

# **EX-93262/EX-93562/EX-93762 Panel PC User Manual**

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# Warning!

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This equipment generates, uses and can radiate radio frequency energy and if not installed and Used in accordance with the instructions manual may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to FCC Rules, which are designed to provide reasonable protection against such interference when Operated in a commercial environment. Operation of this equipment in a residential area is likely To cause interference in which case the user at his own expense will be required to take whatever Measures may be required to correct the interference

Electric Shock Hazard – Do not operate the workstation with its back cover removed. There are dangerous high voltages inside.

## Disclaimer

**This information in this document is subject to change without notice.**

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# Chapter 1

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## 1.1 Features

- **EX-93262:** 12.1" SVGA 800x600 display, 262K colors, 300 cd/m<sup>2</sup> luminance, viewing angle of 120 ° (H), 95 ° (V);  
**EX-93562:** 15" SVGA 1024x768 display, 16.2M colors, 400 cd/m<sup>2</sup> luminance, viewing angle of 170 ° (H), 135 ° (V);  
**EX-93762:** 17" SVGA 1280x1024 display, 16.2M colors, 300 cd/m<sup>2</sup> luminance, viewing angle of 140 ° (H), 130 ° (V)
- Front panel NEMA 4/IP 65 rating (panel-mount)
- Fanless design
- Low noise and low power consumption
- Resistive touch screen (optional)
- Ethernet
- 2 PCI expansion slots
- 2 USB 2.0 ports
- 4 COM ports (one is reserved for touch screen)
- Space for slim CD/DVD combo drive or optional CD-RW/DVD
- DC 12/24V wide-ranging input

## 1.2 Specifications

### System

**CPU:**

Intel® Celeron® M processor with clock rate of 600MHz (non L2 cache)

**Chipset:**

Intel® 852GM+ICH4

**System Memory:**

DDR266 SDRAM (max. 1GB)

**DRAM Socket:**

One 200-pin SO-DIMM

**Hard Drive:**

One 2.5" slim type

**BIOS:**

Phoenix-Award 2MB PnP BIOS

**IDE Interface:**

2 x UDMA 33/66/100

**CD-ROM:**

1 x slim CD/DVD/Combo Drive

**Watchdog:**

1~255 sec. watchdog timer with Reset and NMI

**I/O Port:**

Two COM ports, one SPP/ECP/EPP port, two USB2.0 ports, two PS/2 keyboard and mouse ports

**RJ-45 LAN Port:**

2 x Realtek RTL8100 (10/100Mbps) support Wake-on-LAN with ATX power

**VGA:**

Built-in Intel® 852GM

**Expansion Slot:**

2 x PCI slot

**Touch Screen (optional):**

Resistive

**EMC:**

FCC & CE Class A certified

## Display

- **EX-93262:** 12.1" SVGA 800x600 display, 262K colors, 300 cd/m<sup>2</sup> luminance, viewing angle of 120 ° (H), 95 ° (V);  
**EX-93562:** 15" SVGA 1024x768 display, 16.2M colors, 400 cd/m<sup>2</sup> luminance, viewing angle of 170 ° (H), 135 ° (V);  
**EX-93762:** 17" SVGA 1280x1024 display, 16.2M colors, 300 cd/m<sup>2</sup> luminance, viewing angle of 170 ° (H), 135 ° (V)

## Mechanical

**Construction:**

Heavy-duty steel chassis, NEMA 4/IP65 rated front panel (panel-mount)

**Front Panel Color:**

Beige

**Dimensions:**

EX-93262: 390(W) x 102(D) x 264mm(H)

EX-93562: 410(W) x 106(D) x 310mm(H)

EX-93762: 457(W) x 114(D) x 355mm(H)

**Weight:**

EX-93262: 6.45kgs

EX-93562: 7.48kgs

EX-93762: 8.68kgs

**Power Supply:**

12V/24V DC input 60W ATX PSU

**Environment****Operating temperature:**

0~50 ° C

**Storage temperature:**

-10 ° C ~ 75 ° C

**Relative humidity:**

10~90% @ 40 ° C non-condensing

**Vibration:**

5~17Hz, 0.1" double amplitude displacement

17~640Hz, 1.5G acceleration peak to peak

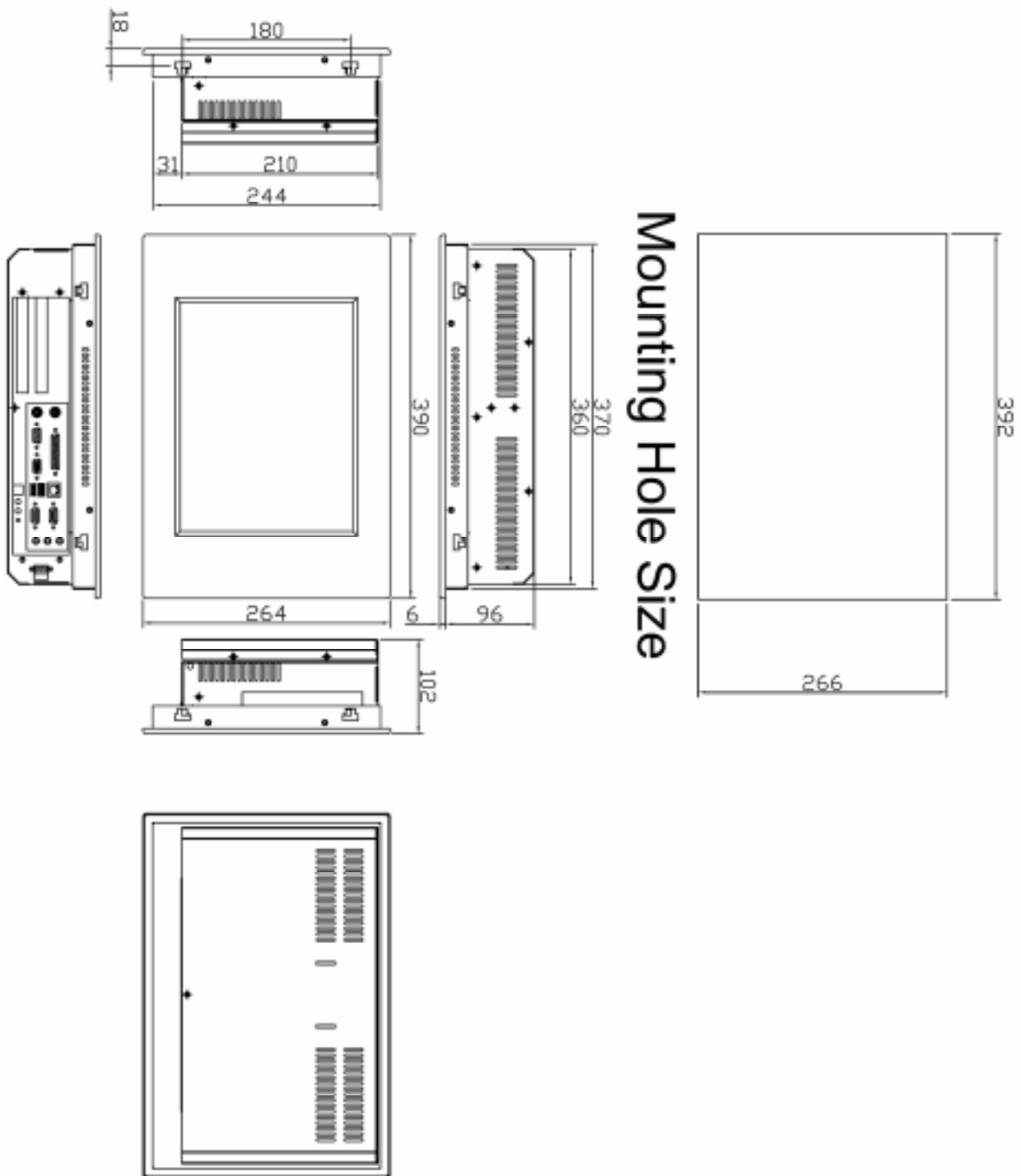
**Shock:**

10G acceleration peak to peak (11 millimeters)

**Ordering Information**

- EX-93262/EX-93562/EX-93762 Barebone w/Celeron® M 600MHz processor w/o HDD, RAM and CD-ROM
- EX-93262-T/EX-93562-T/EX-93762-T Barebone w/Celeron® M 600MHz processor & resistive touch screen w/o HDD, RAM and CD-ROM
- EX-93262-S/EX-93562-S/EX-93762-S Celeron M 600MHz processor, 256MB DDR SO-DIMM, 40GB HDD, slim combo DVD w/o touch
- EX-93262-ST/EX-93562-ST/EX-93762-ST Celeron M 600MHz processor, resistive touch screen, 256MB DDR SO-DIMM, 40GB HDD, slim combo DVD

## 1.3 Dimensions

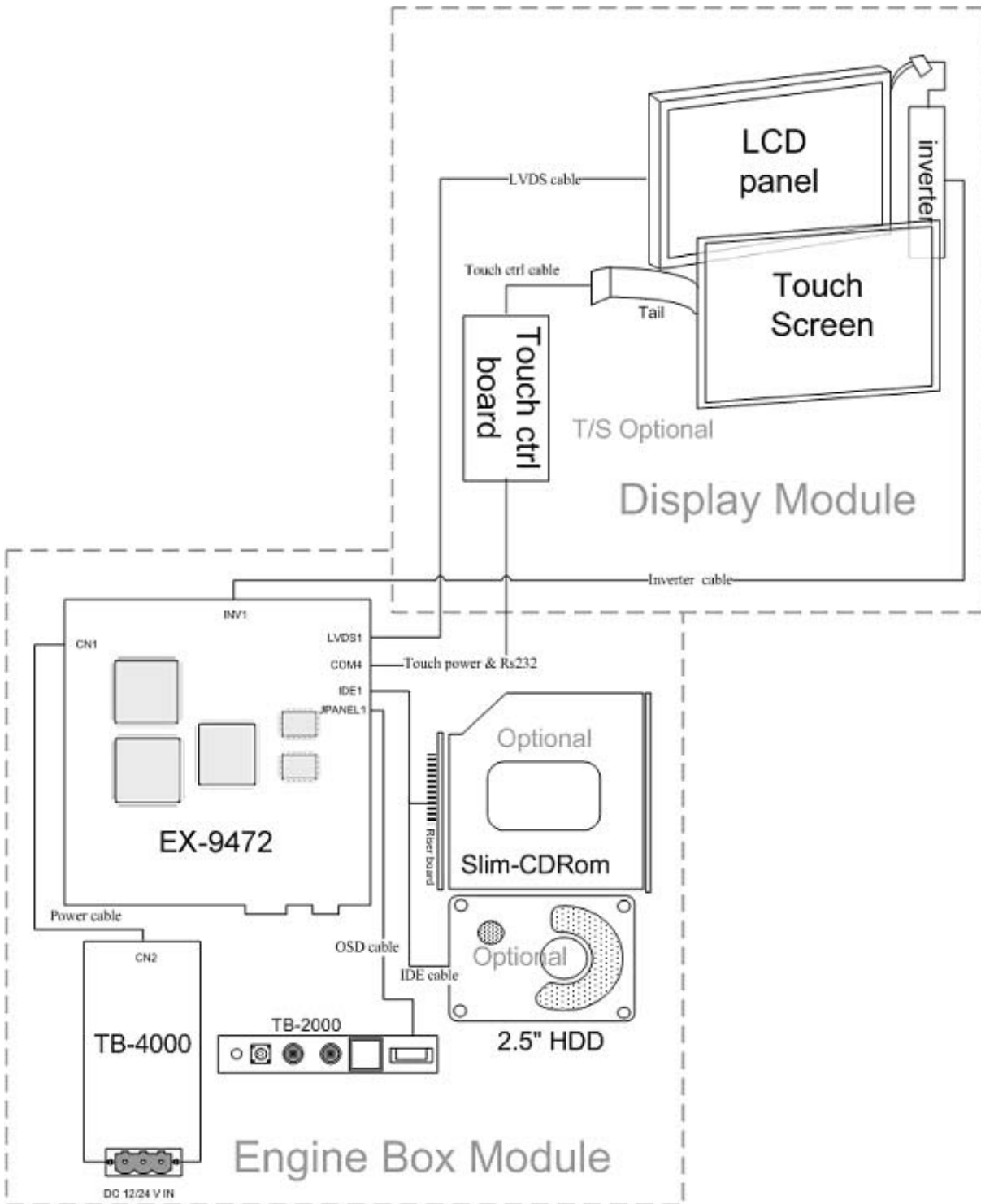


**Figure 1.1: Dimensions of the EX-93262**

**Note:** Structures of the EX-93562 and EX-93762 are the same as that of the EX-93262 shown above except for the dimensions which are 410(W) by 106(D) by 310mm(H) and 457(W) by 114(D) by 355mm(H), respectively.



