INDUSTRIAL PANEL COMPUTERS
(Models AC220, AC240, AC250, and AC270)

(Manual Part Number MAN-UTPPC-001)

WARNING!

Programmable control devices such as the Industrial Panel Computers must not be used as stand-alone protection in any application. Unless proper safeguards are used, unwanted start-ups could result in equipment damage or personal injury. The operator must be made aware of this hazard and appropriate precautions must be taken.

In addition, consideration must be given to the use of an emergency stop function that is independent of the programmable controller.

The diagrams and examples in this user manual are included for illustrative purposes only. The manufacturer cannot assume responsibility or liability for actual use based on the diagrams and examples.

CAUTION
Do not press the Panel Computer touchscreen with any sharp objects. This practice may damage the unit beyond repair.

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Manual P/N MAN-UTPPC-001

MANUFACTURED and MARKETED by   UTICOR

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Manual Organization

The table, below provides an overall description of the topics covered within this manual.

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1 **Introduction**		Provides Manual Organization, and lists what you need to get started. Discusses how to get help with questions or problems you might encounter through Technical Support.
2 **Models and Equipment**		Provides you with a table listing the various models, their part numbers and features. Lists the optional equipment available.
3 **Specifications**		Specifications provide detailed information. Included are display size, connector and expansion card information, CPU type; service power requirements; operating and storage temperatures; available memory; serial communications specs; dimensions, weight, etc.
4 **Installation**		Shows the mounting and cutout dimensions for the panel models.
5 **External Components**		Provides location and description of the available connectors and expansion card slots. Provides location and description of switches, push buttons, display brightness potentiometer, and LEDs. Discusses Communication Setup.
6 **BIOS Setup**		Consult PCA1675 Embedded Processor Board User Manual, Part Number MAN-P1675-002.
7 **Maintenance and Upgrades**		Step-by-step instructions to install an expansion card, remove front assembly and replace hard disk drive are provided. Provides basic maintenance tasks to preserve data. Describes cleaning of touch screen and housing. Lists chemicals that may or may not be compatible with the touchscreen.

Introduction

UTICOR Technology L.P.'s Panel Computer features a 700 Mhz Intel Celeron processor single board computer, in various sizes to fit your application needs. An active matrix LCD, resistive-type touchscreen is mounted in a rugged steel enclosure, with Zinc plating for optimum noise immunity, along with a flat NEMA4/4X sealing bezel to form an aesthetically pleasing package.

The Panel Computer is a full featured computer able to withstand harsh environments. Its rugged design, high performance and easy access for upgrade or maintenance make the Panel Computer ideal for applications requiring the highest reliability, as with all UTICOR electronic components.

The front assembly (includes display) of the Panel Computer swings open (except for the AC220, 10.4-inch model), and is simple to remove entirely, providing easy replacement and access to internal components.

The computers are rated to operate from 0 to 50ºC, at a non-condensing humidity of 10–95%.

The Panel Computer is currently available in 4 sizes — 10.4-inch, 12.1-inch, 15-inch and 17-inch — and is designed to be protected from oil, dust or water damage when properly installed.

This manual will take you through the steps necessary to get your Panel Computers installed and running in the shortest possible time. This manual covers Models AC220, AC240, AC250, and AC270.

What you need to get started:

Hardware
- Industrial Panel Computer Series:
    AC220 — 10.4 TFT Display
    AC240 — 12.1-inch TFT Display
    AC250 — 15-inch TFT Display
    AC270 — 17-inch TFT Display

Software
- Windows XP Pro

Technical Support

Technical Support
If you are having difficulty with a particular aspect of installation or setup, UTICOR technical support is available at **1-800-832-3647 or FAX us at 1-563-359-9094.**

1   INTRODUCTION

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Models

AC220   10.4" Display Industrial Panel Computer

AC240   12.1" Display Industrial Panel Computer

AC250   15.0" Display Industrial Panel Computer

AC270   17.0" Display Industrial Panel Computerf

2 MODELS AND EQUIPMENT

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Accessories

There are replacement parts and optional equipment available to customize or upgrade the Industrial Panel Computer to fit your application. The following tables provide you with a list of this equipment.

Accessories	
Product	**Part Number**
32MB Disk on Chip Flash Memory	AC600
64MB Disk on Chip Flash Memory	AC601
128MB Disk on Chip Flash Memory	AC602
256MB Disk on Chip Flash Memory	AC603
40GB HDD	AC610
256MB MEM	AC615
512MB MEM	AC616
Standard Keyboard	AC620
Keyboard with Trackball	AC621
Multimedia I/R board	AC622
19" R/M Industrial Membrane Keyboard	AC623
2 Button Mouse	AC624
Modem, PCI, 56K V.90	AC630
2-way Video Splitter/Repeater	AC635
Shielded Video Cable - 6'	AC640
Shielded Video Cable - 10'	AC641
Shielded Video Cable - 30'	AC644
Shielded Video Cable - 60'	AC646
RS-232 Serial Cable - 6'	AC651
RS-232 Serial Cable - 10'	AC652
RS-232 Serial Cable - 30'	AC655
RS-232 Serial Cable - 60'	AC656

COMPUTER SPECIFICATIONS

CPU Type:	700 Mhz Intel Celeron Processor
Memory:	128 MB minimum (expandable up to 512 MB)
BIOS:	Flash ROM
SSD:	Optional — Disk On Chip 32 MB minimum (up to 256 MB)
Drive:	40 Gb Hard Drive
Serial Ports:	1 dedicated RS-232 port, 1 RS-232/RS-422/RS-485 port
Parallel Port:	SPP/EPP/ECP supported (configurable to LPT1)
CD ROM:	Optional — external CD ROM drive (through USB port)
LAN:	32-bit PnP Ethernet controller 10 Base-T/100 Base-TX (RJ-45)
USB:	2 Ports (1.1 compliant)
PS/2 Interfaces:	1 Mouse, 1 Keyboard
Floppy DD:	Optional external Floppy Disk Drive (through USB port)
Operating System:	Windows XP Pro (Standard)
Watchdog Timer:	12 level timer with time-out intervals from 0.5 – 30,000 seconds

DISPLAY SPECIFICATIONS

Display:	**AC220:**	10.4" TFT Flat Panel
	AC240:	12.1" TFT Flat Panel
	AC250:	15.0" TFT Flat Panel
	AC270:	17.0" TFT Flat Panel
Touch Screen:	Analog Resistive Type	
View Angle:	U/D: 150, R/L: 120	
Screen Pixels:	**AC220/AC240:**	SVGA 800 x 600
	AC250:	XGA 1024 x 768
	AC270:	
Display Brightness:	**AC220:**	230 nits
	AC240/AC250:	250 nits
	AC270:	

3 SPECIFICATIONS

Backlight Bulb Life:	**AC220:**	20,000 hours (manufacturer's rated minimum life)
	AC240:	40,000 hours (manufacturer's expected half-life rate)
	AC250:	35,000 hours (manufacturer's expected half-life rate)
	AC270:	

VGA Output: XGA Output (60 ft. maximum)

MECHANICAL SPECIFICATIONS

Housing Material: Stud Mounted Metal Bezel — Black

Connectors: COM1 and COM2 D-SUB 9-pin male Serial Ports, LPT1 D-SUB 25-pin female Parallel Port, Two P/S 2 Ports, One RJ-45 for Ethernet, One D-SUB 15-pin female Video port, Two USB ports (1.1 compliant)

