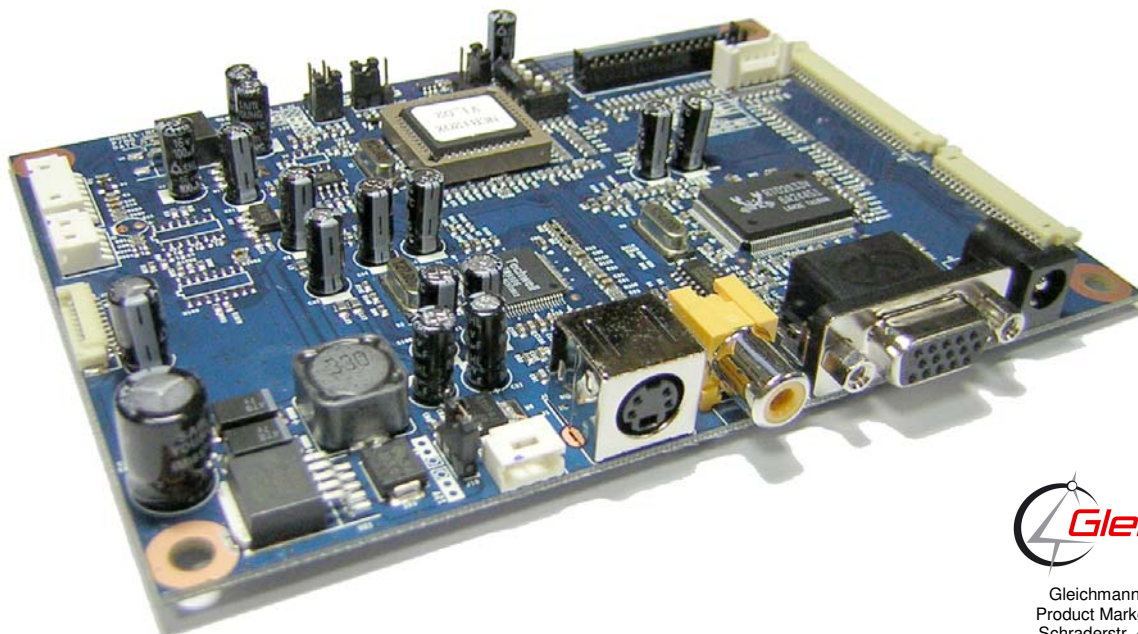


DATA SHEET

TFT LCD Monitor Control Board



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NCB120	
NCB120E1	Analog Only Max Resolution : WSXGA+(1680x1050)
NCB120E3	Analog, Video, S-Video Max Resolution : WSXGA+(1680x1050)

RoHS Compliant

JAN 2007

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1. INTRODUCTION

Designed for LCD monitor and other flat panel display application, the NCB120 controller provides an auto input synchronization and easy to use interface controller for:

- ▶ TFT (active matrix) LCD panels of 640x480 to 1280x1024 & 1680x1050 resolutions
- ▶ Computer video signals of VGA, SVGA, XGA, WXGA+, SXGA, WSXGA+ standard.
- ▶ Video signals of NTSC, PAL standard
- ▶ Input Signal Support
 - All VESA standard

HOW TO PROCEED

- ▶ Ensure that you have all parts & they are correct, referring to:
 - Connection diagram
 - Connector reference
 - Assembly notes
- ▶ Check controller switch & jumper settings (errors may damage the panel)
- ▶ Prepare the PC & Video
- ▶ Connect the parts
- ▶ Understand the operation & functions

IMPORTANT USAGE NOTE

This equipment is for use by developers and integrators. The manufacturer accepts no liability for damage or injury caused by the use of this product. It is the responsibility of the developer, integrators or other users of this product to:

- Ensure that all necessary and appropriate safety measures are taken.
- Obtain suitable regulatory approvals as may be required.
- Check power settings to all component parts before connection.

DISCLAIMER

There is no implied or expressed warranty regarding this material.

2. GENERAL SPECIFICATION

No.	Item	Description		
1	Controller name	NCB120E1/E3	640*480, 800*600, 1024*768, 1440*900, 1680*1050, 1280*1024 Panel support	
2	LCD Module	VGA ~ XGA TTL Interface TFT LCD VGA ~ SXGA LVDS Interface TFT LCD		NCB120E1/E3
3	Signal Input	Analog RGB Input. NTSC/PAL		
4	Resolution Support	H: 31 ~ 61kHz		
		V: 55 ~ 76Hz		
5	OSD Control	Menu, Select (AUTO), Down, Up(Source change), Power		5 keys Note1,2)
	Plug & Play	VESA DDC 1/2B Ver1.3		
6	Power Connector	Input	Type: IEC320 MALE 3Line Connector	
7.	Power Consumption	Supply Voltage	12Vdc	
		Max Power	Note3)	
8	Signal Connector	Analog	15Pin D-SUB Connector	
		Video	MINI DIN	Y / C
			RCA	CVBS
9	Remote Control	I/R		(TBD)
	LED status	Green	Normal state	
		Amber	DPMS state	
		Off	Power off	

Note1) Control functions by '()' are Hot Key functions.

Note2) Source change hot key shall be applicable on NCB120E3 only.

Note3) Max Power is depending on the subject display to be used..