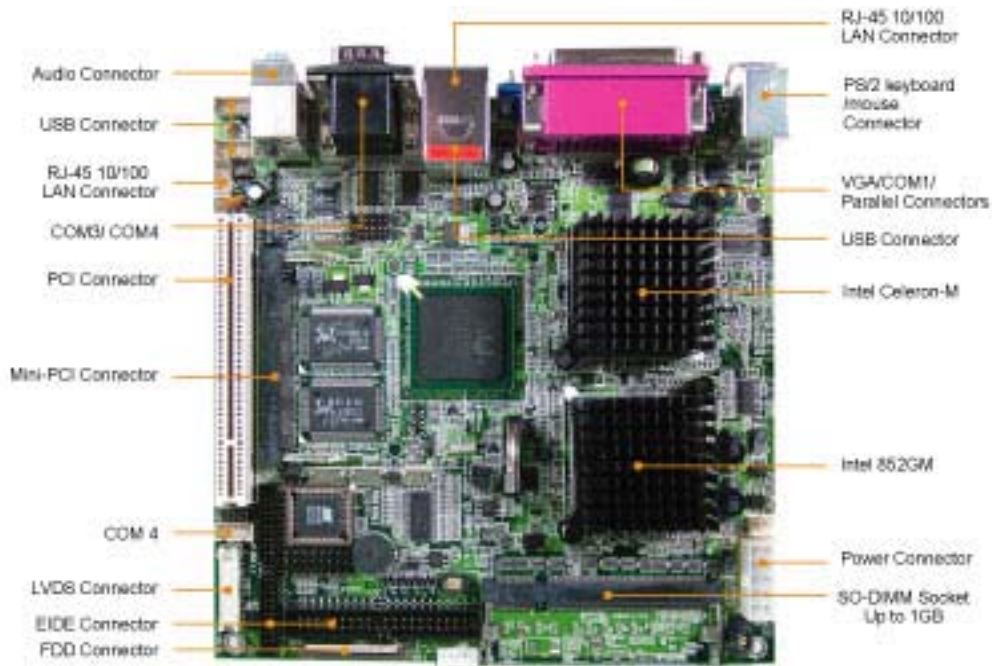
# 1.4 Block Diagram



**Figure 1.2: Block Diagram of the EX-93262/EX-93562/EX-93762**

# 1.5 EX-9472 Celeron® M CPU Card

(for the EX-93262, EX-93562 and EX-93762)



## Specifications

### System

CPU:  
Intel® Celeron® M processor

CPU Frequency:  
ULV 600MHz (non L2 cache)

Chipset:  
Intel® 852GM + ICH4

DRAM:  
One 200-pin DDR SO-DIMM supporting DDR266 SDRAM up to 1GB

BIOS:  
Phoenix-Award PnP BIOS with VGA BIOS

Watchdog:  
1~255 secs watchdog timer selectable w/Reset/NMI

Power Supply:  
Support ATX power

Power Requirements:  
+5V, +12V, -12V, +5VSB

Dimensions:  
170mm x 170mm (6.69 x 6.69 inches)

## **I/O Ports**

IDE Interface:  
One 40-pin IDE (UDMA 33/66/100)

CF:  
One Compact flash slot (IDE)

FDD Interface:  
One FDD

Bus Interface:  
PCI slot, mini-PCI bus

Serial Port:  
Four COM ports: COM1 and 4 for RS232 and COM2 and for RS232/422/485  
(for 16550 compatible type of UART)

Parallel Port:  
One parallel (SPP/EPP/ECP)

IrDA:  
1 (SIR)

Keyboard:  
Mini DIN connector

Mouse:  
Mini DIN connector

LAN:  
Realtek RTL8100C (10/100Mbps)

Support Wake-on with ATX power

USB:

Six USB 2.0

## **Display**

Graphics:

Built-in Intel® 852GM sharing system memory and supporting CRT, LVDS

LCD Interface:

18-/36-bit LVDS

## **Environment**

Operating Temperature:

0 ° ~ 60 ° C (32 ° ~ 140 ° F)

Storage Temperature:

-40 ° ~ 85 ° C (-40 ° ~ 185 ° F)

Operating Humidity:

20~90%

Storage Humidity:

20~95%

## 1.6 Safety Precautions

Follow the messages below to avoid your systems from damage:

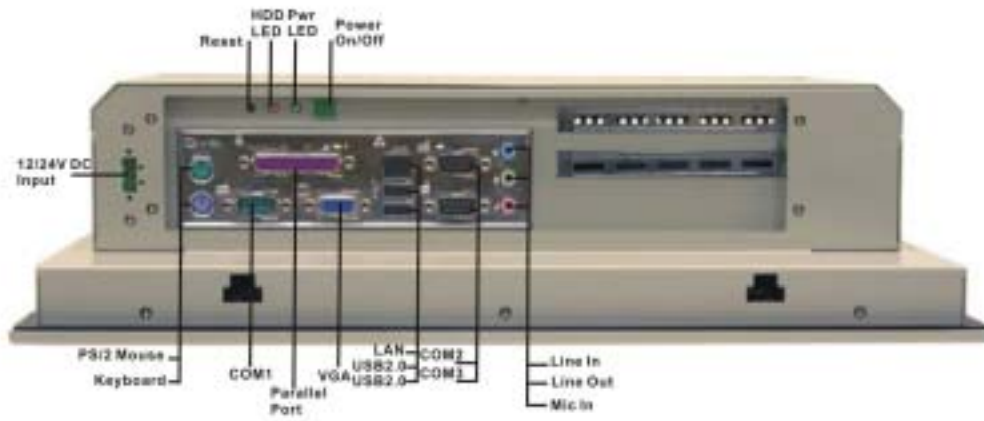
- \* Avoid your system from static electricity on all occasions.
- \* Prevent electric shock. Don't touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.
- \* Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

## 1.7 Brief Description of the EX-93262, EX-93562 and EX-93762

The EX-93262, EX-93562 and EX-93762 are rugged and compact panel-mount industrial fanless PCs, which come with a 12.1-inch (300 cd/m<sup>2</sup>), 15-inch (400 cd/m<sup>2</sup>), and 17-inch (300 cd/m<sup>2</sup>) TFT LCD, respectively. They are powered by an Intel® Celeron® M processor and offer optimal heat dissipation and low-power consumption without sacrifice of speed performance. These industrial panel PCs also feature 2 PCI expansion slots, 4 COM ports and slim CD/DVD combo drive, and support 2 USB 2.0 ports. They come with 12/24V DC power input. They are ideal for use as a PC-based controller for Automotive, Logistic Process, Materials Handling, and Kiosk applications.



**Figure 1.3: Front View of EX-93262/93562/93762**



**Figure 1.4: I/O Layout of EX-93262/93562/93762**

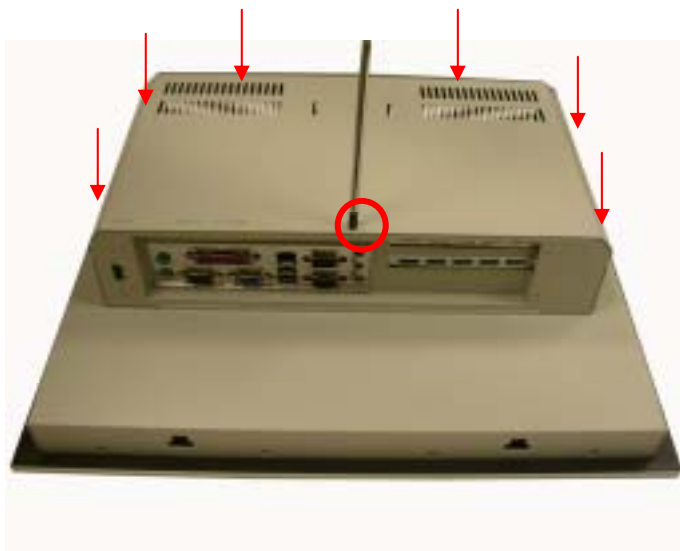
# Chapter 2

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## 2 Installation of the EX-93262/93562/93762 Touch Panel Computer

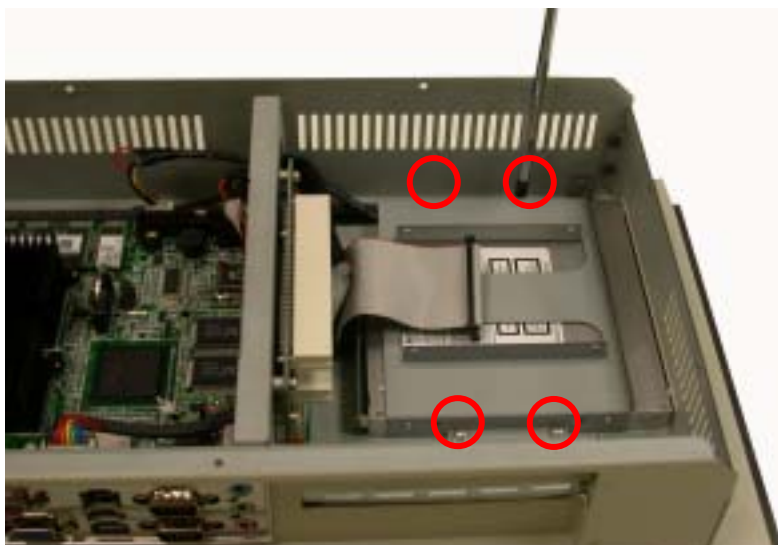
### 2.1 Removal of Chassis Cover

There are 7 screws to deal with when enclosing or removing the chassis. Six are along the three sides of the chassis as shown in the picture by the arrows while one circled is on the top.



### 2.2 Removal of HDD Bracket

To remove the HDD bracket from its position, just unscrew the 4 screws as shown in the picture.



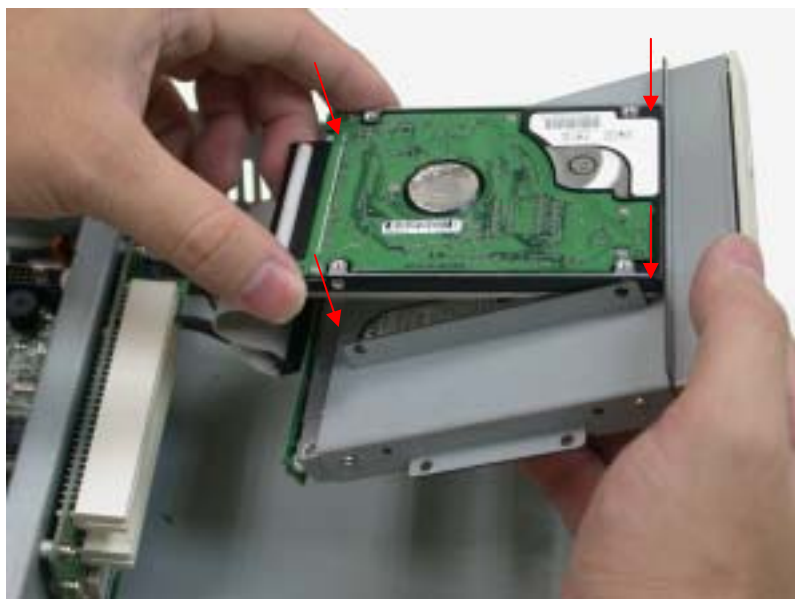
## 2.3 Connecting Cable to HDD

Connect the cable to the HDD, making sure that the red stripe of the cable is on the right side (if connected with the top of the HDD facing upward).



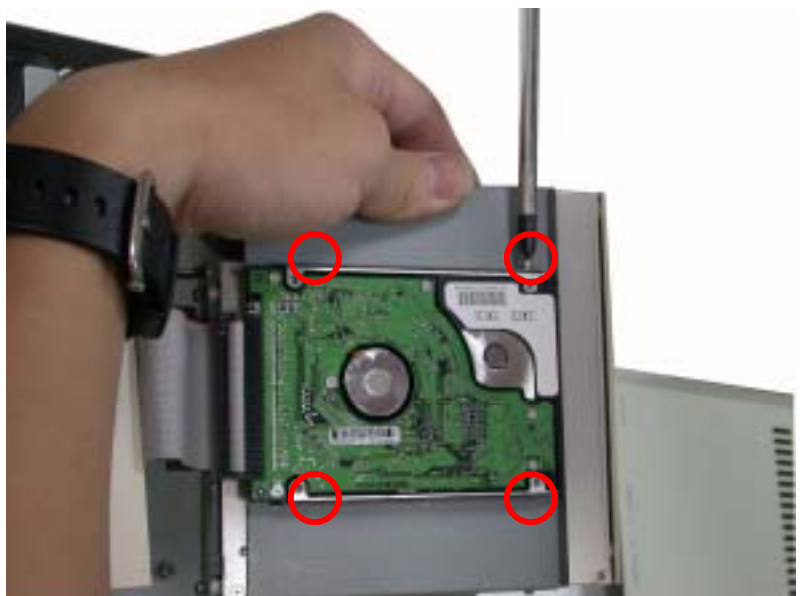
## 2.4 Putting HDD into Bracket

Place the HDD into the base of the bracket as shown in the picture.



## 2.5 Tightening HDD

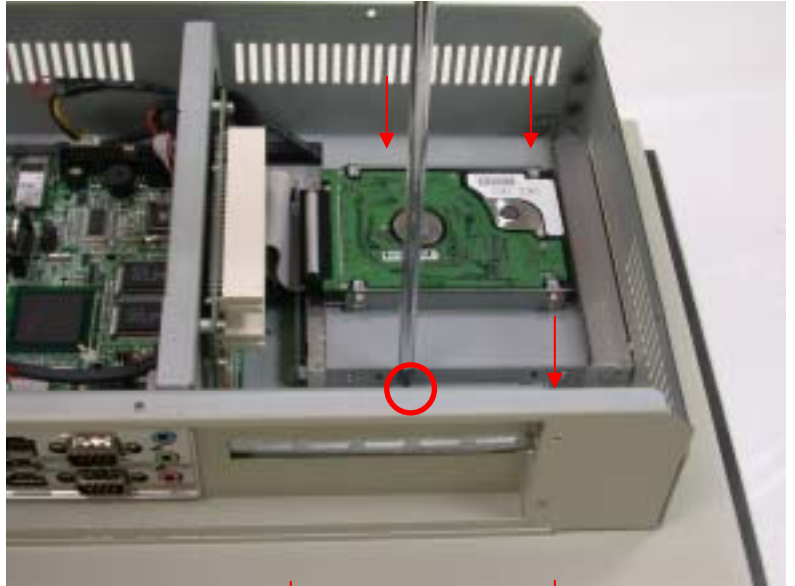
Tightly fasten the four screws as circled to secure the HDD.





