure Chapter 3 -15. Touch screen controller card.

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4. Reconfigure Jumpers J1-J5. Position A = COM2. Position B = PS/2 mouse.
5. Reinstall the touch screen controller card.
6. Reboot the computer.
7. Using the touch screen manual do the following:
   - Load the touch screen drivers.
   - Reconfigure the touch screen driver for COM2.
   - Recalibrate the touch screen.
8. Replace the lid.

Using a Pointing Device with a Touch Screen

The touch screen setup program needs to know if you are using another pointing device with the touch screen. The Windows touch screen driver does not display the cursor. Instead, the pointing device driver is responsible for displaying the cursor.

In the touch screen setup program, *Support for Another Pointing Device,* select the following:

If you are	Select	Result
using a mouse with the touch screen	Yes	The pointing device driver controls the cursor display
not using a mouse	No	The Setup program loads a cursor display driver (MTSMOUSE.DRV) as well as the Windows touch screen driver

Calibrating the Touch Screen

If you need to recalibrate the touch screen, refer to the sections in the touch screen manual that explain calibration and using the diagnostic utility.

You need to calibrate the touch screen if

- The cursor does not follow the movement of your finger or pen.
- You adjust the size of the video image or change the video mode.

Note

The touch screen and controller are a matched pair calibrated at the factory.

Installing the System into a Panel

The system's rugged design allows it to be installed in most industrial environments. The system is generally 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 nearby equipment can generate.

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Mounting Considerations

Once you have established a location for the 9460/9462, install it in the enclosure according to the instructions that follow:

- Select a NEMA rated enclosure and place the unit to allow easy access to the system ports.
- Account for the unit's depth when choosing the depth of the enclosure.
- Provide a NEMA 4 seal by mounting the unit in an approved enclosure that has a 14 gauge (0.075"/1.9mm thick) steel or (0.125"/3.2mm thick) aluminum front face.
- Mount the unit in an upright position.
- Place the unit at a comfortable working level.
- Consider locations of accessories such as AC power outlets and lighting (interior lighting and windows) for installation and maintenance convenience.
- Prevent condensation by installing a thermostat-controlled heater or air conditioner.
- To allow for maximum cooling, avoid obstructing the air flow.
- Place any 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 used. This filtration prevents conductive particles or other harmful contaminants from entering the enclosure.
- 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).
- Place incoming power line devices (such as isolation or constant voltage transformers, local power disconnects, and surge suppressers) away from the system. The proper location of incoming line devices keeps power wire runs as short as possible and minimizes electrical noise transmitted to the unit.
- Make sure the location does not exceed the unit's shock, vibration, and temperature specifications.
- Install in the rack or panel in such a way as to ensure that it does not cause a hazard from uneven mechanical loading.
- Incorporate a readily accessible disconnect device in the fixed wiring on permanently connected equipment.
- Avoid circuit overloading of the supply circuit.

System Power

Using isolation transformers on the incoming AC power line to the system is always a good practice. 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 provides 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),

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continuous, and able to safely conduct the ground-fault current in the system with minimal impedance (minimum wire required is 18 Awg, 1 mm).

Observe the following practices:

- Separate ground wires (P.E. or Protective Earth) 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. Scrape away paint and other nonconductive material from the area where a chassis makes contact with the enclosure. In addition to the ground connection made through the mounting bolt or stud, use a one-inch metal braid or size #8 AWG wire to connect between each chassis and the enclosure at the mounting bolt or stud.

Excessive Heat

The units withstand temperatures from 0º to 50ºC. The systems are cooled by convection, in which a vertical column of air is drawn in an upward direction over the surface of its components. To keep the temperature in range, the cooling air at the base of the system must not exceed 50°C. Allocate proper spacing between internal components installed in the enclosure.

When the air temperature is higher than the specified maximum in the enclosure, use a fan or air conditioner to lower the temperature.

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 as 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 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.

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Line Voltage Variation

The unit's power supply is built to operate with output voltage ranges of 90-132 VAC and 180-264 VAC or 20-36 VDC, whichever applies, and still allow the system to function within its operating margin. As long as the incoming voltage is adequate, the power supply provides all the logic voltages necessary to support the processor, memory, and I/O.

In cases in which the installation is subject to unusual AC line variations, use a constant voltage transformer to prevent the system from shutting down too often. 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, use a constant voltage transformer.

The constant voltage transformer stabilizes the input voltage to the 9460/9462 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 unit.

Creating a Power Cable

This section describes how to create both an AC and a DC power cable.

AC Power Cable

You must create an AC power cable to supply power to units with AC power supplies. You will need the following materials:

- A 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 80º C or better.

Perform the following steps to create the cable:

1. Cut the wire cable to the desired length.
2. Strip 0.25-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 there is no exposed wire. Trim the wire ends of the cable or cut a new cable if necessary.

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4. Insert the three wire ends of the power cable into the three holes of the block plug. Insert the Protective Earth GND ground, L1, and L2/N wires into the corresponding holes, as shown in Figure Chapter 3 -16. Be sure that no bare wires are exposed.

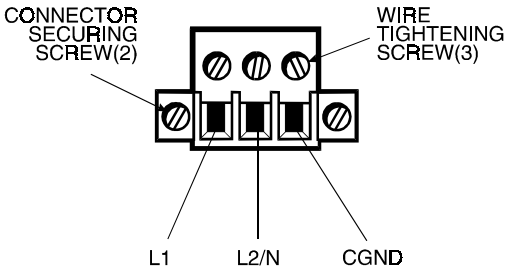


Figure Chapter 3 -16. AC Power Connector

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 provide strain relief to the power cable. When installing the power cable to the unit, use the securing screws on each side of the plug. This strain relief is mandatory for hazardous locations compliance.

Warning

Completely loosen the two securing screws on the plug when disconnecting the power cord from the unit.

DC Power Cable

You must create a DC power cable to supply power to units with DC power supplies. You will need the following materials:

- A three-position power connector (supplied)
- A braid/foil shielded power cable with three 18 (1.0 mm), 16 (1.3 mm), or 14 (1.6 mm) AWG solid or stranded copper wire, rated 80º C or better.

Perform the following steps to create the DC power cable:

1. Cut the wire cable to the desired length.
2. Strip 0.25-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.

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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 there is no exposed wire. 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. Insert the Protective Earth GND ground, + (positive), and - (return) wires into the corresponding holes, as shown in Figure Chapter 3 -17. Be sure that no bare wires are exposed.

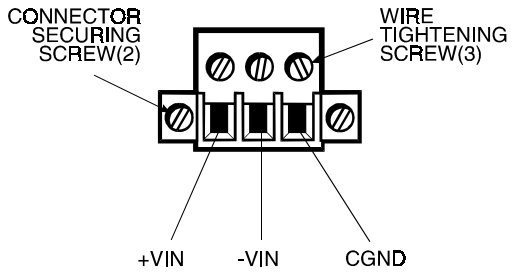


Figure Chapter 3 -17. DC Power Connector

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 plastic cable clamp and #6-32 screw (provided) to secure and strain-relief the cable. When installing the power cable to the unit, use the securing screws on each side of the plug.

> **Warning**
>
> Be sure to completely loosen the two securing screws on the plug when disconnecting the power cord from the unit.

Installation is complete once the power and other optional interface cables are installed.

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Mounting the Unit

Once the conditions in the preceding sections have been met, follow the instructions below to mount the unit:

1. Locate a position for your system that meets the specifications required (see previous sections and Appendix A).
2. Cut the hole according to the cutout dimensions in figures Figure Chapter 3 -18 or Figure Chapter 3 -19.
3. Make sure the area around the cutout is clean and free from metal burrs.
4. Install the unit.
5. Attach the power cable making sure that the system's enclosure is grounded through the power cable.
6. Implement the proper grounding techniques. Establish a ground path from the unit chassis to the enclosure chassis. A 6-32 threaded ground point hole is provided on the bottom panel of the unit.
7. Tighten the 12-#10 nuts to 25 inch-lbs (2.8 Newton-meters) (28Kgf cm).