3. ELECTRICAL SPECIFICATION

3.1 Input characteristic

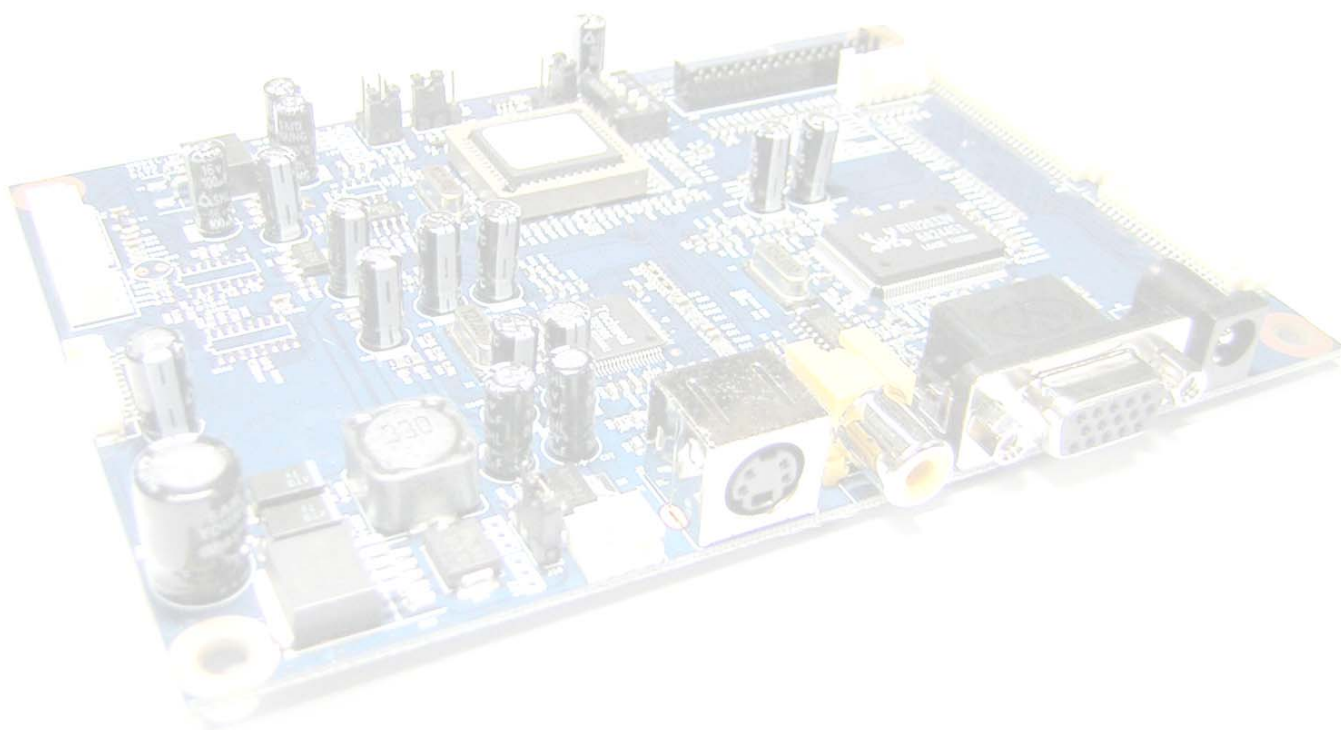
Description	Signal	Unit	Min	Typical	Max	Remarks
Power In (12Vdc)	Input	Vdc	11.4	12	12.6	
	Consumption	Watt			5	Board only
RGB Input	Analog RGB	Vp-p	0		0.7	
	Sync	Vdc	0		5.5	
	H Frequency	KHz	31		61	Depends on Mode
	V Frequency	Hz	55	60	75	
NTSC/PAL	Y/CVBS	Vp-p	0.6	1.0	1.4	
	C	Vp-p	0.6	0.8	1.2	
Infra Red						(TBD)

3.2 Output Characteristics

Description	Signal	Unit	Min	Typical	Max	Remarks
TTL LCD Interface						
	RGB Data	Vp-p		3.3		
	DE, Sync, Clock	Vp-p		3.3		
	Clock Freq.	MHz	25		80	Depends on Mode
	LCD Power (5v)	Vdc	4.5	5	5.5	Jumper option
	LCD Power (3.3v)	Vdc	3.16	3.3	3.5	Jumper option
	LCD Power (12V)	Vdc	11.4	12	12.6	Jumper option
LVDS Interface						
	Differential output	mVp-p	250	350	450	
	LCD Power (5v)	Vp-p	4.5	5	5.5	Jumper option
	LCD Power (3.3v)	Vp-p	3.16	3.3	3.5	Jumper option
	LCD Power (12V)	Vdc	11.4	12	12.6	Jumper option
Inverter Interface						
	Power out	Vdc	11.5	12	12.5	
	On/Off control	Vp-p	0		3.3	L=off, H=on
	Bright control	Vp-p	0		4.0	Jumper option
			4.0		0	

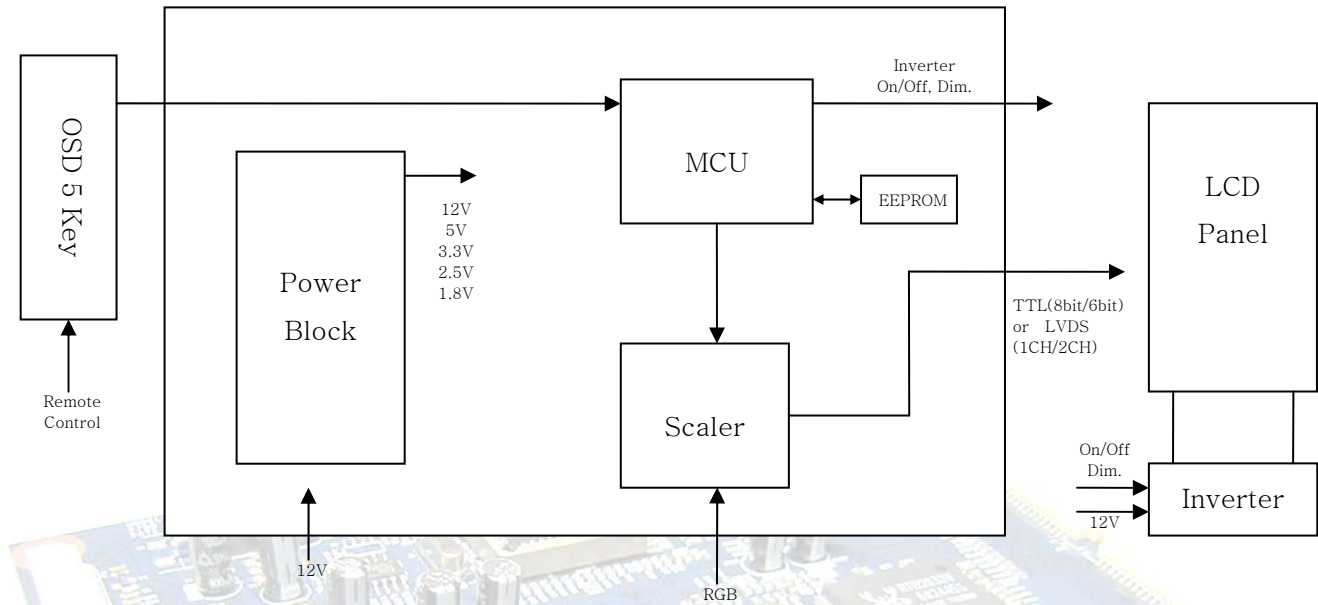
3.3 Absolute Maximum Rating

Item	Unit	Min.	Typical	Max.	Remarks
Operation Temperature	℃	0	-	60	
Storage Temperature	℃	-30	-	80	
Relative Humidity	%		-	90	

