



MODEL: WS Series

8-slot/10-slot or microATX LCD Workstation
RoHS Compliant, IP 65 Protection

User Manual



Revision

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Chapter

1

Introduction

1.1 Overview

The WS Series workstation is a member of IEI's line of sophisticated LCD and chassis designs, and it has been improved to be RoHS compliant.

The WS Series is equipped with a 10.4/12.1/15/17 inch TFT type color LCD. The LCD screen itself features an MTBF up to 50,000 hours. With exceptional brightness, wide-view-angles, and fast response performance, the series is ideal for a wide range of applications.

The WS LCD workstation series supports resolutions up to 1280(H) X 1024(V) pixels with 260,000 colors. For resolutions of other models, please refer to the following discussions.

The WS LCD workstations are designed to fit Industrial automation or any applications that require the capabilities of working under harsh environmental conditions, minimum installation space, and flexible configurations. The front panel provides IP 64 protection which effectively ward off dust, oil, water, and vapors.

Flexible analog interface is provided for ease of connection with an installed SBC (Single Board Computer) or microATX main board. Resistive or capacitive types of touch panels are provided as ordering options. If remote/non-attentive control is preferred, RS-232 or USB interfaces can be applied using customized adapter cables.

The WS Series does not restrict itself to the automation applications. Applicable solutions include the following:

- Any applications that requires HMI (Human Machine Interface) capabilities
 - Tough chassis
 - Front access membrane keypad and mouse pad
- ATE [Auto Test Equipment]
 - Factory automation network nodes
 - Programmable machine controller

WS Series Workstation

1.2 Model Variations

The WS Series comes in a variety of models. The models have special features as identified by their model name. The WS Series model variations are listed in **Table 1-1**.

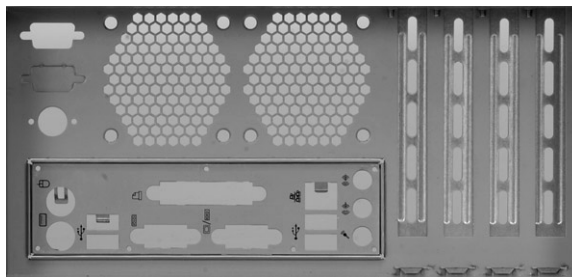
	Touch Screen	Motherboard Form Factor	Power Supply	Expansion Slots
WS-612GS/A255A/R-R20	10.4"	Half-size	ACE-A255A	7
WS-843GS/A130B/R-R20	12.1"	Half-size	ACE-A130B	10
WS-855GS/A130B/R-R20	15"	Half-size	ACE-A130B	10
WS-855GSATX/A130B/R-R20	15"	microATX	ACE-A130B	Motherboard
WS-875GS/A130B/R-R20	17"	Half-size	ACE-A130B	10
WS-875GSATX/A130B/R-R20	17"	microATX	ACE-A130B	Motherboard

Table 1-1: WS Series Model Variations



NOTE:

The microATX and the multi-slot models only differ in the chassis side panel. Shown below is the side panel bracket of the microATX version.



Note the airflow direction if additional cooling fans should be added to the side panel here. The holes as shown above should be the passage drawing in the cooling air.

1.3 System Architecture

The WS Series workstation is designed with considerations for the ease of integration featuring a modular design consisting an IP 64 aluminum LCD panel and a rugged steel chassis.

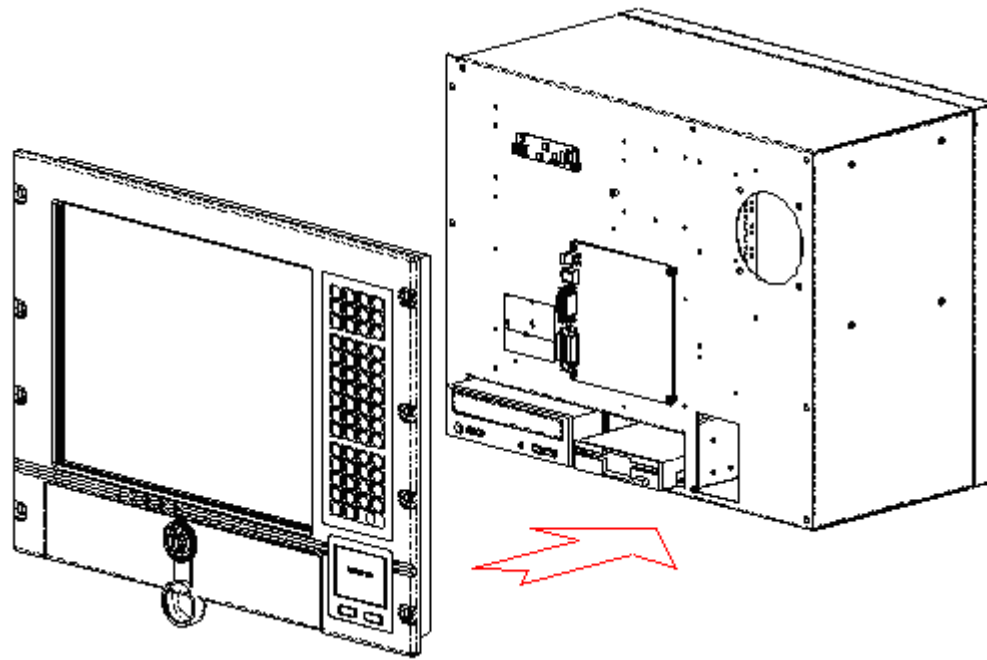


Figure 1-1: Modular Design

1.4 Dimensions

The dimensions of the WS Series workstation are shown in the following figures.

WS Series Workstation

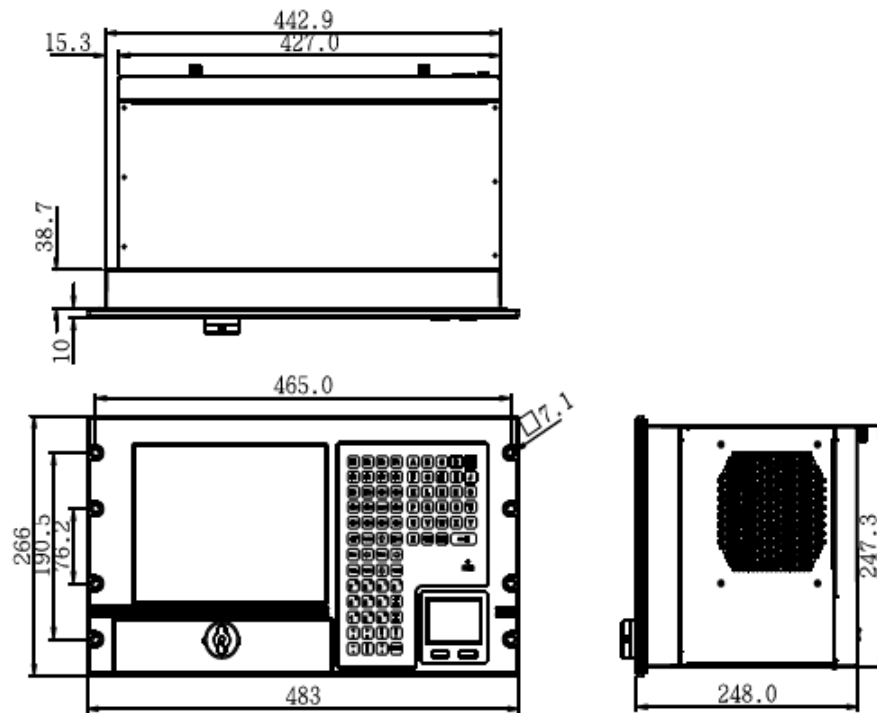


Figure 1-2: WS-612GS Dimensions (mm)

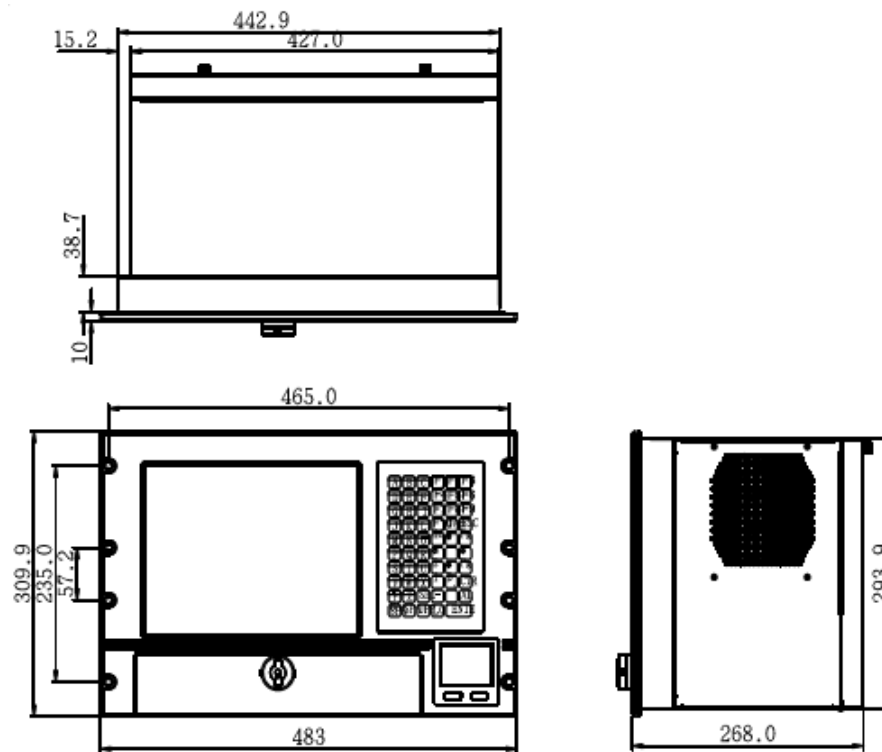


Figure 1-3: WS-843GS Dimensions (mm)

