MonitorMouse®

FOR OS/2
Version 2.1

Manual Version 2.1

MonitorMouse® for OS/2

Version 1.0
User's Guide

Manual Version 1.0a

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by

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ABOUT THIS MANUAL

This manual provides all of the information you need to install and use MonitorMouse® for OS/2, Elo TouchSystems' touchscreen driver for OS/2. This manual is organized as follows:

Chapter 1   Describes the software included, and the hardware requirements.

Chapter 2   Describes how to install the MonitorMouse for OS/2 software.

Chapter 3   Details the use of MonitorMouse for OS/2 and its options.

Appendix A   Provides detailed information on configuring your touchscreen controller.

Appendix B   Provides a reference for the MonitorMouse for OS/2 driver command line and flags.

Appendix C   Gives tips on troubleshooting a MonitorMouse for OS/2 installation and includes a sample CONFIG.SYS file.

Appendix D   Gives additional installation steps for using MonitorMouse for OS/2 with IBM Audio Visual Connection (AVC) multimedia authoring tool.

See the !READ.ME! file (if present) on the accompanying disk. It contains any additions or changes made after this manual was printed.

For details on available product configurations, touchscreen theory of operation, and general troubleshooting, see the *IntelliTouch Product Manual* or the *AccuTouch Product Manual* as appropriate.

ABOUT MONITORMOUSE FOR OS/2

Included on the accompanying disk is MonitorMouse for OS/2, a touchscreen driver for IBM OS/2 versions 1.3 through 3.x (Warp). MonitorMouse for OS/2 allows you to run all Presentation Manager mouse-driven applications and off-the-shelf software without modification using an Elo touchscreen.

MonitorMouse for OS/2 and an Elo touchscreen are recommended for all OS/2 applications that require an intuitive user interface, such as a public kiosk application. Touchscreens are also popular in point-of-sale, process control, instrumentation, multimedia, gaming, education, simulation, and training applications. Elo touchscreens may be used in a harsh environment not appropriate for a mouse or keyboard.

With MonitorMouse for OS/2, the touchscreen may be used alone, or in conjunction with any mouse. Various *mouse button emulation modes* are supported providing options on how button clicks are simulated. You can choose the best mode for your application, and change between modes at any time.

Applications using only the left button are the easiest to use with the touchscreen.

Touchscreen Controller Compatibility

Elo manufactures two types of touchscreen technologies. The IntelliTouch® surface wave technology provides excellent clarity and durability. The AccuTouch® resistive technology features pressure-activated screens with rapid response and high resolution. PC-Bus, Micro Channel, and serial touchscreen controllers are available.

MonitorMouse for OS/2 will work with the Elo touchscreen controllers listed below. E281{A}-4002 refers to both the E281-4002 and E281A-4002 controllers. Likewise, E281{A}-4025 refers to both the E281-4025 and E281A-4025 controllers.

Controller Model	Interface	Touchscreen Type
E281-2300	RS-232	IntelliTouch
E281{A}-4002	RS-232	IntelliTouch
E271-2210	RS-232	AccuTouch
E271-140	RS-232	AccuTouch
E281-4035	PC-Bus	IntelliTouch
E281{A}-4025	PC-Bus	IntelliTouch
E271-2201	PC-Bus	AccuTouch
E271-141	PC-Bus	AccuTouch
E271-2202	Micro Channel	AccuTouch

The following obsolete part numbers may be cross-referenced to some of the controller model numbers referred to above.

Part Number	Controller Model
00285X-XXX Enclosure	Contains E281-4002 IntelliTouch Serial Controller, configured for Stream Mode, Binary Mode, Z-Axis Enabled, 9600 Baud.
E271-3 Enclosure	Contains E271-140 AccuTouch Serial Controller, configured for 2400 Baud, 8-Bit Data, Binary Mode, Filtered Mode, Stream Mode.
002710-XXX Controller	E271-140 AccuTouch Serial Controller
002714-XXX Controller	E271-141 AccuTouch PC-Bus Controller
00285X-2-XXX Controller	E281-4002 IntelliTouch Serial Controller.
00285X-25-XXX Controller	E281-4025 IntelliTouch PC-Bus Controller.

Software Compatibility

MonitorMouse for OS/2 is compatible with OS/2 versions 1.3 through 3.x (Warp).

Coordinates vs. Mickeys

MonitorMouse will work with all Presentation Manager and WIN-OS/2 mouse-driven applications. All OS/2 Full Screen and DOS applications that ask the mouse driver for coordinates (absolute position) rather than mickeys (relative motion) will also work.

If your OS/2 Full Screen or DOS application is mickey-based, find out from the developer if it can also operate in an absolute mode. Sometimes a set-up parameter or flag can be used, or a different input device specified during installation, which also emulates the mouse.

Relative motion cannot be emulated with absolute pointing devices because the position of the cursor or highlighting in mickey-based applications is unknown to the pointing device driver. The driver is not able to determine the distance from a touch to the cursor. Knowing this distance is critical for simulating that motion with mickeys. Other complicating factors include unknown mickey-to-pixel ratios and acceleration or ballistic algorithms used by the application.

Video Compatibility

The video function of the display and the Elo touchscreen installed on the display are entirely separate systems. Therefore, the touchscreen is compatible with all video cards and modes. Problems with the display should be treated as display problems, not touchscreen problems.

Differences from Previous Versions

MonitorMouse for OS/2 version 2.1 replaces version 2.0 on systems with OS/2 1.3 or later. MonitorMouse for OS/2 version 2.1 cannot be used on OS/2 1.1 or 1.2 systems.

Touchscreen performance with MonitorMouse for OS/2 version 2.1 has been enhanced over version 2.0 when using an IntelliTouch controller with firmware revision 2.2 or later, or an AccuTouch or IntelliTouch SmartSet™ controller (E271-22xx or E281-23xx).

Distribution Rights

MonitorMouse for OS/2 and its support software may be distributed freely in executable form with any software you develop using them. See the license agreement at the beginning of this manual for details.

Other Versions of MonitorMouse

MonitorMouse for OS/2 is only one in a family of MonitorMouse products for various operating systems available separately from Elo. Each has a similar "look and feel" for a consistent user interface across platforms.

MonitorMouse for DOS emulates the standard mouse driver MOUSE.COM on the IBM family of personal computers, 100% compatibles, and PS/2 systems running DOS. Programs using MOUSE.COM, MOUSE.SYS, or compatible versions, will work with MonitorMouse. ELODEV™, the Elo touchscreen driver program for DOS, is also included.