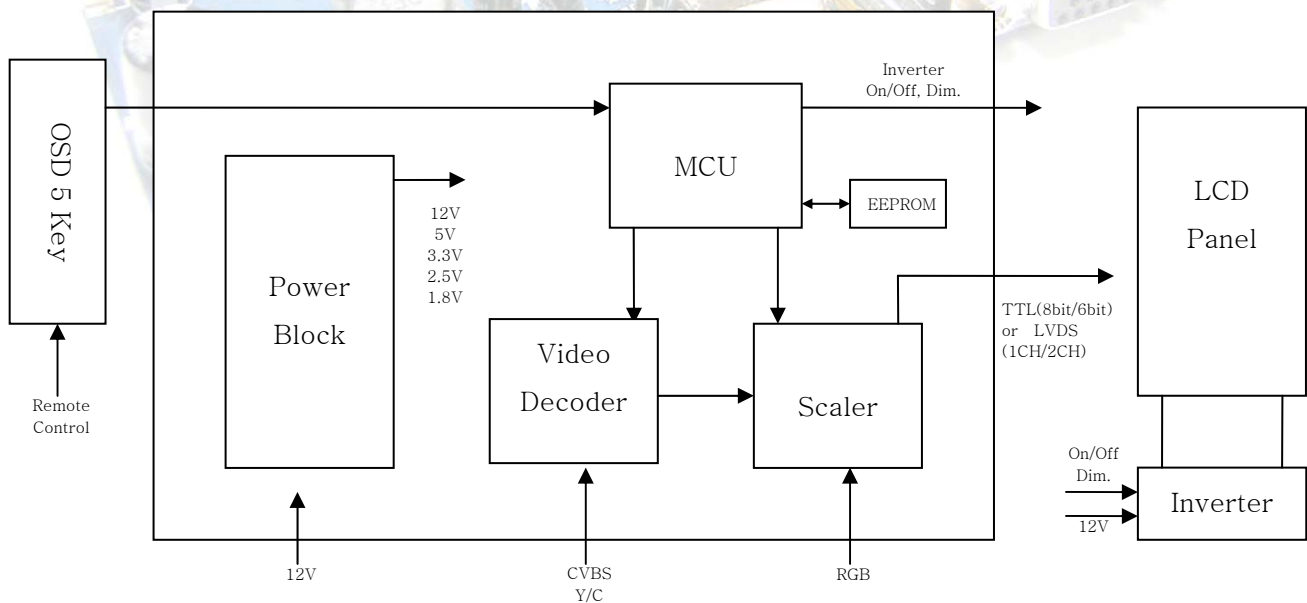


4. BLOCK DIAGRAM

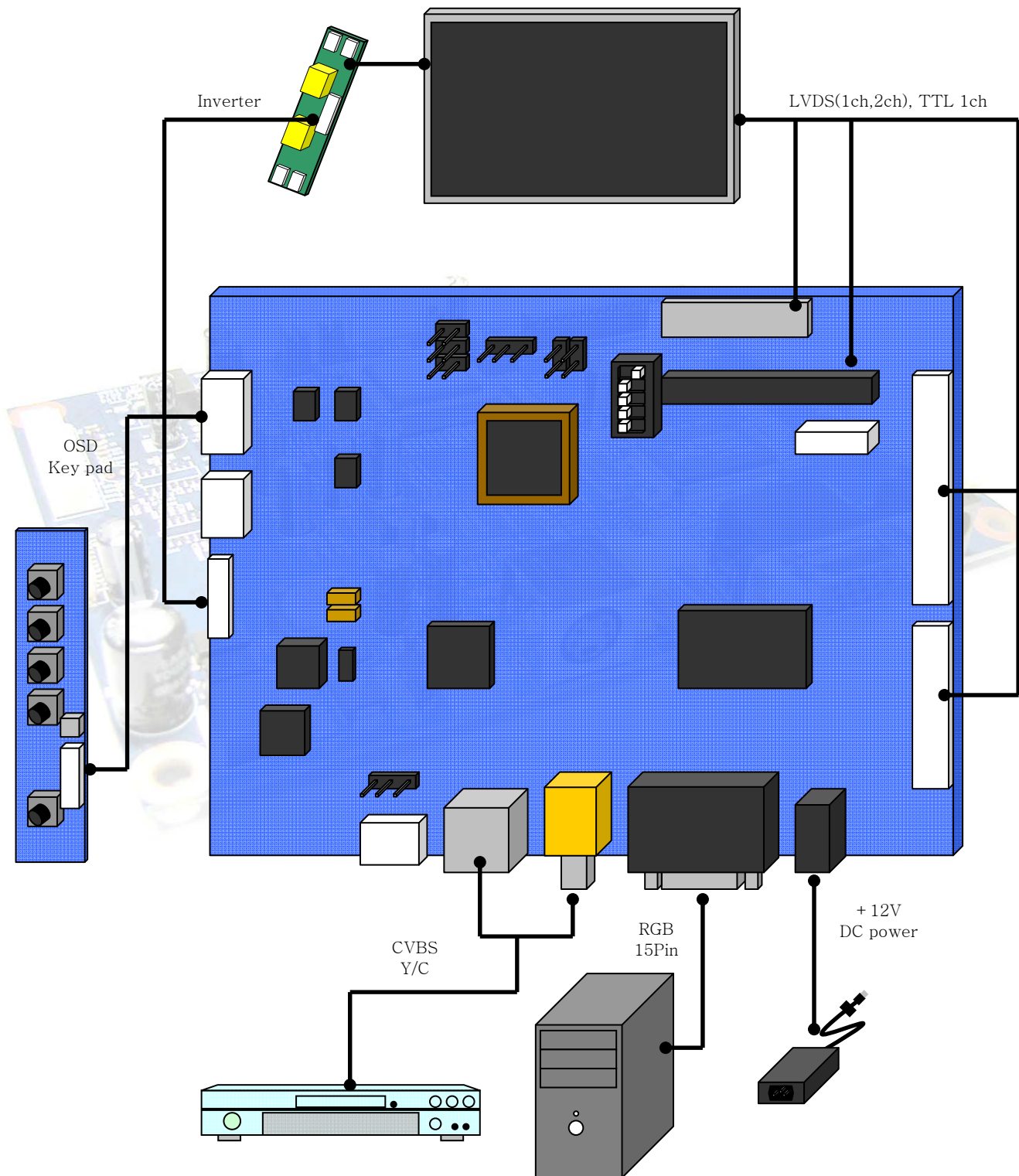
4.1 NCB120E1 Block Diagram



4.2 NCB120E3 Block Diagram



5. CONNECTION CABLE



6. ASSEMBLY NOTES

This controller is designed for monitors and custom display projects using 1680x1050, resolution TFT LCD panels with a VGA, SVGA, XGA, WXGA+, SXGA & WSXGA+ signal input. The following provides some guidelines for installation and preparation of a finished display solution.

Preparation: Before proceeding it is important to familiarize yourself with the parts making up the system and the various connectors, mounting holes and general layout of the controller. As much as possible connectors have been labeled. Guides to connectors and mounting holes are shown in the following relevant sections.

- 1. LCD panel:** This controller has 12V, 5V or 3.3V TTL and LVDS interface logic on the Board for different kind of TFT LCD panel. For the other type of LCD interface like Panel Link interface and etc, this board can accommodate a daughter board instead of on-board LCD interface. Due to the different signal timing and electrical characteristics from each LCD panel manufacturer, for selecting LCD interface type and resolution, put jumper marked J5, J401 and J402 on the right position following LCD panel specification. For selecting DC power level, put jumper marked J19 on the right position. Supplied power level depends on LCD panel specification.
- 2. Controller:** Handle the controller with care as static charge may damage electronic components, Make sure correct jumper and switches settings to match the target LCD panel
- 3. LCD connector board:** Different makers and models of LCD panel require different panel signal connectors and different pin assignments.
- 4. LCD signal cables:** In order to provide a clean signal it is recommended that LCD signal cables should not be longer than 30cm. If loose wire cabling is utilized these can be made into a harness with cable ties. Care should be taken when you place the cables to avoid signal interface. Additionally it may be necessary in some systems to add ferrite cores to the cables to minimize signal noise.
- 5. Inverter:** This will be required for the backlight of an LCD, some LCD panel have an inverter built in. As LCD panels may have 1 or more backlight tubes and the power requirements for different panel backlights may vary, it is important to match the inverter in order to obtain optimum performance. See application notes for more information on connection.
