Engineering Specification

Model No. EFL-3203HUIG

32inches <u>wide</u> LCD Monitor

- AUO DID Full-HD TFT LCD Panel with LED Backlight

- High performance up-Scaling characteristic

- Automatic Scanning

- Wide Viewing Angle, High Speed Response

- Enhanced Video Quality

- Test Pattern for Burn-in & Self Check

- Built in Tempered Glass

- 2 Inputs(VGA, DVI)

- 24V DC Input

- RoHS Compliance

Record of revisions.

Date	Rev. No	Page	Description	Issued by
02/22/2016	N1.0		First Draft (Preliminary) Issued	

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1. GENERAL DESCRIPTION

1-1. Overview

Effinet open frame LCD Monitor EFL-3203HUIG is a high performance TFT LCD monitor providing high quality image from the analog VGA and DVI inputs with tempered protection glass. This monitor supports wide range signal input from VGA to WUXGA resolution at vertical refresh rate of 60Hz. It includes integrated signal processing unit, named LSP (LCD Signal Processor), which had all electronic function for user application.

It is designed for industrial use with up scaling performance adequate for low-resolution application and enhanced design margin for reliability.

1-2. Quick reference table of Characteristics

Panel	Size	32" Diagonal
	Active Display Area	698.4 x 392.85 mm
	Type No.	AUO, P320HVN02
	Number of Pixels	1920 (H) x 1080 (V)
	Pixel Arrangement	RGB Vertical Stripe
	Pixel Pitch	0.3637mm x 0.3637mm
	Color Depth	8 Bit, 16.7M
	Surface Treatments	Anti-Glare (3H) Haze 2%
	Viewing Angle (CR$\geq$10)	Horizontal : θL 89 degrees θR 89 degrees Vertical : Φ H 89 degrees Φ L 89 degrees
	Contrast Ratio	Typ. 3000 : 1
	Response Time	G to G : 8ms
	Average Brightness	Typ. 500 cd/m^2
	Frame Rate	Typ. 60Hz
	Panel Dimension(WHD)	719.2 x 413.7 x 24.8 mm
Scanning Frequency	Horizontal	60 ~ 73KHz
	Vertical	47 ~ 63Hz

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| Resolution	Prime	1920 x 1080 @ 60 Hz
	Standard	720x400 @70 Hz,
		640x480 @60 Hz
		800x600 @56/60 Hz,
		1024x768 @60 Hz,
		1280x768 @60Hz,
		1280x800 @60Hz,
		1280x1024 @60Hz,
		1680 x 1050 @ 60 Hz
Input Signal	VGA (Video / Sync)	RGB Analog (0.7Vp-p, 75ohms) / H/V Separate(TTL)
	DVI	TMDS link(DVI-D)
Sync	Type	Separate H/V sync, Composite, SOG(Sync-On-Green)
	Level	TTL level (V high $\geq$ 2.0V, V low $\leq$ 0.8V)
	Polarity	Positive or Negative
Input Signal Interface	RGB	15Pin D-Sub
	DVI	24Pin D-Sub
Power	DC Input	24V
	Max. power dissipation	55 Watts
	Input Connector	Power Din 4P
Regulation(Safety , Ergonomics, EMC)		CUL, FCC,CE
Environmental Conditions	Operating	Temperature : 0 to 50℃ / Humidity : 10 to 90%
	Storage	Temperature : -20 to 60℃ / Humidity : 10 to 90%
White Color Temperature		10000°K : CIE x=0.280$\pm$0.02 / y=0.290$\pm$0.02
Demonstrated MTBF		More than 30,000 hours
Protection Glass		3.2mm Thickness, Tempered Glare type
Cables/Leads		No power lead, DVI/VGA cables are required to be supplied with the unit.