MonitorMouse for Windows works with all Microsoft Windows applications. MonitorMouse for Windows is included with MonitorMouse for DOS.

MonitorMouse for Windows NT works with all Microsoft Windows NT applications (PC version only).

MonitorMouse for Macintosh works on the Apple Macintosh II computer or later with System 6 or System 7.x.

PRODUCT REGISTRATION

For the latest product announcements and software releases, be sure to fill out and return the product registration card packaged with this manual.

CONTACTING ELO

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CompuServe: GO ELOTOUCH
Select Elo TouchSystems from the Messages and Library menus.

Product announcements, press releases, application notes, software drivers and utilities are available on CompuServe and the Elo BBS.

Your comments and suggestions are welcome.

2
Installing MonitorMouse for OS/2

BEFORE YOU BEGIN

First be sure OS/2 is installed and operating properly with your mouse.

As you will be modifying the CONFIG.SYS file, it is best to have the OS/2 installation disks or a bootable DOS disk readily available. This way, any problems in CONFIG.SYS which cause the system not to boot can be corrected by rebooting from the disk(s).

Five steps are required when installing MonitorMouse for OS/2:

Step 1	Configure your controller
Step 2	Copy the software
Step 3	Modify CONFIG.SYS
Step 4	Install the Touchscreen Control Panel
Step 5	Calibrate the touchscreen

STEP 1 - CONFIGURE YOUR CONTROLLER

Verify your controller configuration using the setup instructions provided in Appendix A. Elo typically ships touchscreen controllers preconfigured for use with Elo software, including MonitorMouse for OS/2. Configuration requires setting switches and/or installing jumpers that determine controller operating parameters. You will need these parameters when you install the MonitorMouse for OS/2 driver software.

For controller installation instructions, refer to the *IntelliTouch Product Manual* or the *AccuTouch Product Manual*.

STEP 2 - COPY THE SOFTWARE

The following files are on the MonitorMouse for OS/2 disk:

!READ.ME!	Text file containing any additions or changes made after this manual was printed.
MONMOU01.SYS	Touchscreen driver for serial touchscreen controllers on PC-Bus systems.
MONMOU02.SYS	Touchscreen driver for serial touchscreen controllers on Micro Channel systems.
MONMOU03.SYS	Touchscreen driver for PC-Bus and Micro Channel touchscreen controllers.
ELOCAL2.EXE	Touchscreen Control Panel used to calibrate the touchscreen and select options.
ELOCAL2.DLL	Used by ELOCAL2.EXE.
ELOCAL2.HLP	Help file for ELOCAL.EXE.
ELO.BMP	Elo desktop wallpaper.
@6253.ADF	Description File for the E271-2202 Micro Channel touchscreen controller.
COMDUMP.EXE	DOS program for testing serial touchscreen controllers.
BUSSTAT.EXE	DOS program for testing PC-Bus touchscreen controllers.
SAWDUMP.EXE	DOS program for testing IntelliTouch touchscreen controllers.

Create a subdirectory on your hard disk and copy the files into it. For example,

```
CD \
MD ELO
COPY A:*.* ELO
```

International Versions

International versions of the Touchscreen Control Panel are included in subdirectories on the MonitorMouse for OS/2 disk. Replace ELOCAL2.DLL and ELOCAL2.HLP on your hard disk with the versions from the appropriate subdirectory.

STEP 3 - MODIFY CONFIG.SYS

MonitorMouse for OS/2 is installed by commands in CONFIG.SYS. Use your system editor to make these changes. In general, the changes are as follows:

- Comment-out the existing DEVICE command(s) for your mouse.

- Add a DEVICE command for the appropriate MonitorMouse for OS/2 touchscreen driver *immediately after* the commented-out DEVICE commands(s).

- Add a new DEVICE command for MOUSE.SYS.

The order of the DEVICE commands is important. See the sample CONFIG.SYS in Appendix C, page 43.

Other changes may be required depending on your hardware configuration and version of OS/2.

Detailed Instructions for System Configurations

Refer to the page number given below for detailed instructions on your specific configuration.

Serial Touchscreen Controller on PC-Bus System

Change your CONFIG.SYS file as follows:

```
rem DEVICE=C:\OS2\MOUSE.SYS [flags]
device=c:\elo\monmou01.sys <controller>,<COM port>,<baud rate>
device=c:\os2\mouse.sys stype=elomou$ [flags - keep same as above]
```

where <controller> is:

> 2300 for the IntelliTouch E281-2300 serial controller.
> 4002 for the IntelliTouch E281{A}-4002 serial controller.
> 2210 for the AccuTouch E271-2210 serial controller.
> 140   for the AccuTouch E271-140 serial controller.

<COM port> is the number of the COM port where the serial output of the touchscreen controller is connected.

<baud rate> matches the switch or jumper settings on the controller.

Here is an example MonitorMouse for OS/2 DEVICE command:

```
device=c:\elo\monmou01.sys 2300,1,9600
```

No Mouse

If you do not wish to have a mouse connected, change the "stype=elomou$" flag to "type=elomou$" on the DEVICE=MOUSE.SYS command.

Disabling the COM Drivers

If your system COM ports are being used by the touchscreen and mouse, REM out the DEVICE=COM.SYS and DEVICE=VCOM.SYS commands (if present) in CONFIG.SYS. This prevents the COM drivers from displaying a message saying the COM ports are unavailable.

If only the touchscreen is using a COM port, move the DEVICE=COM.SYS and DEVICE=VCOM.SYS commands before the DEVICE=MONMOU01.SYS command in CONFIG.SYS. Then add the flag (<COM Port>,0,0) to COM.SYS, where <COM Port> is the same as on the DEVICE=MONMOU01.SYS command. For example,

```
DEVICE=C:\OS2\COM.SYS (1,0,0)
```

Reboot and proceed to Step 4, page 14.

Serial Touchscreen Controller on PS/2 System

Change your CONFIG.SYS file as follows:

```
rem DEVICE=C:\OS2\MOUSE.SYS [flags]
device=c:\elo\monmou02.sys <controller>,<COM port>,<baud rate>
device=c:\os2\mouse.sys stype=elomou$ [flags - keep same as above]
```

where <controller> is:

    2300 for the IntelliTouch E281-2300 serial controller.
    4002 for the IntelliTouch E281{A}-4002 serial controller.
    2210 for the AccuTouch E271-2210 serial controller.
    140   for the AccuTouch E271-140 serial controller.