System Cutout Dimensions

9460/9462

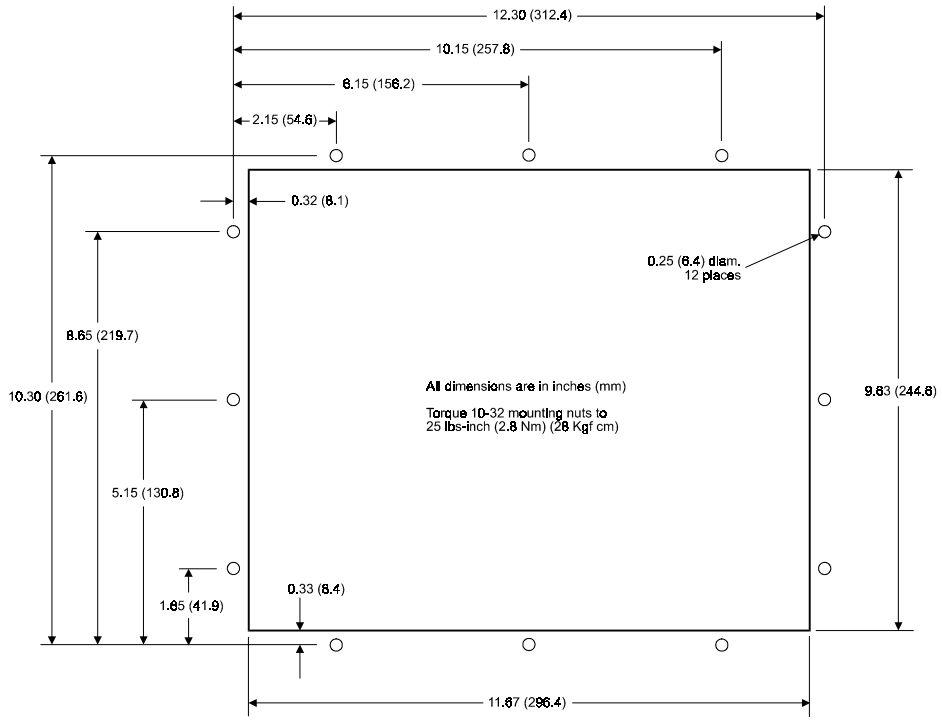


Figure Chapter 3 -18. 9460/9462 System Cutout Dimensions

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9460KP/9462KP

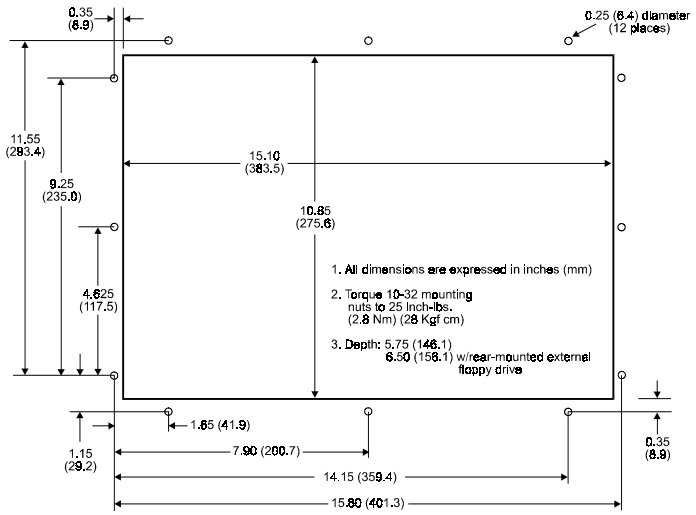


Figure Chapter 3 -19. 9460KP/9462KP System Cutout Dimensions

Power Supply

The power supply provides 80 watts of output throughout the system's temperature range. The expansion power is limited as shown in the following table.

Available Expansion Current

Voltage	Available Current	
	AHIP4+	AHIP5+
+5VDC	6.17A 30.9W	1.54A 7.7W
+12 VDC	1.88A 22.6W	1.82A 21.84W
-5VDC plus -12 VDC combined	0.71A 8.5W total not to exceed 46 watts (based on Am5x86 133Mhz Processor)	0.72A 8.64W total not to exceed 36 watts (based on 200 MHz Pentium MMX Processor)

Hazardous Location Installations

Xycom designed the systems to meet the requirements of Class I, Division 2 Hazardous Locations applications. Division 2 locations are those locations that are normally non-hazardous, but could become hazardous due to accidents that may expose the area to flammable vapors, gases or combustible dusts.

These systems have been designed 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 di-

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ode 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.

Note

It is the customer's responsibility, when adding additional cards, that they meet operating conditions for Class I, Division 2 hazardous 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 presently have a Class, Division, and Group rating, then users should consult the appropriate authorities having jurisdiction in order to determine the correct rating for that Hazardous Location.

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. Only technically qualified personnel should install, service, and inspect these systems.

Warning

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

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

Advertissement Risque D' Explosion

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

Warning - Explosion Hazard

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

Advertissement Risque D' Explosion

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

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Warning - Explosion Hazard

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

Advertissement Risque D' Explosion

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

Warning

To maintain a safe condition, do not use an external keyboard or mouse 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.

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Note

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

Note

Electrical equipment cannot be installed in Division 1 locations unless they are intrinsically safe, installed inside approved explosion-proof enclosures, or installed inside 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 that 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.

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Enclosures

The systems are 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 optional floppy disk/keyboard port access door must be closed and latched at all times in order to maintain a proper seal against the intrusion of water and dust.

Panel flatness and rigidity are important if a proper panel seal is to be maintained. If non-metal type enclosures, such as plastic or fiberglass, are to be used, 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. Tighten the nuts on the mounting studs to 25 inch-pounds.

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 that apply to their specific location. Reference NFPA 70, Article 500 for specific regulations in the United States.

Power Switch

The 9460/9462 systems do not have a power switch. The amount of input power required by these systems classifies the power switch as an incendiary device because the voltage and current across the make/break device are 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.

Use suitable UL listed and/or CSA Certified Class I, Division 1 switches 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 location regulations require that all cable connections be provided with adequate strain relief and positive interlock. Never connect or disconnect a cable while power is applied at either end of the cable.

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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. Always secure the D-Sub connectors to the workstation mating connectors via the two screws located on both sides.

Warning

Never connect or disconnect the communication cables while power is applied at either end of the cable. This may result in an incendiary spark. Permanent damage to the workstation communication components may occur.

Operation and Maintenance

The systems have been designed for compliance with relevant spark ignition tests. However, please note that the workstation front panel contrast adjustment tactile switches 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, never use an external keyboard or mouse when the unit is operating in a hazardous environment.

With respect to hazardous location installations, always observe the following rules:

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 known to be removed and the area is known to be non-hazardous. This includes the installation or removal of power cables, communication cables, or removal of the rear cover of the unit.
4. Only technically qualified service personnel should perform all installation and service. These workstations are designed to require no service in the course of normal operation by an operator.

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Safety Agency Approval

These systems have the following approvals:

- *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 (UL listed, File E180970)
- *Underwriters Laboratories Inc., UL 1950,* Information Technology Equipment (UL recognized, File E181675)
- *Canadian Standard Association, Specification C22.2 No. 213-M1987* Non-incendiary electrical equipment for use in Class I, Division 2 hazardous locations (CUL listed, File E180970)
- *Canadian Standards Association, Specification C22.2 No. 950,* Information Technology Equipment (CUL recognized, File E181675).

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Chapter 4 – Programmable Keypad Utility Program (9460KP/9462KP)

A Keypad Utility Program lets users redefine all keypad keys with new scan codes using utility software.

> **Note**
>
> The keypad switch arrays are disabled while the Programmable Keyboard Interface Module (PKIM) utility is running.

Loading the PKIM Utility

> **Note**
>
> You need MS-DOS® 3.2 or higher to run the PKIM utility. It will *not* work if you are running Windows® 95 or Windows NT™. However, the PKIM utility will run under Windows® 95 in DOS mode.

You can run this utility from the disk or copy it onto your hard drive. To run PKIM from disk, change the directory to the appropriate drive and type `PKIM`. To load the utility onto your hard drive, create a subdirectory, and copy all the files on the disk into that subdirectory. Enter the subdirectory and type `PKIM`.

Using the Programmable Keypad Utility

The PKIM utility uses a menu bar and pull-down menu system. All menu bars are displayed across the top of the screen. “Xycom PKIM Utility” and the current menu titles are shown at the bottom of the screen (see Figure Chapter 4 -1).

You need a full-stroke keyboard to enter keystrokes while recording a new key macro, editing an existing macro, and entering utility commands. All keys on the keypads are redefinable. While the utility is running, the keypads are disabled.

Dialog boxes appear for user prompts and to display error and user advice messages.

Two keys can be used to exit from the menus:

- `ESC` moves to the previous menu or out of the utility from the Main Menu.
- `F1` returns to the current menu headings in some of the menus where Exit can be chosen to exit this menu.

Keys specific to each menu are shown at the bottom of each screen.

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Startup

PKIM [| /t] runs the PKIM utility. The /t switch translates scan codes from keyboards running in XT mode. Some systems initialize the keyboard to run in XT mode. In this case, the scan codes read in from the keyboard when in Teach mode will not be correct unless the utility is started with the /t switch.

Utility Batch Mode

A mode is also available for reprogramming keypads from a batch file. This feature is useful if you wish to reprogram many units with customized keypad macros without having to enter the full PKIM utility for each unit. Once the full utility has been used to create and save keypad macros, the files containing these macros can be included on a disk with the PKIM utility and then used to reprogram other units from a batch file.

The command *PKIM filename* runs the PKIM utility batch mode. *Filename* is the file containing the new keypad macros. You must include the filename extension. For example, the batch file *PKIM def9462.pkm* will reprogram the keypad with default values.

Main Menu

The Main Menu is shown illustrated in Figure Chapter 4 -1. Each menu option is described in the next few paragraphs.

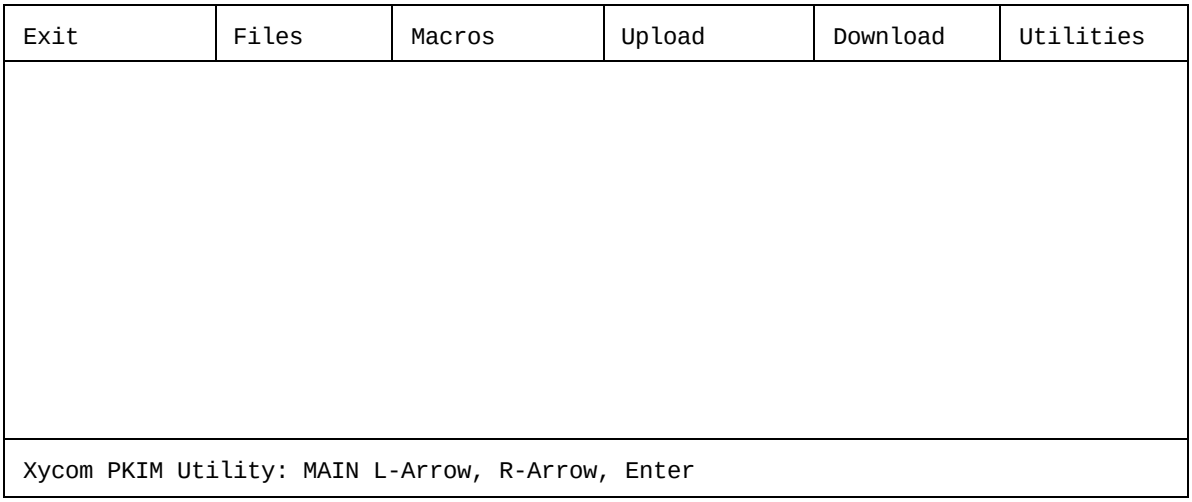


Figure Chapter 4 -1. Main Menu

Exit

Exit closes open files and exits the utility. ESC can also be used for this purpose and for exiting the other menus.