2. USER CONTROL & OSD

2-1. Key Control Board
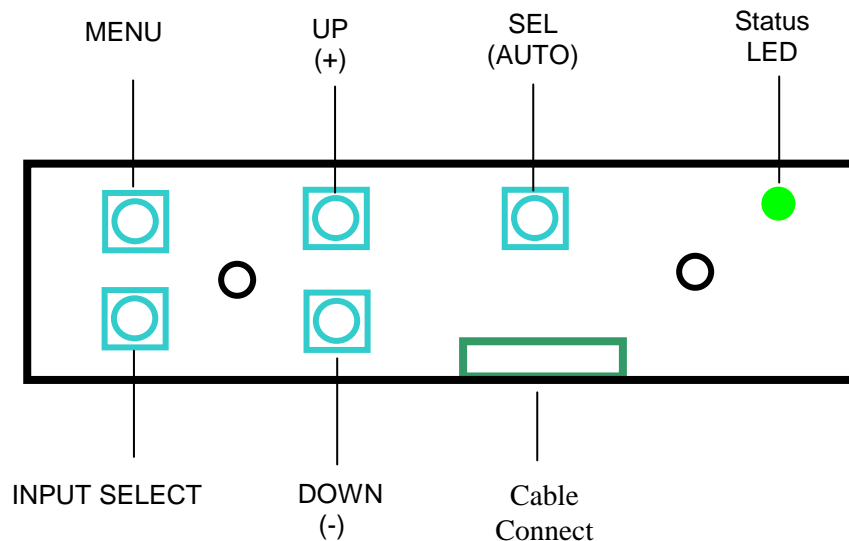
SWITCH NAME	SWITCH FUNCTIONS
MENU	▪ Activate / Deactivate the OSD Menu Window. ▪ Move cursor to Sub Menu from Main menu.
SEL (AUTO)	▪ Move cursor in the Sub-Menu(Brightness ↔ Mode) ▪ **Auto Tracking** (Pressing "SEL" key)
UP(+)	▪ Move cursor at Main Menu(Picture / Utility) ▪ Increase the value of the selected function
DOWN(-)	▪ Move cursor at Main Menu(Picture / Utility) ▪ Decrease the value of the selected function.
INPUT SELECT	▪ Select the input signal (VGA→ DVI → VGA…) ▪ When power off / on, the last memorized input mode will be displayed.

2-2. OSD Menu Screen

- Picture OSD
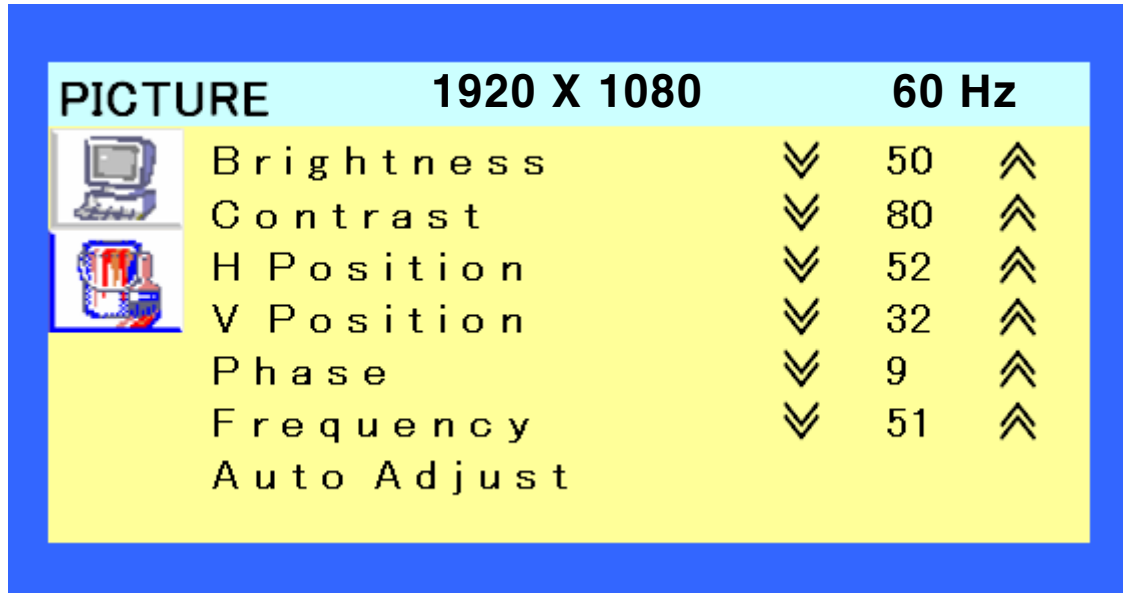
- Utility OSD
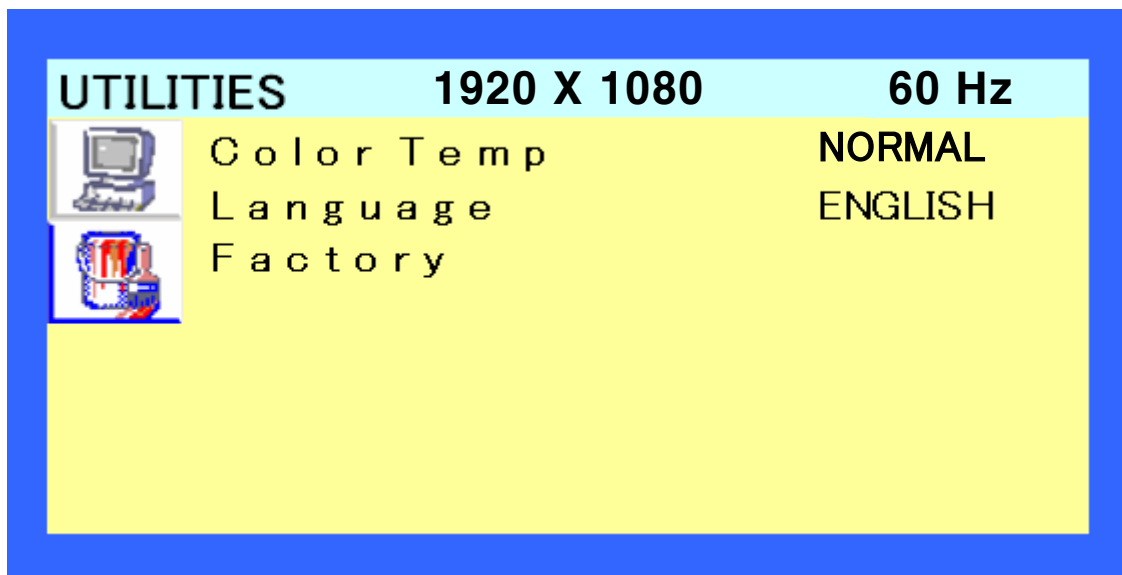
2-3. OSD Control Functions

