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FLM-520
User's Guide

FLM-520 LCD Monitor

Finecom Co., Ltd.

Fine B/D. 673-5 Dungchon-dong,
Kangseo-ku, Seoul 157-030, Korea.
Tel : 82-2-3662-5811
Fax : 82- 2-3663-0987
Web site : http://www.finecom.co.kr

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FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interferences to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit difference from that to which the receiver is connected.

- Consult the dealer of an experienced radio/TV technician for help.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to insure compliance.

1. Outline

1-1) Introduction to FLM-520

FLM-520 is a display device which transforms analogue signals of Graphic inputs (Video signals of VGA, SVGA and XGA) into digital signals and displays them on LCD panel. The user can select OSD Menu items by using external keypad to adjust Brightness, Contrast, Color, Position and etc. for best working condition. Digital/NTSC/PAL is optionally supported

1-2) Features

FLM-520 (15 inch) is the best choice at any applications of financial, industry, government in which working pace, weight and reliance should be thought. This 15 inch LCD monitor provides a viewing area equivalent to a 17 inch CRT monitor. Imbedded 1.5W 2 speakers, displays bright and sharp screen of 200 cd/m2. To provide optimized working environment it can be tilted forward 5 degrees and backward 10 degrees, and swiveled left/right 45 degrees each.

2. Components & Parts names

2-1) Components
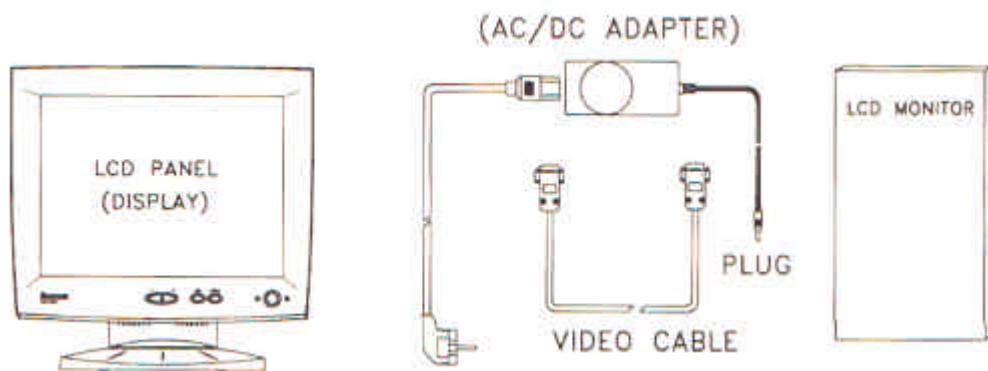
Figure 2-1) : Components

2-2) Front & Rear View
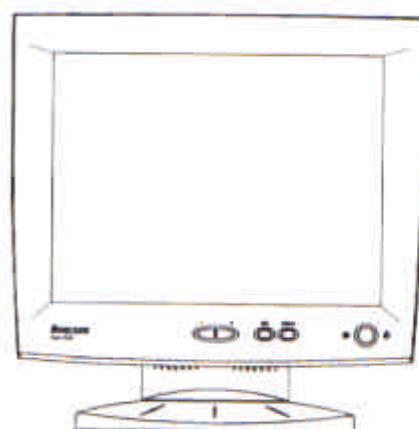
Figure 2-2) Front View   **Figure 2-3) Rear View**
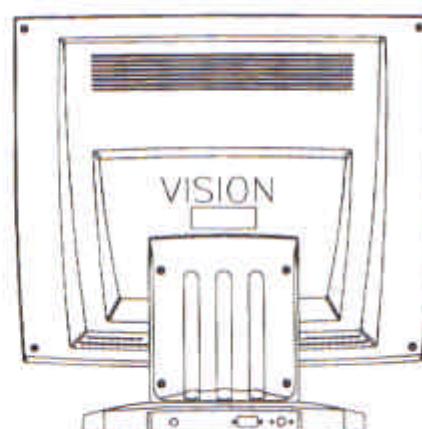
3. Installation

1) Connect the input plug to FLM-520 LCD monitor.

   (Connect 15 pin RGB connector, for analogue RGB input, to FLM-312 as shown Figure 2-3).

2) Connect the 12V Adapter to FLM-520.

   (When you turn on power switch, LED on the board will light Red, Green in turn and then green will remain.)

3) Adjust parameters of OSD Menu by using External keypad.

