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3500 Series Flat Panel Industrial PC

with 6-slot ISA/PCI Expansion

P/N 350006(D)

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Printed in the United States of America

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Revision	Description	Date
A	Manual Released	4/99
B	Added 3515KPM	1/00
C	Updated Bulb Replacement Instructions	11/00
D	Touchscreen Updates	7/02

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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.

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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. For systems other than Pentium II logic board (AHIP6+): 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 AUTOMATION 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 AUTOMATION. 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 One – Introduction

Product Overview

The 3500 series of flat panel industrial PCs with 6-slot ISA/PCI expansion include the 3515, 3515T, 3515KPM, and 3512KPM models. These industrial PCs offer a powerful, compact package for the factory floor and other harsh environments. The 3515 is an industrial PC with a display only (touchscreen optional). The 3512KPM and 3515KPM is an industrial PC with a display, integrated keypads, and an integrated mouse.

They feature an open architecture to meet a wide variety of applications that require both a powerful PC and a durable industrial front panel. The PCs integrate a computer card cage, mass storage, display, and power supply in a truly industrial form. Their modular design allows easy access to expansion boards, jumpers, power supply, flat panel display, and disk drives.

The front panel of every model is sealed to NEMA 4/4X/12, and the flat panel display is protected by an impact-resistant shield.

Standard Features

With AHIP6+ board

- Pentium® III technology
- PCI 64 bit video controller, 2 MB video RAM
- PCI local-bus IDE controller
- Two 168-pin SDRAM DIMMs that support 32, 64, 128, and 256 MB options
- Two USB ports
- 100MHz front side bus with Pentium III processors

With AHIP370+ board

- Celeron ® technology
- AGP 64 bit video controller, 2 MB video RAM
- PCI local-bus IDE controller
- Two 168-pin SDRAM DIMMs that support 32, 64, 128, and 256 MB options
- Two USB ports

On all units

Two serial COM ports

- COM 1
  - RS-232 or RS-485 (DB9 connector)
  - RS-232 (DB25 connector)

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- Flat panel display
  - 15-inch flat panel, 1024x768 resolution (3515T and 3515KPM)
  - 12.1-inch flat panel, 800x600 resolution (3512KPM)
- Parallel port
- VGA port
- Flash BIOS
- 9-inch mounting depth
- 3.5-inch internal, side access floppy drive
- Six AT-bus full-length expansion slots
  - Five ISA slots
  - One PCI or four ISA slots
  - Two PCI slots (4.8” maximum length with AHIP6+ board)
- IR Port (IrDA and ASKIR compatible)
- Rear PS/2 keyboard port and AUX port (also a front PS/2 keyboard port on 3512KPM and 3515KPM)
- Status LEDs
  - Power
  - Disk
  - Com
  - Input
- 3.5-inch internal IDE hard drive
- MS-DOS®
- Front panel sealed to meet NEMA 4/4X/12 specifications when panel mounted in a suitable fire and electrical enclosure.
- Approved for use in Class I, Division 2 hazardous locations
- Autosensing AC power supply
- Side power connector with retainer bracket

Optional Features

- Touchscreen resistive technology with less than 1.5% linearity error
- Higher capacity IDE hard drives and solid state drives
- 3512KPM
  - 40 relegendable function keys (80 with the F/A function)
  - Numeric, PC control, and alpha keypads
  - Integrated mouse
- 3515KPM
  - 40 relegendable function keys (80 with the F/A function)
  - Numeric, PC control, and alpha keypads
  - Windows start menu and pop-up menu keys
  - Integrated mouse

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- Flat-panel display
  - 15.0-inch TFT flat panel (3515 and 3515KPM)
  - 12.1-inch TFT flat panel (3512KPM)
- CD-ROM (internal)
- Pre-installed PCI 10/100 Base-T Ethernet card
- External floppy drive 9000-EXF
- Front mount floppy kit 9000-FFK
- Front access panel for floppy port and keyboard port 9000-FKA
- Preloaded Microsoft Windows 95 or Windows NT® operating system

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.

- 3515, 3515KPM, or 3512KPM unit
- AC power connector
- Power connector retainer bracket with AC power supply
- Sixteen 10-32 hex nuts (2 spares)
- Clip-on Ferrite for AUX cables
- Documentation kit, which includes:
  - Diagnostic software disk (only on units shipped with DOS)
  - VGA utility disk
  - 3515/3512KPM manual
  - CPU manual
  - Business reply card

If you ordered the system with a touchscreen installed, you will also receive a touchscreen driver disk and manual. If you ordered a CD-ROM installed, you will receive the driver disk. If you ordered a 3512KPM or 3515KPM, you will receive a mouse disk and manual. If you ordered the system with an Ethernet card you will receive a driver disk.

Quick Start-up

This section provides the steps to get your unit 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 the outside of the computer.

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Perform the following steps to prepare the system for use.

1. Attach an 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 a 24 VDC outlet, whichever applies (Refer to the Creating a Power Cable section in Chapter 3 for more information.)
4. Turn on the power to the unit. Depending on your operating system, one of the following will occur:
   - In DOS, the system will boot up at the C: prompt
   - In Windows 95 or Windows NT the License Agreement will be displayed
5. Install application software via the floppy, a network connection, the IR port, or a CD-ROM.

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Chapter Two – Testing

On units with MS-DOS installed, diagnostic tests are provided as a tool to verify the operation of 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 Automation's Product Repair & Customization Department (see Chapter 5).

> **Note**
>
> Remove any device drivers or memory resident programs (TSRs) installed on the system before running Xycom Automation diagnostic tests. If you do not, unexpected failures may occur.
>
> The diagnostic disk does not provide an option to test a CD-ROM drive.

Make sure the BIOS setup menus are configured properly (factory set configuration).

To enter the BIOS setup menus,

1. Press F2 after the POST RAM test has completed.
2. Make the necessary changes by following directions on the screen.
3. Press ESC.
4. Press ENTER twice to save the settings and exit the BIOS setup menus.

Refer to your CPU manual for more information on the BIOS setup menus.

Preparing for the Tests

You need the following equipment to test your system:

- Floppy disk drive
- Xycom Automation System Test Disk (3.5-inch, DS/DD bootable disk, Xycom Automation part number 99290-001)
- Centronics-compatible printer cable
- Parallel printer (Centronics-style interface)
- Two serial loopback test connectors (refer to Figure 2-12-1 for pinouts)
- Formatted 3.5-inch, DS/HD disk (1.44 MB)
- IBM PC/AT or PS/2 compatible keyboard

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Perform the steps below 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 illustrates the wiring necessary for the loopback connection.
4. Default the CMOS setup to the factory settings.

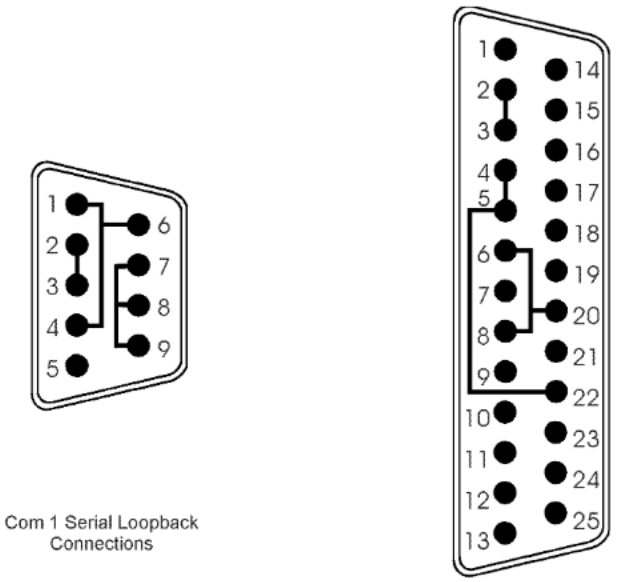


Figure 2-1. Serial Loopback Connections

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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.

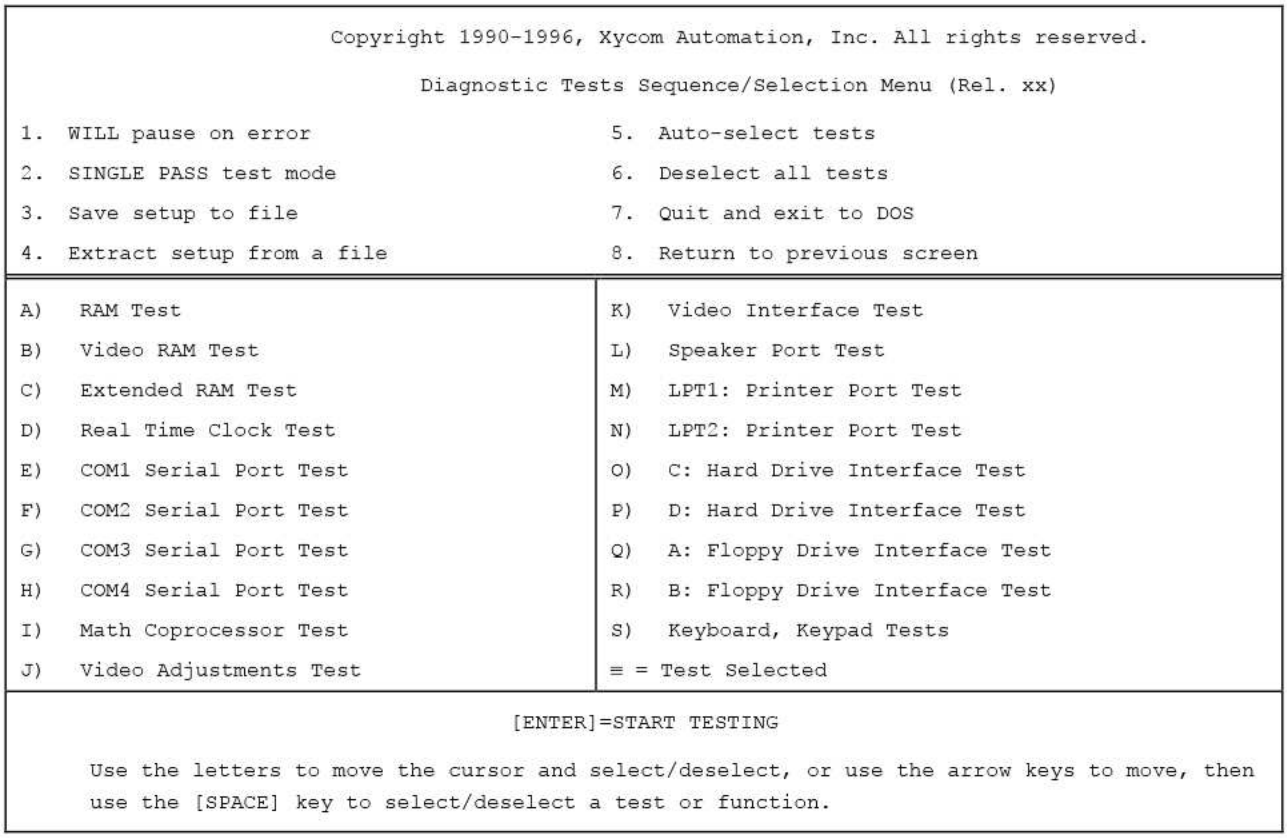


Figure 2-2. Main Menu

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 Three - Installation

System Components

This section describes the components on the unit to help you locate features relevant to installation.

3515 Front Panel

The 3515 comes with a NEMA 4/4X/12 and IP65 sealed front panel with a TFT (Figure 3-3) display. The panel protects the system's interior when the system is properly panel mounted.

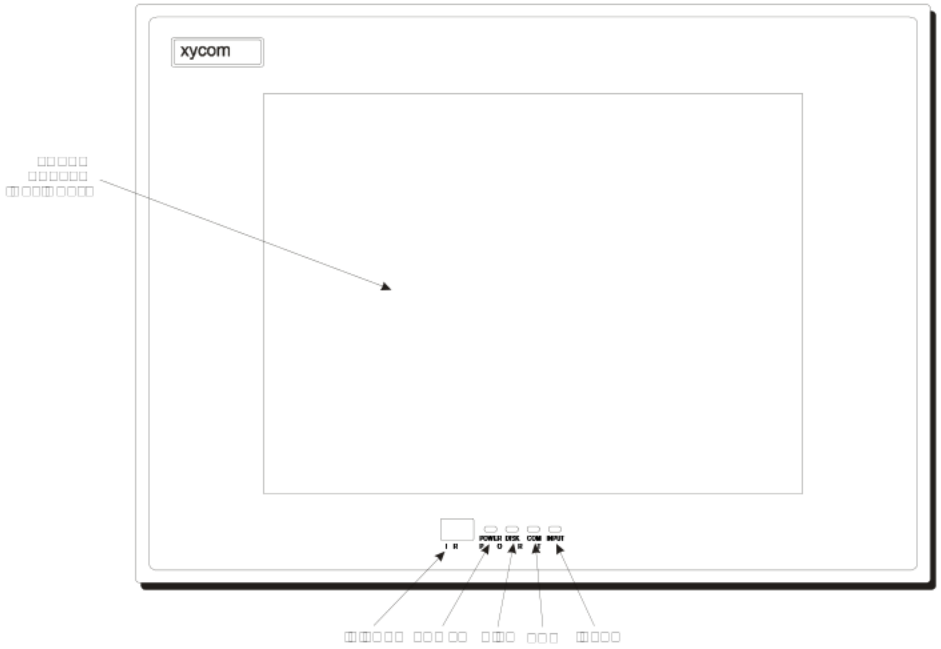


Figure 3-1. 3515 TFT Active Display Front Panel

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Feature	Description
Display	The 3515 comes standard with a 15-inch TFT flat panel. Impact-resistant shields protect the displays from breakage. If a touchscreen is factory installed, the touchscreen is backed by heat-annealed safety glass replacing the impact-resistant shield.
System Status LEDs	The 3515 features four status LEDs on the front panel, which you can use to monitor system operation. Power There is power to the 3515. Disk The computer module is accessing the disk drive. COM There is communication activity on one of the computer module's serial ports, including communication between the computer module and the touchscreen (if on COM2) or a serial device. Input The unit has a touchscreen and the LED gets brighter when touch input is detected. 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 3515 IR port is IrDA, and ASK-IR compliant. You can connect the 3515 to any IrDA compatible device, if you load special software (not included). The infrared (IR) link operates at a distance of 0 to 1 meter and is capable of 115 Kbaud transfer rates. Enable the interface through the BIOS setup menus. *Note: When the IR port is chosen, COM2 is not available. Correspondingly, if COM2 is in use by the touchscreen the IR is not operational.*

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3512KPM and 3515KPM Front Panel

The 3512KPM (Figure 3-2) and 3515KPM (figure 3-3) comes with a NEMA 4/4X/12 sealed front panel. The panel protects the system's interior when the system is properly panel mounted.