CONTROL	FUNCTION
Auto Tracking	Automatic screen adjustment process. **If there is any noise on the screen or screen shift, just press " SEL" button.** **Since this monitor is equipped with "Auto Tracking" function, it will automatically configure the monitor setting.**
Brightness	Adjust the brightness level of the Display
Contrast	Adjust the contrast level of the Display.
H position	Adjust the position of the display horizontally.
V position	Adjust the position of the display vertically.
Phase	Adjust the clock phase of the display.
Frequency	Adjust the clock frequency of the display
Color Temp	Change color temperatures Adjust the Red/ Green / Blue Gain
Language	Select the OSD language
Self Test Pattern	To enter auto burn-in mode, press "Up" key first and then "Sel" key simultaneously for 3 seconds. On this mode, Red – Green – Blue – White – Black test pattern will be displayed. Press Menu key for returning normal display mode.

3. CONNECTOR PIN DESCRIPTIONS

3-1. 15 Pin D-SUB(VGA) Connector

Shape and pin number	Pin	Description	Pin	Description
11 6 1 12 7 2 13 8 3 14 9 4 15 10 5	1	Red	9	No Connection
	2	Green	10	Ground - Sync
	3	Blue	11	No Connection
	4	Ground	12	DDC-SDA
	5	Ground	13	Horizontal Sync
	6	Ground - Red	14	Vertical Sync
	7	Ground - Green	15	DDC-SCL
	8	Ground - Blue		

3-2. DVI Connector

Pin	Symbol	Pin	Symbol	Pin	Symbol
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	TDMS Data2 Shield	11	TDMS Data1 Shield	19	TDMS Data 0 Shield
4	No Connection	12	No Connection	20	No Connection
5	No Connection	13	No Connection	21	No Connection
6	DDC Clock	14	+5V Power	22	TDMS Clock Shield
7	DDC Data	15	Ground (H/V Sync, 5V return)	23	TDMS Clock+
8	Analog Vertical Sync	16	Hot Plug Detect	24	TDMS Clock-

4. STANDARD DISPLAY MODE

No.	Mode	Resolution	Horizontal		Vertical		Pixel clock
			Frequency	Polarity	Frequency	Polarity	
1	VGA	720 x 400	31.47 KHz	N	70.0 Hz	P	28.322 MHz
2		640 x 480	31.47 KHz	N	60.0 Hz	N	25.175 MHz
3	SVGA	800 X 600	35.16 KHz	N / P	56.3 Hz	N / P	36.000 MHz
4		800 X 600	37.88 KHz	P	60.3 Hz	P	40.000 MHz
5	XGA	1024 X 768	48.36 KHz	N	60.0 Hz	N	65.000 MHz
6	WXGA	1280 X 768	47.7 KHz	N	60.0 Hz	P	80.152 MHz
7		1280 X 800	48.635KHz	N/P	60.0Hz	N/P	68.900MHz
8	SXGA	1280 X 1024	63.98 KHz	P	60.0 Hz	P	108.00 MHz
9	WSXGA	1680 X 1050	64.674KHz	N/P	60.0Hz	N/P	119 MHz
10	WUXGA	1920 X 1080	67.5KHz	N/P	60.0Hz	N/P	148.5MHz

5. MECHANICAL STRUCTURE