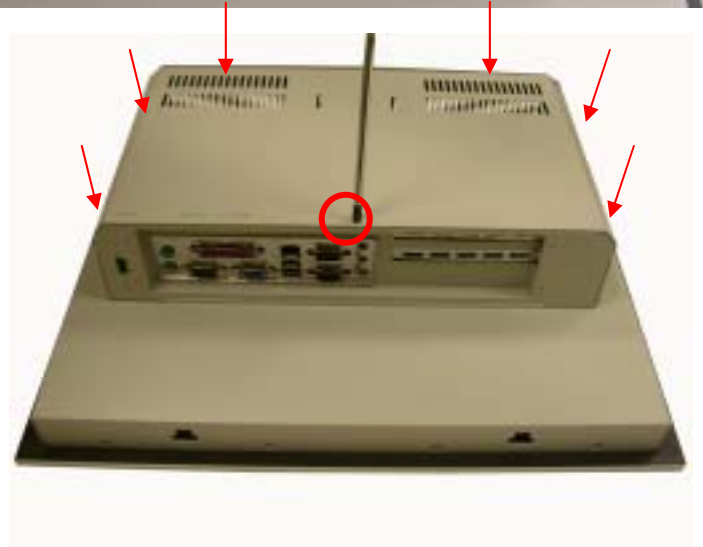
## 2.6 Installing HDD

Get the 4 screws tightened onto the chassis as shown in the picture.



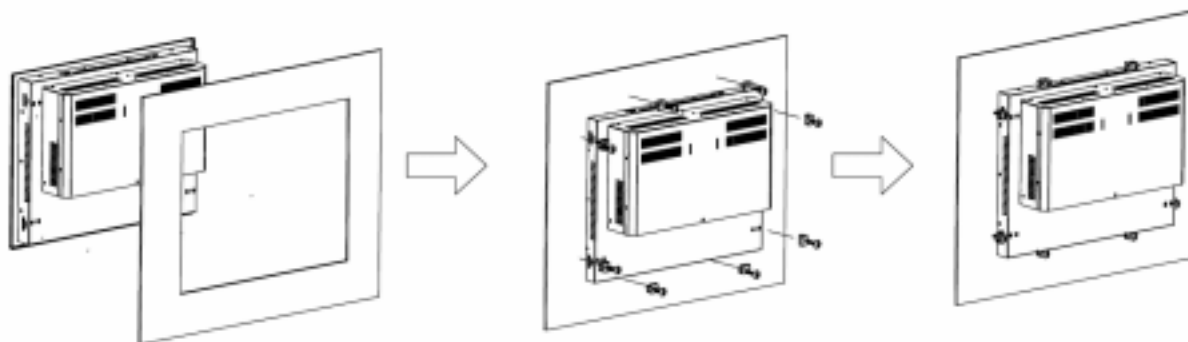
## 2.7 Closing Chassis Cover

To finish the job, just fasten the 7 screws as shown in the picture.



## 2.8 Panel Mounting

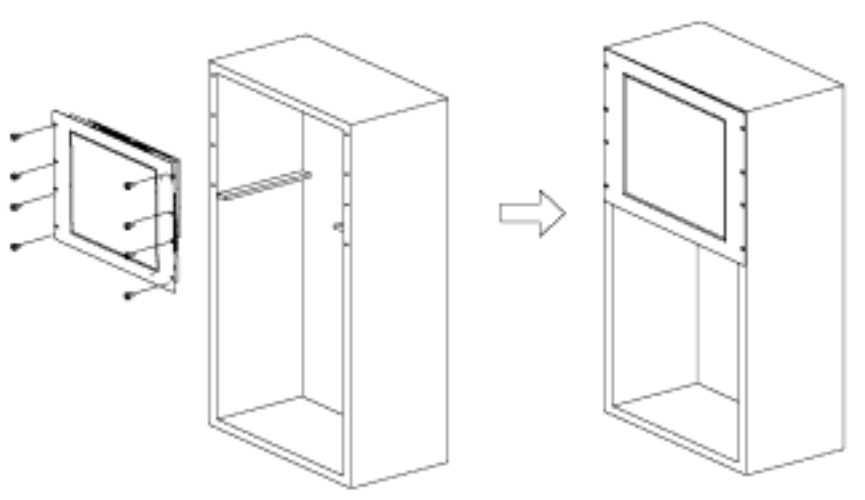
The EX-93262/93562/93762 panel PC is designed to be panel-mounted as shown in Figure 2.1. Just carefully place the unit through the hole and tighten the given 8 screws from the rear to secure the mounting.



**Figure 2.1: Panelmounting of the EX-93262/93562/93762**

## 2.9 Rack Mounting (optional)

The EX-93262/93562/93762 panel PC can be rack-mounted as an option. Just carefully slide it into the rack and tighten the given 8 screws from the front to secure the mounting as shown in Figure 2.2.



**Figure 2.2: Rackmounting of the EX-93262/93562/93762**

# Chapter 3

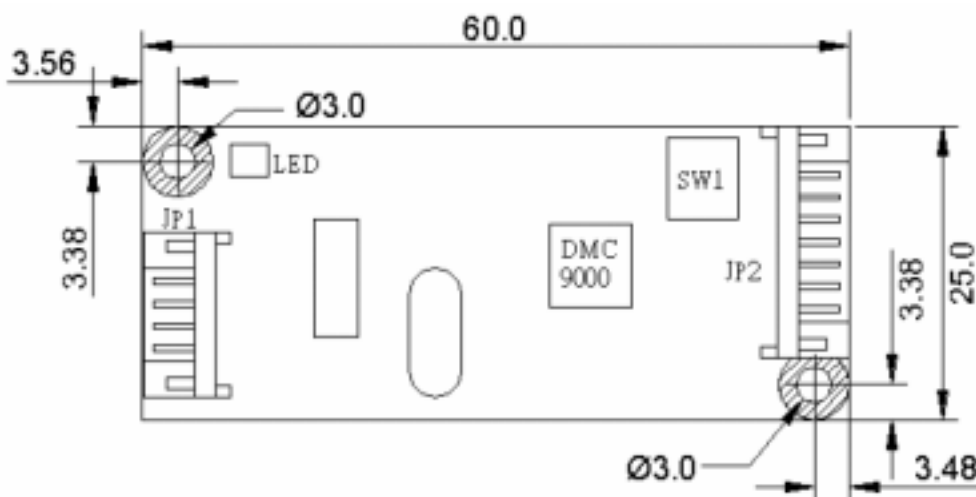
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## 3.1 Introduction to the PenMount 9036 Controller Board

The PenMount 9036 control board is configured for use with the RS-232 interface. It connects to the touch screen, power supply and computer system's RS-232 port, and supports 4-, 5- and 8-wire touch screens. The control board has some advanced functions, such as PnP and non-PnP mode adjustable baud rate, thus making easy for customers to select different touch screens without changing the control board. The size of the board is 25 by 60mm, and it has two connectors and one dipswitch on-board.



**Figure 3.1: Bird's Eye View of PenMount 9036**



**Figure 3.2: Mechanical Drawing of PenMount 9036**

## 3.2 Features

- RS-232 interface
- Touch controller is DMC9000
- Design for the best touch performance and easy configuration
- PnP or Non-PnP mode selectable
- Design for best cost arrangement
- Supporting 2048x2048 pen device resolution
- 19200 or 9600 baud rate transmission selectable
- Upgraded noise handling mechanism (3 level scheme)
- Fixed and high-speed sampling rate
- 4-, 5- and 8-wire touch screen supported
- Touch screen cable, RS-232 with power cable connectors onboard
- 5V to 12V power input
- Circuit protection for input voltage
- Touch-activated LED indicator onboard

## 3.3 Electrical Specifications

Touch Screen:

4-, 5- and 8-wire analog resistive type

Touch Screen Controller:

DMC9000

Communications:

RS-232

Baud Rate:

19200 and 9600 baud rate selection

Resolution:

1024x1024 (10-bit A/D converter inside)

Power Input:

5V ~ 12V DC

Power Consumption:

12V: 24mA+  $i$  where ( $i=v/\text{touch screen sheet R}$ )

5V: 20mA+  $i$  where ( $i=v/\text{touch screen sheet R}$ )

Board Size:  
6.0 x 2.5cm

Portrait:  
Support 90 ° to 279 ° screen rotation

Static Protection:  
ESD device (optional)

### 3.4 Installation of the 9036 Controller Board

Follow the steps below to install the 9036 control board:

1. Power down your computer and display, and open your display or system case. Find space on your system and attach the control board to your system with screws. The control board has industry standard 3 screw holes.
2. Find the white 6-pin right-angle connector (on the left in the image above [see Figure 3.1]). The power cable is pin 1 and pin 2. Solder the power and ground wire to the system. The RS-232 cable is for pins 3 to 6. Attach the RS-232 cable's D-sub connector to a COM port at the back of the computer.
3. Find the white 9-pin right-angle connector (on the right in the image above [see Figure 3.1]). Attach the female end of the touch screen cable to this connector. If you attach the cable of a 4-/5-/8-wire touch screen to pins 1~5/1~6/1~9, attach the male end of the cable to the touch screen tail.
4. Mount your touch screen to the display.
5. Find the onboard DIP switch (on the upper right of the image above [see Figure 3.1]). This switch selects baud rate, PnP or non-PnP mode, and touch screen type. Set the DIP switch to configure your control board according to the definitions and settings of the table below:

Switch	Definition	ON	OFF
S1	Baud Rate Adjustment	9600	19200
S2	PnP enable or disable	Disable	Enable
S3	Touch screen type	5-wire	4-, 8-wire
S4	Touch screen type	4-, 8-wire	5-wire

6. Turn on power to the computer and the display.
7. Install the software drivers and utilities and calibrate the touch screen.

# Chapter 4

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## 4.1 Windows 98/ME Driver Installation for 9036 Controller Board

Before installing the Windows 98/ME driver software, you must have the Windows 98/ME system installed and running on your computer. You must also have the 9036 PenMount Serial Interface controller board installed. Contents of the PenMount Windows 98/ME driver folder are listed below:

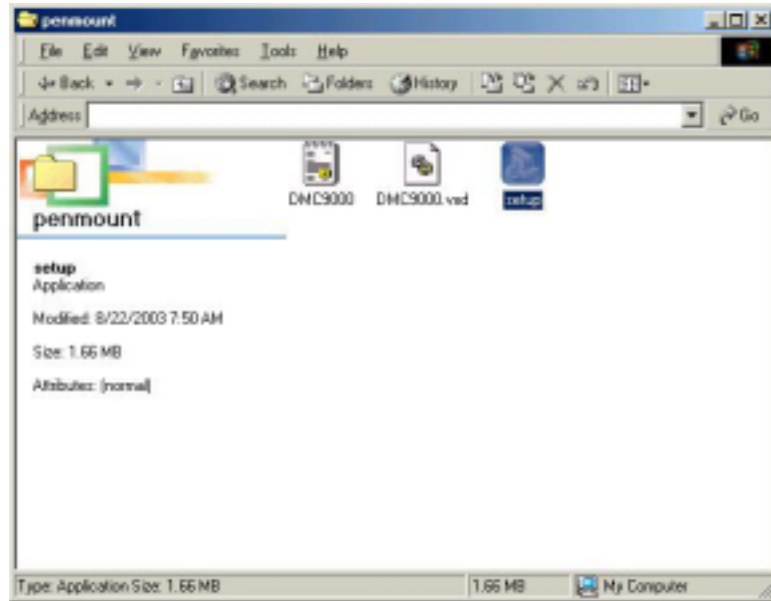
**SETUP.EXE**  
**DMC9000.INF**  
**DMC9000.VXD**

If you have an older version of the PenMount Windows 98/ME driver installed in your system, please remove it first. Follow the steps below to install the PenMount Windows 98/Me driver.

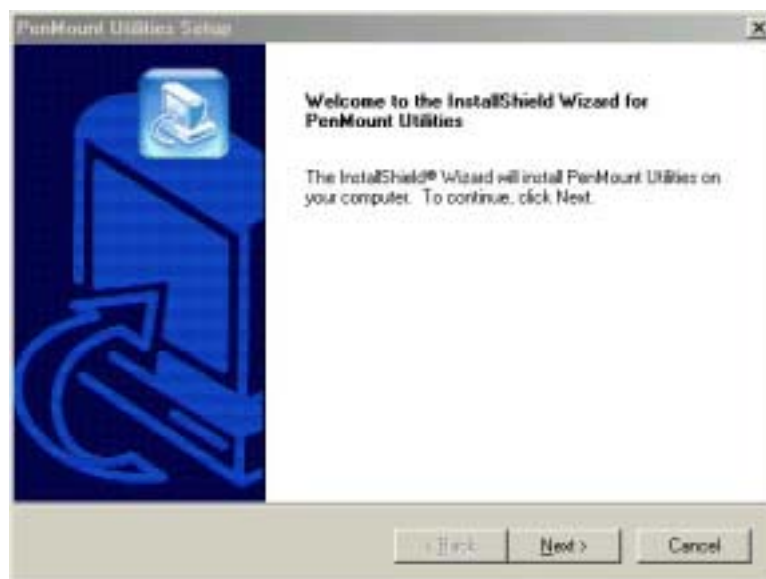
1. When the system first detects the controller board, a screen appears that shows “Unknown Device.” Do not use this hardware wizard. Press Cancel.