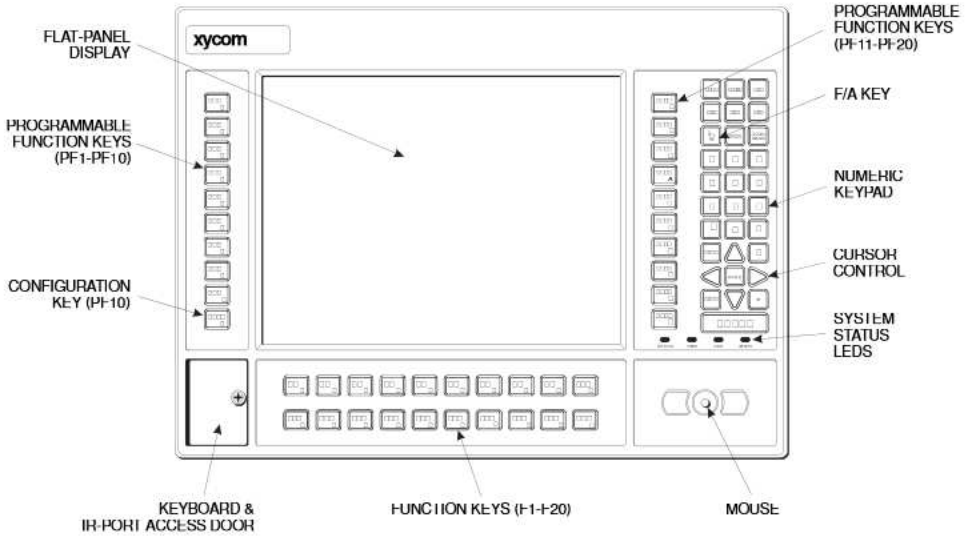


Figure 3-2 3512KPM Front Panel with Keypad

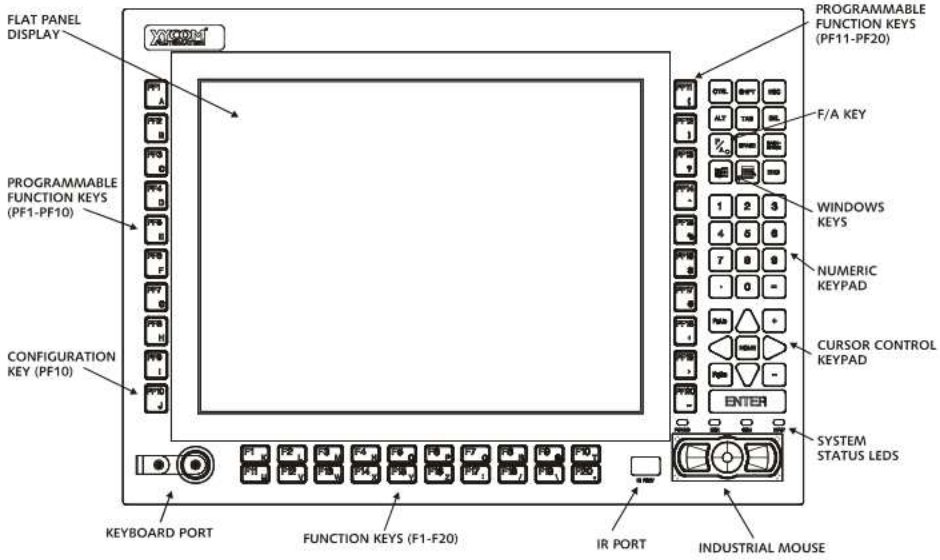


Figure 3-3. 3515KPM Front Panel with Keypad

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Feature	Description
Display	The 3512KPM comes standard with a 12.1-inch TFT flat panel. The 3515KPM comes standard with a 15-inch TFT flat panel. Impact-resistant shields protect the display from breakage. If a touchscreen is factory installed, the touchscreen is backed by heat-annealed safety glass replacing the impact-resistant shield.
System Status LEDs	You can use LEDs on the front panel to monitor system operation. Power Lit when there is 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 touchscreen (if on COM2) or a serial device. Input Lit when the unit has a touchscreen; the LED gets brighter when a touch input is detected or a key is pressed. F/A key Lit when alpha characters are being returned. During power-up, firmware on the processor board checks the hardware configuration against the configuration stored in the CMOS memory.
Function and User-Defined Keys	The 40 relegendable function keys (80 using the F/A key) provide easy access to familiar routines. (The F/A key 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 data entry keypads are for entering data and moving the cursor.
Windows keys (3515KPM only)	These keys access the start menu and pop-up menus in the Windows NT or 95 operating system.
F/A Key	When the LED is lit, alpha characters are returned.
PF10 Key (Keypad Configuration)	This key configures your keypad.
Keyboard Port (front access)	The 3512KPM and 3515KPM support one PS/2 keyboard, located on the lower left side of the front panel. On the 3512KPM the port is behind an access door. When using this port, the side port cannot be used.
Mouse	The built-in pointing device is located on the right-hand side of the front panel. It operates in the same manner as a conventional mouse. Refer to the mouse diskette and manual supplied with your documentation kit. This mouse consists of three basic parts: Left mouse key Serves the same function as the left button on a conventional mouse. Mouse dome Moves the pointer around the screen. Press the edge of the dome that corresponds to the direction in which you wish to move the pointer. Right mouse key Serves the same function as the right button on a conventional mouse.

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I/O Panel

Figure 3-4 illustrates the I/O Panel on the right side of the 3515 and 3512KPM.

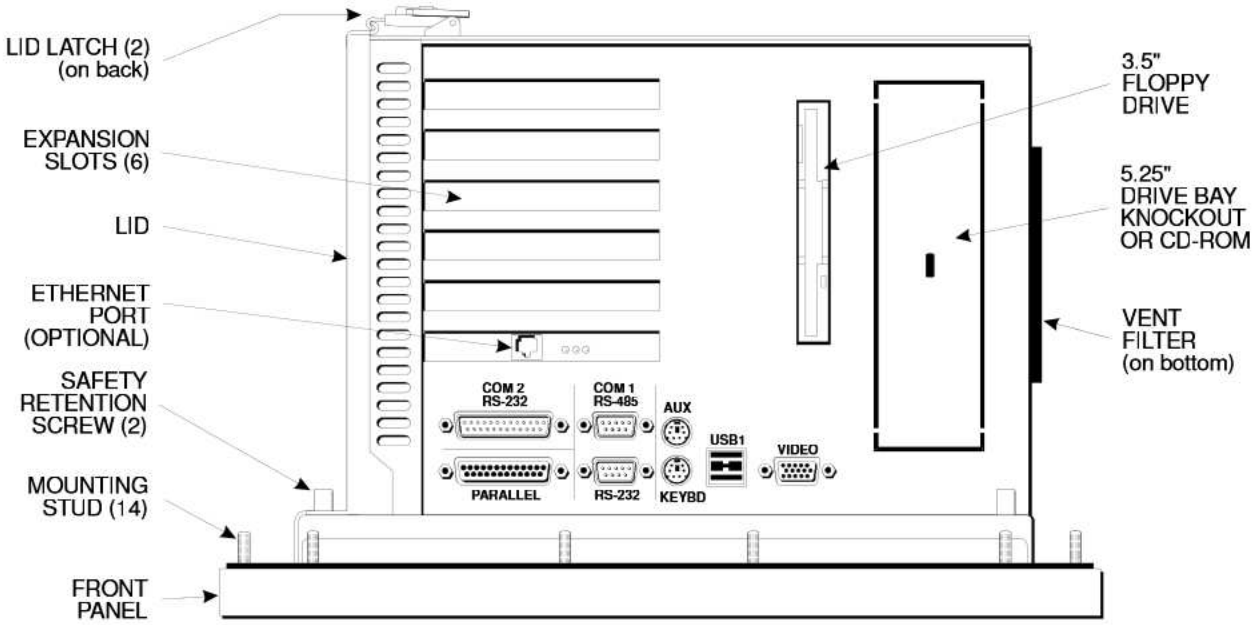


Figure 3-4. 3515/3512KPM I/O Panel

Feature	Description
Parallel Port	The parallel printer port (LPT1) is a stacked 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 consists of two connectors (RS-232 and RS-485) attached to one logical port. Only one connector can be used at a time. COM2 consists of one connector (RS-232).
Keyboard Port	The keyboard port is a PS/2 stacked mini-din that allows you to attach a PC/AT keyboard at the side of the unit. Do not use in a hazardous environment. Note: *You cannot use both keyboard ports on units that have more than one keyboard port.*
USB Port	USB (Universal Serial Bus) is a "plug-and-play" interface between a computer and add-on devices (such as audio players, joysticks, keyboards, telephones, scanners, and printers). With USB, a new device can be added to your computer without having to add an adapter card or even having to turn the computer off. USB supports a data speed of 12 megabits per second. This speed will accommodate a wide range of devices, including MPEG-2 video devices, data gloves, and digitizers.

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Feature	Description
AUX Port	The AUX port is a PS/2 stacked mini-din that allows you to attach a serial device (such as a mouse) at the side of the unit. The AUX port is the upper connector. If you receive a unit with a touchscreen, this port is covered with a label stating that the port is not functional as shipped. Note: *The AUX port is not available on the 3512KPM or 3515KPM. Also, when MS-DOS is installed, the touchscreen on the 3515T is factory configured for the AUX port. Plugging in a serial device while the touchscreen is attached will cause an error message during boot up and neither device will work. The touchscreen must be reconfigured for use on COM2 for the AUX port to be functional.*
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 disabled when shipped. 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. To use both a video display on the video port and the flat panel display, you must enable "Simultaneous Video" (only available on the TFT version) on the Advanced Menu in the BIOS setup menus. Refer to the CPU manual for details.
CD Drive (Optional)	There is a 5¼-inch drive-bay knockout for a CD drive. Caution: If you have a CD-ROM installed, use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.
Floppy Drive	The 3.5-inch internal floppy drive is on the I/O side. The systems have a front mounted external floppy drive option and a front mounted floppy/keyboard access option. Do not order the unit with an internal floppy drive if you want to use these options.
Expansion Slots	There are six slots available: five ISA slots, one PCI bus expansion slot or four ISA, and two PCI bus expansion slots. Note: *If the optional Ethernet card is installed, only five slots are available.*
Ethernet Port (optional)	The Ethernet port provides a 10BASE-T/100BASE-TX auto sensing Ethernet connection.

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Back Panel

Figure 3-5 illustrates the system's back panel.

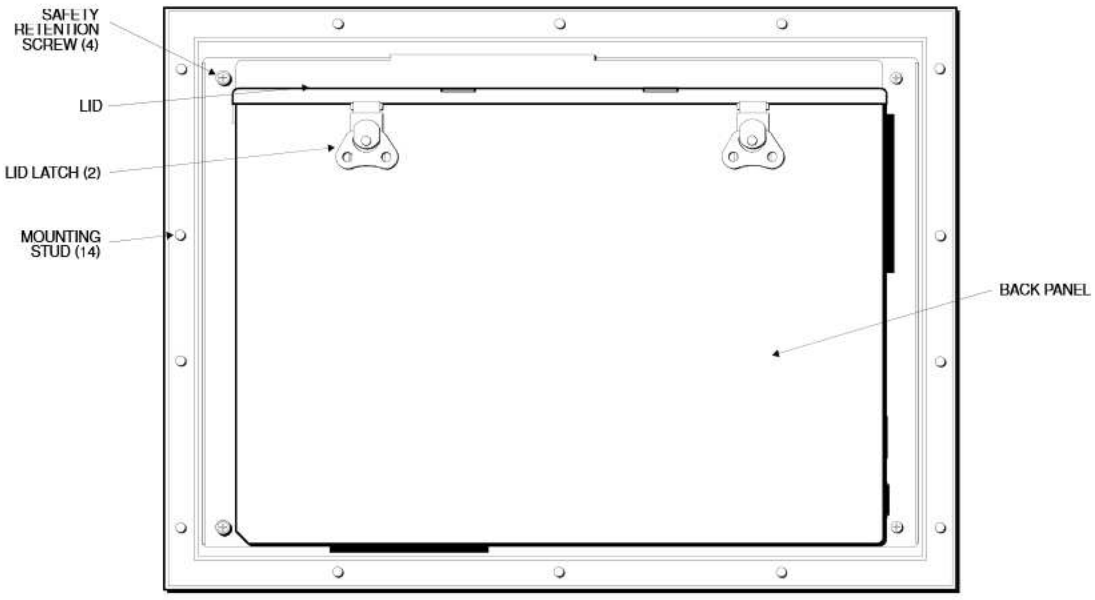


Figure 3-5. Back Panel

Note

If your system has a touchscreen, keypad, keypad LED, or mouse cable, disconnect the cable(s) from the CPU board before removing the back of the unit from the front bezel.

To remove the lid, lift the two latches along the top of the back panel.

To remove the front panel, use a Phillips-head screwdriver and remove the four screws located in the top and bottom corners (refer to Figure 3-5).

Bottom Panel

The features on the bottom panel are listed below.

Feature	Description
Product ID Label	The product ID label is located on the back panel. This label contains the model number and serial number of the unit.
Vent and Filter	The bottom of the unit contains a vent and filter for circulation. This aids in the cooling of the internal components.