Dimensions: **AC220/AC240:** 11.250" x 14.250" x 6.988" (285.750 x 361.950 x 177.495 mm)
AC250: 13.124" x 16.836" x 7.300" (333.350 x 427.622 x 185.420 mm)
AC270: 18.766" x 14.749" x 7.543" (476.644 x 374.625 x 191.592 mm)

Weight: **AC220/240:**   15.4 lbs. (7.0 kg)
AC250:   17.6 lbs. (8.0 kg)
AC270:

Expansion Slots: 3 PCI slots for I/O cards
PCMCIA: Optional (type 2) (uses one PCI slot)

Power Supply: 115/230 VAC @ 50/60 Hz, ATX 145 Watts
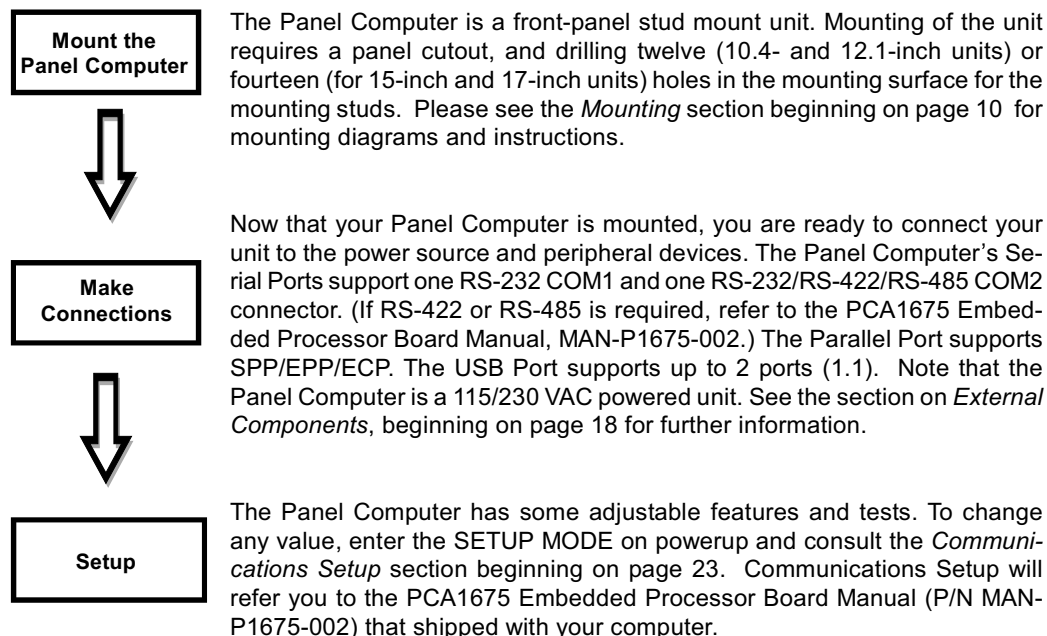
Cooling Fan: Optional

Environmental: NEMA 4/4X (indoor use only)
Temperature: Operating — 0 to 50° C; Non-operating —20 to +60° C
Relative Humidity: 10 to 95% noncondensing
Agency Approvals: UL/CUL, CE Mark, FCC Compliant (pending)

INSTALLING THE INDUSTRIAL PANEL COMPUTER — OVERVIEW

Installing the PANEL COMPUTER requires the following three major steps:

Mount the Panel Computer

The Panel Computer is a front-panel stud mount unit. Mounting of the unit requires a panel cutout, and drilling twelve (10.4- and 12.1-inch units) or fourteen (for 15-inch and 17-inch units) holes in the mounting surface for the mounting studs. Please see the *Mounting* section beginning on page 10 for mounting diagrams and instructions.

Make Connections

Now that your Panel Computer is mounted, you are ready to connect your unit to the power source and peripheral devices. The Panel Computer's Serial Ports support one RS-232 COM1 and one RS-232/RS-422/RS-485 COM2 connector. (If RS-422 or RS-485 is required, refer to the PCA1675 Embedded Processor Board Manual, MAN-P1675-002.) The Parallel Port supports SPP/EPP/ECP. The USB Port supports up to 2 ports (1.1). Note that the Panel Computer is a 115/230 VAC powered unit. See the section on *External Components*, beginning on page 18 for further information.

Setup

The Panel Computer has some adjustable features and tests. To change any value, enter the SETUP MODE on powerup and consult the *Communications Setup* section beginning on page 23. Communications Setup will refer you to the PCA1675 Embedded Processor Board Manual (P/N MAN-P1675-002) that shipped with your computer.
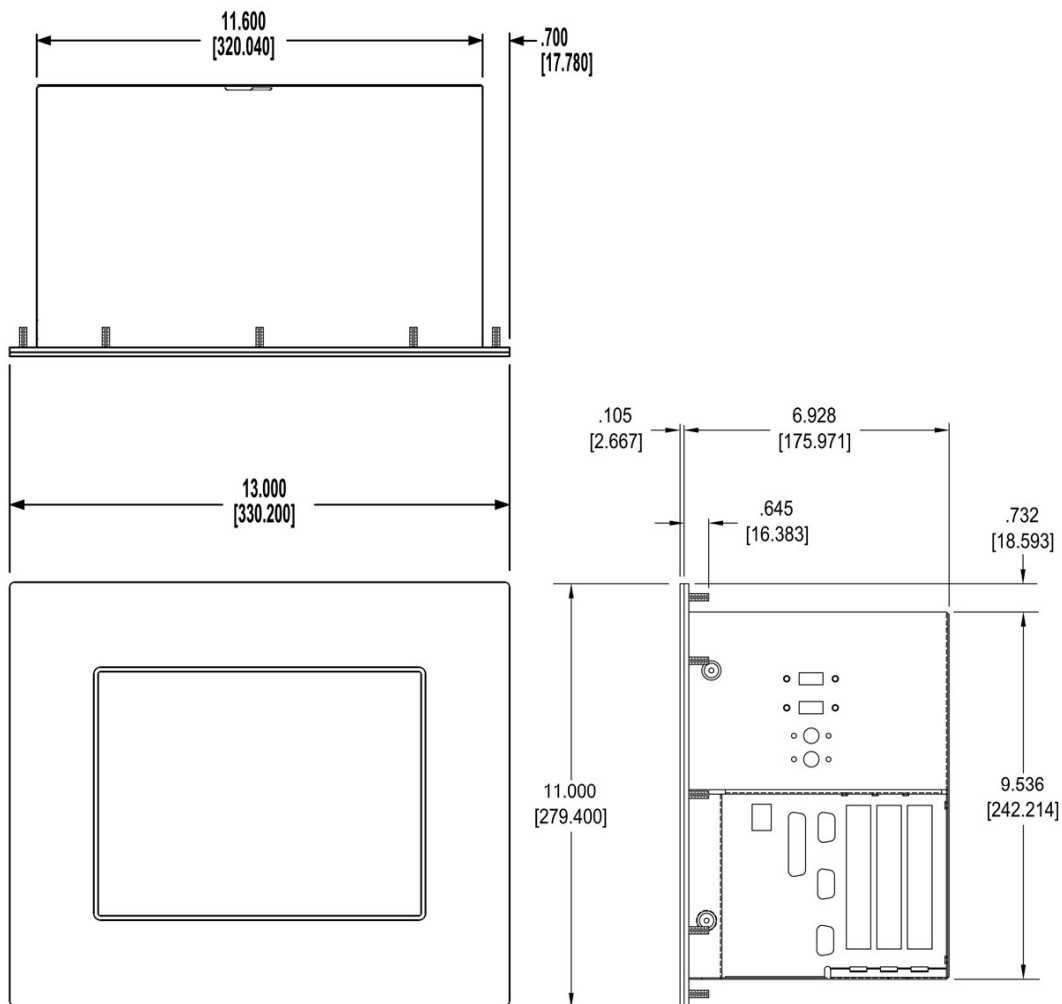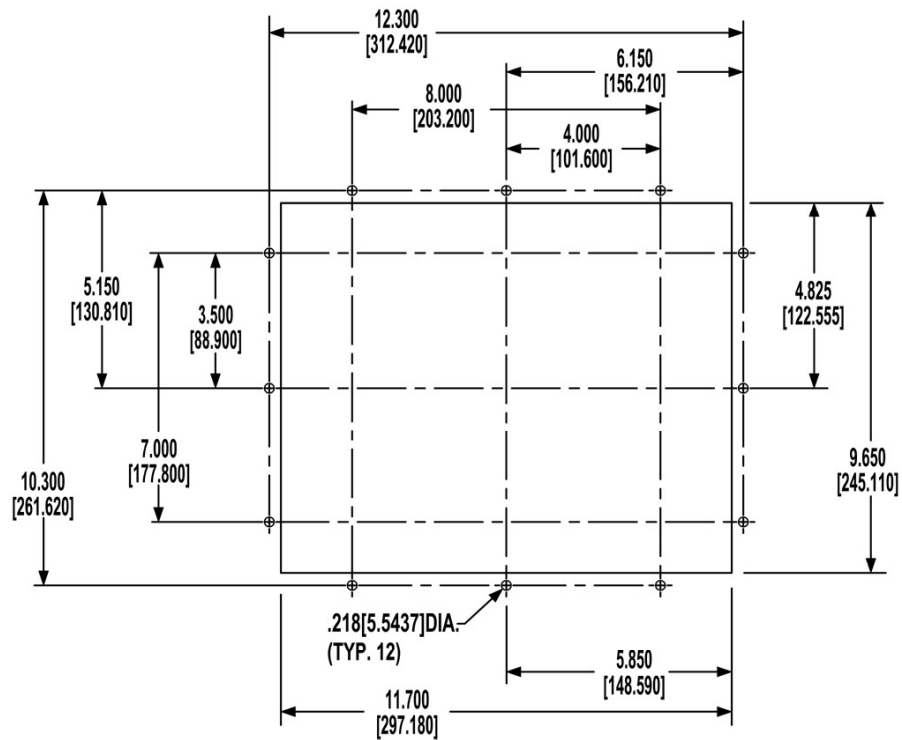
Mounting

