# Metro-X 4.1
## X Window System Server

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# Preface

This manual is intended for use by readers already familiar with UNIX-based operating systems—including system configuration, administration, command structures, and file editing.

Throughout the manual various typographical elements are used to represent different types of information or instruction. Below is an example of each font and its meaning:

- This font is used for instruction, explanation, and reference.
- `This font represents user input or computer output.`
- Specific keyboard keys are represented graphically, such as Alt and Ctrl. In addition, the key labeled as either *Enter* or *Return* on your keyboard is always shown in this manual as Enter.
- When keys are connected with a dash, such as Ctrl-Alt-Delete, those keys should be pressed simultaneously.

Metro-X is available for many operating systems and hardware platforms. As such, it isn't feasible to provide examples for each system. When examples are provided, they should be viewed as guidelines only. Your system may differ. Reference your operating system's documentation for information specific to your set up.

# Contents

CHAPTER 1

# Configuring Metro-X

## Overview

Metro-X is configured for your system through a graphical utility called *ConfigX*, which is used to specify the mouse, keyboard, monitor, graphics card, color depth, and screen resolution(s) you are using.

## Configuration Procedure

### Start-up

1. Login as *root* and type the following command:

```
/usr/bin/X11/configX
```

   On **Linux**, use this command instead:

```
/usr/X11R6/bin
```

2. The explanation of special keys appears. (This message only appears prior to the initial configuration of Metro-X, when no `Xconfig` file exists.)
3. Press (Enter) to continue.

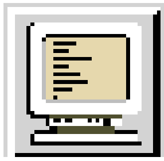
FIGURE 1: **Description of Special Keys**

## Special Keys

When Metro-X is first installed, it doesn't yet recognize your mouse. Special keys must be used to move around the screens and make your selections during the initial configuration process.

TABLE 1: **Function of Special Keys**

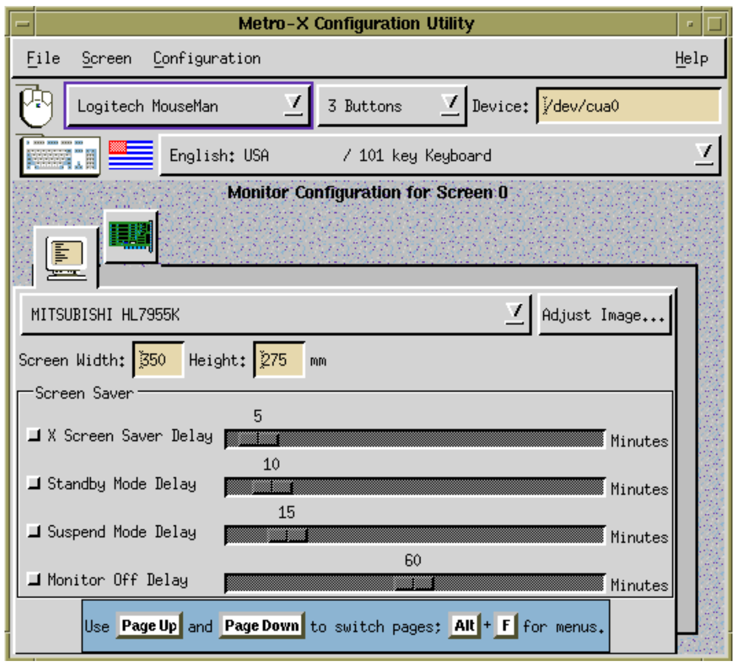
| KEY | FUNCTION |
|---|---|
| Tab | Moves forward from field to field. |
| Shift-Tab | Moves backward from field to field. |
| ↑ ↓ ← → | Changes the value in the current field. |
| Enter | Sets/unsets a toggle button. |
| Page Down | Switches to the next configuration page. |
| Page Up | Switches to the previous configuration page. |
| Esc | Cancels out of the current screen or pop-up. |
| Alt-F | Jumps to the *File* pull-down menu. |
| Alt-S | Jumps to the *Screen* pull-down menu. |
| Alt-C | Jumps to the *Configuration* pull-down menu. |



# Monitor Configuration

The first configuration page controls the mouse, keyboard, and monitor.

