PenMount Touch screen 9000 Control Board Installation Guide

Revision 1.7
15 / November/'12

PenMount®

Preface

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Revision Table

Date	Revision	Changes
28/Dec/'08	1.0	Initial
21/Jul/'09	1.1	**Chapter 5. PenMount Gesture AP** is added.
04/Sep/'09	1.2	Sections updated are: ● **3.2.1. Install PenMount Windows Universal Driver (for 2000/XP/2003/VISTA/7)** ● **3.2.2. > 3.2.2.1. > Setting: Pen Input Emulation** & **Click on Release** are added to **Operation Mode**.
06/Oct/'09	1.3	● Refinement of Installation Diagram in section **2.2.**
21/Oct/'09	1.4	● **Chapter 2** > **2.3** > **2.3.1 PenMount 9036CH:** The picture of *PenMount 9036BH Control Board Upside* is updated and a mechanical diagram is added. ● **Chapter 2** > **2.3** > **2.3.2. PenMount 9026BH**: The picture of *PenMount 9026BH Control Board Upside* is updated and a mechanical diagram is added.
27/Nov/'09	1.5	● **Chapter 2** > **2.2 Installation Diagrams**: The installation diagrams for each 9026BH and 9036BH boards are added.
01/Mar/'10	1.6	● The installation diagrams of PenMount 9036BH and 9026BH Control Boards are to on page 錯誤! 尚未定義書籤。 and **3**. ● Picture and mechanical diagram of PenMount 9036BH Control Board are updated on page 錯誤! 尚未定義書籤。. ● Section 錯誤! 找不到參照來源。 錯誤! 找不到參照來源。 are updated reorganized starting from page 錯誤! 尚未定義書籤。. ● The screenshots of **Edge Compensation** and **About** are updated on page **48**. ● The original **3.6.5 PenMount Rotating Function** is relocated to **3.6.3.3** on page **44**. And "Vista 32/64bit" is deleted from the description. ● The description of section 錯誤! 找不到參照來源。 錯誤! 找不到參照來源。 is updated on page 錯誤! 尚未定義書籤。. ● Linux 錯誤! 找不到參照來源。 table is updated on page 錯誤! 尚未定義書籤。. ● To the software function table in **Chapter 4 Driver Software Functions** on page **51**, VISTA/7 column and an additional remark are added. ● **Gesture Enable** is added to PenMount Control Panel functions on page **52**. ● 4 points calibration is deleted from **4.2 Advanced Calibration** on page **52**. ● "Vista 32/64bit" and "Windows 7 32/64bit" are deleted from the description of **4.3 Multiple Monitors** on page **52**. ● All screenshots in section **4.3 Multiple Monitors** are updated starting from page **52**. ● The original section **4.7. Mouse Emulation (Stream Mode) / Click on Touch (Point Mode)** is deleted and replaced by the new section **4.7 Mouse Operation Mode** on page **59**. ● The screenshots of **PenMount Control Panel** are updated on page **63**. ● The screenshots of **PenMount Control Panel** and **Gesture Setting** are updated on page **63**.

Date	Revision	Changes
		• The screenshots of PenMount Gestures under Windows XP/Vista/7 are updated on page 錯誤! 尚未定義書籤。 and **64**. • Screenshots of **Gesture Setting** and the description of **General Setting Box** are updated on page **65**. • Icons of PenMount gestures are updated on page **66**.
15/Nov/'12	1.7	• PM9036BH is changed to PM9036CH, the pictures and mechanical diagrams are updated on Chapter 1 and Chapter 2 • Updated drivers on Chapter 3.7 and Chapter 4, which support Windows 8, WinCE 7.0 and new Linux system. • Updated PenMount Windows universal driver installation guide is on chapter 3.6.

Table of Contents

Chapter 1.   Introduction

PenMount Touch screen Control Board is the most popular touch screen control board on the market. PenMount control boards, chipsets, and software support a wide range of configurations, applications, and operating systems. Designed for easy configuration and superior touch screen performance, the PenMount 9000 control boards are offered for RS-232 interface.

PenMount Touch screen Control Board is a circuit board that you install between a touch screen and a host computer. The control board converts touch input into digital data, which is then converted by software into data that emulates the input from a computer's mouse device.

The control boards are comprised of an interface board for mounting on a host computer, a controller chip, other supporting components, and software drivers. The bundled software drivers offer unique functions and support the most popular hardware platforms and operating systems.

PenMount control boards are designed not only to be user-friendly, but also to support engineers. All PenMount control boards provide a diagnostic LED that allows both users and engineers to check the touch screen and the control board functions.

1.1.   About this Manual

This manual describes the features of the PenMount Touch screen Control Board series, how to connect a control board, and how to install and use the software drivers and utilities with your operating system.

This manual is for users who are using the PenMount Touch screen Control Board and software, as well as for engineers who are integrating and customizing the control board for use with other products.

1.2.   PenMount 9000 Control Boards

PenMount 9000 control boards are configured for use with RS-232 interface. Depending on design or product requirements, PenMount also provides controller ICs. A 9000 control board connects to a touch screen, a power supply and a computer system's RS-232 port. PenMount 9000 offers two control boards:

Model	Interface	Touch screen Wire Support
PenMount 9026BH	**RS-232**	**4,8**
PenMount 9036CH	**RS-232**	**4,8 or 5**

1.3.   Drivers & Utilities

Both of the 9000 control boards come bundled with software drivers and utilities that support the most popular hardware platforms and operating systems. Once you install the drivers and utilities, you can use this software to configure and calibrate your touch screen. The PenMount drivers support the following operating systems:

Windows 3.1/95/98/ME/NT/2000/XP/2003/VISTA/7/8,
Windows CE/XPE, DOS, Linux, and QNX.

1.4.   After Sales Service

PenMount 9000 control boards and software are modified and updated on a regular basis. For the updated information, downloads, and technical support, please refer to our website at: http://www.penmount.com .

Chapter 2. Install PenMount 9000 Control Boards

The procedures below describe how to install and configure the hardware for each PenMount 9000 Control Board.

2.1. Installation Requirements

You need the following to install a touch screen using a PenMount 9000 Touch screen Control Board:

2.1.1. Computer

- An IBM-compatible host computer
- A communications port of RS-232
- A Compact Disc drive
- One of the following operating systems installed on the computer: Windows 3.1/95/98/ME/NT/2000/XP/2003/VISTA/7/8, Windows CE/XPE, DOS, Linux, and QNX.

2.1.2. Touch screen

- PenMount 9026 board supports 4-wire or 8-wire tail analog resistive touch screens.
- PenMount 9036CH board supports 4,8-wire or 5-wire tail analog resistive touch screens.

2.1.3. Control Board

- A PenMount 9000 Touch screen Control Board
- Cables to connect the control board to the touch screen and the computer's communications port
- A cable to connect the power supply.
- The PenMount Drivers & Utilities disk.

2.2. Installation Diagrams

2.2.1. The Connection of 9026BH Control Board (RS-232)

③ Configure and connect communication cable.

① Connect to ground.

② Connect touch screen cable.

RS-232

5—6 GND
3—5 RXD
2—4 TXD
7—3 RTS
+5~12V VCC
GND

④ Connect 5V power.

8-wire

GND
T
B
L
R
TS
BS
LS
RS

4-wire

GND
T
B
L
R

Follow these steps:

1. Connect the controller to ground.
2. Configure then connect touch screen cable
3. Connect communication cable.
4. Connect power.
5. Turn on computer.
6. Install PenMount drivers.
7. Follow instructions on screen.

2.2.2. The Connection of 9036CH Control Board (RS-232)
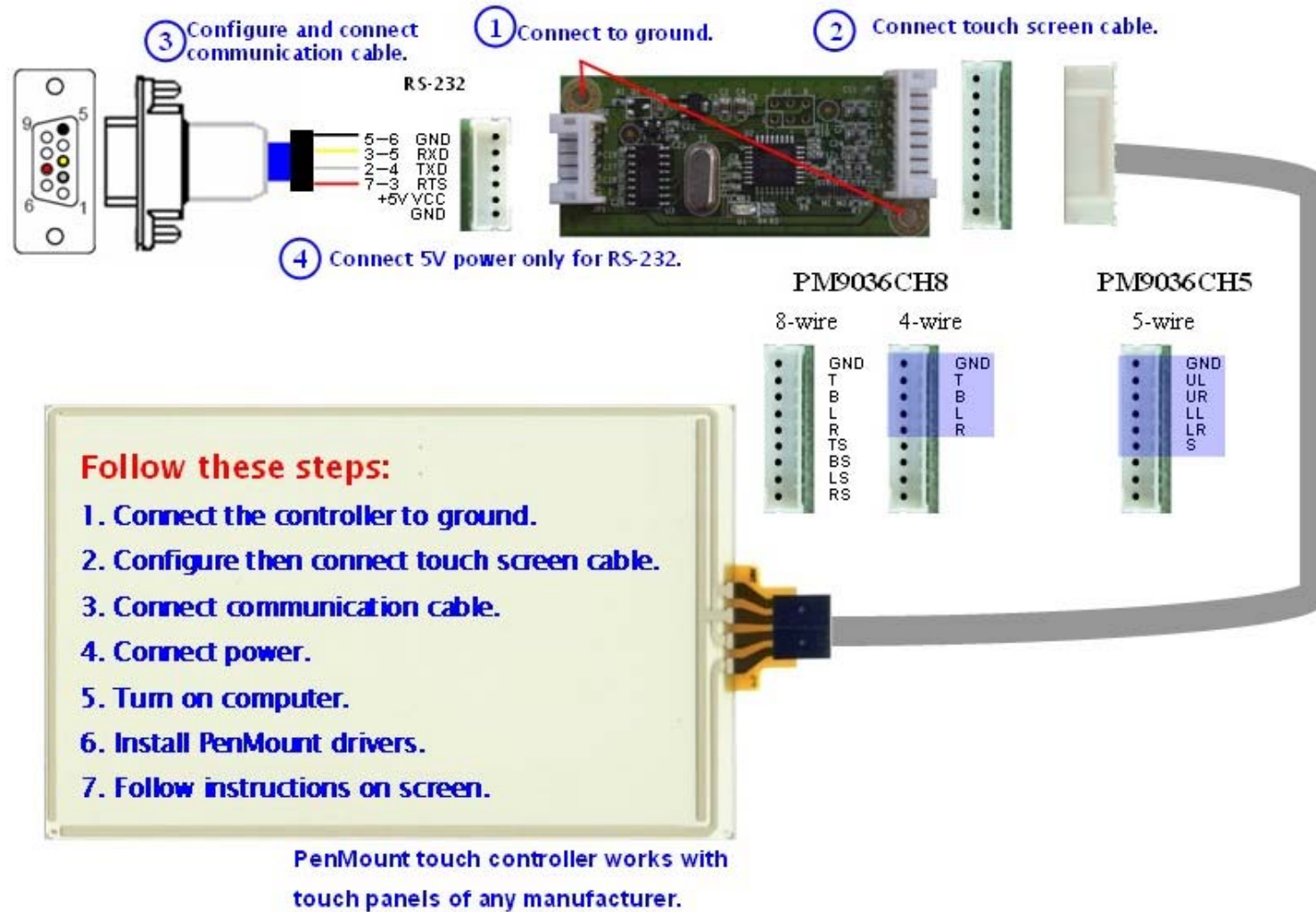
2.3. RS-232 Serial Boards (9000 Series)

PenMount 9000 control boards use the RS-232 serial interface. There are currently two models in the 9000 Series. The general procedure for board installation is similar, though hardware connection and configuration varies for each board.

2.3.1. PenMount 9036CH

PenMount 9036CH control board is a RS-232 interface touch screen control board that supports 4,8-wire or 5-wire touch screens. The size of the board is 60 (L) x 26 (W) x 8.3 (H) mm and it has two connectors and four dipswitches on-board. Follow the steps below to install 9036CH control board.

Cut off the power of your computer and display, and then open the case of the display or the system. Find the space on your system and attach the control board to your system with screws. The control board has 3φ screw holes in industrial standard.
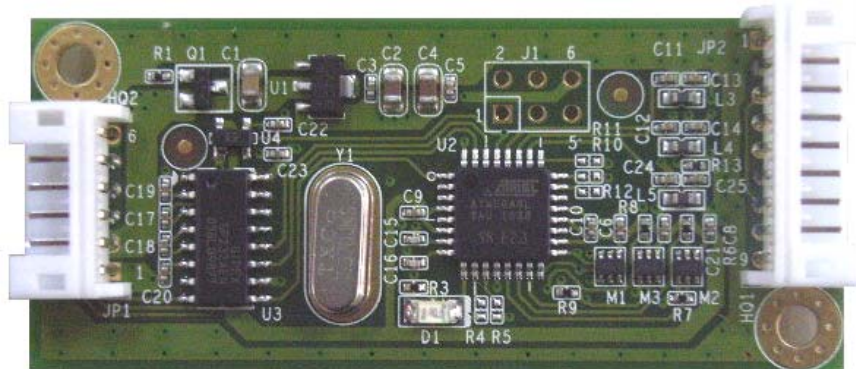
PenMount 9036CH Touch screen Control Board Upside
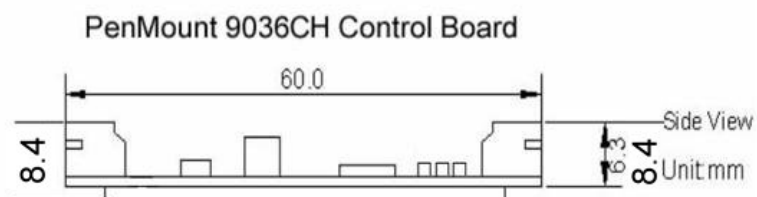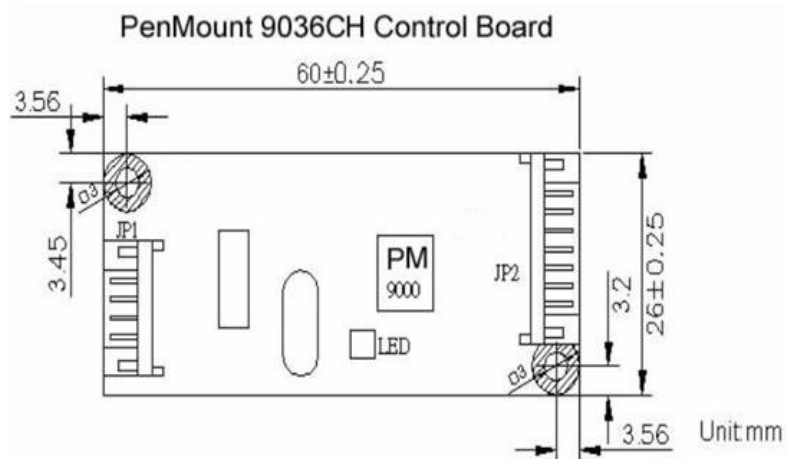
PenMount 9036 Control Board Mechanical Diagram

Find the white 6-pin right angle connector (on the left in the photo above). 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.

Find the white 9-pin right angle connector (on the right in the photo above). Attach the female end of the touch screen cable to this connector. If you have a 4-wire touch screen attach the cable to pins 1~5. If you have a 5-wire touch screen attach the cable to pins 1~6. If you have an 8-wire touch screen attach the cable to pins 1~9. Attach the male end of the cable to the touch screen tail.
Mount your touch screen to the display.

Turn on power to the computer and the display.

Install the software drivers and utilities, then calibrate the touch screen. See **Chapter 3. Install Drivers for 9000 Boards** on page 8.

2.3.2.   PenMount 9026BH

The PenMount 9026BH control board is an RS-232 interface touch screen control board that supports 4-wire and 8-wire touch screens. The size of the board is 60 (L) x 20 (W) x 8.3 (H) mm and it has two connectors on-board. Follow the steps below to install the 9026BH control board.