The Panel Computer is a panel-mount unit. The following diagrams show the outline and cutout dimensions necessary to mount the panel using the studs. All dimensions are in inches (mm in brackets [ ]).

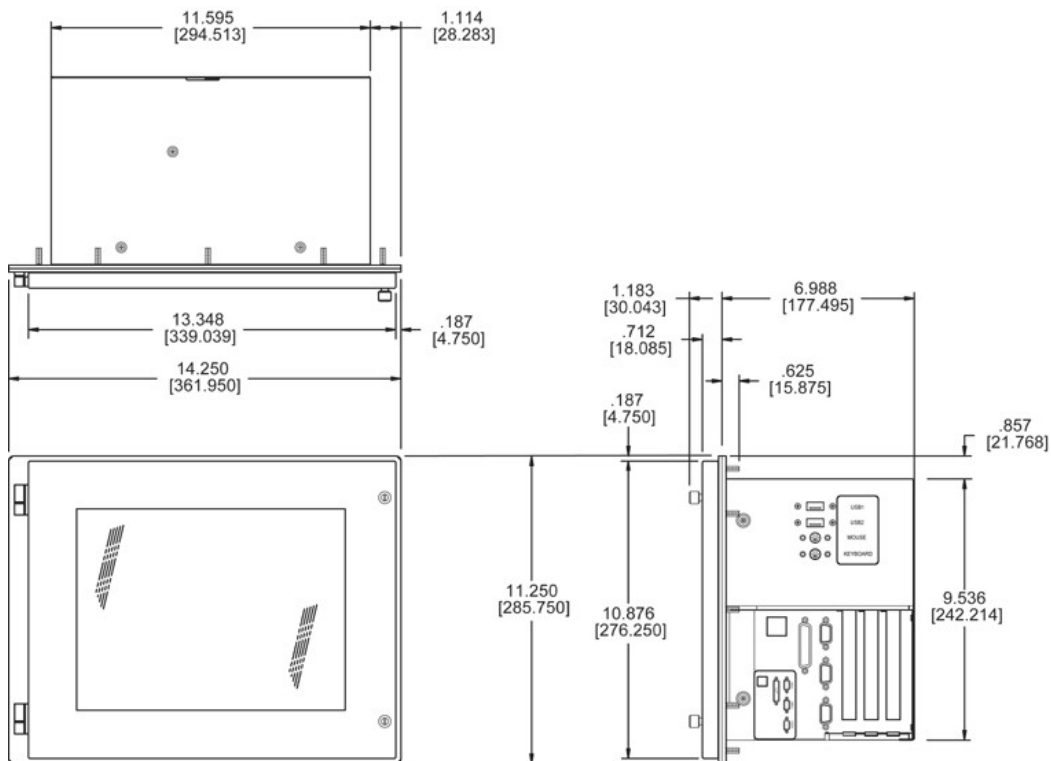## 10.4" Industrial Panel Computer
Model AC220 — Outline Dimensions

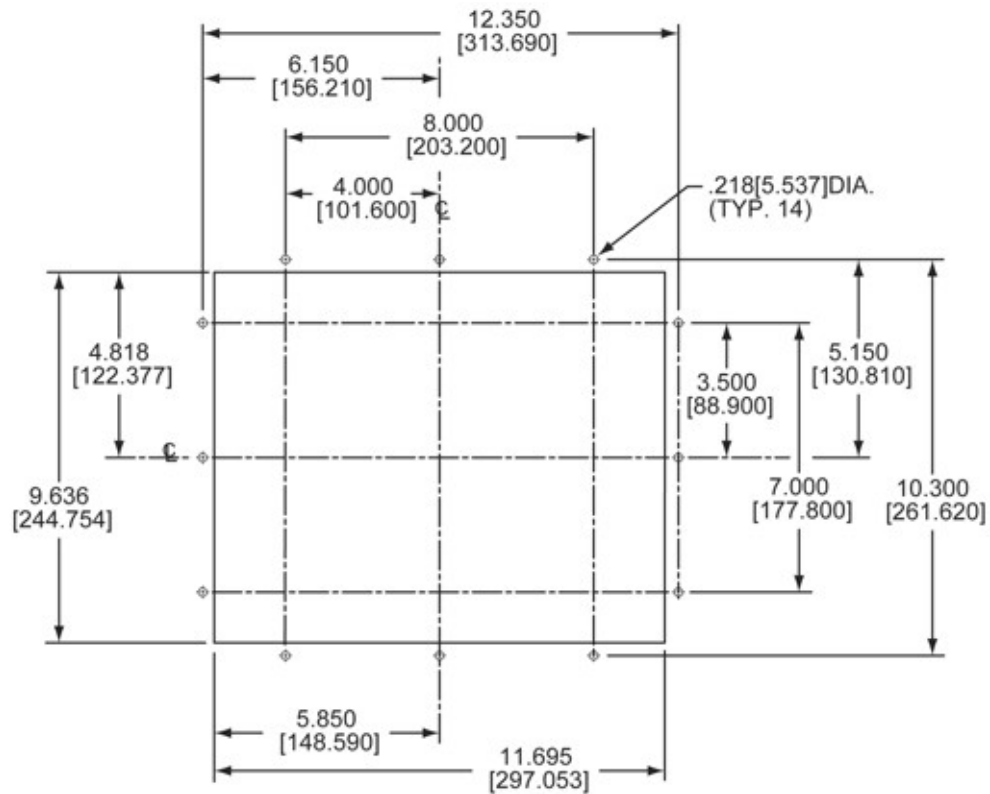**10.4" Industrial Panel Computer
Model AC220 — Cutout Dimensions**