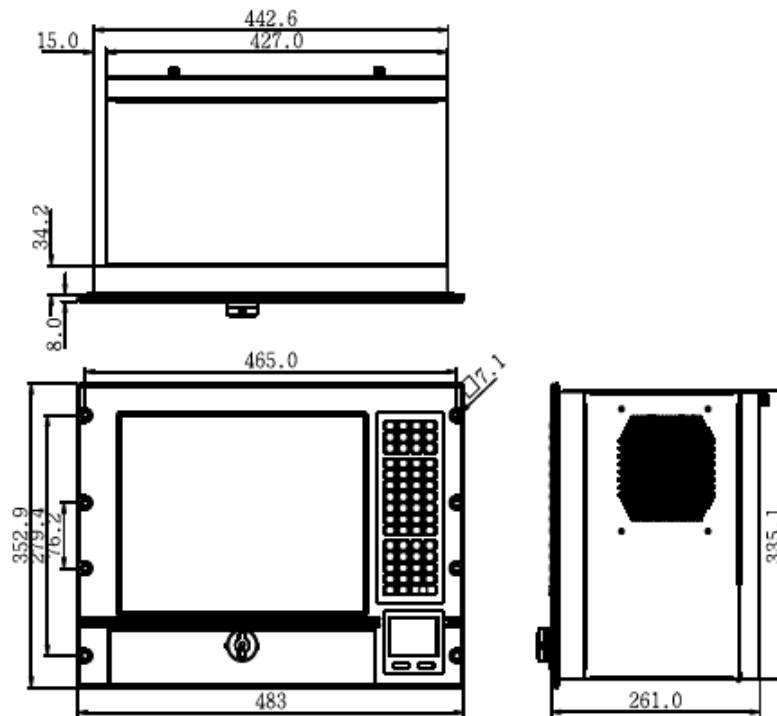


Figure 1-4: WS-855GS Dimensions (mm)

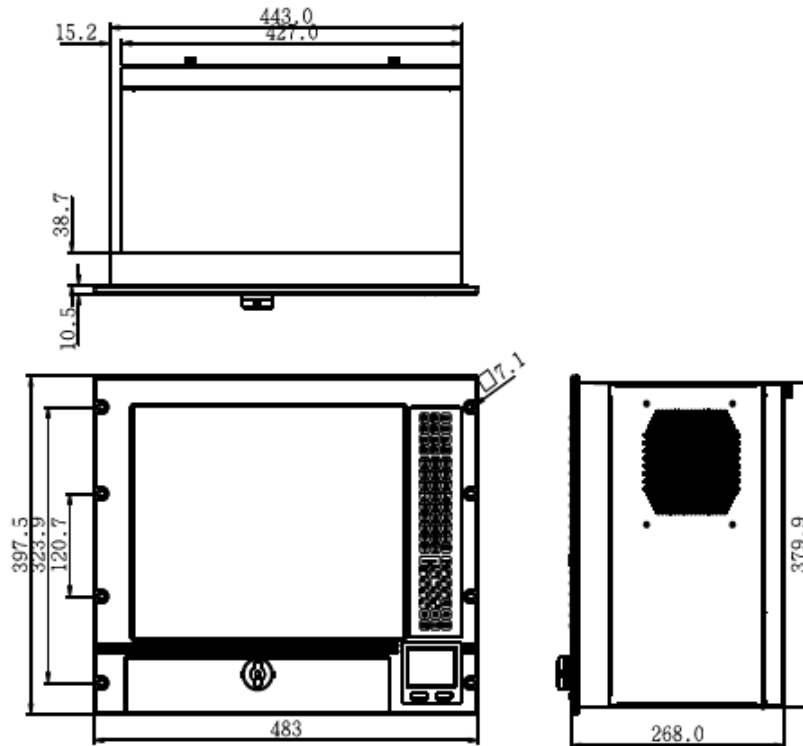


Figure 1-5: WS-875GS Dimensions (mm)

WS Series Workstation

1.5 Specifications

Table 1-2 shows the WS Series specifications.

	WS-612GS	WS-843GS	WS-855GS	WS-875GS
LCD Type	10.4	12.1"	15"	17"
Max. Resolution	800 x 600	1024 x 768	1024 x 768	1280 x 1024
Brightness (cd / m2)	400	500	350	300
Contrast	700:1	700:1	400:1	500:1
LCD Color	262K	262K	262K	16.2M
Backlight MTBF (hrs)	50,000 (LED backlight)	50,000 (LED backlight)	50,000	50,000
Expansion Slots	7 slots	10 slots	10 slots/MB	10 slots/MB
Rack Height	6U	7U	8U	9U
Form Factor	Full-size/Half-size SBC		Full-size/Half-size/microATX SBC	
Input Interface	VGA (DB-15)			
Touchscreen	5-wire resistive type			
Front Panel USB	4	2	2	2
Key Pad	63 keys	59 keys	59 keys	59 keys
Function Key	20 keys	10 keys	10 keys	10 keys
Touch Pad	Yes	Yes	Yes	Yes
HDD Bay	One 3.5" HDD			
CD-ROM Bay	N/A	One 5.25" CD-ROM		
FDD Bay	One 3.5" FDD			
Cooling Fan	12 cm ball bearing 99.6 CFM fan			
Front Frame	Aluminum			
IP Level	IP 64			
Mounting	19" Rack Mount			
Dimensions (WxHxD) (mm)	483 x 266 x 248	483 x 310 x 268	483 x 353 x 261	483 x 398 x 268
Weight (Net/Gross)	9.2 kg/14.4 kg	10.7 kg/17.2 kg	12 kg/18.2 kg	14.2 kg/20.6 kg
Color	Sliver (Pantone PMS-8001)			
Vibration	5 ~ 17 Hz, 0.1" double amplitude displacement 17 ~ 640 Hz, 1.5G acceleration peak to peak			



Shock	10G acceleration peak to peak (11ms)
Humidity	5% ~ 95%, non-condensing
Operating Temperature	0°C ~ 50°C

Table 1-2: WS Series Specifications

1.6 Recommended Backplanes

Table 1-3 shows the recommended backplanes for the WS Series.

	WS-612GS	WS-843GS / WS-855GS / WS-875GS
AT	IP-7S BP-7S	BP-10S
ATX	HPE-7S1 PE-6S/7S PE-7S2	PCI-10S2 HPE-7S1/8S PE-6S/7S/7S2/8S/9S
AT / ATX	PCI-7S	PCI-10S IP-10S IPX-9S

Table 1-3: WS Series Recommended Backplanes

1.7 Recommended Power Supplies

Table 1-3 shows the recommended power supplies for the WS Series.

	WS-612GS	WS-843GS / WS-855GS / WS-875GS
AT	ACE-916AP-RS	ACE-925A(AP-U)-RS ACE-932A-RS ACE-935AL-RS ACE-T140A-RS



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ATX		ACE-4860AP-R11-RS
	ACE-A618A-RS-R11	ACE-828A(A/M/V)-RS
	ACE-4520C-RS	ACE-A130B-R10
	ACE-A225A-R10	ACE-A140A-R10
	ACE-615A-RS-R11	ACE-A140A-S-R10
		ACE-A160A-R10

Table 1-4: WS Series Recommended Power Supplies

1.8 AV-6650 AD Board Overview

The WS Series are all installed with an AD board. The AD board information is described in the following sections.