<COM port> is the number of the COM port where the serial output of the touchscreen controller is connected.

<baud rate> matches the switch or jumper settings on the controller.

Here is an example MonitorMouse for OS/2 DEVICE command:

```
device=c:\elo\monmou02.sys 2300,1,9600
```

No Mouse

If you do not wish to have a mouse connected, change the "stype=elomou$" flag to "type=elomou$" on the DEVICE=MOUSE.SYS command.

Disabling the COM Drivers

If your system has only one COM port which is being used by the touchscreen, REM out the DEVICE=COM.SYS and DEVICE=VCOM.SYS commands (if present) in CONFIG.SYS. This prevents the COM drivers from displaying a message saying the COM port is unavailable.

Otherwise, move the DEVICE=COM.SYS and DEVICE=VCOM.SYS commands before the DEVICE=MONMOU02.SYS command in CONFIG.SYS. Then add the flag (<COM Port>,0,0) to COM.SYS, where <COM Port> is the same as on the DEVICE=MONMOU02.SYS command. For example,

```
DEVICE=C:\OS2\COM.SYS (1,0,0)
```

Reboot and proceed to Step 4, page 14.

PC-Bus Touchscreen Controller

Change you CONFIG.SYS file as follows:

```
rem DEVICE=C:\OS2\MOUSE.SYS [flags]
device=c:\elo\monmou03.sys <controller>,<Base I/O Port>,<IRQ>
device=c:\os2\mouse.sys stype=elomou$ [flags - keep same as above]
```

where <controller> is:

> 4035 for the IntelliTouch E281-4035 PC-Bus controller.
> 4025 for the IntelliTouch E281{A}-4025 PC-Bus controllers.
> 2201 for the AccuTouch E271-2201 PC-Bus controller.
> 141   for the AccuTouch E271-141 PC-Bus controller.

<Base I/O Port> matches the jumper settings on the controller.

<IRQ> matches the interrupt jumper on the controller.

Here is an example MonitorMouse for OS/2 DEVICE command:

```
device=c:\elo\monmou03.sys 2201,280,5
```

No Mouse

If you do not wish to have a mouse connected, change the "stype=elomou$" flag to "type=elomou$" on the DEVICE=MOUSE.SYS command.

Disabling the COM Drivers

If you selected IRQ4 or IRQ3 for the touchscreen controller (the interrupts reserved for COM1 and COM2), move the DEVICE=COM.SYS and DEVICE=VCOM.SYS commands (if present) before the DEVICE= MONMOU03.SYS command in CONFIG.SYS. This prevents the COM drivers from displaying a message saying the COM port is unavailable. Add the flag (<COM Port>,0,0) to COM.SYS, where <COM Port> is 1 for IRQ4 or 2 for IRQ3. For example,

```
DEVICE=C:\OS2\COM.SYS (1,0,0)
```

Reboot and proceed to Step 4, page 14.

Micro Channel Touchscreen Controller

Change your CONFIG.SYS file as follows:

```
rem DEVICE=C:\OS2\MOUSE.SYS [flags]
device=c:\elo\monmou03.sys <controller>
device=c:\os2\mouse.sys stype=elomou$ [flags - keep same as above]
```

where <controller> is:

       2202   for the AccuTouch E271-2202 Micro Channel controller.

Here is an example MonitorMouse for OS/2 DEVICE command:

```
device=c:\elo\monmou03.sys 2202
```

No Mouse

If you do not wish to have a mouse connected, change the "stype=elomou$" flag to "type=elomou$" on the DEVICE=MOUSE.SYS command.

Reboot and proceed to Step 4, page 14.

STEP 4 - INSTALL THE TOUCHSCREEN CONTROL PANEL

The Touchscreen Control Panel program, ELOCAL2.EXE, is a Presentation Manager application for calibrating the touchscreen and setting various options. See Figure 2-1.

Add the \ELO\ELOCAL2.EXE program to the System Setup Folder and label the icon "Touchscreen". This is accomplished as follows:

1. Open the OS/2 System folder, then System Setup.

2. Open the Templates folder.

3. Drag the Program template with the right mouse button into the System Setup folder. A Settings notebook will be displayed.

4. Enter "C:\ELO\ELOCAL2.EXE" as the Path and file name. Enter "C:\ELO" as the Working directory.

5. Select the General tab. Change the Title to "Touchscreen".

6. Close the notebook.

See your OS/2 documentation for detailed instructions on installing new applications.

STEP 5 - CALIBRATE THE TOUCHSCREEN

Double-click the Touchscreen icon with the mouse (as the touchscreen may not be calibrated yet), or use the keyboard if the mouse is not connected. You may also run ELOCAL2.EXE from an OS/2 Window prompt.

Select Calibrate and follow the on-screen instructions. After calibrating, the touchscreen will work like the mouse. The DEVICE=MONMOUxx command in CONFIG.SYS is updated with the new calibration points (-c flag). The calibration points are then set automatically each time the system is started. Recalibration should only be necessary after moving or resizing the video image, or after changing either the touchscreen, controller, or monitor.

Close the Touchscreen Control Panel. (Other options in the Touchscreen Control Panel are described in the next chapter.)
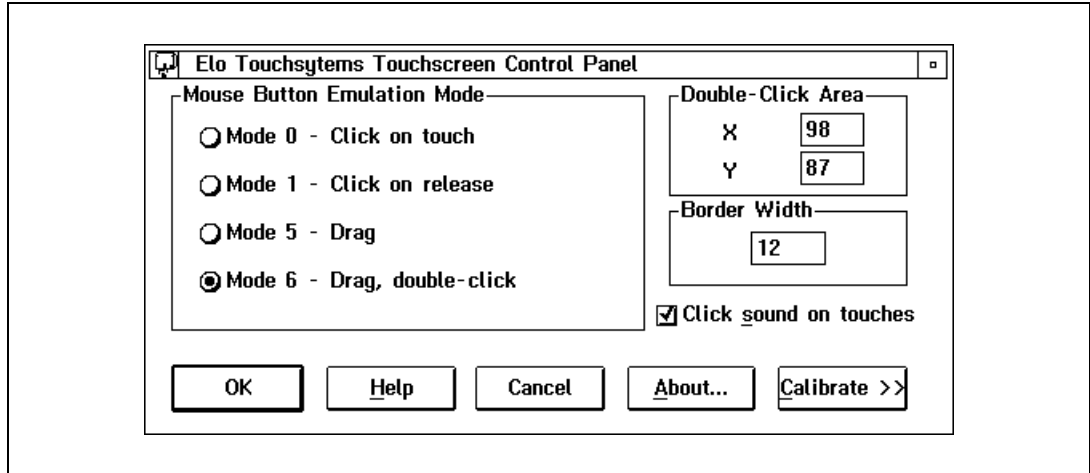
Figure 2-1. MonitorMouse for OS/2 Touchscreen Control Panel

INSTALLING THE ELO WALLPAPER

ELO.BMP can be used to display Elo "wallpaper" when giving demos of MonitorMouse for OS/2. To load, copy the file ELO.BMP to the \OS2\BITMAP directory. Call up the pop-up menu for the desktop with the right mouse button, then choose Open/Settings/Background/Image/Tiled, and select ELO.BMP.