   (Automatic Configuration is convenient to use; When power on or screen mode changes, optimized conditions are made automatically)

4) If there is something wrong with Video Cable or PC power is off, the message of "No Sync" is displayed on the screen. When this condition continues 10 seconds, LED on the board lights red and then the power of LCD panel is automatically cut off. Once Video cable is connected or PC power turns on, LED lights Green and LCD panel power is restored.

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4. Speaker

A speaker plug is ready at the rear of this LCD monitor. It is installed as follows;

1) Connect the PC Audio jack to FLM-520 Speaker plug.(1.5W 8 Ohm, Stereo)

2) Select Speaker volume at OSD initial Menu and then adjust the volume.

   (After adjusting the volume, it shall be saved at the Initial Menu in order to keep

   the setup volume when power on and off.

3) Decrease the volume when it is not used.

   (1.5 W Dual Amplifier is imbedded and it can bring noise when volume is too high)

5. External Keypad

5-1) External Keypad

AT the rear left side External Keypad is ready for user's interface, it is configured as below :

- (Left)   +(Right)   Sel(Down)   LED

                                    Menu   Power Switch
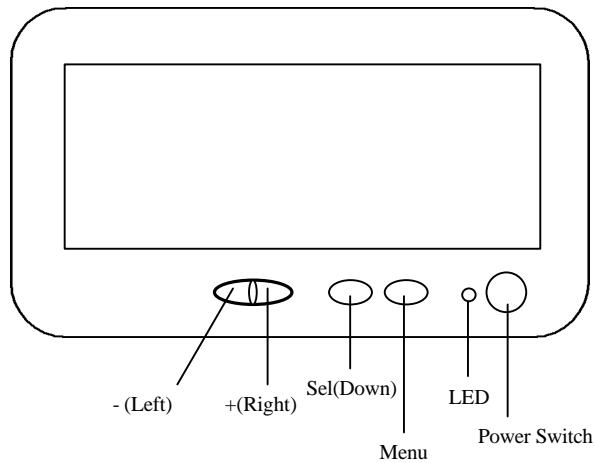
Figure 5-1) External Keypad Block Diagram

If MENU button is pressed, the OSD MENU is displayed. The user can select the Menu item by pushing SEL button, and then adjust the selected values and or move to below Menu by using +(Right) and –(Left) buttons. Adjusted value shall be saved at OSD Menu in order to keep it during power on and off.

5-2) Function of Push button

There are 4 buttons to do following functions.

MENU :   To start or terminate Menu or move to upper Menu.

SEL (Down):   To move to the item's position to be selected.

LEFT (-):   To decrease the selected parameter value or to move to below Menu.

RIGHT (+):   To increase the selected parameter value or to move to below Menu.

6. OSD Overview

6-1) Power On Default Settings

FLM-520 devices are initialized during power-on to the last saved conditions.

During OSD all parameters are saved only when the user select SAVE at the Menu.,

In case the user exits the menus without selecting SAVE at Menu, the parameters are

applied only at present conditions and when Power on/off, it is returned to the last saved

value.

6-2) Value Controls

Many parameters value of Tree-type Menu can be adjusted by using the

+(Right) and –(Left) buttons. SEL button is pressed to move to the next item.

In order to move to the upper Menu, Menu button may be used or "Main Menu"

item is selected.

6-3) LED Active Source Indicator

When the LED lights Green, the monitor is ready to use normally.

When the LED lights Red, Power may be cut off because there is something wrong with

Video Input and or LCD panel power may be off when the user selected ' Power Down'

at OSD Menu.

6-4) Warning Message

A warning message as in Figure 6-1 is displayed when the system detects that an RGB

Video cable is not connected to the FLM-520 monitor. The message is displayed for a

maximum of 10 seconds until the cable is connected.

A message in Figure 6-2 is displayed in case of not-supported Video Mode. Please refer

to Table 2 for supportable Video Modes.

<div style="display:flex; justify-content:space-between;">

No Sync   Video Change Mode

</div>

Figure 6-1) No RGB Warning Message   **Figure 6-2) Unsupported Input Warning**

Message

7. OSD Menu Items

The OSD main Menu is displayed when the Menu keypad push button is pressed when FLM-520 powered on, and inputs & outputs properly connected. The OSD menu display is a combination of graphics and text as in Figure 7. The selected or active menu item is indicated in blue color as below. In PC Graphic mode, the bottom bar indicates the present input image resolution.