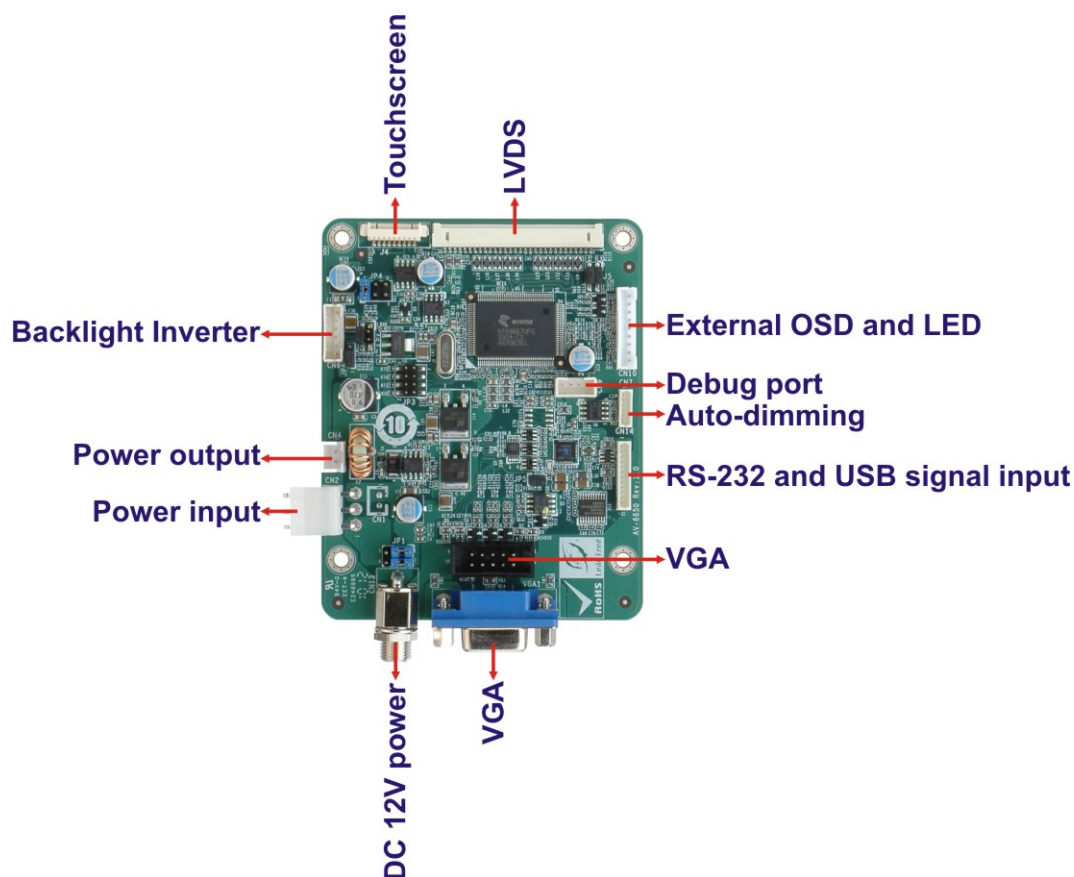


Figure 1-6: AV-6650 AD Board Overview



1.8.1 AV-6650 Peripheral Interface Connectors

Table 1-5 shows a list of the peripheral interface connectors on the AV-6650 AD board.

Connector	Type	Label
Auto-dimming connector	6-pin wafer connector	CN7
Backlight inverter connector	6-pin wafer connector	CN6
Debug port connector	4-pin wafer connector	CN9
External OSD and LED indication connector	9-pin wafer connector	CN10
LVDS output connector	30-pin connector	CN5
Power output connector	2-pin header	CN4
Power input connector	3-pin connector	CN2
RS-232 and USB signal input connector	12-pin wafer connector	CN14
Touchscreen connector	9-pin wafer connector	J4
VGA connector	10-pin box header	VGA2

Table 1-5: AV-6650 Peripheral Interface Connectors

1.8.2 AV-6650 Rear Panel Connectors

Table 1-6 lists the rear panel connectors and jumpers on the AV-6650 AD board.

Connector	Type	Label
DC 12V power connector	DC Power Jack	CN13
VGA connector	15-pin VGA connector	VGA1

Table 1-6: AV-6650 Rear Panel Connectors



Chapter

2

Installation

2.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the WS Series may result in permanent damage to the WS Series and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WS Series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WS Series, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the WS Series, place it on an anti-static pad. This reduces the possibility of ESD damaging the WS Series.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

2.2 Installation Precautions

When installing the WS Series workstation, please follow the precautions listed below:

- The WS Series workstations must be installed and operated only by trained and qualified personnel. Maintenance, upgrade, or repair on the open device may only be RMA'ed or carried out by qualified personnel who are familiar with the associated dangers.
- Since the device may weigh more than 10 kg (not including a wall-mount bracket or accessories of the like), it is advisable to have another person assist in the installation.

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- Make sure there is sufficient air circulation around the device and space for circulation outside the ventilation holes when installing the workstation.
- The openings for cooling on the device (on the upper, side, and the back-end) must not be obstructed by objects or the like. If the ventilation holes are blocked, this can cause an overheating of the system. At least 5 cm of space free around the unit should be available to prevent the device from possibly overheating!
- The workstation should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection as noted by the electrical values indicated on the short description label attached to the back of the power supply module and to the chassis.
- Before the workstation is disassembled, it is strongly recommended to shut down the system and unplug the power cord. Electric shock and personal injury might occur if accessing the components inside the workstation while the power cord is still attached.

2.3 Unpacking

2.3.1 Unpacking Procedure

To unpack the WS Series workstation, follow the steps below:



WARNING:

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the WS Series workstation has been properly installed. This ensures the screen is protected during the installation process.

Step 1: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the external (second) box.

Step 2: Open the external (second) box.

- Step 3:** Use box cutters, a knife or a sharp pair of scissors that seals the top side of the internal (first) box.
- Step 4:** Lift the monitor out of the boxes.
- Step 5:** Remove both polystyrene ends, one from each side.
- Step 6:** Pull the plastic cover off the WS Series workstation.
- Step 7:** Make sure all the components listed in the packing list are present.

2.3.2 Packing List

All the workstation in the WS Series are shipped with the following components:

- 1 x WS Series LCD workstation
- 1 x AC power cord (cable type determined by the shipped-to area; one exemplary P/N: 32000-000002-RS)
- 1 x VGA cable (15-pin D-SUB male-to-male/250mm; P/N: 32000-101200-RS)
- 1 x Screw kit (P/N: 19600-000148-RS)
- 1 x PS_ON cable for ATX signal (P/N: 32100-034801-RS; pre-installed)
- 7 x Press stick rubbers (P/N: 47001-000101-RS)
- 3 x Press stick kit (short; P/N: 41015-0004C0-00-RS)
- 4 x Press stick kit (long; P/N: 41015-0003C0-00-RS)
- 1 x User manual, Utility, and Driver CD.
- 1 x RS-232 cable/touch pen/ driver CD-ROM for touch screen (an optional item for the “T-R” models only; P/N: 32000-101100-RS)
- 1 x Keypad/mouse pad PS/2 cable (P/N: 32000-075000-RS)
- 1 x Keypad/mouse pad PS/2 cable (P/N: 32000-078400-RS; for ATX models)

If any of these items are missing or damaged, contact the distributor or sales representative immediately.

2.4 Airflow Consideration

As diagrammed below, the airflow travel through the workstation chassis from the ventilation holes on the interface panel and chassis rear-end through the cooling fan and

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power supply and exhaled to the outside. Care should be taken not to obstruct the airflow through the interior and around the chassis.

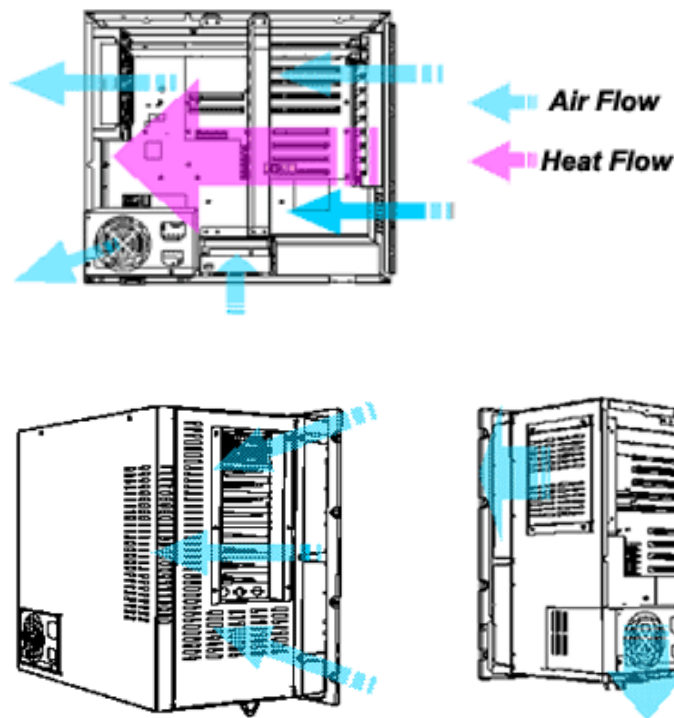


Figure 2-1: Airflow Direction

2.5 Front Control Interface

The front access controls include a membrane keypad, power LED, OSD buttons, and a mouse pad. The keypad interface is managed by a keyboard translator and the membrane keys function like a standard computer key board.

The mouse pad functions like a standard AT mouse, and the function keys, the left- and right- buttons, can be defined through the related driver included in kit. The OSD functions are described in Chapter 3. Figure shows the membrane keypad and mouse pad of the WS-875GS.

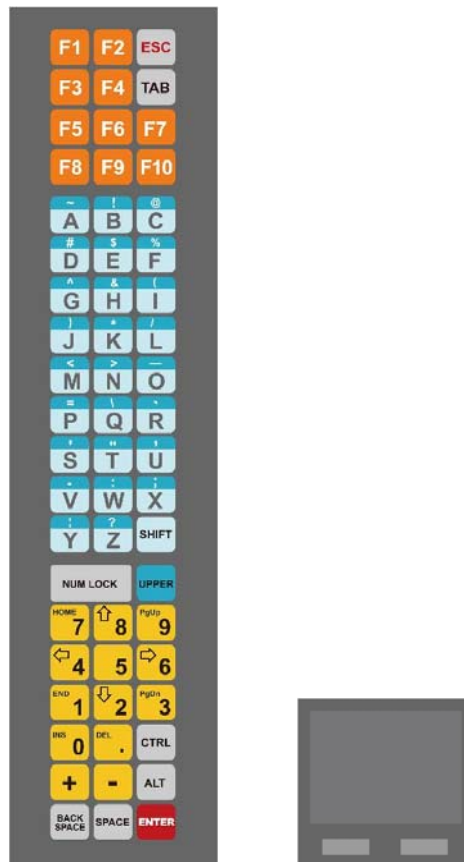


Figure 2-2: WS-875GS Keypad and Mouse Pad



NOTE:

The **WS-612GS** has 20 function keys as shown below. The F1 - F10 function like the function keys on a standard keyboard. The SF11 - SF20 function keys are defined below.