FIGURE 2: **Monitor Configuration Page**




## Mouse

If the default mouse is not correct for your system,

1. Press ↓ to display the list of mice.
2. Press ↑ or ↓ to scroll to your mouse type, then press Enter to select it.
3. Press Tab to move to the next field.
4. Press ↓ to display the list of mouse buttons. (The default entry is based on your mouse selection, and is usually the appropriate choice.)
5. Press ↑ or ↓ to scroll to your button entry, then press Enter to select it.
6. Press Tab to move to the next field.
7. If you need to change the path for your mouse device, edit it here.
8. Press Tab to move to the next field.

If you are using a touch-screen instead of a mouse, refer to *Touch-Screen Support* on page 18 for set-up and calibration instructions.

## Keyboard

Metro-X includes international keyboard support, which allows you to select the keyboard appropriate for your language and country.

1. The initial keyboard setting is *Default: Use default console mapping*, which will work with most keyboards.
2. Press ↓ to display the list of keyboards.
3. Press ↑ or ↓ to scroll to your keyboard entry, then press Enter to select it.
4. Press Tab to move to the next field.

## Monitor

1. The default monitor setting is *Generic 640x480 @ 60Hz 13 inch*.
2. Press ↓ to display the list of monitors.
3. Press ↑ or ↓ to scroll to your monitor entry, then press Enter to select it.
4. Press Tab **twice** to move to the *Screen Width* field. (Bypass the *Adjust Image* button until after you've configured your system. See "Adjust Image (Timing Editor)" on page 12.)
5. If you need to change the screen width (mm), edit it here.
6. Press Tab to move to the next field.
7. If you need to change the screen height (mm), edit it here.
8. Press Tab to move to the next field.

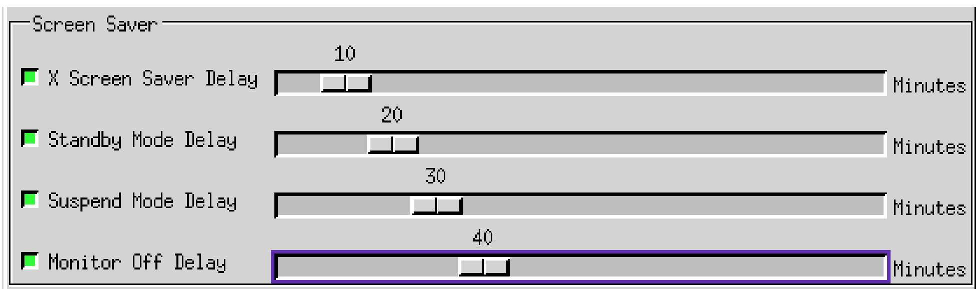
## Screen Saver

Some graphics cards and monitors support the Display Power Management System (DPMS), which minimizes the power used by the monitor when user input ceases. If your hardware has this feature, the phases of DPMS can be controlled in this section. The typical DPMS setup has a cascade effect, with the various phases being activated in succession with your choice of delay times between each.

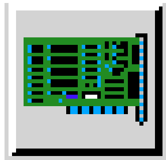
- **X Screen Saver** - Preliminary phase to DPMS, which blanks the screen but provides no power reduction.

- **Standby Mode** - First phase of DPMS, which provides moderate power reduction by disabling the horizontal sync signal to the monitor.
- **Suspend Mode** - Second phase of DPMS, which provides significant power reduction by disabling the vertical sync signal to the monitor.
- **Monitor Off** - Final phase of DPMS, which provides maximum power reduction by disabling both the horizontal and vertical sync signals to the monitor.