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Files Menu

Files containing keypad macro sets (a macro for each key) may be saved on disk and loaded into memory to view, edit, teach, or download to the keyboard controller. Some of these files may be included in the utility package for use in reconfiguring the keypads for different software packages and as templates for defining completely new keypad macro sets.

When you choose `Files`, a pull-down menu is displayed that provides the following choices: `Open, Close, Save, Save As, Delete,` and `Exit`.

Open

Opens a file that contains a macro set for the keypad and loads the contents into memory. Any macro set in memory is overwritten. Once loaded, the macro set is available to edit, view, teach, and/or download to the keyboard controller.

Close

Clears the macro set from memory and closes the file from which they came.

Save

Copies the macro set from memory back into its original file. The original file contents are overwritten.

Save As

Creates a new file under the specified name and copies the macro set from memory into it. For example, to define different sets of codes, save each set under a different name and download the one you wish to use.

Delete

Deletes a file.

Exit

Returns to the Main Menu.

Macros Keypad Type Menu

When you select Macros, a pull down menu displays and provides the following choices: `Function Keys, Alpha Keys,` and `Exit.` Also, another pull down menu displays the following choices once the Macros menu is chosen: `Exit, View, Teach, and Edit.`

> **Note**
>
> You must have a macro file in memory before the Macros Menu is available. To load a macro file, either Open a file or Upload macros.

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Function Keys

Selects the function keys on the keypad to either view, edit, or teach.

Alpha Keys

Selects the alpha keys on the keypad to either view, edit, or teach.

Exit

Returns to the main menu.

Macros Edit Menu

Exit

Returns to the Main Menu.

View

Lets you view, but not edit, the macro for the selected key. When View is chosen, the Exit option is displayed on the menu bar and a graphic representation of the chosen keypad is shown. Select Exit from the View Menu to return to the Macros Menu. To select a key to view, use the arrow keys to position the cursor on the desired key and press ENTER. The macro is displayed as two lines—ASCII and code. The ASCII line displays each keycode as the keys it represents on the full stroke keyboard. Special labels are used for certain keys (e.g., Spc for space bar, UAr for up arrow, and bk for the break code prefix). The code line is displayed in either Hex or decimal, as explained below. There is a one-to-one correspondence between the ASCII and code lines to help interpret the code line.

While viewing the macro, the menu bar displays two options: Exit and Hex/Decimal. Exit returns to the View Menu, while Hex/Decimal toggles between displaying the macro in hex or decimal format. Default is Hex. When Hex is chosen, the keycodes are displayed as hexadecimal value scan codes. When Decimal is chosen, the keycodes are displayed as the decimal equivalent of the hex codes.

For example, the macro *abc* would be displayed as 1C F0 1C 32 F0 32 21 F0 21 in hex, and 28 240 28 50 240 50 33 240 33 in decimal.

Teach

Allows you to record up to 105 key strokes in a macro. When selected, a graphic representation of the keypad currently in memory displays. Menu bar choices are Exit, ASCII/Hex/Decimal, and Click ON/OFF. ***Exit*** returns to the Macros menu. ***ASCII/Hex/Decimal*** chooses the format to display the keystrokes as they are entered. Default is ASCII. ***Click*** is not supported.

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To select a key to define, use the arrow keys to position the cursor on the desired key and press ENTER. After a key is selected, the utility records every key stroke on the external full-stroke keyboard in a macro assigned to the chosen key. As the keys are entered they are displayed using the chosen format. ESC stops recording and returns to the Teach Menu, so it is not a recordable key. However, ESC can be included in a macro by using the editor. Changes made to the macros in the Teach Menu are not programmed until you select Download.

Edit

Displays a graphic representation of the keypad in memory and a menu bar displaying Exit, Click, and ON/OFF. ***Exit*** returns to the Macros menu. ***Click*** is not supported. To select a key to edit, use the arrow keys to position the cursor on the desired key and press ENTER.

In edit mode, the macro is displayed as two lines. The top line (the edit line) displays the macro in either hex or decimal format and is the line in which the actual editing takes place. The bottom line (the ASCII line) displays the macro in ASCII format and is not user configurable. This line helps keep track of which part of the macro you are editing, and will be updated by the utility as editing takes place. For example,

edit line	12	75	F0	75	F0	12	1C	F0	1C	12	22	F0	22	F0	12	0
ASCII line		sh	8	bk	8	bk	sh	a	bk	a	sh	X	bk	X	bk	sh	EOM

The insert, delete, and cursor control keys are active for editing.

When a key is selected from the Edit Macro option, the menu bar displays the following choices: `Exit, Cut, Copy, Paste, Codes, Hex/Decimal`, and `I/O (Insert/Overtype)`. The macro for the chosen key is also displayed.

Cut

Deletes a sequence of scan codes from the macro. To select a section to cut:

1. Place the cursor on the first character to cut.
2. Press F1 and select CUT.
3. Press ENTER. Cut should still be highlighted, but the cursor will appear on the Edit line. Move the cursor on the last character to cut and press ENTER.
4. The last character of every macro is the end of the macro (EOM) and cannot be deleted.

Copy

Copies a sequence of scan codes from the macro into memory. To select the section to copy:

1. Place the cursor on the first character to copy. Press F1 and select `Copy`.
2. Press ENTER. Copy should still be highlighted, but the cursor will appear on the Edit line.
3. Move the cursor on the last character to copy and press ENTER.

The copied item does not appear on the screen until you select `Paste`.

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Paste

Insert a sequence of scan codes (which were saved in memory using Copy) into the macro. To paste a sequence of scan codes that were previously copied, position the cursor where you want the text to appear and then press F1. Select `Paste` and then press ENTER.

Codes

Displays a table of keys and their scan codes in Hex. See the *Codes* section later in this chapter for a complete code listing.

Hex/Decimal

Toggles between displaying the scan codes in Hex and Decimal formats.

Insert

Toggles between insert and overtype mode.

Upload Menu

Use the Upload Menu to choose which data to load. Choices in this menu are: Combo keypad, PKIM Version, and Exit .

Combo Keypad

Commands the keyboard controller to send its entire macro set for the keypad.

PKIM Version

Commands the keyboard controller to send its firmware revision number.

Exit

Returns to the Main Menu.

Note

Only one macro set may reside in memory at one time.

A checksum will be calculated during transmission and an error message displays if an error occurs.

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Download Menu

> **Note**
>
> Any macro set previously programmed is overwritten when you select Download.

Download sends the set of keypad macros to the keyboard controller. The macro set must reside in memory before it can be downloaded. A checksum is calculated during transmission and an error message displays if an error occurs.

As the macro is sent, keyboard controller programs its EEPROM with the new macros which become the new key definitions for the keypad.

Utilities Menu

When Utilities is selected, a menu bar displays four choices: `Func Lock ON`, `Func Lock OFF`, `Clear EEPROM`, and `Exit`.

Func Lock ON

Not available on the 9460KP/9462KP.

Func Lock OFF

Not available on the 9460KP/9462KP.

Clear EEPROM

Erases the EEPROM memory. This clears the entire keypad macro set. After using this feature, the unit should be turned off and then on. This will initialize the EEPROM with the default settings.

Exit

Returns to the Main Menu.

Codes

Special keyboard controller codes replace the standard IBM scan codes for 101-key keyboard enhanced keys in macros that use these keys. The special scan codes are listed in the table below:

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Special PKIM Scan Codes

Code	Meaning
E2	Insert
E3	Home
E4	Page Up
E5	Delete
E6	End
E7	Page Down
E8	Up Arrow
E9	Left Arrow
EA	Right Arrow
EB	Down Arrow
EC	Forward Slash
ED	Print Screens/Sys Rq
EE	Pause/Break

The following table lists the default keypad keycodes the PKIM utility produces.

