Intergraph Monitor

The *Intergraph Monitor* page allows you to review and change the settings for your system's monitor(s).

If a supported video display driver is not running (for example, in the case of initial installation or after booting with the Standard VGA driver), this page will only allow you to change the Monitor Type.

If a supported video display driver is running on your system, this page displays the *Monitor Type* for the monitor(s) present on your system. This page also illustrates the Monitor Orientation for displaying the desktop. From this page, you may go to the Plug & Play Information dialog and the Color Calibration dialog which contain additional information and settings for your monitor(s). You can select settings for only those video attributes supported by your system.

To view the *Plug & Play Information* dialog or the *Color Calibration* dialog, move the pointer to the desired button and click the primary mouse button.

When you have finished configuring the monitor settings found on this page and on the *Color Calibration* dialog, select *OK* or *Apply* to save your modifications. If you want to exit without saving your changes, select *Cancel*.

Monitor Orientation

The buttons in the *Monitor Orientation* group box allow you to select single-screen, multi-screen vertical, multi-screen horizontal, or multi-screen square desktop configurations.

If a supported video display driver is not running, the *Monitor Orientation* buttons appear in gray and cannot be selected. If this page has determined that your system does not support multi-screen mode, the single-screen button will be the only selectable button.

You may select Single Screen (one monitor) when you have one or more graphics cards in the system. The desktop will be displayed on the monitor you have connected to the first detected card in the system. Because the order in which cards are detected is system dependent, you may need to connect the monitor to each card in order to find the active card (if multiple monitors are not available).

You may select Multi Screen Horizontal (monitors side by side) when you have 2 or more graphics cards in the system. The desktop wil be displayed in a horizontal orientation across the total number of cards in the system. For example, a system with 3 cards will have the desktop displayed horizontally across all 3 cards.

You may select Multi Screen Vertical (monitors stacked one on top of the other) when you have 2 or more graphics cards in the system. The desktop wil be displayed in a vertical orientation across the total number of cards in the system. For example, a system with 3 cards will have the desktop displayed vertically across all 3 cards.

You may select Multi Screen Square (2 rows of monitors stacked one on top of the other) when you have 4 graphics cards in the system. The desktop wil be displayed in a square orientation across the cards in the system. For example, one card will represent the upper left portion of the desktop while another will have the lower left portion of the desktop (this also applies to the right portion of the desktop).

To select between the different screen configurations, move the pointer to the button representing your choice of configuration and click the primary mouse button. Changes in screen configurations take effect following a system reboot.

Monitor Type

The *Monitor Type* list box allows you to select the type of monitor attached to your system.

The desktop area and refresh frequencies available in the *Settings* page are very dependent on the selected *Monitor Type*, so it is very important that you select the correct one.

If you are unsure of the *Monitor Type*, look through the part numbers shown in parenthesis beside each of the monitor types until you find a match for the part number located on the back of the monitor. If you have a multisync monitor, the *Generic Multisync Monitor* entry will give many desktop areas and refresh frequencies that are supported on your monitor. However, it is likely that not all selections are supported on your monitor. If you would like for the driver to attempt to retrieve the Extended Display Identification Data (EDID) information from the monitor, select *DDC Monitor*. The *DDC Monitor* type will not be shown if your graphics card is not capable of retrieving EDID information.

To select a monitor, move the pointer to the *Monitor Type* list box and click the primary mouse button. A drop-down list of monitor types for your system will appear. Move the pointer to the monitor type you want and click the primary mouse button.

The new monitor type takes effect after you select *OK* or *Apply* and reboot your system.

NOTE: If the *Monitor Type* is changed, the information on the Plug & Play Information page will not be valid until the system has been rebooted.

WARNING: If you select the wrong monitor, the video display on your system will likely appear garbled after applying. If this occurs, reboot your system and select standard VGA display, start Microsoft's Display applet, select the Intergraph Monitor page, and select the correct monitor from the *Monitor Type* group box, select *OK* and reboot your system to reactivate the video display driver.