- **SF11:** Shift + F1
- **SF12:** Shift + F2
- **SF13:** Shift + F3
- **SF14:** Shift + F4
- **SF15:** Shift + F5
- **SF16:** Shift + F6
- **SF17:** Shift + F7
- **SF18:** Shift + F8
- **SF19:** Shift + F9
- **SF20:** Shift + F10

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2.6 Workstation Installation

The following sections describe how to install backplane, CPU card and hard disk drive into the WS Series workstation.

2.6.1 Accessing the Interior of the Workstation

A variety of microATX boards or industrial PCI/ISA cards, SBCs can be installed into the WS Series workstation. The microATX and multi-slot versions vary only in the side panel which either comes with interface slot brackets or rear-end brackets for multi-slot backplanes.

Step 1: Use a flat-head screwdriver to unscrew and loosen the hand screws that secure the rear cover of the workstation chassis.

Step 2: The rear cover is hinged to the bottom of the chassis. You may also remove the rear cover by removing the four pan head fasteners that secure it to the chassis.



Figure 2-3: Open the Rear Cover

2.6.2 Installing CPU Cards, Backplane, or Micro-ATX Main Board

The WS Series adopts microATX form factor main boards or CPU cards mounted on PCI/ISA backplanes. The backplane and card options have been discussed in Chapter 1.

The mounting holes inside the chassis readily receive the recommended microATX main boards or PCI/ISA cards. Install the included copper pillars to the standoffs. Secure these PCB to the associated mounting positions and use the hold-down clamp to secure the vertically installed cards. Care should be taken with the full-size cards which should be supported by the card holders that came with the fan module.

Figure 2-4 shows a 10-slot backplane is installed in the chassis.

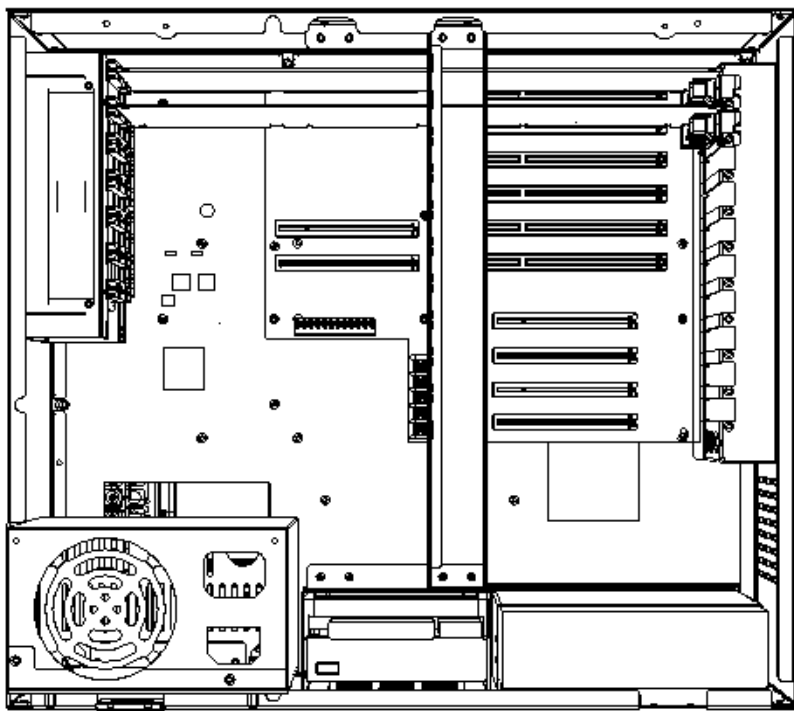


Figure 2-4: Backplane Installation

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Install a CPU card as shown below.



Figure 2-5: CPU Card Installation



NOTE:

- Align or reinstall the card guides on the fan module. Each card guide is secured to the fan module via two pre-drilled holes. When properly installed, the card guides secure the SBC card's position within the chassis and is very important for system stability. Some of the SBCs may come with a large heatsink and cooling fan, therefore properly secure the SBC using the card guide and its slot bracket.
- Carefully route the interface cabling from the SBC to the chassis or peripheral devices. Use of cable ties is recommended and will help the ventilation flow within the chassis.

The chassis comes with two hold-down clamps (**Figure 2-6**). One is installed in the middle. The other secured to the top of the cooling fan module. Both clamps come with rubber foam that helps secure the SBC or extension cards within the chassis.



Figure 2-6: Hold-down Clamps

One end of the longer hold-down clamp is locked on to the side of the chassis over a retainer socket. To install the card, align the end with a cut-out and make sure the protruding metal clip fit into the cut-out. Next secure the hold-down clamp by driving a screw through the hole on the other end to the 3.5" drive bay (see **Figure 2-7**). Therefore, please make sure to install the hold-down clamp after the 3.5" disk drive installation.

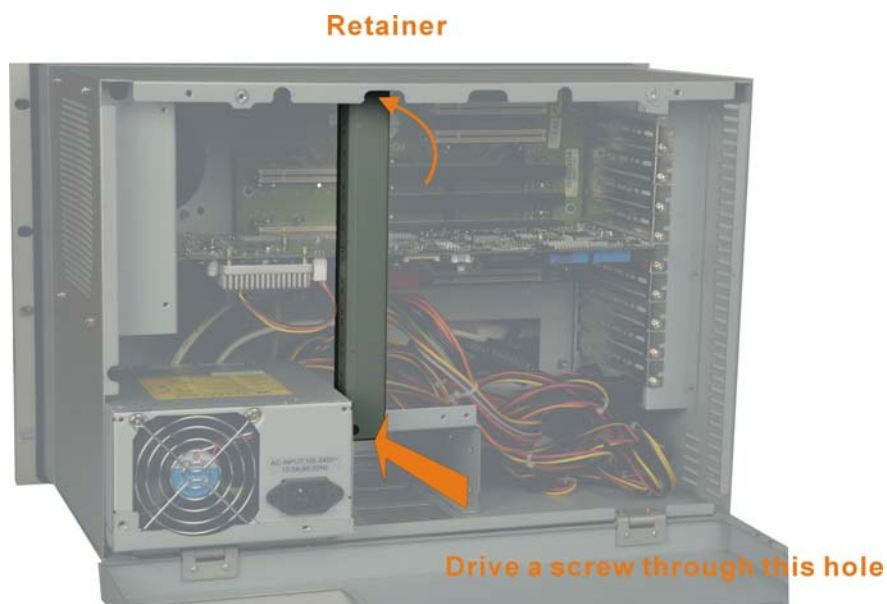


Figure 2-7: Installing the Longer Hold-down Clamp

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The shorter of the hold-down clamps is used to secure full-size cards such as CPU boards. Secure the hold-down clamp by fastening two retention screws to the holes on top of the cooling fan module. See **Figure 2-8**.



Figure 2-8: Installing the SBC Hold-down Clamp

When installed, some cards may still fall short below the hold-down clamps. To better secure the SBC or expansion cards, you may use the included card clamps. First attach the included porons (which are self-adhesive) to the wider end of card clamps. Next locate the screw hole on the hold-down clamp closest to the target card. Adjust the card clamp in a vertical direction until a slight downward force is asserted onto the expansion card, and then fasten a panhead screw to secure the card clamp. With the poron, the card clamp functions as a shock absorber. See **Figure 2-9**.

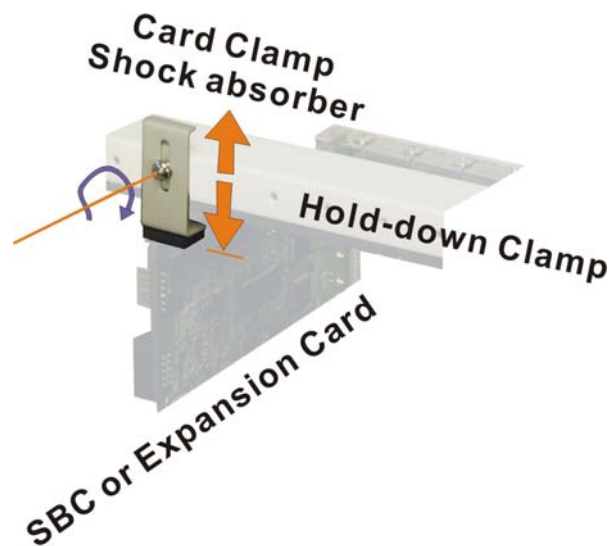


Figure 2-9: Installing the Card Clamp

2.6.3 Installing Peripheral Devices

The WS series provides space for the peripheral devices including one 5.25" and two 3.5" disk drives (one floppy and one hard disk drive). The 5.25" disk drive, usually a CD/DVD-ROM, and 3.5" floppy can be accessed through a front, water-resistant bezel door.

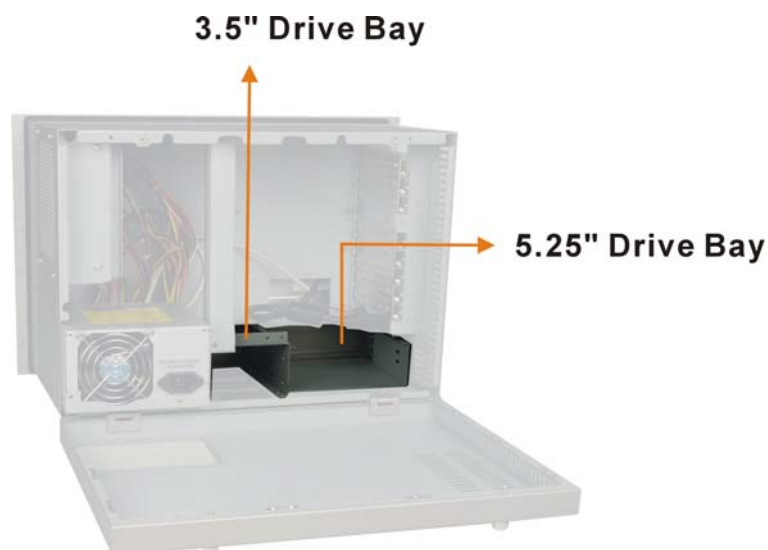


Figure 2-10: Drive Bay Locations

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The 3.5", 5.25" drive bays, and the power supply module are secured through either 2 or 4 screws at the bottom of the chassis (**Figure 2-11**). **Group A** are holes securing the 5.25" drive bay. **Group B** are holes securing the 3.5" drive bay. **Group C** are the holes securing the power supply.