Default Keypad Keycodes

9462KP	F/A key LED off (Function mode)			F/A key LED on (Alpha Mode)		
Description of key	Keyboard Equivalent	Make Codes	Break Codes	Keyboard Equivalent	Make Codes	Break Codes
PF1 / A	F21	14 05	F0 05 F0 14	A	1C	F0 1C
PF2 / B	F22	14 06	F0 06 F0 14	B	32	F0 32
PF3 / C	F23	14 04	F0 04 F0 14	C	21	F0 21
PF4 / D	F24	14 0C	F0 0C F0 14	D	23	F0 23
PF5 / E	F25	14 03	F0 03 F0 14	E	24	F0 24
PF6 / F	F26	14 0B	F0 0B F0 14	F	2B	F0 2B
F1 / G	F1	05	F0 05	G	34	F0 34
F2 / H	F2	06	F0 06	H	33	F0 33
F3 / I	F3	04	F0 04	I	43	F0 43
F4 / J	F4	0C	F0 0C	J	3B	F0 3B
F5 / K	F5	03	F0 03	K	42	F0 42
F6 / L	F6	0B	F0 0B	L	4B	F0 4B
F7 / M	F7	83	F0 83	M	3A	F0 3A
F8 / N	F8	0A	F0 0A	N	31	F0 31
F9 / O	F9	01	F0 01	O	44	F0 44
F10 / P	F10	09	F0 09	P	4D	F0 4D
F11 / Q	F11	12 05	F0 05 F0 12	Q	15	F0 15
F12 / R	F12	12 06	F0 06 F0 12	R	2D	F0 2D
F13 / S	F13	12 04	F0 04 F0 12	S	1B	F0 1B
F14 / T	F14	12 0C	F0 0C F0 12	T	2C	F0 2C
F15 / U	F15	12 03	F0 03 F0 12	U	3C	F0 3C
F16 / V	F16	12 0B	F0 0B F0 12	V	2A	F0 2A
F17 / W	F17	12 83	F0 83 F0 12	W	1D	F0 1D
F18 / X	F18	12 0A	F0 0A F0 12	X	22	F0 22
F19 / Y	F19	12 01	F0 01 F0 12	Y	35	F0 35
F20 / Z	F20	12 09	F0 09 F0 12	Z	1A	F0 1A
PF7 / (	F31	11 05	F0 05 F0 11	(	12 46	F0 12 F0 46
PF8 /)	F32	11 06	F0 06 F0 11	)	12 45	F0 12 F0 45
PF9 / *	F33	11 04	F0 04 F0 11	*	12 3E	F0 12 F0 3E
PF10 / \	F34	11 0C	F0 0C F0 11	\	5D	F0 5D
PF11 / /	F35	11 03	F0 03 F0 11	/	4A	F0 4A
PF12 / :	F36	11 0B	F0 0B F0 11	:	12 4C	F0 12 F0 4C

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9462KP	F/A key LED off (Function mode)			F/A key LED on (Alpha Mode)		
Description of key	**Keyboard Equivalent**	**Make Codes**	**Break Codes**	**Keyboard Equivalent**	**Make Codes**	**Break Codes**
CTRL	CTRL	14	F0 14	CTRL	14	F0 14
SHIFT	SHIFT	12	F0 12	SHIFT	12	F0 12
INS	INS	70	F0 70	INS	70	F0 70
ALT	ALT	11	F0 11	ALT	11	F0 11
TAB	TAB	0D	F0 0D	TAB	0D	F0 0D
DEL	DEL	71	F0 71	DEL	71	F0 71
F/A						
SPACE	SPACE	29	F0 29	SPACE	29	F0 29
+	+	79	F0 79	+	79	F0 79
1	1	16	F0 16	1	16	F0 16
2	2	1E	F0 1E	2	1E	F0 1E
3	3	26	F0 26	3	26	F0 26
4	4	25	F0 25	4	25	F0 25
5	5	2E	F0 2E	5	2E	F0 2E
6	6	46	F0 46	6	46	F0 46
7	7	25	F0 25	7	25	F0 25
8	8	3E	F0 3E	8	3E	F0 3E
9	9	46	F0 46	9	46	F0 46
.	.	49	F0 49	.	49	F0 49
0	0	45	F0 45	0	45	F0 45
-	-	7B	F0 7B	-	7B	F0 7B
BACKSPACE	BACK SPACE	66	F0 66	BACK SPACE	66	F0 66
up arr	up arr	E0 12 E0 75	E0 F0 75 E0 F0 12	Contrast Up	E0 12 E0 75	E0 F0 75 E0 F0 12
PREV	PgUp	E0 12 E0 7D	E0 F0 7D E0 F0 12	PgUp	E0 12 E0 7D	E0 F0 7D E0 F0 12
left arr	left arr	E0 12 E0 6B	E0 F0 6B E0 F0 12	Contrast Down	E0 12 E0 6B	E0 F0 6B E0 F0 12
][	HOME	E0 12 E0 6C	E0 F0 6C E0 F0 12	HOME	E0 12 E0 6C	E0 F0 6C E0 F0 12
right arr	right arr	E0 12 E0 74	E0 F0 74 E0 F0 12	Contrast Up	E0 12 E0 74	E0 F0 74 E0 F0 12
ESC	ESC	76	F0 76	ESC	76	F0 76
down arr	down arr	E0 12 E0 72	E0 F0 72 E0 F0 12	Contrast Down	E0 12 E0 72	E0 F0 72 E0 F0 12
NEXT	PgDn	E0 12 E0 7A	E0 F0 7A E0 F0 12	PgDn	E0 12 E0 7A	E0 F0 7A E0 F0 12
ENTER	ENTER	5A	F0 5A	ENTER	5A	F0 5A

NOTE: F11-F20 = SHIFT F1-F10
F21-F26 = CTRL F1-F6
F31-F36 = ALT F1-F6

Note

If you make any changes to your keypad and want to set it back to the default settings, open the file titled `DEF9462.PKM` from the File/Open menu and then download it from the download menu. **Do not save any changes to the default files.**

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Chapter 5 – Maintenance

The 9460/9462/9460KP/9462KP was designed to withstand the harsh environment of the factory floor. Routine maintenance can help keep your system in good operating condition. Preventive maintenance consists of several basic procedures that will greatly reduce the chance of system malfunction. Schedule preventive maintenance along with the regular equipment maintenance to minimize down time.

Preventive Maintenance

Here are some preventive measures you can take:

- Clean the monitor screen using a non-residue cleaner such as a mild window cleaning solution or CRT screen cleaner. Take care not to scratch the screen face.
- Clean or change the fan filter periodically to ensure that the air circulating in the unit is clean. Wash the filter with warm water and dish soap, and let it air dry. Do not scrub the filter, and do not re-install it into the unit until it is completely dry.
- Base your maintenance schedule on the type of environment the system is in (i.e., if the area is dusty, schedule maintenance more often than if it is a dry, clean area). Check the filter often to determine if it needs to be changed ahead of schedule.
- 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, such as drawings or manuals, from the unit. They can obstruct air flow and create hot spots, which causes the system to malfunction.
- Do not place noise generating equipment near the 9460/9462.
- Stock spare parts to minimize down time resulting from part failure. Spare parts stocked should be 10 percent of the number of each unit used. Main CPU cards should have one spare each. Each power supply should have a back-up. In applications where immediate operation of a failed system is required, you may need to stock an entire spare computer module. Refer to the Spare Parts List in this chapter.
- Replace the module with the correct type. If the new module solves the problem but the failure reoccurs, check for inductive loads that may be generating voltage and current spikes and may require external suppression.

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Route Maintenance

This section describes the maintenance you can perform on the 9460/9462.

Fuse Replacement

The 9460/9462 has no accessible fuse. Return the unit to Xycom for fuse replacement.

Fan Filter Replacement

To change the fan filter, remove the grill and filter as illustrated in Figure Chapter 5 -1. Clean or replace the filter and snap the assembly back into position.

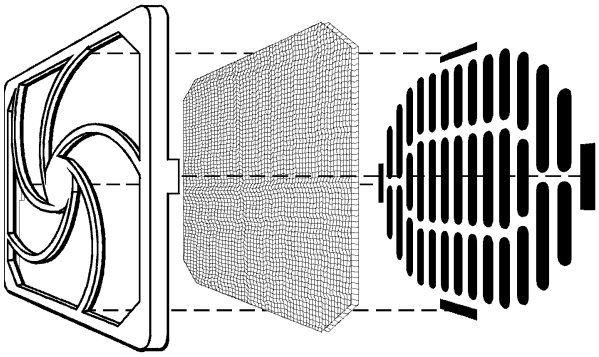


Figure Chapter 5 -1. Fan Assembly

Caution

Do not operate the 9460/9462 without a fan filter. Dust build-up could cause the unit to malfunction.

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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 9460/9462 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 9460/9462.

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 85ºC (185º F). Some contain aromatic hydrocarbons which should be avoided.

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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

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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 (65º 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 cleaning agents are known to be detrimental to the 9460/9462 unit.

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

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Spare Parts List

Description	Xycom Part Number 9460	Xycom Part Number 9462
Front Panel Assembly		
Touch screen		
STN	117321-101	119032-101
TFT	117334-101	119045-101
KP	132274-001	132290-001
(panel assembly includes T/S controller)		
Non-touch	117321-001	119032-001
STN	117334-001	119045-001
TFT	132261-001	132287-001
KP		
Drives		
Hard Drive–2160 Mbytes	109456-004	109456-004
Solid State (Flash) Drive		
10 Mbytes	109469-004	109469-004
20 Mbytes	109469-001	109469-001
40 Mbytes	109469-002	109469-002
60 Mbytes	109469-003	109469-003
3.5", 1.44 Mbyte Floppy Drive	101610	101610
CPU Assembly		
AHIP4+ CPU kit	117319-001	117319-001
AHIP5+ CPU kit		
133 MHz	121607-001	121607-001
200 MHz MMX	121648-001	121648-001
233 MHz MMX	124647-001	124647-001
DRAM		
1M x 32 (4 Mbytes)	104273	104273
2M x 32 (8 Mbytes)	104258	104258
4M x 32 (16 Mbytes)	104302	104302
8M x 32 (32 Mbytes)	106054	106054
16M x 32 (64 Mbytes)	123514	123514
Note: Unless unit originally shipped with 128 Mbytes DRAM, you will need a different COAST stick. Consult with the factory for use.		
Replacement Bulb Assembly		
STN	117347-001	121565-001
TFT	121663-001	121578-001
TFT (9462KP only)		125155-001
9000-RFI 19" Rack Filler Plate	116771-001	116771-001
9000-RFC 19" Floppy Door Plate	110843-001	110843-001
Filter Media	110383	110383
Media Retainer	110650	110650
Input Power Connector	99711-001	99711-001

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9000 Accessories		
9000-EXF External Floppy Kit	116074-001	116074-001
9000-FKA	116087-001	116087-001
9000-FFK	116061-001	116061-001

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Product Repair Program/Returning a Unit to Xycom

Xycom's Product Repair & Customization Department (PR&C) restores equipment to normal operating condition and implements engineering changes that enhance operating specifications. Xycom tests products returned to Xycom with the standard Xycom test diagnostics.