Cut off the power of your computer and display, then open the case of the display or the system.   Find the space on your system and attach the control board to your system with screws. The control board has 3φ screw holes in industrial standard.

PenMount 9026BH Touch screen Control Board Upside

Penmount 9026BH Control Board

Unit:mm
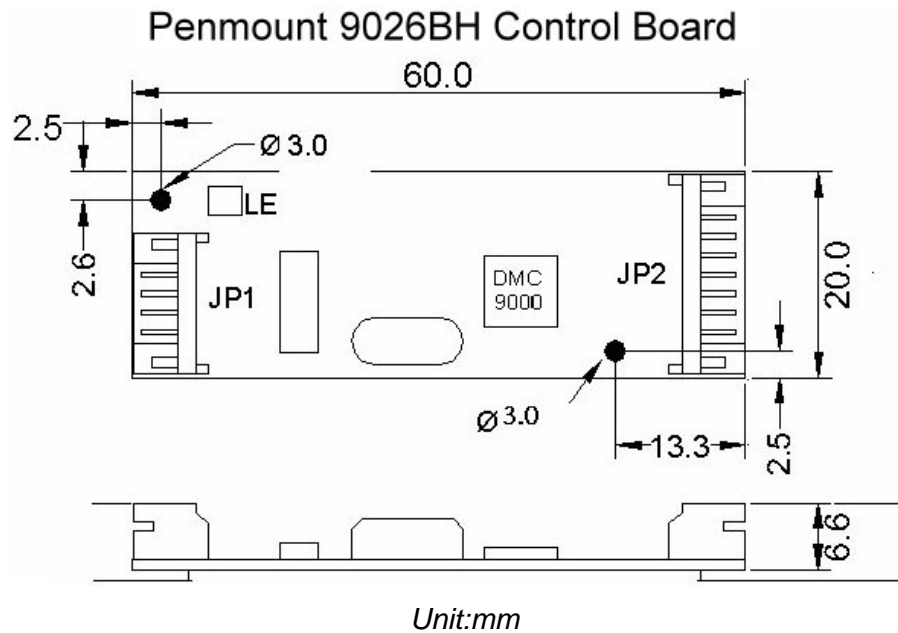
PenMount 9026BH Control Board Mechanical Diagram

Find the white 6-pin right angle connector (on the left in the photo above). The power cable is pin 1 and pin 2. Solder the power and ground wire to the system. The RS-232 cable is from pins 3 to 6. Attach the RS-232 cable's D-sub connector to a COM port at the back of the computer.

Find the white 9-pin right angle connector (on the right in the photo above). Attach the female end of the touch screen cable to this connector. If you have a 4-wire touch screen attach the cable to pins 1~5. If you have an 8-wire touch screen attach the cable to pins 1~9. Attach the male end of the cable to the touch screen tail.

Mount your touch screen to the display using tape or Velcro.

Turn on power for the computer and the display.

Install the software drivers and utilities, and then calibrate the touch screen. See **Chapter 3. Install Drivers for 9000 Boards** on page 8.

Chapter 3. Install Drivers for 9000 Boards

This chapter describes how to install drivers and other software that will allow your PenMount 9000 Control Boards (RS-232) work with various operating systems.

3.1.   Install PenMount DOS Driver

Before installing the DOS driver software, you must have the DOS system installed and running on your computer. You must also have installed either PenMount 9026BH or 9036CH control board.

3.1.1.   Install PenMount DOS Driver

PenMount DOS Driver version 2.10 diskette contains the following files:

INSTALL.EXE	--	PenMount installation program
PM2.EXE	--	PenMount Utility, to configure or test the PenMount touch screen
PMOUSE.EXE	--	Driver loader, to load or unload driver.
PMTSR.COM	--	PenMount DOS Driver
PMOUSE.CFG	--	The configuration file for PenMount DOS driver
README.TXT	--	The file you're reading now.
PMINIT.BAT	--	Reload DOS driver batch file
PMUNLOAD.BAT	--	Unload DOS driver batch file
PMTEST.EXE	--	PenMount driver test utility to verify PenMount driver working.
MOUSETST.COM	--	Mouse Test utility

If you have an older version of the PenMount DOS driver installed in your system, please remove it first. PenMount 9000 control board has a 9-pin D-sub connector. Before installation, plug into the COM port of PC. (e.g. COM1, COM2, COM3 or COM4)

Follow the steps below to install the PenMount DOS driver.

Step 1: Decompress the driver package. (e.g. C:\TEMP)

Step 2: Go to the working directory. (E.g. cd \TEMP)

Step 3: Run the installation program 'install.exe" at DOS prompt.

Step 4: The install.exe will lead you to complete the installation.

Step 5: Restart computer (Recommanded)
        or
        press 'ESC' key and issue 'SET
        PENMOUNT=<penmount_installation_path>' at DOS prompt.

Step 6: The PenMount driver will be loaded after restarting computer.

NOTE:

● **Environment Variable - PENMOUNT**

The environment is variable, PENMOUNT needs PenMount driver v2.10.
The installation program will put the command line 'SET PENMOUNT=<penmount_install_path>' into the AUTOEXEC.BAT, like:

SET PENMOUNT=C:\PM2   (e.g. PenMount installation path is C:\PM2)

The driver can't be loaded, if the environment variable is not configured properly and the utility can't be run. Issue the command 'set' at DOS prompt to check the environment variable.

● **Environment Variable - PATH**

The installation program will put the installation path into the environment PATH. You can run program in any working directory at DOS prompt regardless of where the working directory is.

3.1.2.   PenMount DOS Driver Functions

The PenMount DOS driver offers several functions. You can change the settings with the following utilities:

1. PM2 Panel

Run the batch file 'PM2.EXE'. Type the command at DOS prompt:

PM2

Before running PM2, you must remove PenMount driver or another mouse driver, if you have installed one.

There are several functions to select, and the launch key is in brackets. (E.g. press '2' key to do calibration)

Use <arrow key> (up/down) to select, and **<Enter>** to launch the following functions:

(1)   Draw
(2)   Calibrate
(3)   Detect
(4)   Configure
(5)   Packet
(6)   Help
(7)   Exit

2. Draw

Run the '**Draw**' in PM2 Panel, and use the arrow keys or hot keys (A~Y)

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to choose one of 25 video modes.

Video modes:

mode	width	height	colors
0Dh	320	200	16
13h	320	200	256
10Dh	320	200	32K
10Eh	320	200	64K
10Fh	320	200	16M
0Eh	640	200	16
10h	640	350	16
100h	640	400	256
12h	640	480	16
101h	640	480	256
110h	640	480	32K
111h	640	480	64K
112h	640	480	16M
103h	800	600	256
113h	800	600	32K
114h	800	600	64K
115h	800	600	16M
105h	800	768	256
116h	1024	768	32K
117h	1024	768	64K
118h	1024	768	16M
107h	1280	1024	256
119h	1280	1024	32K
11Ah	1280	1024	64K
11Bh	1280	1024	16M

There are several function keys in the drawing screen:

[ESC] - exit
[Space] - clear screen and information
[F1] - help, list the function keys
[F2] - style, toggle line or dot.
Line mode is default.
Dot mode is not to draw line between dot and next dot.
[F3] - frame, show / hide the frame
[F4] - dock, show / dock the status bar at bottom of screen
[F5] - pen color
There are 16 colors of pen color:
rainbow, blue, green, cyan, red, magenta, brown, lightgray, darkgray, lightblue, lightgreen, lightcyan, lightred, lightmagenta, yellow and white.
[F6] - highlight, highlight the dot in the line mode.
[F9] - camera, you can get the snapshot, and store it in bitmap file.

The filename is 'PM<HHMMSS>.BMP', <HHMMSS> is hour, minute and second. The resolution of bitmap file is the same as video mode, and the color depth is 4 bits. (16colors)

Status bar:

640x480   - screen resolution (320x200, 640x480....etc)
S: - number of dots were received per second.
Pen   - pen color
P: - the counter of received dots
D: - the counter of pen down
U: - the counter of pen up
(x,y)   - current coordinate of dot
x:y: - minimum value of coordinate
X:Y: - maximum value of coordinate

3. Calibrate

Run the 'Calibrate' in PM2 Panel, and choose one of the 25 video modes.

The purpose of calibration is to adjust the touch screen mapping to meet the display screen properly.

You will be asked to select a video mode number. Select your display mode by using keyboard to start calibration.

Touch the upper point, then touch the right point, bottom point and left point, and press **<Enter>** key to pass the point. After calibration, the calibrated data will be shown in the screen.

After calibration, we recommend you to do drawing test to verify the touch screen and monitor mapped properly.

Function Keys:

[Enter] - pass current point
[F9]   - camera, see above.

4. Detect

Detect PenMount automatically. You can press any key to abort the detection.

Use the following list to detect PenMount:

COM1 (Base 03F8) (Baud 19200):   IRQ 3, 4
COM2 (Base 03F8) (Baud 19200):   IRQ 3, 4
COM3 (Base 03F8) (Baud 19200):   IRQ 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,
                                   13, 14, 15
COM4 (Base 03F8) (Baud 19200):   IRQ 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,
                                   13, 14, 15
COM1 (Base 03F8) (Baud 9600):   IRQ 3, 4
COM2 (Base 03F8) (Baud 9600):   IRQ 3, 4
COM3 (Base 03F8) (Baud 9600):   IRQ 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,
                                   13, 14, 15
COM4 (Base 03F8) (Baud 9600):   IRQ 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,
                                   13, 14, 15

If you cannot find the PenMount, come 'configure' to set your COM port.

5. Configure

COM Port: COM5~COM9 is for customized settings.
IRQ no.: IRQ3~IRQ15
I/O base: COM1~COM4 are fixed while COM5~COM9 are for customization.
Baud: 19200 / 9600
Calibrate: left, right, top, and bottom point.
POMODE: the relationship between touch panel and monitor.
Beep Duration: beep duration time (0ms~5500ms), 0ms = turn off the beep.
Beep Freq: beep frequency (20Hz ~10000 Hz)

Other configurations for customization in PenMount 9000:

● jitter threshold
● SSD threshold
● Z threshold
● pen-up threshold
● digital filter

Function Key:

[ESC]- exit
[Tab] - toggle the fields
[up] - increase value
[down]- decrease value
[right]- increase value by 100 (Beep Freq)
[left]- decrease value by 100 (Beep Freq)
[Enter]- save configuration and exit

6. Packet

By using this function, you can get the touch data. Simply touch the screen and you will see the data gotten.

The output format is as follows:

<counter> : counter of raw data
* : current dot
<raw data> : the raw data of touch
<coordinate> : the X, Y of A/D
<offset> : the offset between last dot

Function Key:

[ESC] - exit

7. Help

See 'README.TXT' file

8. Test

Before test, make sure the driver is loaded.

<1>. The test program is named 'MOUSETST.EXE'. You can run it with parameter:

MOUSETST 18

The parameter is video mode number:
mode 18 (12h) : 640x480x16color
mode 19 (13h) : 320x240x256color
....
or run:

MOUSETST

to see what the parameters are

<2>. run pmtest.exe

<3>. edit

You can also run 'EDIT', the editor bundle in MS-DOS.

3.2.   Install PenMount Windows 3.1 Driver

Before installing the Windows 3.1 driver software, you must have the Windows 3.1 system installed and running on your computer. You must also have PenMount Serial Interface either 9026BH or 9036CH control board installed.

3.2.1.   Install PenMount Windows 3.1 Driver

Contents of **PenMount Windows 3.1 Driver** folder are listed below.

COMPRESS.EXE
CTRLPAL.EX$
DETCMD.DL_
DIALOGUE
INSTALL.EXE — Installation program for PenMount Windows 3.1 driver
MPEN.38$
MPEN.DR$
SHOWCUR.EX$
STFSETUP.EX_
STFSETUP.IN_
UNINSTPM.EXE
VER.DL_

If you have an older version of PenMount Windows 3.1 driver installed in your system, please remove it first. Follow the procedure below to install the PenMount Windows 3.1 driver.

1. Make sure the Windows 3.1 system is installed in your computer. The PenMount Windows 3.1 driver lets your touch screen coexist with a mouse. If you wish to use a mouse and touch screen at the same time,

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plug a mouse into one COM port and the PenMount touch screen to another COM port before installing the PenMount Windows 3.1 driver.

2. Open the FILE MANAGER and under the MAIN group, run the "**Install.exe**" software in the PenMount "**WIN31**" directory. The first display shows "**Welcome to install the PenMouse Driver**." Click "**Continue**" to begin installation.

3. Select the COM port you plugged the PenMount touch screen into, and click "**Continue**."

4. The next screen is "**Set the PORT address for com<x>**", select "**...[default]**" or choose "**User define**". Then "**Set the IRQ Number**", select "**...[default]**" or choose "**User define**." If you choose "**User define**," key in an IRQ number. Click "**Continue**".

5. The last screen shows "**Setup succeeded…**" Click '**EXIT**' to finish setup. A new "**PENMOUNT**" group is generated after installing the PenMount Windows 3.1 driver. Restart Windows 3.1. In the PenMount group, two icons appear, "**PenMount Control Panel**" and "**UNINSTALL**," The PenMount Windows 3.1 driver is working concurrently with mouse.
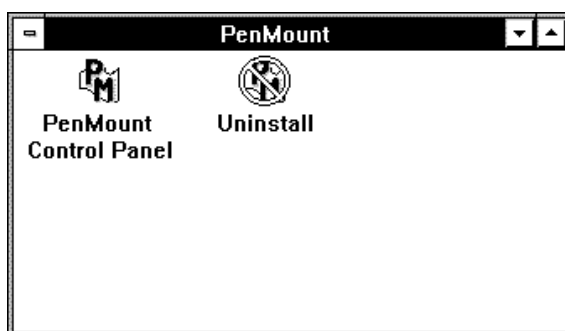
3.2.2.   PenMount Windows 3.1 Driver Functions

After installing PenMount the Windows 3.1 driver, the system generates a Group named "PenMount" with two icons in the Group.

3.2.2.1. PenMount Control Panel

The functions of the PenMount Control Panel are described as following:

Config
This sets the COM port, IRQ number and base address. Select COM port and a default IRQ number appears. If the default IRQ number is not what you require, click "**USER DEFINE**" and key-in an IRQ number and base address.

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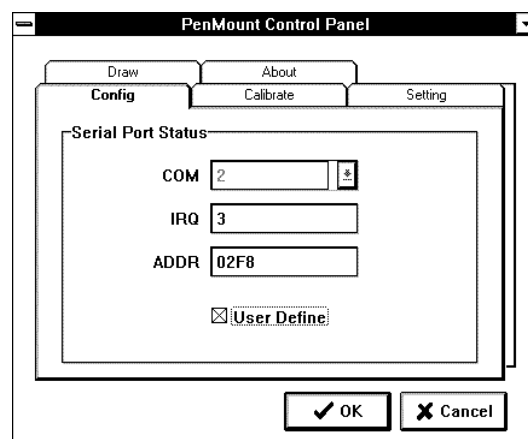
Calibrate
The two screen areas are **Initial** and **Calibrate**. Click **Calibrate** to map the touch screen. The display shows a circle in the screen's upper-center, touch it. The display then shows a circle in the right-center, bottom-center and left-center of the screen. Touch these circles to map the touch screen to the display. Press the **Initial** button to re-establish the connection with the control board conveniently if the RS-232 serial port becomes disconnected.
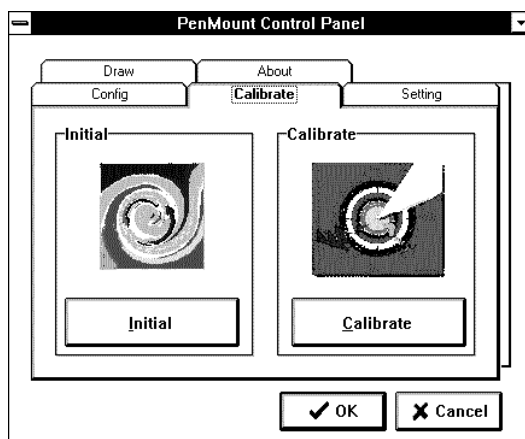
Setting
This sets mouse performance, double click area, speed and testing area.