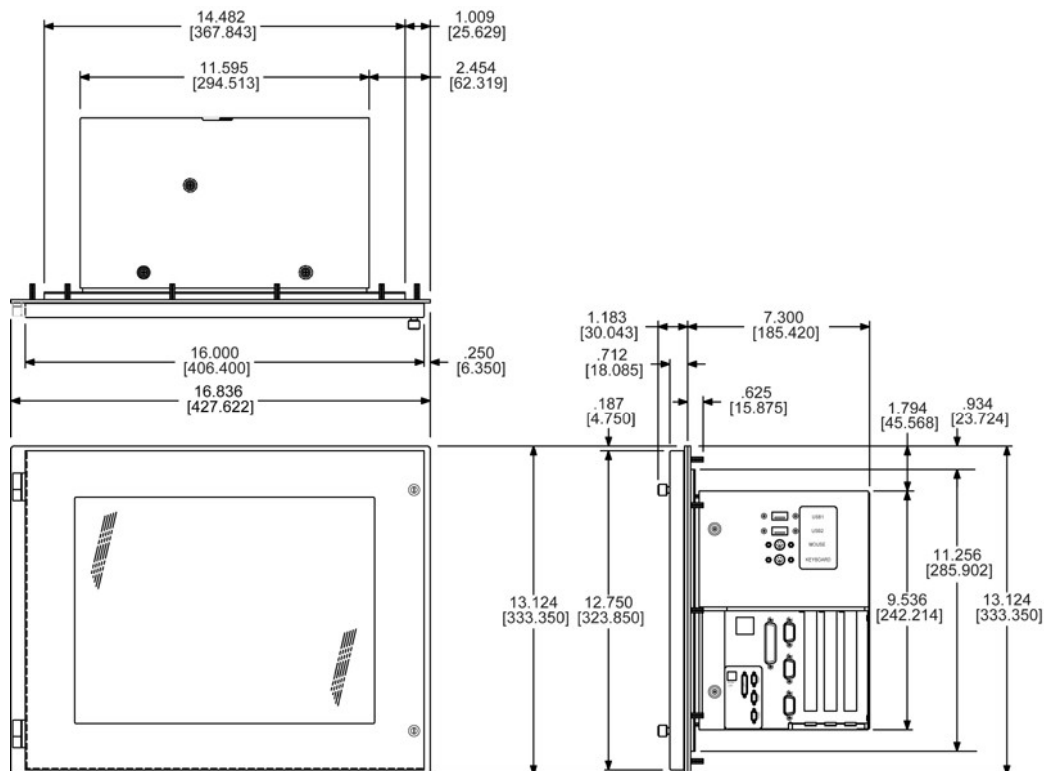**12.1" Industrial Panel Computer
Model AC240 — Outline Dimensions**

12.1" Industrial Panel Computer
Model AC240 — Cutout Dimensions

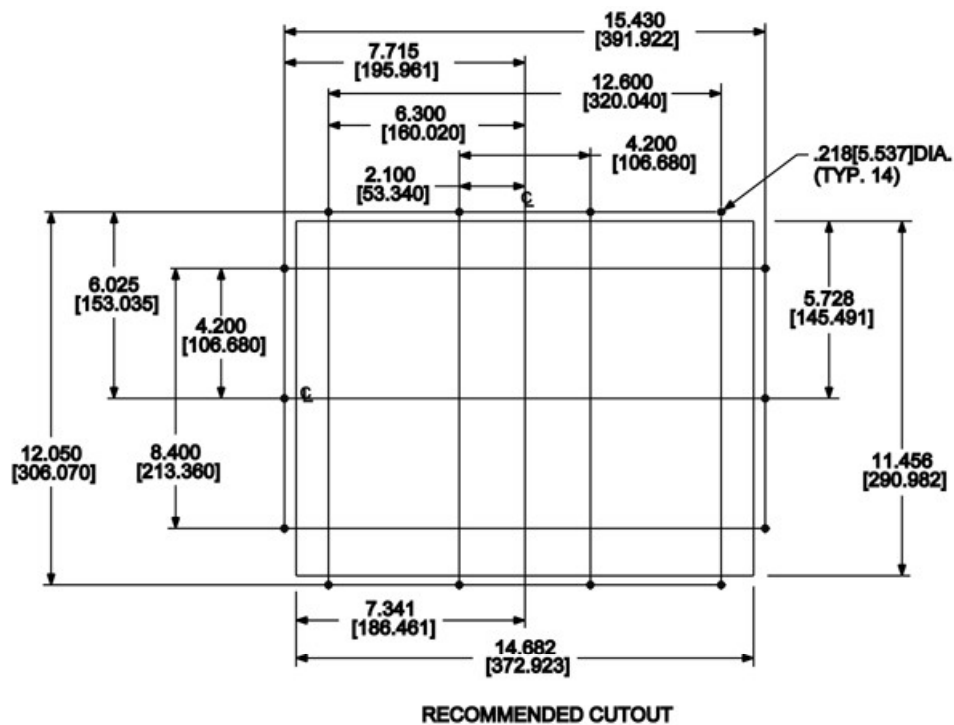## 15" Industrial Panel Computer — Model AC250
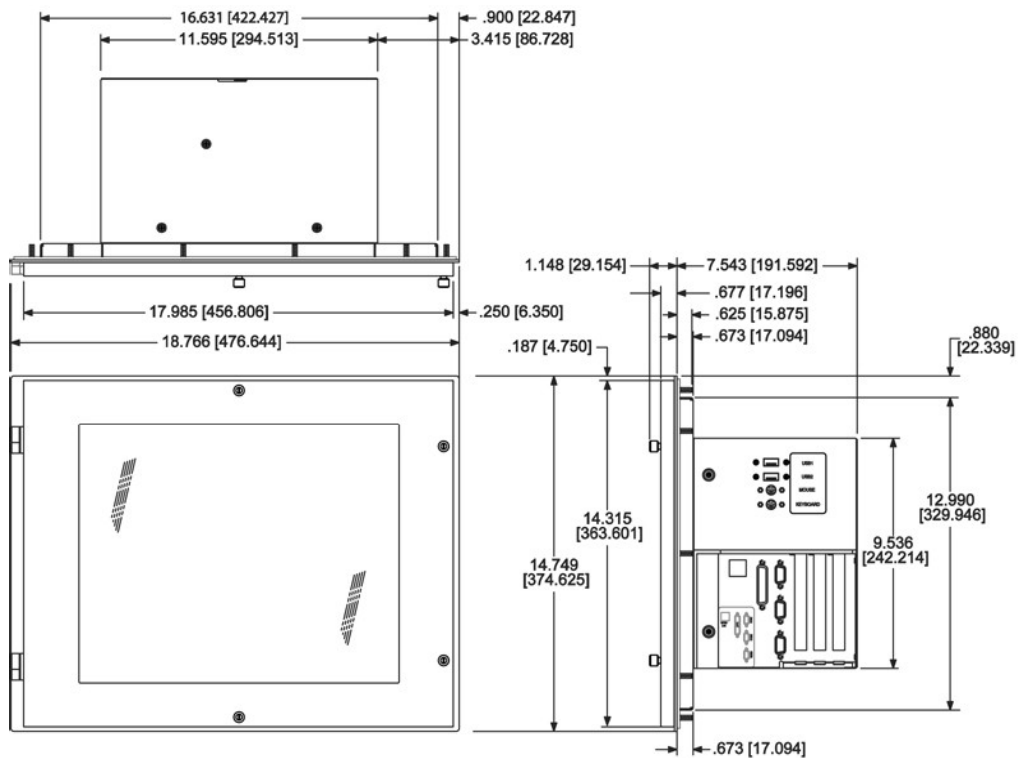## Outline Dimensions

