

Display Tune: The Advantages Are Clear

Users can take control of their monitor configuration with the familiar keyboard and mouse

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A sense of excitement takes hold when a user unpacks a new LCD monitor. The unblemished screen presents a world of potential, a fresh new view, and the promise of a more enjoyable interaction with the computer. Then reality sets in. Maybe the brightness and contrast need to be adjusted to accommodate the room lighting conditions. Maybe color images have a hue that's not quite right. Maybe all the text looks fuzzy. The end result is a disappointed buyer who finds that the anticipation does not match what appears on the screen.

Of course, if the user has read the monitor's documentation, the front panel controls may offer a solution. Yet on-screen displays (OSDs) with complex menus, tiny buttons with illegible icons, and confusing multiple functions for each button can rapidly lead to frustration.

Surely there must be a better way. Thanks to Windows Plug-and-Play, the computer already knows the monitor's attributes; why can't the computer help the user set the display settings to match the monitor's native resolution? And while we're at it, why not use the familiar and handy mouse and keyboard to adjust the monitor, rather than force the user to struggle with a new and unfamiliar interface and control buttons?

The fact is the better way already exists: Display Tune from Portrait Displays. This software solution makes it easy and quick for monitor manufacturers to let users control their monitors right within Windows using mouse and keyboard, not front panel buttons.

Hasn't this been done before?

Systems that let users control their monitors with their computers are not new, but the limitations of past attempts doomed them to failure. Years ago, some CRT makers tried to use serial port connections to communicate between computer and monitor, but this was less than satisfactory. Serial ports require both ends of the connection to be configured with the same settings, some of which were arcane. Most users didn't want to cope with start and stop bits, word lengths, and baud rates. Serial ports were in short supply on most computers; a mouse and modem usually took the two available connections, and conflicts were common when you tried to add more ports. And then there was the potential mystery of how the serial cable itself should be wired in order to get a functioning connection.

The Universal Serial Bus (USB) addressed many of the problems of serial ports. Cables were standardized — more or less — while transmission speeds increased, hubs made

multiple ports more common, and there were no messy configuration issues. Still, it required another cable connection from the computer to the monitor, and this meant additional costs for monitor makers at a time when selling prices were becoming even more competitive.

But Display Tune takes a different approach. There is no extra cable required. The one cable that the user plugs into the computer's graphics adapter card— either analog or digital — also provides the two-way communication required for the computer to control the monitor's configuration.

VESA sets the standard

This design is made possible by the adoption of the Display Data Channel Command Interface (DDC/CI) standard by the Video Electronics Standards Association (VESA). The same group that untangled a mess of incompatible timings for 800 by 600 pixel signals with the SVGA standards has done the same with monitor-to-computer communications.

The DDC/CI provides bi-directional communications between the computer graphics adapter card and the monitor. The most obvious benefit of these communications shows up when installing a new monitor. Windows Plug-and-Play is able to use the Extended Display Identification Data (EDID) generated by the monitor's controlling circuitry to set the graphics adapter card's settings so that a visible image is displayed without any user intervention. It may not be the optimal settings, but at least the user is able to see the Windows information on screen, and navigate to the point where better settings can be selected.

What about Microsoft?

According to reports, Microsoft will be adding monitor control features to the next version of Windows, raising the question of whether Display Tune will be obsolete soon.

The first point to consider is when Longhorn will ship; current reports estimate that it will be in 2006. Even if it does ship on time, it may be a long time before a majority of users have migrated to the new version. Each step in the transition from Windows 3 to 95 to 98 to XP has taken longer and longer for users to make the switch, and it is not clear that Longhorn will provide reasons to upgrade that will be compelling enough to reverse this trend.

Furthermore, Longhorn's monitor control features will require support from new graphics chips; compatibility with older legacy graphics adapters is not likely. Users are as slow to upgrade their computers as they are their operating system, so this will further delay Longhorn's adoption.

Even once Longhorn is in place, the monitor control features will be rudimentary. At present, there do not appear to be any facilities for additional functions, so users will be limited to the support that comes out of the box with Longhorn.

In contrast, Display Tune is a solution that is ready right now, and works with the vast majority of existing graphics adapters. It will take five years or more for a new version of Windows to have a significant impact on the advantages Display Tune makes available today. And the fact that Display Tune is both customizable and extensible through plug-ins puts the monitor manufacturers in control of what features they want to offer their customers, and how these features will appear on the screen.

The bi-directional nature of the DDC/CI connection offers much greater potential benefits, however. Not only can the monitor tell the computer about its innate abilities, it can also send information about the status of its current configuration. And the computer can in turn send commands to the monitor in order to make changes to that configuration.

These commands take the form of Virtual Control Panel (VCP) commands, which are specified in the Monitor Control Command Set (MCCS) standard established by VESA. The standard allows for control of a wide range of features, including geometry issues such as horizontal/vertical position and size, brightness, contrast, and color temperature. There is even a command to initiate an LCD monitor's autosync command. Unfortunately, using MCCS requires sending and deciphering strings of hexadecimal values, which is beyond the reach of most end users.

Display Tune makes it easy

Display Tune hides all the complexity of MCCS and the DDC/CI behind a simple Windows application that is easy to use. A set of straightforward menu choices leads to screens that clearly tell the user what to do and why. Familiar sliders and buttons make the adjustments easy. And a Wizard

choice will step the user through all aspects of screen adjustments when a new monitor is set up for the first time.

The end user can quickly adjust brightness, contrast, focus (choosing the native resolution), position, and color balance and temperature. Users can also store their settings and quickly recall them, so different settings can be used for different applications or room lighting conditions. And this is all accomplished with a Windows application, and the user never has to touch the monitor.

Advantages for developers

A solution that is easy for end users is always a good idea, but what about the monitor manufacturers? If the system is too costly or difficult to implement, it will never see the light of day in the highly competitive desktop display market.

The first and most important fact is that Display Tune is easy to implement. It is an existing application, and all that it requires is that the monitor be MCCS-compliant. This feature can be a simple addition to the monitor's controlling circuitry. The Display Tune application can be customized, but the underlying code is already written and tested, so development time is short.



In fact, this easy implementation can reduce the total cost of developing a new monitor. While it can be used to augment a design that uses front panel controls and an OSD, Display Tune also makes it practical to create a monitor without these features. This means that the development costs of the OSD can be eliminated, along with the engineering and aesthetic design of the front panel controls. Eliminating the buttons will also reduce manufacturing and assembly costs. The reduced number of components and connections increases reliability.

In addition to the cost savings in design overhead and per-unit production costs, Display Tune can also reduce the ongoing cost of customer support. The application is easier to use than OSD systems, so end users will make fewer support calls seeking help with adjusting the monitor.

Now and for the future

Since Display Tune is based in software and not silicon, it is a flexible solution that can be customized and modified. Manufacturers won't be painted into a corner with this

solution; changes can be made with a simple software update.

For example, the user interface can be altered to meet the needs of the manufacturer. This can be as simple as putting the company name or logo on the user interface, or as complex as the development of custom skins for a unique look.

The software architecture also makes it easy to create additional functions through plug-ins that seamlessly become part of the Display Tune program. The first optional plug-in is already available: color calibration. Other plug-ins are also in development, including asset management and theft deterrence modules.

The end result is a new user interface for controlling LCD monitors that does not rely on any extra cables or signal pins, is based on existing and widely-implemented industry standards, and saves manufacturers time and money when developing a new model while giving end users control over monitor settings using a familiar Windows interface, mouse, and keyboard.