FIGURE 3: **Screen Saver Configuration**



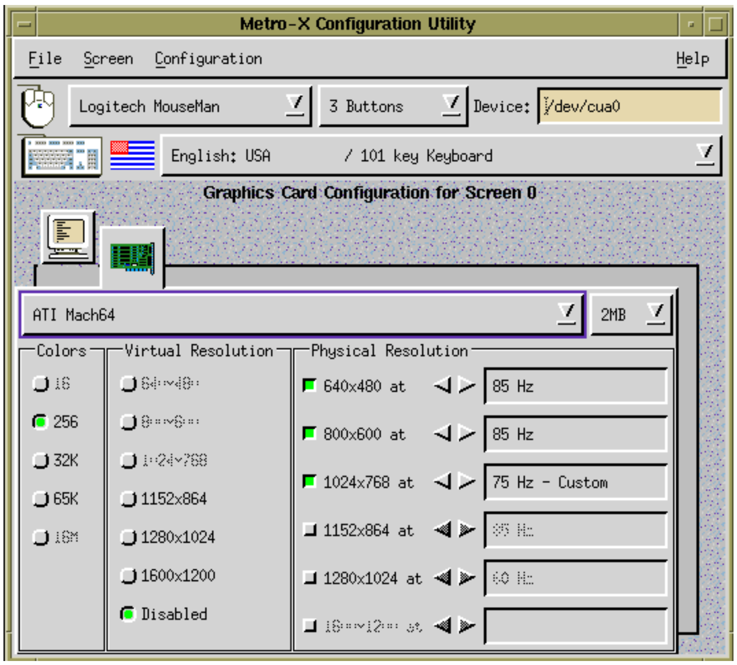

1. In the *X Screen Saver Delay* field, press Enter to toggle this option on or off.
2. If toggled on, press Tab to move to the *Minutes* field, then use ← or → to set the value.
3. Press Tab to move to the next field.
4. In the *Standby Mode Delay* field, press Enter to toggle this option on or off.
5. If toggled on, press Tab to move to the *Minutes* field, then use ← or → to set the value.
6. Press Tab to move to the next field.
7. In the *Suspend Mode Delay* field, press Enter to toggle this option on or off.
8. If toggled on, press Tab to move to the *Minutes* field, then use ← or → to set the value.
9. Press Tab to move to the next field.
10. In the *Monitor Off Delay* field, press Enter to toggle this option on or off.
11. If toggled on, press Tab to move to the *Minutes* field, then use ← or → to set the value.



## Graphics Card Configuration

Press (Page Down) to move to the second configuration screen, which controls the graphics card, the number of colors, the virtual resolution, and the physical resolution.

FIGURE 4: **Graphics Card Configuration Page**




Each graphics card configuration consists of five elements:

- The graphics card (make and model).
- The number of colors supported on screen simultaneously (color depth).
- The virtual resolution of the screen (width x height).
- The physical resolution of the screen (width x height).
- The screen refresh rate (Hz).

Non-interlaced modes give a better screen appearance than refresh rates which are labeled “Interlaced”. The highest refresh rate that your monitor supports will give the best image. At higher screen resolutions a higher refresh rate is particularly important to prevent the screen from visibly flickering. The highest refresh rate supported by the selected monitor is automatically displayed.

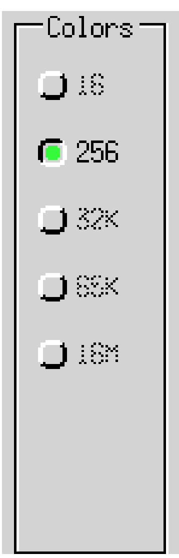
## Graphics Card

1. The default graphics card setting is *IBM VGA*.
2. Press ↓ to display the list of graphics cards.
3. Press ↑ or ↓ to scroll to your graphics card entry, then press Enter to select it.Only models specifically listed are officially supported by Metro-X. If your card model is not listed, try selecting one of the "generic" entries with the same components (graphics chip and ramdac). This may work for you.
4. Press Tab to move to the next field.

## Memory

1. Scroll through the pull-down list of memory amounts and select the amount of memory on the graphics card you are using. (The memory affects the availability of colors and resolutions.)
2. Press Tab to move to the next field.

## Colors



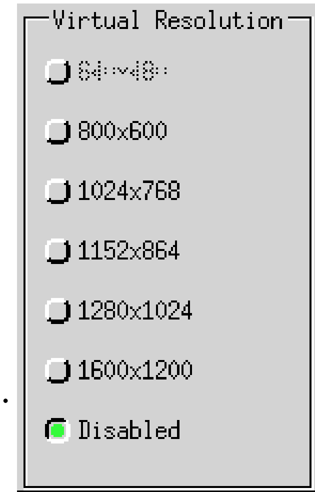

Not all graphics cards can support all color depths (number of colors). Only the options for the color depths supported by your card will be sensitive in this field. The other options will be grayed out.

- Only **one** color option can be selected (due to design limitations of X).
- In some cases the color options available will be limited by the physical resolution(s) you choose, based on the capabilities of your graphics card. Not all color depths are available at high resolutions.

