



---

## **NCBridge 3.1.102 Errata (Dual Monitor)**

With the NCBridge 3.1.102 software patch release, Tektronix offers support for NC400 dual monitor network computers. The dual monitor option allows customers to double their display real estate.

Follow the instructions below to install the NCBridge 3.1.102 software patch and read the tips on configuring your NC400 for dual monitor functionality.

### **Table of Contents**

Requirements .....	2
Using a dual monitor network computer .....	3
Configuring your network computer for a second display .....	3
Dual monitor limitations .....	4
Dual monitor tips .....	5
A note on colormaps and color flashing .....	7



## Requirements

Here are the requirements to operating an NC400 dual monitor network computer:

- NCBridge 3.1 and the latest software patch, 3.1.102 (or higher);
- *Boot Monitor* version 7.7 or higher; and
- an NC400 network computer with the dual monitor option board (with option DM preinstalled at the factory, or with the dual monitor option board f-kit NCFDM installed at your site).

Your Tektronix network computers do not require an updated authorization key to operate after a successful dual monitor option board installation. Nor should you need any extra memory.

### NCBridge 3.1.102

We periodically update NCBridge with minor enhancements and make these software “patches” available on our FTP server at no charge. Each patch includes a file that documents the differences between the last patch and the current one. You can download the latest patch (3.1.102, with the dual monitor code) from our FTP server at:

```
ftp.tek.com/nwd/NCBridge/Patches/V3.1
```

You can also get to our FTP server from <http://www.tek.com/VND> by clicking on “Service, Support, and Training” then clicking “All Current FTP Sites”. From there, you can navigate to the “Network Computers FTP Area” and click through the directory structure to the correct folder. Clicking on the files you want will automatically download them to a location you specify on your host machine.

If you do not have access to a browser, or if you wish to manually download the files, do the following from an FTP command line:

```
%ftp ftp.tek.com
Name (ftp.tek.com:username): anonymous
Password: <your_email_address>
ftp> cd nwd/NCBridge/Patches/V3.1
```

Use the “dir” and “mget” commands to list and obtain all the *README* files. Open and read the *README.1st* file to obtain information on downloading and installation. This file will direct you to other *README* files.

**NOTE:** Major releases of NCBridge software are chargeable and are not made available on the FTP server.

## Using a dual monitor network computer

After proper installation of the dual monitor option board, you may want to configure your network computer to take full advantage of the second monitor. This section also gives a few tips on operating a dual monitor network computer.

### Configuring your network computer for a second display

With the dual monitor option board installed, the boot ROM automatically determines that this is a dual monitor device and alters the diagnostics and certain *Setup* configuration menus accordingly.

The X Window System defines your X server's primary display as Screen 0.0; additional displays that may be attached to the same X server are defined as Screen 0.1, Screen 0.2, etc.. At startup, output is displayed on Screen 0.0 by default. All control displays (such as the *Boot Monitor*, the Extended Self-Test menus, *Setup*, *Console*, and *Launcher*, etc.) will appear on Screen 0.0. Furthermore, some of the *Boot Monitor*'s Extended Self-Test output will display *only* on Screen 0.0 (Mouse Test, LAN Test, etc.); others--the Monitor Pattern Test, for example--will display on both screens. Window manager pop-up menus will appear on the screen containing the pointer, and selections made from pop-up menus will produce windows on the invoking screen. If you use your mouse in the root window of Screen 0.1 to launch a new client, for instance, the new window will appear in Screen 0.1.

By default, the dual monitor network computer is set to a logical<sup>1</sup> horizontal configuration. In the horizontal model, the screens are logically side by side, with Screen 0.0 (the default monitor) on the left and Screen 0.1 (the secondary monitor) on the right. To change this, you will have to launch the *Setup* client.

In *Setup*, go to **Configuration Summaries | X Environment**. "Dual Display" is a field that will automatically appear when the network computer is properly configured for a second monitor. There are three buttons next to this new field: **Horizontal**, **Vertical**, and **Mono-Head**.

In the horizontal model (default), when you move your mouse from left to right on your mousepad, the pointer will move from the left of your primary monitor until it reaches the right edge. When it goes beyond the last pixel on your primary monitor, the pointer will reappear on the left edge of your second monitor. Clicking the **Vertical** button will

---

1. These are "logically" horizontal or vertical--but not definitively so--because you can physically set your monitors up anywhere you choose. Internally, however, the network computer software assumes that the monitors will be set up as described and will interpret incoming mouse data accordingly.



---

## NCBridge 3.1.102 Errata (Dual Monitor)

switch immediately to the vertical model, in which the screens are logically one on top of the other, with Screen 0.0 on the bottom and Screen 0.1 on top. In the vertical model, when you move your mouse from the bottom of your mousepad to the top, the pointer will move from the lower part of the primary monitor to the top of the display. When it crosses the last pixel on the top edge, it will reappear on the lower edge of the secondary monitor.

If you click the **Mono-Head** button, your network computer will cease to allow you to move the pointer to the secondary display. The reason for this selection is to allow you to utilize your network computer in a normal fashion if the secondary monitor proves faulty or if you disconnect it. If you operate a single display device configured for either of the dual display options, you may lose track of the pointer (in the missing “screen”).