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Power Panel

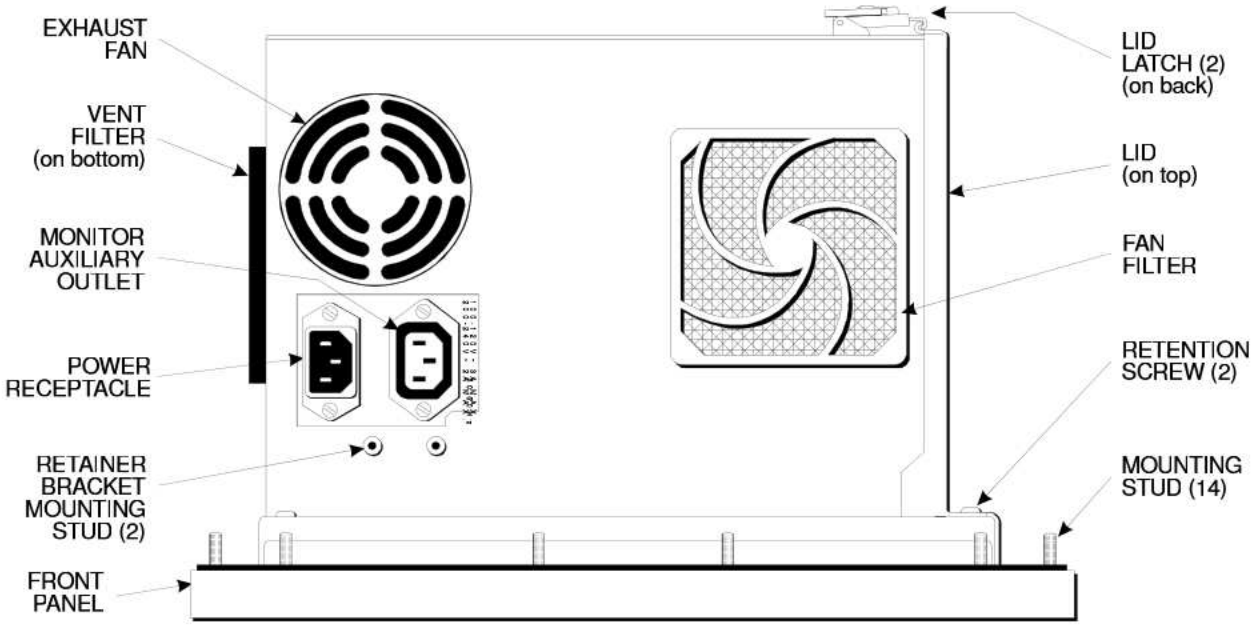


Figure 3-6. Unit with AC Power Supply

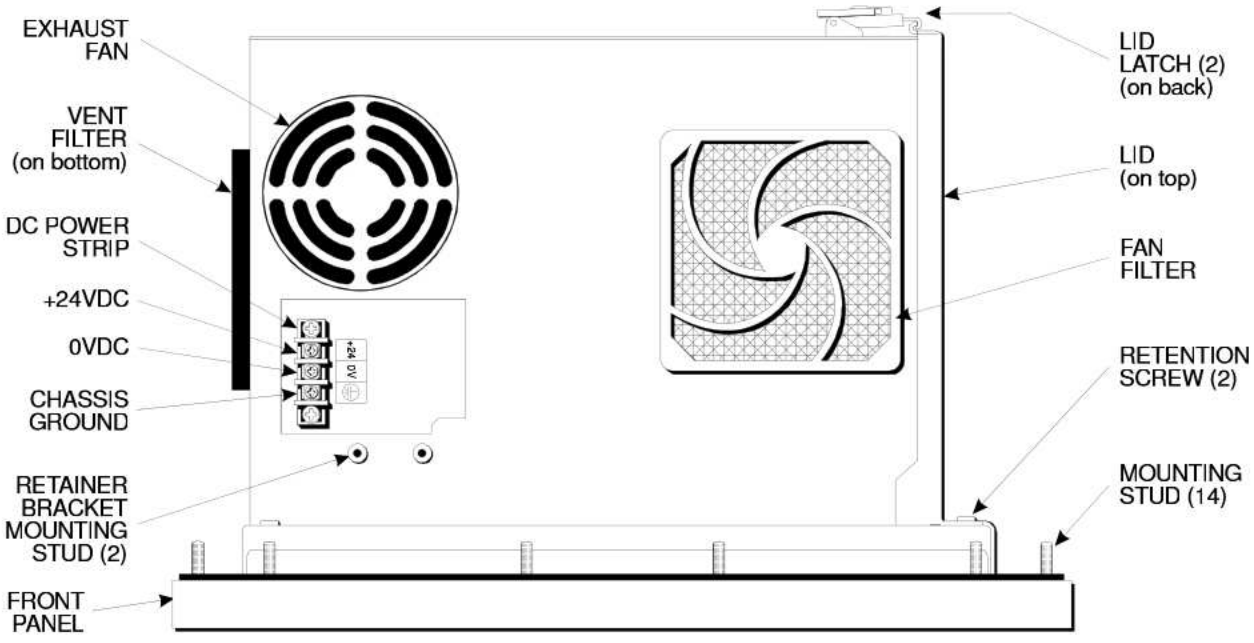


Figure 3-7. Unit with DC Power Supply

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Feature	Description
Power Receptacle	The AC power receptacle is a three-pin connector on the left side of the unit; the DC power supply uses a terminal block.
Monitor Auxiliary Power Outlet	The outlet is intended for use only in testing situations, outside hazardous locations, and is covered by a retainer bracket for safety reasons. Note: *A flat panel display and a CRT cannot be used simultaneously on a display. Simultaneous video is only available on TFT systems with the "Simultaneous Video" utility program, or configured in the BIOS setup menus.*.
Retainer Bracket (AC) or P-Clamp (DC)	With an AC power supply, this bracket can be screwed into the two studs, as shown in 3-21, to retain the power connector and to cover the Monitor Auxiliary outlet. If an optional DC power supply is installed, use the P-Clamp to provide power cord strain relief. Warning: Absence of this bracket may result in a disengaged power connector. If this occurs, an explosion may result in a hazardous environment.
Fan and Filter	The fan and filter, located on the left side panel, are cooling system components. The filter is replaceable and can be removed for cleaning.
Exhaust Fan	The exhaust fan is a cooling system component.
Vent Filter	The vent and filter is a cooling system component to allow air to circulate.

Installation Options

This section describes how to install internal and external hardware options.

Internal Hardware Options

Caution

Turn off the unit and remove power before installing internal hardware.

To install internal hardware options unlatch and remove the lid.

SDRAM and Additional SDRAM Dual In-Line Memory Modules (DIMMs)

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

PC/AT or PCI Boards

1. Check that the memory and I/O configuration of the board you want to install do not conflict with the CPU and I/O memory maps in your CPU board manual.
2. Using the two latches, remove the lid.
3. Remove the ORB screw and blank ORB from the desired track.

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4. Slide the PC/AT or PCI 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 and relatch the lid.

> **Caution**
>
> On Pentium II equipped units, do not block the CPU fan when installing a card in the slot closest to the processor. The processor may overheat.

External Hardware Options

The 3515 and 3512KPM supports front access to keyboard and floppy drive connectors with the 9000-FKA kit and front access to an externally mounted floppy drive with the 9000-FFK kit.

> **Warning**
>
> To maintain a safe condition, do not use an external keyboard or mouse or USB port devices when the unit is operating in a hazardous environment.

Externally Mounted Floppy Drive

The connector for the external floppy is mounted in the location of the internal floppy bay. Since the 3515/3512KPM supports one floppy drive, you cannot use the external floppy option if the unit has an internal floppy drive.

The floppy drive access door is provided for installations using the filler with cutout, or panel mount installations that provide a cutout for the front mounted floppy drive. See Figure 3-8 for cutout dimensions.

> **Note**
>
> Make sure the floppy drive cable reaches the floppy connector on the unit before making the cutout.

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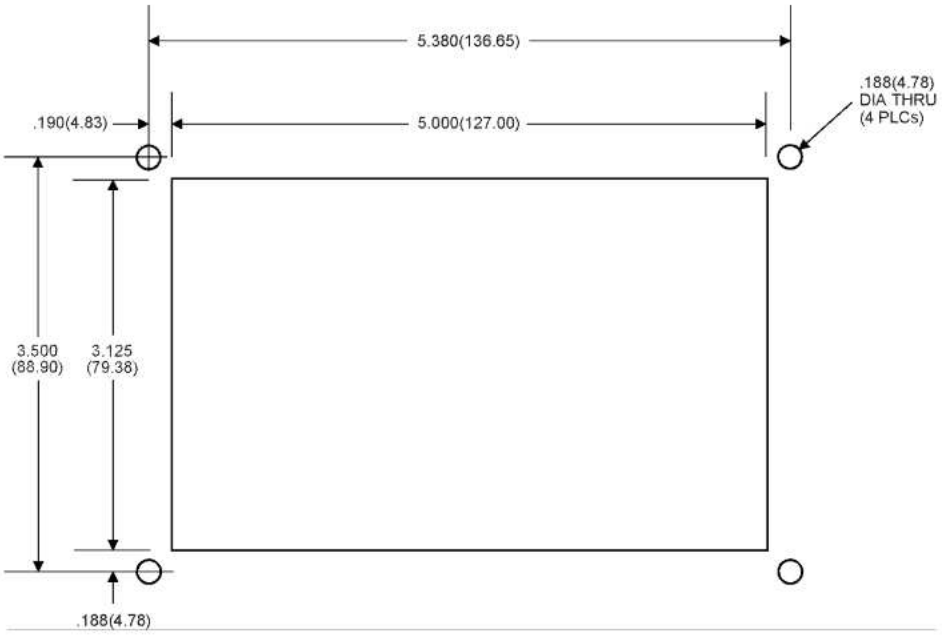


Figure 3-8. Front Mounted Floppy Cutout Dimensions

Mount the floppy drive access door to the filler plate or the panel, using the four mounting nuts as shown in Figure 3-9. Torque the nuts to 35 in/lb. (3.95 Newton Meters).

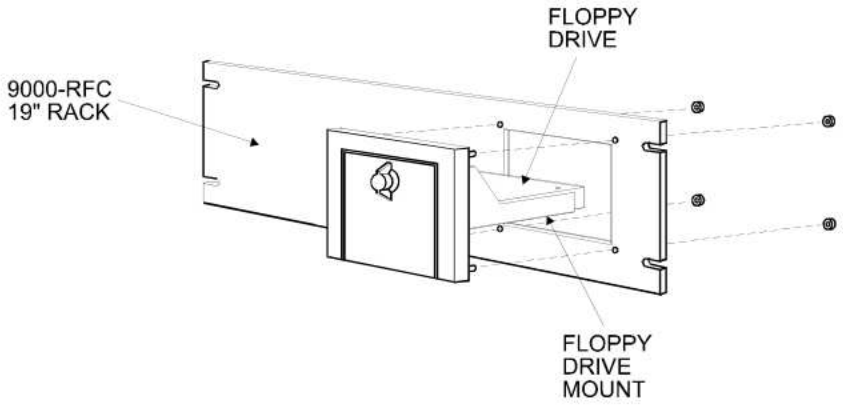


Figure 3-9. Floppy Drive - Front Mounting Option

Figure 3-10 shows an overhead view of the Front Floppy Kit with the floppy drive mounted into the rack.

Note

Do not attach the drive with a disk installed to avoid corrupting a disk when using the external floppy drive.

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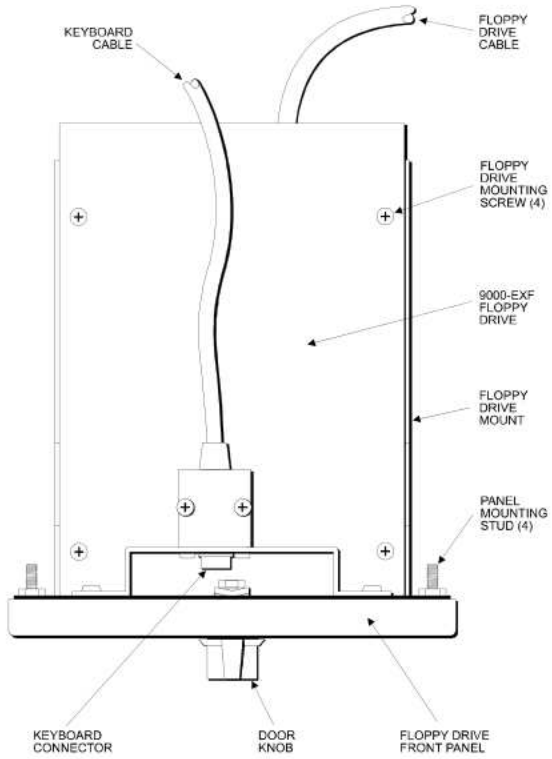


Figure 3-10. Floppy Drive - Front Mounting Option (top view)

Front Access Keyboard and Floppy Connectors

You can access these keyboard and floppy drive connectors with the 9000-FKA kit in installations that provide a cutout for the front mounted connections, you must install the 9000-FKA kit. The kit's keyboard cable connects to a PS/2 stacked mini-din located on the side of the unit. The floppy drive cable connects to a port mounted in the internal floppy bay. Since the 3500 series only supports one floppy drive, you cannot use the external floppy option if the unit has an internal floppy drive. See Figure 3-11 for cutout dimensions.

Note

Make sure the keyboard and floppy drive cables reach the ports on the unit before making the cutout.

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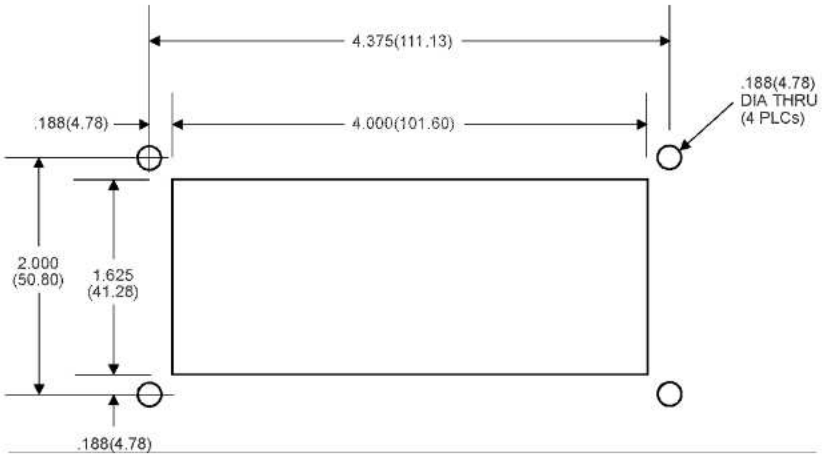


Figure 3-11. Front Mounted Connectors Cutout Dimensions

Mount the front floppy and keyboard access kit to the plate or the panel as shown (3-12). Torque the nuts to 35 in/lb. (3.95 Newton Meters).

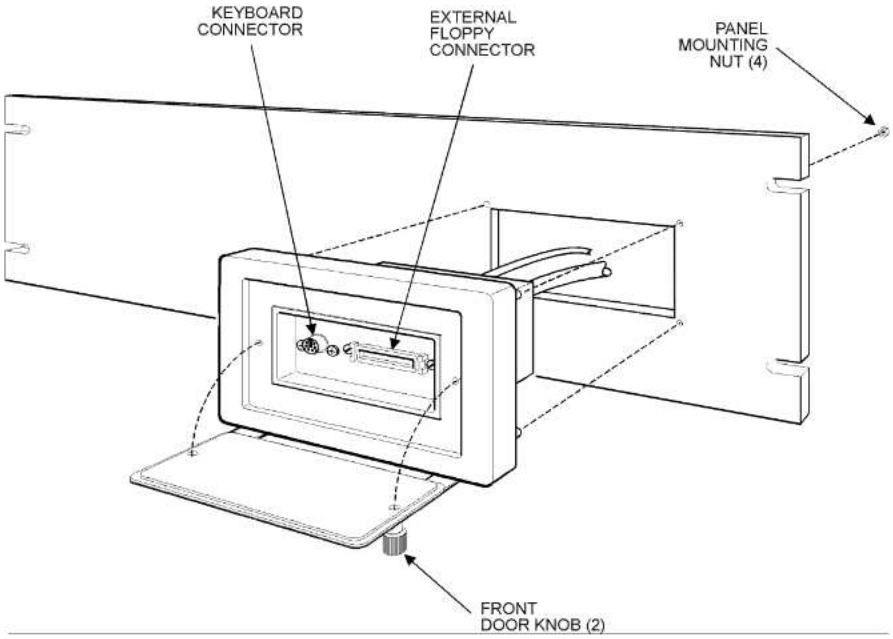


Figure 3-12. Front Floppy and Keyboard Access Option

Note

The 3500 series supports one floppy drive. If you want to use the floppy drive connector, the unit cannot have an internal floppy drive. (The external floppy's connector is mounted in the internal floppy bay.)