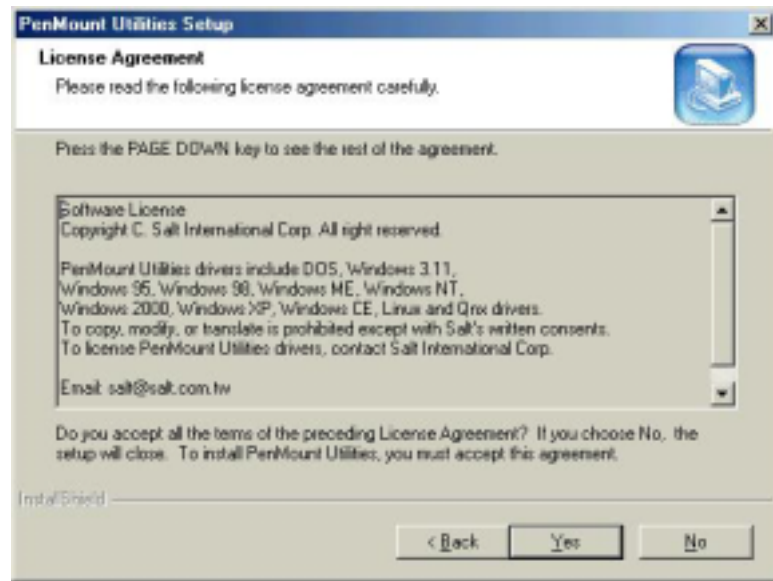
2. Install the PenMount Windows 98/ME driver onto your system from the CD-ROM:



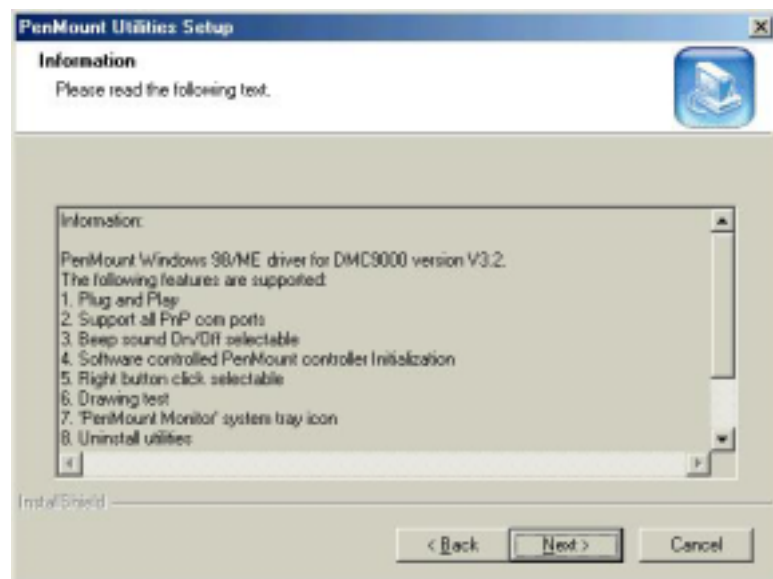
3. A welcome message for the PenMount utilities setup program appears. Select "Next".



4. The Software License Agreement screen appears. Select "Yes".

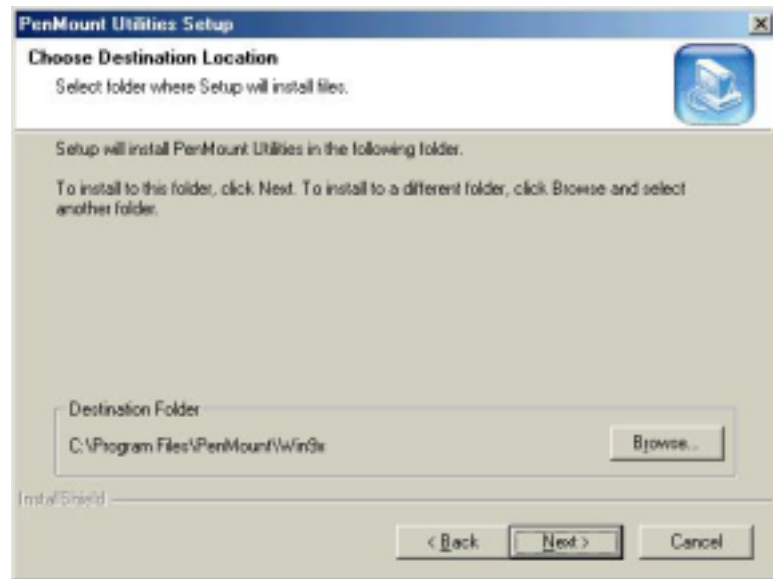


5. The Information screen appears. Select "Next".

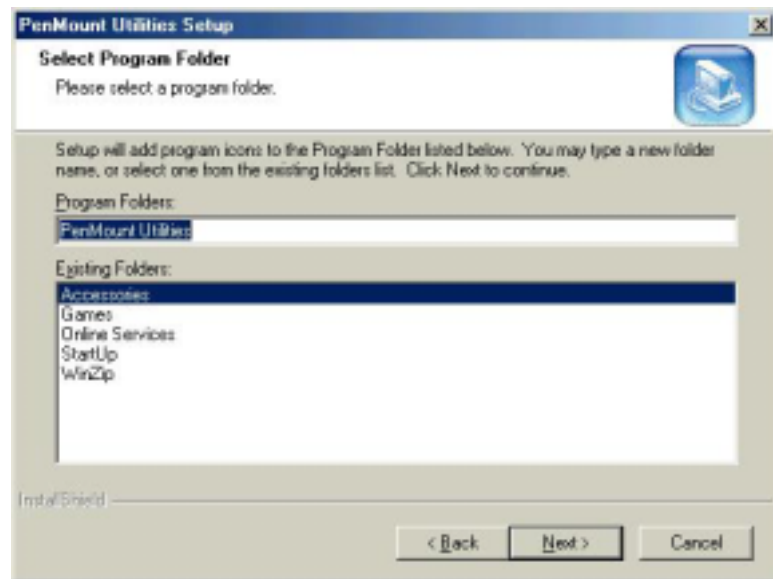




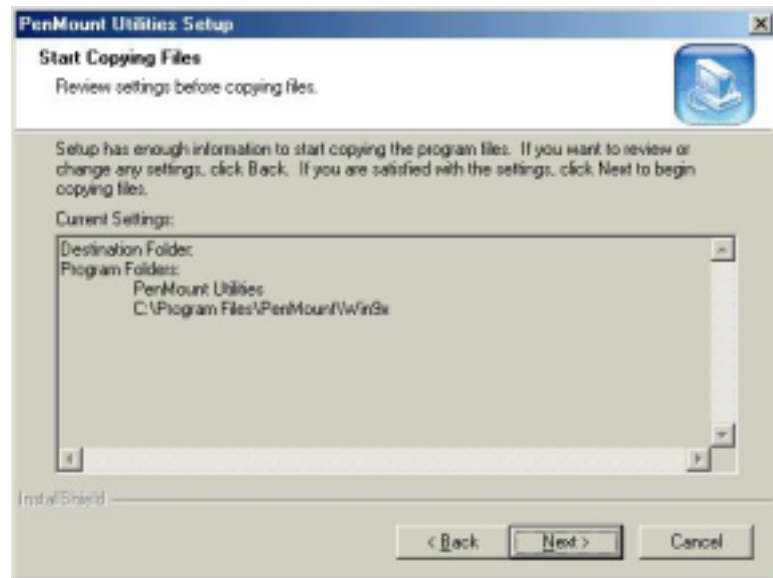
- The Choose Destination Location screen appears. This installs PenMount Utilities in the folder: C:\Program Files\PenMount\Win9x. Select "Next" or modify the folder name to the one you would like to use.



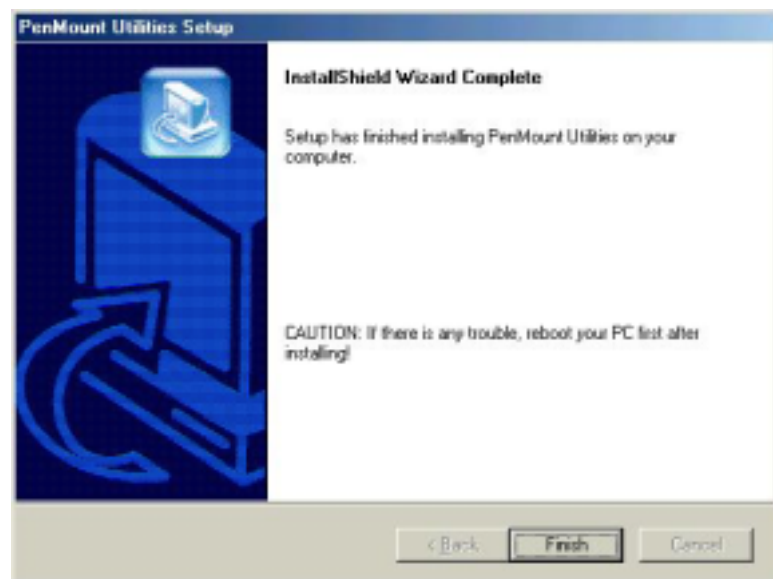
- The Select Program Folder screen appears. The default is "PenMount Utilities". Select "Next" or change it.



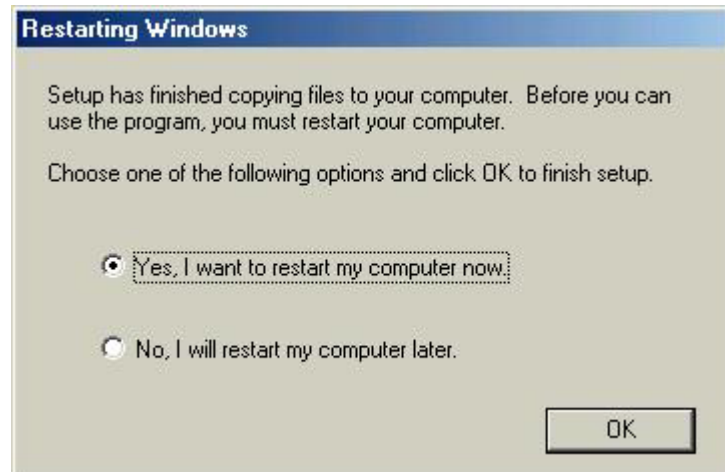
8. The Start Copying Files screen appears. Select "Next" to copy files to the system.



9. The Setup Complete screen appears. Select "Finish".



10. The “Restarting Windows” screen appears, choose “Yes, I want to restart my computer now,” and “OK.”



## Configuring the PenMount Windows 98/Me Driver

Upon restarting, the computer automatically finds the new 9000 controller board. The touch screen is connected but not calibrated. Follow the procedures below to carry out calibration.

1. After installation, click the PenMount Monitor icon “PM” in the menu bar.
2. When the PenMount Control Panel appears, click “Calibrate.”

## PenMount Control Panel

The functions of the PenMount Control Panel are explained in the following sections.

### Calibrate

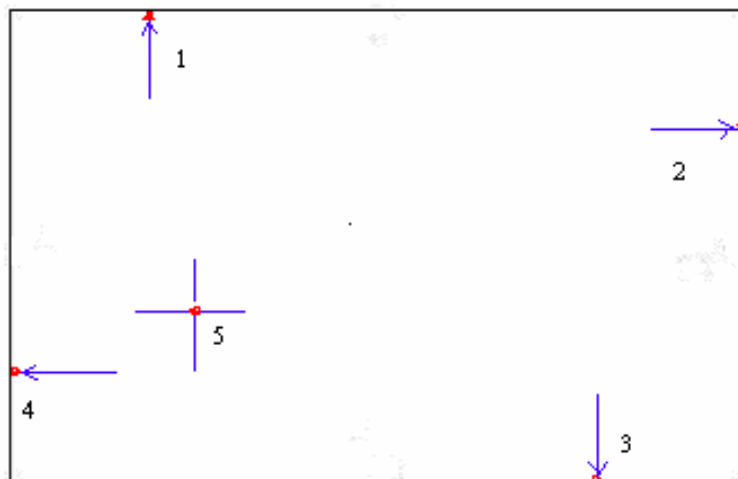
This function offers two ways to calibrate your touch screen. ‘Standard Calibration’ adjusts most touch screens. ‘Advanced Calibration’ adjusts aging touch screens.

Standard Calibration      **Click this button and arrows appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After the fifth red point calibration is complete. To skip, press ‘ESC’.**

Advanced Calibration      **Advanced Calibration uses 4, 9, 16 or 25 points to effectively calibrate touch panel linearity of aged touch screens. Click this button and touch the red squares in sequence with a stylus. To skip, press ESC’.**



**NOTE:** The older the touch screen is, the more Advanced Mode calibration points you need for an accurate calibration. Use a stylus during Advanced Calibration for greater accuracy.





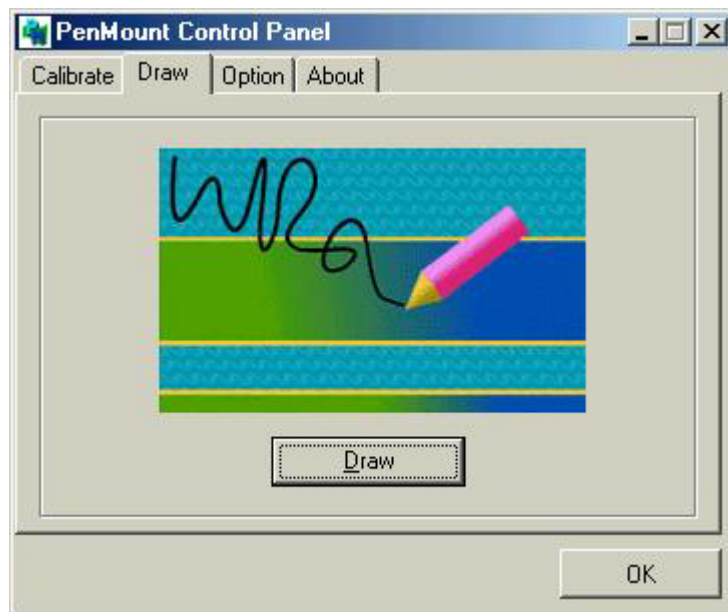
Plot Calibration Data

**Check this function and a touch panel linearity comparison graph appears when you have finished Advanced Calibration. The blue lines show linearity before calibration and black lines show linearity after calibration.**

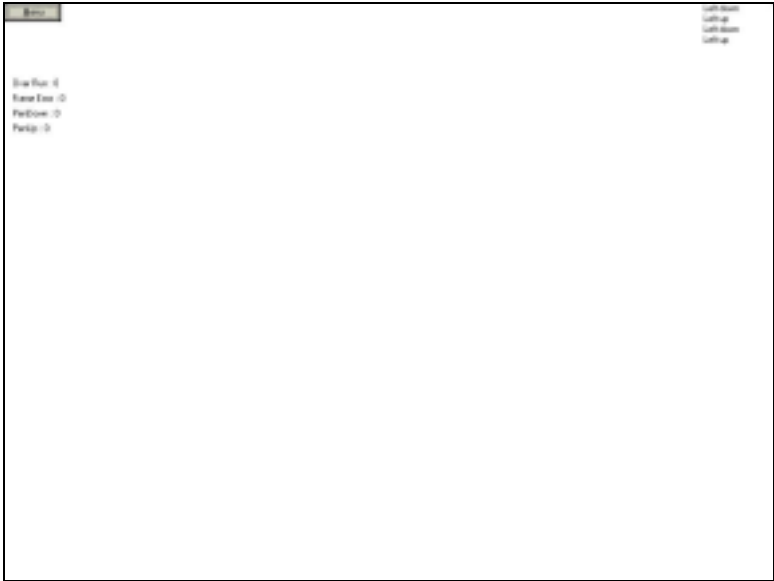


## Draw

Tests or demonstrates the PenMount touch screen operation. The display shows touch location. Click **Draw** to start.



