



FLAT DISPLAY TECHNOLOGY



This product is RoHS compliant

§ SPECIFICATION APPROVAL SHEET §

Fdt Tech Module No LP102V8IB~~x~~-F~~x~~R

Description: 10.2" Digital TFT-LCD Module

SPEC No.: SAS-1003003

Version: 0.0

Issue Date: March 9, 2010

※ This approval sheet contains 25 pages including the cover and appendix.

Customer:

Date: / / 10

APPROVED BY:

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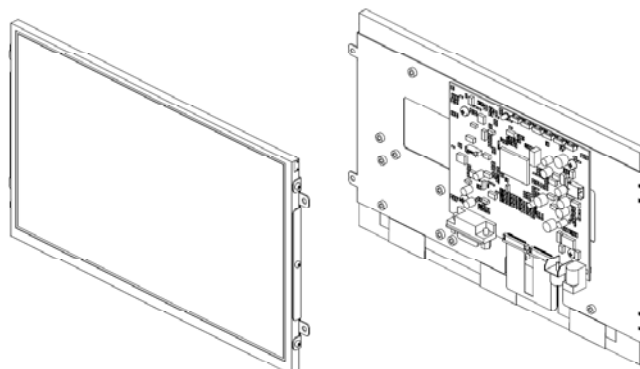
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DESIGNED BY:



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10.2" Digital TFT-LCD Module



■ LP102V8IB~~x~~-F~~x~~R

1. General Description

1.1 Features

- INNOLUX AT102TN03 V8 Digital TFT LCD
- Ultra Compact
- NTSC/PAL/SECAM Video Auto Switch
- Single Operation Voltage +12V
- CVBS / Analog RGB (PC Mode) Signal Input
- All Functions can be controlled by UART
- Support Touch Screen Function (Option)

1.2 Applications

- Portable product
- Industrial
- Hand-held
- Security
- Instrument Display
- Office Electronics

1.3 Application Precautions

Do not use the products herein for the following equipment which demands extremely high performance in terms of functionality, reliability, or accuracy.

- Aerospace equipment
- Communication equipment for trunk lines.
- Control equipment for the nuclear power industry.
- Medical equipment related to life support, etc.

The other application that demands high reliability and functionality should first contact a sales representative.

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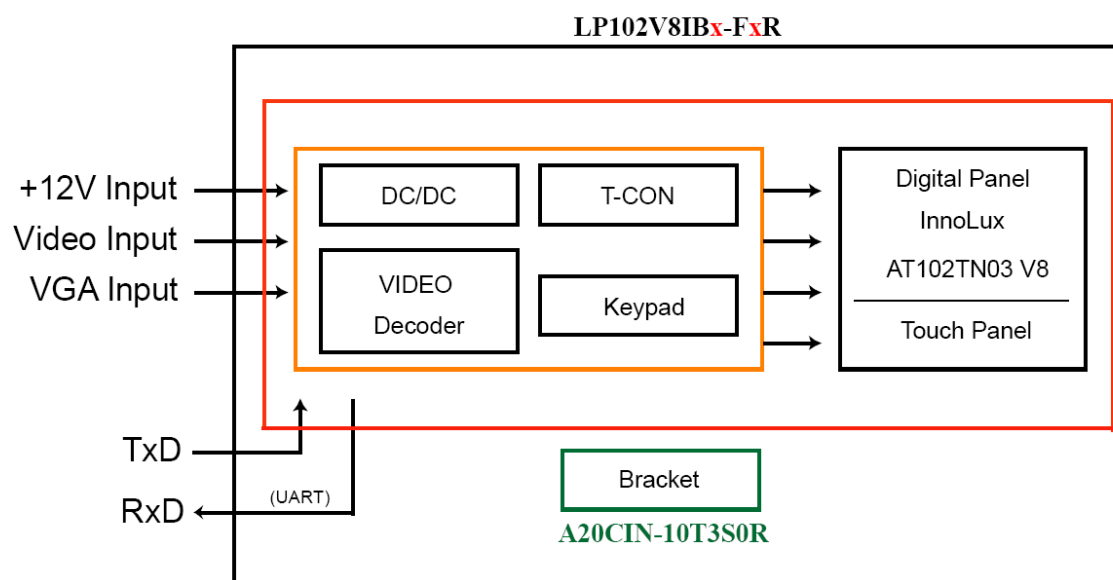
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3. Block Diagram

3.1 Block Diagram



4. TFT-LCD Information

4.1 TFT-LCD Mechanical Specifications

Parameter	Specifications	Unit
Screen Size	10.2 (diagonal)	inch
Display Format	800 x (R.G.B) x 480	dot
Active Area	222.0 (W) x 132.48 (H)	mm
Pixel Pitch	0.2775(W) x 0.276 (H)	mm
Pixel Configuration	Stripe	
Outline Dimension	235 (W) x 145.8 (H) x 6.1(D)	mm
Surface Treatment	Anti – Glare	
Weight	332 (Typ)	g

4.2 TFT-LCD Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	55	65	---	deg	
		Right	55	65	---	deg	
	Vertical	Top	35	45	---	deg	
		Bottom	55	65	---	deg	
Contrast Ratio	CR	At optimized Viewing angle	250	300	---	---	
Response time	Rise Fall	Tr	---	15	30	ms	
		Tf	---	20	40	ms	
Uniformity	U		70	75	---	%	
Brightness	L		280	350	---	cd/m ²	
White Chromaticity	x	$\theta = 0^\circ$	0.26	0.31	0.36		
	y	$\theta = 0^\circ$	0.28	0.33	0.38		
LED Life Time		25°C	20000	---	---	Hr	