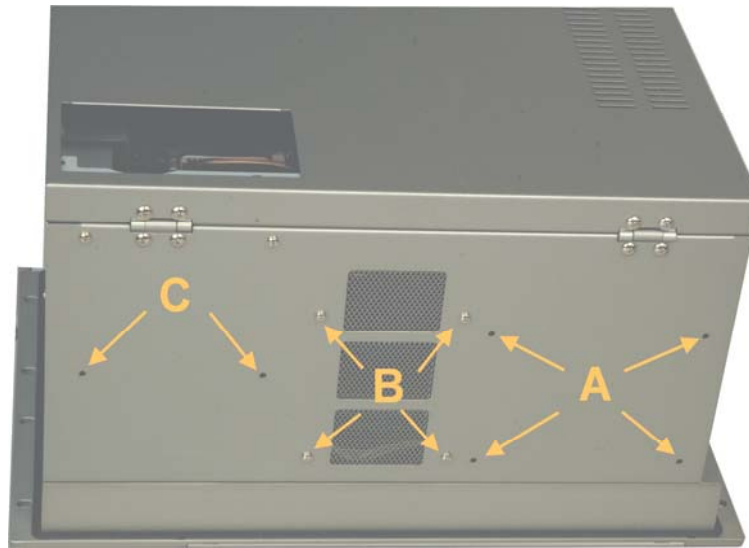


Figure 2-11: Screw Locations at the Chassis Bottom

To install a front-accessible disk drive, remove the drive bays and then remove the 3.5" or 5.25" drive bay cover. Another 3.5" hard drive can be installed to the 5.25" drive bay using separately-purchased brackets. Install peripheral devices by fastening them using the holes on the sides of the drive bays. Note that installing two hard disk drives into the 3.5" drive bay is not recommended. Stacking two hard drives tightly together may cause problems with heat dissipation.

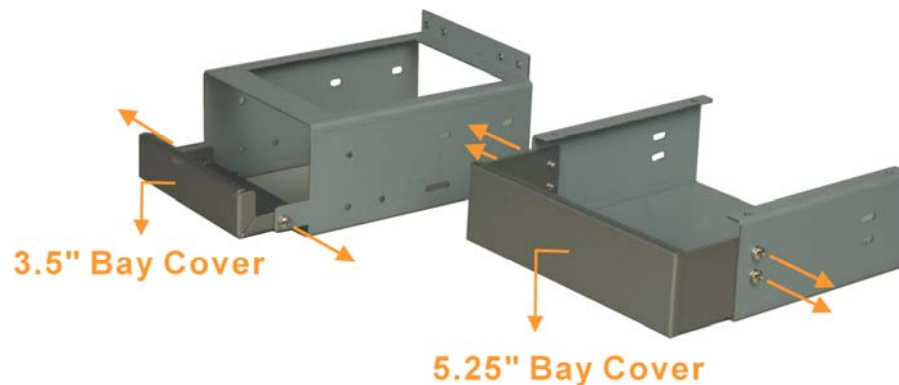


Figure 2-12: Screw Locations at the Chassis Bottom

During the installation process, the power supply module may need to be temporarily removed. The power supply is secured to the chassis using two mounting screws at the bottom of the chassis, and another two screws at the rear end through an adapter bracket. Note that these two screws are different. One is the standard M3 pan-head screw while the other is a flathead screw. Installing the wrong screw will cause problems with closing the rear cover.

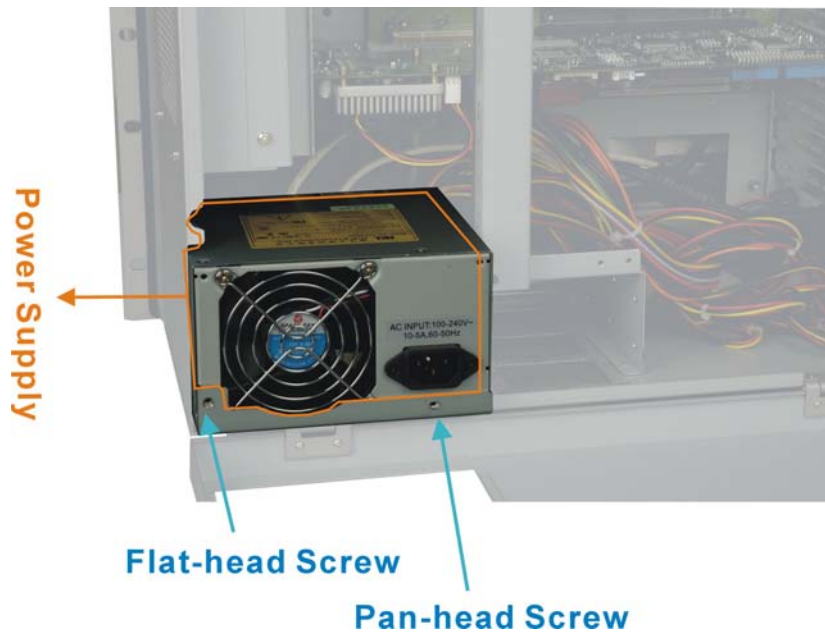


Figure 2-13: Power Supply Installation

WS Series Workstation



NOTE:

In installations where the water-proof feature is required, always remember to properly lock the front bezel and close the rubber key lock end cap.



Water-proof Endcap

2.7 Cabling

After the peripheral devices and CPU card/main board are installed, connect the signal bus cables and the associated power cords. In addition to the storage devices, connect the following internal and external cables.

2.7.1 Internal Cabling

- A 5-pin header for front bezel keypad and mouse pad. Please refer to the documentation that came with the associated CPU card/main board for the location of the keypad and mouse connector.
- An 8-pin USB adapter cable to the USB ports on the front bezel.
- Two 1-pin cables to the power switch.
- One 4P power header that supplies power to the AD card (LCD panel adapter board).
- One 4P power header that supplies power to the cooling fan module.

**NOTE:**

- The KB/MS 5-pin header is also routed to a PS/2 header on the side panel.
- A 15-pin VGA cable is connected from the AD board to the side panel as the graphics input of the LCD display. The VGA interface is then connected via an included, 35cm, loop-back cable to the VGA interface of the SBC or microATX main board.

2.7.2 External Cabling

Connect the CPU card or main board VGA interface connector to the VGA connector on the side panel.

In addition to the membrane keypad on the front panel, an external keyboard or mouse can be connected to the workstation using a PS/2 adapter cable. A PS/2 connector can be located on the left side panel.

There are two keypad/mouse interface connectors. You may either connect the internal 5-pin header cable to the SBC or main board if the SBC or main board comes with the corresponding interface. The user may also connect the PS/2 interface connector on the side panel to the PS/2 connector on the SBC card's rear bracket panel.

The LCD display panel connects to the SBC or main board using a look-back VGA cable as shown in **Figure 2-14**.

Some WS workstations may come with an optional touchscreen. The user may then connect the serial port provided with the chassis to the SBC or main board's serial port connector.

WS Series Workstation

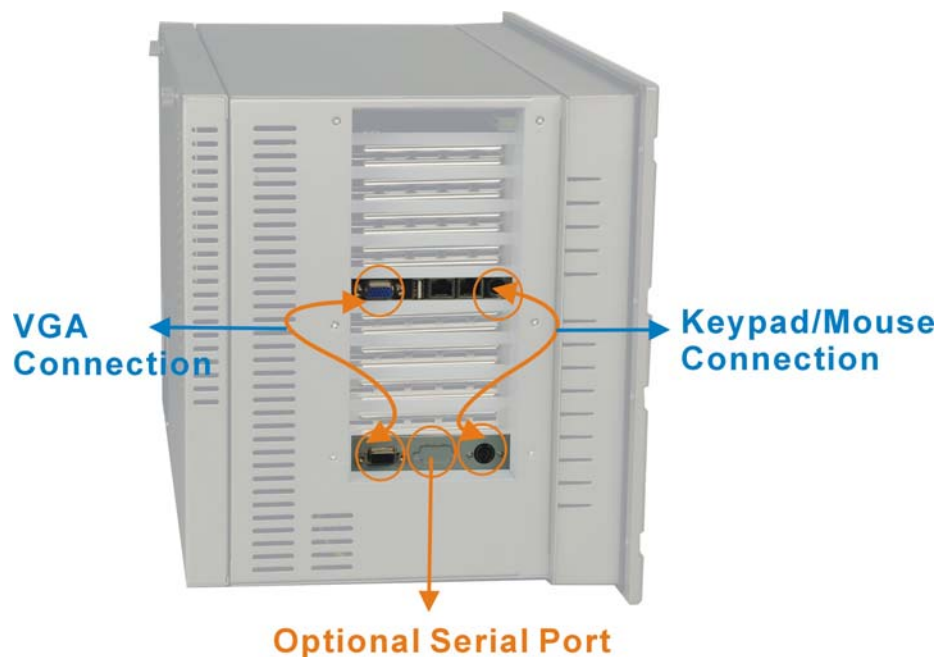


Figure 2-14: Side Panel Cabling

2.8 Mounting the Workstation

The WS Series workstation can be mounted to a panel or a cabinet. Make sure that all cabling is correctly attached and carefully routed when installing the workstation.