Touch the screen with your finger or a stylus and the drawing screen will register touch activity such as **left**, **right**, **up**, **down**, **pen up**, and **pen down**.



Click Clear Screen to clear the drawing.



## Option

This panel function supports two modes—Operation Mode and Beep Sound Mode—which allow configuration for specific touch screen applications, such as point-of-sales (POS) terminals.

**Operation Mode**      **This mode enables and disables the mouse’s ability to drag on-screen icons—useful for configuring POS terminals.**

*Stream Mode* – Select this mode and the mouse functions as normal and allows dragging of icons.

*Point Mode* – Select this mode and the mouse only provides a click function, and dragging is disabled.

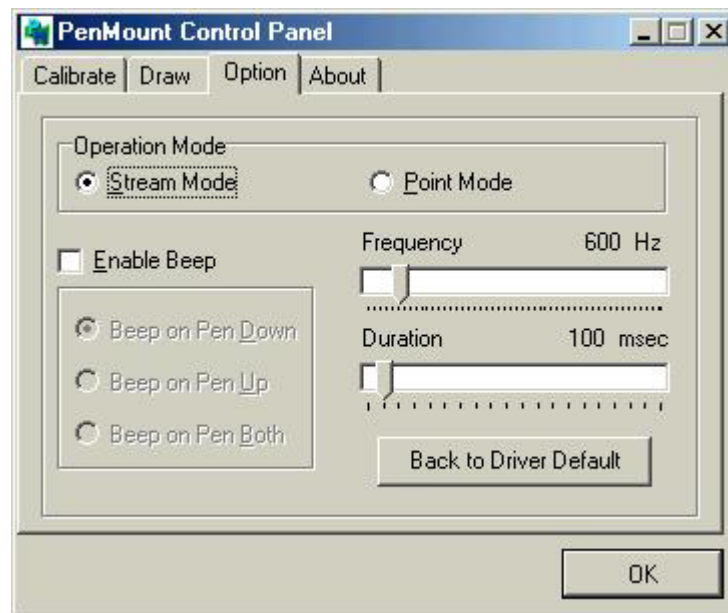
**Beep Sound Mode**      ***Enable Beep Sound* – turns beep function on and off**  
***Beep on Pen Down* – beep occurs when pen comes down**

***Beep on Pen Up* – beep occurs when pen is lifted up**

***Beep on both of Pen Down/Up* – beep occurs on both**

***Beep Frequency* – modifies sound frequency**

***Beep Duration* – modifies sound duration**





## About

This panel displays information about the PenMount controller and this driver version.



## PenMount Monitor Menu Icon

The PenMount monitor icon (PM) appears in the menu bar of Windows 98/ME system when you turn on the PenMount Monitor in the PenMount Utilities.



The PenMount Monitor has the following functions:



Right Click Button      **When you select this function, a mouse icon appears in the right-bottom of the screen. Click this icon to switch between Right and Left Button functions.**



Beep Sound      **Turns beep on or off.**

Enable PNP      **Turns PNP on or off. When this is unchecked, PNP is off. The RS-232 transfer signal is continuous when the cable is unplugged and plugged into the serial port.**

Exit      **Exits the PenMount Monitor function.**

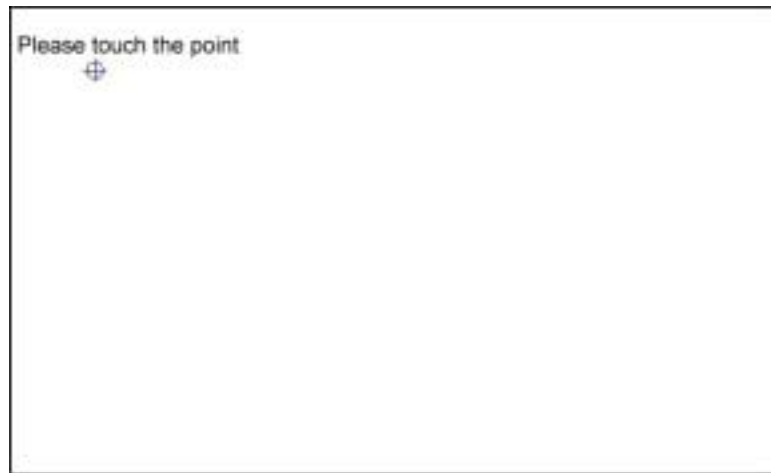
## PenMount Rotating Functions

The PenMount driver for Windows 98/ME supports several display rotating software packages. The PenMount drivers for Windows 95, Windows 98/ME, Windows 2000/XP, as well as Windows 98 USB and Windows ME/2000/XP support display rotating software packages such as:

- Portrait's Pivot Screen Rotation Software
- ATI Display Driver Rotate Function
- nVidia Display Driver Rotate Function
- SMI Display Driver Rotate Function
- Intel 845G/GE Display Driver Rotate Function

## Configuring the Rotation Function

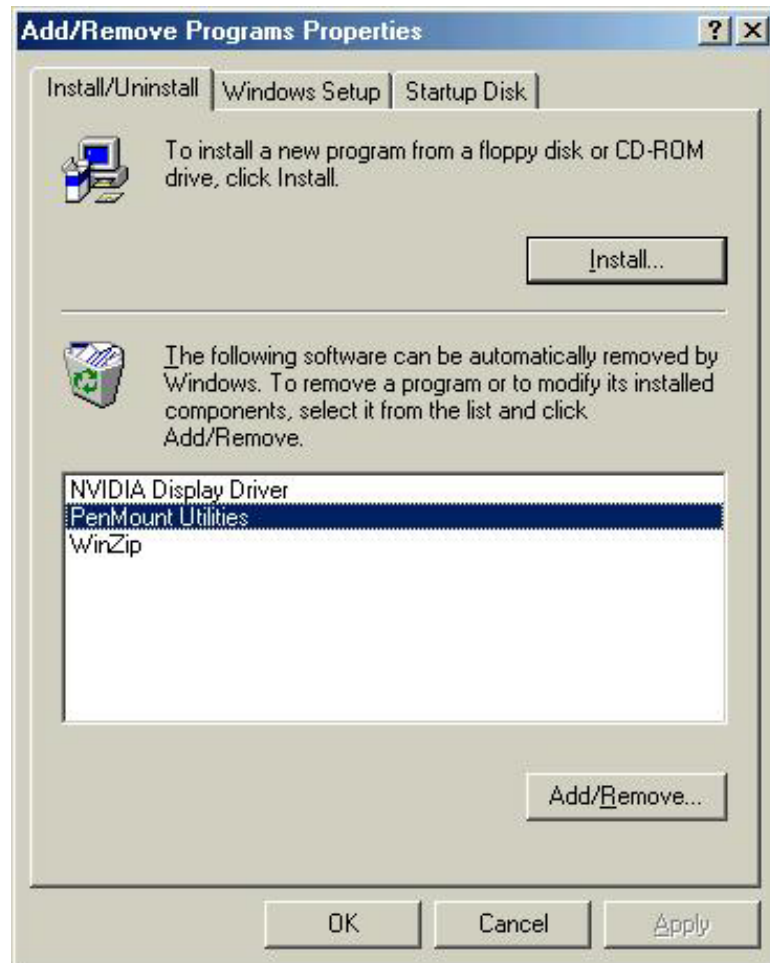
1. Install the rotation software package.
2. Choose the rotating function ( $0^\circ$ ,  $90^\circ$ ,  $180^\circ$ ,  $270^\circ$ ) in the 3<sup>rd</sup> party software. The calibration screen appears automatically. Touch this point and rotation is mapped.



**NOTE:** The Rotating function is disabled if you use Monitor Mapping

## 4.2 Uninstall the PenMount Windows 98/ME Driver

1. Exit the PenMount monitor (PM) in the menu bar.



2. From "PenMount Utilities" in "Programs", select the "Uninstall" utility
3. This message appears: "Are you sure you want to completely remove 'PenMount Utilities' and all its components?"
4. Select "Yes" to remove the PenMount Windows 98/ME driver.
5. Reboot system and the PenMount Windows 98/ME driver is removed from system.

## 4.3 Windows 2000/XP Driver Installation for 9036 Control Board

Before installing the Windows 2000/XP driver software, you must have the Windows 2000/XP system installed and running on your computer. You must also have the 9036 PenMount Serial Interface controller board installed. Contents of the PenMount Windows 2000/XP driver folder are listed below:

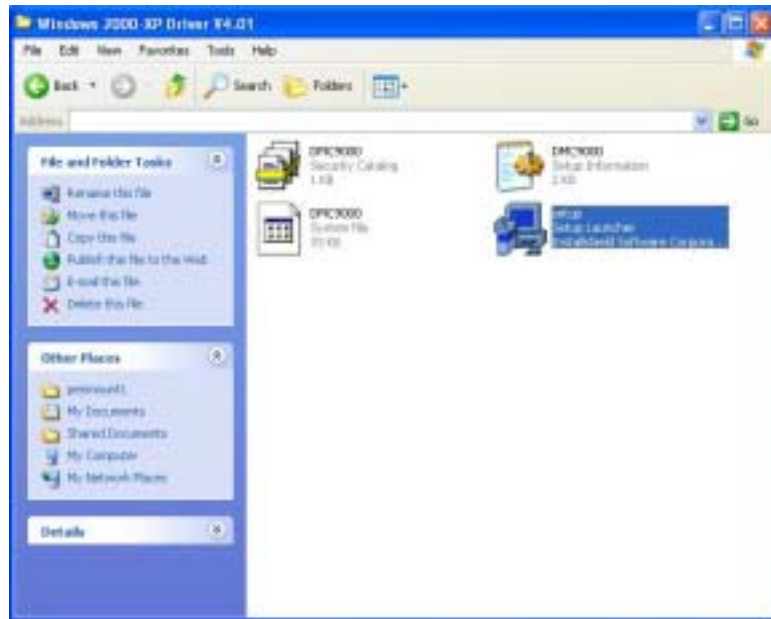
**DMC9000.inf**  
**DMC9000.sys**  
**DMC9000.cat**  
**SETUP.EXE**

If you have an older version of the PenMount Windows 2000/XP driver installed in your system, please remove it first. Follow the steps below to install the PenMount Windows 2000/XP driver.

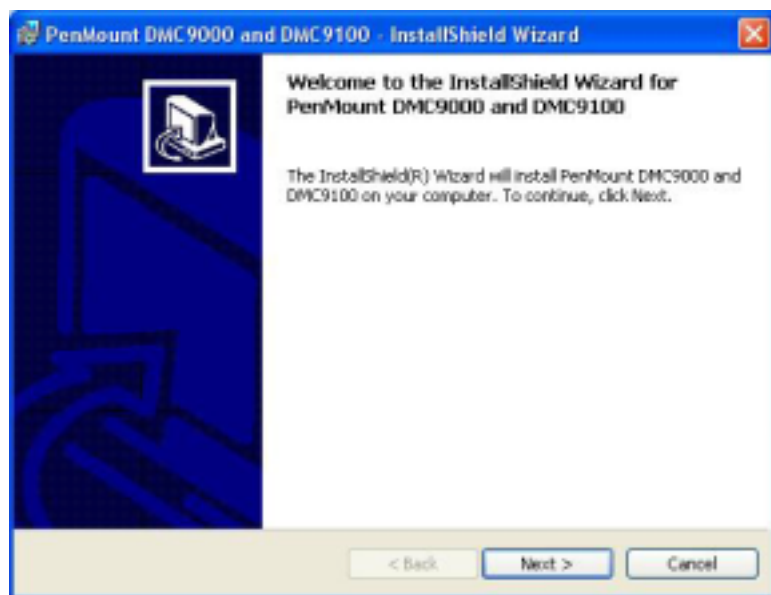
1. When the system first detects the controller board, a screen appears that shows “Unknown Device”. Do not use this hardware wizard. Press Cancel.