Draw
This drawing function tests and demonstrates the touch screen. Menu items include **CLEAR** and **EXIT**.

About
This displays the PenMount controller information.

3.2.3.   Uninstall Windows 3.1 Driver

Click this icon and the system removes all utilities and the PenMount group automatically.

3.3.   Install PenMount Windows 95 Driver

Before installing the Windows 95 driver software, you must have the Windows 95 system installed and running on your computer. You must also have installed either PenMount9026BH or 9036CH control board.

3.3.1.   Install PenMount Windows 95 Driver

Contents of the PenMount Windows 95 driver folder are listed below.

_INST32I.EX	**_SETUP.EXE**
_ISDEL.EXE	**OS.DAT**
LANG.DAT	**_SETUP.DLL**
SETUP.INS	**DATA.TAG**
SETUP.INI	**_SYS1.HDR**

_SYS1.CAB	**_USER1.HDR**
_USER1.CAB	**SETUP.LID**
SETUP.BMP	**DATA1.HDR**
DATA1.CAB	**LAYOUT.BIN**
CONFIG.INI	**README.TXT**

If you have an older version of the PenMount Windows 95 driver installed in your system, please remove it first. Follow the steps below to install the PenMount Windows 95 driver:

1. When the system first detects the control board, a screen appears that shows "**Unknown Device.**" Press **Cancel**.

2. Select "**Run**" in the "**Start**" menu.

3. Find "**setup.exe**" in the Windows 95 driver folder.

4. The PenMount logo appears, then "**Installation Wizard**," '**PenMount Utilities**" and a "**Welcome**" message appear. Select "**Next**."

5. The Software License Agreement screen and Information screen appear. Select "**Yes**" and "**Next**".

6. The Choose Destination Location screen appears. To install PenMount Utilities into the folder: C:\Program Files\PenMount\Win9x, select "**Next**' or modify the folder name to one you would like to use.

7. The Select Program screen appears. The default is "**PenMount Utilities**". Select "**Next**" or change it.
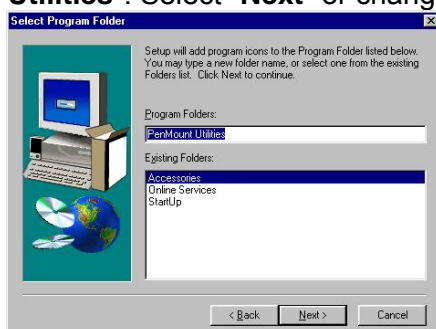
8. The **Start Copying Files** screen appears. Select "**Next**" to copy files to the system.

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

3.3.2. Configure PenMount Windows 95 Driver

After you install the software, PenMount Control Panel appears. In the "Configure" panel set the correct COM port, IRQ number and base address. Each of the functions in the PenMount Control Panel is explained in the following section.

If your touch screen is connected to the COM1 or COM2, use the "**Detect**" button to auto-detect the COM port. If you do not know which COM port is connected, the "**Advance**" detect button helps you find the correct data. Before selecting the "**Advance**" button you must close all other programs first, otherwise it may cause these programs to crash. A third way to define the COM port is to input the data directly by selecting "**User Define**". After making selections click OK and the system asks to reboot. Once the system reboots, the PenMount touch screen should be working.
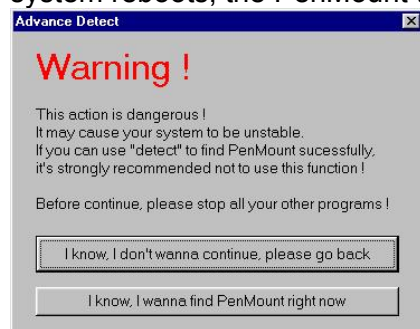
You must perform a calibration after rebooting the system. Select '**PenMount Control Panel**' from '**PenMount Utilities**' that is in '**Programs**', or select the '**PM Control Panel**' by clicking the '**PM**' icon in the notification area. Refer to the PenMount Windows 95 Driver Functions below on how to perform a calibration.

3.3.3. PenMount Windows 95 Driver Functions

Windows 95 driver functions are described below.

3.3.3.1. PenMount Control Panel

Configure
This item screen sets hardware connections, such as the RS-232 port, the IRQ number and the base address.

Controller Type   This shows the PenMount controller type, which is DMC9000.

Baud Rate   Baud rate is fixed at 19200 for DMC9000.

Detect   Detect the connected port only if it is COM1 or COM2.

Advance   This detects COM1 to COM4 port, detecting the COM port and IRQ number in sequence. Note that you must close all other programs running before you select this function.

**User Define**   Lets you input this data from your keyboard.
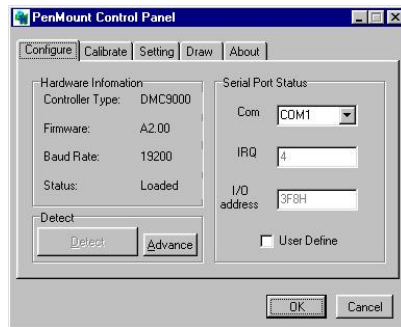
Calibrate

This item provides the **Initial** and **Calibration** functions.

Initial   This button conveniently re-establishes connection with the control board if the RS-232 serial port becomes disconnected.

Calibration   This button maps the touch panel to the display. Click **Calibration** and touch the five points in sequence to calibrate.

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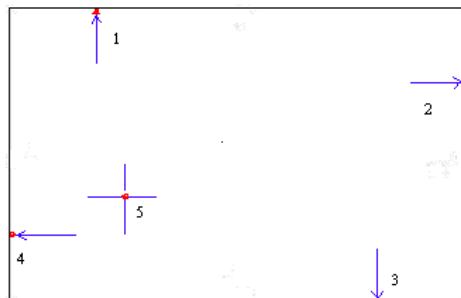
Setting
This item allows setting the mouse and other interface functions.
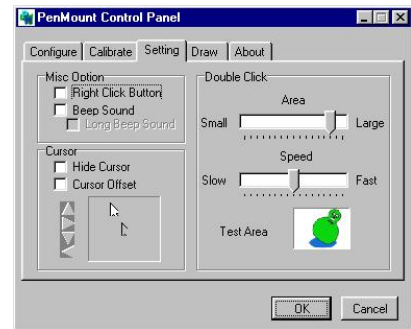
Misc. Option   Set the **Right Click Button**, **Beep Sound** and **Long Beep Sound**.

Cursor   Set **Hide Cursor** or **Cursor Offset**. Use the arrow keys to adjust cursor offset.

Double Click   Adjusts and tests double click area and speed. Double click in the test area and the tumbler swings back and forth.

Draw
Test or demonstrate PenMount touch screen operation. The display shows touch location. Click **Draw** to start.
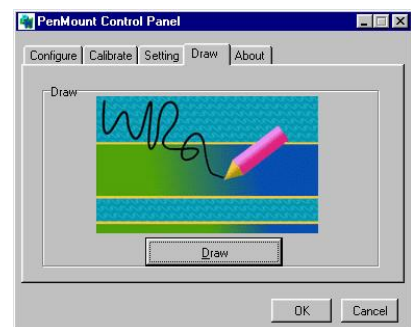
Touch the screen with your finger or a stylus and the drawing screen registers touch activity such **left**, **right**, **up**, **down**, **pen up**, and **pen down**.
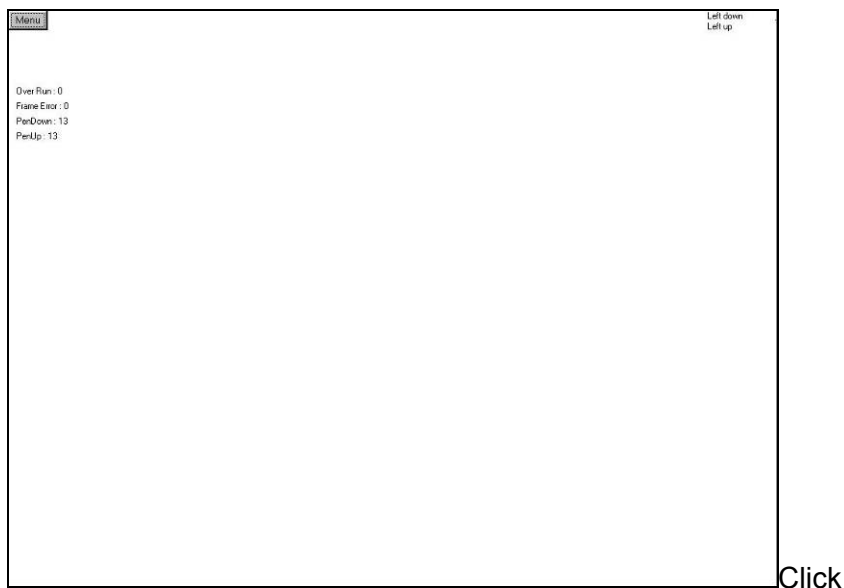
Click **Clear Screen** to clear the drawing.
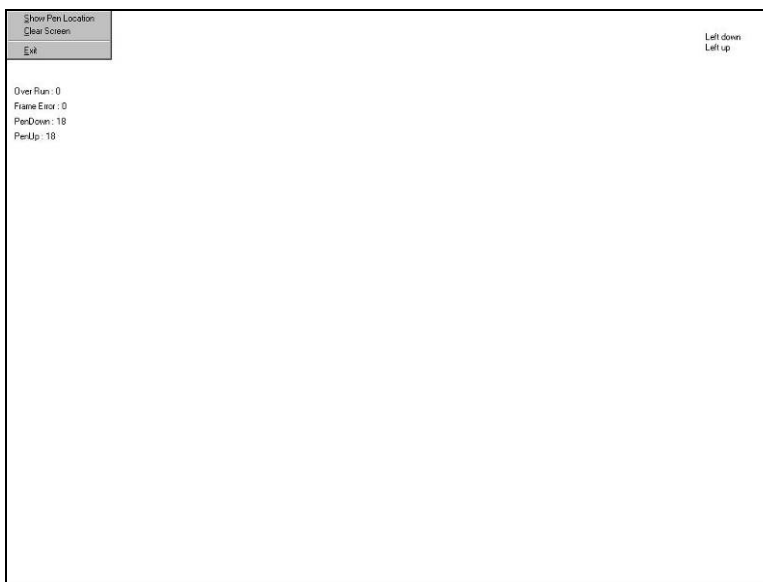
About

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

3.3.3.2. PenMount Monitor Menu Icon

PenMount monitor icon (PM) appears in the notification area of Windows 95 system when you turn on **PenMount Monitor** in PenMount utilities.
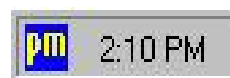
PenMount Monitor has the following functions.

Initial	This resets the PenMount controller chipset. Normally, you do not need to use this function. The Windows 95 driver checks the controller chipset automatically.
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.
Hide Cursor	Set to hide or show cursor.
Cursor Offset	Adjust the cursor offset. See **Setting** of PenMount **Control Panel** on page 19.
Beep Sound	Turn on or off the beep.
Exit	Exit **PenMount Monitor** function.

3.3.3.3. PenMount Rotating Functions

PenMount Windows 95 Driver supports several display rotating software packages. See **Chapter 4. Driver Software Functions** on page 51 for more information. PenMount drivers for Windows 95, 98/ME, NT, and 2000/XP/2003/VISTA/7 support the following display rotating software packages:

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

Configure Rotate Function

1. Install the rotation software package.

2. Choose rotate function (0°, 90°, 180°, 270°) in the 3rd party software. The calibration screen appears automatically. Touch this point and rotation is mapped.
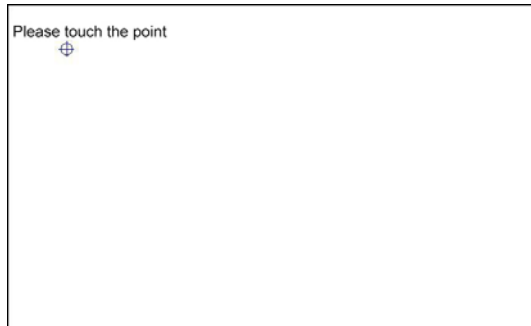
NOTE: Rotate function will be disable if you use Monitor Mapping.

3.3.4. Uninstall PenMount Windows 95 Driver

1. Exit **PenMount Monitor** (PM) in the notification area.

2. From '**PenMount Utilities**' in '**Programs**', select the '**Uninstall**' utility.
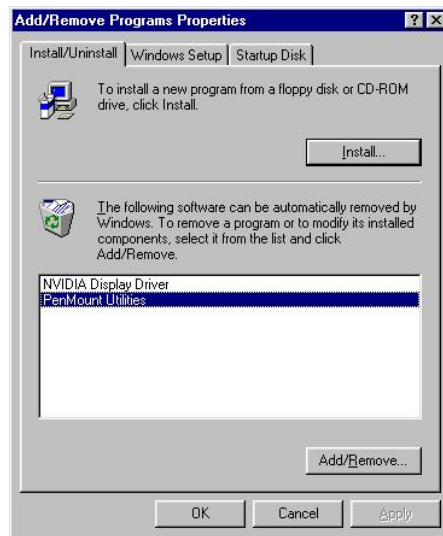
3. This message shows up: "**Are you sure you want to completely remove 'PenMount Utilities' and all its components?**"

4. Select '**Yes**' to remove **PenMount Windows 95 Driver**.

5. Reboot system and **PenMount Windows 95 Driver** is removed from the system.

3.4. Install PenMount Windows 98/ME Driver

Before installing **PenMount Windows 98/ME Driver**, you must have had Windows 98/ME system installed in your computer. You must also have installed either PenMount 9026BH or 9036CH control board.

3.4.1. Install PenMount Windows 98/ME Driver

The content of **PenMount Windows 98/ME Driver** folder is listed below:

SETUP.EXE
DMC9000.INF
DMC9000.VXD

If you have an older version of **PenMount Windows 98/ME Driver** installed in your system, remove it first and follow the steps below to install **PenMount Windows 98/ME Driver**.

When system first detects the control board, a screen appears that shows "**Unknown Device**". Do not use this hardware wizard. Press **Cancel**.

Install **PenMount Windows 98/ME Driver** to your system from the CD-ROM:
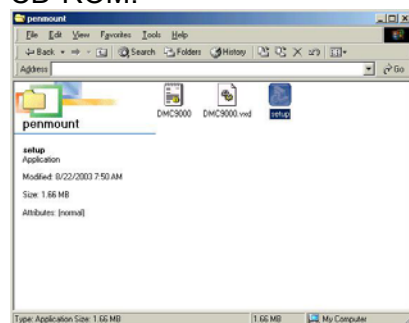
A welcome message for the PenMount utilities setup program appears. Select "**Next**".

A **Software License Agreement** screen appears. Select "**Yes**".
A information screen appears. Select "**Next**".
Choose Destination Location screen appears. To install PenMount utilities into the folder: C:\Program Files\PenMount\Win9x, select "**Next**" or modify the folder name to one you would like to use.

