[0038] The controller **500** activates the fans **402/408** when the reported temperature from the temperature sensors **502** exceeds a minimum temperature (e.g., 20° C.) programmed into the controller **500**. This allows the bulbs to attain optimum minimum bulb wall temperature (MBWT). Once activated by the controller **500**, the fan speed is determined by the internal temperature sensed by the temperature sensors **502**. A programmable maximum operating temperature can be set in the controller **500**. In an exemplary embodiment, if either of the temperature readings is within five degrees of the maximum operating temperature, the event is recorded and date/time stamped into non-volatile memory and a visual indicator is provided on the LED **504**. If the temperature achieves, or exceeds, the maximum recommended operating temperature, an event is recorded and date/time stamped, and a different visual indicator is provided on the LED **504**. The duration of the over-temperature condition can be recorded for warranty and troubleshooting purposes. An identical process can be performed for an under-temperature condition where the minimum operating temperature is programmable and can be set by an operator. This allows the bulb temperature to remain in a preferred temperature range often referred to as a "sweet spot." It is known that certain bulbs operate more efficiently at an optimum MBWT. The control techniques used in the invention allow the bulb temperature to remain in this range.

[0039] If the over-temperature condition persists, the controller **500** executes a soft failure that begins by reducing the inverter output in steps (e.g. by 50%, then by another 50%) and it may result in one of the inverters **202/204** being shut off completely if reducing inverter output does not cure the over-temperature condition. When the temperature returns to a safe operating range, the controller **500** will return the inverters **202/204** to normal operation. If the temperature does not return to a safe operating range then the monitor will be shut-down completely while still allowing log data to be downloaded through the I/O device **510**. In addition, the controller **500** records the maximum and minimum temperature extremes, experienced while under power on the non-volatile memory or monitoring computer. Alert messages can be sent from the controller **500** and instructions can be received by the controller **500** through a network connection implemented by the I/O device **510**.

[0040] As depicted in **FIG. 5**, the fans **402/408** are monitored by the controller **500**. Fan failure can be detected by the controller **500** and a warning issued to the user through the LED **504**. An anomaly in the current waveform of a fan **402/408** may indicate a fan failure or fault and the fault may be stored in the memory associated with the controller.

[0041] In an exemplary embodiment, a personal computer is used to execute software that predicts failures and determines the need for preventive maintenance using fault and event data that has been logged in the memory associated with the controller **500**. In addition, a personal computer can be used to control the backlit LCD monitor through a diagnostic mode in which backlit LCD monitor parameters (e.g., bulb brightness, temperature) can be monitored and controlled from a personal computer.

[0042] The I/O device **510** allows the controller **500** to send data to an external device, such as a personal computer, for analysis and to receive commands from the external device. In addition to receiving commands from an external device, software upgrades to the controller can also be received from an external device. An embodiment of the present invention provides a secure, password protected method of performing software upgrades. In an exemplary embodiment, the external device is a personal computer that can use the I/O device or communication controller **510** to access fault and event data in the log stored in the memory associated with the controller **500**. A video controller **512** is also connected to the controller **500**. In addition to a personal computer, any external device known in the art that can execute computer software can be used with the present invention. The personal computer can execute software to perform predictive fault analysis using the log data and historical statistical data to determine if failure of the backlit LCD monitor is imminent and recommend appropriate service. For example, bulb current and brightness can be recorded at pre-selected intervals. This data, or an aggregate of this data for several monitors, can be used to predict failures and replacement timeframes. Also, the personal computer can issue commands to the controller **500** through I/O device **510** to perform a variety of actions such as a command to modify brightness. The I/O device **510** may be a serial port (e.g., RS232 port), an infrared data association (IrDA) port, a communications controller or any other communications interface known in the art. In an exemplary embodiment, the I/O device **510** allows the controller to send and receive data over a communications network.

[0043] In an exemplary embodiment, the controller **500** date/time stamps and records all of the failures and events in non-volatile memory. The log data stored in non-volatile memory can include: the conditions at failure (e.g., temperatures, fan speeds, brightness), the duration of the failure and the action taken in response to the failure. In addition to fault and event data, the controller **500** can maintain data that includes: date of manufacture of the monitor, serial number of the monitor, component serial numbers, installation dates, hours in use, and warranty expiration dates, system alias, and non-volatile memory available. In an exemplary embodiment, the components include: AC power supply, LCD video controller, brightness sensor array module, three cooling fans, inverter module, DC/DC power supply, backlight assembly, controller **500**, and LCD display. The recorded data in the controller can be retrieved for viewing and additional analysis through the I/O device **510**.

[0044] In an exemplary embodiment, an operator can request, through the I/O device **510**, a snapshot of the current conditions in the monitor. The data sent to the operator can include: failure data, current temperatures, current fan speeds, current brightness, run time for the monitor and for each component, current status of each component, the minimum and maximum temperatures, the amount of controller memory currently in use and the software version being executed by the controller.

[0045] In an exemplary embodiment, the LED **504** depicts the status of the fans **402/408**, the temperature, the power and the inverters **202/204**. The fan status LED can be set to "green" to indicate that the fan status is "good" and set to "red" if a fan failure has occurred. The temperature status LED can be set to "green" if the temperature is a "safe temperature", set to "yellow" if the temperature is a "caution temperature", and set to "red" if the temperature is an "over temperature." Similarly, the power status LED can be set to "off" to indicate "no power", "green" to indicate "power