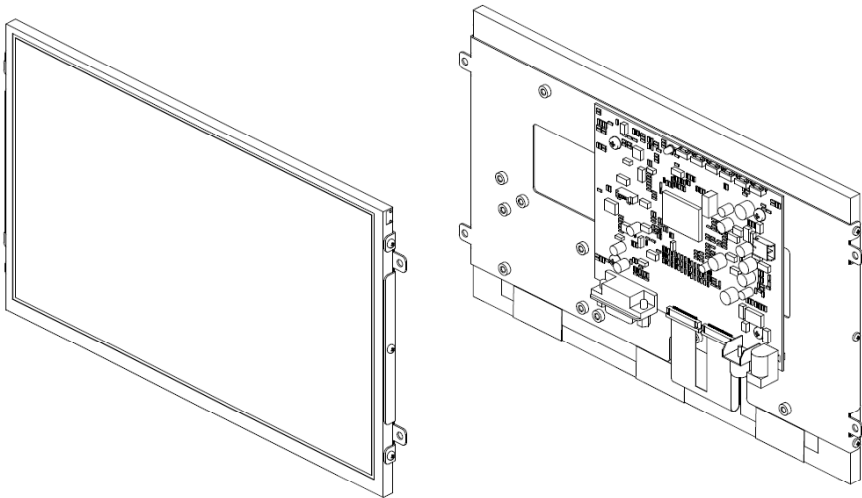
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5. Order Information

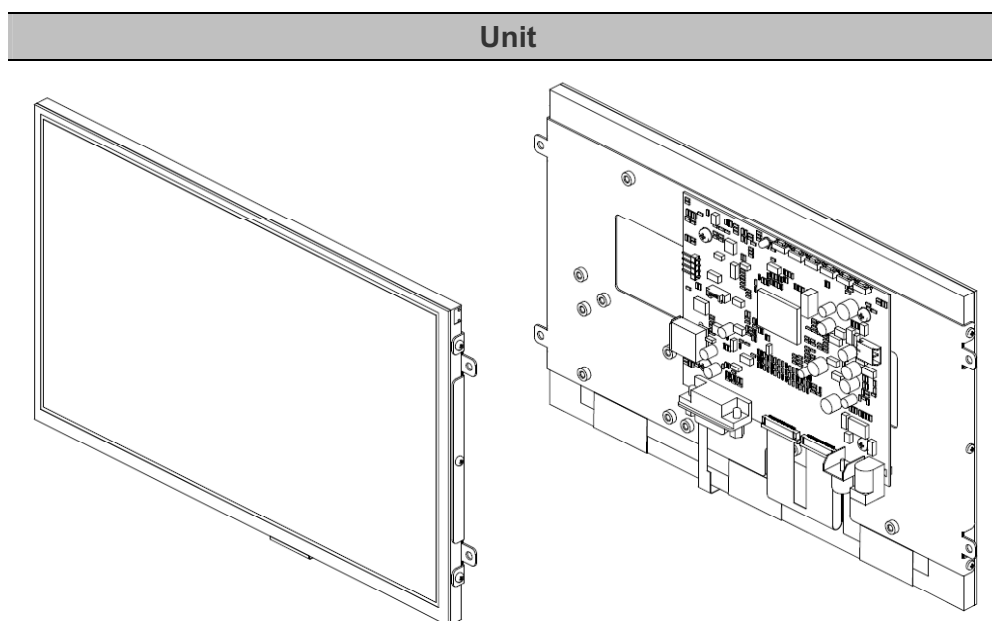
5.1 Unit

Unit



Parameter	LP102V8IB1-FBR	LP102V8IB1-FNR	Unit
CVBS	1	1	
VGA (D-Sub15 / 2.0mm 14Pin)	D-Sub15	D-Sub15	
AC to DC Adapter 12V/2.5A (LASTD12025-FDR)	⊙	-	
Power Cord Plug Type B for USA (LAAC818000-FDR)	⊙	-	
Video Cable (LAVDO18000-FDR)	⊙	-	
VGA Cable (LAVGA16000-FDR)	⊙	-	

5.2 Unit (Touch)



Parameter	LP102V8IB4-FBR	LP102V8IB5-FBR	LP102V8IB4-FNR	LP102V8IB5-FNR	Unit
CVBS	1	1	1	1	
VGA (D-Sub15 / 2.0mm 14Pin)	D-Sub15	D-Sub15	D-Sub15	D-Sub15	
Touch Panel Type	4W Resistive	4W Resistive	4W Resistive	4W Resistive	
Touch Screen Interface	USB	RS232	USB	RS232	
AC to DC Adapter 12V/2.5A (LASTD12025-FDR)	⊙	⊙	-	-	
Power Cord Plug Type B for USA (LAAC818000-FDR)	⊙	⊙	-	-	
Video Cable (LAVDO18000-FDR)	⊙	⊙	-	-	
VGA Cable (LAVGA16000-FDR)	⊙	⊙	-	-	
USB Cable (LAUSB18000-FDR)	⊙	-	-	-	
RS-232 Cable (LARS218000-FDR)	-	⊙	-	-	
Touch Screen Driver CD Disk	⊙	⊙	⊙	⊙	