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Serial AUX

If an auxiliary device is used, the ferrite included in the documentation kit must be installed to maintain CE compliance.

> **Note**
>
> The AUX port is disabled when a touchscreen is factory installed.

Creating a Custom Logo

This section provides the necessary information to create a custom logo.

3515

After you create a label, remove the Xycom Automation label and place your custom logo label in the pocket. Refer to Figure 3-13 for the dimensions and recommended requirements.

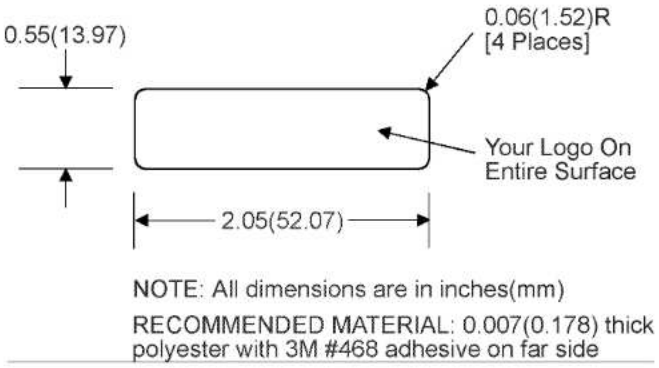


Figure 3-13. 3515 Logo Label Dimensions

3512KPM/3515KPM

After you create a label, remove the Xycom Automation label and place your custom logo label in the pocket. Refer to Figure 3-14 for label dimensions.

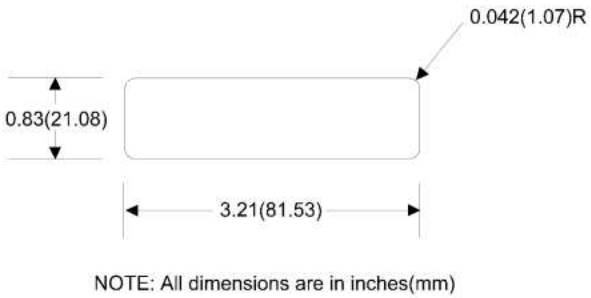
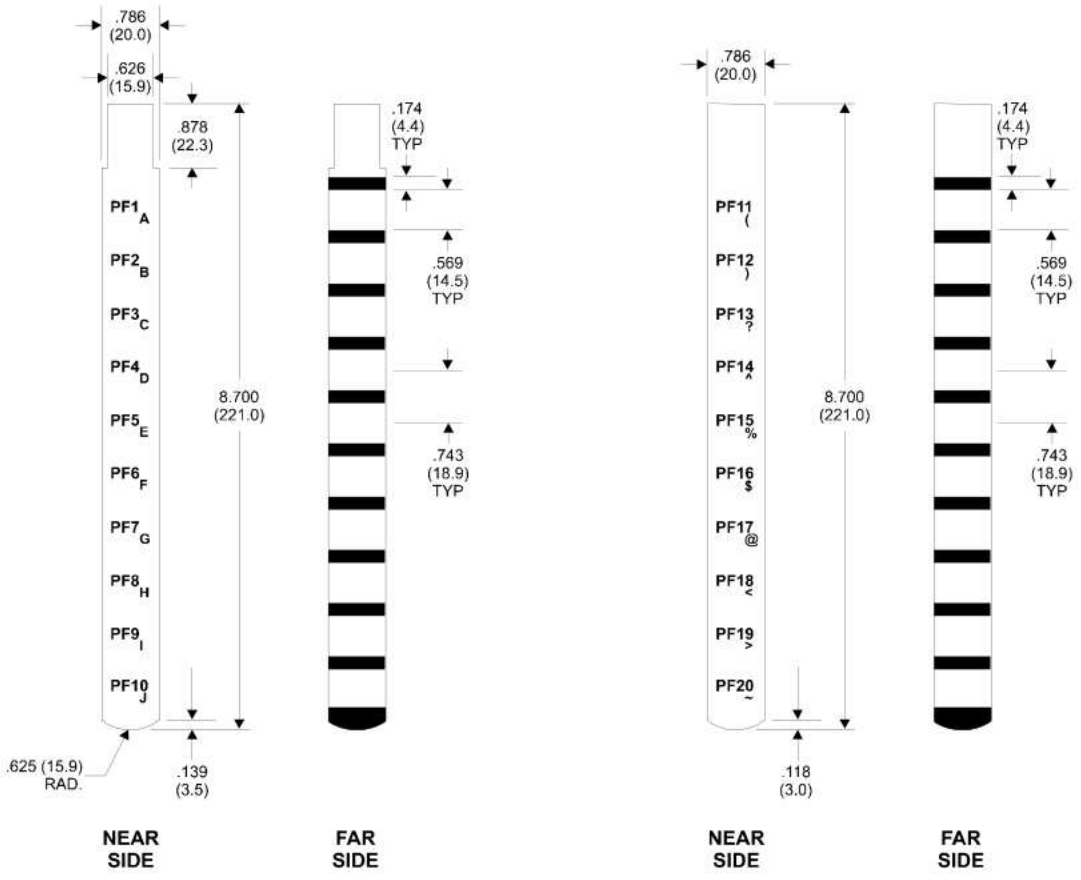


Figure 3-14. 3512KPM/3515KPM Logo Label Dimensions

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Creating Custom Keypad Inserts (3512KPM/3515KPM only)

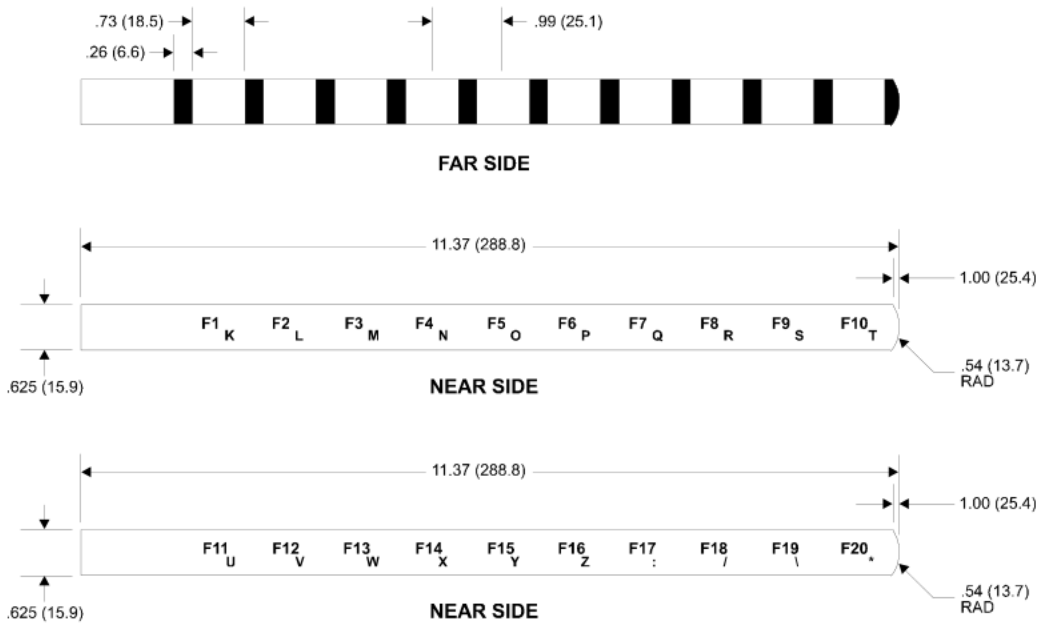
You can customize your keypad with keypad inserts. Refer to Figure 3-15 and Figure 3-16 for insert dimensions and installation.



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

Figure 3-15. Keypad Inserts with Dimensions (PF1 - PF20)

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

Figure 3-16. Keypad Insert with Dimensions (F1 - F20)

Figure 3-15 provides information on positioning keypad inserts.

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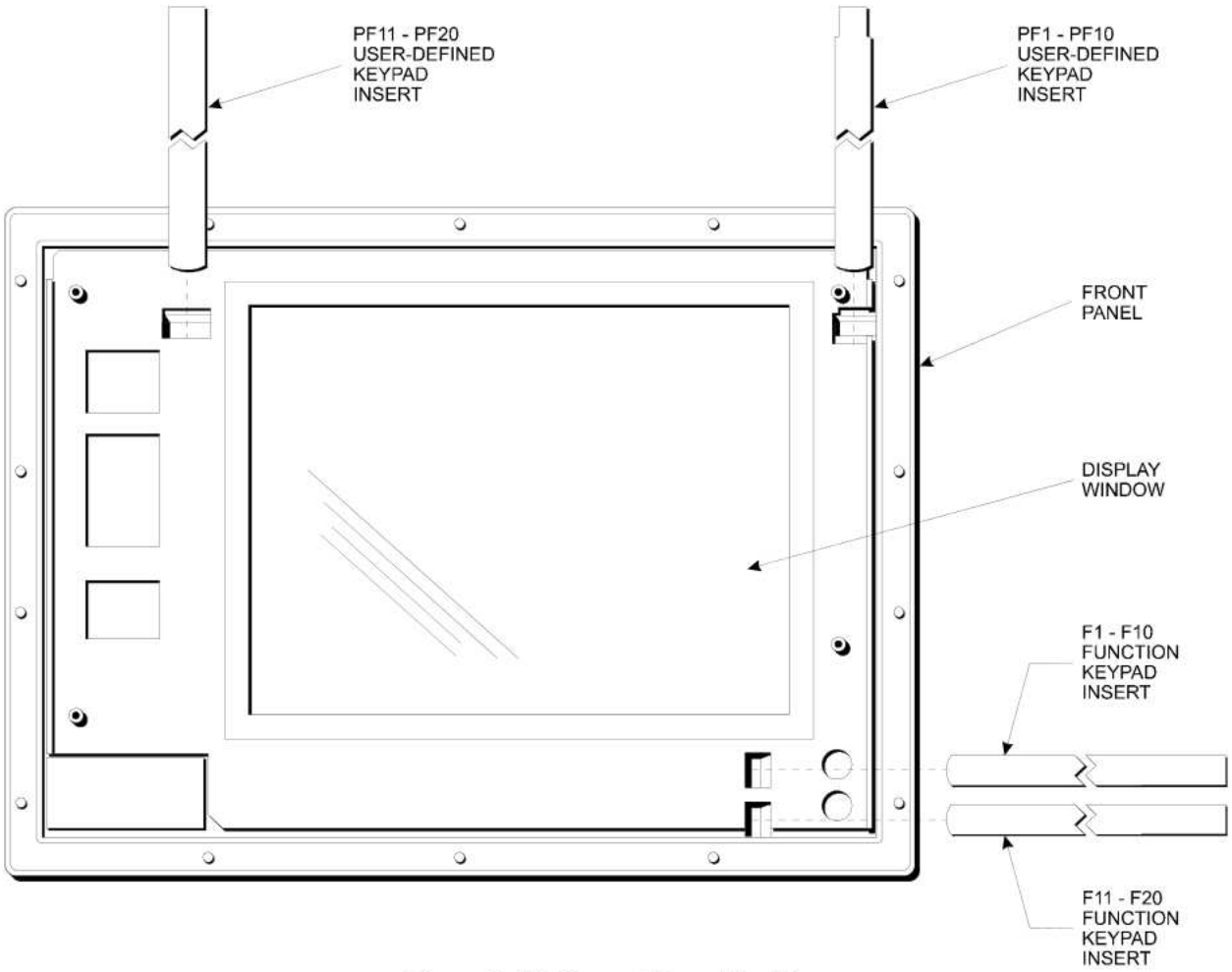


Figure 3-17. Keypad Insert Position

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	Diskette
Windows 95	CD ROM
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 need to reinstall Windows NT system, you must have an internal CD-ROM drive or an external parallel port CD-ROM drive as Windows NT only ships on a CD-ROM disk.

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Installing Drivers

This section describes how to install the drivers associated with the 3500 series.

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 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.

If you install Windows 3.1 on your system, Xycom Automation provides the Ethernet drivers. They can be found 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 Automation. 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 for each operating system are on the diskettes included with the documentation kit. To install a video driver, refer to the INSTALL.TXT file on the diskette for your operating system.

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Touchscreen Drivers

Depending upon the date of purchase, the Xycom Automation unit will have one of two possible touchscreen controllers:

- The Microtouch Controller P/N 114084
- The Xycom Controller P/N 140554

These controllers function similarly. However, the following sections require attention to the type of controller installed.

Microtouch Controller

If the touchscreen is factory-installed, you will receive a disk with MS-DOS and Windows 95 touchscreen drivers. If Windows 95 or Windows NT is factory-installed, the touchscreen drivers are provided. If you change the operating system, you must install the corresponding touchscreen driver software. Refer to the touchscreen manual for instructions.

Note

If the Windows or Windows NT operating system is factory installed, then touchscreen is set up on COM2, making this port unavailable.

Xycom Controller

If the touchscreen is factory-installed, you will receive a CD with MS-DOS and Windows touchscreen drivers. If Windows is factory-installed, the touchscreen drivers are provided. If you change the operating system, you must install the corresponding touchscreen driver software. Refer to the touchscreen manual for instructions.

CD-ROM Drivers

A CD-ROM driver disk comes with the CD-ROM option, as well as the preinstalled driver for the operating system you have selected. If you change operating systems and need help loading the required CD-ROM driver, contact Xycom Automation technical support at 1-800-289-9266 x450.

Note

If you need to reinstall Windows NT, you must have an internal CD-ROM drive or an external parallel port CD-ROM drive as Windows NT only ships on a CD-ROM disk.

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Caution

Use of controls, adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Miscellaneous Drivers

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

Using a Touchscreen

The Xycom Automation touchscreen, based on resistive membrane technology, consists of two layers with transparent, conductive coatings on the facing sides. Finger or stylus pressure causes the outer layer to make electrical contact with the inner layer. Xycom Automation's touchscreen complies with environmental specifications and maintains a NEMA 4 seal when panel mounted. It remains operational even after 30 million touches.

The touchscreen interface module circuit impresses a voltage across the conductive coatings. When the touchscreen is pressed the circuit converts from analog to x and y digital coordinate positions and then passes the x and y codes to the installed touchscreen driver. The touchscreen Monitor Mouse driver emulates a Microsoft pointer.