15" Industrial Panel Computer — Model AC250
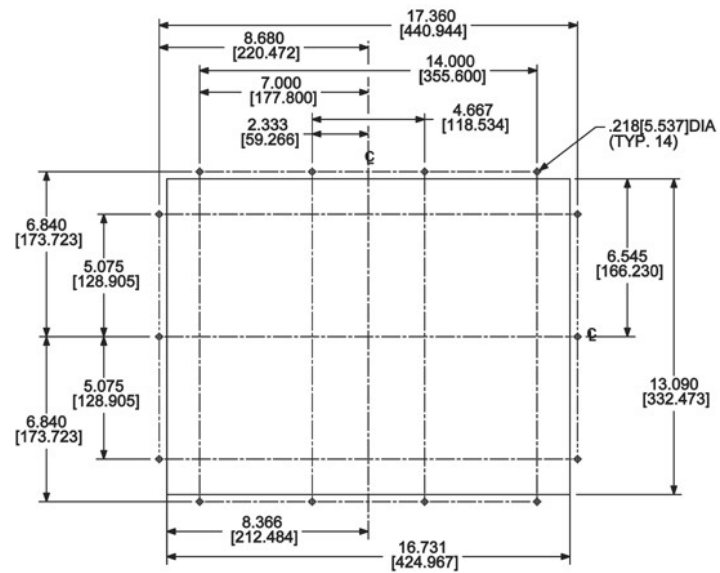## Cutout Dimensions

RECOMMENDED CUTOUT

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17" Industrial Panel Computer — Model AC270
Outline Dimensions

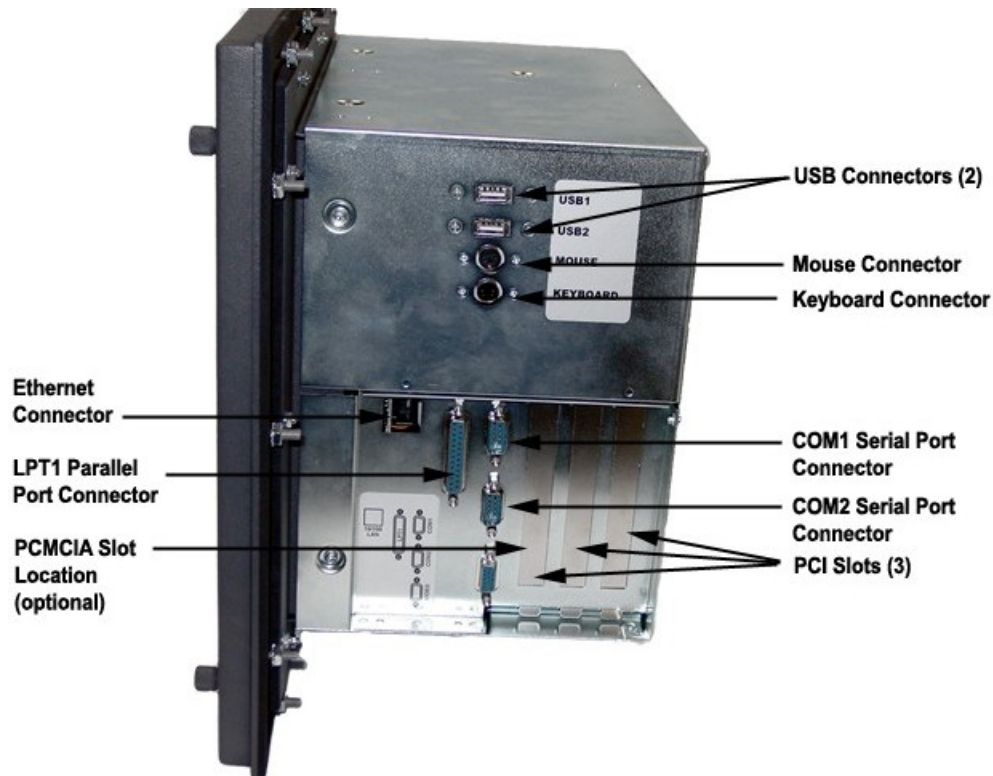## 17" Industrial Panel Computer — Model AC270
Cutout Dimensions

5 EXTERNAL COMPONENTS

CONNECTORS

Side Panel

Located on one side of the Industrial Panel Computers are the following connectors:

Two USB (Universal Serial Bus) Connectors
There are two USB connectors located on the side of the unit. Many devices now use this type of connector (i.e., scanner, printer, mouse, etc.). You can also use the USB to connect to an external Floppy Disk Drive or external CD ROM Drive. One or both ports may be used.

One KEYBOARD Connector
A personal system/2 (PS/2)–style keyboard port.

One MOUSE Connector
A personal system/2 (PS/2)–compatible mouse port.

10/100 ETHERNET
10/100–megabit-per-second (Mbps) network interface controller (NIC) provides all the functions of a separate network card with Wakeup on LAN technology. The NIC supports both the 10 BASE-T and 100 BASE-TX Ethernet standards.

LPT1
Parallel Port (LPT1) is a 25-pin male D-Sub connector that is used to connect to a printer.
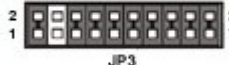
VIDEO
A 15-pin D-sub female connector for attaching a VGA monitor to the Panel Computer. The video signal sent to an external VGA monitor will duplicate the video resolution and image on the flat panel display.