**NOTE:** *In the mono-head model, the primary device (Screen 0.0) is the one which will function with your network computer. In the case of a defective monitor, you will have to connect the VGA connector of a good monitor to the Screen 0.0 video output connector on the back of the logic base (not the dual monitor option board connector).*

## Dual monitor limitations

There are a few limitations to what you can do with a dual monitor network computer:

- A window can appear in either Screen 0.0 or in Screen 0.1, but not in both.
- You cannot drag a window from one screen to the other.
- Screen capture applications, such as XV, will not capture images on the opposite screen. An iteration of XV invoked on Screen 0.0 will be able to capture windows on Screen 0.0 but not on Screen 0.1 (and vice-versa).
- In some--but not all--multiple-workspace window manager environments (CDE, for example), the secondary display might not yield multiple workspaces. The primary display will still produce the four to six virtual desktops that a single monitor network computer would; but the secondary monitor will remain with one workspace.
- If you have the hardware-MPEG digital video option (DV) installed on your NC400, you can view digital video *only* on your primary display (Screen 0.0); digital video will *not* run on the secondary display.
- You can configure your NC400 (dual monitor and single monitor versions) for 8-bit pseudo color or 16-bit true color (if you also have option V2, an extra 2MB of RDRAM). However, the ICA client (for Windows application access) and the digital video client will not work in 16-bit color configurations.

## Dual monitor tips

Depending on which window manager you use, you may have to alter your `.Xdefaults` or `.Xresources` file to allow a second screen. OLWM starts with multiscreen functionality by default, so it will recognize that you have a second screen at startup; MWM, on the other hand, starts with multiscreen off by default. One way to enable dual monitor capability for MWM is to add the `-multiscreen` argument to your MWM command in your `.Xsession` or `.Xinitrc` file. The next time you reboot, MWM will recognize the second monitor. Another way is to add a multiscreen command to your `.Xdefaults` or `.Xresources` file as follows:

```
*mwm*multiScreen:      True
```

Again, MWM will check for the second monitor. After you add this line to your file, enter the following command:

```
xrdb -merge .Xdefaults
```

This will merge the new multiscreen setting with those settings that are already loaded in the X resource database. The last thing you will have to do is restart MWM.

**NOTE:** *Adjusting your `.Xresources` or `.Xsession` files to accommodate dual monitor functionality will not prevent you from operating single monitor network computers.*

To test whether your network computer is operating in multiscreen mode, try a couple of simple `xsetroot` commands for each display:

```
xsetroot -solid blue -display <IP-address>:0.0
xsetroot -solid gold -display <IP-address>:0.1
```

This should make the root window of your primary display blue and the root window of your secondary display gold. For a more interesting look, try some of the default X11 bitmaps and cursors, using different foreground and background colors for each display. (See *Example 1* below.)

### Example 1. A few lines from a sample `.Xinitrc` file

```
xsetroot -bitmap /usr/include/X11/bitmaps/wingdogs
        -fg darkgreen -bg green4 -display 128.181.57.166:0.0
xsetroot -bitmap /usr/include/X11/bitmaps/mensetmanus
        -fg blue -bg blue4 -display 128.181.57.166:0.1
xsetroot -cursor_name shuttle
        -fg red -bg white -display 128.181.57.166:0.0
xsetroot -cursor_name pirate
        -fg red -bg white -display 128.181.57.166:0.1
```



---

## NCBridge 3.1.102 Errata (Dual Monitor)

After you have ascertained that you have multiscreen functionality with your window manager, you might want to further customize your environment to produce different default results for each of your two screens. To do this, you will again have to edit your `.Xresources` or `.Xdefaults` file, adding “if” statements, as shown in *Example 2* below.

### Example 2. Dual monitor `.Xdefaults` example

```
! conditional screen resources

! screen 0 resources
#if SCREEN_NUM == 0
*foreground:      gold
*background:     blue
#endif

! screen 1 resources
#if SCREEN_NUM == 1
*foreground:      blue
*background:     gold
#endif
```

An “if” statement in your `.Xdefaults` or `.Xresources` file will allow you to customize your two screens. A window invoked in Screen 0.0 may have background, foreground, and menu bar colors that are different from those in a window invoked in Screen 0.1.

The same applies to “focus” statements and other window manager settings. For example, you can assign *explicit* focus to one screen and *pointer* focus to the other. You can also set different client-specific resources for each screen, forcing `xterm`, `xclock`, or other X clients to appear and behave differently, depending on which screen they are executing on. Follow the same procedure given above for foreground and background settings, substituting your client-specific statements.

Remember that whatever changes you make to your `.Xdefaults` or `.Xresources` file will not take place automatically. After you save these changes to your file, download the updated file using the `xrdb -merge` command as explained above. Then restart your window manager or your entire session.

## **A note on colormaps and color flashing**

A colormap is a table of red, green, and blue values for each pixel that a display device consults when determining what intensity of each of these primaries to reproduce on the display. Colormaps are limited by the number of bits available for each of these RGB values.

Many display devices are configured for 8-bit pseudo color, which means they are limited to 256 colors at any given moment. If this number is exceeded, the user may experience a “color flash” when switching from one client to another because these individual clients may have mapped colors differently. The question is, will using separate colors for each screen cause an NC400 with the dual monitor option to run out of available colors sooner?

Not necessarily. The dual monitor option board comes with its own video memory (4MB of RDRAM) to go along with the standard 2MB of video memory on the main logic board. So each screen has its own 256-cell colormap, yielding a total capability of 512 simultaneous colors in 8-bit pseudo color mode. Moreover, you can isolate certain color-hungry applications--such as Netscape Navigator and the Tektronix ICA client--to opposite screens, thus further avoiding color flashes.

And if that isn't enough colors, the NC400 with option DM (dual monitor) and option V2 (2MB of additional video memory) supports 16-bit true color mode, which allows separate colormaps of 65,536 colors for each screen. (See [Dual monitor limitations](#) on page 4 for restrictions when using 16-bit true color on your NC400.)



---

*NCBridge 3.1.102 Errata (Dual Monitor)*