1. The default setting is at the lowest value for your card.
2. Decide which available color setting you want to use.
3. Press Tab to move to that color setting, then press Enter to select it. (The previous setting will be cancelled.)
4. Press Tab to move to the next field.

## Virtual Resolution

The *Virtual Resolution* setting allows you to have a work area that is actually larger than your physical screen. Windows can extend beyond the screen's physical boundaries and are viewed by scrolling into the extended areas. Only the options for the virtual resolutions supported by your card will be sensitive in this field. The other options will be grayed out. If you don't want to use this feature, select the *Disabled* option.

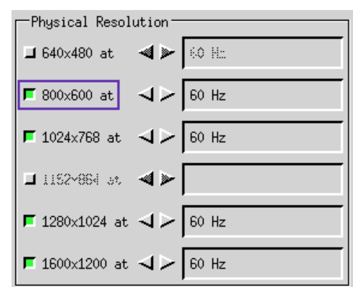



- ✥ Only **one** virtual resolution can be selected.
- ✥ In some cases the virtual-resolution options available will be limited by the physical resolution(s) you choose, since the virtual resolution must always be greater than the highest physical resolution.

1. The default setting for virtual resolution is *Disabled*.
2. Decide which available virtual resolution you want to use.
3. Press Tab to move to that setting, then press Enter to select it. (The previous setting will be cancelled.)
4. Press Tab to move to the next field.

## Physical Resolution

- ✥ Not all graphics cards and monitors can support all physical resolutions. Only the options for the resolutions supported by your hardware will be sensitive in this field. The other options will be grayed out.




- ✥ **Multiple** physical resolutions can be selected. You can switch between these resolutions while running Metro-X by pressing a hot-key combination:
  - ✥ Press Ctrl-Alt-+ to change to the next resolution.
  - ✥ Press Ctrl-Alt-– to change to the previous resolution.

5. If you want only **one** resolution, make sure only **one** *Physical Resolution* toggle button is selected.

- ✥ In some cases the physical resolution(s) you choose may limit the selections you can make in *Colors* and *Virtual Resolution*, depending on the capabilities of your graphics card.
- ✥ If the word "Custom" appears after the frequency, you have used the timing editor to modify a mode. See "Adjust Image (Timing Editor)" on page 12. Changing the graphics card or monitor invalidates the custom modes, and you will no longer see the custom tag in the frequency box.

1. The default setting is at the lowest value for your card.
2. Decide which available resolution(s) you want to use.
3. Press Tab to move to the setting, then press Enter to select it.

4. Press Tab to move to the corresponding field to set the screen refresh rate (Hz) for that resolution, then use ← or → to select a value from the frequency options available. The default setting is the highest frequency your monitor supports, and is usually the appropriate choice.
5. Repeat this procedure for each physical resolution you want to set.

## Multiple-Screen Configuration

Metro-X supports up to four screens which can all be controlled simultaneously with a single keyboard and mouse. This allows you to run many applications without overlapping windows, and is particularly useful for image-processing work.

For each screen used, a separate configuration must be created for that screen's monitor and graphics card. See *Multiple Screens* on page 17 for graphics card requirements.

## Adding a Screen

Metro-X defaults to a single-screen setup. The first screen configured is labeled *Screen 0*. When you add a second screen, all of its configuration default settings will duplicate the current settings of Screen 0. So if your hardware is the same on all screens, you can save time by configuring Screen 0 before adding the other screens. Similarly, as more screens are added, the settings of whichever one is currently active when you add another screen will determine the default settings of the new screen.

1. Press Alt-S to display the *Screen* pull-down menu.
2. Type *A* for *Add*.
3. The *Monitor* and *Graphics Card* icons for Screen 0 become outlines, and two full-color icons appear for Screen 1.
4. Refer to the procedures described earlier in this chapter if any changes need to be made to the new screen's configuration.
5. Use the Page Down and Page Up keys to move to the configuration pages of each screen.