- 6. Inverter cable:** Different inverter models require different cables and different pin assignment. Make sure the correct cable pin out to match the inverter. Unsuitable cable pins out may damage the inverter.
- 7. AV cable:** Standard composite or S-video cables can be used. Reasonable quality cables should be used to avoid image quality degradation.
- 8. OSD button:** See Operational Function section.

9. 3 Color LED: This LED shows the state of controller.

- Green – Normal state
- Off – Off mode
- Amber – DPMS mode

10. Power switch: This switch is located on OSD button board.

11. Power input: +12Vdc is required to supply power for the controller, the Inverter and the LCD panel

12. VGA input cable: As this may affect regulatory emission test result, a suitably shielded cable should be utilized.

EMI: Shielding will be required for passing certain regulatory emissions tests. Also the choice of video board and power supply can affect the test result.

Consideration should be given to:

- Electrical insulation.
- Grounding.
- EMI shielding.
- Heat & ventilation

Caution: Ensure that the equated insulation is provided for all areas of the PCB with special attention to high voltage parts such as the inverter.

13. Setup for operation

Once the circuit has been connected, a setup procedure for optimal requires a few minutes The following instructions are likely to form the basis of the finished product operation manual.

PC settings

The PC needs to be set to an appropriate graphics mode that has the same resolution with the LCD panel to have clear screen image. And the vertical refresh rate should be set to one of 56~75Hz, non-interlaced signal.

LCD display system settings

The OSD (On Screen Display) provides certain functions to have clear image and others. This board supports 5 buttons OSD operation as a standard, but 6 - button operation can be supported with a different firmware if it is required. The control functions defined on OSD operation are as below.

PC Graphics Output: A few guidelines:

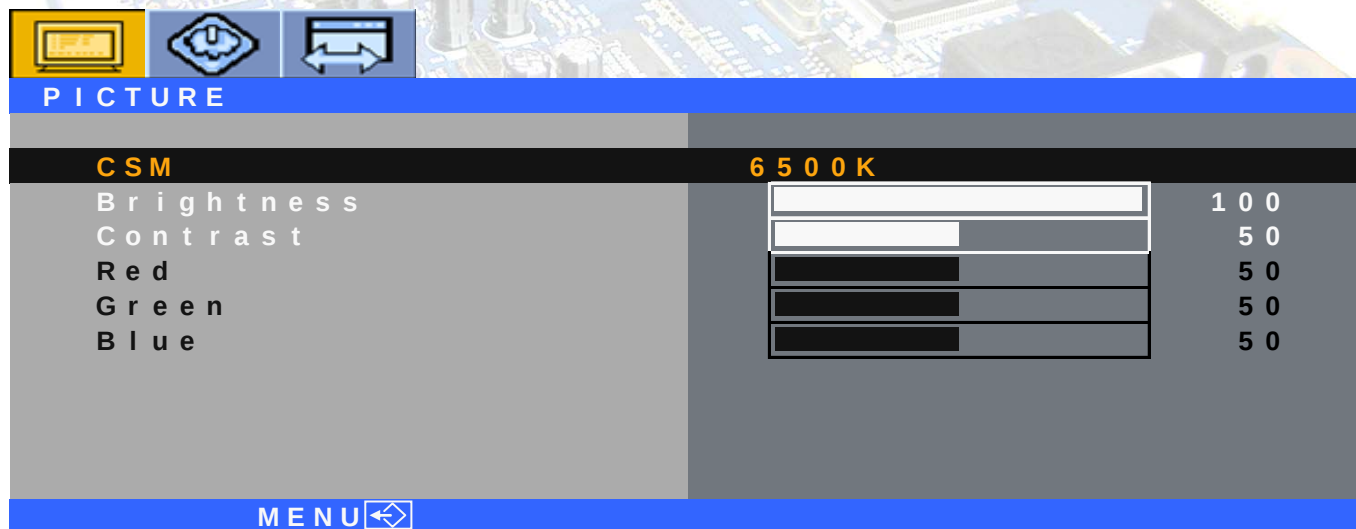
- Signal quality is very important, if there is noise or instability in the PC graphics output this may result in visible noise on the display
- Refer to the graphic modes table in specification section for supported modes.
- Non-interlaced & interlaced video input is acceptable.