3

Using MonitorMouse for OS/2

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TOUCHSCREEN CONTROL PANEL

The MonitorMouse for OS/2 Touchscreen Control Panel (see Figure 2-1, page 15) is detailed in the following sections.

Calibration

Select <u>C</u>alibrate to initiate the calibration sequence. Follow the on-screen instructions. You will be given the opportunity to confirm the calibration points.

The need for calibration is unique to the touchscreen. Unlike mouse or keyboard applications where the cursor is part of the image, a touchscreen is a physical overlay with an independent coordinate system. Only by knowing the position of the image can the driver software convert touchscreen coordinates into image coordinates.

Besides the differences in touchscreens and controllers, calibration also compensates for variations in the video image among displays. Calibration is also

affected by horizontal and vertical adjustments on the monitor and by the physical mounting of the touchscreen.

Additional calibration complications include image blooming, where brightly-colored images expand, and the "pincushion" effect, which causes the corners of the display to be stretched. Poor display linearity can cause similarly-sized boxes to be larger at the edges of the screen than they are in the middle, or vice-versa. The displayed image can also be tilted. Even changing video modes can affect the screen size.

Perfect calibration cannot be achieved in all circumstances. For example, the user can encounter parallax problems with a change in position, or because the present user is not the same stature as the person who calibrated the screen.

Even the most sophisticated calibration techniques can only partially overcome such variations. Therefore, most touchscreen software uses only a two- or three-point calibration sequence and instead relies on well-placed touch zones and appropriate user feedback.

The three-point calibration sequence used by the Touchscreen Control Panel automatically corrects inverted touchscreen installations and backwards cable connections. X- or Y-axis inversion is normal for most touchscreens.

Once calibrated, MonitorMouse for OS/2 will be ready to run automatically each time the system is restarted. Recalibration should only be necessary after moving or resizing the video image, or after changing either the touchscreen, controller, or monitor.

Mouse Button Emulation Mode

Four mouse button emulation modes are supported, equivalent to the corresponding mode numbers in the other versions of the MonitorMouse family of products. The current mode may be changed with the Touchscreen Control Panel. After selecting the mode, CONFIG.SYS is updated (-m flag). Mode 6 is the default.

The modes vary in the button actions they support (clicking, dragging, double-clicking, etc.) You should choose the *simplest* mode that will work for your application.

Mode 0   Left button clicking only. No dragging or right button is supported. Works with large targets. Recommended for public kiosk applications.

Moves the mouse pointer to your point of touch and "clicks" the left button. A beep will confirm the click. The mouse pointer will not

move, nor will any other clicks be simulated until your finger is lifted and the screen retouched.

Mode 1   Left button clicking only. No dragging or right button is supported. Works with large and small targets.

The mouse pointer follows your sliding finger and the left button is clicked at the point of release (lift-off).

Mode 5   Left button clicking and dragging. No right button is supported.

The left button is held down when you touch the screen, and it stays down until you release, dragging as you move.

Mode 6   Same as Mode 5, but supports double-clicking by tapping twice. Recommended for general use.

If the second touch occurs immediately after the first and is nearby, a double-click will be simulated at the exact point of the first touch. If you do not hear two beeps, you have tapped too fast.

Double Clicking

Double clicking is common in the OS/2 environment, so MonitorMouse mouse button emulation mode 6 is recommended. If you are running a dedicated application which does not use double clicking, you may use one of the other modes.

The double-click speed for the mouse can be adjusted by changing the mouse settings in the System Setup folder. It may be helpful to adjust this threshold towards the slower end of the scale.

The hardware limitations of the touchscreen controller, the driver software, and the system clock combine to limit the minimum double-tapping speed. A threshold setting which permits a rapid double click with the mouse may not allow an equal double-click speed with the touchscreen. Use the mouse settings program to test the double-click speed for both the mouse and the touchscreen.

If you do not hear two beeps when double tapping with some older touchscreen controllers, you are tapping too fast. Use a relaxed pace.

Click Sound on Touches

A check box is available in the Touchscreen Control Panel for enabling/disabling the "click" sound from the PC's internal speaker for each touch. Audible feedback is important because the touchscreen does not have any tactile feedback mechanism. CONFIG.SYS is updated with the new setting (-b flag). Beeps are enabled by default.

Double-Click Area

The double-click area may be specified in the Touchscreen Control Panel. This area is used for detecting double-clicks in mouse button emulation mode 6. Normally, OS/2 expects a double-click to be on the same pixel–easy to do with a mouse, but almost impossible with a touchscreen. By expanding this area, it becomes easier to double-click by double-tapping anywhere within this area. The default number of pixels for X and Y are calculated after you calibrate the touchscreen. CONFIG.SYS is updated with the new values (-a flag).

Border Width

To make resizing windows easier with the touchscreen, increase the Border Width for the desktop. A value of 17 is recommended for 640x480 video resolution, 26 for 1024x768. For other resolutions, pick a border width that visually matches the title bar width. Wide borders may look strange at first, but after awhile they will seem normal. The new border width will not be reflected until the system is rebooted.

TIPS ON USING THE TOUCHSCREEN IN PRESENTATION MANAGER

The following are suggestions for using the touchscreen with Presentation Manager. Mouse button emulation mode 6 is assumed.

Removing the Mouse Pointer

A mouse pointer is not required in most touchscreen applications and may actually be a distraction. The user's eyes will follow the pointer's movement instead of focusing on the application. With a pointer present, the user performs the indirect act of moving the arrow to an object instead of the direct, natural act of touching the object.