Select Program Folder screen appears. The default is "**PenMount Utilities**". Select "**Next**" or change it.
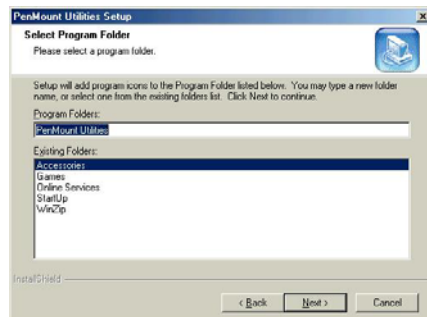
Start Copying Files screen appears. Select "**Next**" to copy files to the system.

Setup Complete screen appears. Select "**Finish**". "**Restarting Windows**" screen appears, choose "**Yes, I want to restart my computer now,**" and "**OK**".

3.4.2. Configure PenMount Windows 98/ME Driver

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

1. After installation, click PenMount Monitor icon "**PM**" in the notification area.

2. When PenMount **Control Panel** appears, click "**Calibrate**".

3.4.2.1. PenMount Control Panel

The functions of 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 dot of 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 a touch screen is, the more **Advanced Mode** calibration points it needs. Use a stylus to make the **Advanced Calibration** for the best accuracy.

Plot Calibration Data

Check this function and a touch panel linearity comparison graph shows up when you finish the **Advanced Calibration**. The black lines reflect the ideal linearity assumed by PenMount's application program while the blue lines show the approximate linearity calculated by PenMount's application program as the result of user's execution of **Advance Calibration**.

Draw

To test or demonstrate PenMount touch screen operations, the display shows touch location. Click **Draw** to start.
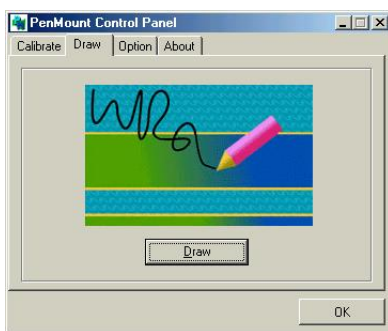
Touch the screen with your finger or a stylus and the drawing screen registers touch activity such **left**, **right**, **up**, **down**, **pen up**, and **pen down**.

Click **Clear Screen** to clear the drawing.

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Show Pen Location
Clear Screen
Exit
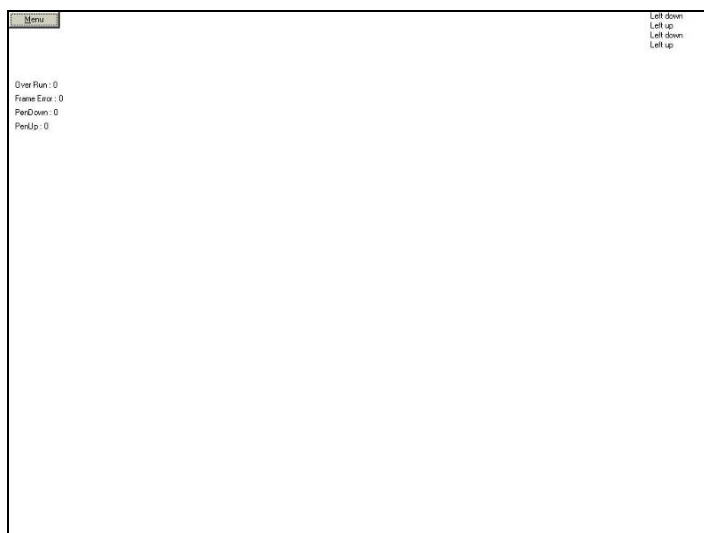
Option

This panel function supports two modes - **Operation Mode** and **Beep Sound Mode** – which allows configuration for specific touch screen applications, such as point-of-sales (**POS**) terminals.
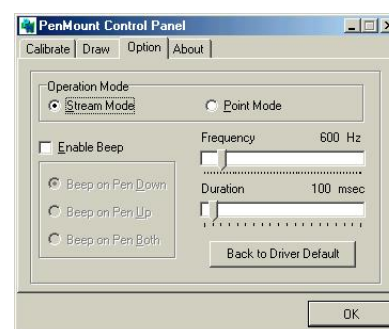
Operation Mode	This mode enables and disables the mouse's ability to drag on-screen icons—useful for configuring POS terminals.
	Stream Mode – Select this mode and the mouse functions as normal and allows dragging of icons.
	Point Mode – Select this mode and the mouse only provides a click function, 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 PenMount controller and this driver version.

3.4.2.2. PenMount Monitor Menu Icon

PenMount monitor icon (PM) appears in the notification area of Windows 98/ME system when you turn on PenMount Monitor in PenMount Utilities.
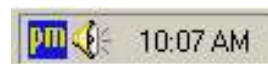
PenMount Monitor has the following functions.

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   Turn on or of the beep.

Enable PNP   Turn on or turn off PNP. When it is not selected, PNP is off and the RS-232 transfer signal continues when unplugging and plugging the cable into the serial port.

Exit   Exit **PenMount Monitor** function.

3.4.2.3. PenMount Rotating Functions

PenMount Windows 98/ME Driver supports several display rotating software packages. Please see **Chapter 4. Driver Software Functions** on page 51 for more information. PenMount drivers for Windows 95, Windows 98/ME, as well as 2000/XP/2003/VISTA/7/8 support the following display rotating software packages:

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

Configure Rotate Function

1. Install the rotation software package.

2. Choose rotate function (0°, 90°, 180°, 270°) in the 3rd party software. The calibration screen appears automatically. Touch this point and rotation is mapped.

Please touch the point
⊕
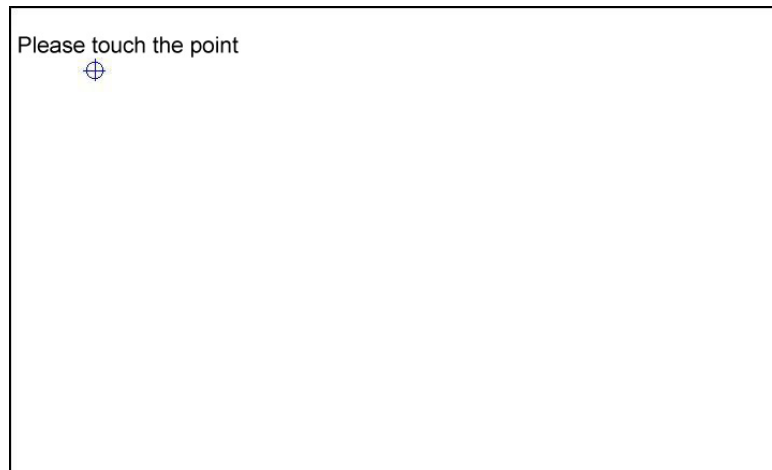
NOTE: Rotate function will be disable if you use Monitor Mapping.

3.4.3. Uninstall PenMount Windows 98/ME Driver

1. Exit **PenMount Monitor** (PM) from the notification area.

2. Select '**Uninstall**' utility from '**Programs**' of '**PenMount Utilities**'.

3. A message appears: "**Are you sure you want to completely remove 'PenMount Utilities' and all its components?**"

4. Select '**Yes**' to remove PenMount Windows 98/ME Driver.

5. Reboot system and PenMount Windows 98/ME Driver is removed from system.
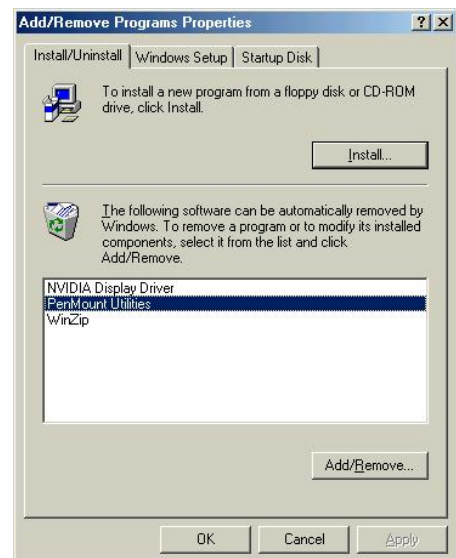
3.5. Install PenMount Windows NT Driver

Before installing **PenMount Windows NT Driver**, you must have had Windows NT system installed and run in your computer. You must also have PenMount Serial Interface either 9026BH or 9036CH control board installed.

3.5.1. Install PenMount Windows NT Driver

Content of **PenMount Windows NT Driver** folder is listed below.

_USER1.HDR	_ISDEL.EXE
_SETUP.DLL	_SYS1.CAB
_SYS1.HDR	_USER1.CAB
_INST32I.EX	CONFIG.INI
DATA.TAG	DATA1.CAB
DATA1.HDR	INFO.TXT
LANG.DAT	LAYOUT.BIN
LICENSE.TXT	OS.DAT
README.TXT	SETUP.LID
SETUP.INS	SETUP.INI
SETUP.EXE	SETUP.BMP

If you have an older version of **PenMount Windows NT Driver** installed in your system, remove it first and follow the steps below to install **PenMount Windows NT Driver**.

1. Insert PenMount driver CD-ROM. Go to the Windows NT Driver folder. Click setup.exe.
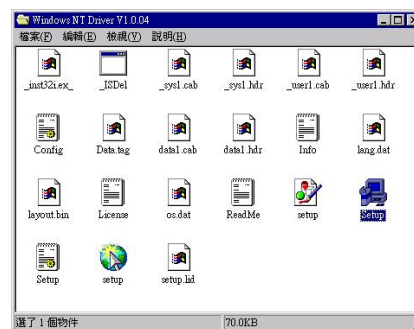
2. A welcome message for the PenMount setup program appears. Select "**Next**".

3. **Software License Agreement** screen appears. Select "**Yes**".
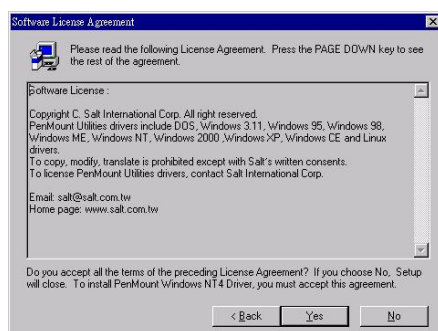
4. **Choose Destination Location** screen appears. Then install
    PenMount utilities into folder: C:\Program Files\PenMount\NT. Select
    "**Next**' or modify the folder name to one you would like to use.

5. **Select Program Folder** screen appears. The default is "**PenMount
    Utilities**". Select "**Next**" or change it.
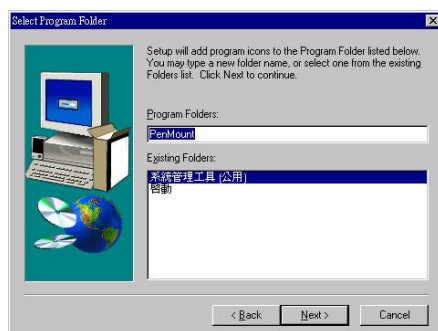
6. **Start Copying Files** screen appears. Select "**Next**" to copy files to the
    system.
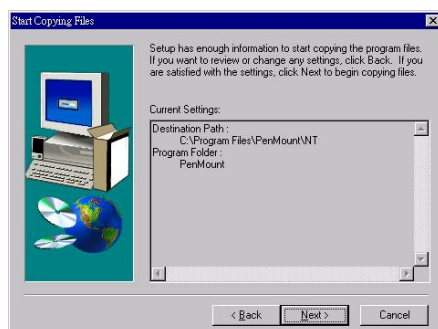
7. **Setup Complete** screen appears. Check "**I would like to view the README file**". Select "**Finish**".

8. **README** file appears. After reading, cancel the window and press "**Finish**" again.

9. **PenMount Control Panel** appears. In **Configure** panel press the **Detect** button to auto-detect the correct COM port.
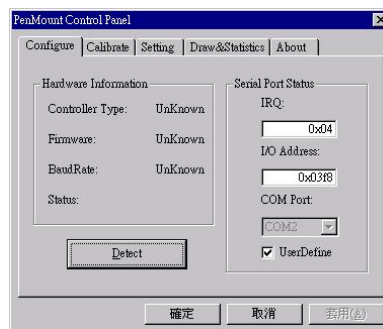
10. Reboot the system.
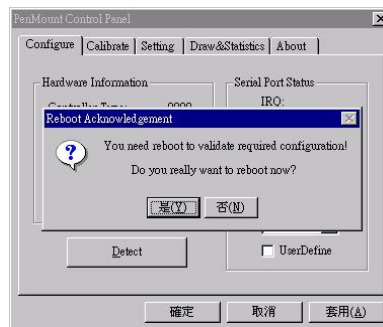
11. After rebooting, go to "**Programs**", "**PenMount Utilities**", and then "**PenMount Control Panel**". The **PenMount Control Panel** appears. Select **Calibrate** and begin calibration to adjust the mapping of the touch screen and display.

3.5.2. Configure PenMount Windows NT Driver

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

3.5.2.1. PenMount Control Panel

You can access the PenMount control panel from the "PM" icon in the notification area. The functions of PenMount Control Panel are explained below.

Configure
This item configures the driver to use with the hardware by setting COM port, IRQ number and I/O address.

Controller Type	This shows the PenMount controller type, which is DMC9000.
Baud Rate	Baud rate is fixed at 19200 for DMC9000.
Detect	Click this button to auto-detect COM port, IRQ number, or base address.
User Define	Lets you input this data from your keyboard.
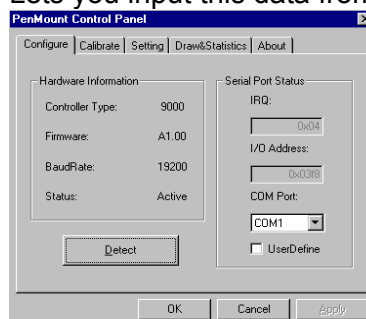
Calibrate:
This item provides **Initialize** and **Calibration** functions.

Initialize   This button re-establishes connection with the control board if the RS-232 serial port becomes disconnected.

Calibration   This button maps the touch panel to the display. Click **Calibration** and touch the five points in sequence to calibrate.

Setting

This item allows setting the mouse and other interface functions.

Misc. Option   Sets the **Right Click Button** and **Beep Sound**

Cursor   Sets **Hide Cursor** or **Cursor Offset**. Press the four triangles with a stylus to adjust cursor offset.

Double Click   Adjusts and tests double click area and speed. Double click in the test area and the tumbler swings back and forth.

Draw & Statistics

To test or demonstrate PenMount touch screen operations. The display also shows touch location. Click **Draw & Statistics** to start.
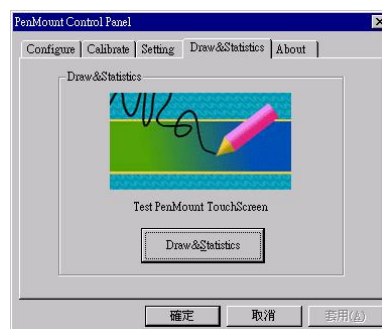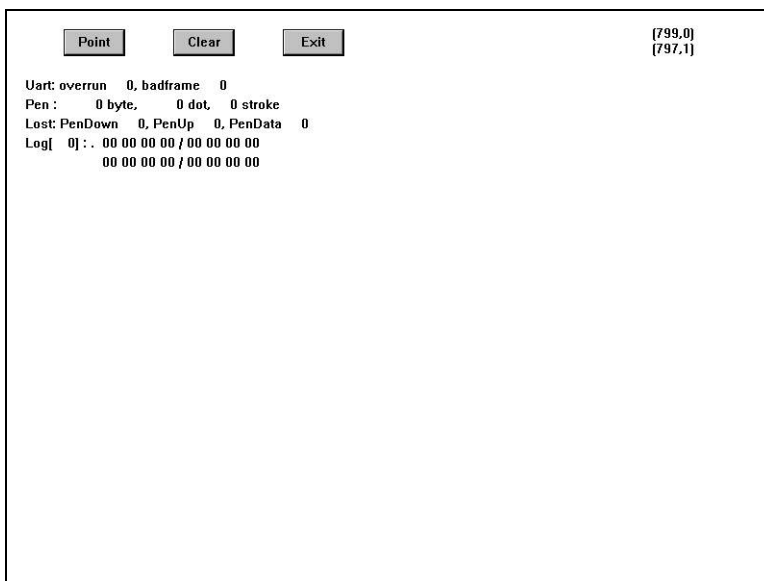
33

About
This panel displays information about PenMount controller and this
driver version.
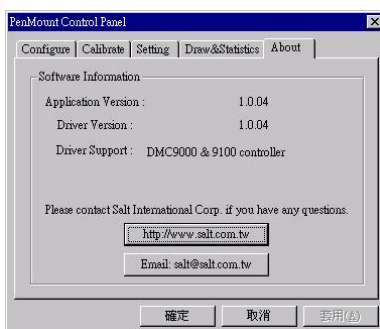
3.5.2.2. PenMount Monitor Menu Icon

PenMount monitor icon (PM) appears in the
notification area of Windows NT system when
you turn on **PenMount Monitor** in PenMount
utilities. **PenMount Monitor** has the following
functions.