Note

Refer to the touchscreen manuals (included in the Documentation kit) for complete driver installation details.

Depending upon the date of purchase, the Xycom Automation unit will have one of two possible touchscreen controllers:

- The Microtouch Controller P/N 114084
- The Xycom Controller P/N 140554

These controllers function similarly. However, the following sections require attention to the type of controller installed.

Microtouch Controller

Note

If touchscreen is factory installed along with MS-DOS, the touchscreen is set up on the AUX port, making this port unavailable.

If the Windows 95 or Windows NT operating system is factory installed, then touchscreen is set up on COM2, making this port unavailable.

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If you want to reconfigure the touchscreen to use the COM2 port, perform the following steps:

1. Disconnect the power.
2. Remove the lid.
3. Remove the touchscreen controller card (see Figure 3-18A).

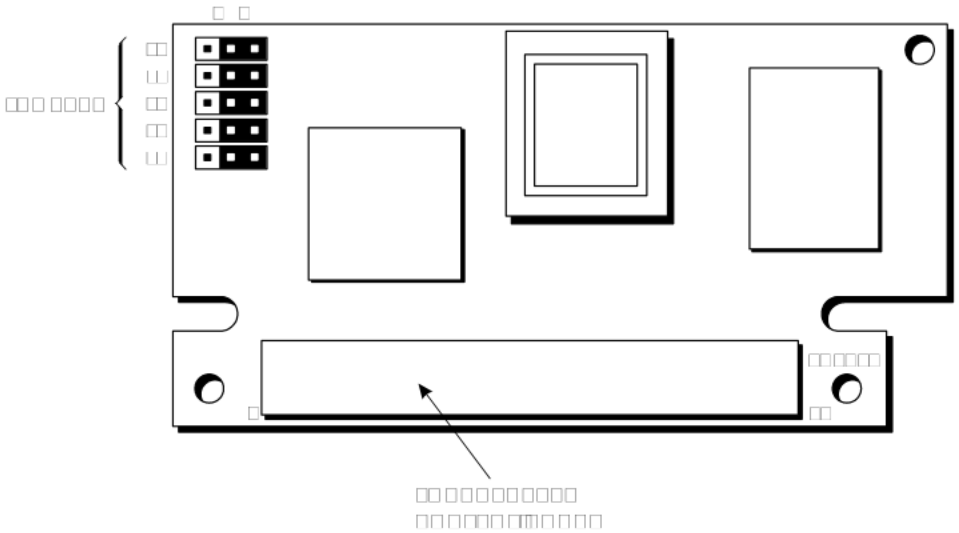


Figure 3-18A. Touchscreen controller card

4. Reconfigure jumpers J1-J9. Position A = COM2. Position B = PS/2 AUX. (Note: all jumpers must be in the A or B position).
5. Reinstall the touchscreen controller card.
6. Reboot the computer.
7. Using the touchscreen manual, do the following:
   - Load the touchscreen drivers
   - Reconfigure the touchscreen driver for COM@
   - Recalibrate the touchscreen
8. Replace the lid.

Note

If you ordered Windows 95 or NT on your system, the COM2 port is not available.

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Xycom Controller

> **Note**
> For VNHS with the AHIP6 board: If touchscreen is factory installed, the touchscreen is set up on the AUX port, making this port unavailable.

If you want to reconfigure the touchscreen to use the COM2 port, perform the following steps:

1. Disconnect the power.
2. Remove the lid.
3. Remove the touchscreen controller card (see Figure 3-18B).

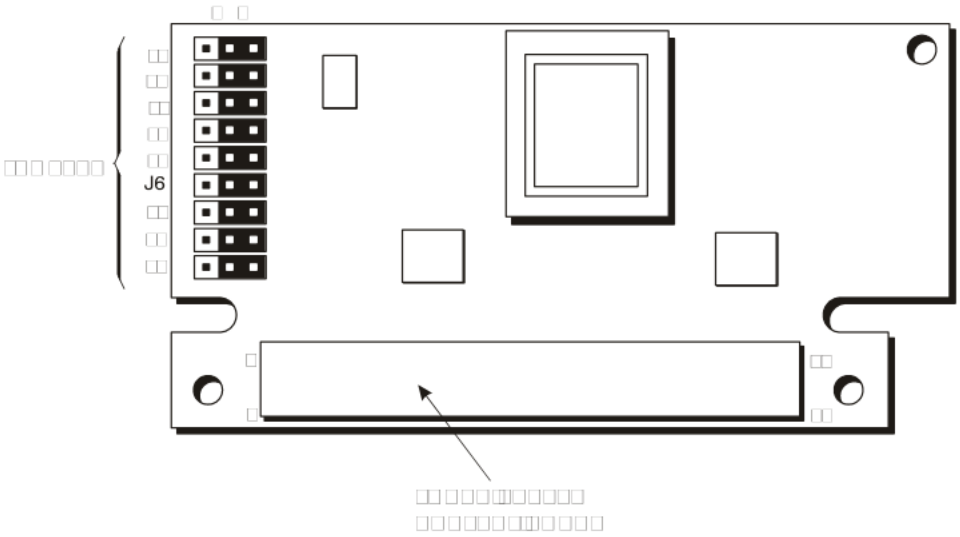


Figure 3-18B. Touchscreen controller card

4. Reconfigure jumpers J1-J9. Position A = COM2. Position B = PS/2 AUX. (Note: all jumpers must be in the A or B position).
5. Reinstall the touchscreen controller card.
6. Reboot the computer.
7. Using the touchscreen manual, do the following:
   - Uninstall the UPDD Touch driver.
   - Locate the Touch-Base Serial mode driver on the Xycom DOC CD.
   - Follow the instructions on the readme.txt file for the serial mode UPDD driver.
8. Replace the lid.

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Specifying the Port

To reconfigure the touchscreen driver for COM2, uninstall the Universal Pointer Device Driver (UPDD).

To reinstall UPDD for serial mode:

1. Locate the Xycom Documentation CD.
2. Search the CD for Touch-Base touch drivers.
3. Locate the Touch Serial Mode folder.
4. Follow the installation instructions in the readme.txt file

Calibrating the Touchscreen

Depending upon the date of purchase, the Xycom Automation unit will have one of two possible touchscreen controllers:

- The Microtouch Controller P/N 114084
- The Xycom Controller P/N 140554

These controllers function similarly. However, the following sections require attention to the type of controller installed.

Microtouch Controller

If you need to recalibrate the touchscreen, refer to the sections in the touchscreen manual that explain calibrating the touchscreen and using the diagnostic utility.

Note

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

Xycom Controller

If you need to recalibrate the touchscreen, run the Pointer Devices Control Panel applet. Select Help for details about calibrating. For best results, use the 25 point calibration setting with Start In At set to 0.

You need to calibrate the touchscreen 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

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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 95, Windows NT, or OS/2 user, do not plan to run DOS applications, and have not modified the default expansion mode in the BIOS setup menus.

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. To more efficiently make use of the flat panel display's active area, it is necessary to employ an expansion technique that 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 1024 x 768 display of the unit will be partially 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. Expansion is not necessary since there is a specific driver for each resolution.

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 after expansion.

You can turn expansion off in the BIOS setup menus, 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.

Table 3- 1. 3515/3512KPM Video Expansion Options

Utility	Mode	Panel Type/Size	
		15"	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[a]
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			

[a]Text expansion cannot be turned off.

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On a 1024 x 768 display, the stretching algorithm does not completely fill the display horizontally or vertically. You can achieve a greater vertical text expansion by changing to VGA mode 3* (see Note below). This is an 80 column, 25 row text mode with an effective resolution of 640 x 350. The 350 lines stretch better to fill the 768 line display.

Note

The utility disk includes the MOD3_350.EXE utility, allowing you to switch to VGA mode 3*. The MOD3_400.EXE utility allows you to change the mode back to the DOS default of 3+.

Windows may come up with a blank screen when using Windows 3.X on a unit, with expansion turned on either through the BIOS setup menus or using the EXP_ON.EXE utility.

There are two available options (second option being the best) to resolve this situation:

- Press the CTRL-ALT-DEL keys simultaneously. When the Windows message appears, press any key to return to Windows. The Windows screen should appear.
- Turn off the expansion.
- Default to factory settings in the BIOS setup menus.
- Use the appropriate utility as shown in the Video Expansion Options table.

Note

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

Mounting Considerations

This section describes issues you must address before placing the unit inside an enclosure. Consider the following points and precautions:

- Select an enclosure and place the unit to allow easy access to the 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 with 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 airflow.
- Place any fans or blowers close to the heat generating devices. If using a fan, ensure that outside air is not brought inside the enclosure unless a fabric or other reliable

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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 unit.
- 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 panel in such a way as to ensure that it does not cause a hazard from uneven mechanical loading.
- Avoid overloading the supply circuit

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 for 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 floppy disk/keyboard port access door must be closed and latched at all times to maintain a proper seal against water and dust.

Panel flatness and rigidity are important to maintain a proper panel seal. If you are using non-metal type enclosures, such as plastic or fiberglass, install a rigid metal stiffener behind the front panel. Failure to do so may result in an inadequate panel seal due to flexure of the front panel material between the stud mounts. 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.

System Power

On the average, the temperature within the system is 7-10°C higher than that outside the enclosure. When the ambient (exterior) temperature reaches 42°C, the system's power supply will begin to derate at a rate of 3.25 watts per increase of 1°C.

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The unit is rated to work at temperatures up to 50°C (at 50ºC, no more than 100 watts of expansion can be added to the system).

Refer to the table below for more information.

Voltage	Available Current[a] AHIP6+
+3.3 VDC	10.6A[b]
+5 VDC	10.6A[b]
+12 VDC	4.88A
-12 VDC	0.76A
-5 VDC	0.50A

[a]Total expansion power not to exceed 100 watts
[b]Combined 3.3V and 5V expansion is 10.6A

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

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

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 are expected. Ground the chassis with a ground rod or attach to a 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 system withstands operating temperatures from 0º to 50º C (32º to 122º F). To keep the temperature in the specified range, the 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 50ºC in the enclosure use a fan or air conditioner.

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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 that can result in hazardous machine operation in certain applications. Noise may be present at certain times, may appear between widely spread intervals, or in some cases, may exist continuously.

Noise commonly enters through input, output, and power supply lines and may also be coupled through the capacitance between these lines and the noise signal carrier lines. This usually results from the presence of high voltage or long, close-spaced conductors. When control lines are closely spaced with lines carrying large currents, the coupling of magnetic fields can also occur. Use shielded cables to help minimize noise. Potential noise generators include switching components, relays, solenoids, motors, and motor starters.

Refer to the relevant Federal, State, Provincial, and local electric codes. These codes provide data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. It is recommended that the high voltage and low voltage cabling be separated and dressed apart. In particular, the AC cables and switch wiring should not be in the same conduit with all communication cables.

Line Voltage Variation

The unit's power supply is built to operate with output voltage ranges of 100-120 VAC and 200-240 VAC with an AC power supply and 19-30 VDC with a DC power supply, 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 unit 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 system.

Creating a Power Cable

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

AC Power Cable

A power cable must be created to supply power to the unit. The materials needed are:

- A three-position power connector (supplied)

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- 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 wires, rated 80ºC or better

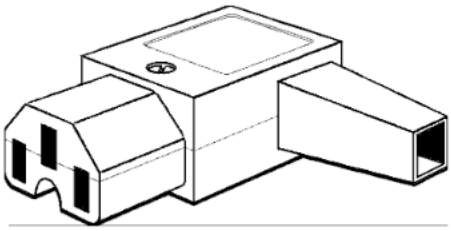


Figure 3-19. 3515 AC Power Connector.

Perform the following steps to create and attach the cable:

1. Cut 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.

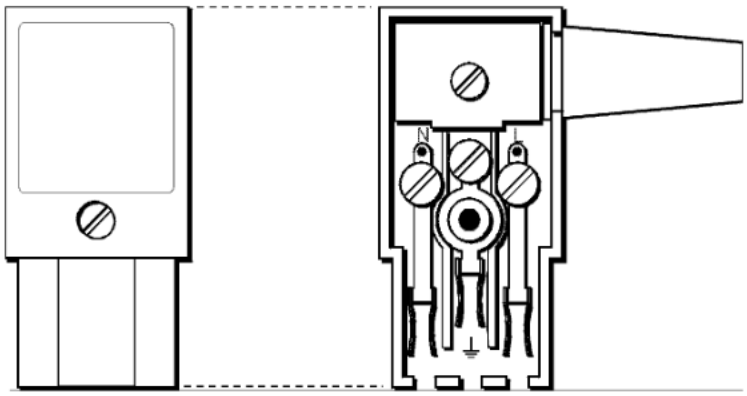


Figure 3-20. Internal View of 3515 AC Power Connector

4. Insert the three wire ends of the power cable into the hole of the connector plug. Bend the Protective Earth ground (PE) wire, the neutral (N) wire, and the line (L) wire around the corresponding screw. Be sure that no bare wires are exposed.
5. Tighten the three screws above the wires to hold them firmly in place.

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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 the screw provided to secure and strain-relief the power cable inside the connector. Plug the power cable into the power supply located on the side of the unit.
7. Once the power cable and other optional interface cables are installed, installation is complete.

Note

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

Cable Retainer Bracket

Once you have created the power cable, attach the retainer bracket that secures the cable connector to the unit. You must use this retainer bracket in hazardous locations.

Warning

Absence of this bracket can allow a power connector to become disengaged. An explosion could result if this occurs in the presence of a hazardous environment.

1. Plug the completed cable into the system's power supply.
2. Place the retainer bracket over the connector so that the shorter sides wrap around the connector and the screw holes on the large flange line up with those on the case.
3. Insert the two 6-32 screws and tighten to the standard torque (11-in/lb).

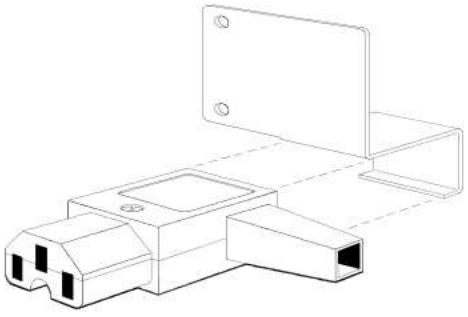


Figure 3-21. 3515/3512KPM Cable Retainer Bracket

Warning

The connector retainer bracket must be placed around the cable connector and screwed into the 3515/3512KPM case.

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Mounting the Unit

The system's rugged design allows it to be installed in most industrial environments. The unit 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 may be generated by nearby equipment.