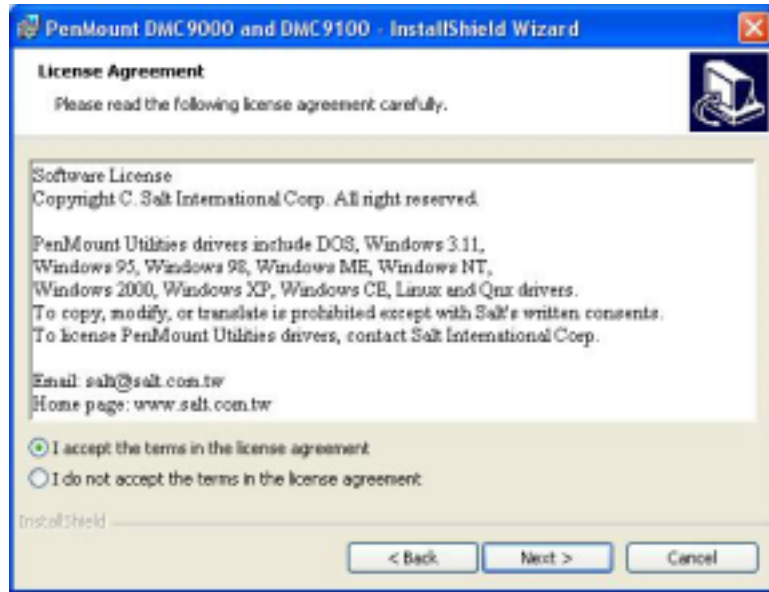
2. Insert the PenMount Driver CD-ROM. Go to the Windows 2000-XP Driver folder. Click **setup.exe**.



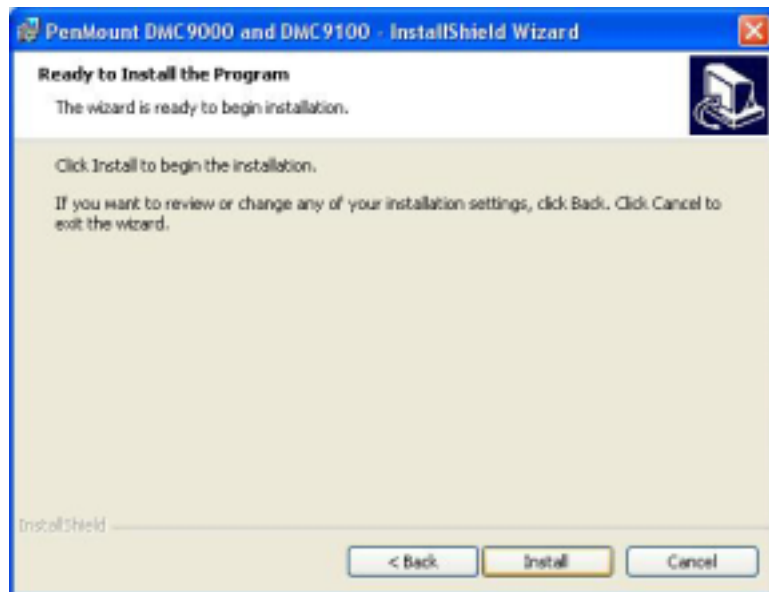
3. The screen displays the installation wizard for the PenMount software. Click "Next".



3. A License Agreement appears. Click “I accept...” and “Next”.



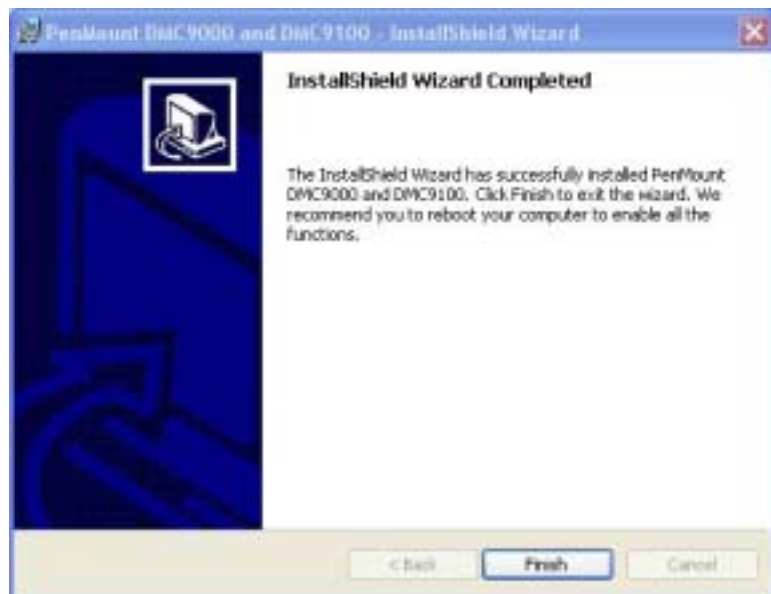
4. The “Ready to Install the Program” screen appears. Select “Install”.



5. The next screen is “Hardware Installation”. Select “Continue Anyway”.



6. The “InstallShield Wizard Completed” appears. Click “Finish”.





## 4.4 Configuring the PenMount Windows 2000/XP Driver

Upon rebooting, the computer automatically finds the new 9036 controller board. The touch screen is connected but not calibrated. Follow the procedures below to carry out calibration.

1. After installation, click the PenMount Monitor icon “PM” in the menu bar.
2. When the PenMount Control Panel appears, click “Calibrate”.

### PenMount Control Panel

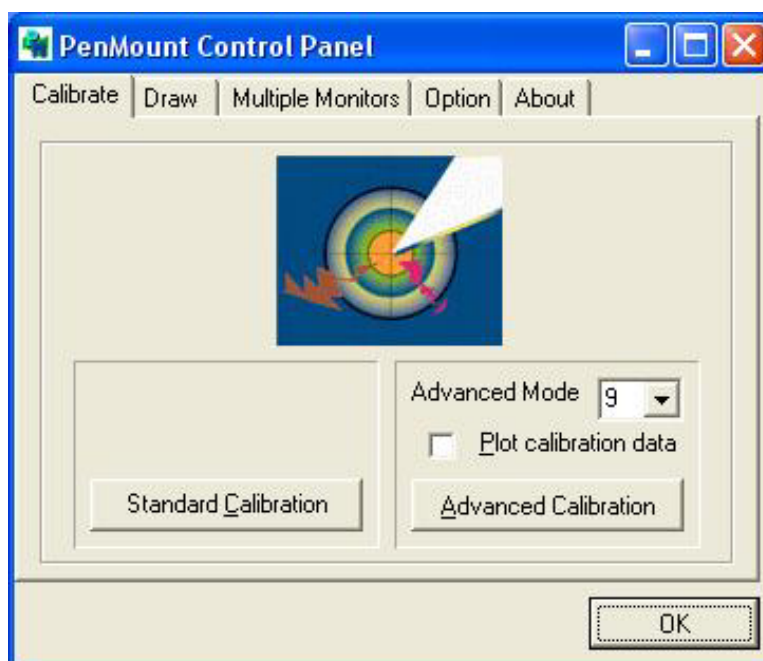
The functions of the PenMount Control Panel are **Calibrate**, **Draw**, **Multiple Monitors**, **Option**, and **About**, which are explained in the following sections.

### Calibrate

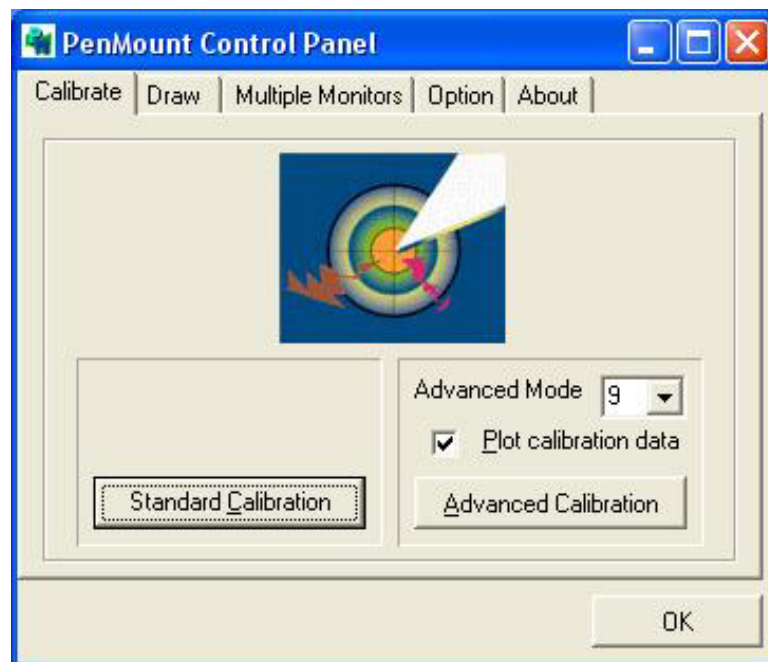
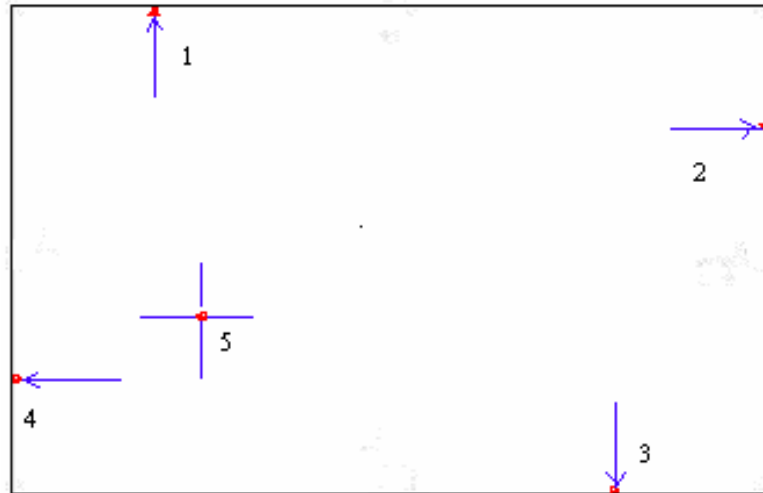
This function offers two ways to calibrate your touch screen. “Standard Calibration” adjusts most touch screens. “Advanced Calibration” adjusts aging touch screens.

Standard Calibration      **Click this button and arrows appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After the fifth red point calibration is complete. To skip, press ‘ESC’.**

Advanced Calibration      **Advanced Calibration uses 4, 9, 16 or 25 points to effectively calibrate touch panel linearity of aged touch screens. Click this button and touch the red squares in sequence with a stylus. To skip, press ‘ESC’.**



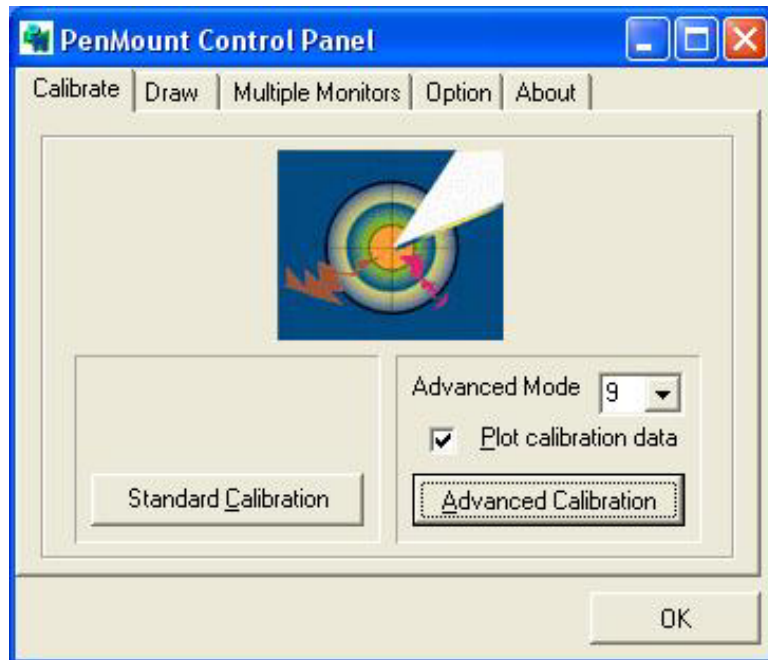
**NOTE:** The older the touch screen is, the more Advanced Mode calibration points you need for an accurate calibration. Use a stylus during Advanced Calibration for greater accuracy.





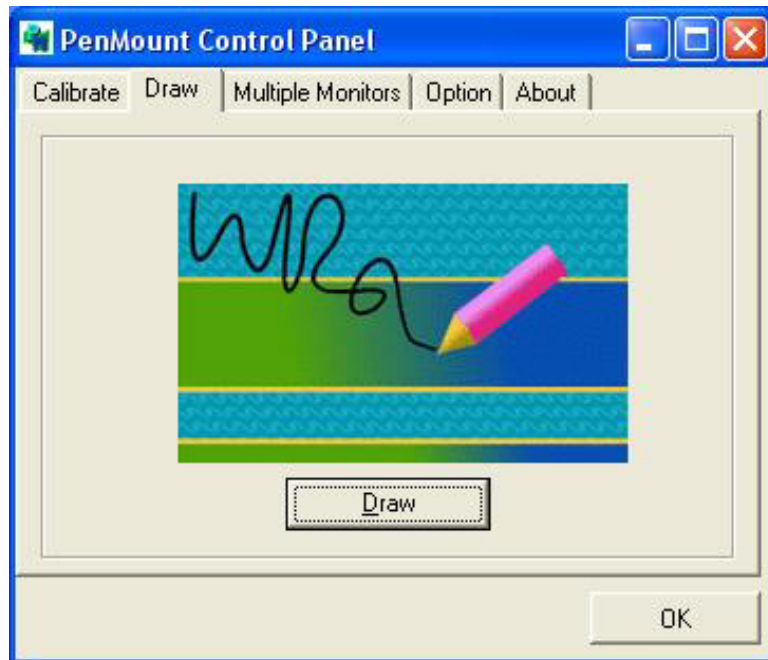
Plot Calibration Data

**Check this function and a touch panel linearity comparison graph appears when you have finished Advanced Calibration. The blue lines show linearity before calibration and black lines show linearity after calibration.**



## Draw

Tests or demonstrates the PenMount touch screen operation. The display shows touch location. Click **Draw** to start. Touch the screen with your finger or a stylus and the drawing screen will register touch activity such as **left**, **right**, **up**, **down**, **pen up**, and **pen down**.