Follow the steps below to prepare the unit for shipment:

1. Obtain an RMA number for your unit by calling your nearest Xycom Repair Department or Xycom, Inc. at 1-800-289-9266 or 313-429-4971.

   Please have the following information:

   - Company name, shipping and billing address
   - Type of service desired: product repair or product exchange
   - Product model number, part number, quantity, serial number(s), and warranty status
   - Failure mode and failure systems
   - Purchase order number or repair order number
2. Make sure the front panel assembly is properly attached to the unit.
3. Attach failure information to the unit to speed processing.
4. Place the unit securely in its original packaging or an equivalent heavy-duty box.
5. Mark the RMA number on your purchase order and on the outside of the box.
6. Send the unit to the address given when you receive your RMA number.

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Appendix A – Technical Specifications

Hardware Specifications

9460/9460KP/9462/9462KP Hardware Specifications

Characteristic	Specification	
Mechanical		
Height	11.0" Front Panel; 14" (KP units)	
Width	13.0" Front Panel 19" (KP units)	
Depth	6.5" overall 5.75" behind front panel 0.75" front panel protrusion 7.25" overall with back-mounted external floppy	
Weight	16 lbs; 18 lbs with external floppy	
Electrical		
AC	115/230 VAC 50-60 Hz 3.0/1.5 AMPS	
DC	20-36 VDC 24 V nominal 10 A maximum	
Power Supply	80 watts	
Available Power	With AHIP4+ CPU board*	With AHIP5+ CPU board*
	+ 5 V @ 30.9W 6.17A	+ 5 V @ 7.7W 1.54A
	+12 V @ 22.6W 1.88A	+12 V @ 21.84W 1.82A
	-5 V plus -12 V @ 8.5W 0.71A	-5 V plus -12 V @ 8.64W 0.72A
	Caution: Total expansion power not to exceed 46 watts.	**Caution**: Total expansion power not to exceed 36 watts.
	* Based on Am5x86 133 MHz Processor	* Based on 200 MHz MMX Pentium Processor
Passive Backplane	Two PC/AT bus ISA length expansion slots One PCI or PC/AT bus ISA length expansion slot	
Mounting	Panel Mount or 19” rack with optional filler plate.	
Flat Panel	10.4" STN passive color display 10.4" TFT active color display 12.1" STN passive color display 12.1" TFT active color display	
Agency Approvals	UL 1950 UL 1604 CUL C22.2, No. 950 CUL C22.2, No. 213	
Regulatory Compliance	FCC 47 CFR. Part 15, Class A CE EMI EN55022: 1994 Class A IMMUNITY EN50082-2:1995 SAFETY EN60950	

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Environmental Specifications

Environmental Specifications

Characteristic	Specification
Temperature	
Operating	0° to 50° C (32° to 122° F) TFT
Non-operating	-20° to 60°C (-4° to 140°F)
Humidity	
Operating	20% to 80% RH non-condensing
Non-operating	20% to 80% RH non-condensing
Altitude	
Operating	Sea level to 10,000 feet (3048 m)
Non-operating	Sea level to 40,000 feet (12192 m)
Vibration*	5 to 2000 Hz
Operating	0.006” (0.15mm) peak to peak displacement 1.0g maximum acceleration
Non-operating	0.015” (0.38mm) peak to peak displacement 2.5 g maximum acceleration
Shock*	
Operating	15g peak acceleration, 11 msec duration
Non-operating	30g peak acceleration, 11 msec duration

** These values are with solid state hard drives and not rotating media drives.*

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Appendix B – Block Diagram

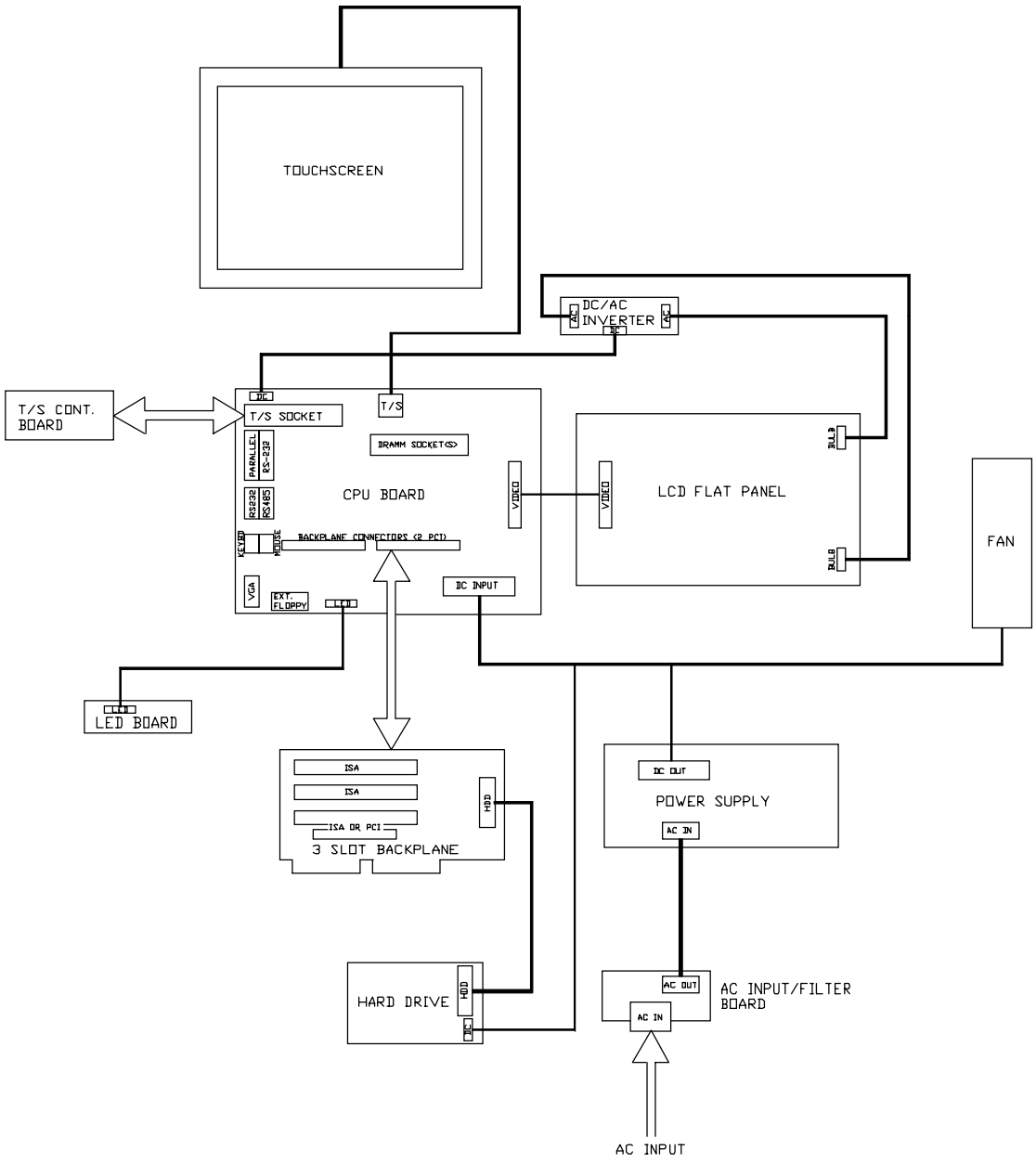


Figure Appendix B -1. 9460/9462 System Block Diagram

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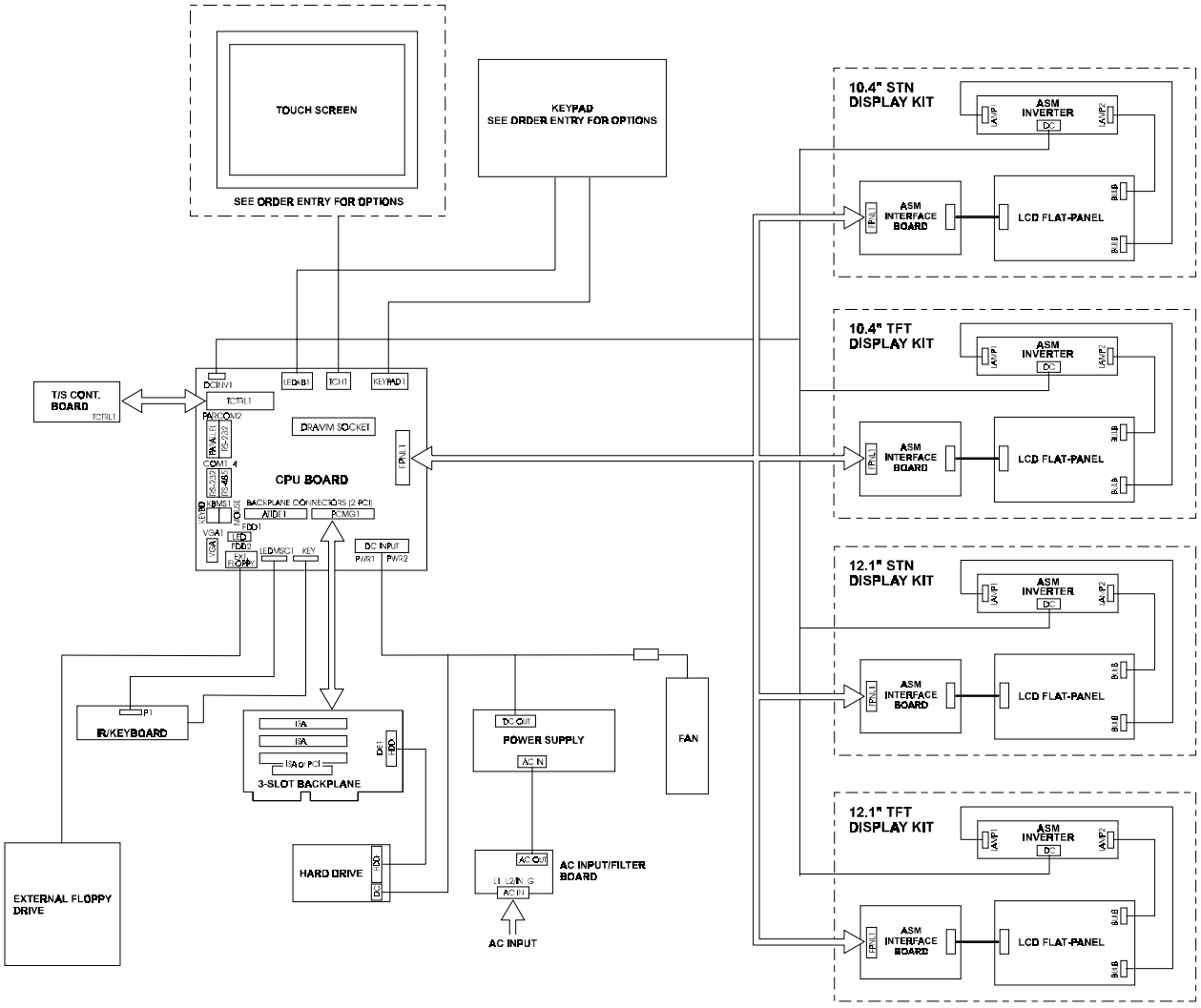