## Deleting a Screen

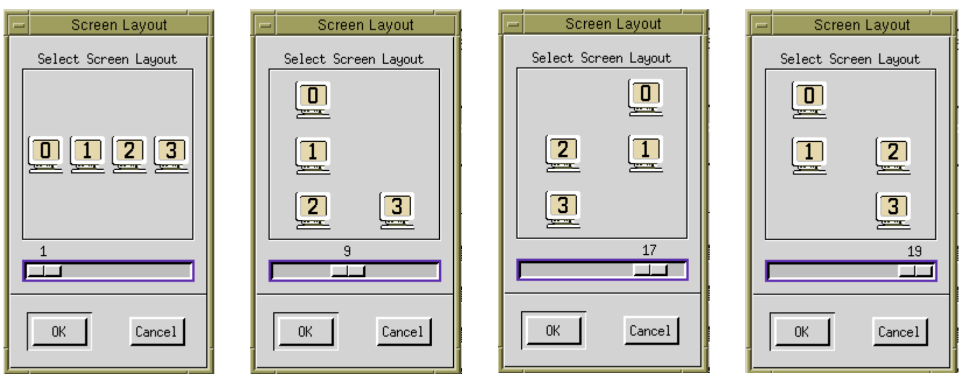
When a screen is deleted, all screens with higher screen numbers immediately drop down one slot. For instance: You currently have screens 0, 1, and 2 configured and you delete screen 1. That screen and all of its configuration information disappears. Screen 2 then becomes screen 1, but retains its own configuration. You are left with screens 0 and 1.

1. Use the Page Down or Page Up key to activate the set of icons for the screen you want to delete.
2. Press Alt-S to display the *Screen* pull-down menu.
3. Type *D* for *Delete*.
4. One set of *Monitor* and *Graphics Card* icons disappears. Higher-numbered screens (if any) immediately fill the gap of the deleted screen.

### Screen Layout

The *Screen Layout* window lets you specify how the multiple screens are arranged in your workspace so mouse movement from screen to screen will be appropriate.

FIGURE 5: **Several Screen-Layout Windows**

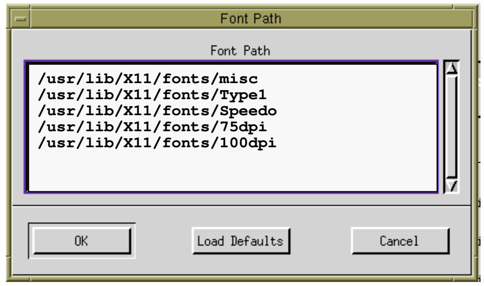



1. Press Alt-S to display the *Screen* pull-down menu.
2. Type *L* for *Layout*.
3. The *Screen Layout* window appears.
4. Press ← and → to view the various layout combinations for your number of screens.
5. When the layout you want is displayed, press Enter to select it.

## Font Path

If needed, you can edit your font path from within the Metro-X Configuration Utility. This will be necessary if you are using a font server instead of or in addition to your existing fonts.

FIGURE 6: **Font-Path Window**




1. Press Alt-C to display the *Configuration* pull-down menu, then press Enter.
2. The *Font Path* window appears.
3. Edit the file as necessary for your system. Metro-X looks for fonts in the order in which the directories are listed in this file.

   If you are using a font server, enter this as the first line:

   ```
   tcp/<fontserver machine>:7000
   ```

   If your port number is not the default `7000`, change it to the appropriate port number for your system.
4. Press Tab to move to and amongst the bottom buttons, then press Enter to select one. If the information is correct, select the *OK* button. If you want to disregard the changes you've made, select the *Cancel* button. If you've edited your font path and want to go back to the original settings, select the *Load Defaults* button.

## Save and Exit

1. Press Alt-F to display the *File* pull-down menu.
2. Type *S* for *Save and Exit*.
3. Your changes are saved, the Metro-X Configuration Utility closes, and your system is now ready to run Metro-X!

## Quit Without Saving

1. Press Alt-F to display the *File* pull-down menu.
2. Type *Q* for *Quit*.
3. A precautionary dialog box appears: *Save current configuration before exiting?*

4. Press (Tab) to move to the *No* button, then press (Enter) to confirm that you want to exit the Metro-X Configuration Utility without saving your changes.