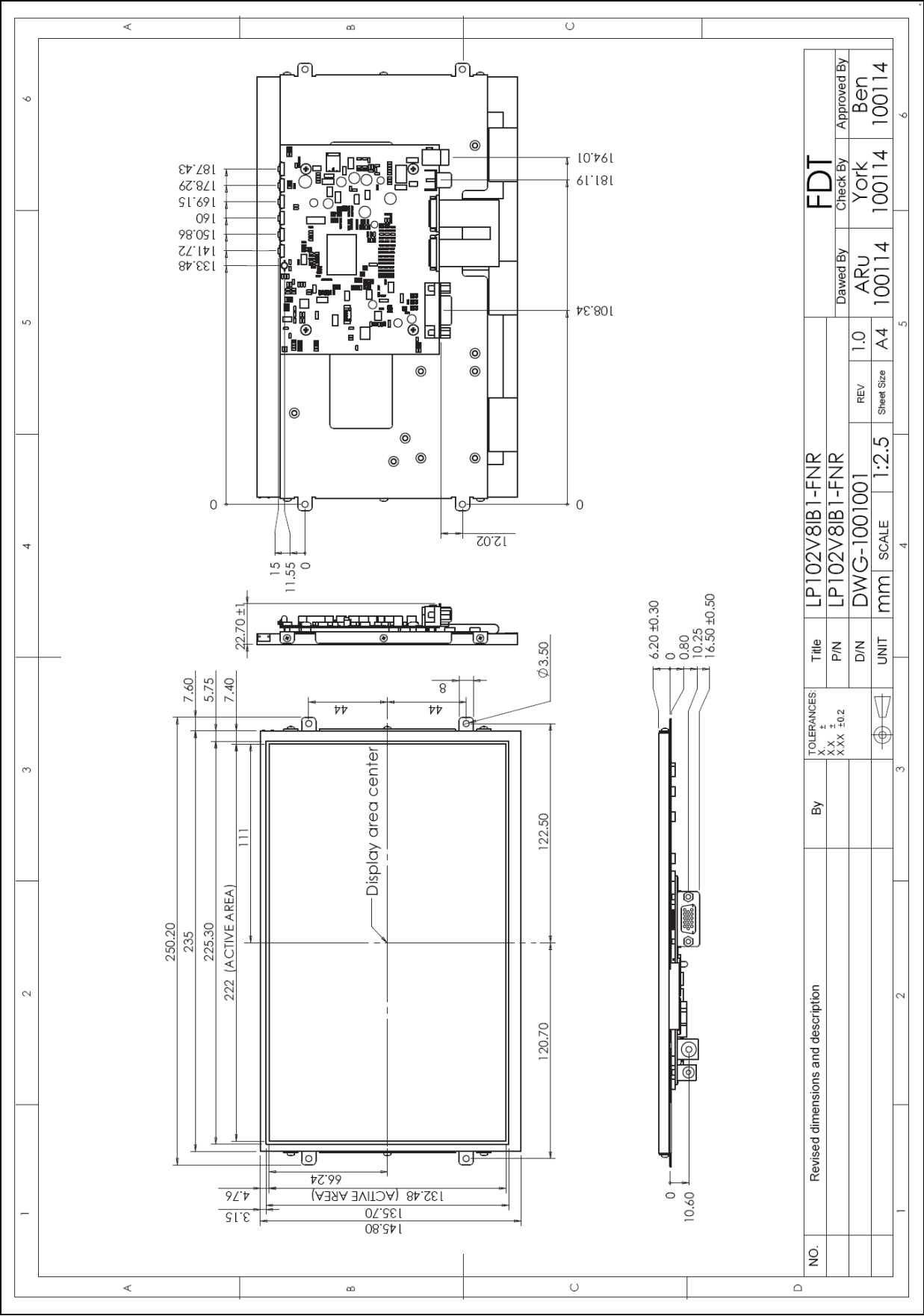
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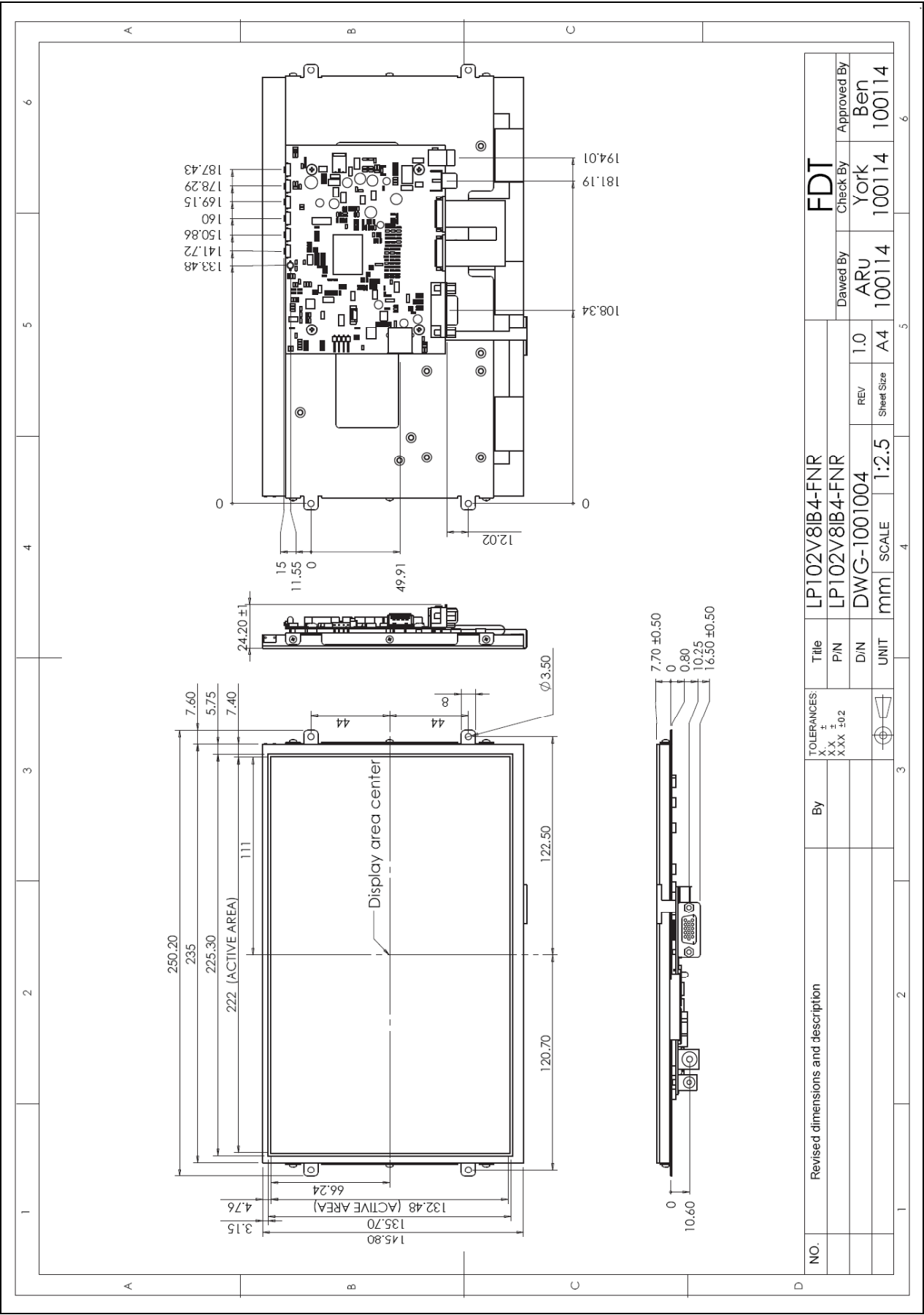