Figure Appendix B -2. 9460KP/9462KP System Block Diagram

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Appendix C – Pinouts

This appendix provides the AHIP4+ and the AHIP5+ pinouts for the keyboard, mouse, LPT1, COM1, COM2, and VGA connectors. The following table defines abbreviations used in this Appendix.

Abbreviation	Definition
NC	No connect

Keyboard Port Connector

This double stacked connector provides an upper and lower connector for the keyboard and mouse port.

Pin	Signal
1	KB_DATA
2	NC
3	GND
4	5VFUSE
5	KB_CLK
6	NC

PS/2 Mouse Port Connector

If the touch screen controller is using the mouse port, this interface is not available.

Pin	Signal
1B	AUX_DATA
2B	NC
3B	GND
4B	5VFUSE
5B	AUX_CLK
6B	NC

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Parallel Port Connector (LPT1)

LPT1 is a 25-pin connector.

Pin	Signal
1A	STROBE
2A	PD(0)
3A	PD(1)
4A	PD(2)
5A	PD(3)
6A	PD(4)
7A	PD(5)
8A	PD(6)
9A	PD(7)
10A	PACK
11A	PBUSY
12A	PE
13A	SELECT
14A	AUTOFEED
15A	PERROR
16A	INIT
17A	SELIN
18A	GND
19A	GND
20A	GND
21A	GND
22A	GND
23A	GND
24A	GND
25A	GND

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Serial Port Connectors

There are two serial ports supported on the AHIP4+ and the AHIP5+ boards.

COM1

COM1 consists of two connectors attached to one logical port. Only one connector can be used at a time either the RS-232 port or the RS-485 port. All termination is done outside the unit.

RS-232

Pin	Signal
1A	DCD1
2A	RXD1
3A	TXD1
4A	DTR1
5A	GND
6A	DSR1
7A	RTS1
8A	CTS1
9A	RI1

RS-485

Pin	Signal
1B	TXD-
2B	TXD+
3B	TXD TERM -
4B	TXD TERM +
5B	GND
6B	RXD-
7B	RXD+
8B	RXD TERM +
9B	RXD TERM -

Note

"A" denotes the lower connector (RS-232) and "B" denotes the upper connector (RS-485).

Note

For TXD termination, connect a 150Ω, ½watt resistor from pin 3B to pin 4B, with pin 1B connected to pin 3B and pin 2B connected to pin 4B. For RXD termination, connect a 150Ω, ½watt resistor from pin 8B to pin 9B, with pin 6B connected to pin 9B and pin 7B connected to pin 8B.

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COM2

COM2 is connected to a 25 pin DB that sits on top of the parallel port.

RS-232

Pin	Signal
1B	ORB_GND
2B	TXD2
3B	RXD2
4B	RTS2
5B	CTS2
6B	DSR2
7B	GND
8B	DCD2
9B	NC
10B	NC
11B	PB_RESET
12B	NC
13B	NC
14B	NC
15B	NC
16B	NC
17B	NC
18B	NC
19B	NC
20B	DTR2
21B	NC
22B	RI2
23B	NC
24B	NC
25B	NC

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VGA Connector

The VGA connector is a 15-pin connector.

AHIP4+

Pin	Signal
1	RED
2	GREEN
3	BLUE
4	NC
5	ORB_GND
6	ORB_GND
7	ORB_GND
8	ORB_GND
9	NC
10	ORB_GND
11	NC
12	NC
13	HSYNC
14	VSYNC
15	NC

AHIP5+

Pin	Signal
1	RED
2	GREEN
3	BLUE
4	NC
5	ORB_GND
6	ORB_GND
7	ORB_GND
8	ORB_GND
9	Fused VCC
10	ORB_GND
11	NC
12	DDCDAT
13	HSYNC
14	VSYNC
15	DDCCLK

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Floppy Connector

The floppy interface supports only Xycom's external floppy option.

Pin	Signal
1	+5V
2	IDX
3	FDS1
4	+5V
5	NC
6	DCHG
7	NC
8	NC
9	NC
10	MO1
11	NC
12	FDIRC
13	NC

Pin	Signal
14	FSTEP
15	NC
16	FWD
17	GND
18	FWE
19	GND
20	FTK0
21	GND
22	FWP
23	GND
24	FRDD
25	GND
26	FHS

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Appendix D – Replacing Flat-Panel Display Bulbs

This appendix describes how to replace the bulbs in your flat-panel display. We recommend you send the flat-panel display to Xycom for bulb replacement. However, if you would like to replace the bulbs on site, refer to the following instructions.

> **Note**
>
> Refer to the label on the back of your unit to determine the flat-panel display model. If you are unsure which instructions to use, call Xycom Customer Support at 800-289-9266.

9460 Units

Kyocera STN Flat-Panel Display (model #KCS6448HSTT-X21)

1. Turn off the power source.
2. Using a small Phillips-head screwdriver, loosen the two protruding captive screws at the top back of the unit, and remove the lid.
3. If a touch screen is installed, disconnect the touch screen cable (TCH1) at the top of the system board.
4. Set the unit with the front panel down and loosen the four captive screws holding the front panel to the display adapter plate.
5. While securely holding the front panel, flip the unit over.
6. Lift off the front panel, and set it aside.
7. Unscrew the four screws that attach the flat-panel display to the standoffs.
8. Disconnect the bulb connectors from the inverter.
9. Gently lift the right side of the flat-panel display, and disconnect the data interface connector (on the left side).
10. Lay the flat-panel display facedown on a protective surface.
11. Referring to Figure Appendix D -1, remove the bulb assembly cover screws. Each cover has two screws.

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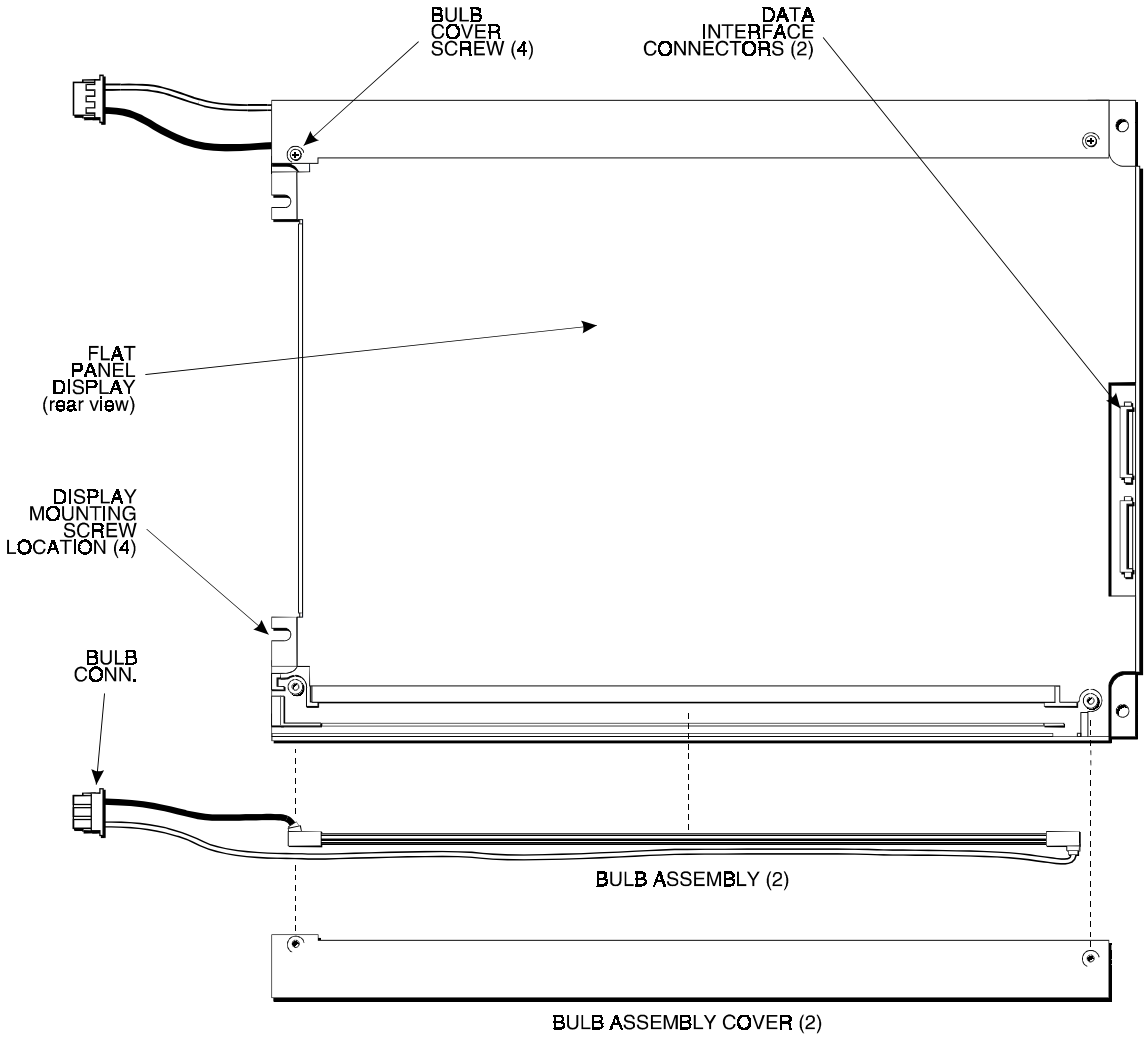