NOTE:

At least two people are required to mount the workstation. The panel, rack or cabinet into which the workstation is installed should provide adequate and sufficient ventilation, grounding, power source, and stability features.

2.8.1 Panel Mounting

The WS Series can be mounted within a panel. The workstation can be secured to a panel through the eight mounting holes on the sides of its front panel. Please make sure that the dimensions of the chassis are within panel aperture so that your screw holes line up with the mounting bolts on the flange of workstation.

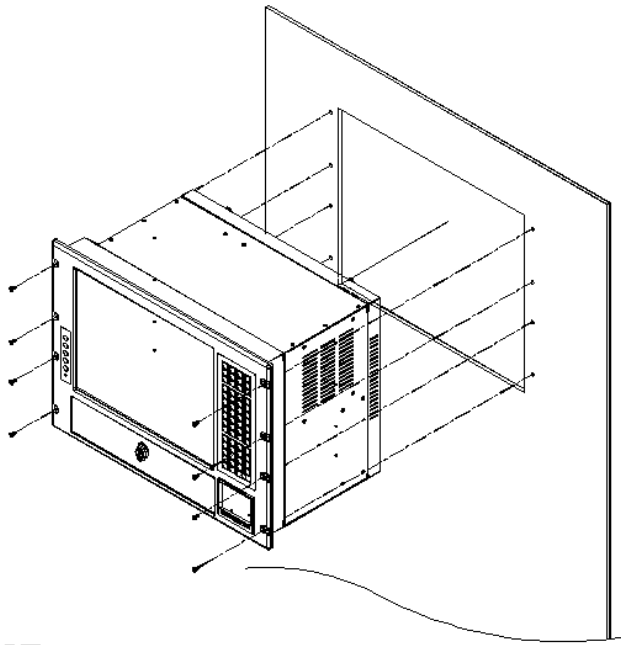


Figure 2-15: Panel Mounting

2.8.2 Rack Mounting

The WS Series workstation can be mounted to the rack posts of a standard 19" rack cabinet. Adequate rails, rack tray, or side brackets should also be available for supporting the weight of the workstation.

WS Series Workstation

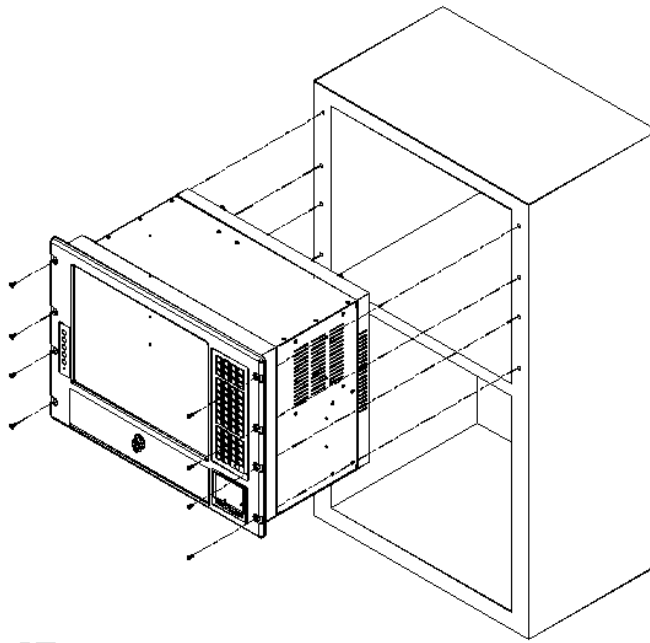


Figure 2-16: Rack Mounting

Chapter

3

On-Screen-Display (OSD) Controls

WS Series Workstation

3.1 User Mode OSD Structure

3.1.1 OSD Buttons

There are several on-screen-display (OSD) control buttons oriented horizontally along the bottom of the front panel protected with a cover. **Figure 3-1** shows the arrangement of OSD controls for the WS Series.

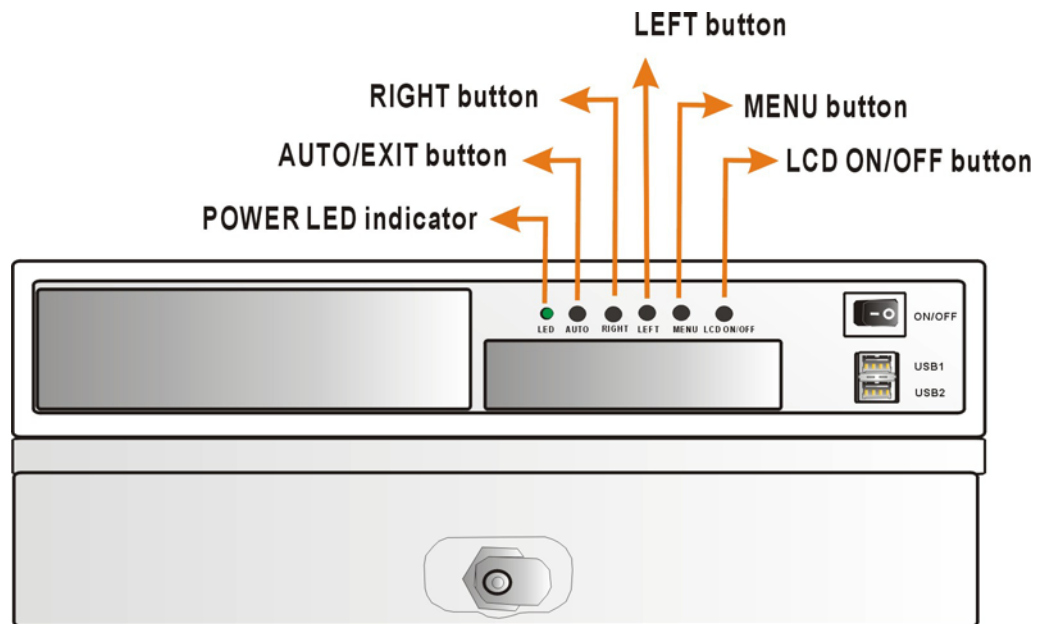


Figure 3-1: OSD Control Buttons



NOTE:

Pressing the direction keys (LEFT or RIGHT) can bring out a simple menu which adjusts the LCD screen brightness and contrast values.



3.1.2 OSD Menu Structure

Table 3-1 shows the OSD menu structure for all models of the SRM series LCD monitor.

Level 0	Level 1	Value
Main Display Features Menu	Brightness	0 to 100
	Contrast	0 to 100
	Clock	0 to 100
	Phase	0 to 100
	H. Position	0 to 100
	V. Position	0 to 100
	Sharpness	1 to 5
Color Menu	6500K	- Preset NTSC value
	7500K	- Preset NTSC value
	9300K	- Preset NTSC value
	Red	RGB values from 0 to 100
	Green	RGB values from 0 to 100
	Blue	RGB values from 0 to 100
OSD Menu	OSD Time Out	0 to 60 sec
	OSD Position	1 to 5
	OSD Transparency	20, 40, 60, 80, 100
	Factory Reset	Select
	Auto Adjust	Select
	Auto Color	Select
	Gamma	Off, On
Exit Menu	Exit	Select

Table 3-1: OSD Menus



WS Series Workstation

3.2 Using the OSD

OSD menu options are described below.

3.2.1 Main Display Features

Main display features are shown in **Figure 3-2**.



Figure 3-2: Main Display Features

Brightness	The brightness option adjusts the brightness of screen. This function adjusts the offset value of ADC. Setting this value too high or too low will affect the quality of image. When the auto- dimming function is turned on, the brightness control is not effective.
Contrast	This function adjusts the gain value of ADC. Adjusting this value too high or too low will worsen the quality of image.
Clock	Adjusts the width of the display screen.
Phase	Adjusts the input signal.
H. Position	Adjusts the horizontal position of the display screen.
V. Position	Adjusts the vertical position of the display screen
Sharpness	Adjust the sharpness of the display

3.2.2 Color

Color options are shown in **Figure 3-3**.

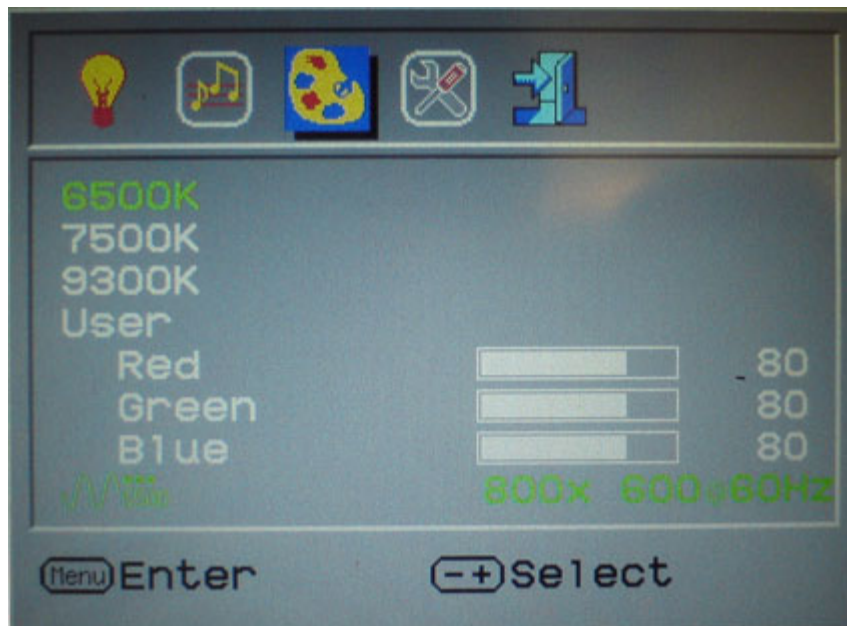


Figure 3-3: Color Options

The Color menu fine-tunes the palette of color hues for the LCD.