Touch the screen with your finger or a stylus and the drawing screen will register touch activity such as **left**, **right**, **up**, **down**, **pen up**, and **pen down**.



Click Clear Screen to clear the drawing.



## Multiple Monitors

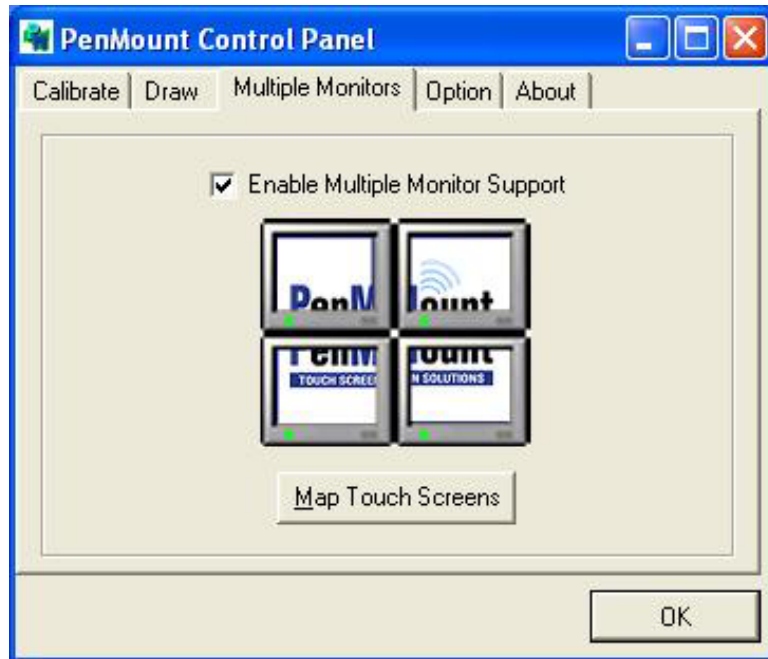
Multiple Monitors support from two to six touch screen displays for one system. The PenMount drivers for Windows 2000/XP support Multiple Monitors. This function supports from two to six touch screen displays for one system. Each monitor requires its own PenMount touch screen control board, either installed inside the display or in a central unit. The PenMount control boards must be connected to the computer COM ports via the RS-232 interface. Driver installation procedures are the same as for a single monitor. Multiple Monitors support the following modes:

Windows Extends Monitor Function  
Matrox DualHead Multi-Screen Function  
nVidia nView Function

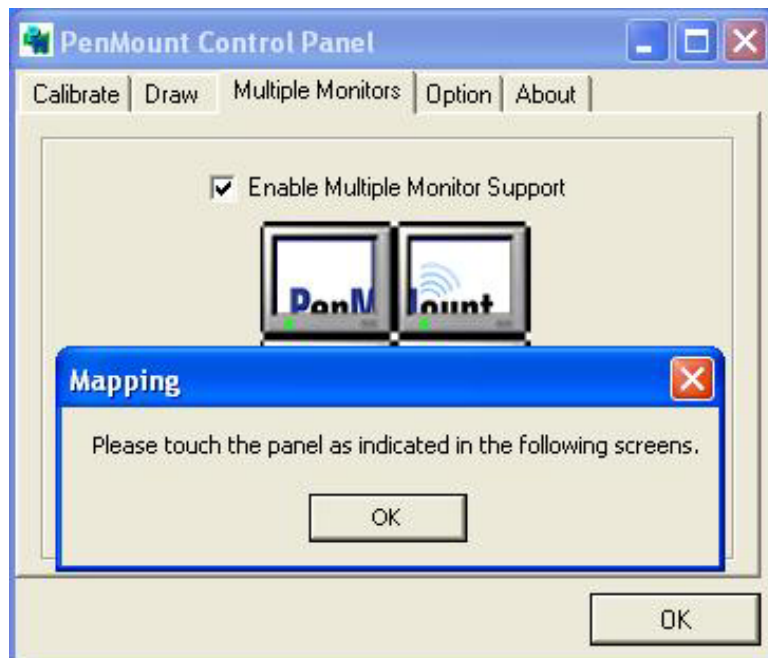
**NOTE:** The Multiple Monitor function is for use with multiple displays only. Do not use this function if you have only one touch screen display. Please note once you turn on this function the rotating function is disabled.

Enable the multiple display function as follows:

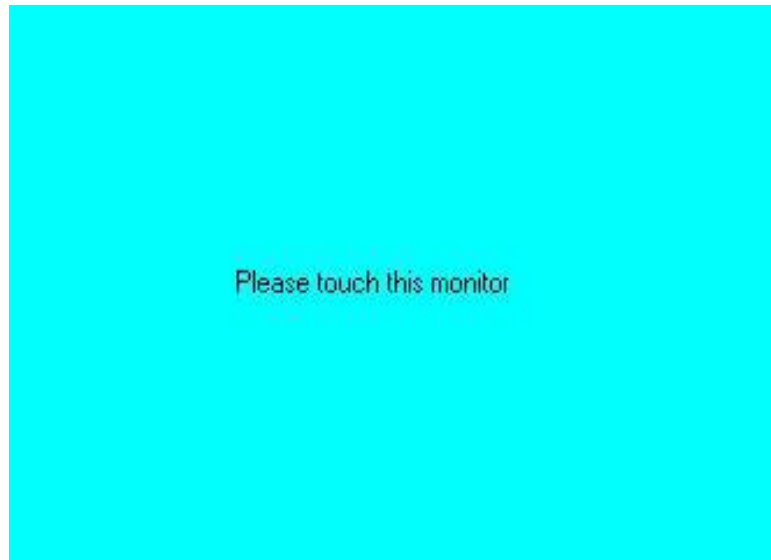
1. Check the **Enable Multiple Monitor Support** box; then click **Map Touch Screens** to assign touch controllers to displays.



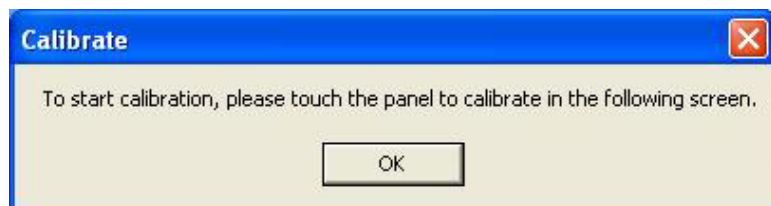
2. When the mapping screen message appears, click OK.



3. Touch each screen as it displays “Please touch this monitor”. Following this sequence and touching each screen is called **mapping the touch screens**.



4. Touching all screens completes the mapping and the desktop reappears on the monitors.
5. Select a display and execute the “Calibration” function. A message to start calibration appears. Click OK.

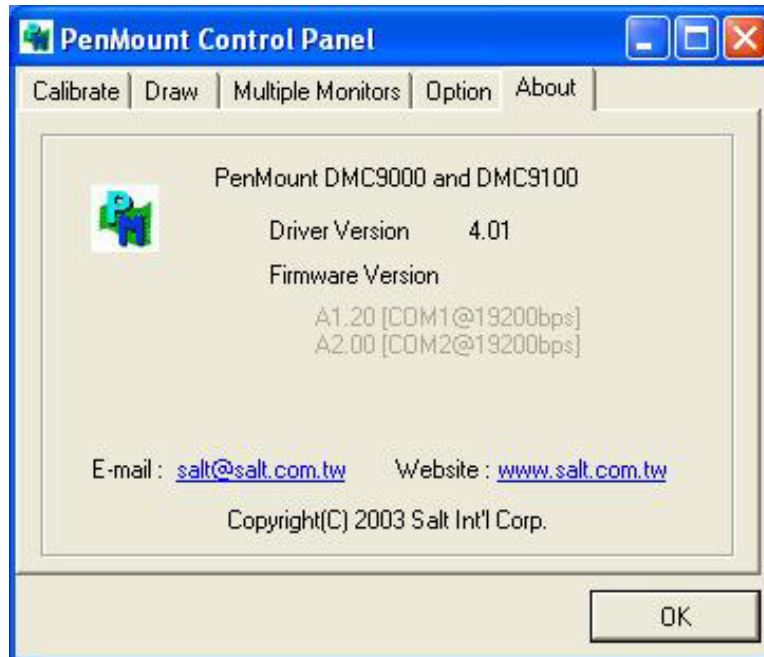


6. “Touch this screen to start its calibration” appears on one of the screens. Touch the screen.
7. “Touch the red square” messages appear. Touch the red squares in sequence.
8. Continue calibration for each monitor by clicking **Standard Calibration** and touching the red squares.

- NOTES:**
1. If you use a single VGA output for multiple monitors, please do not use the **Multiple Monitor** function. Just follow the regular procedure for calibration on each of your desktop monitors.
  2. The Rotating function is disabled if you use the Multiple Monitor function.
  3. If you change the resolution of display or screen address, you have to redo **Map Touch Screens**, so the system understands where the displays are.

## About

This panel displays information about the PenMount controller and this driver version.



## PenMount Monitor Menu Icon


The PenMount monitor icon (PM) appears in the menu bar of Windows 2000/XP system when you turn on the PenMount Monitor in the PenMount Utilities.



The PenMount Monitor has the following functions:





Beep	<b>Turns beep on or off.</b>
Right Button	<b>When you select this function, a mouse icon appears in the right-bottom of the screen. Click this icon to switch between Right and Left Button functions.</b>
	
Pen Stabilizer	<b>Check this function to reduce cursor vibration for relatively unstable touch screens, or where there may be excess vibration. Normally this function is not checked.</b>
Exit	<b>Exits the PenMount Monitor function.</b>

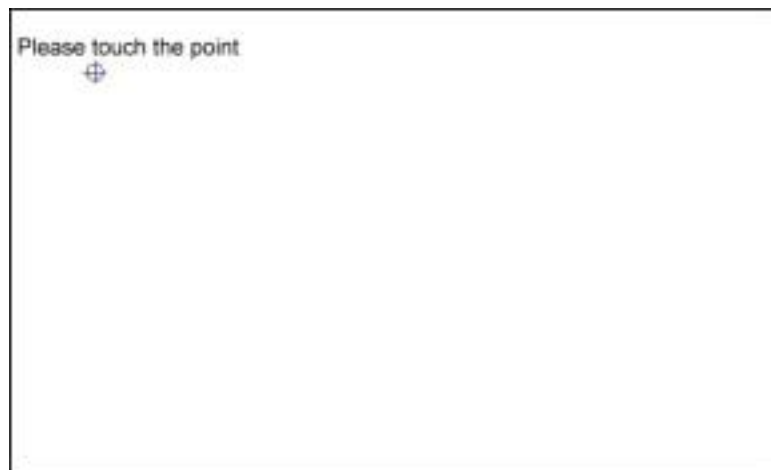
## PenMount Rotation Functions

The PenMount driver for Windows 2000/XP supports several display rotating software packages. The PenMount drivers for Windows 95, Windows 98/ME, Windows 2000/XP, as well as Windows 98 USB and Windows Me/2000/XP support display rotating software packages such as:

- Portrait's Pivot Screen Rotation Software
- ATI Display Driver Rotating Function
- nVidia Display Driver Rotating Function
- SMI Display Driver Rotating Function
- Intel 845G/GE Display Driver Rotating Function

## Configuring the Rotation Function

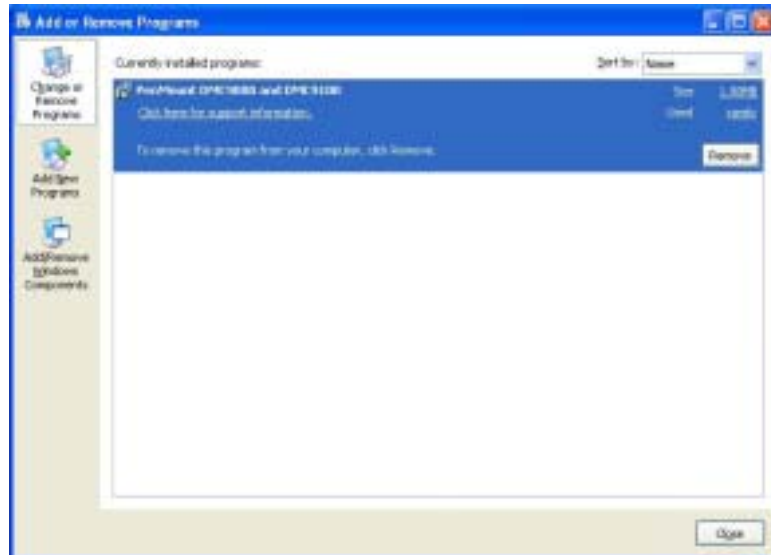
1. Install the rotation software package.
2. Choose the rotating function (0°, 90°, 180°, 270°) in the 3<sup>rd</sup> party software. The calibration screen appears automatically. Touch this point and rotation is mapped.



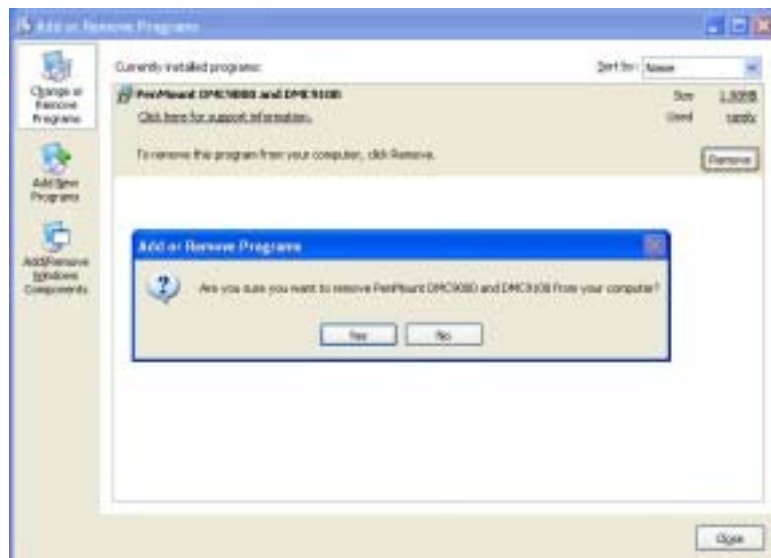
**NOTE:** The rotating function is disabled if you use Monitor Mapping

## 4.5 Uninstall the PenMount Windows 2000/XP Driver

1. Exit the PenMount monitor (PM) in the menu bar.
2. Go to **Settings**, then **Control Panel**, and then click **Add/Remove program**. Select **PenMount DMC9000** and click the **Add/Remove** button.



