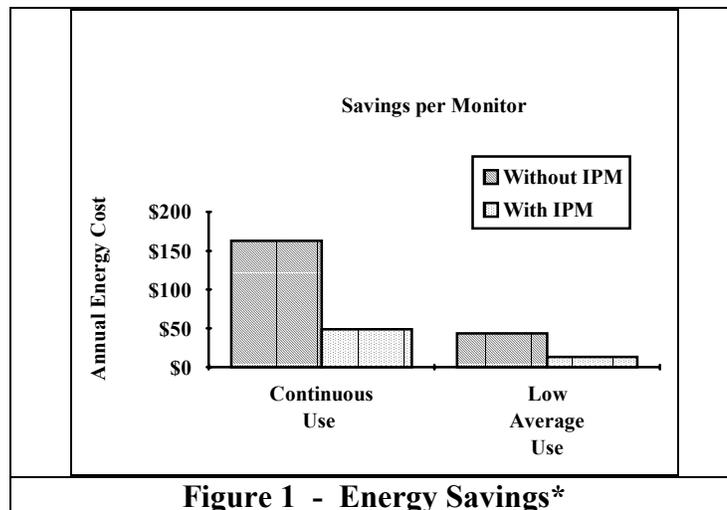# IPM™ (Intelligent Power Manager) System

NEC Technologies' IPM™ (Intelligent Power Manager) System allows the computer system to reduce the power consumption that the monitor uses during normal operation by turning off the essential elements of the monitor after a period of inactivity. This energy saving feature helps protect our environment by reducing energy consumption along with the added cost savings of additional electrical usage and the savings on air conditioning. IPM is NEC's answer to the concern that many people have in regard to computers and the impact they have on the earth's environment. As Vice President Gore stated in an address made to industry leaders:

> *"The creation of energy-efficient computers for the marketplace is a landmark in the development of environmental technologies. They show how economic development and environmental protection go hand-in-hand. U.S. manufacturers and workers profit from creating the first ever energy-efficient computers in the market, and the environment benefits because increasing energy-efficiency decreases pollution." (6/17/93)*

NEC understands this goal and, with the help of the Video Electronics Standards Association's (VESA) Display Power Management Signaling (DPMS) as its guideline, developed the IPM System for its MultiSync® and AccuSync™ family of monitors. The DPMS is the signaling method in which the NEC monitors use to help in conserving energy.

This energy-saving feature works in conjunction with your DPMS compliant system, video card, or software. When in power saving mode the monitor will power down, saving up to 70% of the total power drawn under normal operation. This innovation adds up to substantial energy savings and longer monitor life, which translates directly into cost savings (**Figure 1**).

Savings per Monitor

☐ Without IPM
☐ With IPM

Annual Energy Cost

$200
$150
$100
$50
$0

Continuous Use

Low Average Use

Figure 1 - Energy Savings*

The three stages that the IPM System incorporates to help the monitor save energy are all dictated by the videos horizontal and vertical sync signals (**Table 1**).

Stage one - **ON** - is the state when the monitor is normally on. In this stage, the horizontal and vertical pulses are both **ON**; therefore, your video is active.

Stage two - **STANDBY** - has a partial power reduction with the shortest recovery time. In stage two, there is no horizontal pulse but there is a vertical pulse being sent by the video sub-system. The monitors three video guns are shut off resulting in a blank screen. The **STANDBY** mode offers minimal power reductions and cost savings for a monitor when it powers down. However, as monitors develop with additional features like multimedia, manufactures may use the **STANDBY** stage for additional savings that may not be easily evident today.

The final stage that the IPM system offers is the **SUSPEND** or **SLEEP** mode. **SUSPEND** refers to the level of power management in which substantial power reduction and cost savings is achieved by the monitor. In this stage, there is a horizontal pulse but no vertical pulse being sent to the monitor via the video sub-system of the computer. When the monitor detects this type of activity, the high voltage, video and horizontal and vertical deflection circuits of the monitor are turned off . This is why this stage has the greatest power savings and in turn the greatest cost savings -- up to $95 per year per monitor.

It should be noted that the IPM System is dependent on the video sub-system, one which supports this type of feature (DPMS) so the monitor will not be able to take advantage of the IPM System - via its microprocessor - and go into the different states of power down if it does not receive the proper signal from the computers video.

State	Signals			Power Savings	Recovery Time
	Horizontal	Vertical	Video		
On	On	On	On	None	N/A
Standby	Off	On	Blanked	Minimal	Short
Suspend	On	Off	Blanked	Substantial	Longer

Table 1 IPM (Intelligent Power Manager System)

- Continuous Operation: Monitor left on 24 hours a day, 7 days a week.
- EPA Average: Of 100 monitors, 40% are in continuous operation; the other 60% are on 9 hours a day, 5 days a week.
- Energy savings based on 11 cents per kilowatt hour. Your costs may vary according to your service classification and usage pattern.
  Use the Savings guide as comparison only.