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 Figure 3-22.
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 3515/3512KPM enclosure is grounded through the power cable.
6. On a system with an AC power supply, attach the connector retainer bracket; on a system with a DC power supply, attach the aluminum p-clamp.
7. Implement the proper grounding techniques. Establish a ground path from the 3515/3512KPM chassis to the enclosure chassis. A 6-32 threaded ground point (⏚) hole is provided on the left back of the front panel (as viewed from the front) of the unit. There is also an internal ground point (⏚).
8. Tighten the 14-#10 nuts to 27 inch pounds (3.0456 Newton-meters).

Caution

If you use the CD-ROM, use of controls, adjustments, or the performance of procedures other than those specified herein, may result in hazardous radiation exposure.

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System Cutout Dimensions

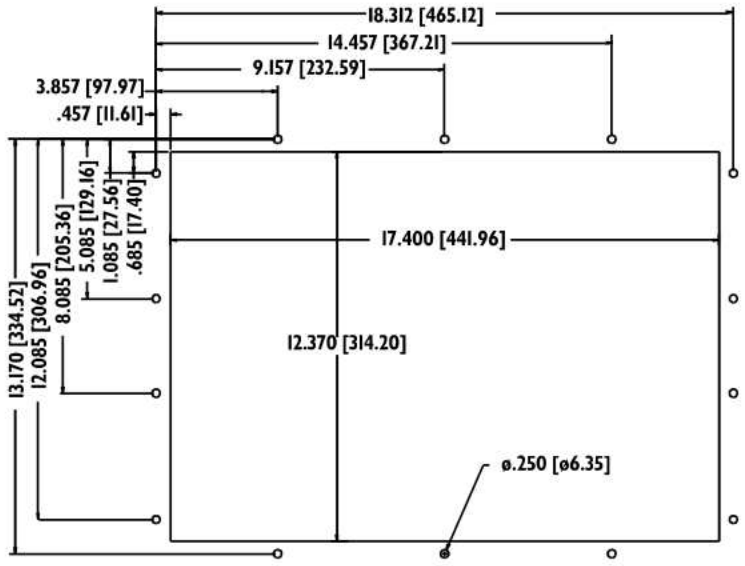


Figure 3-22. System Cutout Dimensions

Hazardous Locations Installations

Xycom Automation designed the systems with the intention of meeting the requirements of Class I, Division 2 Hazardous Locations applications. Division 2 locations are those locations that are normally non-hazardous, but potentially hazardous should an accident expose the area to flammable vapors, gases or combustible dusts.

These systems are non-incendiary devices. They are not intrinsically safe and should never be operated within a Division 1 (normally hazardous) location when installed as described here. Nor should any peripheral interface device attached to these systems be located within Division 1 locations unless approved and/or certified diode barriers are placed in series with each individual signal and DC power line. Any such installations are beyond the bounds of Xycom Automation design intent. Xycom Automation 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.

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In accordance with Federal, State/Provincial, and Local regulations, all hazardous location 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

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.

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

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.

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Warning

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

Definitions

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

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

Class I Locations

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

Class II Locations

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

Division 1 Locations

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

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

Note

Xycom Automation 3515/3512KPM 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.

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Division 2 Locations

- 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.

Power Switch

The systems do not have a power switch. The amount of input power required by these systems classifies a 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

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responsibility of the customer to ensure that the power switch selected for their installation has the correct hazardous locations rating for the location in which it is installed.

Cable Connections

Division 2 hazardous locations' regulations require that all cable connections be provided with adequate strain relief and positive interlock. USB connections can never be used in hazardous location installations, because USB connectors do not provide adequate strain relief. Never connect or disconnect a cable while power is applied at either end of the cable.

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 3515/3512KPM 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 or USB port devices when the unit is operating in a hazardous environment.

Always observe the following rules with respect to hazardous location installations:

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.

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3. Never subject the unit to any installation or service procedures unless power is 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.

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.

Safety Agency Approval

The Xycom Automation systems are designed to meet the following standards:

- Underwriters Laboratories Inc., UL 1604 Standard for Safety
  Electrical equipment for use in Class I and Class II, Division 2, locations
- Underwriters Laboratories Inc., UL 1950, Information Technology Equipment
- Canadian Standard Association, Specification C22.2 No. 213-M1987
  Non-incendiary electrical equipment for use in Class I, Division 2 hazardous locations
- Canadian Standards Association, Specification C22.2 No. 950
  Information Technology Equipment
- EN 60950, Information Technology Equipment

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Chapter Four – Keypad Utility Program

The Keypad Utility lets users redefine all keypad keys with new scan codes using utility software. Use an external full-stroke PC/AT keyboard to access the utility (you cannot redefine the keyboard).

> **Note**
>
> The keypad switch arrays are disabled while the keypad utility is running.

Loading the Keypad Utility

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

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

Using the Keypad Utility

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

A full-stroke keyboard is needed to enter keystrokes while recording a new key macro, editing an existing macro, and entering utility commands. You can redefine all keys on the keypads. 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 allow you to exit 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

Type `kputil` to run the full keypad utility.

Utility Batch Mode

You can also use a batch file to reprogram keypads. This feature is useful if you wish to reprogram many units with customized keypad macros without having to enter the full keypad 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 keypad utility and then used to reprogram other units from a batch file.

The command `keypad filename` runs the keypad utility batch mode. "`Filename`" is the file containing the new keypad macros. The filename extension must be included. For example, in a batch file, the command `keypad def3512kpm.pkm` would reprogram the keypad on the 3512KPM with default values for the numeric keypad. After programming, the system will reboot.

Main Menu

Figure 4-1 illustrates the Main Menu.

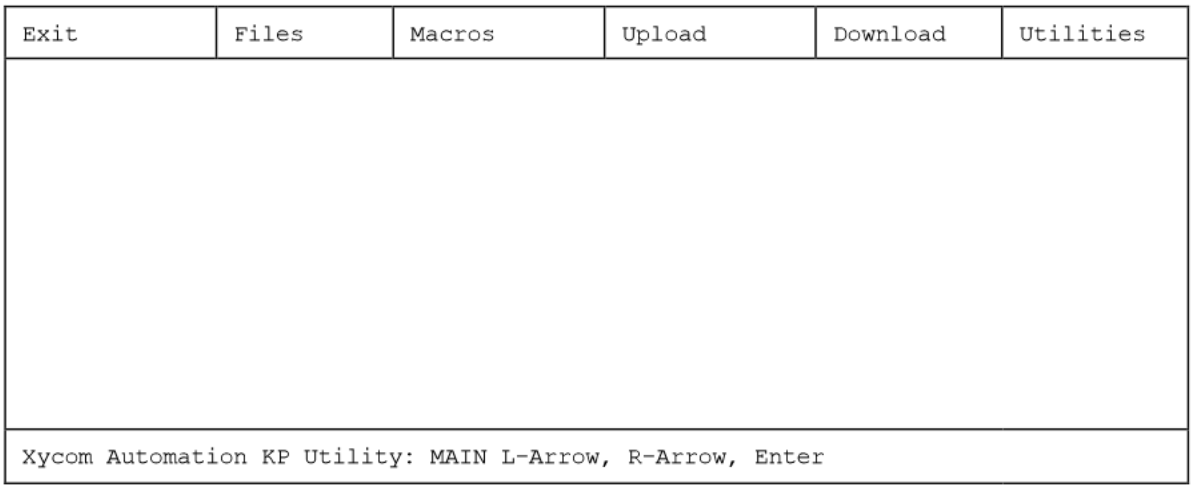


Figure 4-1. Main Menu

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

You can save files containing keypad macro sets (a macro for each key) on disk, and then loaded them 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 File, a pull-down menu will display the following choices: Open, Close, Save, Save As, Delete, and Exit. The following table describes the menu commands.

Command	Description
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, 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, open a file or upload macros.

Command	Description
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.

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Macros Edit Menu

Command	Description
Exit	Returns to the Main Menu.
View	Allows you to 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. There is a one-to-one correspondence between the ASCII and code lines. 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. 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 keystrokes 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 specifies the format to display the keystrokes as they are entered. Default is ASCII. Click is not supported. To select a key to define, use the arrow keys to position the cursor on the desired key and press ENTER. After you select a key, the utility records every keystroke 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 you cannot record the ESC 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.

Command	Description
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 editing takes place. The bottom line displays the macro in ASCII format; it is not user configurable. This line keeps track of which part of the macro you are editing, and is updated by the utility as editing takes place. 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.

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	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. Paste inserts 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 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, Keypad Version, and Exit.

Command	Description
Combo Keypad	Commands the keyboard controller to send its entire macro set for the keypad.
Keypad 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. If an error occurs, an error message will display.

Download Menu

Note

When you select Download, any macro set previously programmed is overwritten.

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.

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As the macro is sent, the keyboard controller programs its non-volatile memory with the new macros that become the new key definitions for the keypad. After programming the system will reboot.

Utilities Menu

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

Command	Description
Func Lock ON	Not available on the 3512KPM or 3515KPM.
Func Lock OFF	Not available on the 3512KPM or 3515KPM.
Factory Default	Reprograms the keypad macros to the factory default settings. After completion, the system will reboot.
Exit	Returns to the Main Menu.

Keypad Scan Codes

The utility's default keypad keycodes are listed in the following table.

Default Keypad Keycodes

3512KPM	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
PF7 / G	F27	14 83	F0 83 F0 14	G	34	F0 34
PF8 / H	F28	14 0A	F0 0A F0 14	H	33	F0 33
PF9 / I	F29	14 01	F0 01 F0 14	I	43	F0 43
PF10 / J	F30	14 09	F0 09 F0 14	J	3B	F0 3B
F1 / K	F1	05	F0 05	K	42	F0 42
F2 / L	F2	06	F0 06	L	4B	F0 4B
F3 / M	F3	04	F0 04	M	3A	F0 3A
F4 / N	F4	0C	F0 0C	N	31	F0 31
F5 / O	F5	03	F0 03	O	44	F0 44
F6 / P	F6	0B	F0 0B	P	4D	F0 4D
F7 / Q	F7	83	F0 83	Q	15	F0 15
F8 / R	F8	0A	F0 0A	R	2D	F0 2D
F9 / S	F9	01	F0 01	S	1B	F0 1B
F10 / T	F10	09	F0 09	T	2C	F0 2C
F11 / U	F11	12 05	F0 05 F0 12	U	3C	F0 3C
F12 / V	F12	12 06	F0 06 F0 12	V	2A	F0 2A
F13 / W	F13	12 04	F0 04 F0 12	W	1D	F0 1D
F14 / X	F14	12 0C	F0 0C F0 12	X	22	F0 22
F15 / Y	F15	12 03	F0 03 F0 12	Y	35	F0 35
F16 / Z	F16	12 0B	F0 0B F0 12	Z	1A	F0 1A

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3512KPM	F/A Key LED Off (Function Mode)			F/A Key LED On (Alpha Mode)		
F17 / :	F17	12 83	F0 83 F0 12	:	12 4C	F0 12 F0 4C
F18 / /	F18	12 0A	F0 0A F0 12	/	4A	F0 4A
F19 / \	F19	12 01	F0 01 F0 12	\	5D	F0 5D
F20 / *	F20	12 09	F0 09 F0 12	*	12 3E	F0 12 F0 3E
PF11 / (	F31	11 05	F0 05 F0 11	(	12 46	F0 12 F0 46
PF12 /)	F32	11 06	F0 06 F0 11	)	12 45	F0 12 F0 45
PF13 / ?	F33	11 04	F0 04 F0 11	?	12 4A	F0 12 F0 4A
PF14 / ^	F34	11 0C	F0 0C F0 11	^	12 36	F0 12 F0 36
PF15 / %	F35	11 03	F0 03 F0 11	%	12 2E	F0 12 F0 2E
PF16 / $	F36	11 0B	F0 0B F0 11	$	12 25	F0 12 F0 25
PF17 / @	F37	11 83	F0 83 F0 11	@	12 1E	F0 12 F0 1E
PF18 / <	F38	11 0A	F0 0A F0 11	<	12 41	F0 12 F0 41
PF19 / >	F39	11 01	F0 01 F0 11	>	12 49	F0 12 F0 49
PF20 / ~	F40	11 09	F0 09 F0 11	~	12 0E	F0 12 F0 0E
CTRL	CTRL	14	F0 14	CTRL	14	F0 14
SHIFT	SHIFT	12	F0 12	SHIFT	12	F0 12
ESC	ESC	76	F0 76	ESC	76	F0 76
ALT	ALT	11	F0 11	ALT	11	F0 11
TAB	TAB	0D	F0 0D	TAB	0D	F0 0D
DEL	DEL	E0 12 E0 71	E0 F0 71 E0 F0 12	DEL	E0 12 E0 71	E0 F0 71 E0 F0 12
F/A						
SPACE	SPACE	29	F0 29	SPACE	29	F0 29
BACK SPACE	BACK SPACE	66	F0 66	BACK SPACE	66	F0 66
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	36	F0 36	6	36	F0 36
7	7	3D	F0 3D	7	3D	F0 3D
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
=	=	55	F0 55	=	55	F0 55
PgUp	PgUp	E0 12 E0 7D	E0 F0 7D E0 F0 12	PgUp	E0 12 E0 7D	E0 F0 7D E0 F0 12
up arr	up arr	E0 12 E0 75	E0 F0 75 E0 F0 12	up arr	E0 12 E0 75	E0 F0 75 E0 F0 12
+	+	79	F0 79	+	79	F0 79
left arr	left arr	E0 12 E0 6B	E0 F0 6B E0 F0 12	left arr	E0 12 E0 6B	E0 F0 6B E0 F0 12
HOME	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	right arr	E0 12 E0 74	E0 F0 74 E0 F0 12
PgDn	PgDn	E0 12 E0 7A	E0 F0 7A E0 F0 12	PgDn	E0 12 E0 7A	E0 F0 7A E0 F0 12
down arr	down arr	E0 12 E0 72	E0 F0 72 E0 F0 12	down arr	E0 12 E0 72	E0 F0 72 E0 F0 12
-	-	7B	F0 7B	-	7B	F0 7B
ENTER	ENTER	5A	F0 5A	ENTER	5A	F0 5A
END	END	E0 12 E0 69	E0 F0 69 E0 F0 12	END	E0 12 E0 69	E0 F0 69 E0 F0 12
Left Start	Mouse click (windows start menu)	E0 12 E0 1F	E0 F0 1F E0 F0 12		E0 12 E0 1F	E0 F0 1F E0 F0 12
Explorer	Mouse click (windows pop-up	E0 12 E0 2F	E0 F0 2F E0 F0 12		E0 12 E0 2F	E0 F0 2F E0 F0 12

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3512KPM	F/A Key LED Off (Function Mode)			F/A Key LED On (Alpha Mode)		
	menu)					

NOTES:

- F11-F20 = SHIFT F1-F10
- F21-F30 = CTRL F1-F10
- F31-F40 = ALT F1-F10
- END, LEFT START, and EXPLORE keys are only available for 3515KPM units.