Initialize	This resets the PenMount controller chipset. Normally, you do not need to use this function because the Windows NT driver checks the controller chipset automatically.
Right Click	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.

Hide Cursor	Set to hide or show cursor.
Cursor Offset	Adjust the cursor offset. See
	Setting of the PenMount **Control Panel** on page 33.
Beep Sound	Turn on or of the beep.
Exit	Exits **PenMount Monitor** function.

3.5.2.3. PenMount Rotating Functions

PenMount Windows NT Driver supports several display rotating software packages. Please see **Chapter 4. Driver Software Functions** on page 51 for more information. PenMount drivers for Windows 95, Windows 98/ME as well as Windows 2000/XP/2003/VISTA/7/8 support the following display rotating software packages:

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

Configure Rotate Function

- Install the rotation software package.

- Choose rotate function (0°, 90°, 180°, 270°) in the 3rd party software. The calibration screen appears automatically. Touch this point and rotation is mapped.
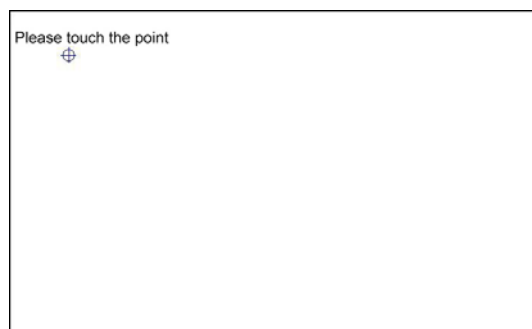
> **NOTE:** **Rotate function will be disable if you use Monitor Mapping.**

3.5.3. Uninstall PenMount Windows NT Driver

- Exit PenMount Monitor (PM) in the notification area.
- From 'PenMount Utilities' in 'Programs', select the 'Uninstall' utility.
- This message appears: "Are you sure you want to completely remove 'PenMount Utilities' and all its components?"
- Select 'PenMount Windows NT Driver' and click Remove.

- Reboot system and PenMount Windows NT Driver is removed from system.

3.6. Install PenMount Windows Universal Driver (for 2000/XP/XPT/XPE/2003/VISTA/7/WES7/2008/8)

Before installing **PenMount Windows Universal Driver**, you must have had installed one of the operating systems from Windows 2000/ XP/ XPT/ XPE/ 2003/ VISTA/ 7/ WES7/ 2008/ 8 in your computer, and either PenMount 9036CH or 9026BH must have been installed.

Before installing PenMount Windows Universal driver V2.4.0.306, you may modify the default options from \PenMount Universal Driver V2.4.0.306\Driver\Install.ini:

Install	USB	1. Install PenMount USB driver. 0. Uninstall PenMount USB driver.
	COM	1. Install PenMount RS232 driver. 0. Uninstall PenMount RS232 driver.
	MMonitor	1. Install PenMount driver for multi- device recognition. 0. Uninstall PenMount driver for multi- device recognition.
	ENUM	1. Install PenMount driver for Non- pnp device recognition. 0. Uninstall PenMount driver for Non- pnp device recognition.
Option	**TouchReport**	1. The default setting of Windows 2k/XP/Vista/7 is mouse mode. 2. The default setting of Windows 2k/XP is mouse mode; the default setting of Windows 7/ Vista is digitizer mode.
	EdgeOffset	0,5,10,15,20,25,30 are the default values for edge compensation.
	Smoothing	1. Turn on the smoothing function. 0. Turn off the smoothing function.
	Operation	The default settings of operating mode: 0, Pen Input Emulation 1, Click on Touch 2, Mouse Emulation 3, Click on Release
	CalibOffset	This function is unable to be modified.
	RBtnPressNHold	0. Turn on long- pressed right key function. 1. Turn off long- pressed right key function.
Serial	**ScanAllPorts**	1. Turn on "Scan All Ports" to confirm PenMount RS232 device. 0. Turn off "Scan All Ports" to confirm PenMount RS232 device.
	COM3=xxxx,yyyy	To set up the permanent system COM port for PenMount RS232 driver. COM3- to correct it to be correspondent with the actual COM PORT. xxxx- the supporting item number: 9000/ 6000 or PCI. yyyy- the baud rate of 6000 or 9000 is 19200 or 9600; baud rate 38400 is only for PCI items. # Please note that the data above must be correct, so that the device can just work normally, and ENUM must be set as 1.

		Example:
		COM1= PCI, 38400
		# Permanently install PCI RS232 38400bps at COM1
		COM3= 6000,19200
		#Permanently install PM6000 RS-232 19200bps at COM3
		COM4=9000,9600
		#Permanently install PM9000 RS-232 9600bps at COM4

PS. Set the symbol";" in front of the parameter, which means not to perform the parameter.
Example:
; **TouchReport =2**，it will not be installed as Digitizer mode directly in Windows Vista/ 7/ 2008/ WES7/ 8, the user can select Digitizer or mouse mode during the installation procedure.
; **COM1=PCI,38400**，it will not install the driver at COM1 permanently.

3.6.1. Install PenMount Mouse Driver in Windows 2000/XP/XPT/ XPE/2003/VISTA/7/WES7/2008/8

If you have an older PenMount driver installed on your system, uninstall it first and follow the steps below to install **PenMount Windows Universal Driver**:

Plug in your PenMount 6000 control board and install **PenMount Windows Universal Driver**. Make sure the driver is installed before plugging the control board. Then the driver will make the assigned COM port or USB port to detect PenMount device.

To install the driver:
1.   In folder **PenMount Universal Driver**, find "**Setup.exe**" and run it.
2.   A **License Agreement** window appears. Click "**I Agree**" and then "**Next**".
3.   When ready to install the program, click "Install".
4.   Installation takes some time.
5.   When the warning message screen appears, please click "**Continue Anyway**" to continue.

6.   When the window below shows up, please select "yes" for installing PenMount as mouse mode; select "no" for digitizer mode. If your operating system doesn't support Windows tablet input, digitizer device can't be used, therefore you have to select "yes" here, otherwise after the installation the touch doesn't work after re-booting.

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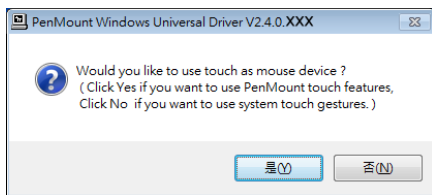
7. A window notifying of installation completion appears. Click "Finish".

    NOTE: If you are installing the driver with Microsoft WHQL, you will see the screen in step 6 directly instead of step 5.

8. Then restart operating system.

    As soon as driver installation finishes, both the icons of **PenMount Monitor** **pm** and **Gesture AP** 🖥 show up in the notification area.


3.6.2. Install PenMount Digitizer Driver in Windows XPT/VISTA/7/ WES7/2008/ 8

The default installation steps are same as XP. To select "no" in step 6, PenMount will be installed as a digitizer device; If your operating system doesn't support Windows tablet input, digitizer device can't be used, therefore you have to select "yes" here, otherwise after the installation the touch doesn't work after re-booting.

After the installation，You will see the difference that a **PenMount Control Panel** icon shows up on the desktop without the **pm** icon in the notification area. See the screenshot below:
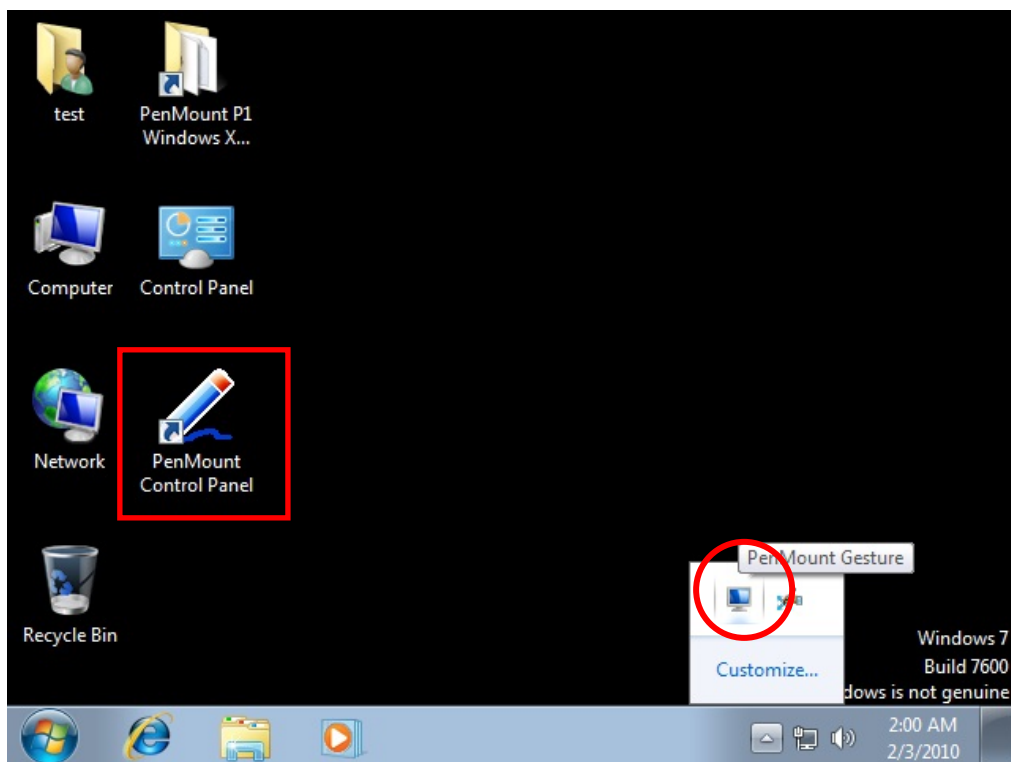
3.6.3. Configure Touch screen In PenMount mouse driver
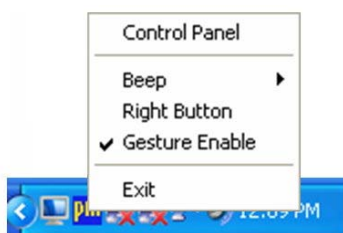
Click **PenMount Monitor** icon [pm] at the notification area and select **Control Panel** from the menu.

On PenMount Control Panel you are able to see the device of PenMount 9000 RS-232 detected by your system under **Device** tab. Select a device and click the **Configure** button.
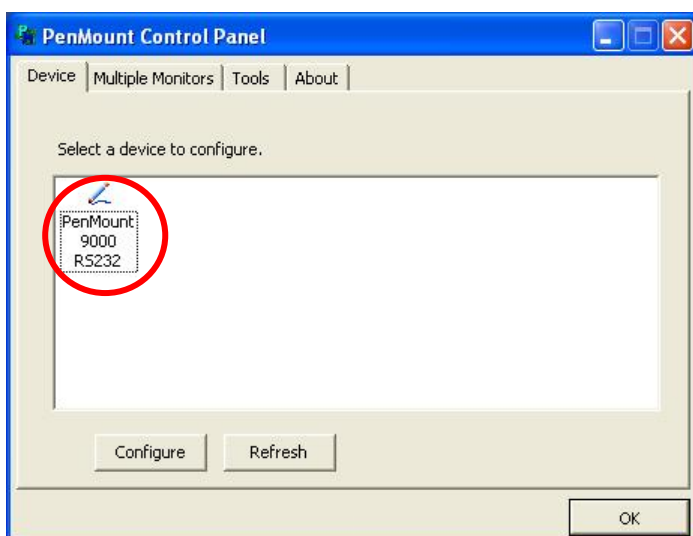
3.6.3.1 PenMount Control Panel

The functions of **PenMount Control Panel** are:

Device
In this window, you can find out how many devices are detected in your system.
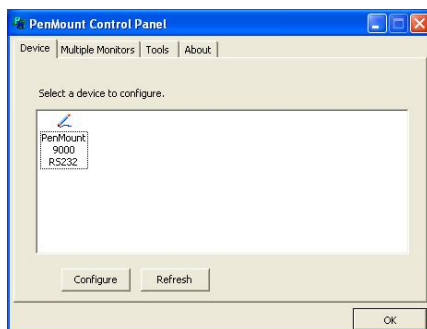
Calibrate
This function offers two ways to calibrate your touch screen. '**Standard Calibration**' adjusts most touch screens while '**Advanced Calibration**' adjusts aging touch screens.

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 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**'.
Command Calibration	**Command call calibration function. Use command mode call calibration function, this can uses 4, 9, 16 or 25 points to calibrate.** E.g. Please run ms-dos prompt or command prompt. c:\Program Files\PenMount Universal Driver\DMCCtrl.exe -calibration 4 (Standard Calibration) DMCCtrl.exe - calibration ($) 4= Standard Calibration 4 9= Advanced Calibration 9 16= Advanced Calibration 16 25= Advanced Calibration 25

To calibrate your touch screen:
1. Please select a device then click "**Configure**". You can double click the device too.
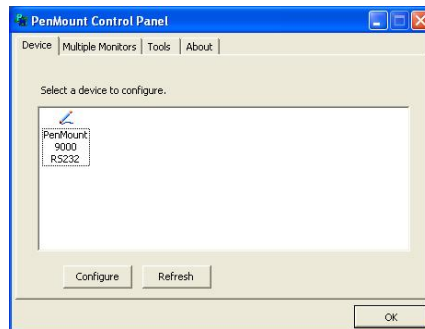
2. Click "**Standard Calibration**" to start the standard calibration or "**Advanced Calibration**" for Advanced Calibration.
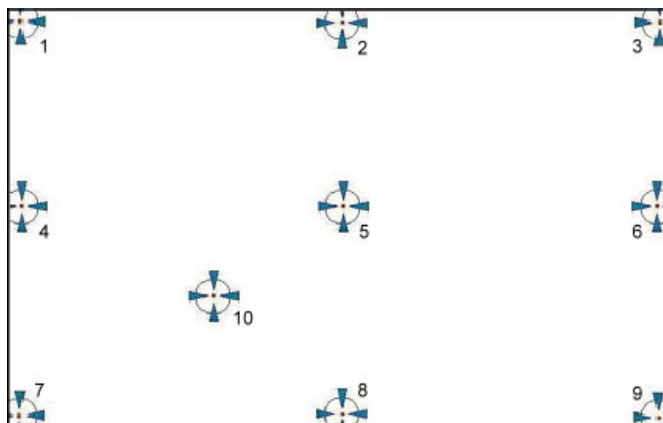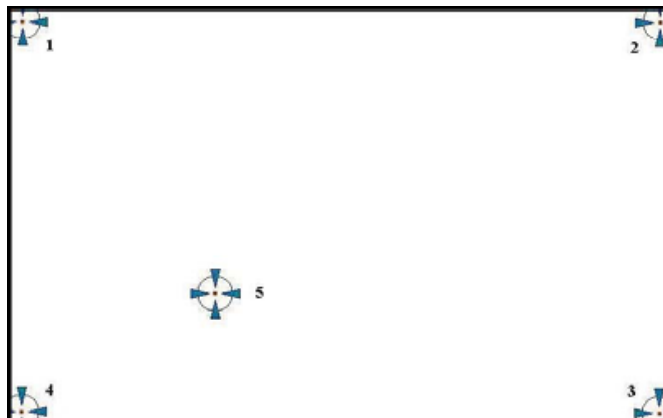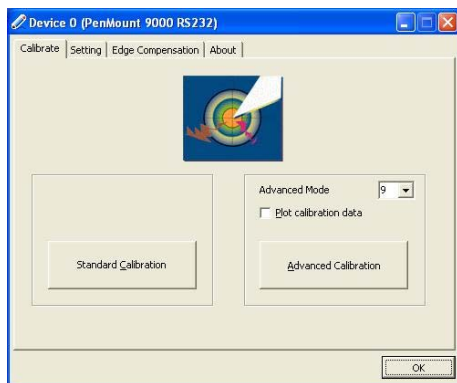
NOTE : The older a touch screen is, the more calibration points of the **Advanced Mode** it needs. For an optimal accuracy, we suggest to use a stylus to make the advanced calibration.