6500k	NTSC standard Kelvin
7500k	NTSC standard Kelvin
9300k	NTSC standard Kelvin
User	This item allows fine-tuning the balance among Red, Green, and Blue color hues if images look garish or unrealistic.

WS Series Workstation

3.2.3 OSD Configurations

The OSD configurations are shown in **Figure 3-4**.



Figure 3-4: OSD Configurations Menu

OSD Configurations are described below.

OSD Time Out	Determines how many seconds the OSD screen stays on screen before it disappears when OSD is left unattended.
OSD Position	Adjusts the OSD position on the screen. Position 1 is in the upper left of the screen, position 2 in the upper right and position 3 in the center.
OSD Transparency	Adjust the transparency of the OSD menu background.
Factory Reset	Restores the default OSD settings. Note that this will restore all default display settings.
Auto Adjust	Automatically adjusts the position of the display screen
Auto Color	Automatically adjusts the color settings.

Chapter

4

Software Drivers

4.1 Introduction

The touch panel controller enables analog resistive touch panels for four-wire, five-wire & eight-wire models. The controller directly communicates with the PC system through the touch panel communications interface. The controller design is superior in sensitivity, accuracy, and friendly operation. The touch panel driver emulates the left mouse button and the right mouse button functions.

The touch panel driver supports the following operating systems:

- Microsoft® Windows® versions:
 - Microsoft® Windows® 2000
 - Microsoft® Windows® XP
 - Microsoft® Windows® 2003
 - Microsoft® Windows® 2008
 - Microsoft® Windows® Vista
 - Microsoft® Windows® 7
- Microsoft® Windows® CE versions:
 - Microsoft® Windows® CE 4.2
 - Microsoft® Windows® CE 5.0
 - Microsoft® Windows® CE 6.0
- Linux Kernel 2.6
- DOS

Driver installation is described below.

4.2 RS-232 or USB Touch Screen

Before installing the driver, connect the WS Series monitor to the motherboard. The WS Series monitors support touch screen modality through an RS-232 or USB interface connection. Decide through which interface the touch screen is to be controlled.

- **RS-232 Interface:** If the touch screen interface connection is an RS-232 connection, connect the RS-232 connector on the single board computer to the DB-9 connector of the WS Series monitor.

- **USB Interface:** If the touch screen interface connection is a USB connection, connect the USB connector on the single board computer to the external USB port connector of the WS Series monitor.

4.3 Touch Panel Driver Installation



WARNING:

Before the touch screen driver is installed, make sure the system is connected to the monitor with a USB cable or an RS-232 null cable. Also, make sure the VGA connector on the system is connected to the VGA connector on the bottom of the monitor.

To install the touch panel driver for the WS Series, please follow the instructions below:

- Step 1:** Connect the WS Series monitor to the single board computer. See above.
- Step 2:** **Install the driver CD.** Install the driver CD into the system to which the WS Series monitor is connected.
- Step 3:** Select the **Touch Screen** option in the menu of driver CD. The directory in **Figure 4-1** appears.

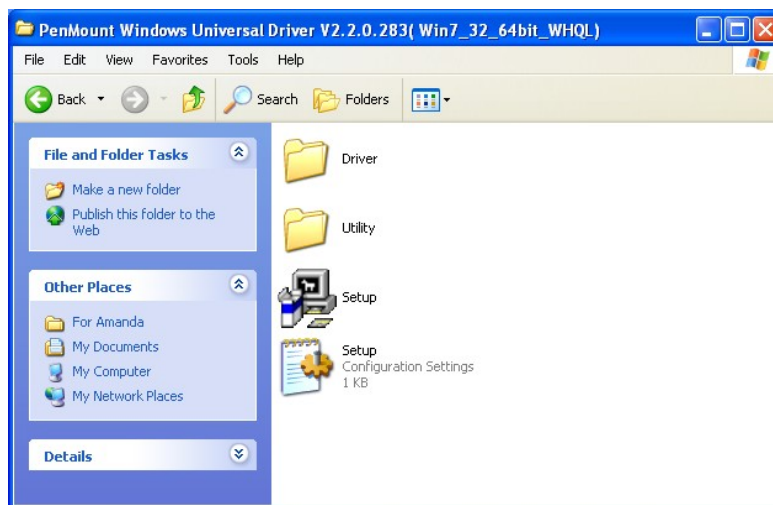


Figure 4-1: Setup Icon

WS Series Workstation

Step 4: Double click the setup icon in **Figure 4-1**.

Step 5: The Welcome screen in **Figure 4-2** appears.



Figure 4-2: Welcome Screen

Step 6: Click **Next** to continue.

Step 7: The license agreement in **Figure 4-3** appears. Accept the terms of the agreement by clicking **I Agree**.

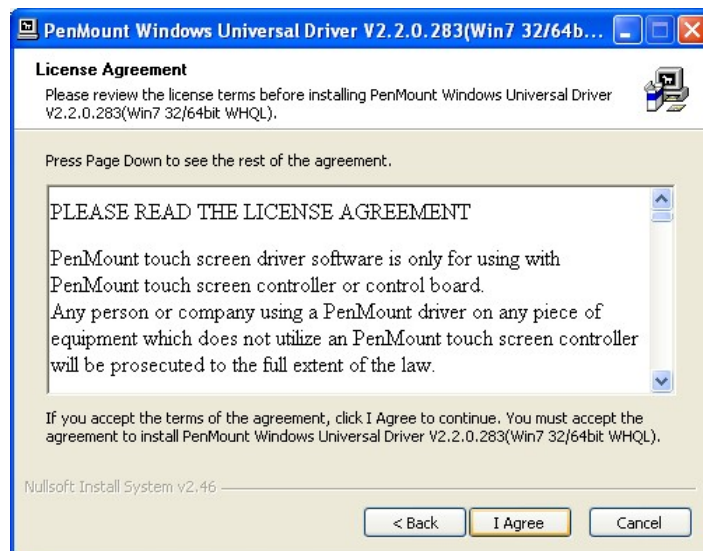


Figure 4-3: License Agreement

Step 8: The installation destination screen appears. See **Figure 4-4**. Click **Install**.

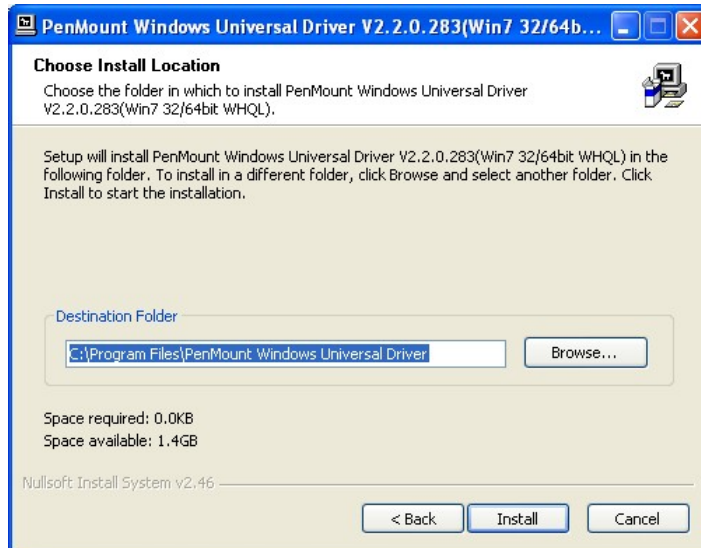


Figure 4-4: Initiate Install

Step 9: The installation of the program begins. See **Figure 4-5**.

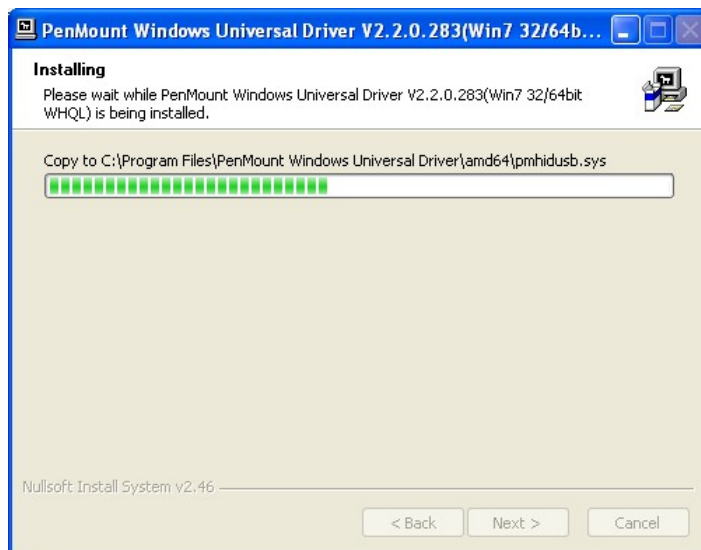


Figure 4-5: Installation Starts

Step 10: When the installation is complete, the complete screen appears. See **Figure 4-6**.