Plug & Play Information

The *Plug & Play Information* dialog displays the *Monitor Information* retrieved from the Extended Display Identification Data (EDID) information describing the monitor present on your system. A list of the timings supported by both the monitor and the display driver are also given.

If a supported video display driver is not running on your system, the push button to activate this dialog will be disabled. You will not be able to view this dialog.

If the monitor attached to your system is not a DDC capable monitor or if the Monitor Type on the Intergraph Monitor page is not set to *DDC Monitor*, no information is displayed.

If your system is multi screen capable (two or more cards), the *Plug & Play Information* dialog will vary according to your selected monitor orientation setting. If a multi screen configuration is selected in the Monitor Orientation box on the *Intergraph Monitor* page, a *Multi Screen Selection* list-box will be placed in the upper portion of the dialog. This list-box will contain board numbers for each board found in the system. The *Monitor Information* and *Supported Monitor Timings* shown in the dialog are for the currently selected board. To view the information for a particular monitor, move the pointer to the *Multi Screen Selection* list-box and click the primary mouse button. The list-box will display the board numbers for each board found in the system. Highlight the desired board and the *Monitor Information* and *Supported Monitor Timings* will change to reflect the information for the attached monitor.

If you have a single screen system (one monitor) the *Plug & Play Information* dialog will contain no *Multi Screen Selection* list-box. All information will be that of the primary monitor.

Select *OK* to close the dialog.

Color Calibration

The *Color Calibration* dialog allows you to change the Contrast and Gamma Correction for your monitor.

If a supported video display driver is not running on your system, the push button to activate this dialog will be disabled. You will not be able to view this dialog.

Depending upon your graphics hardware and selected video display settings, the appearance of the *Color Calibration* dialog will vary. If your graphics hardware does not support screen contrast changes, the *Contrast* scroll bar for altering the screen contrast will not be present.

If your system is multi screen capable (two or more cards), the *Color Calibration* dialog will vary according to your selected monitor orientation setting. If a multi screen configuration is selected in the Monitor Orientation box on the Intergraph Monitor page, a *Multi Screen Selection* list-box will be placed in the upper portion of the dialog. This list-box will contain board numbers for each board found in the system. The contrast level and gamma correction settings shown in the dialog are for the currently selected board. To view or modify the settings of a particular monitor, move the pointer to the *Multi Screen Selection* list-box and click the primary mouse button. The list-box will display the board numbers for each board found in the system. Highlight the desired board and the contrast level and gamma correction settings will change to reflect the settings for the attached monitor.

If you have a single screen system (one monitor) the *Color Calibration* dialog will contain no *Multi Screen Selection* list-box. All choices will apply to the primary monitor.

If the *Contrast* and *Gamma Correction* appear as you desire, select *OK* to retain the current contrast level and gamma correction settings and close the dialog; otherwise, select *Cancel* to restore the contrast level and gamma correction to the last saved settings and close the dialog. Upon exiting this dialog and returning to the *Intergraph Monitor* page, select *OK* or *Apply* to save all settings.

Contrast

The *Contrast* scroll bar allows you to change the screen contrast of your monitor on those graphics cards that support contrast adjustment. If this feature is not supported in the hardware the *Contrast* scroll bar will not appear on the dialog.

The valid range for screen contrast is from 30 percent to 100 percent. A screen contrast value of less than 30 percent is not allowed to prevent the screen from being too dark to see the *Contrast* scroll bar.

To adjust the screen contrast, move the pointer to the scroll box on the scroll bar, pick up the scroll box by pressing and holding the primary mouse button, and drag the scroll box in the desired direction by moving the mouse. When you reach the desired level of screen contrast, release the primary mouse button. You may adjust the contrast value in single-unit increments by moving the pointer to the arrow on either side of the scroll bar and clicking the primary mouse button. You may adjust the contrast value in 5-unit increments by moving the pointer to the scroll bar shaft to the left (to decrease screen contrast) or right (to increase screen contrast) of the scroll box and clicking the primary mouse button.

