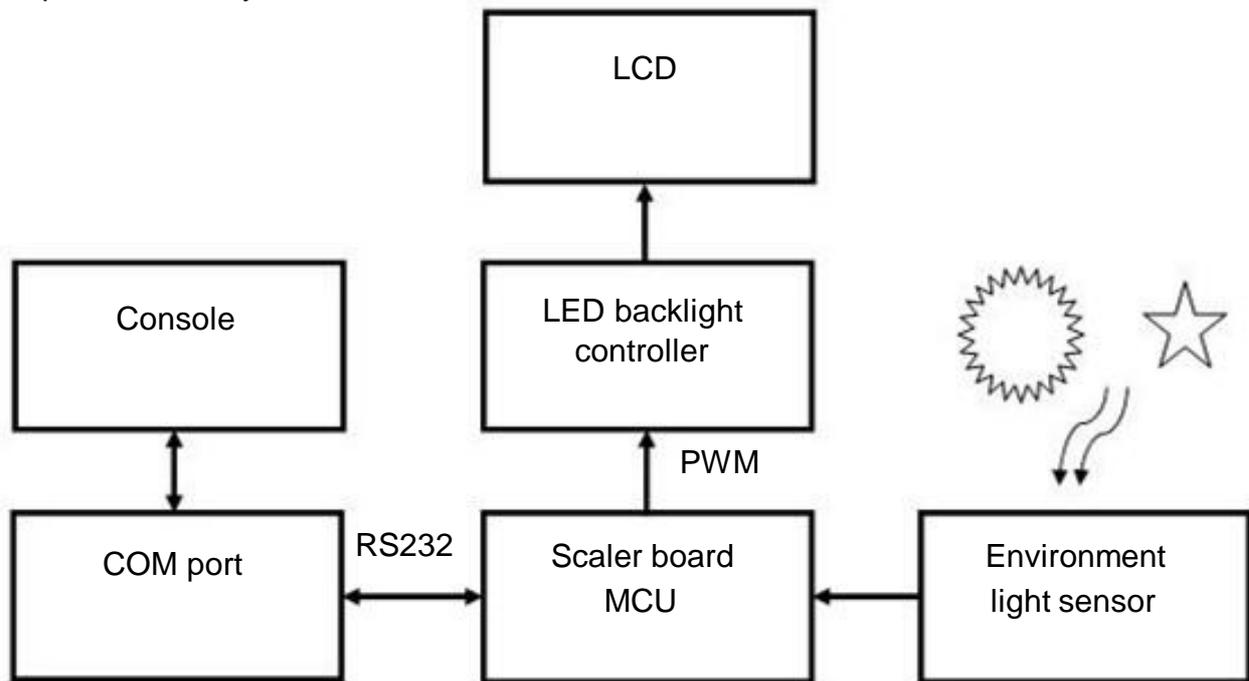


How the high brightness LCD monitor with auto-dimming works

Operation theory



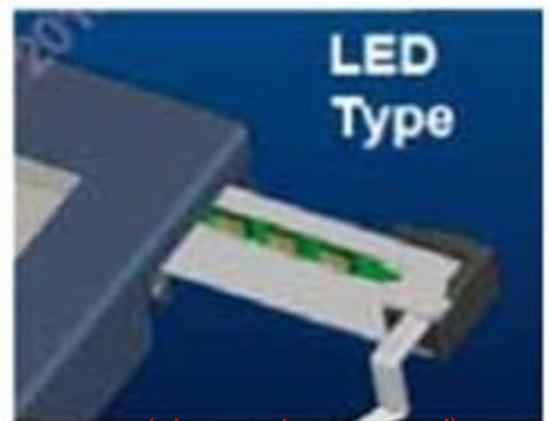
The environment light sensor is able to detect the intensity or the brightness of light surrounding the display. The light is converted to an electronic signal and is sent to the scaler board. The smart program of the MCU then adjusts the percentage of backlight accordingly.

Furthermore, the sensor function can be disabled directly on the monitor or via RS232 if connected to the console.

LED backlight

Compared with conventional CCFL, LED technology has many advantages.

- Lower power consumption
- Longer lifetime
- Thinner and lighter
- Better dynamic contrast
- Wider color gamut
- Safer without Hg (mercury)



(photo to be renewed)

PWM (Pulse Width Modulation)

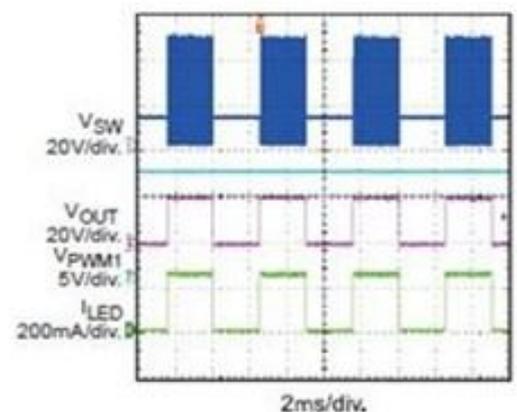
The current mode PWM technology is used for LED backlight control. Higher efficiency and more linear control range makes the brightness of the LED backlight smooth and stable.