Important: please read the application notes section for more information.

7. OSD MENU

7.1 PC Mode

7.1.1 Picture Menu



CSM(Color Standard Mode) : Color temperature 6500K,9300K, and User mode are adjustable as wished.

Brightness : To adjust screen brightness.

Contrast : To adjust screen contrast.

Red/Green/Blue : These will be highlighted when CSM is set on user mode and then color temperature is adjustable as wished by user.

7.1.2 Setup Menu



Language : Language selectable by user.

Transparency : Transparency of background on OSD menu is adjustable.

Factory Reset : This can initialize monitor's setting..

7.1.3 Screen Menu(PC mode Only)



SCREEN

Auto Configure
H Position
V Position
Clock
Phase

MENU



SCREEN

Auto Configure	To Start
H Position	50
V Position	50
Clock	50
Phase	0

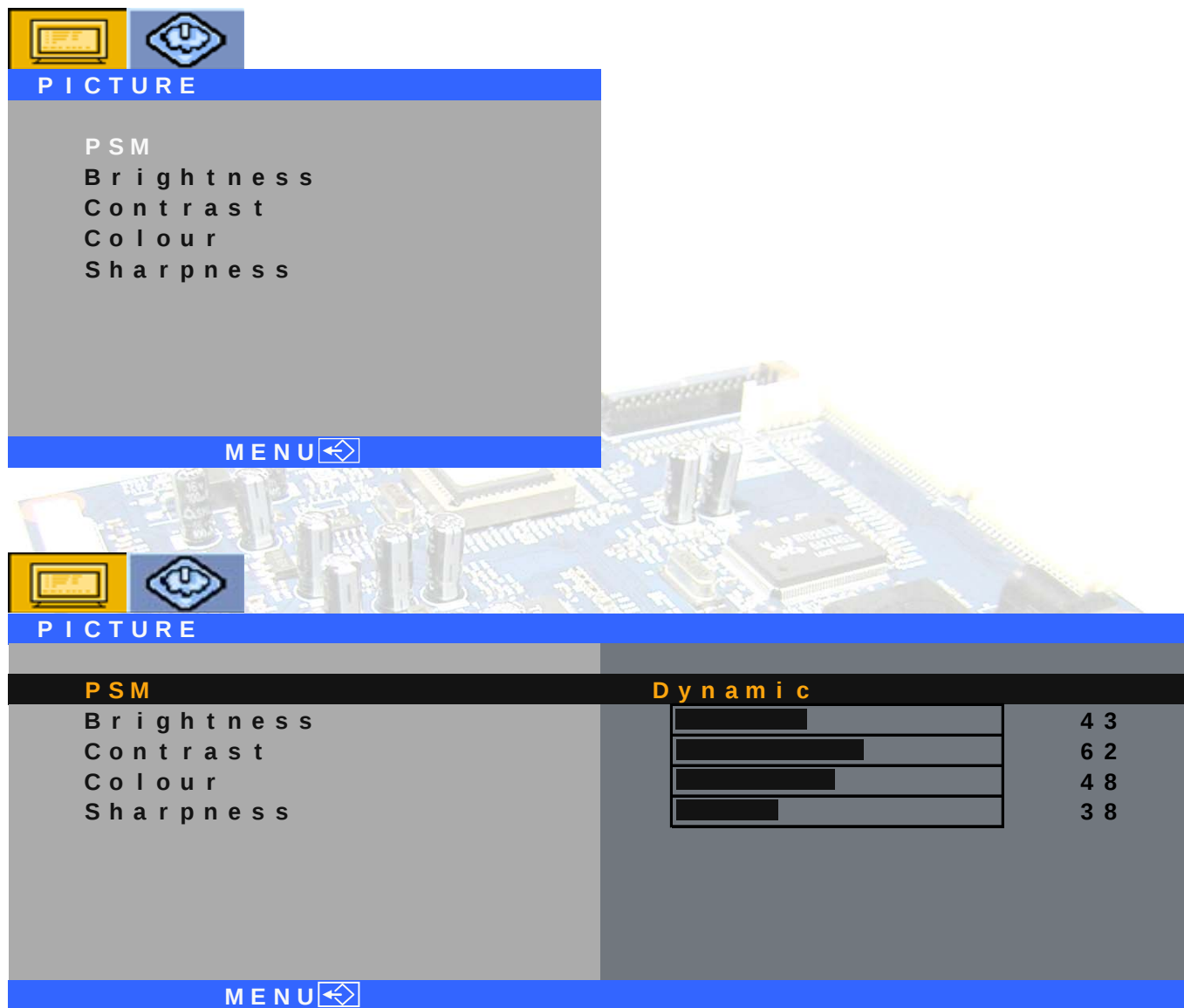
MENU

Auto Configure : Execute AUTO function.

H Position / V Position / Clock / Phase : Adjustment for screen Position, Clock and Phase.