Sel(Down) button is used to move from item to item. The + and – keypad push buttons are used to select the Menu or to change the value. The selected item is highlighted. The Menu button is pressed to close the OSD Menu.

```
R G B Menu
Geometry Menu
Contrast Menu
Info
Input Type
● ● ● ● ● ● ● ● ● ● ● ● ●
Auto Config
NVRAM Init
Power Down
Revert
Save
  S     1024x768
```
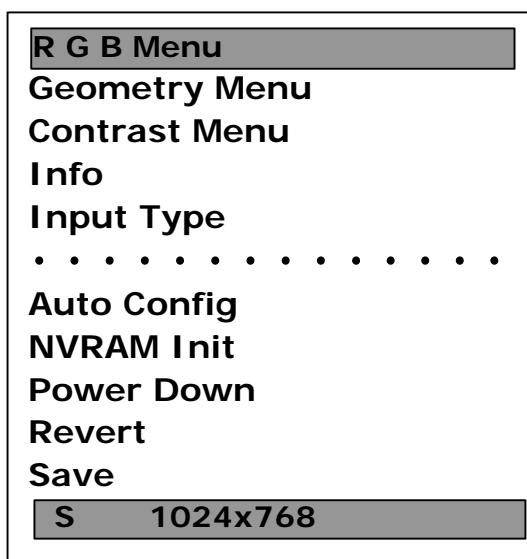
Figure 7) OSD Main Menu

There are 10 items within the main Menu.

RGB Menu: Adjusts color and brightness.

Geometry Menu: Adjusts the screen position.

Contrast Menu: Adjusts image contrast.

Info: Displays the product information.

Input Type: Selects Input Source.(Analog, Digital, NTSC/PAL)

Auto Config: Optimizes it into best condition automatically**.**

NVRAM Init: Initializes the saved value setup.

Power Down: Turn the power into power saving.

Revert: Turn into the last saved condition.

Save: Saves the setup value.

7-1) RGB Menu

RGB item is used to adjust the image color and brightness. Indicated number shows the present brightness value as Figure 7-1. The range of adjustment is –127 to 127. The RGB value is adjusted according to the input selected.

```
Brightness
    Red                  0
    Green                0
    Blue                 0
  Color Temp             3
  Sharpness
  Main Menu
```
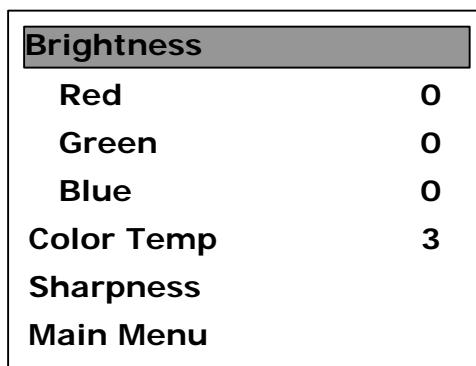
Figure 7-1) Contrast Slider

Brightness

Adjusts the screen brightness by adjusting Red, Green and Blue in total**.**

Red

Adjusts brightness of Red color by increasing or decreasing Red Color Channel of PC Graphic.

Green

Adjusts brightness of Green color by increasing or decreasing Green Color Channel of PC Graphic.

Blue

Adjusts brightness of Blue color by increasing or decreasing Blue Color Channel of PC Graphic.

Color Temp

Adjusts Gamma table suitable for the PC. Range of adjustment is 0 to 6.

Sharpness

Adjusts the Graphic outline. Range of adjustment is 0 to 4.

7-2) Geometry Menu

This Menu is used to adjust screen position of the monitor by adjusting Clock (Pixel) numbers per a line or automatically.

```
┌─────────────────────────────────┐
│ Auto Adjustment                 │
│ H Position              0        │
│ V Position              0        │
│ H Total                 0        │
│ Auto Phase                       │
│ Delay                   3        │
│ Main Menu                        │
└─────────────────────────────────┘
```
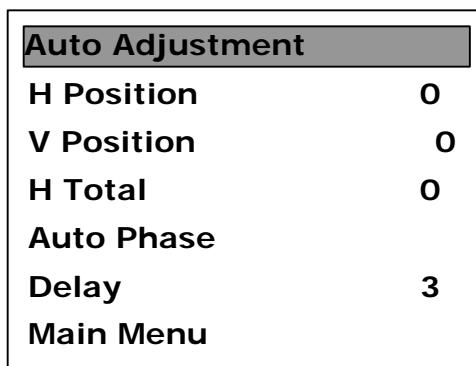
Figure 7-2) Geometry Menu

Auto Adjustment

Adjusts automatically the position or size by searching for the optimized condition to the PC Graphic.