With OS/2 3.0 (Warp), it is possible to disable the mouse pointer as follows:

1. Open the OS/2 System folder, then System Setup.

2. Open the Mouse icon. A Settings notebook will be displayed.

3. Select the Pointers tab.

4. Highlight the arrow icon. Select Edit.

5. With the Icon Editor, select File/New to create a null cursor. Select File/Save.

6. Close the notebook.

Resizing Windows

See *Border Width*, page 20.

Menus

Menus are best navigated by sliding along the menu bar, then down a drop-down menu. Highlighting will follow your finger, indicating the position of touch. When you release, the highlighted item will be selected. This technique is easier than accurately tapping an item on the menu bar, and then tapping an item within a drop-down or pop-up menu.

Scrolling

Scrolling lists can be performed by touching the scroll bars, as you would with the mouse. Some lists can be scrolled more easily by touching the data area, sliding your finger to an edge, then continuing to slide outside the area. This technique works in drop-down lists, for example. In fact, the farther away you slide from the list, the faster the data scrolls.

Maximizing Windows

To maximize a window, double tap on the window's title bar, rather than tapping the Maximize button. Likewise, to restore a maximized window to its previous size, double-tap its title bar instead of tapping the Restore button. You can also use the Control menu to maximize, minimize, and restore windows.

Using the Overscan Area

MonitorMouse for OS/2 pushes all touches in the display's overscan area within the screen image. This effectively enlarges the active touch area of zones on the edges of the image. You may touch the edges and corners of the CRT face to easily click on items displayed at the extremes of the image. For example, when a

window is maximized, you may touch the upper-right corner to restore the window, touch the top to click on the window title, and double-tap the upper-left corner to close the window.

Option Buttons and Check Boxes

It is easier to select an option by touching the option name rather than touching the option button. The same is true with check boxes.

Choosing the Control-Menu, Minimize, Maximize, and Restore Buttons

Windows can be maximized and restored easily by double-tapping the title bar as described above. The Minimize, Maximize, and Restore buttons, and the Control-menu box can be difficult to touch as they are quite small on high-resolution screens. Since they all act on button release, you can slide among them before selecting as with the drop-down menus. You can also use the Control menu to easily maximize, minimize, restore, and close windows.

TIPS ON PUBLIC ACCESS KIOSK APPLICATIONS

1. Run the application full screen. Do not have a title bar, menu bar, etc.

2. Use bright background colors (never black) to hide fingerprints and reduce glare. A patterned background, such as dithering, will also help the eye focus on the image rather than reflections, especially in background areas where there are no icons or menu choices. Fingerprints make a system look dirty and unattractive.

3. Use a simple point-and-click interface with large buttons. Do not use dragging, double clicks, scroll bars, drop-down menus, multiple windows, etc.

4. Turn off the cursor. Users will focus on the entire screen instead of the arrow. The presence of a cursor makes the user subconsciously think "how do I get the arrow to do what I want?" By removing the cursor, the user's thinking/action is direct instead of indirect, unlocking the true power of touchscreens.

5. Always give feedback to the user instantly on touch. A 3-D button effect works well (such as an OS/2 standard button). Output a click sound, etc. Clear the screen while searching for the next screen. Use an hourglass. Immediate feedback is necessary because the touchscreen has no tactile feedback mechanism.

6. Optimize the application for speed. A quick response keeps the user's attention. Users will walk away from a sluggish system. Speedy systems also reduce vandalism. Do not use a graphics mode with higher than necessary colors/resolution. It will only slow down the system. (Use of 256 colors is typically more important than resolution above 640x480.)

7. The application must be intuitive. Guide the user. Limit choices. Test the application on focus groups. If anyone pauses for even a moment, think how to improve the application so it is totally obvious.

8. Consider using a sound card with digitized speech to prompt the user through the application. For example, "Touch the first letter of the company you are looking for." Click. "Now touch OK." Click. There is something almost magical about a user interface with voice prompting and touch response. Your brain can simultaneously process voice while absorbing an image.

9. The main screen must attract the user from a distance. Animation and large fonts are ways to catch the eye. An attractive kiosk design is also important.

10. Other kiosk design tips: If forced air ventilation is used, position the fan at the top near the monitor's vents. The intake should not be near the floor where airborne dust from footsteps can become a problem. Air should not enter around the CRT face either. The kiosk design should accommodate variation in monitor dimensions and bezels, as monitor models may come and go every few months. Speakers should point towards the user's face, not their knees. Choose a finish that does not show fingerprints. Avoid polished stainless steel, chrome, and glossy black paint.

All of the above suggestions may seem obvious, but it is surprising how many developers miss some of these points. Sometimes a simple change to the application can mean the difference between a project's success or failure.

PROGRAMMING OPTIONS

Presentation Manager applications can launch the Touchscreen Control Panel (ELOCAL2.EXE) with the DosExecPgm() function.

It is also possible to directly call the calibration procedure in the Touchscreen Control Panel by executing ELOCAL2.EXE with a flag as follows:

ELOCAL2 -Calibrate

Appendix A
Configuring Your Controller

- *General Information* **25**

- *Controller Data Sheets* **26**

GENERAL INFORMATION

This appendix describes how to configure your controller's switch and/or jumper settings for use with MonitorMouse for OS/2. Controllers are typically shipped pre-configured for use with MonitorMouse for OS/2.

Your controller's switch and jumper settings can be found on one of the next few pages. Our recommendations should give you the best performance, but feel free to try other settings if an option is given.

For controller drawings and installation instructions, refer to the *IntelliTouch Product Manual* or the *AccuTouch Product Manual*.

Choosing an Interrupt (IRQ) for PC-Bus Controllers

MonitorMouse for OS/2 requires all PC-Bus controllers to be in Interrupt Mode. Choose the interrupt (IRQ) carefully so it will not conflict with another device installed in the system.

The following table lists the devices normally assigned to each IRQ:

IRQ	Device
2	Mapped to IRQ9
3	COM2
4	COM1
5	LPT2
6	Floppy disk controller
7	LPT1

Below are Elo's recommendations for choosing an interrupt, in order of preference. Skip the IRQ if a conflict may exist.

5, 7, 2, 3, 4, 6

CONTROLLER DATA SHEETS

Setup information for each controller begins on a new page. Skip to the appropriate page for your controller.

NOTE

Switches may be labeled either OFF/ON or OPEN/CLOSE, depending on your controller. The data sheet tables always list switch positions as OFF (open) or ON (close).