To complete the installation process click **Finish**.

WS Series Workstation

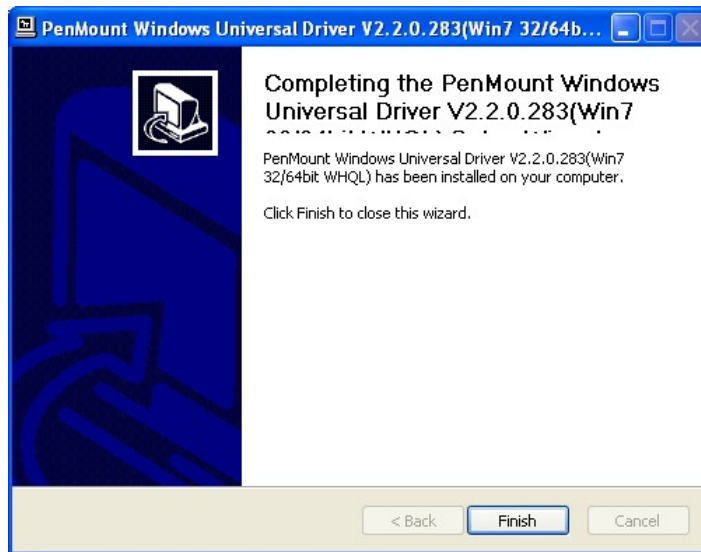


Figure 4-6: Finish Installation

4.4 Change the Touch Screen Interface

If the touch screen interface must be changed from an RS-232 interface to a USB interface or, from a USB interface to an RS-232 interface, the following steps must be followed.

- Step 1:** Uninstall the touch screen driver
- Step 2:** Remove the interface cable i.e. remove the RS-232 cable or the USB cable
- Step 3:** Install the new cable i.e. install the USB cable or the RS-232 cable.
- Step 4:** Reinstall the driver CD as described above.

4.5 Calibrating the Touch Screen

To calibrate the touch screen cursor with the motion of the touch screen pen (or finger), please follow the steps below:

- Step 1:** Make sure the system is properly connected through an RS-232 or a USB interface to the WS Series monitor.
- Step 2:** Make sure the touch screen driver is properly installed.

Step 3: Locate the PenMount Monitor icon in the bottom left corner of the screen.



Figure 4-7: PenMount Monitor Icon

Step 4: Click the icon. A pop up menu appears. See **Figure 4-8**.

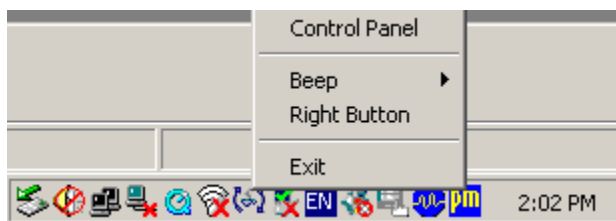


Figure 4-8: PenMount Monitor Popup Menu

Step 5: Click Control Panel in the pop up menu shown in **Figure 4-8**.

Step 6: The configuration screen in **Figure 4-9** appears.

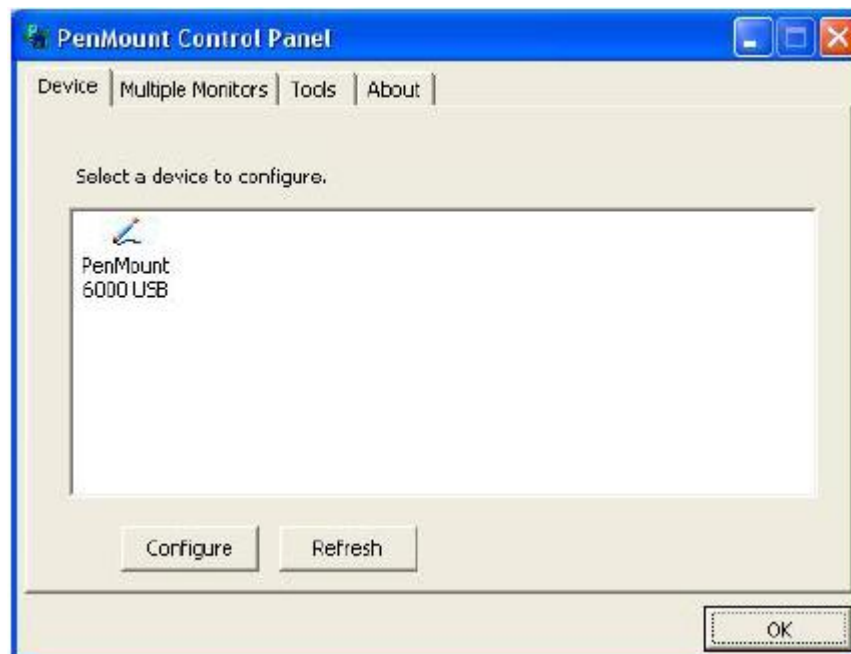


Figure 4-9: Configuration Screen

WS Series Workstation

Step 7: Double click the PenMount 6000 icon as shown in **Figure 4-9**.

Step 8: The calibration initiation screen in **Figure 4-10** appears.

Step 9: Select the Standard Calibration button as shown in **Figure 4-10**.

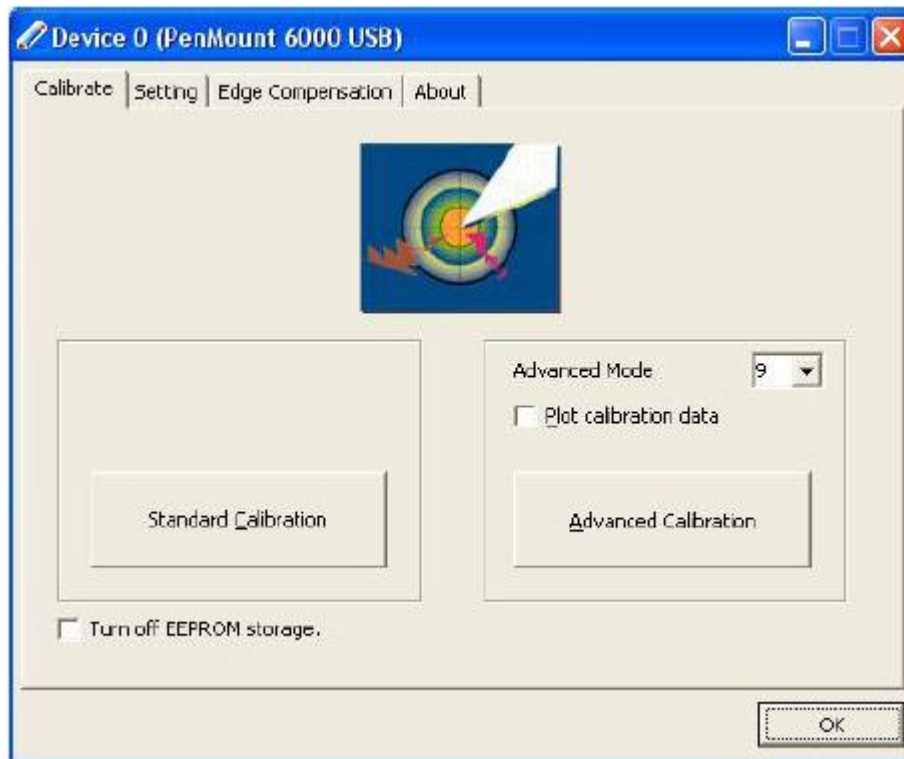


Figure 4-10: Calibration Initiation Screen

Step 10: The calibration screen in is shown. See **Figure 4-11**.



Touch the red square.

Figure 4-11: Calibration Screen

Step 11: Follow the instructions. The user is asked touch the screen at five specified points after which the screen is calibrated.

Appendix

A

Safety Precautions

**WARNING:**

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the WS Series.

A.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the WS Series is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the WS Series is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range.*** Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the WS Series chassis is opened when the WS Series is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the WS Series.
- ***If considerable amounts of dust, water, or fluids enter the WS Series,*** turn off the power supply immediately, unplug the power cord, and contact the WS Series vendor.
- **DO NOT:**
 - Drop the WS Series against a hard surface.
 - Strike or exert excessive force onto the LCD panel.
 - Touch any of the LCD panels with a sharp object
 - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the WS Series may result in permanent damage to the WS Series and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WS Series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WS Series is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding:*** Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component:*** When handling the electrical component, hold the electrical component by its edges.

WS Series Workstation

A.1.3 Product Disposal

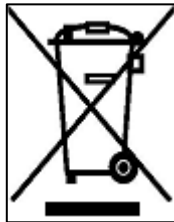


CAUTION:

Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords.

When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the WS Series, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the WS Series, please read the details below.

- Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.
- The interior of the WS Series does not require cleaning. Keep fluids away from the WS Series interior.
- Be cautious of all small removable components when vacuuming the WS Series.
- Turn the WS Series off before cleaning the WS Series.
- Never drop any objects or liquids through the openings of the WS Series.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the WS Series.
- Avoid eating, drinking and smoking within vicinity of the WS Series.

A.2.2 Cleaning Tools

Some components in the WS Series may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the WS Series.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the WS Series.
- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the WS Series.
- **Using solvents** – The use of solvents is not recommended when cleaning the WS Series as they may damage the plastic parts.
- **Vacuum cleaner** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the WS Series. Dust and dirt can restrict the airflow in the WS Series and cause its circuitry to corrode.
- **Cotton swabs** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- **Foam swabs** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

Hazardous Materials Disclosure

B.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

WS Series Workstation

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O
O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006						

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						