A change to the screen contrast value is immediately apparent on the monitor. The current screen contrast value displays above the *Contrast* scroll bar.

Gamma Correction

Gamma Correction is a method for fine-tuning the display of color intensity. The *Gamma Correction* group box allows you to specify the gamma correction for your monitor.

Selecting the *Default Gamma Value* option results in the calculation of gamma correction data using the default gamma value of 1.00.

Selecting the Gamma Value option allows you to select the gamma value used to calculate gamma correction data.

Selecting the Gamma File activates the *Browse...* button. The *Browse...* button allows you to browse through and select files using a menu interface. By default, the expected extension for a gamma correction file is "*.gc* ". Once you have selected a file, the filename is displayed in the *Gamma File* box. Use the *Test* button to verify the effect of your gamma correction file. The *Test* button displays the effect of the selected gamma correction file for five seconds.

To select the method of modifying gamma correction data, move the pointer to the desired option and click the primary mouse button. A filled circle indicates the selected option.

The new gamma value/table takes effect after you select *OK* or *Apply*.

Selecting a Gamma Value

The *Gamma Value* scroll bar allows you to select a gamma value which is used to calculate the gamma correction data for your monitor.

To adjust the gamma value, move the pointer to the button on the scroll bar, pick up the scroll box by pressing and holding the primary mouse button, and drag the scroll box in the desired direction by moving the mouse. When you reach the desired gamma value, release the primary mouse button. You may adjust the gamma value in hundredths by moving the pointer to an arrow on either side of the scroll bar and clicking the primary mouse button. You may adjust the gamma value in five hundredths by moving the pointer on the scroll bar shaft to the left (to decrease the gamma value) or right (to increase the gamma value) of the scroll box and clicking the primary mouse button.

Specifying a Gamma Correction File

The *Browse...* button allows you to browse through files on your system using a menu interface to locate your desired gamma correction file. The *Browse...* window initially shows files with the extension ".gc", but you may modify this behavior to show all files.

The file you specify must contain a complete gamma correction table as well as a unique numerical identifier and DAC Resolution for verification. An entire valid file consists of 770 lines each containing a single numerical value. The first line contains the unique numerical identifier, or "magic number". This value is 47434446 (a representation of the hexadecimal ASCII code for GCDF; "Gamma Correction Data File"). The second line contains the DAC Resolution which is ten (10). The next 256 lines contain the gamma corrected digital values to be presented to the monitor for Red. These are followed by 256 lines containing values for Green then 256 lines containing values for Blue. These digital values are integers in the range 0 - 1023. A sample excerpt from a gamma correction file is shown below:

```
47434446            <- Magic Number
10                  <- DAC Resolution
0                   <- First Red Value
338
388
421
.
.
.
1023                <- Last Blue Value
```

Use the *Test* button to verify the effect of your gamma correction file. The *Test* button displays the effect of the selected gamma correction file for five seconds.

Intergraph Settings

The *Intergraph Settings* page allows you to review and change the settings for your system's video attributes.

If a supported video display driver is not running (for example, in the case of initial installation or after booting with the Standard VGA driver), this page will not be visible.

If a supported video display driver is running on your system, this page displays text describing the system's graphics hardware. This page also shows the number of different *Planes Per Pixel* for the current configuration -- plane types with *(DB)* beside them are double buffered planes. From this page, you may go to the Performance dialog and the Advanced Configuration dialog which contain additional video attributes. You can select settings for only those video attributes supported by your system.

To view the *Performance* dialog or the *Advanced Configuration* dialog, move the pointer to the desired button and click the primary mouse button.

When you have finished configuring the video attributes found on the *Performance* dialog and on the *Advanced Configuration* dialog, select *OK* or *Apply* to save your modifications. If you want to exit without saving your changes, select *Cancel*.