H Position

H-Position is used for the user to manually adjust the image horizontal position, the range of value adjustment is different according to Input Mode selected.

V Position

V-Position is used for the user to manually adjust the image vertical position, the range of value adjustment is different dependent on Input Mode selected.

H Total

H-Total is used to adjust Clock(Pixel) numbers, the value can be changed according to the PC screen.

Auto Phase

Auto Phase makes the screen optimized by adjusting ADC Sample Pixel Clock according to the PC Graphic environment.

Delay

Setup the delay value of SCLK Clock. The range is 0 to 47.

7-3) Contrast Menu

Contrast Menu is used to adjust image contrast. The range of adjustment can be changed according to the screen Mode.

```
┌─────────────────────────────┐
│ Auto Balance                │
│ Contrast                    │
│   Red              O         │
│   Green            O         │
│   Blue             O         │
│ Main Menu                   │
└─────────────────────────────┘
```
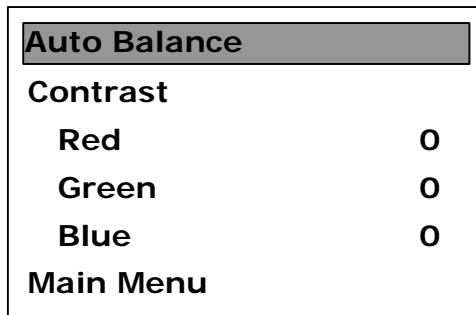
7-3) Contrast Menu

Auto Balance

Makes the image contrast optimized by searching for the PC Graphic condition.

Contrast

Adjusts the screen contrast by adjusting Red, Green and Blue in total.

Red

Adjusts the Red color contrast by increasing or decreasing Red Color Channel of the PC Graphic.

Green

Adjusts the Green color contrast by increasing or decreasing Green Color Channel of the PC Graphic.

Blue

Adjusts the Blue color contrast by increasing or decreasing Blue Color Channel of the PC Graphic.

7-4) Info

Can check Firmware Version, Model number of FLM-520 LCD monitor.

```
         FLM-520

        Version 1.x

      Finecom Co., Ltd.

     URL:www.finecom.co.kr
```

Figure 7-4) Info

7-5) Input Type

Setups the Input Type.

Caution) Digital Input, NTSC/PAL are optional. Even in case the user did not choose the option, Digital Input and NTSC/PAL are displayed in the OSD Menu but they are not operating.

```
  Analog Input
  Digital Input
  NTSC / PAL Input
  Main Menu
```
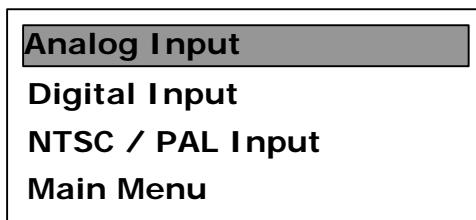
Figure 7-5) Input Type selection

Analog Input

 Selects the Input Signal which has Red, Green and Blue Signals**.**

Digital Input

 Selects Digital Input(TMDS method).

NTSC/PAL

 Selects NTSC/PAL(Color TV receiver method) Input.

 (**NTSC** : National Television System Committee, **PAL** : Phase Alternation by Line)

7-6) Auto Config

Makes the screen condition optimized by searching screen condition.

7-7) NVRAM Init

Initializes the saved value of FLM-520 NVRAM when the power turns off.
Even though you selected NVRAM, the present value is not changed.

7-8) Power Down

Changes Board LED to Red and cuts off the power of LCD panel.
To restore the power, press the external Keypad button.

7-9) Revert

This Menu is used to return to the last saved value. It is used to revert the last
saved value when the user changed the setup by mistake and or the user would
like to return to the last saved value.

7-10) Save

Saves the present setup into NVRAM.

8. Installation of Windows Driver

FLM-520 provides Windows 95/98 Driver, which is recommended to install for the case of " screen is not displayed because video mode not supported by FLM-520 is set".

It is not necessary to inevitably install FLM-520 Windows driver. But when installed, supported resolution and revival frequency(screen return/frequency) are indicated in the list. Accordingly, the user cannot set resolution and frequency not supported by this device so that the monitor's non-operation by the user's mistake can not happen.