7.2 AV Mode(Video/S-Video)

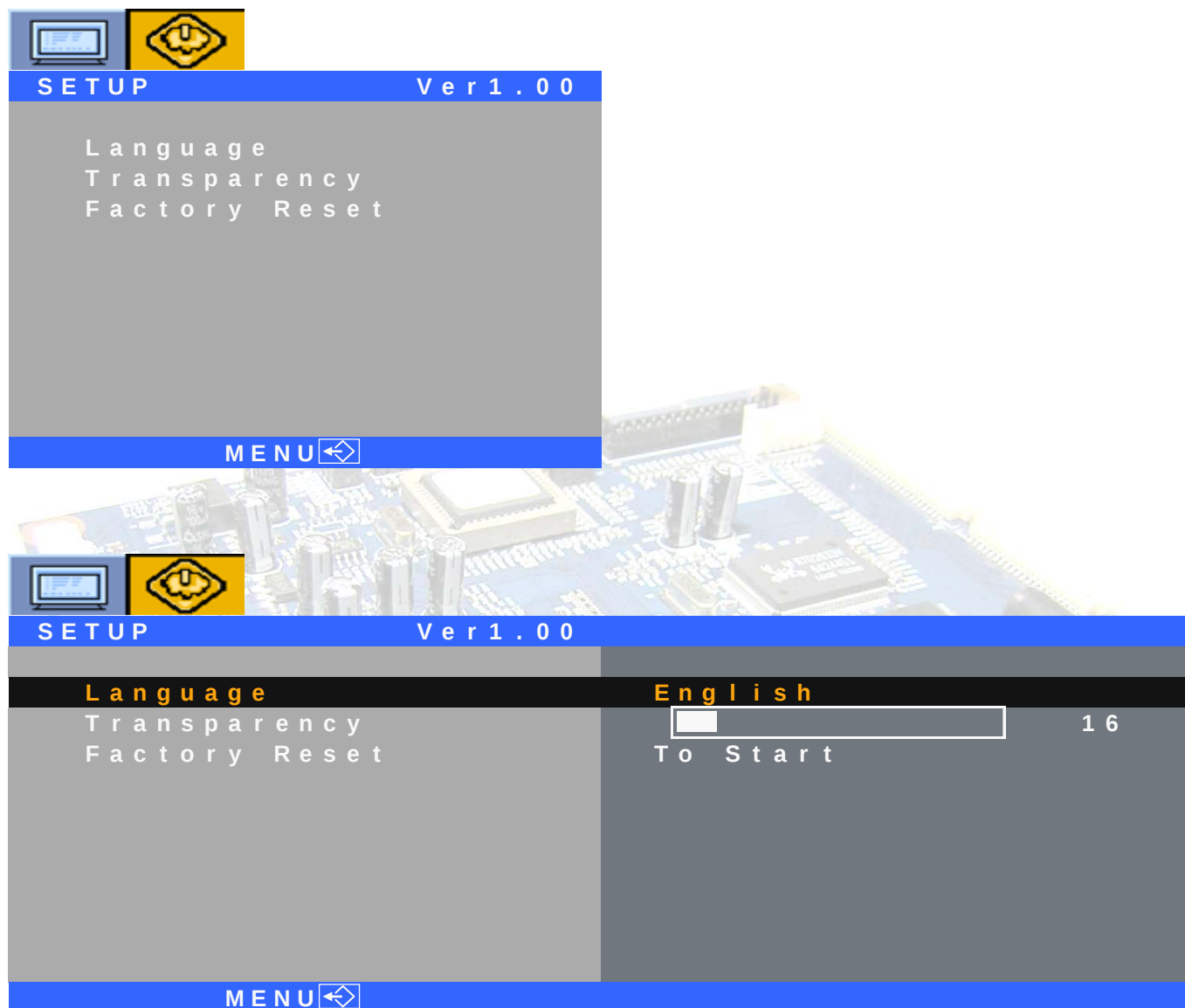
7.2.1 Picture Menu



PSM(Picture Standard Mode) : Mode selectable among Dynamic/Standard/Mild/Game/User.

Brightness, Contrast, Colour, Sharpness : These are highlighted when PSM is set on User mode and then selectable as wished by the user.

7.2.2 Setup Menu



Language : Language selectable by user.

Transparency : Transparency of background on OSD menu is adjustable.

Factory Reset : This can initialize monitor's setting..

7.3 OSD GUI Control Table

MAIN MENU	SUB MENU	CONTROL	
PICTURE	PSM	Dynamic/Standard/Mild/Game/User	
		USER	Brightness, Contrast, Color, Sharpness
	CSM	CSM/Brightness/Contrast	
		CSM	6500K/9300K/User
		User	Red/Green/Blue
SETUP	Language	English/Deutsch/François/Italiano/Espanol	
	Transparency	16 (0 ~100)	
	Factory Reset	On/Off	
SCREEN	Auto Configure	On/Off	
	H Position	50(0 ~ 100)	
	V Position	50(0 ~ 100)	
	Clock	50(0 ~ 100)	
	Phase	50(0 ~ 100)	
		RGB PC	

7.4 Operation Message

OUT OF RANGE

OUT OF RANGE
RGB

This is when Input Signal is over the range or frequency.

NO SIGNAL

NO SIGNAL
RGB

This is when Input Signal is not present. This message is disappeared after 5 seconds.
(but not disappeared at Video/S-Video mode)

CHECK SIGNAL CABLE

CHECK SIGNAL CABLE
RGB

This is when Input Signal is not present after power on with power switch.
This message is not disappeared before power off or activity of input signal

Auto Configure

Auto configure
Processing auto
adjustment

Execute AUTO Function

8. CONNECTION & OPERATION

CAUTION: Never connect or disconnect parts of the display system when the system is powered up as this may cause serious damage.