6. Dimension Information

6.1 Unit (LP102V8IB1-FNR)



6.2 Unit (LP102V8IB4-FNR)



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The drawing includes three views of the LCD module:

- Front View:** Shows the display area with dimensions: 120.70 (width), 145.80 (height), 132.48 (active area width), 135.70 (active area height), 66.24 (bezel width), 4.76 (bezel height), 3.15 (bottom bezel), 4.76 (top bezel), 111 (display area height), 222 (active area height), 225.30 (module height), 235 (module height), 250.20 (module height), 7.60 (top bezel), 5.75 (top bezel), 7.40 (top bezel).
- Side View:** Shows the module thickness with dimensions: 24.20 ± 1 (total thickness), 11.55 (display area thickness), 0 (display area thickness), 45.61 (module thickness), 12.02 (module thickness), 108.34 (module thickness), 181.19 (module thickness), 194.01 (module thickness).
- Internal View:** Shows the internal components with dimensions: 133.48, 141.72, 150.86, 160, 169.15, 178.29, 187.43.

Other dimensions and tolerances shown include: 7.70 ± 0.50, 0, 0.80, 10.25, 16.50 ± 0.50, 10.40, 0, 120.70, 122.50, 145.80, 135.70, 132.48, 66.24, 4.76, 3.15, 111, 222 (ACTIVE AREA), 225.30, 235, 250.20, 7.60, 5.75, 7.40, 44, 44, 8, Ø3.50, 15, 0, 12.02, 108.34, 181.19, 194.01.

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7. Pin Description

7.1 CN1 : TFT-LCD Panel I/O Terminals (FPC 30 Pin Below Contact Type)

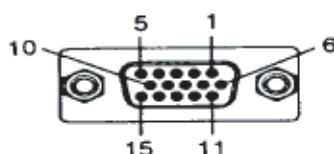
Pin No	Symbol	I/O	Description	Remark
1	POL	I	Polarity selection	
2	STVD	I/O	Vertical start pulse input when U/D= H	
3	OEV	I	Output enable	
4	CKV	I	Vertical clock	
5	STVU	I/O	Vertical start pulse input when U/D= L	
6	GND	P	Power ground	
7	EDGSL	I	Select rising edge or rising/falling edge	
8	VCC	P	Power supply for digital circuit	
9	V9	I	Gamma voltage level 9	
10	VGL	P	Gate OFF voltage	
11	V2	I	Gamma voltage level 2	
12	VGH	P	Gate ON voltage	
13	V6	I	Gamma voltage level 6	
14	U/D	I	Up/down selection	
15	VCOM	I	Common voltage	
16	GND	P	Power ground	
17	AVDD	P	Power supply for analog circuit	
18	V14	I	Gamma voltage level 14	
19	V11	I	Gamma voltage level 11	
20	V8	I	Gamma voltage level 8	
21	V5	I	Gamma voltage level 5	
22	V3	I	Gamma voltage level 3	
23	GND	P	Power ground	
24	R5	I	Red data(MSB)	
25	R4	I	Red data	
26	R3	I	Red data	
27	R2	I	Red data	
28	R1	I	Red data	
29	R0	I	Red data(LSB)	
30	GND	P	Power ground	