Installation method

1) Insert the provided Windows Driver diskette into the floppy drive.
2) When the program is executed, click "driver Installation".
3) When driver is copied, system rebooting will finish driver installation.

For reference, in case not supported Mode has already been installed, it is possible to install by booting Windows safe Mode.

9. Specifications

- **LCD panel**:   TFT
- **Viewable area**:   15"
- **Resolution**:   1024×768
- **Viewing Angle**:   R/L: 50/50, Up/Down: 25/50
- **Pixel pitch**:   0.297 x 0.297 mm
- **Display color**:   262,144 Colors
- **Brightness**:   200 cd/mxm
- **Contrast ratio**:   200
- **Response time**:   40 ms
- **Input video signal**:   VGA Compatible Analog RGB
- **Horizontal frequency**:   31~60KHz
- **Vertical frequency**:   56~75Hz
- **Screen expansion**:   Advanced Image Magnification Zoom Scaler
- **Compatibility**:   IBM VGA, SVGA, XGA
- **OSD Control**:   Brightness, Contrast, Color, Position, Phase
- **Speaker**:   1.5Watt x 2 Speakers
- **Power Source**:   12V AC-DC Adapter(Input 100~240V AC, 50~60Hz)
- **Power consumption**:   40W Max
- **Dimension (WxHxD)**:   385(W) x 329(H) x 90(D) mm
- **Weight**:   5.0 kg
- **Temperature**:   1~50 °C
- **Humidity**:   90%

10. Problems and Check Points

* No Image shows up: - Check if the power indicator is on.

- Check if you turned on the power S/W.

- See that Power cable is connected well.

- Ensure any pin of connectors are not broken or crooked.

* **Image not centered, not stable**:   Please refer to OSD functions.

* Warning: Please do not open the Monitor, it may cause serious problem.

When you or your supplier cannot solve the problem, please contact

the service personnel at the maker.

Table 1 : Analog RGB Input Port Signal Description

Pin No.	Pin Name	Logic	Description
1	RED	Analog	Red Input Signal
2	GRN	"	Green "
3	BLU	"	Blue "
13	HSYNC	TTL	Horizontal Sync
14	VSYNC	"	Vertical "
12	Monitor ID bit 1	"	DDC SDA
15	Monitor ID bit 3	"	DDC SCL
9	+5V-DDC1	Power	+5V From Graphic Card, Not Used
5,6,7,8,10	GND		Grond
4,11, 9	No Connect		Not Used

Table 2: Supported RGB PC Graphics Input Formats

VESA MODES							
			Horizontal^2		**Vertical^2**		
Mode	**Resolution**	**Nominal Total**	**Nominal Frequency +/- 5kHz**	**Sync Polarity**	**Nominal Frequency +/- 1 Hz**	**Sync Polarity**	**Nominal Pixel Clock (MHz)**
VGA(6)[7]	640x480@60Hz	800x525	31.649	N	59.940	N	25.175
VGA(8)	640x480@72Hz	832x520	37.861	N	72.809	N	31.500
VGA(9)	640x480@75Hz	840x500	37.500	N	75.000	N	31.500
SVGA(11)	800x600@56 Hz	1024x625	35.156	N/P	56.250	N/P	36.000
SVGA(12)[7]	800x600@60 Hz	1056x628	37.879	P	60.317	P	40.000
SVGA(13)	800x600@72Hz	1040x666	48.077	P	72.188	P	50.000
SVGA(14)	800x600@75Hz	1056x625	46.875	P	75.000	P	49.500
XGA(17)5	1024x768@60Hz	1344x806	48.363	N	60.004	N	65.000
XGA(18)	1024x768@70Hz	1328x806	56.476	N	70.069	N	75.000
XGA(19)	1024x768@75Hz	1312x800	60.023	P	75.029	P	78.750
IBM MODES							
EGA(1)[3]	640x350@70Hz	800x449	31.469	P	70.086	N	25.175
CGA(23)[4]	640x400@70Hz	800x449	31.469	N	70.086	P	25.175
EGA(25)[3]	720x350@70Hz	900x449	31.469	P	70.086	N	28.322
DOS(4)[4]	720x400@70Hz	900x449	31.469	N	70.086	P	28.322
XGA(24)	1024x768@72Hz	1304x798	57.515	P	72.1	P	75.000