IntelliTouch Serial Controller (E281-2300)

Verify the controller's jumper settings are as follows:

	(From Left)
9600 Baud	J0 - N
	J1 - N
Binary Mode	J2 - N
Hardware handshaking enabled	J3 - N
Stream Mode	J4 - N
Reserved	J5 - N
Reserved	J6 - N
Power-on settings from jumpers	J7 - Y
Reserved	J8 - N
Reserved	J9 - N
Emulation mode disabled	J10 - N
	J11 - N

Jumpers cross-connected horizontally on the *bottom* pins of the jumper block have no effect and are available as extra jumpers.

IntelliTouch Serial Controller (E281{A}-4002)

Verify the controller's switch settings are as follows:

	(From Bottom)
Stream Mode	SW0 - OFF
Binary Mode	SW1 - OFF
Z-axis enable	SW2 - ON
9600 Baud (recommended)	SW3 - ON
	SW4 - ON
	SW5 - ON
Reserved	SW6 - ON
Reserved	SW7 - ON

AccuTouch Serial Controller (E271-2210)

Verify the controller's jumper settings are as follows:

	(From Left)
9600 Baud	J0 - N
	J1 - N
Binary Mode	J2 - N
Hardware handshaking enabled	J3 - N
Stream Mode	J4 - N
Reserved	J5 - N
Reserved	J6 - N
Power-on settings from jumpers	J7 - Y
Reserved	J8 - N
Reserved	J9 - N
Emulation mode disabled	J10 - N
	J11 - N

Jumpers cross-connected horizonatally on the *bottom* pins of the jumper block have no effect and are available as extra jumpers.

AccuTouch Serial Controller (E271-140)

Verify the controller's switch settings are as follows:

Baud Rate
      9600   SW1 - OFF   SW2 - OFF
      4800   SW1 - ON   SW2 - OFF
      2400 (recommended)   SW1 - OFF   SW2 - ON
      300   SW1 - ON   SW2 - ON
8-Bit Data   SW3 - OFF
Binary Mode   SW4 - ON
Filtered Mode   SW5 - ON
Stream Mode   SW6 - OFF

2400 baud is recommended to limit the excessive amounts of data at higher baud rates.

Next, verify the Touchscreen Type jumpers. The controller is shipped with a jumper installed on the pins marked W1. This is the correct setting for E274 5-wire touchscreens. If you are using an older E270 3-wire touchscreen, install the jumper on W2 instead.

IntelliTouch PC-Bus Controller (E281-4035)

Verify the controller's switch settings are as follows:

12-Bit Mode	SW1 - ON
Reserved	SW2 - ON
Stream Mode	SW3 - OFF
Reserved	SW4 - ON
Z-axis enable	SW5 - ON
Reserved	SW6 - ON

Next, set the controller's Base I/O Port address with the W2 and W3 jumpers. W3 selects the high-order address, and W2 th low-order address. The values of the settings are shown in the following table:

W3		**W2**	
HI (100X)		**LOW (10X)**	
Position (from top)	**Value (in hex)**	**Position (from top)**	**Value (in hex)**
0	000	0	00
1	100	2	20
2 (recommended)	200	4	40
3	300	6	60
		8 (recommended)	80
		A	A0
		C	C0
		E	E0

To calculate the Base I/O Port address, add the values of the jumpered positions of W3 and W2. For example, the E281-4035 is shipped jumpered for a Base I/O Port address of 280 hexadecimal. W3 is jumpered in the third position (200), and W2 is jumpered in the fifth position (80). The address is the sum of 200 + 80, which is 280.

Next, install a jumper vertically at W1 to select the Interrupt (IRQ). The E281-4035 is shipped jumpered for IRQ5. See *Choosing an Interrupt (IRQ) for PC-Bus Controllers*, page 25. The jumper block positions are as follows:

Interrupt (IRQ)
W1
(from left)
2
3
4
5 (factory set)
6
7

Remember the Base I/O Port address and IRQ values. You will need them when updating your CONFIG.SYS file.

E281-4035 Emulation Modes

The E281-4035 controller is software compatible with the E281A-4025 controller. If you are using driver software that only supports the AccuTouch E271-141 protocol, the E281-4035 can be set up through switch SW5 (Z-axis disable) for hardware compatibility with the E271-141 controller.

IntelliTouch PC-Bus Controller (E281{A}-4025)

Verify the controller's switch settings are as follows:

	(From Bottom)
12-Bit Mode	SW1 - ON
Reserved	SW2 - ON
Stream Mode	SW3 - OFF
Reserved	SW4 - ON
Z-axis enable	SW5 - ON
Reserved	SW6 - ON
Reserved	SW7 - ON
Reserved	SW8 - ON

Next, set the controller's Base I/O Port address with the W2 and W3 jumpers. W3 selects the high-order address, and W2 the low-order address. The values of the settings are shown in the following table:

W3		**W2**	
Position (from top)	**Value (in hex)**	**Position (from top)**	**Value (in hex)**
4	300	8	E0
3 (recommended)	200	7	C0
2	100	6	A0
1	000	5 (recommended)	80
		4	60
		3	40
		2	20
		1	00

To calculate the Base I/O Port address, add the values of the jumpered positions of W3 and W2. For example, the E281{A}-4025 is usually shipped jumpered for a Base I/O Port address of 280 hexadecimal. W3 is jumpered in the third position (200), and W2 is jumpered in the fifth position (80). The address is the sum of 200 + 80, which is 280.

Next, install a jumper vertically at W1 to select the Interrupt (IRQ). A jumper is supplied, but may be found in a horizontal, inactive position. See *Choosing an Interrupt (IRQ) for PC-Bus Controllers*, page 25. The jumper block positions are as follows:

W1 Position (from left)	Interrupt (IRQ)
6	2
5	3
4	4
3	5 (factory set)
2	6
1	7

Remember the Base I/O Port address and IRQ values. You will need them when updating your CONFIG.SYS file.

AccuTouch PC-Bus Controller (E271-2201)

Verify the controller's jumper settings are as follows:

	(From Top)
Default from jumpers	J7 - Y
Reserved	J6 - N
Touchscreen Type	
AccuTouch	J5 - Y
Stream Mode	J4 - N
No Interrupt (software selected)	J3 - N
	J2 - N
Base I/O Port (in hex)	
280 (recommended)	J1 - N
	J0 - N
240	J1 - N
	J0 - Y
180	J1 - Y
	J0 - N
100	J1 - Y
	J0 - Y
2A0	Cross-connect (connect jumper vertically so the left pins of J0 and J1 are jumpered)

J10 and J11 elsewhere on the controller should not be jumpered.