Plot Calibration Data Check this function to have touch panel linearity comparison graph appear when you finish **Advanced Calibration**. The black lines reflect the ideal linearity assumed by PenMount's application program while the blue lines show the approximate linearity calculated by PenMount's application program as the result of user's execution of **Advance Calibration**.

Turn off EEPROM storage This function disables the write-in of calibration data in **Controller**. This function is enabled by default.

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Setting
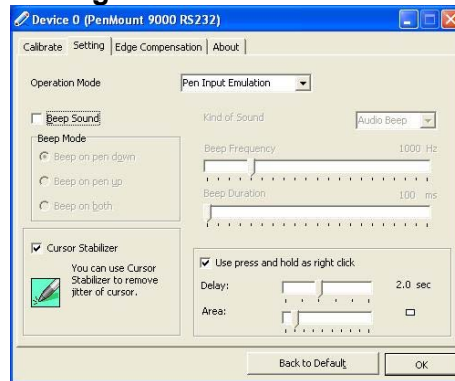
Operation Mode	This mode enables and disables mouse's ability of dragging on-screen icons—useful for configuring POS terminals.	
	Pen Input Emulation	Select this mode and mouse will emulate Windows Vista pen input device operation, by which no mouse event will be sent until the touch is dragged out of range or released from the screen.
	Mouse Emulation	Select this mode and mouse functions as normal and allows dragging of icons.
	Click on Touch	Select this mode and mouse only provides a click function, and dragging is disabled.
	Click on Release	Select this mode and mouse only provides a click function when the touch is released.

Beep Sound	**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 –	beep occurs when comes down and is lifted up.
	Beep Frequency –	modifies sound frequency.
	Beep Duration –	modifies sound duration.

Cursor Stabilizer	Enable the function support to prevent cursor shake.

Use press and hold as right click	You can set the time out and area for you need

Edge Compensation
This page is the edge compensation settings for the advanced calibration.

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You can adjust the settings from 0 to 30 for accommodating the difference of each touch panel.
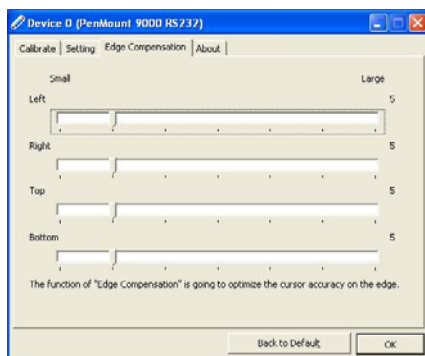
About

This panel displays information about the PenMount controller and driver version
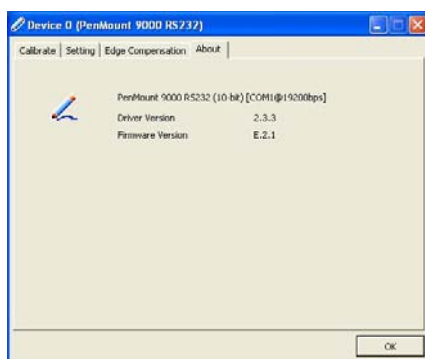
3.6.3.2   PenMount Monitor Menu Icon

PenMount Monitor icon (PM) appears in the notification area of Windows system when you turn on **PenMount Monitor** in **PenMount** utility.

PenMount Monitor has the following functions:

Control Panel	Open PenMount **Control Panel**.
Beep	Setting **Beep** function for each device.
Right 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.

>   **Exit**   Exits the **PenMount Monitor** function.

3.6.3.3   PenMount Rotating Functions

PenMount Windows Universal Driver supports several display rotating software packages and auto-detects rotate function (0°, 90°, 180°, 270°). The display rotating software package supported in Windows 2000, XP 32bit, Vista 32/64bit are:

1. Intel Display Driver Rotate Function.
2. ATI Display Driver Rotate Function.
3. nVidia Display Driver Rotate Function.
4. SMI Display Driver Rotate Function.
5. Portrait's Pivot Screen Rotation Software.

Configure Rotate Function in Windows XP 64bit

1.   There is a **"Screen Rotation Monitor"** button that appears only in the PenMount driver utilities for Windows XP 64bit system.
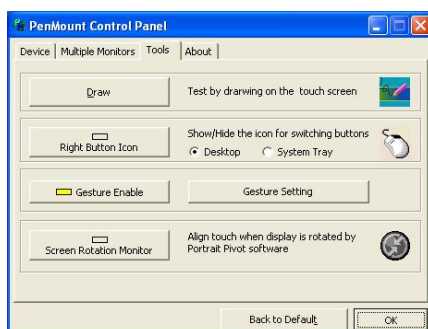
2.   On **"Screen Rotation Monitor"**, you will see a screen like below:
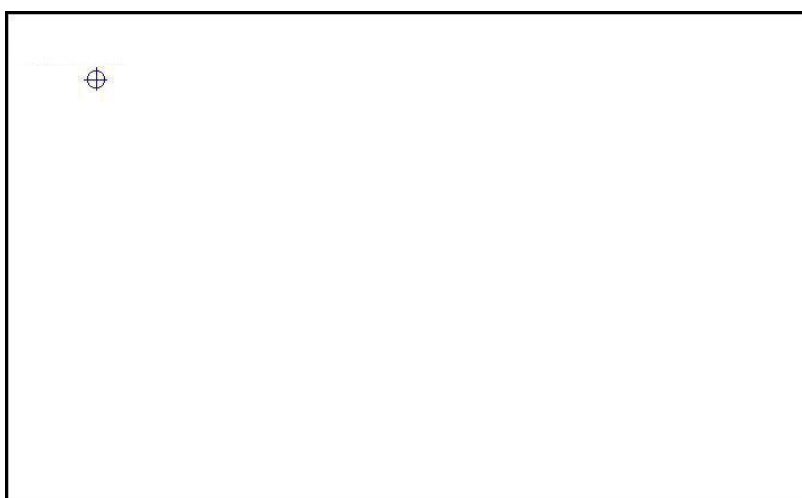
3.   Choose rotate function (0°, 90°, 180°, 270°) in the 3rd party software. The calibration screen will appear automatically. Touch this point and rotation is mapped.

NOTE: Rotate function will be disable if you use Monitor Mapping.

3.6.4. The Touch screen Configure of PenMount Digitizer Driver

To configure touch screen in PenMount Digitizer driver:

Double-click on the **PenMount Control Panel** icon on the Desktop.

On PenMount Control Panel you are able to see the device of PenMount 9000 RS-232 detected by your system under **Device** tab. Select a device and click the **Configure** button to configure it.
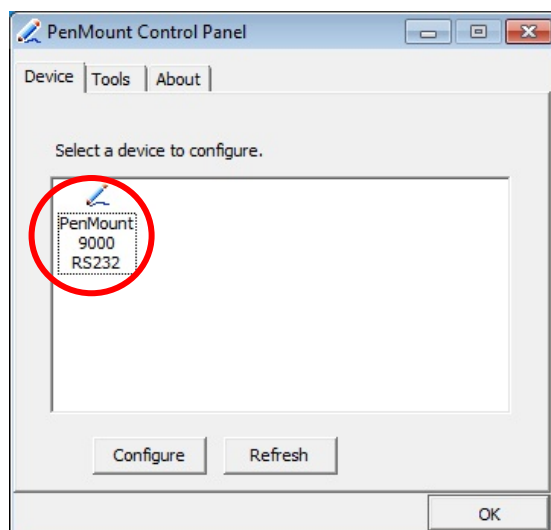
3.6.4.1. PenMount Control Panel

The functions under **PenMount Control Panel** are:

Device
In this tab, you can find out how many devices are detected on your system. Select any device by clicking on its icon.

Calibrate
This function offers two ways to calibrate your touch screen. '**Standard Calibration**' adjusts most touch screens while '**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 the calibration is complete. To skip, press '**ESC**'.
Advanced	**Advanced Calibration** uses 9, 16 or 25 points to

Calibration	calibrate touch panel linearity of aged touch screens efficiently. Click this button and touch the red squares sequencely with a stylus. To skip, press '**ESC**'.
Command Calibration	**Command call calibration function. Use command mode call calibration function, this can uses Standard, 4, 9, 16 or 25 points to calibrate.** E.g. Please run ms-dos prompt or command prompt. c:\Program Files\PenMount Universal Driver\DMCCtrl.exe -calibration 0 (Standard Calibration) DMCCtrl.exe - calibration ($) 0= Standard Calibration 4=Advanced Calibration 4 9=Advanced Calibration 9 16=Advanced Calibration 16 25=Advanced Calibration 25

To calibrate your touch screen:

1. Please select a device then click "**Configure**". You can double click the device too.

2. Click "**Standard Calibration**" to start the standard calibration.

NOTE :   The older a touch screen is, the more calibration points of the **Advanced Mode** it needs. For an optimal accuracy, we suggest to use a stylus to make the advanced calibration.

Plot Calibration Data	Check this function to have touch panel linearity comparison graph appear when you finish **Advanced Calibration**. The black lines reflect the ideal linearity assumed by PenMount's application program while the blue lines show the approximate linearity calculated by PenMount's application program as the result of user's execution of **Advance Calibration**.
Turn off EEPROM storage	This function disables the write-in calibration data function in Controller. This function is enabled by default.

Edge Compensation
This page is the edge compensation settings for the advanced calibration. You can adjust the settings from 0 to 30 for accommodating the difference of each touch panel.
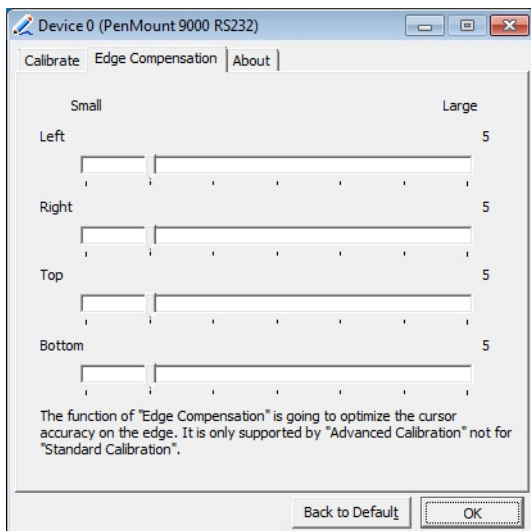
About
This panel displays information about the PenMount controller and driver version
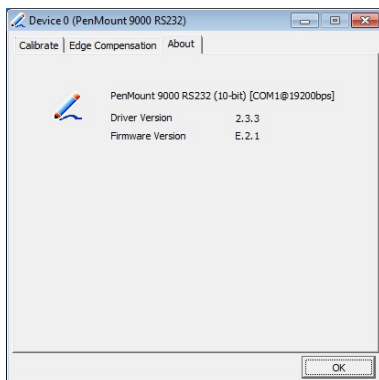
3.6.5. Uninstall PenMount Windows Universal Driver

1. Go to **Control Panel**. Click "**Add/Remove program**". Select "**PenMount Universal Driver**". Click "**Change/Remove"** button..
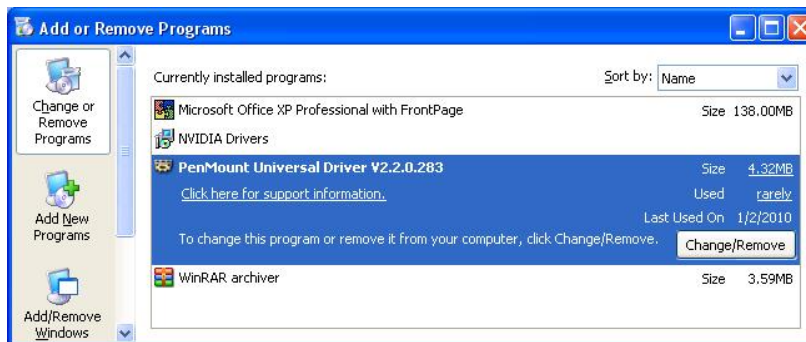
2. Select '**Uninstall**' to remove **PenMount Windows Universal Driver**.
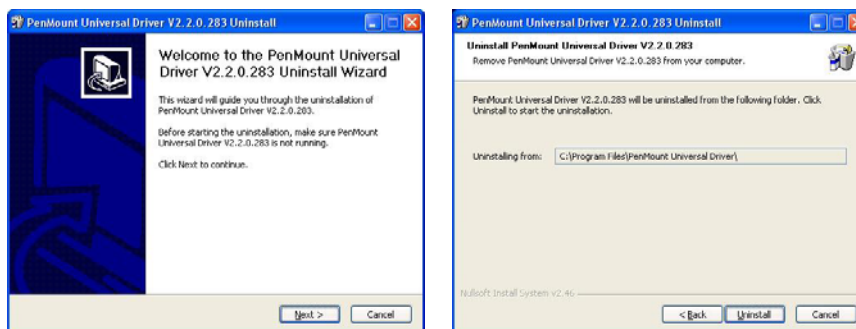
3.7. Install PenMount Linux X Window RS-232 Driver

Before installing **PenMount Linux X Window RS-232 Driver**, you must have Linux X Window installed and running on your computer. You must also have PenMount Serial Interface either 9026BH or 9036CH control boards installed.

PenMount Linux X Window RS-232 Driver supports the following operating systems:

	RS232
Ubuntu 6.06/ 6.10/ 7.04/ 7.10/ 8.04/ 8.10/ 9.04/ 9.10/ 10.04/ 10.10/ 11.04/ 11.10/12.04 32_64bit	●
Debian 4.0/ 5.0 32_64bit/ 6.0	●
Debian 3.1	
Fedora 4/5/6/7/89/10/11/12/13 /14/15/16/17 32_64bit	●
Fedora Core4_64bit	
Fedora Core3	●
Fedora Core2	●
Slackware12.0/12.1	●
Slackware10.0	
Red Hat 9.0	●
Red Hat 7.3/8.0	●
OpenSuse 10.1/ 10.2/ 10.3/ 11/ 11.1/ 11.2/ 11.3/ 11.4/ 12.1 32_64bit	●
Suse 10.0	●
Suse 9.2/9.3	
Suse 8.0/9.0/9.1	
Cent OS 5.2/ 5.3/ 5.4/ 5.5/ 6.0/ 6.2 32_64bit	●
Linux XFree86 4.x.x	
Linux XFree86 3.3.6	
Linux For GPM	●
QNX 6.4.1/ 6.5	●
QNX 6.3.2	
QNX 6.2	●
Android	●

3.7.1. Install PenMount Linux X Window RS-232 Driver

Please see the readme file included in the driver folder.