CONNECTION

1. **LCD panel & Inverter:** Connect the inverter (if it is not built-in the panel) to the CCFT lead connector of the LCD panel.
2. **TTL type panels:** Plug the signal cables direct to J14 (for Single 6bits, or Single higher 6bit, J13 (8bits single lower 2bit) on the controller board. Plug the other end of cables to the LCD connector board (if connector board is required, otherwise the signal can be directly plugged to the LCD panel connector).
3. **LVDS type panels:** Plug the signal cables direct to J100 of the controller board for Single Channel interface resolution Panel or J802 for dual channel interface panel. Plug the other end of cables to the LCD connector board.
4. **Inverter & Controller:** Plug the inverter cable to J3 of the controller board and another end to the connector on the inverter. If any certain display can not be driven as per Standard Panel Jumper Setting, then please check below different panel setting per each panel and re-set the jumper to drive properly
5. **Function switch & Controller:** Plug the OSD switch mount cable to CN104 of the controller board and another end to the OSD board.
6. **Jumpers & Switch:** Check all jumpers J19 (Target panel power is setting), J5, J401, J402 (Target Panel Option switch) are set correctly. Details referring the jumpers and switches setting table (in the following section)
7. **VGA cable & Controller:** Plug the VGA cable to the connector J6 of the controller board.
8. **S/C Video Cable & Controller:** Plug S-Video Cable to the connector J1, C-Video Cable to the J8
9. **Power supply & Controller:** Plug the DC 12V power in to the connector J20.
10. **Power on:** Switch on the controller board and panel by using the OSD switch mount.

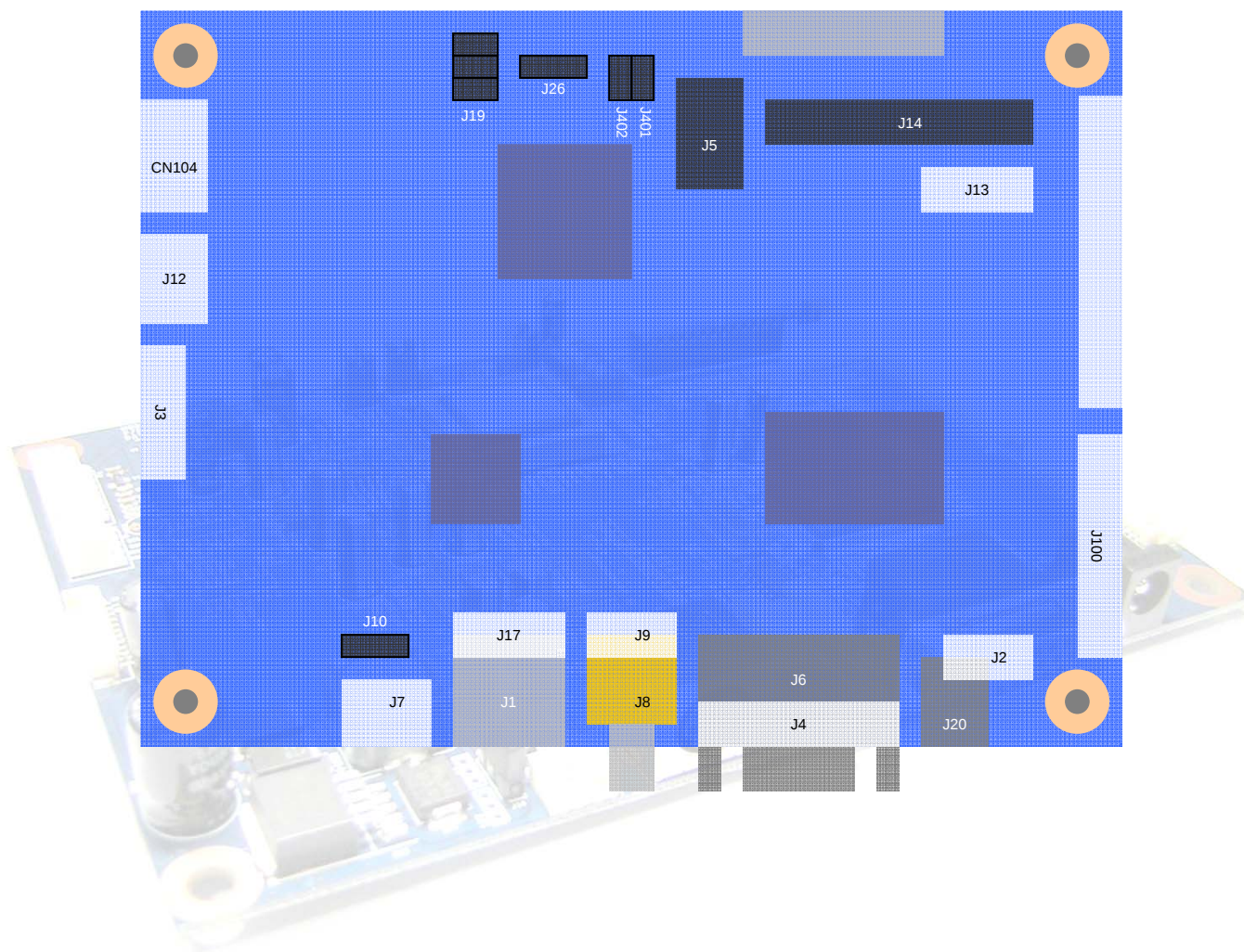
General:

- If you use supplied cables & accessories, ensure that they are correct for the model of the panel and the controller.
- If you make your own cables & connectors, refer carefully to both the panel & inverter specifications and the section in this manual, "Connectors, Pin outs & Jumpers" to ensure the correct pin to pin wiring.

PC Setting:

The controller has been designed to take a very wide range of input signals however to optimize the PC's graphic performance we recommend choosing 60Hz vertical refresh rate – this will not cause screen flicker.