7.2 CN2 : TFT-LCD Panel I/O Terminals (FPC 30 Pin Below Contact Type)

Pin No	Symbol	I/O	Description	Remark
31	GND	P	Power ground	
32	G5	I	Green data(MSB)	
33	G4	I	Green data	
34	G3	I	Green data	
35	G2	I	Green data	
36	G1	I	Green data	
37	G0	I	Green data(LSB)	
38	STHL	I/O	Horizontal start pulse input when R/L = L	
39	REV	P	Control signal are inverted or not	
40	GND	I	Power ground	
41	DCLK	I	Sample clock	
42	VCC	P	Power supply for digital circuit	
43	STHR	I/O	Horizontal start pulse input when R/L = H	
44	LD	I	Latches the polarity of outputs and switches the new data to outputs	
45	B5	I	Blue data (MSB)	
46	B4	I	Blue data	
47	B3	I	Blue data	
48	B2	I	Blue data	
49	B1	I	Blue data	
50	B0	I	Blue data (LSB)	
51	R/L	I	Right/ left selection	
52	V1	I	Gamma voltage level 1	
53	V4	I	Gamma voltage level 4	
54	V7	I	Gamma voltage level 7	
55	V10	I	Gamma voltage level 10	
56	V12	I	Gamma voltage level 12	
57	V13	I	Gamma voltage level 13	
58	AVDD	P	Voltage for analog circuit	
59	GND	P	Power ground	
60	VCOM	I	Common voltage	

7.3 J405 : Pin Assignment of Analog RGB Input (D-Sub 15Pin)

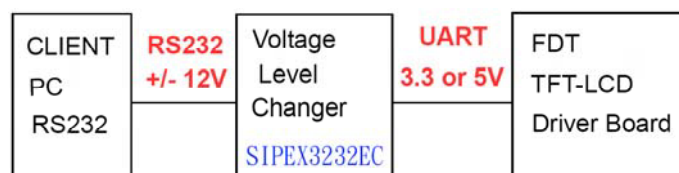
Pin No	Symbol	I/O	Description	Remark
1	RI+	I	Analog Red Signal	
2	GI+	I	Analog Green Signal	
3	BI+	I	Analog Blue Signal	
4	NC	-	No Connection	
5	GND	-	Ground	
6	AGND	-	Analog Ground	
7	AGND	-	Analog Ground	
8	AGND	-	Analog Ground	
9	NC	-	No Connection	
10	NC	-	No Connection	
11	NC	-	No Connection	
12	NC	-	No Connection	
13	HS_IN	I	TTL Horizontal sync	
14	VS_IN	I	TTL Vertical sync	
15	NC	-	No Connection	



7.4 J101: Pin Assignment of UART (Pitch 1.25mm 4Pin, Side Entry Type)

Pin No	Symbol	I/O	Description	Remark
1	TX	O	UART Transmission Data	
2	RX	I	UART Receive Data	
3	GND	-	Ground	
4	+5VA	O	+5V Output Voltage	

Note: All Functions can be controlled by UART , About UART command list please contact FDT sales.



7.5 DC 401: Pin Assignment of Power Input (Inside Diameter:2.1 ϕ Outside Diameter:5.5 ϕ Side Entry Type)

Pin No	Symbol	I/O	Description	Remark
1	VIN	I	+12V Input Voltage	
2	GND	-	Power Ground	

7.6 RCA 401: Pin Assignment of Video Input (RCA JACK Yellow, Side Entry Type)

Pin No	Symbol	I/O	Description	Remark
1	Video	I	Video Input	
2	AGND	-	Analog Ground	

7.7 J601 : Pin Assignment of Touch USB (USBA-Female 2.0mm, Side Entry Type)(Option)

Pin No	Symbol	I/O	Description	Remark
1	DGND	-	Digital Ground	
2	D+	-	DATA (+)	
3	D-	-	DATA (-)	
4	VBUS	-	USB VCC	

7.8 DB601 : Pin Assignment of Touch RS232 (D-SUB 9 FEMALE)(Option)

Pin No	Symbol	I/O	Description	Remark
1	NC	-	No Connection	
2	TXD	-	Transmit Data	
3	RXD	-	Receive Data	
4	NC	-	No Connection	
5	GND	-	Ground	
6	NC	-	No Connection	
7	NC	-	No Connection	
8	NC	-	No Connection	
9	NC	-	No Connection	

8. Absolute Maximum Ratings

8.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	Vin	+9	+15	V	
Video Input Signal	Video in	0.5	2.0	Vp-p	@75Ω
Analog RGB Input Signal	Analog RGB in	0.5	2.0	Vp-p	@75Ω
Digital Input Signal	TTL	+0.3	+3.6	V	
Operating Temperature Without TSP		-20	+70	°C	
Operating Temperature With TSP		-5	+60	°C	
Storage Temperature Without TSP		-20	+70	°C	
Storage Temperature With TSP		-20	+70	°C	

9. Recommended operating conditions

9.1 Electrical Characteristics

Parameter	Symbol	I/O	Min	Typ	Max	Unit	Note
Input Voltage	Vin	I	+10	+12	+14	V	
Total Current	Iin	I		-		mA	
Power Consumption		I		-		W	@+12V
Output Voltage	VDD	O	+3.2	+3.3	+3.4	V	I=10mA
Video Input Signal	Video in	I		1.0		Vp-p	@75Ω
Analog RGB Input Signal	Analog RGB in	RGB		0.7		Vp-p	@75Ω