Note

If you make any changes to your keypad and want to set it back to the default settings, open the pkm file for your unit (e.g., 3512KPM.PKM for 3512KPM" 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 Five - Maintenance

The 3500 series was designed to withstand the harsh environment of the factory floor. Routine maintenance can help keep your unit in good operating condition. Preventive maintenance consists of several basic procedures that significantly reduce the chance of system malfunction. Schedule preventive maintenance along with the regular equipment maintenance to minimize downtime.

Preventive Maintenance

Following are preventive measures you can take:

- Clean the monitor screen using a nonresidue cleaner such a mild window cleaning solution or CRT screen cleaner. Take care not to scratch or mar 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 operating environment of the system (i.e., if the area is dusty, you should 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 secure.
- 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 3515.
- Stock spare parts to minimize downtime resulting from part failure. The spare parts stocked should be 10 percent of the number of each unit used. The main CPU cards should have one spare each. Each power supply should have a back-up. In certain applications where immediate operation of a failed system is required, you may need to stock an entire spare computer module see figure 5-6, Spare Parts List.
- Replace the module with the correct type. If the new module solves the problem but the failure recurs, check for inductive loads that may be generating voltage and current spikes and may require external suppression.

Xycom Recommended Hard Drive Preventative Maintenance

Xycom Automation has recognized that hard drive failures may begin to increase an average of four to five years into the life of most computers used in industrial

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applications. Therefore, it is our recommendation as a preventative maintenance measure that all hard drives used in these types of applications be replaced before the four to five year time period to avoid any down time related to hard drive failure.

The purpose of this message is to merely bring this to our customer's attention, to offer alternative solutions, and to provide all of our customers with the excellent service they deserve.

Any questions regarding this issue may be directed to our support center at support@xycom.com.

Please note Xycom recommends frequent back ups of your hard drive, especially before beginning any preventative maintenance procedures.

Fuse Replacement

The unit has no accessible fuse. Return the unit to Xycom Automation for fuse replacement.

Fan Filter Replacement

To change the fan filter, remove the grill and filter as illustrated in the figure below. Clean or replace the filter and snap the assembly back into position.

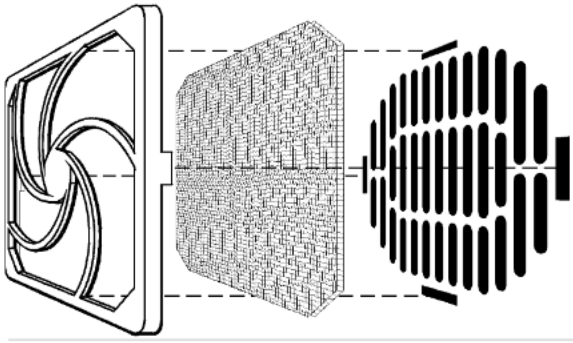


Figure 5-1. Fan Assembly

Caution

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

Chemical Compatibility

Certain combinations of chemical environments, temperature, and stress can adversely affect parts made from thermoplastic resin. For this reason material that may come in

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contact with the 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 table below lists general, chemical compatibility guidelines.

Figure 5-2. Chemical Compatibility

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.

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.

Figure 5-3. Compatible Lubricants

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

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Lubricants	Manufacturer
Martemp® 2500	E.F. Houghton & Co. 303 W. Lehigh Ave. Philadelphia, PA 19133 (215) 666-4000
Nyogel® 795A Rheolube® 368 Rheolube® 723G Rheolube® 788 Synthetic Oil® 181	Wm. J Nye P.O. Box G-927 New Bedford, MA 02742 (617) 966-6721
SF® 1147 Versilube® F-50	GE Silicone Products Waterford, NY 12188 (518) 237-3330
Terrestic ® 77	Exxon P.O. Box 2180 Houston, TX 77092 (713) 680-5712

Compatible Cleaning Agents

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

Figure 5-4. 3515 Compatible Cleaning Agents

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 immersed completely, care should be taken to remove last traces of solvent by forced-air drying or rinsing in hot water.

Noncompatible Cleaning Agents

The following cleaning agents are known to be detrimental to the unit.

Figure 5-5. 3515 Non-compatible Cleaning Agents

Type	Agents
Bases	25% Ammonium Hydroxide, 10% Potassium Hydroxide, Sodium Hydroxide

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Organic Solvents	Lacquer Thinner, Toluene, Methyl Cellosolve, Methylethylketone

Spare Parts List

Figure 5-6. Spare Parts List

Description	Xycom Automation Part Number
3515 Front Panel Assembly[a]	
With touchscreen[b]	132566-001
Without touchscreen[c]	132579-001
3512KPM Touchscreen Replacement[d]	135162-001
3515KPM Touchscreen Replacment[d]	139963-001
Drives	
Hard Drive	
6480 MB	109456-005
Solid State (Flash) Drive	
16 MB	139556-001
24 MB	139557-001
48 MB	139558-001
3.5", 1.44 Mbyte floppy drive	139964-001
CD-ROM Drive	139806-001
Bulb Replacement Kits	
12.1" TFT (#LQ12S41)	125155-001
15" TFT (#LQ15XO1W)	132581-001
15" TFT (#LQ150X1DG16)	139965-001
CPU Assembly	
AHIP370 CPU board[e]	139966-001
300 MHz Celeron® processor	139785-001
AHIP6+ CPU board[e]	139797-001
400 MHz Pentium II processor	139786-001
450 MHz Pentium II processor	139787-001
500 MHz Pentium III processor[f]	139967-001
CPU mounting kit[f]	139968-001
SDRAM	
32 MB	139798-001
64 MB	139788-001
128 MB	139799-001
256 MB	139801-001
9000-RFC 19" Floppy Door Plate[g]	110843-001
Filter Media	110383
Media Retainer	110650
Input Power Connector	139807-001
9000 Accessories[g]	
External Floppy Kit	
9000-EXF	116074-001
9000-FKA	116087-001
9000-FFK	116061-001

[a]Consult factory for repair of 3512KPM front panels.

[b]Includes touchscreen, front panel, controller, and manual

[c]Includes front panel and overlay only

[d]Includes touchscreen, controller, and manual

[e]AHIP6+ board and processor must be ordered separately.

[f]The CPU mounting kit is only required for Pentium III processors.

[g]Do not order these accessories if the 3515 ships with an internal floppy.

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roduct Repair Program/Returning a Unit to Xycom Automation

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

Follow the steps below to prepare the unit for shipment:

1. Obtain an RMA number for your unit by calling Xycom Automation headquarters, Product Repair Department at 1-800-289-9266 or 734-429-4971. Have the following information ready:
   - Company name, shipping and billing address.
   - Type of service desired product repair or product exchange.
   - Product model number, part number, quantity, serial number(s) (used to determine warranty).
   - Failure mode and failure systems.
   - Purchase order number or repair order number. **No product out of warranty will be returned without a purchase 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 your local Xycom Automation repair center.

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Appendix A – Technical Specifications

Hardware Specifications

Figure A- 1. Hardware Specifications

Characteristic	Specification
Mechanical	
Height	14.2"
Width	19"
Depth (Mounting Depth)	9.75" (9.00")
Weight	42 lbs
Electrical	
AC	115-230 VAC 50-60 Hz 6.3A autosensing
Power Supply	200 watts
Available Power[a]	+3.3 VDC 10.6A[b] +5 VDC 10.6A[b] +12 VDC 4.88A -12 VDC 0.76A -5 VDC 0.50A
Passive Backplane	Six full length expansion slots: Five ISA slots One PCI bus expansion slot or four ISA Two PCI bus expansion slot (maximum 4.8" length with AHIP6+) **Note**: Only five slots are available if the optional Ethernet card is installed.
Mounting	Panel Mount or 19" rack mount
Flat Panels	12.1" TFT SVGA color display (800 x 600) (3512KPM) 15" TFT XGA color display (1024 x 768) (3515, 3515KPM)
Agency Approvals	UL 1950 and 1604 CUL C22.2, No. 950 and 213
Regulatory Compliance	CE: EMI EN55022: 1994 Class A IMMUNITY EN50082-2:1995 SAFETY EN60950 FCC 47 CFR. Part 15, Class A

[a]Total expansion power not to exceed 100 watts

[b]Combined 3.3V and 5V is 10.6A

Environmental Specifications

Figure A- 2. Environmental Specifications

Characteristic	Specification
Temperature	
Operating	0° to 50° C (32° to 122° F)
Nonoperating	-20° to 60°C (-4° to 140°F)
Humidity	
Operating	20% to 80% RH noncondensing
Nonoperating	20% to 80% RH noncondensing

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Altitude		
	Operating	Sea level to 10,000 feet (3048 m)
	Nonoperating	Sea level to 40,000 feet (12192 m)
Vibration*		
	Operating	5-55 Hz 0.006" peak to peak displacement 56-2000 Hz 1.0g maximum acceleration
	Nonoperating	5-55 Hz 0.006" peak-to-peak displacement 56-2000 Hz 2.5 g maximum acceleration
Shock[a]		
	Operating	15g peak acceleration, 11 msec duration
	Nonoperating	30g peak acceleration, 11 msec duration

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

Note

CD-ROM and standard hard disk drives should not be used in applications where high levels of shock and vibration are present.

If a CD-ROM drive is installed, the shock and vibration specifications of the unit are limited to the shock and vibration specifications of the CD-ROM drive.

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Appendix B – Block Diagrams

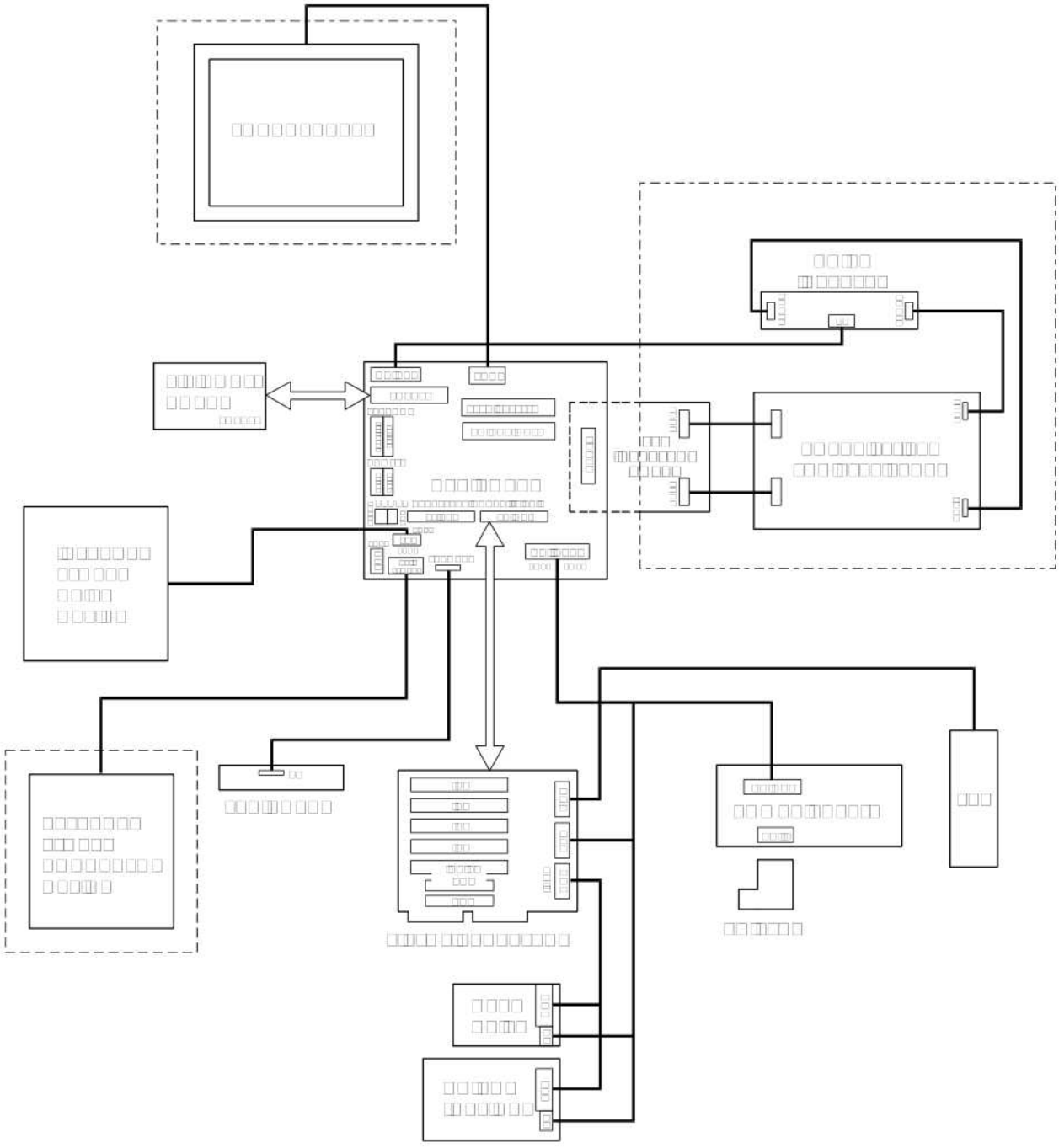


Figure B- 1. 3515 TFT System Block Diagram

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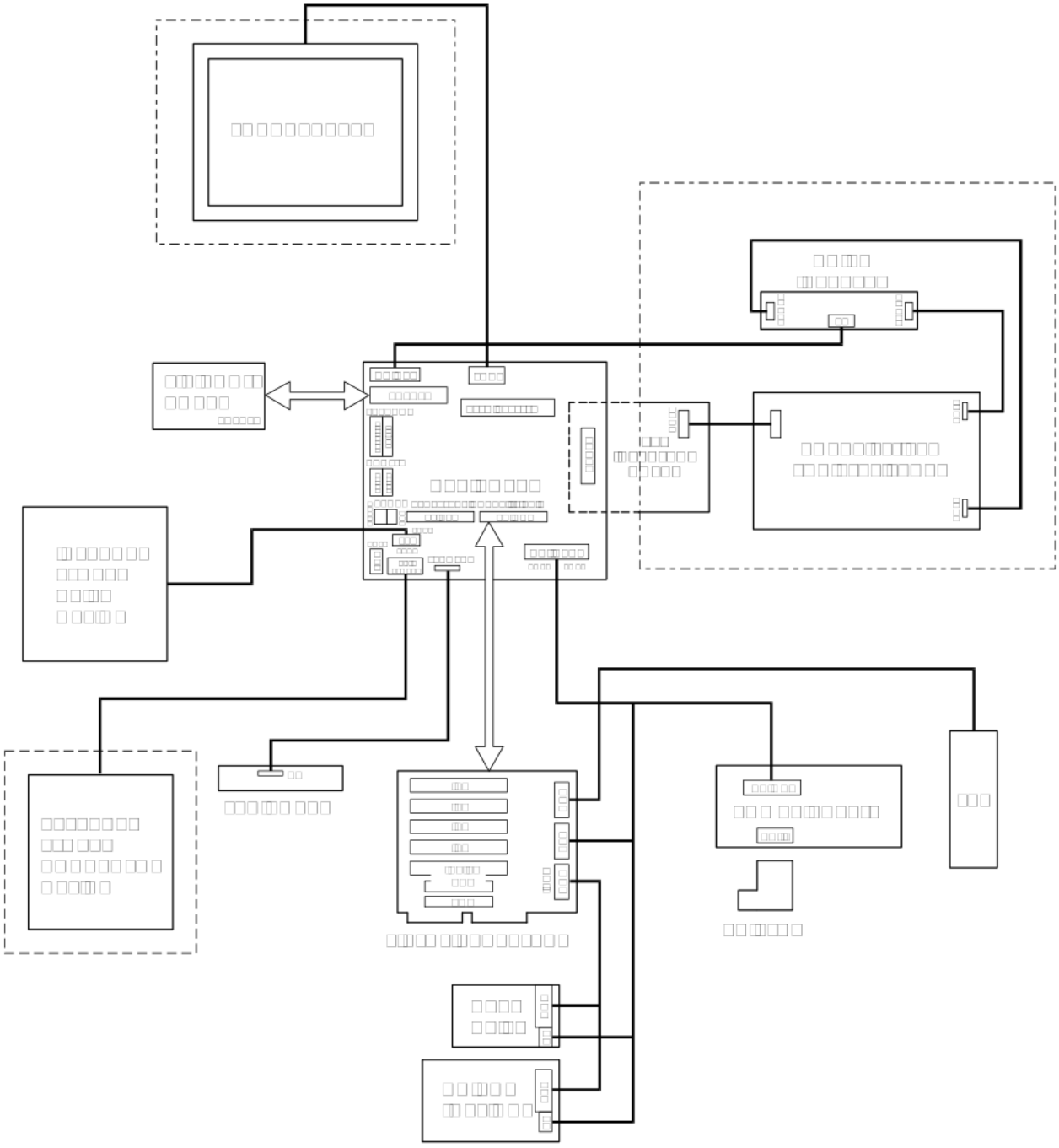