Through the PWM dimming control, the LED backlight can be driven to its minimum without flicking effects under dark environment operation.

Wide temperature range operation

External PWM Dimming

$f_{PWM} = 2\text{kHz}$, $D_{PWM} = 50\%$



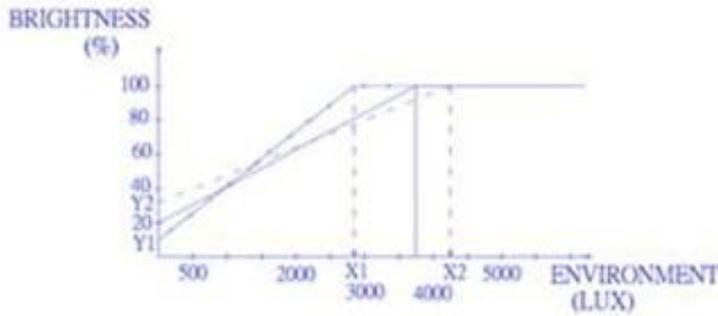
Auto-dimming

The removable light sensor box can be located at any preferred place.

The auto-dimming design will adjust the screen brightness to a comfortable level automatically according to the ambient light day or night.

The X-axis shows a proper setting to define the environment luminance for a readable screen.

The Y-axis shows a proper value to prevent eye fatigue in a darker environment.



Referenced illuminance (Lux)	outdoor under shade	outdoor under roof	indoor under fluorescent lamps
Sunny	~10000	~4000	~600
cloudy	~6000	~2000	~300
night	0	0	0

The following photos are of a side-by-side comparison between a high-brightness monitor with the auto-dimming function and a notebook PC shown with constant brightness from morning to night. As can be seen, the high-brightness monitor gives a brighter picture in the daytime and the screen dims at nighttime automatically.

Morning



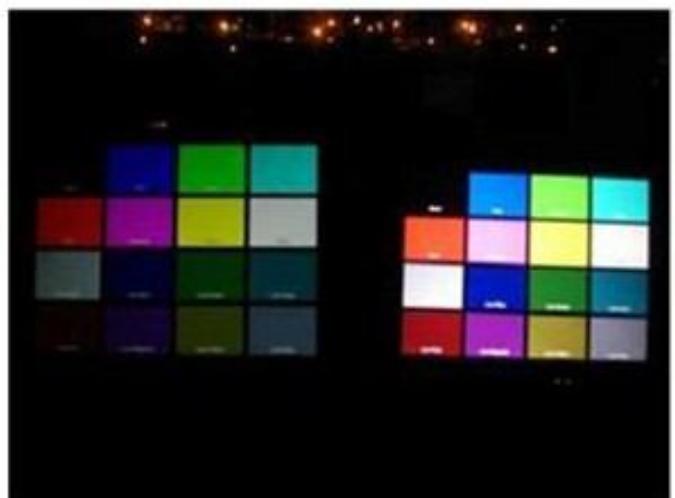
Afternoon



Twilight



Night



Friendly OSD adjustment

A simple and friendly OSD design makes adjustment simple for users.

OSD key	Function
LEFT	ADJ- / SEL-
RIGHT	ADJ+ / SEL+
EXIT	Auto adjust (OSD OFF)
ENTER	OSD ON
POWER	POWER ON / OFF



RS232

ADS provides an UART **protocol** to customers who intend to program their own API under Windows for the remote control through RS232.

Baud rates of 9600` 4800 and 2400 can be used as well as the COM port.

For those customers need the AP but don't have their own resources, ADS may offer a standard API for an additional charge.



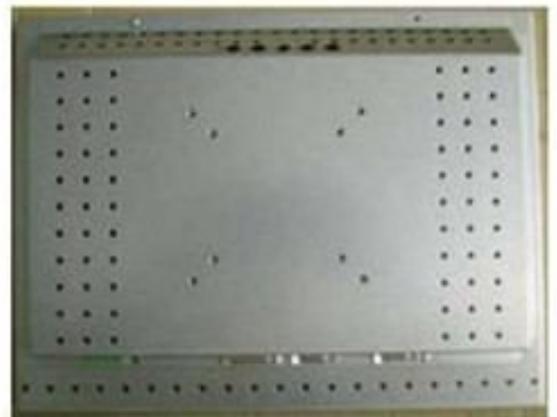
Open frame

An open frame design allows customers to place the unit into any cabinet using optional mounting adders or VESA mount.