9.2 VGA Mode Characteristics

Dots per inch	Hor.	Unit	Polarity	Ver.	Unit	Polarity	Note
640*480	31.469	KHz	Negative	59.941	Hz	Negative	
800*600	37.879	KHz	Positive	60.317	Hz	Positive	
1024*768	48.363	KHz	Negative	60.004	Hz	Negative	

9.3 Optics Sample Test Data

Parameter	White Window	Red	Green	Blue	Remark
S/N : 001 x	-	-	-	-	
.y	-	-	-	-	±15%
L(cd/m²)	-	-	-	-	
TC(°K)	-	-	-	-	

Note: 1. Luminance Meter : BM-7 FAST(TOPCON)

2.Video Pattern Generator: FLUKE PM54200

3. Measurement Distance : 500mm±50mm

4. TOPCON BM-7 Luminance Meter 2° filed of view is used in the testing

(After 10min ~20min operation)

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10.4W Resistive Touch Panel Characteristics

10.1 Pin assignment (Pitch :1.0 mm)

Pin No	Symbol	Description	Remark
1	Y2	Upper electrode Y (Down side)	
2	X2	Lower electrode X (Right side)	
3	Y1	Upper electrode Y (Upper side)	
4	X1	Lower electrode X (Left side)	

10.2 Electrical Performance

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Terminal Resistance	X	250	-	1200	Ω	
	Y	100	-	600	Ω	
Input Voltage	VT	-	-	7.0	V	
Linearity		-	-	1.5	%	
Insulation Impedance		25	-	-	MΩ	DC 25V

10.3 Optical Performance

Parameter	Specifications
Transmittance	82% Min.
Haze	5.0% Typ.

10.4 Mechanical Performance

Parameter	Specifications
Input Method	Finger or stylus pen
Operating Force	Max: 80gf
Surface Hardness	3H

10.5 Durability Performance

Parameter	Specifications
Pen Sliding Durability	≥ 50000 words, with R0.8 mm polyacetal stylus, 250g, 60 mm / sec
Finger knocking Durability	≥ 1000000 times, with R8.0 mm silicon rubber, 250g, 5Hz

10.6 Environmental

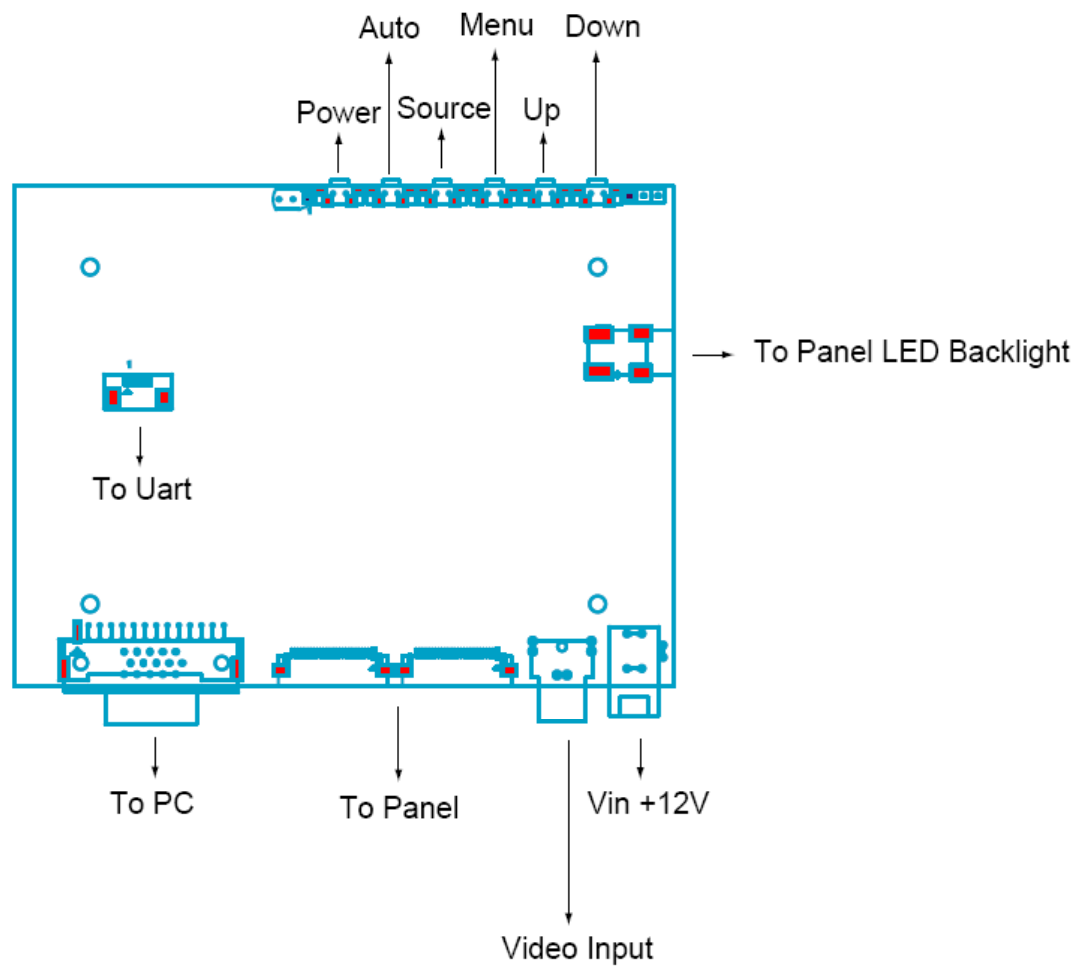
Parameter	Specifications
Operating Temp.	-5°C~60°C (Except dew condensation)
Storage Temp.	-20°C~70°C (Except dew condensation)
Operating Humidity (Non Condensing)	20% RH~ 90%RH
Storage Humidity (Non Condensing)	10% RH~ 90%RH

10.7 Reliability test procedure

Parameter	Specifications
High temperature storage test	70°C for 240 hours.
Low temperature storage test	-20°C for 240 hours.
Thermal Cycling	-20°C (0.5 hr each)~70°C (0.5 hr each) for 50 cycles.
High temperature and high humidity	40°C, 95%RH for 240 hours.