Performance

The *Performance* group box contains an option that allows you to change the behavior of double buffering on systems which support double buffering in hardware and to change the format of pixel colors.

When the *Synchronize Buffer Swap to Vertical Sync* switch is checked, the graphics driver will wait for a vertical retrace of the monitor to occur before switching the displayed buffer in a double buffering sequence. If this switch is not checked, the graphics driver will switch the displayed buffer without waiting. Double buffering will run faster if the buffers are switched without waiting for vertical retrace, but depending on the application being run an annoying flicker is sometimes noticeable. Checking the *Synchronize Buffer Swap to Vertical Sync* switch will prevent this flicker. The default value for *Synchronize Buffer Swap to Vertical Sync* is on.

The *Pixel Color Format* box allows you to choose the order of the pixel components sent to the driver from the operating system. The format may be either *RGB* (red, green, blue) or *BGR* (blue, green, red). For some media players, one format may run slightly faster than the other when playing *.avi files. The default settting for *Pixel Color Format* is *RGB*.

If the *Synchronize Buffer Swap to Vertical Sync* switch and *Pixel Color Format* are set as you desire, select *OK* to retain the current settings and close the dialog; otherwise, select *Cancel* to restore the last saved settings and close the dialog. Upon exiting this dialog and returning to the Intergraph Settings page, select *OK* or *Apply* to save all settings. The new display mode takes effect after you reboot your system.

Advanced Configuration

The Advanced Configuration dialog allows you to change the Stereo Settings and enable Color Sequential Display mode.

If the *Stereo Settings* and the *Color Sequential Display* mode are set as you desire, select *OK* to retain the current settings and close the dialog; otherwise, select *Cancel* to restore the last saved settings and close the dialog. Upon exiting this dialog and returning to the Intergraph Settings page, select *OK* or *Apply* to save all settings. The new display mode takes effect after you reboot your system.

Stereo Settings

The *Stereo Settings* group box allows you to select a stereo display mode. Stereo display modes present a single image as two separate fields which are viewed independently by each of your eyes; this allows for a more realistic depth effect than is possible with the presentation of the image in a single frame. One of these two fields is presented to your left eye and the other is presented to your right eye. External hardware (head mounted display or stereo glasses) is required to actually view in stereo.

When *Frame Sequential* stereo mode is selected, each field will be displayed using every scan line of the display. The first field is for the left eye and the second field is for the right eye. In order to present two separate fields from a single image and display each field using all of the scan lines, twice as much data (and memory) is required for this stereo mode than for interlaced stereo modes. Because twice as much memory is needed, this mode may not be available for higher resolutions.

When *Interlaced* stereo mode is selected, one field uses only the odd-numbered scan lines of the display, and the other field uses only the even-numbered scan lines of the display. The first field is for the left eye and the second field is for the right eye.

When *Frame Interlaced* stereo mode is selected, each frame contains information for both the left eye and the right eye. The odd-numbered scan lines are for one eye and the even-numbered scan lines are for the other eye. It is up to the external hardware to determine which lines of the frame to send to the left eye and which lines to send to the right eye.

To enable the stereo option, move the pointer to the *Enable Stereo Display* check box and click the primary mouse button. A check mark indicates the option has been enabled. The stereo modes that are supported with the current configuration of your system will be activated. Move the pointer to the active stereo mode you desire and click the primary mouse button. A filled circle indicates the selected option.

Color Sequential Display

The *Color Sequential Display* switch enables color sequential displaying for head mounted displays designed for this type of output.

The head mounted display converts the standard RGB video signals into separate red, green, and blue fields (frames for non-interlaced). These fields are displayed at three times the normal rate (180 Hz vs. 60 Hz) by the graphics card onto monochrome monitors. A color filter device between the viewer's eyes and the monochrome monitor is synchonized to display the appropriate color during the corresponding video. Your eyes, however, perceive a full color image.

To enable the color sequential display option, move the pointer to the *Color Sequential Display* check box and click the primary mouse button. A check mark indicates the option has been enabled.