Jumpers cross-connected vertically on the *right* side of the jumper block have no effect and are available as extra jumpers.

AccuTouch PC-Bus Controller (E271-141)

Verify the controller's switch settings are as follows:

	(From Top)
12-Bit Mode	SW1 - ON
No calibration data on reset	SW2 - ON
Stream Mode	SW3 - OFF
Filtered Mode	SW4 - ON

Next, set the controller's Base I/O Port address with the W2 and W3 jumpers. W3 selects the high-order address, and W2 the low-order address. The values of the setting are shown in the following table:

W3		**W2**	
Position (from top)	**Value (in hex)**	**Position (from top)**	**Value (in hex)**
1	000	1	00
2	100	2	20
3 (recommended)	200	3	40
4	300	4	60
		5 (recommended)	80
		6	A0
		7	C0
		8	E0

To calculate the Base I/O Port address, add the values of the jumpered positions of W3 and W2. For example, the E271-141 is usually shipped jumpered for a Base I/O Port address of 280 hexadecimal. W3 is jumpered in the 3rd position (200), and W2 is jumpered in the 5th position (80). The address is the sum of 200 + 80, which is 280.

Next, install a jumper vertically at W1 to select the Interrupt (IRQ). A jumper is supplied, but may be found in a horizontal, inactive position. See *Choosing an Interrupt (IRQ) for PC-Bus Controllers*, page 25. The jumper block positions are as follows:

Position (from left)	Interrupt (IRQ)
1	2
2	3
3	4
4	5 (factory set)
5	6
6	7

Remember the Base I/O Port address and IRQ values. You will need them when updating your CONFIG.SYS file.

Next, verify the Touchscreen Type jumpers. The controller is shipped with a jumper installed on the pins marked W4. This is the correct setting for E274 5-wire touchscreens. If you are using an older E270 3-wire touchscreen, install the jumper on W5 instead.

AccuTouch Micro Channel Controller (E271-2202)

Verify the controller's jumper settings are as follows:

	(From Top)
Default from jumpers	J7 - Y
Reserved	J6 - N
Touchscreen Type	
AccuTouch	J5 - Y
Stream Mode	J4 - N
Reserved	J3 - N
Reserved	J2 - N
Reserved	J1 - N
Reserved	J0 - N

Jumpers cross-connected vertically on the right side of the jumper block have no effect and are available as extra jumpers.

Controller Installation

Installing controllers in a Micro Channel computer requires several additional steps. Proceed in order as follows:

Copy the file @6253.ADF from the MonitorMouse for OS/2 distribution disk to your Backup Copy of your "IBM PS/2 Reference Disk". If you do not have a backup of your Reference Disk, boot with the Reference Disk in drive A and follow the on-screen instructions to create one.

Follow the "Installing an Adapter" instructions in your *IBM Personal System/2 Quick Reference*. The controller (adapter) may be installed in any available slot.

Power up with your backup copy of the Reference Disk in drive A. Error 165—Adapter Configuration Error—will appear because you just installed a new adapter. Press [Enter] on the logo screen, then follow the on-screen instructions to "Automatically configure the system."

Next, follow the on-screen instructions to "View Configuration" and verify that the E271-2202 controller was detected. You should see installed in a slot the "Elo E271-2202 Touchscreen Controller". The Base I/O Port and selected Interrupt (IRQ) will also be shown. Later, if you have problems, you can "Change Configuration" of the controller's Base I/O Port and Interrupt.

Quit the program, remove the Reference Disk, and restart the computer. The system should now boot without any error messages. Continue your MonitorMouse for OS/2 installation as you would with other controllers.

Appendix B

Driver Command Reference

COMMAND LINE

In general, the MonitorMouse for O/S2 driver is configured with parameters and flags as follows:

```
device=c:\elo\monmou<XX>.sys <controller parameters> <flags>
```

where <XX> is:

01   for serial touchscreen controllers on PC-Bus systems.
02   for serial touchscreen controllers on Micro Channel systems.
03   for PC-Bus and Micro Channel touchscreen controllers.

and the <controller> parameters are:

<controller>,<COM port #>, <baud rate>	for serial touchscreen controllers.
<controller>,<base port>,<interrupt (IRQ)>	for PC-Bus touchscreen controllers.
<controller>	for Micro Channel touchscreen controllers.

FLAGS

The following <flags> may be specified on the DEVICE=MONMOUxx command line in any order, upper or lower case, separated by spaces. No flags are required during initial installation. Some flags will be added and updated by the Touchscreen Control Panel program, ELOCAL2.EXE.

-c<n1,..,n6>	The -c flag lists the n1-n6 calibration points in the order XLow, XHigh, YLow, YHigh, ZLow, ZHigh. Calibration points are determined and updated by the Touchscreen Control Panel program.
-s<+/->	The -s+ flag may be added by the Touchscreen Control Panel program after calibrating to correct swapped X and Y axes due to incorrect cabling. -s- is the default.
-m<n>	The -m flag specifies the mouse button emulation mode, identical to the modes used in MonitorMouse for DOS, Windows, Windows NT, and Macintosh. Mode 6 is suggested for general use in Presentation Manager. The -m flag can be changed with the Touchscreen Control Panel program. -m6 is the default.
-b<+/->	The -b+ flag enables a "click" sound on touch. The -b flag can be changed with the Touchscreen Control Panel program. -b+ is the default.
-a<x>,<y>	The -a flag specifies the size of the *double-click area* in pixels. This area is used for detecting double-clicks in mouse button emulation mode 6. Normally, OS/2 expects a double-click to be on the same pixel—easy to do with a mouse, but almost impossible with a touchscreen. By expanding this area, it becomes easier to double-click by double-tapping anywhere within this area. The defaults for <x> and <y> are calculated after you calibrate with the

Touchscreen Control Panel program. This area may then be manually adjusted with the Touchscreen Control Panel.

-w\<n>   This flag is not normally required. If a stationary touch generates continuous mouse clicks, add the -w flag. Causes of continuous mouse clicks include IntelliTouch controller firmware prior to version 2.2, serial controllers operating at slower   than recommended baud rates, or controllers operating in environments of extreme noise. Start with -w2 and increase \<n> until the problem is solved.