Figure Appendix D -1. Model #KCS6448HSTT-X21 Bulb Assembly

12. Lift the cover. Note how the wiring on the bulb assembly is routed.
13. Pop the wires out of the wire guides and remove the bulb assembly.
14. Insert the new bulb assembly. Use care as the bulbs are very fragile.
15. Route the wiring to the original position.
16. Replace the cover, and insert and tighten the bulb assembly cover screws.

Note

Xycom recommends replacing both bulbs at the same time.

17. Repeat steps 11 through 16 to replace the second bulb assembly.
18. Reverse steps 1 through 10 to reassemble the unit.

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Sharp TFT Flat-Panel Display (model #LQ10D421)

1. Turn off the power source.
2. Using a small Phillips-head screwdriver, loosen the two protruding captive screws at the top back of the unit, and remove the lid.
3. If a touch screen is installed, disconnect the touch screen cable (TCH1) at the top of the system board.
4. Set the unit with the front panel down and loosen the four captive screws holding the front panel to the display adapter plate.
5. While securely holding the front panel, flip the unit over.
6. Lift off the front panel, and set it aside.
7. Unscrew the four screws that attach the flat-panel display to the standoffs.
8. Disconnect the bulb connectors from the inverter.
9. Locate the bulb assembly on the left, outside edge of the flat-panel display.
10. Referring to Figure Appendix D -2, insert a flat-bladed screwdriver in the opening at the end of the bulb assembly, and push up until the bulb assembly releases.

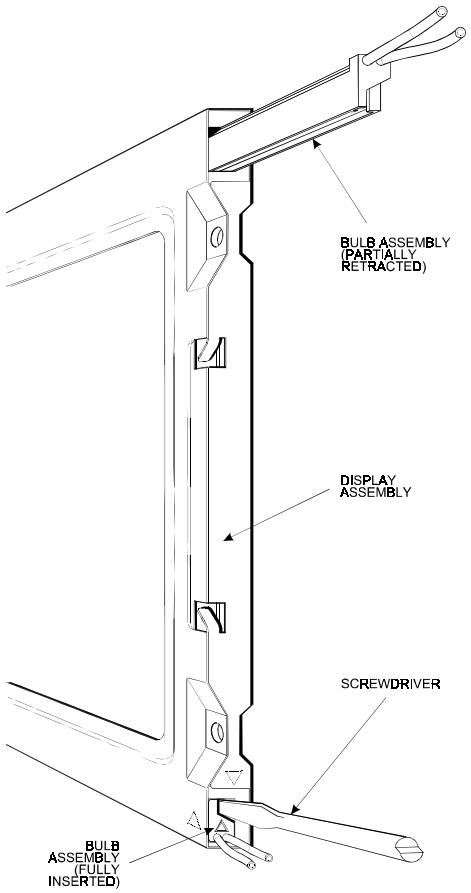


Figure Appendix D -2. Model #LQ10D421 Bulb Assembly

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11. Slide out the bulb assembly.
12. Slide the new assembly into the opening from which the old assembly was removed.

> **Note**
>
> Xycom recommends replacing both bulbs at the same time.

13. Repeat steps 10 through 12 to replace the bulb assembly on the right, outside edge of the flat-panel display.
14. Reverse steps 1 through 8 to reassemble the unit.

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Mitsubishi TFT Flat-Panel Display (Model #AA12SB6C-ADFD)

1. Turn off the power source.
2. Using a small Phillips-head screwdriver, loosen the two protruding captive screws at the top back of the unit, and remove the lid.
3. If a touch screen is installed, disconnect the touch screen cable (TCH1) at the top of the system board.
4. Set the unit with the front panel down and loosen the four captive screws holding the front panel to the display adapter plate.
5. While securely holding the front panel, flip the unit over.
6. Lift off the front panel, and set it aside.
7. Unscrew the four screws that attach the flat-panel display to the standoffs.
8. Disconnect the bulb connector from the inverter card.

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9. Gently lift the right side of the flat-panel display, and disconnect the data interface connector.
10. Lay the flat-panel display faceup on a flat surface.
11. Referring to Figure Appendix D -3, remove the five smaller bezel mounting screws.

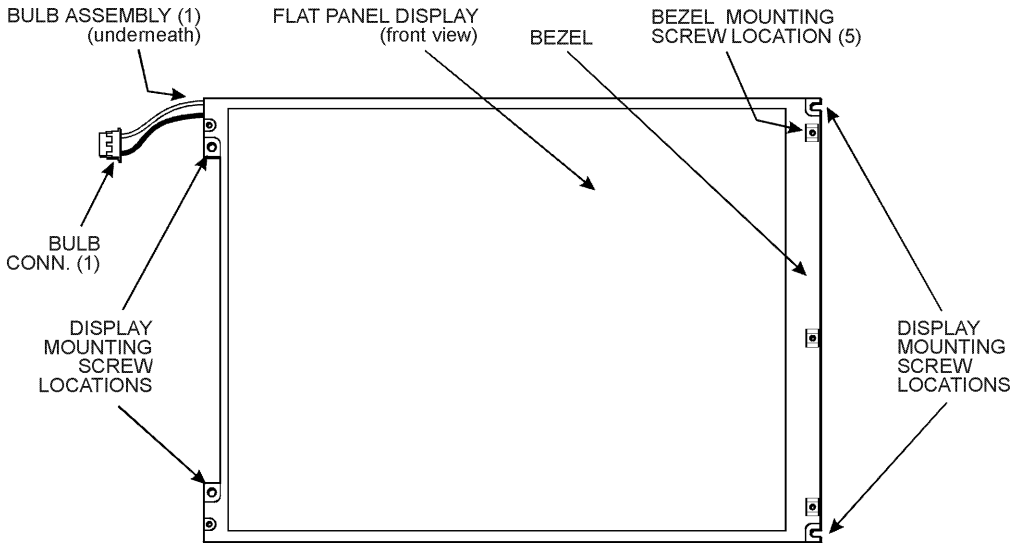


Figure Appendix D -3. Model #AA12SB6C-ADFD Bulb Assembly - Front View

12. Turn the display facedown on a protective surface.
13. Remove the metal tape holding the bulb assembly cover.
14. Referring to Figure Appendix D -4, remove the bulb assembly cover and bend back the foil reflector to expose the bulb assembly.

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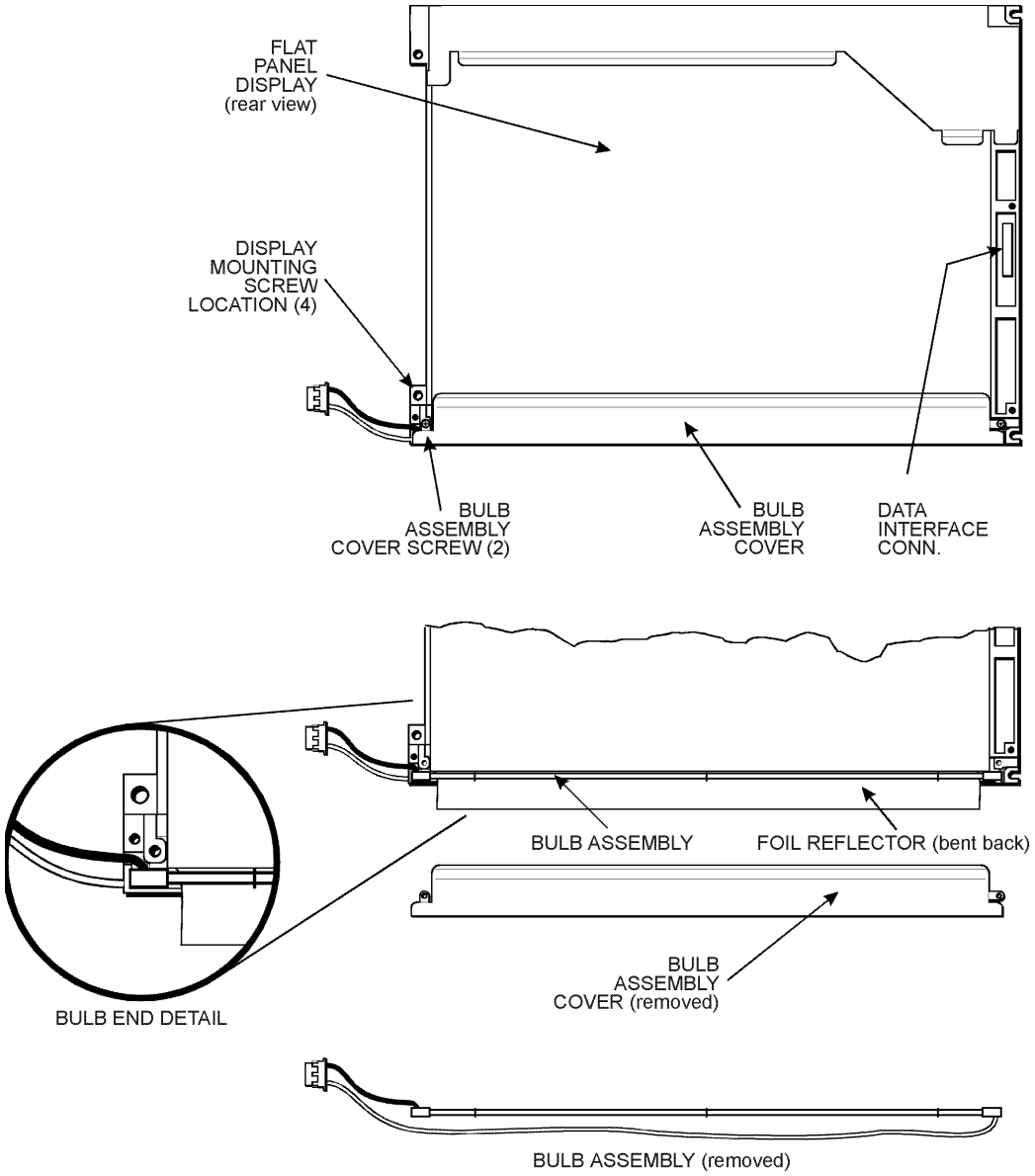