COM1
COM2
COM1 and COM2 serial ports are 9-pin male D-Sub connectors. COM1 is a dedicated RS-232 port. COM2 is a RS-232/RS-422/RS-485 port. ***Please Note: Manufacturer's default for COM2 is RS-232. To select RS-422 or RS-485, use the JP3 Jumper settings shown below. COM1 and COM2 Connector assignments are provided in the tables on the following page.***

COM 2 FUNCTION	JUMPER SETTING (pin closed)	JUMPER ILLUSTRATION
RS-232	Open	
RS-422	1-2, 5-6, 7-8, 9-10, 11-12, 13-14, 15-16, 17-18, 19-20	
RS-485	1-3, 4-6, 7-8, 9-10, 11-12, 13-14, 15-16, 17-18, 19-20	

5 EXTERNAL COMPONENTS

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COM1 Connector
The COM1 Connector assignments (DSUB pinouts) are as follows:

PIN	ASSIGNMENT
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI/+5V/+12V selectable

COM2 Connector
The COM2 Connector assignments (DSUB pinouts) are as follows:

PIN	ASSIGNMENT RS-232	RS-422	RS-485
1	DCD	TX–	TX–
2	RX	TX+	TX+
3	TX	RX+	RX+
4	DTR	RX–	RX–
5	GND	GND	GND
6	DSR	RTS–	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI/+5V/+12	CTS–	NC

PCMCIA Slot (optional, uses one PCI slot)
PCMCIA (Personal Computer Memory Card International Association) are small form factor devices that are used in a variety of applications and devices, particularly in digital cameras, lap top computers, PDAs, and many other mobile devices. You can order a Panel Computer with one installed or install your own.
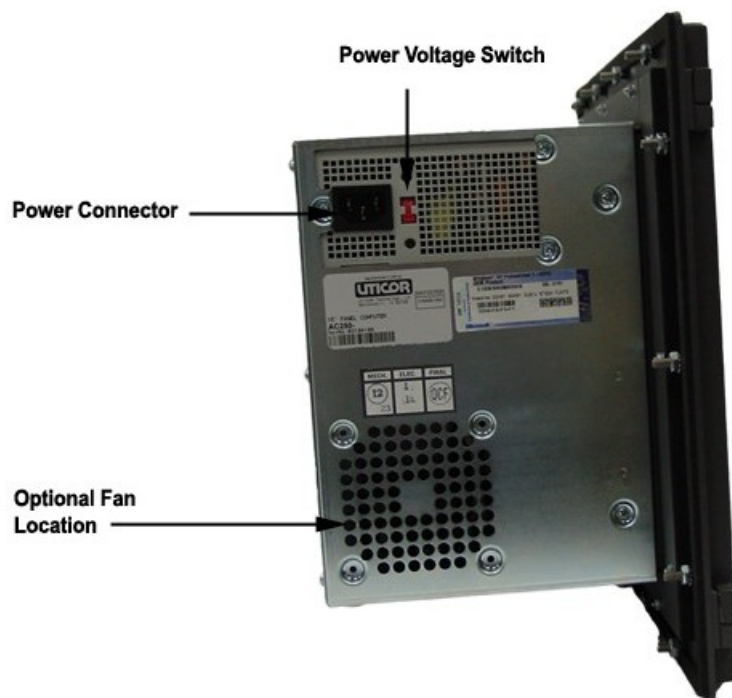
3 PCI Slots
The Panel Computer will support the addition of three 32-bit PCI (Peripheral Component Interconnect) Cards if you want to upgrade your system.

On the other side of the Panel Computer you will find the **Power Connector** and a **Power Voltage Switch**. Use the power voltage switch to select 115 or 230 V AC. Also shown is the location of the optional fan.
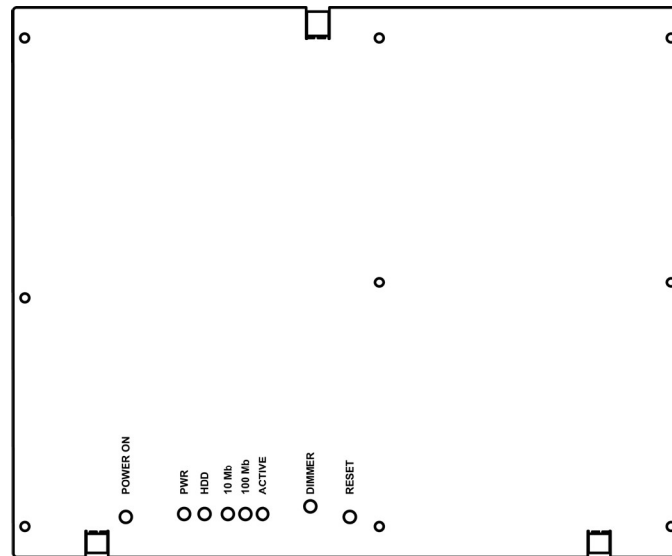
Side Panel

Rear Panel

Push Buttons

Located on the bottom rear panel, you will find a recessed **POWER ON** push button and a recessed **RESET** push button. There is also a recessed **DIMMER** potentiometer to adjust the display brightness on the 15" model (not available on the 10.4" and 12.1" model). Use a small flat blade screwdriver to adjust the DIMMER pot and to access the POWER ON and RESET push buttons.

LEDs

There are also 5 LEDs located on the bottom rear panel. They are labeled **PWR** to indicate power is applied to unit; **HDD** to indicate the hard disk drive is active; **10Mb**, **100Mb**, and **ACTIVE** all indicate Ethernet activity.

BIOS Setup

Once you have the Panel Computer installed and the peripheral devices connected, you are ready to power up the computer. Press the POWER ON push button located on the rear panel of the computer (as described on page 18).

Consult the PCA1675 Embedded Processor Board Manual, part number MAN-P1675-002 to set up your Industrial Panel Computer's BIOS.

COM1 and COM2 Serial Port Setup

For wiring pinouts for COM1 and COM2, see page 20. For COM2, The default setting is RS-232. For COM2 RS-422 or RS-485 communications, install jumpers as shown on page 19. For more information, see the PCA1675 Embedded Processor Board Manual, part number MAN-P1675-002.

UPGRADES

Expansion Card Installation

The Panel Computers can accommodate up to 3 expansion cards. To install an expansion card:

⚠️ **CAUTION: Before opening the Panel Computer or handling any expansion cards, be sure to protect the equipment from electrostatic discharge (ESD) by properly grounding yourself.**

1. Disconnect the power source from the Panel Computer.

2. To open the rear of the enclosure, remove 9 screws from back captive panel. Panel is still held in place by 3 retaining tabs, one on top and two on the bottom. Just slide the rear panel to the right until the top tab aligns with the hole in the housing. Swing top out and lift back panel away from housing.
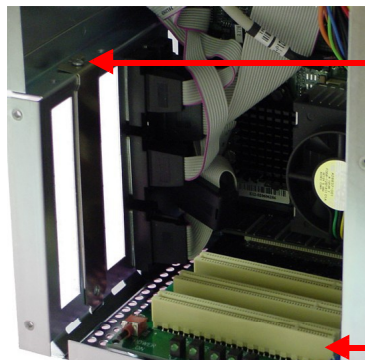
Rear panel
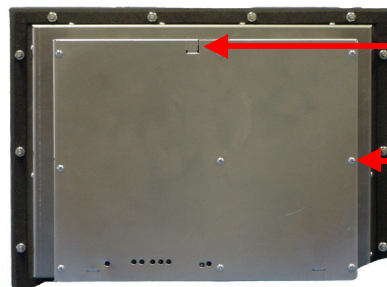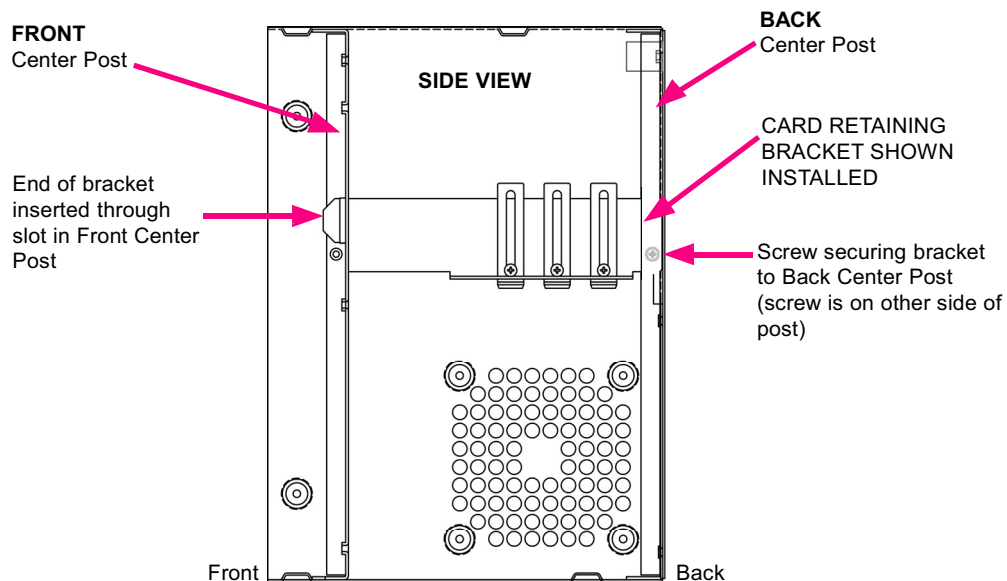
Retaining Tabs (3)