3.7.2. Calibration Utilities

Please see the readme file included in the driver folder.

3.8. Install PenMount WinCE Driver

Before installing **PenMount WinCE Driver**, you must have WinCE system installed and running on your device. You must also have PenMount Serial Interface either 9026BH or 9036CH control boards installed.

NOTE: Make sure you can move the WinCE cursor with a serial mouse attached to the target COM port (e.g. COM2) before connecting the 9000 control board.

3.8.1. Install PenMount WinCE Driver

Please see the readme file included in the driver folder.

Chapter 4.   Driver Software Functions

This chapter will guide you to the special software functions that configure and adjust PenMount control boards and touch screen hardware. Please note that not all of the functions are available for every driver. See the following table for drivers' software functions and their availability for specific interface and systems.

Software Function	DOS	Win 3.1	95	98/ME	NT	2000/XP /2003/	VISTA/7/ 8	CE	Linux	QNX
Standard Calibration	●	●	●	●	●	●	●	●	●	●
Advanced Calibration				●	●	●	●	●	●	
Multiple Monitors						●	●			
Multi Device						●	●			
Rotation			●	●	●	●	●			
Operation Mode				●		●	●			
Drawing mode	●	●	●	●	●	●	●	●		
Beep Sound	●	●	●	●	●	●	●		●	●
Beep sound adjustable				●		●	●			
Wake up function				●		●	●			
Showing linearity				●		●	●			
Right button		●	●	●	●	●	●	●	●	●
Hide cursor	●	●	●		●					
Double click area and speed adjustable			●		●	●	●			
About		●	●	●	●	●	●			
Edge Compenstation						●	●			
Refresh						●	●			

Remark: With PenMount Windows Universal V2.2.0.283 and the versions later, since the touch screen is installed as a digitizer device in Windows Vista/7/8 automatically, the functions which are built in Windows Vista / 7/ 8, such as rotation, multi-monitors, flicks, and context menu function (which launches a context menu by long-pressing on touch screen rather than clicking the right-mouse button or pressing the application key on the keyboard will be supported.

The following content in this chapter deals mainly with **PenMount Windows Universal Driver** (for 2000/XP/2003/VISTA/7/8). When you click PenMount icon in the notification area and select "**Control Panel**" from the menu, "**PenMount Control Panel**" with the four tags "**Device**", "**Multiple-Monitors**", "**Tools**", "**About**" will appear as the screenshot below:
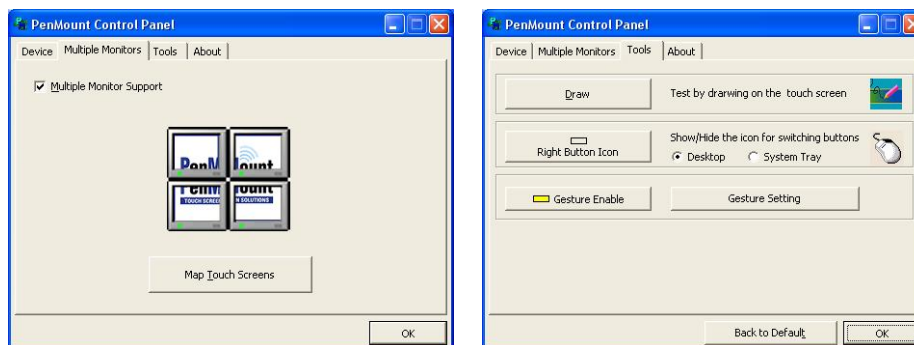
The buttons on **"Tools"tab** have the following functions:

Draw	Tests or demonstrates the **PenMount** touch screen operation.
Right Button Icon	Enable right button function. The icon can be shown on **Desktop** or in the **notification area**.
Gesture Enable	Enable/configure **Gesture AP** to support PenMount gestures recognition.
Screen Rotation Monitor	The function supports **nVidia**, **Intel**, **SMI** or **ATI** and software such as **Portrait Pivot Pro** rotation automatic detection.

4.1. Standard Calibration

Standard Calibration allows touch screen match the display so that the point you where you touch can be traced accurately on the screen. **Standard Calibration** only requires four points for calibration and one point for confirmation. Under normal circumstance, **Standard Calibration** is all you need to perform an accurate calibration.

4.2. Advanced Calibration

Advanced Calibration: improve the accuracy of calibration by using the more complicated 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 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. A stylus is recommended for the most accurate results.

4.3. Multiple Monitors

PenMount mouse drivers for Windows **2000/XP/XPE/2003/VISTA/72008/WES7/8** support **Multiple Monitors**. **Multiple Monitors** 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. 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 supports the following modes:

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

NOTE: **Multiple Monitors** 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 **Rotating** function is disabled.

4.3.1.   Requirements

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

-    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.)
-    Two or more touch screens
-    Two or more Serial Ports
-    Two or more PenMount 9000 control boards such as the 9036CH or 9026BH.
-   PenMount Windows Universal Driver (for 2000/XP/2003/VISTA/7/8).

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.

Enable Multiple Monitors

Enable the multiple display function as follows:

1.   In PenMount **Control Panel**, under **Multiple Monitors** tag, check the "**Multiple Monitor Support**" box. Then click "**Map Touch screens**" to assign touch controllers to displays.
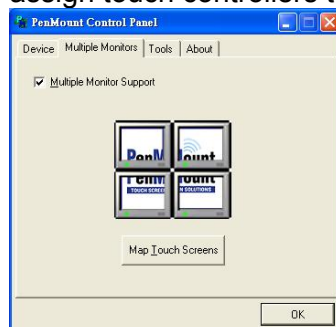
2.   When the mapping screen message appears, click "**OK**".

3.   Touch each screen as it displays "**Please touch this monitor. Press 'S' to skip**". Follow this sequence and touch each screen to map the touch screens.

Please touch this monitor. Press 'S' to skip.
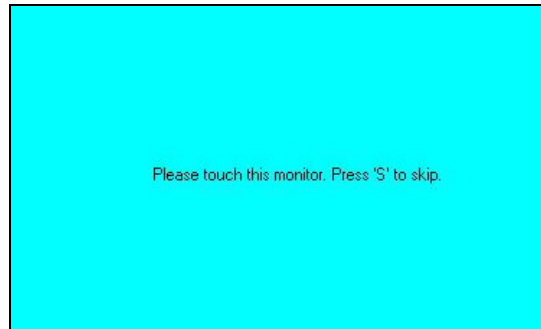
4. After the setting procedure is finished, maybe you need to calibrate for each panel and controller.

    NOTE: If you use a single VGA output for multiple monitors, please do not use **Multiple Monitors** function. Just follow the regular procedure for calibration on each of your desktop monitors.

    Rotate function will be disable if you use **Multiple Monitors** function.

    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.

    If you have multiple monitors but only one touch screen, press '**S**' to skip mapping step.

4.3.2.   An Example for 2 Touch Monitors

1. Please make sure 2 touch monitors are plugged in and detected.
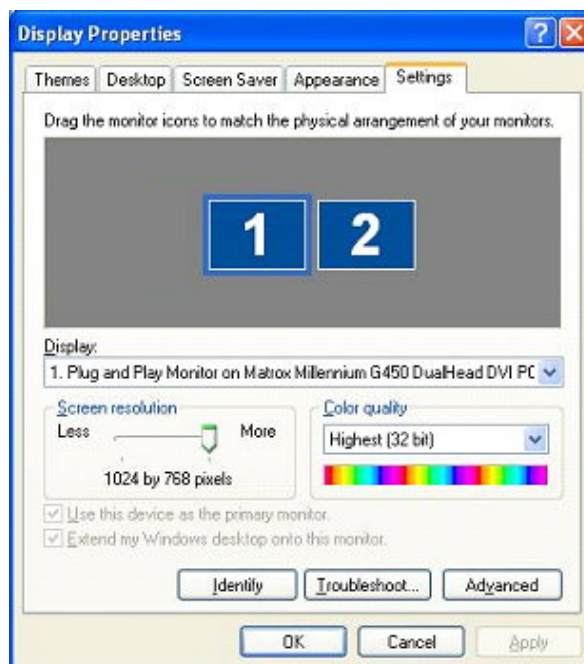
2. In PenMount **Control Panel**, under **Multiple Monitors** tag, click "**Map Touch screens**" then click "**OK**".
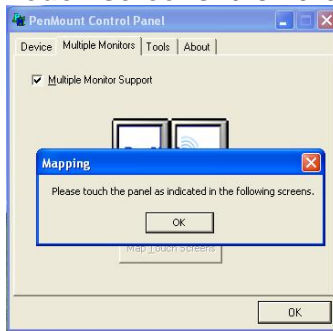
3. Then follow the screen instructions to match the controller with the touch screen.

    3-1. Click "**S**" to skip if you don't use the touch function on that screen.
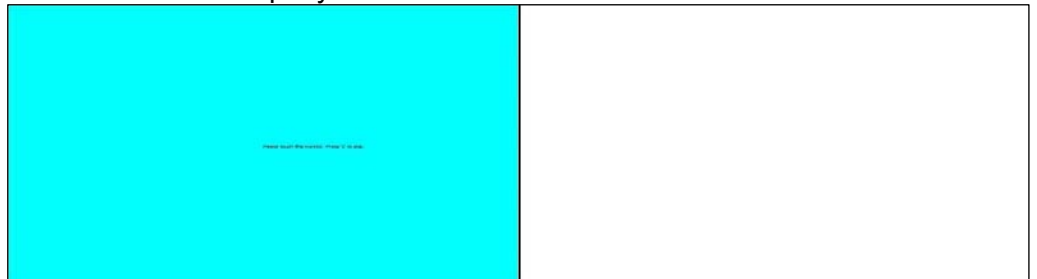
    3-2. When it jumps to screen 2, touch it. If you don't use touch function on screen 2, press "**S**" to skip it.
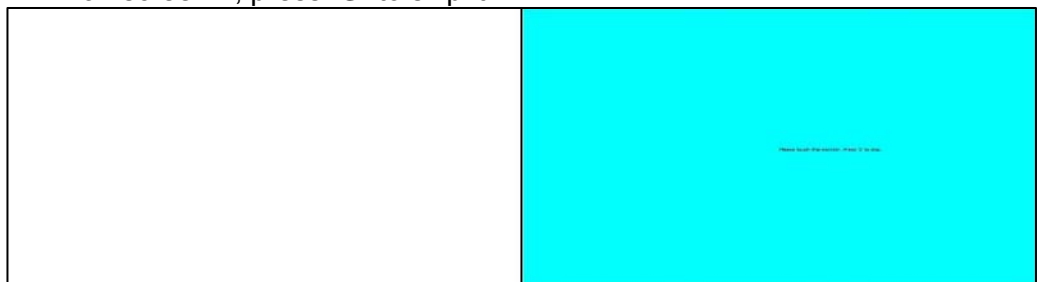
4. Before calibrating the screens, finish the procedure of "**Map touch screens**".

5. Carry out **Calibrate** for each device in sequence.
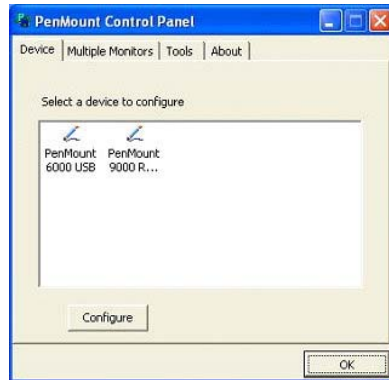
6. Press each device & start with **Standard Calibrate**, for instance, device 0.

7. After you press device 0, one of the screens will show calibration map.

8. Calibrate the other screens with the same way.
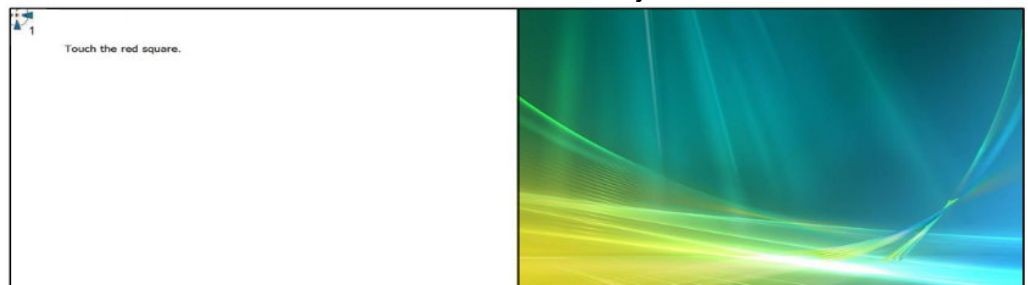
4.4.   **Multiple Devices**

Multiple Devices: allow using two or more monitors to display the same image. Software that supports this function includes the PenMount Windows Universal Driver (for 2000/ XP/XPE/2003/VISTA/7/2008/WES7/8) only. This driver for PenMount can support up to six control boards.

4.4.1.   Compare Functions

The differences of the functions between **Multiple Monitors** and **Multiple Devices** are illustrated below.

or
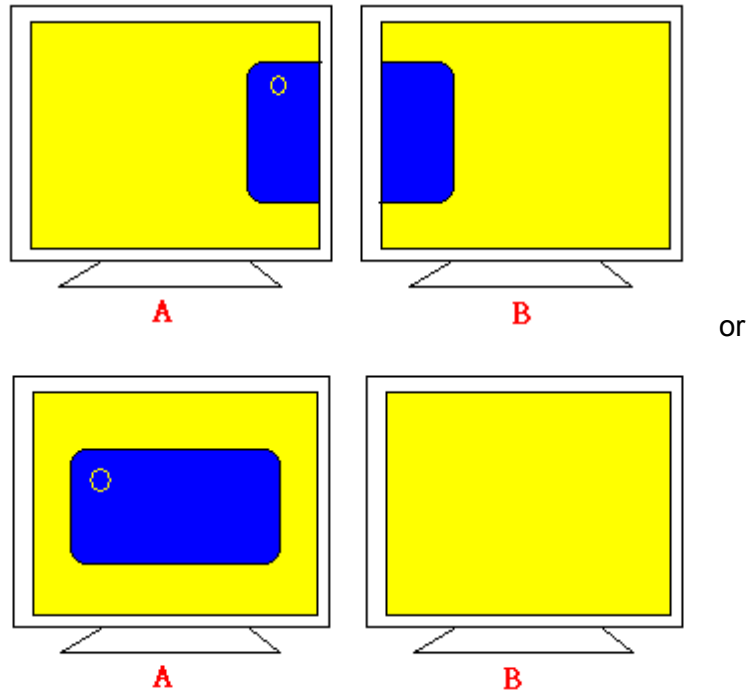
Multiple Monitors function shown above extends the screen into 2 or more monitors.
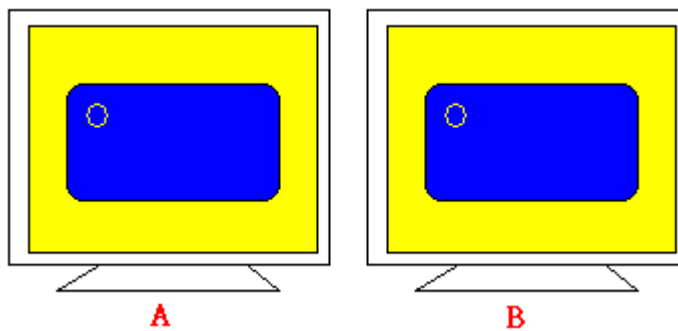
Multiple Devices function displays the same image on two or more monitors.