11. Operation manual

11.1 Driver Board Manual



12. Packing List

Before you begin installing the KIT, please make sure that the following materials have been shipped:



A. LASTD12025-FDR



B. LAAC818000-FDR



C. LAVDO18000-FDR



D. LAVGA16000-FDR



E. LAUSB18000-FDR



F. LARS218000-FDR



G.

- A. AC to DC Adapter (100-240VAC 50-60Hz to +12VDC @ 2.5A)
- B. Power Cord (Plug Type B for USA)
- C. Video Cable
- D. VGA Cable
- E. USB Cable
- F. RS-232 Cable
- G. Touch Screen Driver CD Disk / User Manual

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

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13. Key Function by OSD

13.1 Menu Operation

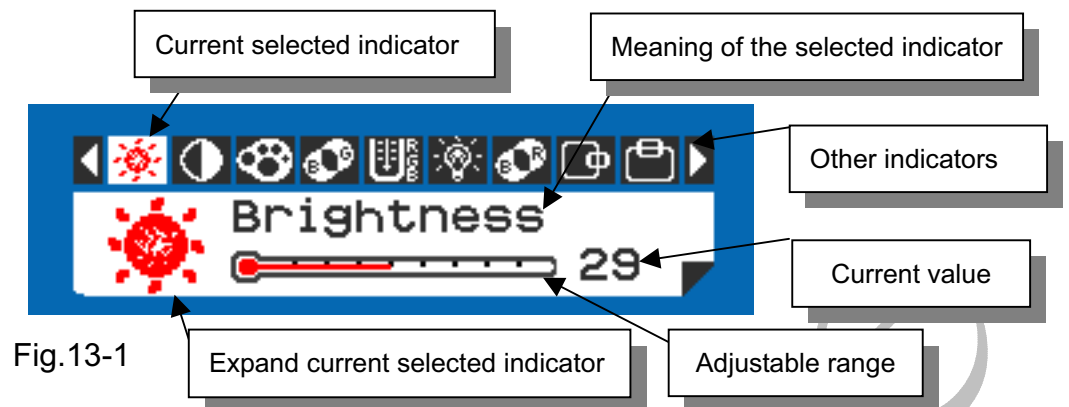
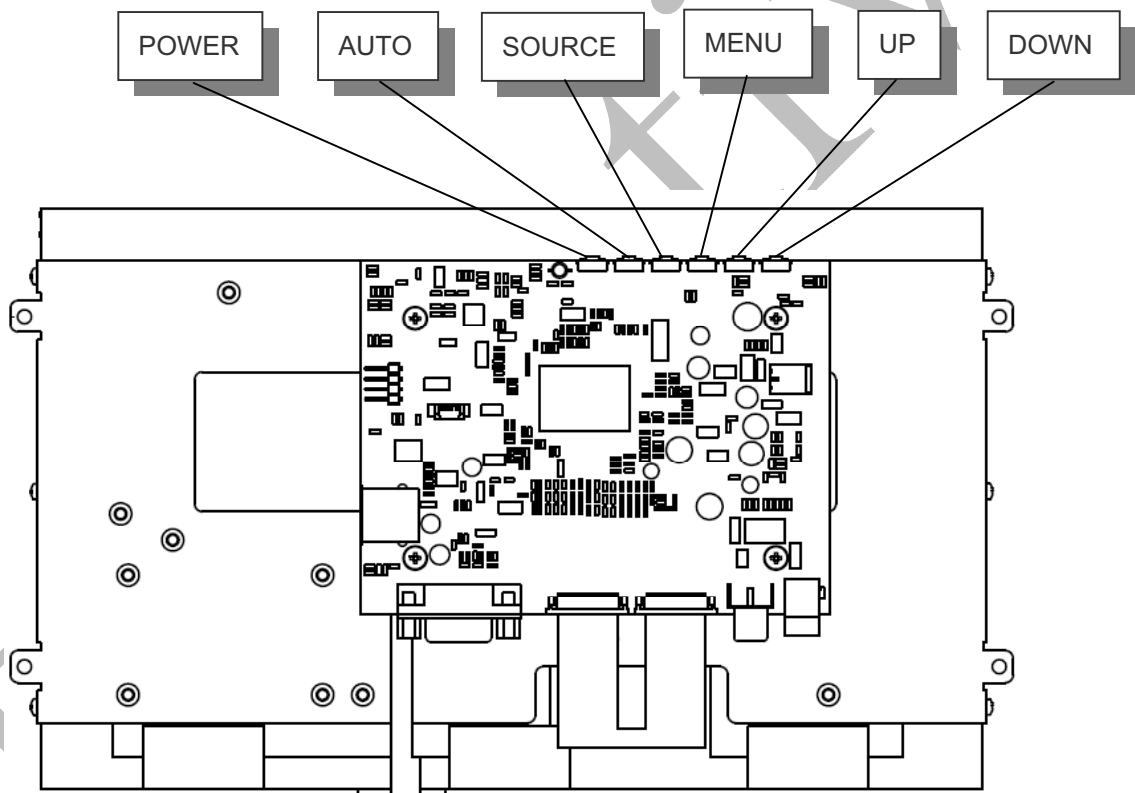


