[0045] In particular various BIOS boot screens and VESA video modes are typically used during processes where an outside controller to a display device cannot control what is being displayed on the display device. As is generally known in the art, the firmware or code specific to the display device itself typically controls what is being shown on the display device during boot processes and other situations where BIOS, VESA and other basic video modes are used. The inability of an outside controller to control or coordinate the content on multiple screens, at least during such start-up, boot, and other critical times, serves to exacerbate viewing conflicts between the displays on multiple screens within a multi-layer display. Such viewing conflicts can be alleviated through the use of the various specialized controller arrangements and configurations disclosed herein.

[0046] In various preferred embodiments, the firmware of the multi-layer display device itself can be adapted to analyze the relevant display signals to determine whether or not one or more of the various display screens should be automatically blanked out at a particular time. Such components can then facilitate such an automated blanking of one or more display screens of the overall multi-layer display based upon whether one or more screen blanking criteria are detected in the received display signal or signals. In this manner, the relevant screen or screens that should be viewed as a single display can be more easily seen.

[0047] FIGS. **4**A through **4**C illustrate in block diagram format exemplary controller systems for multi-layer displays according to various embodiments of the present invention. FIG. **4**A illustrates one embodiment whereby a separate display controller **402***a*, **402***b* may be coupled to each of the separate display screens **18***a*, **18***b* in a multi-layer display. Although only two display screens (and display controllers) are shown for purposes of illustration, it will be readily appreciated that one or more additional display screens may also be used. The embodiment of FIG. **4**B is similar to that of FIG. **4**A, except that a single display controller **404** may be coupled to each of the display devices **18***a*, **18***b*, such that one display controller **404** controls all the display devices **18***a*, **18***b*.

[0048] Where each display screen has its own display controller, such as that which is shown in FIG. **4**A, each display controller could then receive its own separate display signal for display on its respective display screen. A similar arrangement might exist where a display controller is adapted to control multiple display screens, such as that which is shown in FIG. **4**B, in that display controller **404** could receive multiple display signals and then be configured to send the appropriate display signal for display to each respective display screen.

[0049] Alternatively, display controller **404** could receive a "doubled" display signal, such as a "double-wide" or "double-tall" signal comprising one signal having two distinct displayable portions therein. In such cases, the display controller can be adapted to split such a doubled signal and send one portion to one display screen and another portion to another display screen. For example, two different 800×600 pixel display portions for two separate display screens might be bundled into a single "double-tall" 800×1200 pixel signal for ease of transmission. Display controller **404** could be adapted to split this single signal into its appropriate components to send each component to its proper display screen. In such instances, the respective display resolutions for screen blanking criteria could be adjusted accordingly, as will be readily appreciated.

[0050] The display controller(s) **402***a*, **402***b*, **404** may be in communication with a logic device, such as processor **332**. The display controller(s) **402***a*, **402***b*, **404** may receive data and/or display signals from the processor **332**, such as start-up display data to display on the display devices **18***a*, **18***b*. The display controller(s) **402***a*, **402***b*, **404** may also be in communication with a video processor **406**. However, display controller(s) **402***a*, **402***b*, **404** generally communicate with the video processor **406** after initial boot or start-up is completed.

[0051] FIG. **4**C illustrates an exemplary display controller **402** (i.e., display controller(s) **402***a*, **402***b* or **404**) of FIGS. **4**A and **4**B. The display controller **402** may have an interface **410** to allow the display controller **402** to communicate with other devices, such as processor **322**, video processor **406**, and the like. The type of interface is not intended to be limiting, as any combination of hardware and software needed to allow the various input/output devices to communicate with the other devices may be used. The interface **410** may be in communication with processor **420**. The processor **420** may be in communication with memory **412**. Memory **412** may be separate from processor **420** as illustrated or may be part of processor **410**. Memory **412** may be any known type of memory, such as a random access memory, to store data. Furthermore, although illustrated with a single memory, any number of memories may be used as desired.

[0052] Processor **420** may run or be associated with a data or display signal analyzer **414**. Data or display signal analyzer **414** can be configured to analyze one or more received display signals for one or more screen blanking criteria. Screen blanking criteria can include a specific display mode, a specific display resolution and/or a specific refresh rate detected with respect to a given display signal. For example, the resolution **416** and/or refresh rate **418** of a given display signal can be analyzed by analyzer **414**.

[0053] As will be readily appreciated, there can be significant differences between the video or display signals that are intended for use to create a coordinated visual presentation on multiple display screens, and those video or display signals that are not intended for such use. Again, pertinent examples of display signals that are not for use on multiple stacked displays can include those signals that are sent during a boot, start-up or diagnostics process. Typically, the types of signals that are sent during these times can be distinguished from the relatively more complex signals that are sent for a robust multi-layer display presentation. For example, typical boot or diagnostics signals are sent using DOS, BIOS or VESA video modes. Screen resolutions for these modes tend to be larger or cruder, and the refresh rate of such signals tends to be slower than the more complex displays and modes that would be used for a typical multi-layer display visual presentation.

[0054] Accordingly, the display signal analyzer can be adapted to detect the presence of a display signal that is in DOS, BIOS or VESA modes. Of course, other display modes and/or other screen-blanking criteria may also be used. If such a display signal mode (or other critical screen-blanking criteria) is detected, then the associated display controller can facilitate the presentation of a substantially blank display on the appropriate screen or screens. In some embodiments, this can be accomplished by sending an instruction from the display controller to the screens to be blanked. In some embodiments, the display controller can simply forward a display signal that is completely or substantially blank. In various embodiments, the screen or screens to be blanked can be those that correspond to display signals that are detected to have the screen blanking criteria, while in some embodiments, the detection of certain screen blanking criteria can result in other screens being blanked instead, and/or the use of the affected display signal on an actual display.