Appendix C
Troubleshooting

Most problems are due to improper installation of the software drivers. Below is a sample OS/2 2.1 CONFIG.SYS file.

```
IFS=C:\OS2\HPFS.IFS  /CACHE:64 /CRECL:4
PROTSHELL=C:\OS2\PMSHELL.EXE
SET USER_INI=C:\OS2\OS2.INI
SET SYSTEM_INI=C:\OS2\OS2SYS.INI
SET OS2_SHELL=C:\OS2\CMD.EXE
SET AUTOSTART=PROGRAMS,TASKLIST,FOLDERS,CONNECTIONS
SET RUNWORKPLACE=C:\OS2\PMSHELL.EXE
SET COMSPEC=C:\OS2\CMD.EXE
LIBPATH=.;C:\OS2\DLL;C:\OS2\MDOS;C:\;C:\OS2\APPS\DLL;
SET PATH=C:\OS2;C:\OS2\SYSTEM;C:\OS2\MDOS\WINOS2;C:\OS2\INSTALL;C:\;C:\OS2\MDOS;C:\OS2\APPS;
SET DPATH=C:\OS2;C:\OS2\SYSTEM;C:\OS2\MDOS\WINOS2;C:\OS2\INSTALL;C:\;C:\OS2\BITMAP;
         C:\OS2\MDOS;C:\OS2\APPS;
SET PROMPT=$i[$p]
SET HELP=C:\OS2\HELP;C:\OS2\HELP\TUTORIAL;
SET GLOSSARY=C:\OS2\HELP\GLOSS;
SET IPF_KEYS=SBCS
PRIORITY_DISK_IO=YES
FILES=20
DEVICE=C:\OS2\TESTCFG.SYS
DEVICE=C:\OS2\DOS.SYS
DEVICE=C:\OS2\PMDD.SYS
BUFFERS=30
IOPL=YES
DISKCACHE=1024,LW,AC:C
MAXWAIT=3
MEMMAN=SWAP,PROTECT
SWAPPATH=C:\OS2\SYSTEM 2048 2048
BREAK=OFF
THREADS=256
PRINTMONBUFSIZE=134,134,134
COUNTRY=001,C:\OS2\SYSTEM\COUNTRY.SYS
SET KEYS=ON
BASEDEV=PRINT01.SYS
BASEDEV=IBM1FLPY.ADD
BASEDEV=IBM1S506.ADD
BASEDEV=OS2DASD.DMD
```

```
SET BOOKSHELF=C:\OS2\BOOK
SET EPMPATH=C:\OS2\APPS;
PROTECTONLY=NO
SHELL=C:\OS2\MDOS\COMMAND.COM C:\OS2\MDOS
FCBS=16,8
RMSIZE=640
DEVICE=C:\OS2\MDOS\VEMM.SYS
DOS=LOW,NOUMB
DEVICE=C:\OS2\MDOS\VDPX.SYS
DEVICE=C:\OS2\MDOS\VXMS.SYS /UMB
DEVICE=C:\OS2\MDOS\VDPMI.SYS
DEVICE=C:\OS2\MDOS\VCDROM.SYS
DEVICE=C:\OS2\MDOS\VWIN.SYS
DEVICE=C:\OS2\OS2CDROM.DMD /Q
IFS=C:\OS2\CDFS.IFS /Q
BASEDEV=OS2SCSI.DMD
BASEDEV=AHA154X.ADD
DEVICE=C:\OS2\MDOS\VMOUSE.SYS
DEVICE=C:\OS2\POINTDD.SYS
rem DEVICE=C:\OS2\MOUSE.SYS
device=c:\elo\monmou03.sys 4035,280,5 ·s· ·c62,2377,1854,137,1,15 ·m6 ·b+ ·f·
device=c:\os2\mouse.sys stype=elomou$
DEVICE=C:\OS2\COM.SYS
DEVICE=C:\OS2\MDOS\VCOM.SYS
CODEPAGE=437,850
DEVINFO=KBD,US,C:\OS2\KEYBOARD.DCP
DEVINFO=SCR,VGA,C:\OS2\VIOTBL.DCP
SET VIDEO_DEVICES=VIO_VGA
SET VIO_VGA=DEVICE(BVHVGA)
DEVICE=C:\OS2\MDOS\VVGA.SYS
```

If the driver commands are correctly placed in CONFIG.SYS, verify that the controller type and communication parameters match the controller's. See Appendix A for controller switch/jumper settings.

Check for any error message displayed by the drivers when the system is started. The touchscreen driver will display power-on diagnostic results for most touchscreen controllers, possibly indicating a hardware problem. Verify all connections.

To display the diagnostic results, controller communication parameters, controller firmware revision level, and software revision levels from the Touchscreen Control Panel, select <u>A</u>bout, then <u>I</u>nfo.

Several DOS programs are included to assist in troubleshooting. Use COMDUMP or BUSSTAT after booting under DOS to see if the touchscreen is transmitting any data. Refer to the *DOS and Windows Driver Guide* for instructions. The SAWDUMP utility displays the power-on diagnostics for IntelliTouch controllers and gathers other useful information for Elo Technical Support.

For additional hardware troubleshooting steps, see the *IntelliTouch Product Manual* or the *AccuTouch Product Manual* as appropriate. If you need help, see *Contacting Elo*, page 6.

Appendix D
Installation for AVC

To use MonitorMouse for OS/2 with IBM Audio Visual Connection (AVC) multimedia authoring tool, perform the following additional steps after verifying correct operation of the touchscreen with pRESENTATION Manager.

1. Extract the TOUCH.SYS and VTOUCH.SYS files from your OS/2 disks or CD-ROM. Place TOUCH.SYS in the \OS2 directory and VTOUCH.SYS in \OS@\MDOS directory.

2. Add DEVICE commands to your CONFIG.SYS file for TOUCH.SYS nad VTOUCH.SYS as in the following example. These commands are in addition to the change described in Chapter 2.

   ```
   DEVICE=C:\ELO\MONMOU0X.SYS [existing parameters]
   DEVICE=C:\OS2\TOUCH.SYS TYPE=ELOTOU$
   DEVICE=C:\OS2\MDOS\VTOUCH.SYS
   DEVICE=C:\OS2\MOUSE.SYS [existing parameters]
   ```

3. Reboot.

If the touchscreen does not appear properly calibrated in AVC applications, verify that Presentation Manager is running in 640x480 resolution and recalibrate the touchscreen with the Touchscreen Control Panel

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