Figure Appendix D -4. Model #AA12SB6C-ADFD Bulb Assembly - Rear View

15. Because the white wire runs under the bulb assembly, detach the rear of the display from the front with a small flat-bladed screwdriver.
16. Lift the rear display panel section to expose the full bulb assembly. Note how the wiring on the bulb assembly is routed.
17. Pop the wires out of the wire guides and remove the bulb assembly.
18. Insert the new bulb assembly. Use care as the bulbs are fragile.
19. Route the wiring to the original position.
20. Cover the bulb assembly with the foil reflector, and replace the bulb assembly cover.
21. Repeat steps 1 through 12 to reassemble the unit.

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Kyocera STN Flat-Panel Display (Model #KCB8060BSTT-X4)

1. Turn off the power source.
2. Using a small Phillips-head screwdriver, loosen the two protruding captive screws at the top back of the unit, and remove the lid.
3. If a touch screen is installed, disconnect the touch screen cable (TCH1) at the top of the system board.
4. Set the unit with the front panel down and loosen the four captive screws holding the front panel to the display adapter plate.
5. While securely holding the front panel, flip the unit over.
6. Lift off the front panel, and set it aside.
7. Unscrew the four screws that attach the flat-panel display to the standoffs.
8. Disconnect the bulb connectors from the inverter.
9. Gently lift the right side of the flat-panel display, and disconnect the data interface connector (on the left side).
10. Lay the flat-panel display facedown on a protective surface.
11. Referring to Figure Appendix D -5, depress the tab at the end of the bulb assembly to release it.

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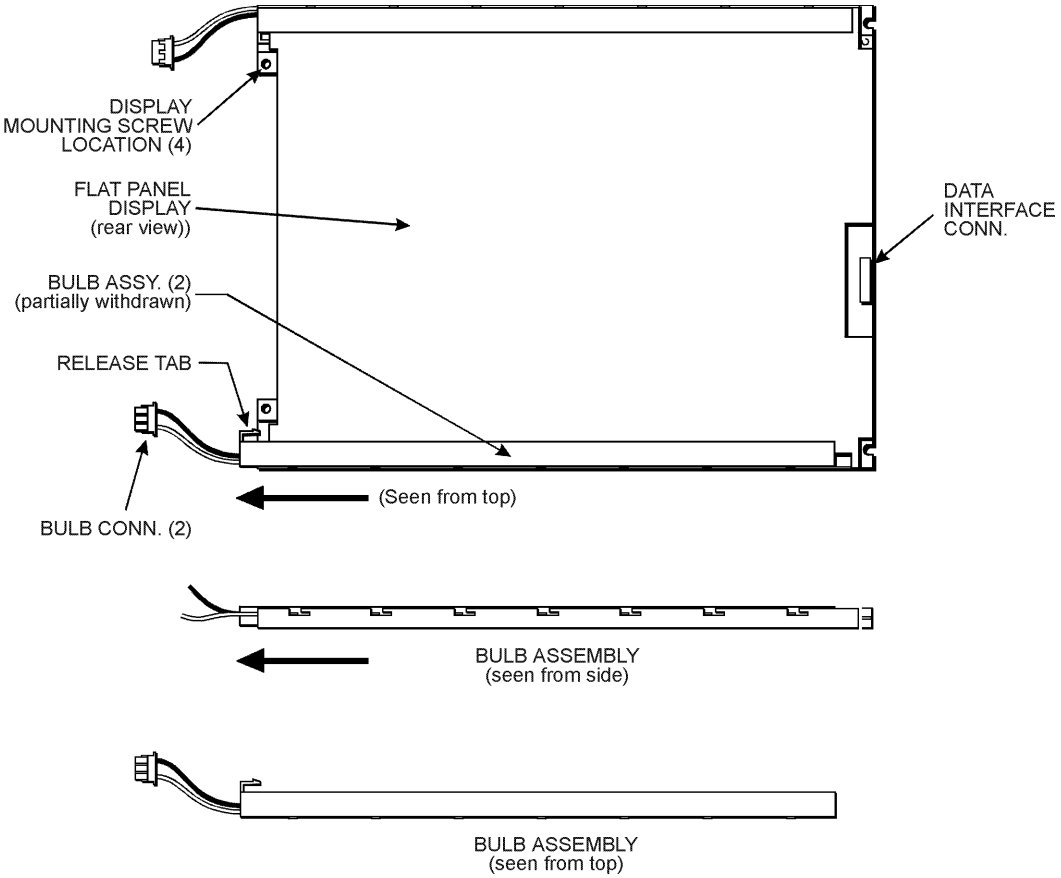


Figure Appendix D -5. Model #KCB8060BSTT-X4 Bulb Assembly - Rear View

12. Slide the bulb assembly out until it disengages from the notches, and then lift it out of the display.
13. Insert the new bulb assembly by placing it over the notches and sliding it until the release tab locks.

Note

Xycom recommends replacing both bulbs at the same time.

14. Repeat steps 11 through 13 to replace the second bulb assembly.
15. Reverse steps 1 through 9 to reassemble the unit.

Note

When reconnecting the bulb connectors, route them inside the standoffs before connecting them to the inverter board. If you do not, you may not be able to attach the front panel to the display adapter board.

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Sharp 12.1" TFT Flat-Panel Display (Model #LQ12S41)

1. Turn off the power source.
2. Using a small Phillips-head screwdriver, loosen the two protruding captive screws at the top back of the unit, and remove the lid.
3. If a touch screen is installed, disconnect the touch screen cable (TCH1) at the top of the system board.
4. Disconnect the KEYPAD1 and LEDKB1 cables.
5. Set the unit with the front panel down and loosen the four captive screws holding the front panel to the display adapter plate.
6. While securely holding the front panel, flip the unit over.
7. Lift off the front panel, and set it aside.
8. Unscrew the four screws that attach the flat-panel display to the standoffs.
9. Disconnect the bulb connectors from the inverter.
10. Gently lift the right side of the flat-panel display, and disconnect the data interface connector (on the left side).
11. Lay the flat-panel display facedown on a protective surface.

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12. Referring to Figure Appendix D -6, pull the tab on the bulb assembly toward you until it releases, and then slide the assembly out.

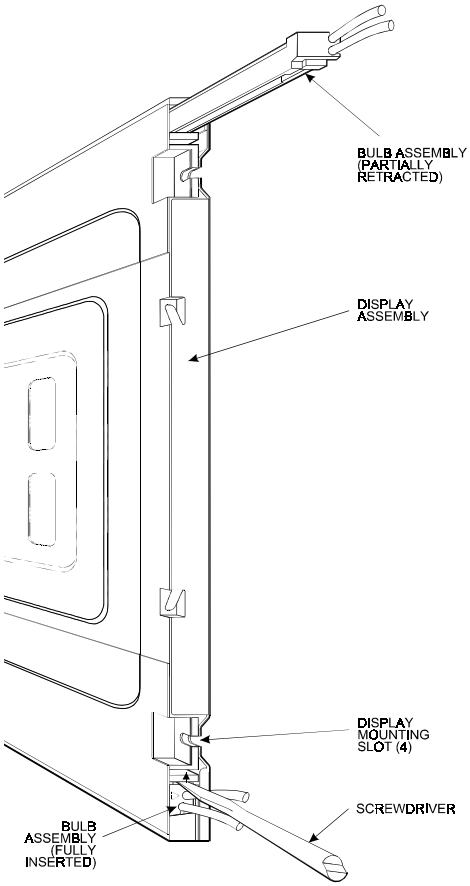


Figure Appendix D -6. Model #LQ12S41 Bulb Assembly

13. Insert the new bulb assembly, and push in until the tab locks in place.

Note

Xycom recommends replacing both bulbs at the same time.

14. Repeat steps 12 and 13 for the second bulb assembly.
15. Reverse steps 1 through 10 to reassemble the unit.

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