Figure B- 2. 3512KPM Block Diagram

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Appendix C – Pinouts

This appendix provides the pinouts for the keyboard, AUX, LPT1, COM1, COM2, USB1, and VGA connectors. The following table defines abbreviations used in this Appendix.

Abbreviation	Definition
NC	No connect

Keyboard Port Connectors

This connector is a standard PS/2-compatible connector.

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

Aux Port Connector

This PS/2 mini-DIN connector allows you to attach a serial device.

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

Note

You cannot use the AUX port when the touchscreen controller is using it.

Dual USB Connector (USB1)

Pin Number	Description
1A	5VFUSE
2A	USBP0-
3A	USBP0+
4A	GND

Pin Number	Description
1B	5VFUSE
2B	USBP1-
3B	USBP1+
4B	GND

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Parallel Port Connector (LPT1)

This is a 25-pin DB 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

Pin	Signal
14A	AUTOFEED
15A	PERROR
16A	INIT
17A	SELIN
18A	GND
19A	GND
20A	GND
21A	GND
22A	GND
23A	GND
24A	GND
25A	GND

Serial Port Connectors

Serial ports RS-232 and RS-485 are supported on the AHIP6+ boards. Only one connector can be used at a time. All termination is done outside the unit.

COM1

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 -

.

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Technical Note

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

COM2

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

Pin	Signal
14B	NC
15B	NC
16B	NC
17B	NC
18B	NC
19B	NC
20B	DTR2
21B	NC
22B	RI2
23B	NC
24B	NC
25B	NC

Caution

The COM2 port can be used (only one at a time) for the touchscreen controller, IrDA interface, or RS-232 connector. The BIOS setup determines whether COM2 is used for either the connector or the IrDA interface. Jumpers on the touchscreen controller select the COM2 port or the AUX port.

VGA Connector

The VGA connector is a 15-pin connector.

Pin	Signal
1	RED
2	GREEN
3	BLUE
4	NC
5	ORB_GND
6	ORB_GND
7	ORB_GND
8	ORB_GND

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Pin	Signal
9	Fused VCC
10	ORB_GND
11	NC
12	DDCDAT
13	HSYNC
14	VSYNC
15	DDCCLK

External Floppy Connector

This connector is only available if the unit is ordered without the internal floppy (since the floppy interface supports only one floppy option).

Pin	Signal
1	+5V
2	IDX
3	FDS1
4	+5V
5	NC
6	DCHG
7	NC
8	NC
9	GND
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

We recommend sending the flat-panel display to Xycom Automation for bulb replacement. However, if you would like to replace the bulbs on site, this appendix provides 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 Automation Customer Support at 800-289-9266.

3515 TFT Flat-Panel Display (Sharp #LQ150X1DG16 or Samsung #LTM150XS-T01)

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.

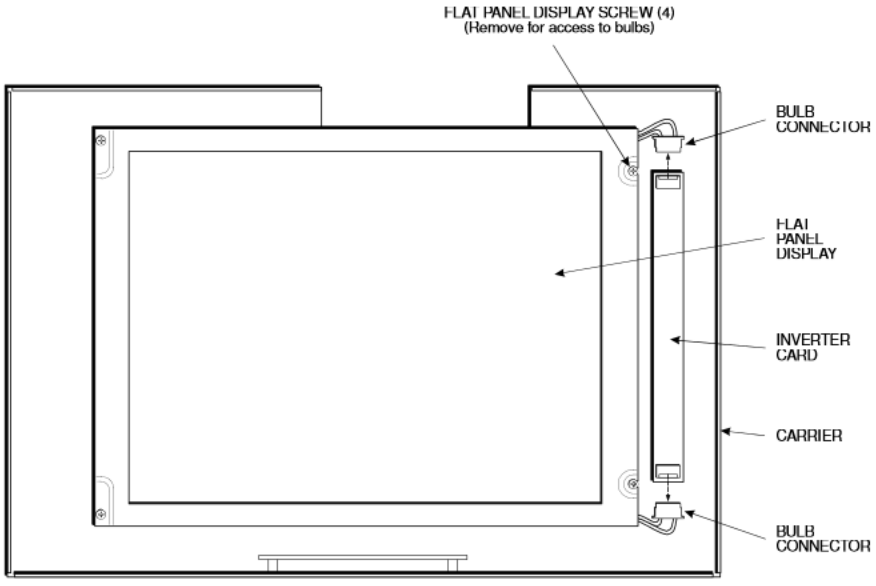


Figure D- 1. Model #LQ150X1DG16 - Front View

3. If a touch screen or keypad is installed, disconnect the cable(s) at the top of the system board.

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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.
9. Gently lift the left side of the flat panel display, and unscrew the two screws to disconnect the data interface connector.
10. Turn the display face up on a protective surface.
11. Referring to Figure D-2, remove the two set screws and slide the bulb assemblies out.

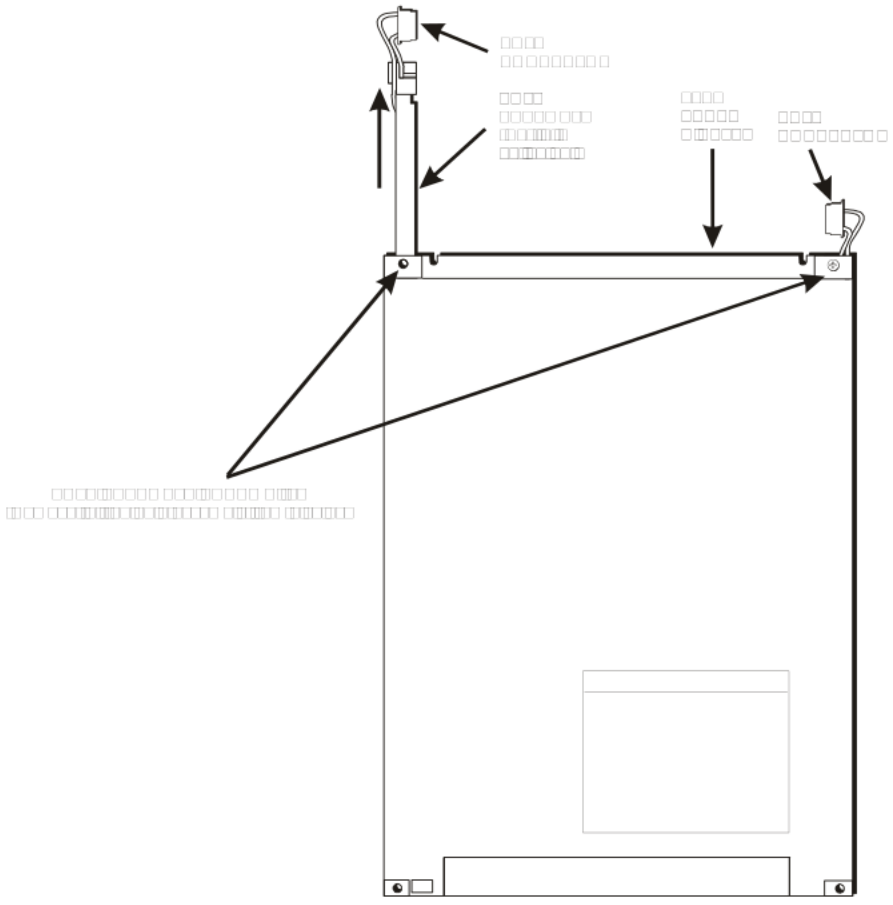


Figure D- 2. Model #LQ150X1DG16- Rear View

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

12. Slide the new assemblies into the openings from which the old assemblies were removed.
13. Repeat steps 1 through 9 in reverse order to reassemble the unit.

3515KPM, KPT, KPMT TFT Flat-Panel (Sharp #LQ150X1DG16 or Samsung #LTM150XS-T01)

1. Turn off the power source.
2. Unlatch and remove the lid.
3. If a touch screen is installed, disconnect the touch screen cable.
4. Disconnect the KEYPAD1, LEDKB1, and MS2 connectors.
5. Remove the four screws holding the front panel to the display adapter plate.
6. Remove the front panel, and set it aside.
7. Set the unit on the left side (power panel face down).
8. Disconnect the bulb connectors from the inverter.
9. Unscrew the four screws that attach the flat-panel display to the standoffs.
10. Disconnect the data interface cable from the display.
11. Gently lay the flat-panel display facedown on a protective surface next to the unit.
12. Referring to Figure D-3, unscrew the setscrews that secure the bulb assemblies and slide the bulb assemblies out of the display.

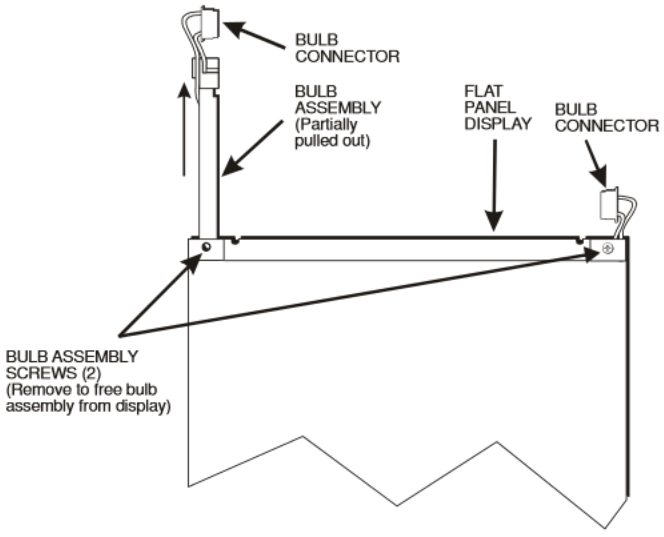


Figure D- 3. Model #LQ150X1DG16

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13. Insert the new bulb assembly, and fasten the screw to secure.

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

14. Reverse steps 1 through 10 to reassemble the unit.

3512KPM, KPT, KPMT TFT Flat-Panel Display (Sharp #LQ12S41)

1. Turn off the power source.
2. Unlatch and remove the lid.
3. If a touch screen is installed, disconnect the touch screen cable (TCH1).
4. Disconnect the KEYPAD1, LEDKB1, and MS2 connectors.
5. Set the unit with the front panel facing down, and remove the four screws holding the front panel to the display adapter plate.
6. Flip the unit over, lift off the front panel, and set it aside.
7. Unscrew the four screws that attach the adapter plate to the standoffs.
8. Unscrew the four screws that attach the flat-panel display to the inner set of 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.
12. Referring to Figure D-4, push in the tab at the end of the display with a flat-bladed screwdriver, and slide the bulb assembly out.

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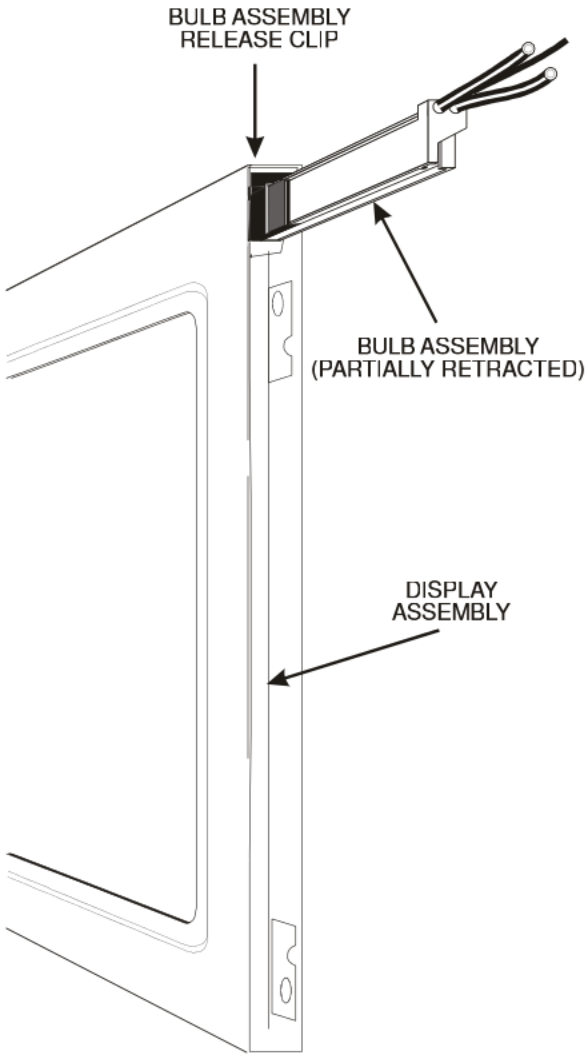


Figure D-4. Model #LQ12S41

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

Note

Xycom Automation recommends replacing both bulbs at the same time.

14. Repeat steps 11 and 12 for the second bulb assembly.

15. Reverse steps 1 through 10 to reassemble the unit

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