Screws (9)

3. Remove and set aside the screw that secures the slot cover where the expansion card will be installed. Discard cover.

Slot cover screw (1 per cover)

PCI Expansion Card Connectors

4. Remove the "card retaining bracket" from center posts by removing screw from back post holding card retainer. Lift up retainer and slide out of the slot in the front post.

FRONT
Center Post

BACK
Center Post

SIDE VIEW

CARD RETAINING BRACKET SHOWN INSTALLED

End of bracket inserted through slot in Front Center Post

Screw securing bracket to Back Center Post (screw is on other side of post)

Front

Back

5. Insert the expansion card into the backplane connector and reinstall the screw to secure the card's end plate to the enclosure.

Reinstall cover screw here to secure card end plate to enclosure

Expansion Card seated in backplane connector
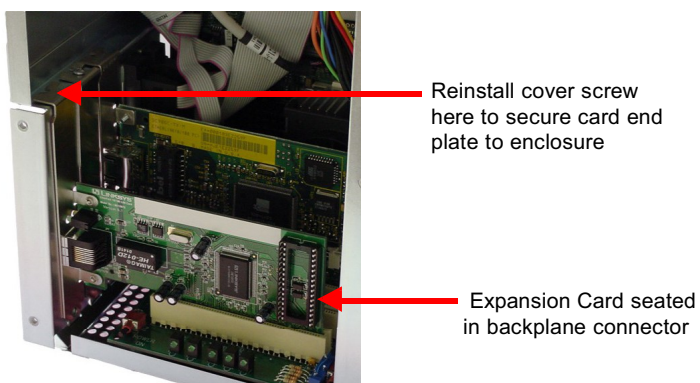
6. Reinstall card retainer bracket. Slide bracket into the slot in the front post and secure with a screw in the back post.

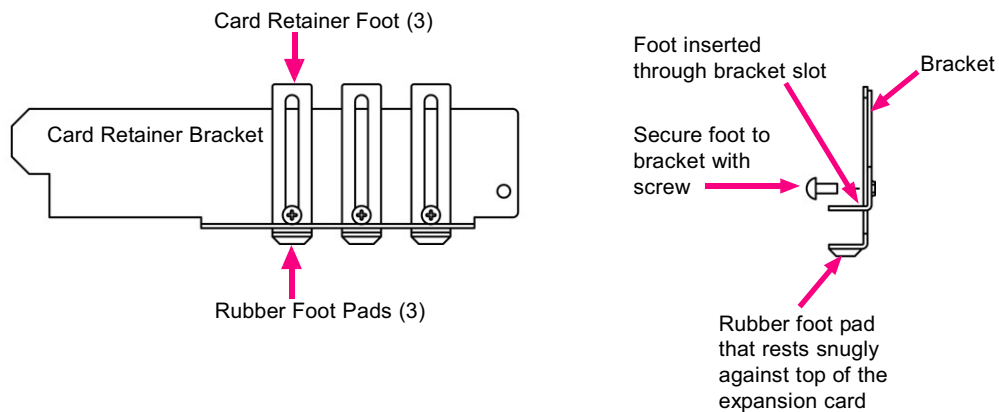7. Adjust card retainer foot until it is securely against the top of the card that you have just installed. Tighten the screw to ensure that the card will remain properly seated in the backplane connector.

8. Replace the rear panel and reconnect the power source.

Card Retainer Foot (3)

Card Retainer Bracket

Rubber Foot Pads (3)

Foot inserted through bracket slot

Bracket

Secure foot to bracket with screw

Rubber foot pad that rests snugly against top of the expansion card
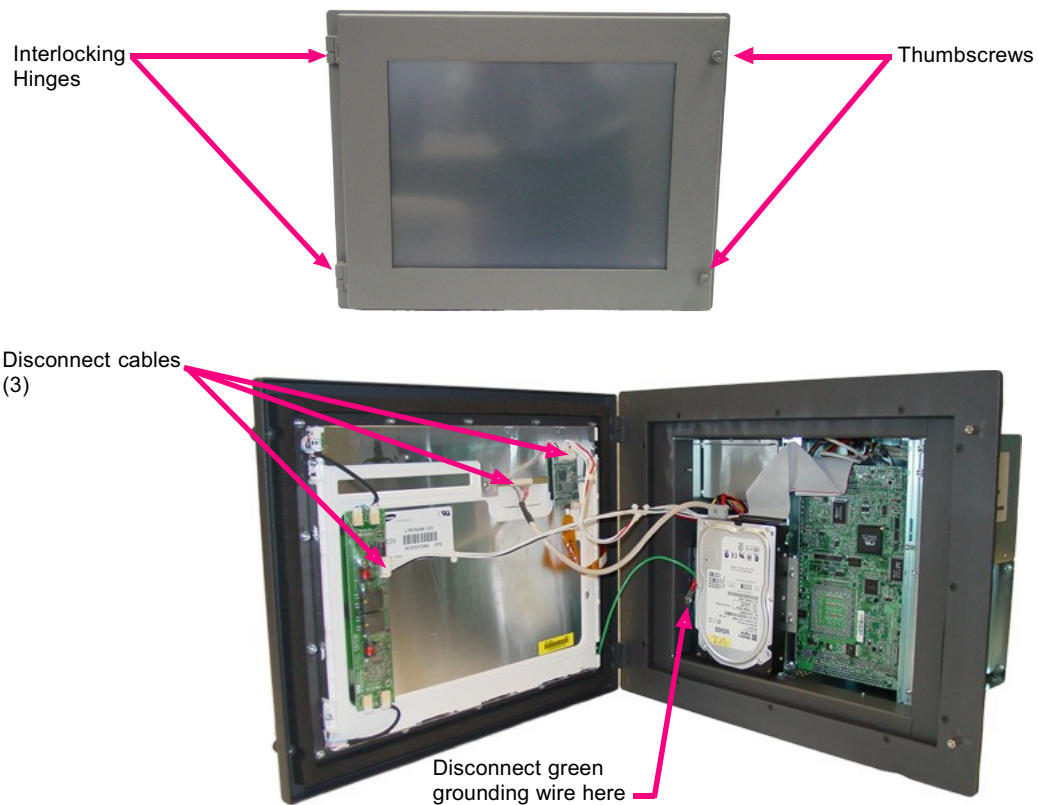
Maintenance

⚠ *WARNING: Disconnect the Panel Computer from power source before opening the unit and disconnecting or removing any component. Failure to do so may result in electrical shock and/or damage to the unit.*

⚠ **CAUTION: Before opening the Panel Computer or handling any expansion cards, be sure to protect the equipment from electrostatic discharge (ESD) by properly grounding yourself.**

Replacing Front Door Assembly

The entire front of the unit (which includes the display) is easily removeable from the panel chassis. To remove the front door assembly, reference the figures below and perform the steps on the following page:

Interlocking Hinges

Thumbscrews

Disconnect cables (3)

Disconnect green grounding wire here

1. Disconnect Power Source and loosen the two spring-loaded thumb-screws on the door assembly.

2. The door assembly can now swing open.

3. Disconnect the three cables attached to the front assembly. (You will disconnect them from the door assembly, leave them attached to the components within the panel chassis.)