Fig.13-1



Operations of key board :

1. To navigate the menu, press [MENU]. (Fig.13-1)
2. The indicator lighting up in white color is the selected adjustment item.
3. To Next Item of the menu, press [MENU] again.
4. The operations below are only available when "Menu" is started.
5. Press [UP] / [DOWN] to adjust the value of the selected item.

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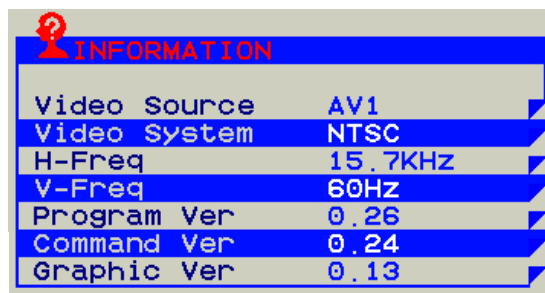
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Overview of the menu :

Firmware must be $\geq$ VER 0.26

Indicator	Meaning	Adjustable range	For	Remark
	Brightness	0 ~ 64	AV / VGA	Adjust-Bar
	Contrast	0 ~ 64	AV / VGA	Adjust-Bar
	Color	0 ~ 64	AV	Adjust-Bar
	Tint	0 ~ 32	AV	Adjust-Bar
	Sharpness	0 ~ 16	AV	Adjust-Bar
	Dimmer	0 ~ 9	AV / VGA	
	Color Tone	Normal / Warm / Cool	AV / VGA	
	Mirror	OFF / ON	AV / VGA	
	Flip	OFF / ON	AV / VGA	
	H-Position	-25 ~ +25	AV / VGA	Balance-Bar
	V-Position	-10 ~ +10	AV / VGA	Balance-Bar
	Scale	Full / 4:3	AV / VGA	
	Scan	Over Scan / Under Scan	AV	
	Information		AV / VGA	Fig.13-2
	Setup		AV / VGA	Fig.13-3
	Factory Set		AV / VGA	
	Exit		AV / VGA	

Fig.13-2



Setup Menu :



Fig.13-3

Indicator	Meaning	Adjustable range	Function	Remark
	Show Status	ON / OFF	Show signal status.	ON: Show OFF: Hidden
	Blue Screen	ON / OFF	If loss signal will put on the blue or black screen.	ON: Blue OFF: Black
	Auto Power On	ON / OFF	Power input module will be auto turn on.	ON: Auto OFF: Manual
	Auto Saving	OFF / 3s / 5s / 15s / 30s	If signal lost over setting times will be power off.	ON: Auto OFF: Normal
	Detect Source	ON / OFF	Auto detection which source is existence and change.	ON: Auto OFF: Normal
	Return			

Note : VGA only type don't have Detect Source function.

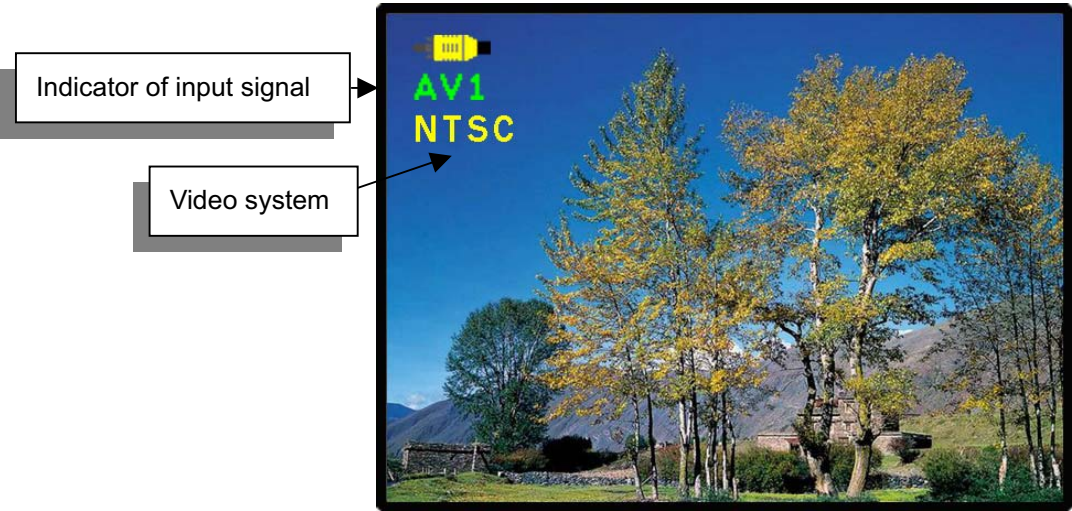


Fig.13-4

[Power] : Monitor power on / off
[Source] : Input signal switch

Overview of input signals :

Indicator	Input signal	Interface	Video system
	AV1	Composite	NTSC / PAL / SECAM
	VGA	Analog RGB	640x480_60 / 800x600_60 / 1024x768_60