## Adjust Image (Timing Editor)

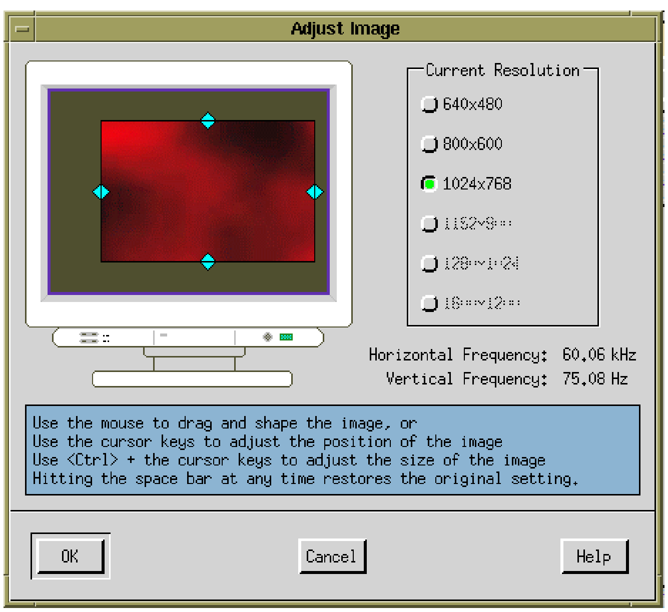
The *Adjust Image* pop-up window lets you tailor the size and position of the image to your monitor. This is also known as a timing editor. Adjust the image for each of the physical resolutions you previously selected in ConfigX.

**IMPORTANT:**

**Before adjusting the image, you must first configure your system, save and exit from ConfigX, restart your server, then run ConfigX again and select *Adjust Image*. Only then will you be adjusting the actual image supplied by your graphics card under its current configuration.**

On the left side of the *Adjust Image* pop-up window is a picture of a monitor. The blue box on the monitor's screen represents the image displayed on your own screen at the current resolution. The yellow diamonds on each side of the blue box are handles which you can use to adjust the image.

FIGURE 7: **Adjust Image Pop-up**



## Ways to Adjust the Image

- Use the mouse to drag the image to a new position.
- Use the mouse on the handles to stretch the image to a new size.
- Use the cursor keys to move the image to a new position.
- Use Ctrl with the cursor keys to adjust the size of the image.

  **NOTE: Hitting the spacebar at any time will restore the image to its original setting.**

## Procedure

1. Activate a resolution toggle button to make it the current resolution (your screen will automatically change to this resolution), then adjust the image for that setting.
2. Repeat the procedure for each resolution you will be using.

## Starting X

After configuring the server for the first time, test the server by itself. This helps you determine the source of potential problems.

Follow these steps to test the server:

1. Exit from X windows (if you had it running).
2. Make sure that your system's login-prompt program (`xdm` on most systems; `scologin` on SCO) is not running. To determine if it is running, type

   ```
   ps -e | grep xdm
   ```

   If it is running, note the `pid` number then type this command to stop it:

   ```
   kill <pid>
   ```

   On UnixWare use this command also, to prevent `xdm` from starting automatically:

   ```
   /usr/X/bin/disable_glogin
   ```

   On SCO use:

   ```
   scologin stop
   ```

   Then:

   ```
   scologin disable
   ```

3. At the system prompt, type:

   ```
   /usr/bin/X11/X
   ```

4. You will see the Metro Link copyright notice and start-up messages, then the screen will enter graphics mode.
5. After a few seconds, the screen should be painted with the standard gray background and have a small "X" cursor midscreen. The "X" cursor should move in response to mouse movements.
6. If everything is as described, the server is functioning correctly. If not, you may have chosen the wrong configuration for your card.
7. To exit the server, even if the screen is not properly displayed, press:

   Ctrl-Alt-Backspace

If the server was OK, you can now start `xdm` or use `xinit` to start your normal X session. If things were not configured correctly, use Ctrl-Alt-Backspace to exit the server, then examine your configuration.

Once you have the server properly configured, re-enable `xdm`.

On UnixWare, run:

```
/usr/X/bin/enable_glogin
```

On SCO, run:

```
scologin enable
scologin start
```

CHAPTER 2

# Special Features

## Hot-Key Exit

Metro-X supports a hot-key exit. This is useful for terminating the X server if the last client in your `.xinitrc` or `.xsession` does not provide a way to exit the session. The exit key combination is Ctrl-Alt-Backspace.

## Hot-Key Resolution Switching

When configuring Metro-X you can select several screen resolutions. You can then change resolutions on the fly while running your X server by pressing the appropriate key combination. To switch to the next resolution, press Ctrl-Alt-+. To switch to the previous resolution, press Ctrl-Alt-–.