Side mount



VESA mount



- **Diagnostic**

Another optional sensor and design provide a diagnostic function for customers to know if the LCD is alive. At the bottom-right corner, a small section of the LCD is reserved to display red, green or blue where the sensor is aimed. The sensor signals the console via serial port where the API shows if the backlight works.

Since the sensor board is thin and should be installed in front of the LCD panel, a proper mechanical design to protect it is recommended, such as tempered glass.

This function is very useful for large size monitors on digital signage applications.



- **Sunlight readable**

Using a higher brightness LCD by adding a transfective film or anti-reflective glass, the unit has a higher contrast ratio which is the basic requirement for an outdoor application.

Also, a proper heat dissipation design and water-proof treatment will be necessary for outdoor use where a wider temperature range is needed.

Unless installing into an enclosure, glass or touch sensor bonding will help in an outdoor application. Not only will this raise the contrast ratio, but also prevent moisture and possible damage from the environment.

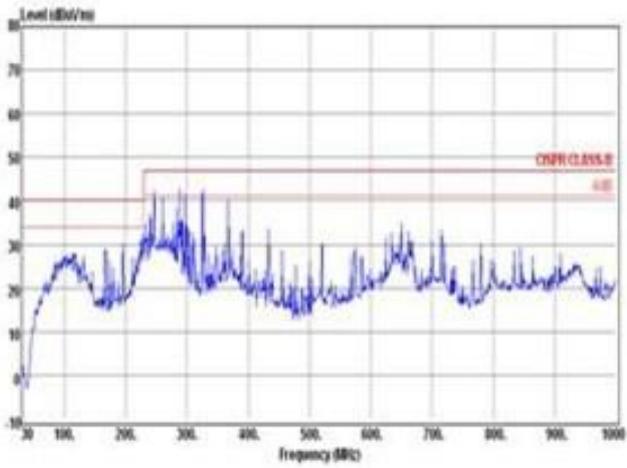


(photo to be renewed)

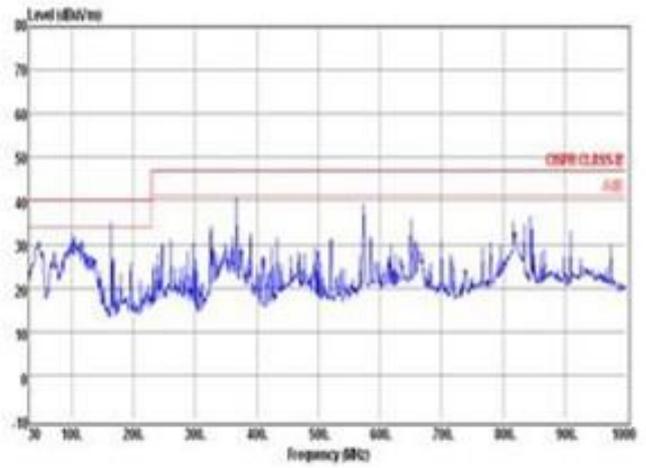
Agency test

The following data shows a self-certificated EMC test has been done. All the radiation and conduction data are class B under 6 db.

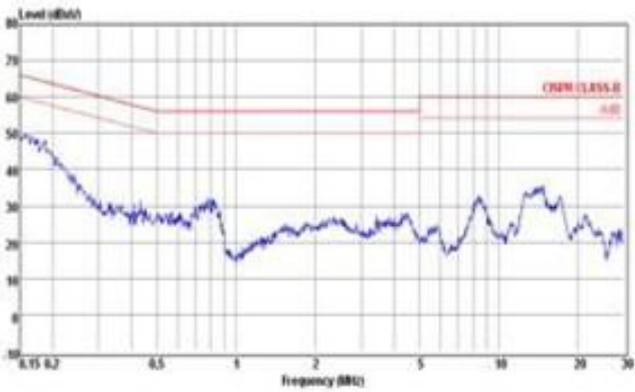
Radiation (horizontal)



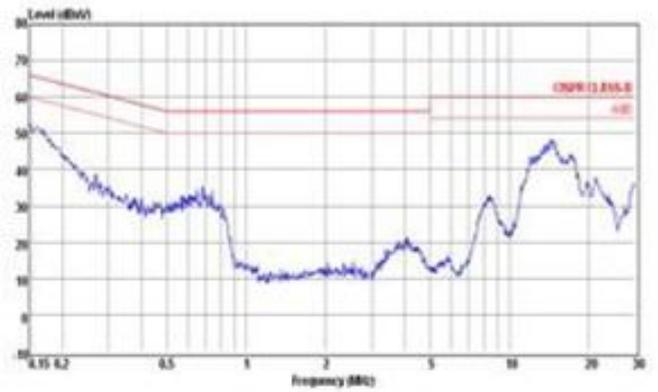
Radiation (vertical)



Conduction (line)



Conduction (neutral)



Radiation test

Conduction test