4. Disconnect the green grounding wire from the quick disconnect on the inside of the panel chassis.

5. Lift up on the door assembly to separate the interlocking hinges on the assembly from the chassis.

6. Mount the new door assembly on the hinges.

7. Reconnect cables.

8. Connect the 3 cables to the front door assembly, and then close the door and tighten the thumbscrews. (Make sure that you do not pinch any of the cables when closing the front door assembly.)

9. Reconnect power to the unit.
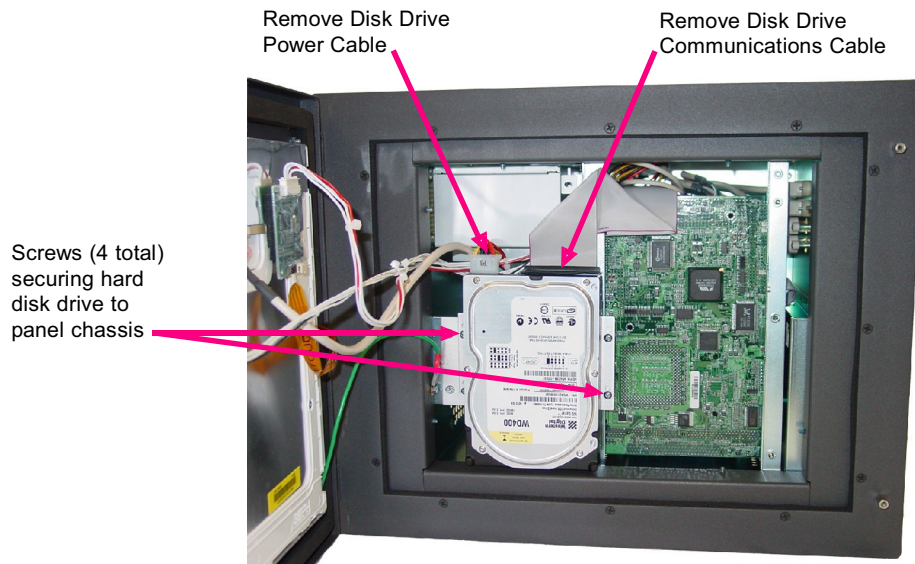
Replacing Hard Disk Drive

WARNING: Disconnect the Panel Computer from power source before opening the unit and disconnecting or removing any component. Failure to do so may result in electrical shock and damage to the unit.

CAUTION: Before opening the Panel Computer or handling any expansion cards, be sure to protect the equipment from electrostatic discharge (ESD) by properly grounding yourself.

In the event you should have to replace the hard disk drive in the unit, perform the following steps:

1. Disconnect power source.

2. Loosen the two spring-loaded thumbscrews on the front of the unit and swing open the door.

3. Disconnect the 2 cables from the disk drive.

4. Remove and set aside four screws in plate that secures hard disk drive to the panel chassis.

Remove Disk Drive Power Cable

Remove Disk Drive Communications Cable

Screws (4 total) securing hard disk drive to panel chassis

5. Remove and set aside four screws that secure hard disk drive to the plate.

6. Attach new hard disk drive to the plate using the four screws that were removed earlier.

7. Secure plate with new hard disk drive attached to the panel chassis with the four screws that were removed earlier.

8. Reconnect cables.

9. Make sure that the 3 cables to the front door assembly are connected, close the door, and tighten the thumbscrews. (Make sure that you do not pinch any cables when closing the front door assembly.)

10. Reconnect power to the unit.

Preserving Data
Viruses can corrupt files; files can be inadvertently deleted; and hard-disk drives can fail after extended used. To avoid data loss, regularly back up the data files on the hard-disk drive. If you lose the contents of your hard-disk drive, you can reinstall programs, but your data files will be lost if you don't have a backup. We recommend you back up the hard-disk drive at least once a week, with a daily backup of those files that have been changed.

External Components
To clean the exterior computer cabinet, perform the following steps:

1. Place a grounding strap around your wrist to reduce the effects of electrostatic discharge (ESD).

2. Turn off the computer and any attached devices.

3. Use a small vacuum cleaner to remove any dust from the slots and holes on the computer.

4. Moisten a soft cleaning cloth with water and liquid dishwashing detergent.

Caution: DO NOT SOAK the cloth in the solution—you must not let the solution drip inside the computer.

5. Use the damp cloth to wipe the computer housing.

Touchscreen/Display
To ensure the longevity and effectiveness of the touchscreen please take note of the following precautions:

•   Do not press sharp objects against the screen.
•   Do not strike the panel with hard objects.
•   Do not press the screen with excessive force.
•   Once the panel is mounted and has power applied, do not place any objects over the ventilation slots. This will result in heat buildup and may damage the unit.

Touchscreen/Chemical Compatibility

The touchscreen has a polyester surface. The following list is provided to make you aware of the general compatibility between chemicals that may be present in your work environment and the polyester surface of the touchscreen. Use the chart to determine those chemicals that are safe to use around your Panel Computer and those that may harm the touchscreen. The list rates these chemicals as **E—Excellent**, **G—Good**, **F—Fair**, and **N—Not Recommended.** Because the ratings are for ideal conditions at 57°C, consider all factors when evaluating your application.

Chemical	Rating	Chemical	Rating
Acetone	G	Aniline	G
Auto fuel	E	Auto lubricants	E
Auto Hydraulics	E	Bromine (wet)	N
Butyl Cellosolve	E	Butyl Ether	G
Chloroform	G	Clorox	E
Coffee	E	Cupric Sulfate	E
Cyclohexanone	N	Cyclohexanol	E
Downy	E	Diethyl Ether	G
Dioctyl Phthalate	G	Ethyl Acetate	E
Ethanol	E	Ethylene Chloride	G
Fantastic	E	Formula 409	E
Grape Juice	E	Heptane	E
Hexane	E	Hydrogen Peroxide	N
Isopropyl Alcohol	E	Ketchup	E
Lemon Juice	E	MEK	F
Methylene Chloride	N	Mineral Acids (dilute)	E
Mineral Acids (strong)	G	Mr. Clean	E
Mustard	G	Naphtha	G
Phenol	N	Sodium Hydroxide (dilute)	G
Sodium Hydroxide (strong)	F	Sodium Hypochlorite	E
Spray 'N Wash	E	Tea	E
Toluene	E	Tomato Juice	E
Top Job	E	Trichloroacetic acid	F
Triethanolamine	G	Vinegar	E
Wisk	F	Xylene	E
Zinc Chloride	E		

Touchscreen Cleaning

The touchscreen has a scratch resistant coating. This adds a slight chemical barrier to the screen, but the coating's primary purpose is to protect the screen from abrasion. The touchscreen should be cleaned as needed with a soft cloth dampened with warm, soapy water.