3. Select **PenMount DMC9000** and **DMC9100**. Click the **Remove** button.



4. Select "Yes" and "Close" to remove the PenMount Windows 2000/XP driver, and reboot the system.

# Chapter 5

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## 5.1 Software Functions

This chapter describes the special software functions that configure and adjust the PenMount controller board and touch screen hardware. Please note that not all of the functions are available for every driver. Software functions and their availability for specific interface and systems are shown in the table below—a description for each function follows:

Software Function	DOS	Win 3.1	95	98/Me	NT	2000/XP	CE	Linux	QNX
Standard Calibration	●	●	●	●■	●	●■	●■	●■	●
Advanced Calibration				●■	●	●■	●■		
Multiple Monitors						●			
Multi Device				■		●■	■		
Rotation			●	●■	●	●■			
Stream/Point mode				●■		●■			
Drawing mode	●	●	●	●■	●	●■	●■		
Beep Sound	●	●	●	●■	●	●■		●■	●
Beep sound adjustable				●■		●■			
Wake up function				●■		■			
Showing linearity				●■		●■			
Right button		●	●	●■	●	●■	●■		●
Hide cursor	●	●	●		●				
Double click area and speed adjustable			●		●				
About		●	●	●■	●	●■			

- RS-232 Interface (9000 series)
- USB Interface (5000 series)

## 5.2 Software Function Description

Description for each of the software functions shown in the table above follows:

### Standard Calibration

The Standard Calibration function lets you match the touch screen to your display so that the point you touch is accurately tracked on screen. Standard calibration only requires four points for calibration and one point for confirmation. Under normal circumstances, Standard Calibration is all you need to perform an accurate calibration.

### Advanced Calibration

The Advanced Calibration function improves the accuracy of calibration by using more involved engineering calculations. Use this function only if you have tried the Standard Calibration and there is still a discrepancy in the way the touch screen maps to the display. You can choose 4, 9, 16 or 25 points to calibrate, though we suggest that you first try 9 points, if it is still not tracking well then try 16 or 25 points. The more points you use for calibration, the greater the accuracy. Errors in calibration may occur due to viewing angle, or individual skill, and there may be little difference in using 16 or 25 points. Note that a stylus is recommended for the most accurate results.

### Multiple Monitors

Until now most touch screen systems only support one monitor, and users of multiple monitors have not been able to use touch screen systems. This situation has inspired PenMount to design and develop Multiple Monitors support using the PenMount 9036 control board and Windows 2000/XP driver. Our advanced design supports from 2 to 6 monitors that can be split horizontally or vertically.

### Requirements

Before using the Multiple Monitor function, you need the following:

1. A display card that supports multiple monitors such as the Matrox, nVidia, ATI, etc. (Two or more display cards supported by Windows are also OK.)
2. Two or more touch screens
3. Two or more serial ports
4. Two or more PenMount 9000 control boards such as the 9036, 9026, 9084, or 90A4
5. The PenMount 9000 Windows 2000/XP v4.01 or greater software driver

Before using Multiple Monitors you must have two or more monitors that are in extension mode. For display cards that support multiple monitors, we suggest you consider Matrox,

nVidia, or ATI cards and inquire about operation and usability issues.

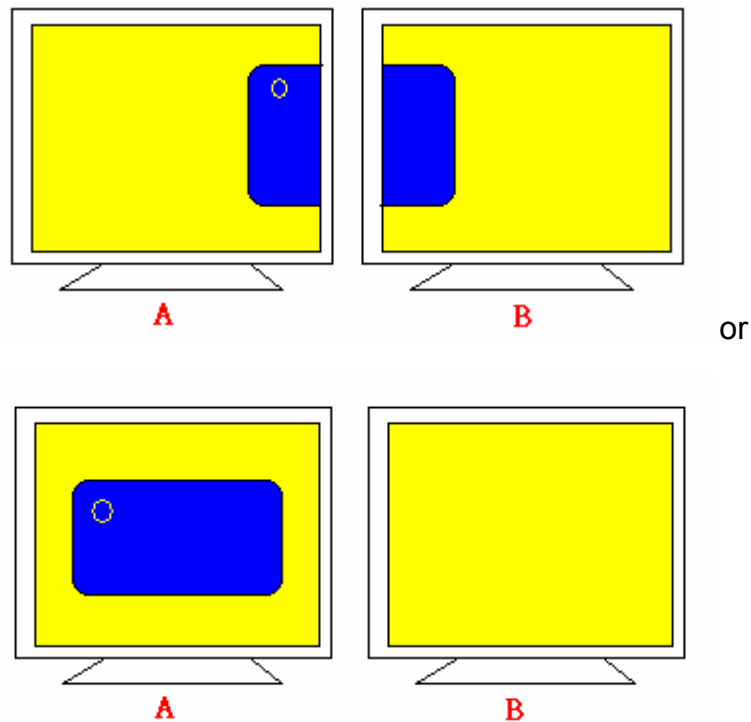
**Note:** Before you can use multiple monitors, you need to map each monitor.

## Multiple Devices

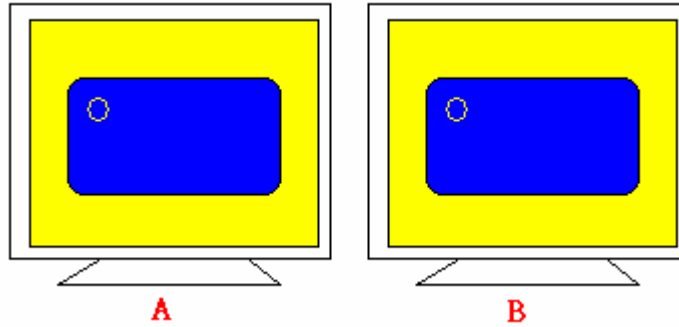
The Multiple Devices function is designed to let you use two or more monitors to display the same image. Software that supports this function includes the PenMount 9000 2000/XP drivers and the PenMount 5000 98/Me/2000/XP/CE drivers. The drivers for PenMount 9000 can support up to six control boards, and the drivers for PenMount 5000 support up to 16

## Comparing Functions

The difference between the Multiple Monitors function and the Multiple Devices function are illustrated below:



The Multiple Monitors function shown above extends the screen into 2 or more monitors.



The Multiple Devices function displays the same image on two or more monitors.

## Requirements

Before using the Multiple Monitors function, you need the following:

1. A display card that supports Dual Monitors such as the Matrox, nVidia, ATI, etc., or that outputs into a 1-into-2 VGA signal box
2. Two or more touch screens
3. Two or more serial ports or USB ports
4. Two or more PenMount 9000 control boards such as the 9036, 9026, 9084, or 90A4, or PenMount 5000 control boards such as the 5184 or 51A5
5. If using the PenMount 9000 control board the driver must be the PenMount 9000 Windows 2000/XP v4.01 or greater software driver
6. If using the PenMount 5000 control board the driver must be for Windows 98/ME/2000/XP/CE

## 9000 Control Boards

To use multiple devices with 9000 Control Boards:

1. Configure your computer hardware.
2. Attach each 9000 Control Board to a different computer's serial port.
3. Install the appropriate PenMount software driver in each computer.
4. Use each driver's Calibration function to calibrate each computer's touch screen.  
You must calibrate each touch screen before configuration is complete.

## Rotation

There are currently a number of software packages on the market that support rotating monitors 0°, 90°, 180°, and 270°. However, you will not be able to use a touch screen unless it is matched to the appropriate rotation. Our rotation configuration function allows you to easily match the touch screen when you rotate your monitor.

If you use a rotating monitor, you will need a display card such as from nVidia, Intel, SMI or ATI and software such as Portrait Pivot Pro. For software operation and features, please refer to your software manual.

Configuring the rotation function is easy. Select this option and a 'point' appears for you

to touch. Once the point is touched, the software driver understands which degree you plan to rotate your display. The rotation function supports 90, 180 and 270 degrees rotation.



**0 degrees**





**90 degrees**



**180 degrees**



**270 degrees**

## **Stream/Point Mode**

Stream and point modes control the touch and drag function of the touch screen. The point mode only allows “touch” interaction with the screen and does not allow the user to drag objects. The point mode is useful for maintaining the location of screen icons such as on POS terminals. The stream mode allows a user to touch and drag icons and other items around on the screen, similar to using a mouse.

## **Drawing Mode**

Drawing mode is a utility that lets the user draw on the screen using a finger or stylus. This allows the user to test the touch screen and touch controller to see if it is operational or is mapped correctly. The drawing mode can display either the matrix address of points touched or just show lines drawn. One of the PenMount driver’s strengths is a special mathematical algorithm that minimizes the occurrence of noise and smooths the drawing of lines.

## **Beep Sound**

All of PenMount’s drivers support the beep sound function; however, some PC systems may only offer a fixed buzzer sound.

## **Beep Sound Adjustable**

Software drivers for Windows systems let the user adjust the frequency and length of the beep sound. The drivers let the user adjust the desired touch screen sound, as well as turn the sound off.

## **Wake Up Function**

The Wake Up function lets the user touch the screen and wake the system up from ‘suspend’ mode.

## **Point Calibration Data**

The Plot Calibration Data function displays the touch screen linearity map, which is available if the PenMount driver provides an Advance Calibration function when touch screens age their touch linearity declines. This non-linearity is apparent when the touched point on the touch screen is not the same as the point on the display. The plot calibration data function shows the linearity status of the touch screen. This is only a support function for the user. The exact linearity of a touch screen requires a linearity test machine.

## **Right Button**

The Right Button function simulates the right button function of a mouse. Click the right button and the user can only touch the screen once and the driver changes the touch definition to the left button.

## **Hide Cursor**

The Hide Cursor function keeps the cursor arrow and other cursor symbols from appearing when using the touch screen. The cursor appears when the user turns this function off.

## **Cursor Offset**

The Cursor Offset function lets the user adjust the position of the touch point to a desired location away from the real touch point.

## **Double-Click Area and Speed**

The Double-Click Area and Speed function lets the user adjust the double-click area and speed to their personal preference.

## **About**

This option shows the exact version of the drivers and controller firmware. Updated drivers are available for download on the PenMount website.

# Appendix A: Board Descriptions & Specifications

This appendix provides information on controller board features and specifications.

## PenMount 9036 Control Board

The PenMount 9036 control board is configured for the RS-232 interface and it supports 4-wire, 5-wire and 8-wire touch screens.

### PenMount 9036 Features

- DMC9000 touch controller
- Diagnostic LED on board
- Supports PnP and non-PnP mode
- Supports 4-wire, 5-wire and 8-wire touch screen
- Baud rate 19200 or 9600 bps selectable
- Automatic pin assignment adjustment
- Input voltage is 5V to 12V
- Bundled with PenMount drivers, which are also available for download from our website

### Connector Pin Definitions

Pin definitions for the two connectors on the PenMount 9036 control board follow:

#### Connector Pin Definitions for Touch Screen

<b>Pin definition / wires</b>	<b>4-wire touch screen</b>	<b>5-wire touch screen</b>	<b>8-wire touch screen</b>
PIN 9	N/A	N/A	Right Sense
PIN 8	N/A	N/A	Left Sense
PIN 7	N/A	N/A	Bottom Sense
PIN 6	N/A	Sense	Top Sense
PIN 5	Right	LR	Right
PIN 4	Left	LL	Left
PIN 3	Bottom	UR	Bottom
PIN 2	Top	UL	Top
PIN 1	Ground	Ground	Ground

### Connector Pin Definitions for Power and RS-232

	<b>Power</b>	<b>Lines</b>		<b>RS-232</b>	<b>Interface</b>	
<b>Pin #</b>	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6
<b>Definition</b>	Ground	5V~12V power	RTS	TXD	RXD	Ground

# Appendix B: Controller IC Specifications

This appendix offers information on touch screen controller IC features and specs.

## PenMount DMC9000 Touch Screen Controller IC

The PenMount DMC9000 is the best-performance touch screen controller. Designed with PnP features for new system trends, it offers RS-232 touch screen interface. The DMC9000 is designed for those who need an all-in-one solution with a built-in A/D converter for a denser total printed circuit board.



### Electrical Specifications



<b>Touch Screen:</b>	4, 5 & 8 wire
<b>Package:</b>	28-pin PDIP or 32-pin TQFP
<b>Communications:</b>	RS-232
<b>Characteristics:</b>	8-bit RISC microprocessor with built-in functions including 10-bit ADC, UART, Timer, Counter, Comparator, Watchdog, Memory, etc.
<b>Voltage Range:</b>	+ 4.0V to +6.0V
<b>Power Consumption:</b> (at 4 MHz, 3V)	Active: 3.4 mA / Idle Mode: 1.4mA Power Down Mode: <1 $\mu$ A
<b>Operating Temperature:</b>	-40° C to +85° C
<b>Storage Temperature:</b>	-65° C to +150° C
<b>Volt. on RESET with respect to Ground:</b>	-1.0V to +13.0V
<b>DC Current per I/O Pin:</b>	40.0 mA
<b>DC Current Vcc and GND Pins:</b>	300.0 mA

### Driver Software

DOS, Windows 3.11, Windows 95/98/ME, Windows NT/2000/XP, Linux, QNX, Windows CE (for both X86 and SA CPUs)