Title : USB TO VGA ADAPTER

S P E C I F I C A T I O N

This invention relates in general to electrical connectivity but more particularly to a novel concept of using Universal Serial Bus (USB) to Video Graphics Array (VGA) adapters to support extra monitors on electronic devices.

In the current stage of electronic devices, particularly slot machines, more and more new game innovations and features are being developed to enhance the player's gaming experiences. This could be either linked or standalone on progressive jackpots, extra game features in addition to the base game, or allow the player to participate in other games such as baccarat, keno or horse racing while at their slot machine. These extra features require increasing the number of displays in the monitor so that the player can view or interact with them without interrupting his slot game.

Traditionally, the support of an extra LCD is provided via adding an extra VGA card or having an externally dedicated graphic unit (includes Central Processing Unit, memory and port for communications with main board) that drives the Liquid Crystal Display (LCD).

An extra VGA card is inserted into one of the spare slots on the main board. The LCD is then connected to the video output socket on the VGA card. The video output is controlled directly by the main control unit.

To pursue this method, a VGA card is needed and the main board must have extra slots to support the card. Proprietary boards that do not provide extra Peripheral Component Interconnect (PCI) or Accelerated Graphics Port (AGP) slots cannot support this architecture. The game station is one example where the main board does not have any PCI slots. In addition, low configuration VGA cards are phased out very quickly. It is quite possible for some VGA cards to stop production and platform will be required to upgrade to a different card. This would require software changes.

A small dedicated graphics unit with CPU, memory and communications port can be used externally to drive the LCD. The unit will be connected to the main control board via Ethernet or USB cable and the video output will be connected to the LCD.

The graphics unit having CPU and memory means can operate independently from the main control unit. Graphics can be downloaded and stored on the graphics unit from the main board and used when instructed from the main control unit. This downloading can either be done during power up or when new graphics are needed. Communications between graphics unit and the main control unit is exchanged via the cable connecting the two units. Ethernet or USB cables are ideal because they permit downloading of large graphic files in minimal time.

This form of architecture will free the main control unit to devote more time on critical processes and less time towards handling the Belly LCD. As graphics units are specifically optimized for graphics, 3D graphics and sound are also supported in these units.

As this unit will be a specialized proprietary graphic unit, it is highly unlikely that this would require further changes once production has commenced, hence saving long term development costs. However, if there is a need to upgrade some parts (such as CPU or Ram size) then the board would need to be redesigned to handle the new requirements.

It is the primary object of the present invention to provide a USB to VGA adapter to display extra LCD screens. The adapter allows the connection of a monitor to an USB port on the main board. The display of the video is sent through the USB cable into the adapter and video is sent out to the monitor. The adapter has onboard 8 or 16 M ram (depending on model) used for caching video. This would minimize graphics downloading time as graphics that are already cached are not needed to be downloaded again.

Another object of using the USB to VGA adapter is to provide the main control unit with direct control of the LCD while also enjoying the use of the cache memory available on board the adapter. It also supports resolutions up to 1680 x 1050 allowing flexibility in

choice of resolutions. The adapter can also be changed or upgraded without any other changes.

Moreover, the number of extra monitors that can be supported on a slot machine can be limitless as the number of monitors is restricted only by the number of USB ports that are available. USB ports itself can also be expanded limitlessly via USB hubs.

Also, each adapter can support different resolutions on the slot machine concurrently. For example, the main screen can be set at 800 x 600 but a secondary screen using USB-VGA adapter can be set at a higher or lower resolution than the primary screen. This allows huge flexibility in developing graphics for games.

These and other objects and advantages of the present invention would be apparent upon reading the following detailed description taken in conjunction with the appended drawings wherein:

Figure 1 is a perspective view of the present USB-VGA adapter; and

Figure 2 is a schematic diagram of the electrical connectivity of the adapter.

With reference to the several views of the drawings, the present USB-VGA adapter 10 enables one to connect any monitor, LCD, projector to one's Personal Computer (PC) or notebook. You can use it as an extended desktop or as a larger/different display from your main screen. By using USB 2.0 technology, there is no need to open the computer or struggle with compatibility issues related to a second VGA card.

The adapter has the following product specification: plug and play compliant, driver supports (windows 2000/XP/Vista), Graphic chipset (SiS), display memory (8MB SDDRAM) PCB Version (USB2.0-VGA Ver 1.6) and Firmware Version/check sum (0900/64A0).

CLAIM:

1. A USB-VGA adapter that enables one to connect any monitor, LCD, projector to one's PC or notebook thereby allowing multiple screen displays.

2. The USB-VGA adapter as claimed in Claim 1 having the following product specification: plug and play compliant, driver supports (windows 2000/XP/Vista), Graphic chipset (SiS), display memory (8MB SDDRAM) PCB Version (USB2.0-VGA Ver 1.6) and Firmware Version/check sum (0900/64A0).