4.4.2.   Requirements

To use **Multiple Devices** with PenMount Control Boards, you need to do the following:

1.   Configure your computer hardware. See **Chapter 2: Install PenMount 9000 Control** Boards on page 2.

2.   Attach each PenMount Control Board to a different computer's serial or USB port.

3.   Install the appropriate PenMount software driver in each computer— see **Chapter 3. Install Drivers for 9000** Boards on page 8.

4. Use each driver's **Calibrate** function to calibrate each computer's touch screen.

5. You must calibrate each touch screen before configuration is complete.

4.5. 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 match the touch screen easily 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-degree rotation.

4.6. Draw

To test or demonstrate 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 registers touch activity such **left**, **right**, **up**, **down**, **pen up**, and **pen down**.

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

Click **Menu** button for more functions.
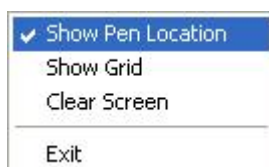
Show Pen Location is to show the locations where pen comes down and lifted up on the monitor.
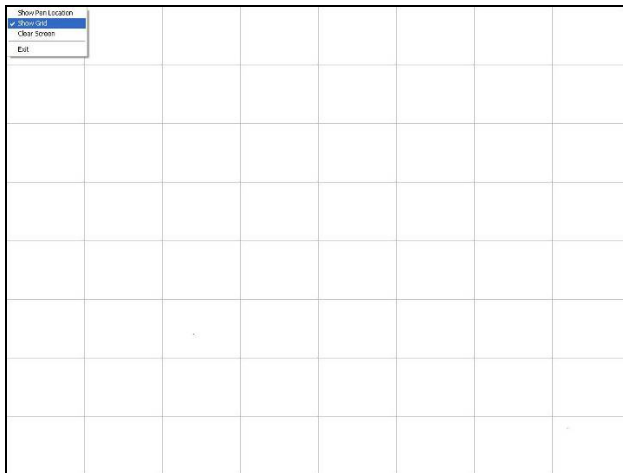
Show Grid is to show grid on the entire monitor. This is for linearity test.

Select **Clear Screen** to clear drawing.

Select **Exit** to quit draw function

4.7.   Mouse Operation Mode

Mouse Operation Mode enables and disables mouse's ability of dragging onscreen icons, which is applicable to the configuration of POS terminals.

Pen Input Emulation –   Select this mode and mouse will emulate Windows Vista pen input device operation, by which no mouse event will be sent until the touch is dragged out of range or released from the screen.

Mouse Emulation –   Select this mode and mouse functions as normal and allows dragging of icons.

Click on Touch –   Select this mode and mouse only provides a click function, disable dragging function.

Click on Release –   Select this mode and mouse only provides a click function when the touch is released.

4.8.   Beep Sound

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

4.9.   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.

4.10.   Wake Up Function

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

4.11.   Plot Calibration Data

Plot Calibration Data function displays the touch screen linearity map, which is available if the PenMount driver provides an **Advance Calibration** function. Touch panel's linearity decreases with panel's age. This non-linearity is apparent when the touched point on the touch screen is not the same as the point on the display. **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.

4.12.   Right Button

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.

4.13.   Hide Cursor

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

4.14.   Cursor Offset

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

4.15.   Double Click Area and Speed

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

4.16.   About

This option shows the exact version of the drivers and controller firmware. Updated drivers are available for downloading on the PenMount website at
http://www.penmount.com/ .
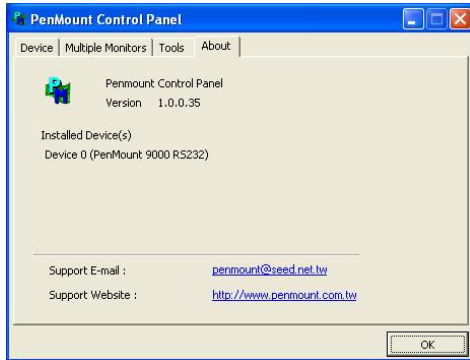
4.17. Edge Compensation

In PenMount **Control Panel**, when any of the detected PenMount device is selected and the **Configure** button is clicked, you will be able to see the **Edge Compensation** tag, which is for **Advanced Calibration**. You can adjust the settings from 0 to 30 for accommodating the difference of each touch panel. (Note: **Edge Compensation** is only supported by PenMount Windows Universal Driver (for Windows 2000/ XP/ XPE/ 2003/ VISTA/ 7/ 2008/ WES7/ 8)
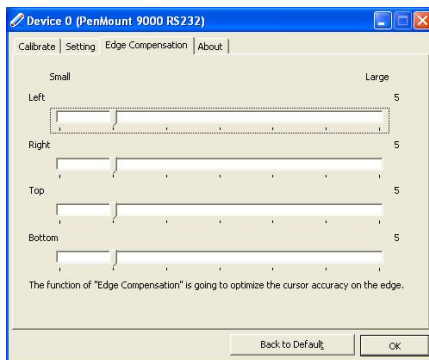
4.18. Refresh

If you install PenMount driver package after(includes) 2.1.0.187, you can click the **Refresh** button in PenMount **Control Panel** to detect the newly attached PenMount devices. (Note: **PenMount Windows Universal Driver only supports Refresh** (for Windows 2000/ XP/ XPE/ 2003/ VISTA/ 7/ 2008/ WES7/ 8).
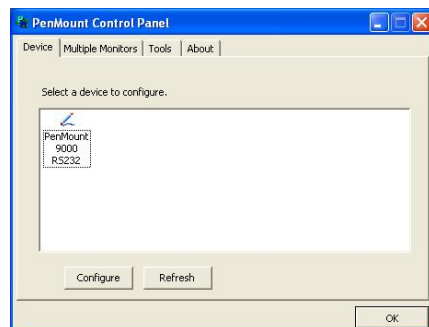
Chapter 5. PenMount Gesture AP for Windows 2000/XP/VISTA/7/8

This chapter will guide you to the PenMount Gesture AP that is applicable in Windows 2000/XP/Vista/7/8.

5.1.   Invoke PenMount Gesture AP

1. Make sure you have installed PenMount touch screen control boards (whether 6000 or 9000 series).

2. Make sure you have installed PenMount Universal Driver V2.1.0.XXX or later versions to your system.

3. To run PenMount Gesture AP

   In the notification, right-click on the PenMount icon and select **Gesture Enable** from the menu. A **PenMount Gesture AP** icon will show up in the notification area. See the illustration below. **PenMount Gesture AP** is running.
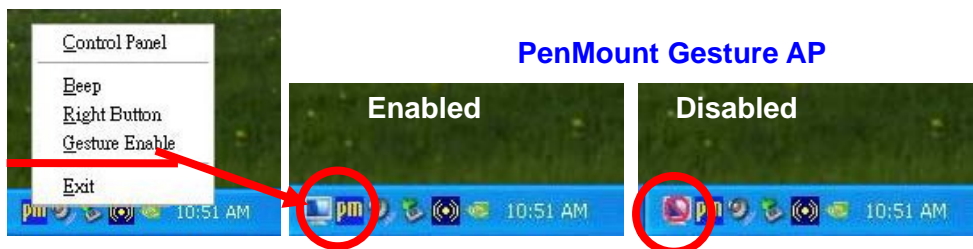
   or

   In **PenMount Control Panel**, select **Tools** tab and press **Gesture Enable** button. **PenMount Gesture AP** icon shows up in the notification area. **PenMount Gesture AP** is running.

5.2. Configure PenMount Gesture AP

To configure PenMount Gesture AP

1. Right-click on the **PenMount Gesture AP** icon in the notification area, select **Gesture Setting** from the menu that appears. See the illustration below.

 or

Select **Tools** tab and press **Gesture Setting** button in **PenMount Control Panel**.
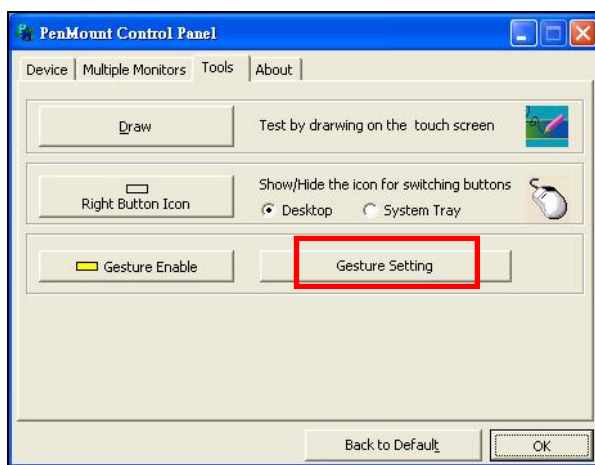
2. **[Gesture Setting]** window displays.
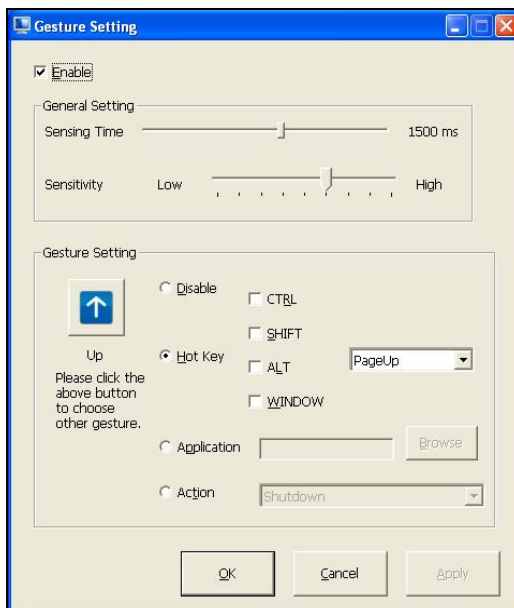
3. 15 **PenMount Gestures** are provided in total.

For Windows XP
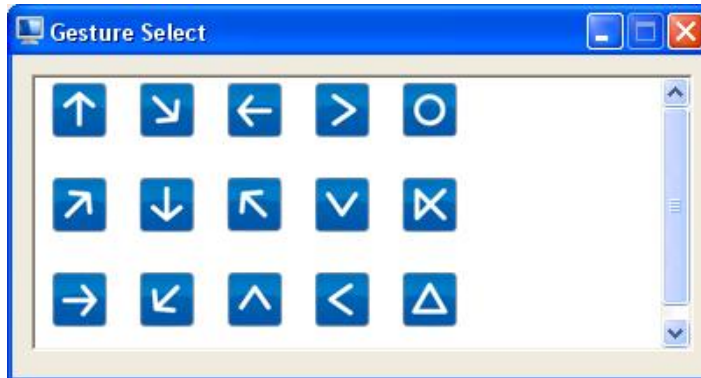
For Windows Vista / 7/ 8
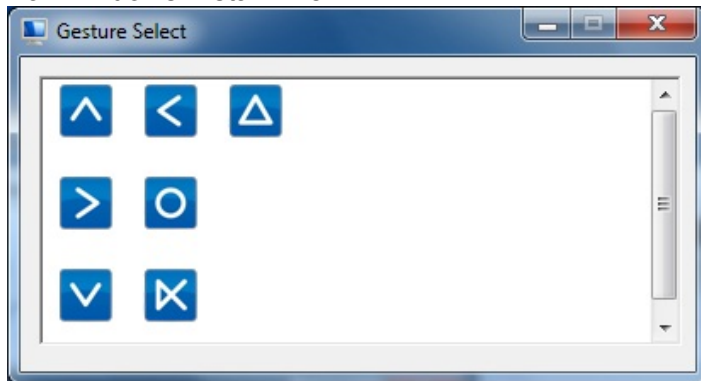
4. In the [**Gesture Setting**] window, you can proceed to configure **PenMount Gesture AP:**
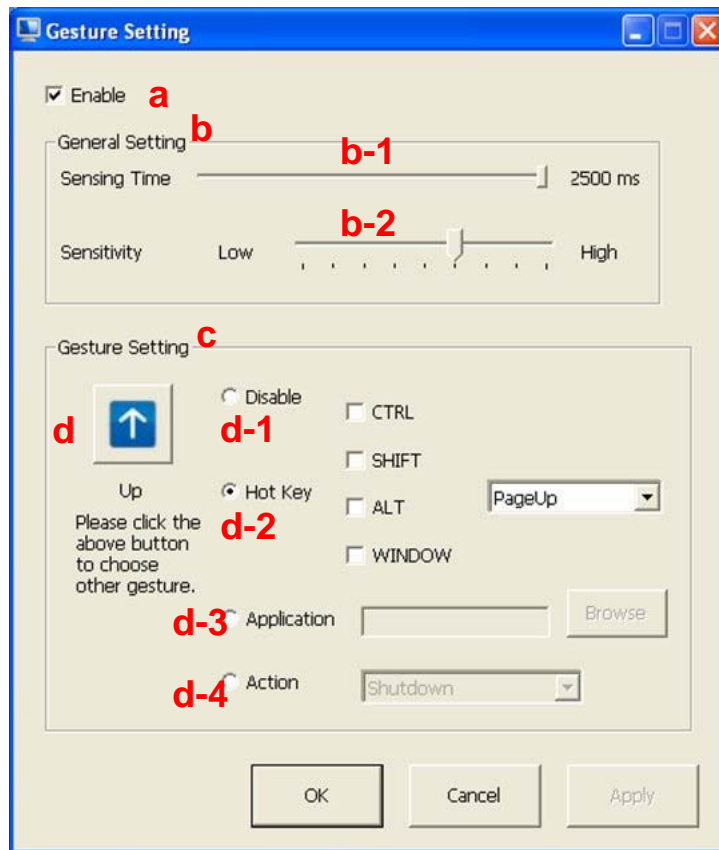
a. **Enable/disable Check Box**. Select/deselect the box to enable/disable PenMount Gestures.

b. **General Setting Box**

b-1. **Sensing Time** - Move the slider to adjust **PenMount Gestures Sensing Time** between 200 ms (0.2 sec) and 2500 (2.5 sec). The shorter the sensing time is configured, the faster the gesture has to be done.

b-2. **Sensitivity** – Move the slider to adjust how sensitive you want your finger stroke on the touchsceen to be sensed.

c. **Gesture Settings Group Box.** This group box allows you to individually configure each gesture.

d. **Gesture Select Button.** Press this button to select the specific gesture you are going to configure. When the gesture icon turns to blue, it is enabled. When it is gray, it is disabled. See the following for details.

d-1. **Disable Button.** When this button is selected, the gesture is disabled.

d-2. **Hot-key Configure Button.** Configure the hot-keystrokes for specific gesture. The hot-key can include up to 5 keystrokes. When that gesture is sensed, the configured keystrokes will be reported.

d-3. **Application Invoke Button.** Configure to invoke a specific application with particular gesture. So that when the gesture is sensed, the specific application will run.

d-4. **Action Configure Button.** Configure to make use of **PenMount Gesture AP**'s built-in shortcuts. So that when a particular gesture is sensed, a specific action will be taken. **PenMount Gesture AP** have the following shortcuts built in:

Note: For **Disable touch function**, after touch function is disabled, the mouse-pointer won't move following your finger sliding on the touch screen and your finger tapping won't trigger any action, however, gestures will still be sensed.
(Note: If you select Disable touch function, the curser will not react to finger movement on the touch screen and the tapping will not trigger any program action. However, the gesture recognition is still functioning.)

5.3.   PenMount Gestures' Default Values in Windows XP

↑	Page Up	↓	Page Down
←	Backward (Left Arrow)	→	Forward (Right Arrow)
↗	Copy (Ctrl + C)	↘	Paste (Ctrl + V)
↙	Undo (Ctrl + Z)	↖	Delete
∧	Zoom in ([Pad] +)	∨	Zoom out ([Pad] -)
<	Rotate Counter Clockwise (Ctrl + L)	>	Rotate Clockwise (Ctrl + K)
△	Open On-Screen Keyboard (Execute OSK.EXE)	O	Save Document (Ctrl + S)
⋈	Close Program (Alt + F4)		