## Hardware Panning

Metro-X supports hardware panning. This lets you set the virtual resolution higher than the monitor's physical resolution. Windows can then extend beyond the screen's physical boundaries and can be viewed by scrolling into the extended area.

## Multiple Screens

Metro-X supports up to four screens which can all be controlled simultaneously with a single keyboard and mouse. This allows you to run many applications without overlapping windows, and is particularly useful for image-processing work.

In a multiple screen configuration there is one X process, one mouse, and one keyboard— but several screens. The mouse/cursor can be moved between the different screens. Clients connect to the different screens with the syntax

```
-display :0.X
```

where *X* is the screen number.

### Supported Cards

Use up to four of any combination of graphics cards from the following list.

**NOTE: You must disable VGA on all but one of the cards.**

- One or more Matrox Millennium
- One or more Matrox Millennium II
- One or more Matrox Mystique

## Touch-Screen Support

Metro-X includes touch-screen support for Elographics serial touch-screen controllers, Carroll serial touch-screen controllers, and Lucas/Deeco serial touch-screen controllers. Touch-screens are simple devices that transmit absolute x and y coordinates to the UNIX serial driver when the screen is pressed. The X11 server reads these coordinates and converts them into X11 events, treating the touch-screen as if it were a one button mouse.

### Configuring a Touch-Screen

You can add one touch screen for every monitor (screens 0 - 3) displayed in ConfigX. Each touch screen will be associated with one monitor and one graphics card.

FIGURE 8: **Touch Screen Configuration Page**

1. Select the monitor icon to which the touch-screen will be associated. (The active icon is in color; inactive icons appear as maroon outlines.)
2. Go to the *Touch Screen* menu on the menu bar and select *Add*. A *Touch Screen Configuration* page will appear.
3. Scroll through the pull-down list of touch screens and select the type of touch screen you are using.
4. In the *Device* field, enter the name of the serial device to which your touch screen is attached.
5. Under *Report*, scroll through the pull-down list of events and select the type of event you want a touch to report. This report can be either a mouse-button event (buttons 1-4) or an X input event.
6. You are now ready to calibrate your touch screen. See the next section for details.

## Touch-Screen Calibration

All touch-screens need to be calibrated to match the display. Some touch-screens are pressure sensitive, so the calibration process uses variations in pressure to distinguish between a button click or a simple move. Since touch-screens vary, the calibration process must be set individually for each.

1. Click on the *Calibrate...* button on the *Touch Screen Configuration* page to begin the calibration of your touch screen. A pop-up window will appear with instructions.
2. A flashing target will appear in the upper-left corner of the screen. Touch the center of the target.
3. A flashing target will appear in the lower-right corner of the screen. Touch the center of the target.
4. A *Calibration Test* pop-up window will appear with a flashing target above it. Touch the target and drag it around the screen to verify your calibration settings.The icon on the pop-up window shows what is being recorded (no touch, a touch, or a click).
5. If your touch screen is pressure sensitive, use the slider bar to adjust the click threshold. Any touch pressure higher than the click threshold is reported as a button click.
6. If you need to re-calibrate your touch screen, click on the *Re-calibrate...* button.
7. If the calibration is correct, click *OK*.

### Deleting a Touch-Screen

1. In ConfigX, select the icon of the touch screen you want to delete.
2. Go to the *Touch Screen* menu on the menu bar and select *Delete*. The *Touch Screen Configuration* page will disappear.

## International Keyboards

Metro-X uses the X Keyboard extension to support various keyboards. The keyboard description contains information about the physical layout of a keyboard, the key codes that come from the keyboard, and the symbol information needed to map the keycodes into keysyms.

Metro-X provides many predefined configurations, sorted by language and country. These configurations are selected through *ConfigX*. See *Keyboard* on page 4 for details.

### Supported Keyboards

Metro-X supports the following keyboards:

- Danish: Denmark
- Dutch: Belgium
- English: Canada
- English: UK
- English: USA
- French: France
- French: Switzerland
- German: Germany
- German: Switzerland
- Italian: Italy
- Norwegian: Norway
- Portuguese: Brazil
- Portuguese: Portugal
- Spanish: Spain
- Swedish: Finland
- Swedish: Sweden