9. CONNECTOR, PINOUT & JUMPERS



9.1 Summary : Connector & Jumper

Reference	Description	Connector Type
CN104	OSD control Connector	MOLEX 53015-0710 2.0mm RIGHT ANGLE
J1	S-video Jack	MJ373-4-BASE (MINIDIN 3PIN)
J2	Input Dc power Jack	DC-001 2.5Ø
J3	Inverter Connector	YEON-HO 12505WR-10A00 10P 1.25MM
J4	D-SUB Connector	53015-1210 MOLEX 2.0mm RIGHT ANGLE
J5	Panel Type Select Switch	HDR5X2, 14pin
J6	D-SUB Jack	15P D-SUB 2.29MM RIGHT ANGLE
J7	Out Power Connector	MOLEX 53015-0310 2.0mm RIGHT ANGLE
J8	Video Jack	VIDEO 3P JACK (RCA 3PIN)
J9	Video Connector	53015-0310 MOLEX 2.0mm RIGHT ANGLE
J10	Out Power Jumper	HDR3X1 CON3P-BASE
J12	RS232C Communication Connector(TBD)	MOLEX 53015-0410 2.0mm RIGHT ANGLE
J13	LCD Interface TTL - Single lower 2 bit	YEON-HO SMW200-06P
J14	LCD interface board Connector for TTL 6bit	16*2 HEADER PIN
J15	LCD interface board Connector for TTL 8bit FPC	YEONHO 05002HR-50A01
J17	S-video Connector	MOLEX 53015-0510 2.0mm RIGHT ANGLE
J19	Panel Power Out Jumper	3*2 Header
J20	DC power input Connector	MOLEX 53015-0410 2.0mm RIGHT ANGLE
J26	Inverter Dimming Reverse Jumper	HDR3X1 CON3P-BASE
J100	LCD interface board Connector for LVDS 1ch	YEONHO 12507WR-20
J401	F/W Jumper Setting (Optional)	2*1 Header
J402	F/W Jumper Setting (Optional)	2*1 Header
J802	LCD interface board Connector for LVDS 2ch	YEONHO 12507WR-30

9.2 Connector Pin Assignment

CN104 : OSD control Connector

Pin No.	Symbol	Description
1	VCC	+5V power for IR sensor
2	IRQ	Infrared rays signal line.
3	LED2	RED LED
4	LED1	GREEN LED
5	GND	Ground
6	KEY1	Up, Power
7	KEY0	Menu, Select, Down

J1 : S-video Jack

Pin No.	Symbol	Description
1	GND	Ground
2	GND	Ground
3	C-in	CROMA signal input
4	Y-in	LUMA signal input
5	GND	Ground
6	GND	Ground
7	GND	Ground

J2 : Input Dc power Jack

Pin No.	Symbol	Description
1	Vcc	12V
2	GND	Ground
3	GND	Ground

J3 : Inverter Connector

Pin No.	Symbol	Description
1	DIM-adj	DIM-adjustment
2	GND	Ground
3	GND	Ground
4	GND	Ground
5	ON/OFF	Inverter ON/OFF
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	Vcc	12V
10	Vcc	12V

J4 : D-SUB Connector

Pin No.	Symbol	Description
1	SCL	Serial Clock Line for DDC
2	SDA	Serial Data Line for DDC
3	NC	No Connection
4	VSNC	Vertical Sync
5	HSYNC	Horizontal Sync
6	GND	Ground for HSYNC, VSNC, SCL, SDA
7	BLUE	BLUE analog input
8	BLUE GND	Ground for BLUE Input Signal
9	GREEN	GREEN analog input
10	GREEN GND	Ground for GREEN Input Signal
11	RED	RED analog input
12	RED GND	Ground for RED Input Signal

J6 : D-SUB Jack

Pin No.	Symbol	Description
1	Red1	Red analog input
2	Green1	Green analog input
3	Blue1	Blue analog input
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	NC	Not connected
10	GND	Ground
11	GND	Ground
12	DSDA	DDC-SDA
13	HSYNC	Horizontal Sync
14	VSNC	Vertical Sync
15	DSCL	Serial Clock Input

J7 : Out Power Connector

Pin No.	Symbol	Description
1	Vcc	12V/5V
2	GND	Ground
3	GND	Ground

J8 : Video Jack

Pin No.	Symbol	Description
1,2	Composite	Composite-video input
3	GND	Ground

J9 : Video Connector

Pin No.	Symbol	Description
1,2	Composite	Composite-video input
3	GND	Ground

J12 : RS232C Communication Connector(TBD)

Pin No.	Symbol	Description
1		
2		
3		
4		

J13 : LCD Interface TTL - Single lower 2 bit

Pin No.	Symbol	Description
1	R0	. Red output data
2	R1	. Red output data
3	G0	Green output data
4	G1	Green output data
5	B0	Blue output data
6	B1	Blue output data

J14 : LCD interface board Connector for TTL 6bit

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	ROA (7)	Red output data	17	BOA (7)	Blue output data
2	ROA (6)	Red output data	18	BOA (6)	Blue output data
3	ROA (5)	Red output data	19	BOA (5)	Blue output data
4	ROA (4)	Red output data	20	BOA (4)	Blue output data
5	ROA (3)	Red output data	21	BOA (3)	Blue output data
6	ROA (2)	Red output data	22	BOA (2)	Blue output data
7	GND	Ground	23	GND	Ground
8	GND	Ground	24	GND	Ground
9	GOA (7)	Green output data	25	DVS	Display Vertical Sync
10	GOA (6)	Green output data	26	DHS	Display Horizontal Sync
11	GOA (5)	Green output data	27	DCLK	Display Clock
12	GOA (4)	Green output data	28	GND	Ground
13	GOA (3)	Green output data	29	DEN	Display Enable
14	GOA (2)	Green output data	30	MOD_PWR	VDD For LCD Module
15	GND	Ground	31	MOD_PWR	VDD For LCD Module
16	GND	Ground	32	MOD_PWR	VDD For LCD Module

J15 : LCD interface board Connector for TTL 8bit FPC(Optional)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

J17 : S-video Connector

Pin No.	Symbol	Description
1,2	C-in	CROMA signal input
3	GND	Ground
4,5	Y-in	LUMA signal input

J19 : Panel Power Out Jumper

Pin No.	Symbol	Description
1	3.3V	3.3V
2	12V	12V
3	5V	5V

J20 : DC power input Connector

Pin No.	Symbol	Description
1	Vcc	12V
2	Vcc	12V
3	GND	Ground
4	GND	Ground

J100 : LCD interface board Connector for LVDS 1ch

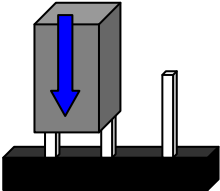
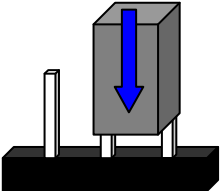
Pin No.	Symbol	Description
1	GND	Ground
2	GND	Ground
3	Y3P	LVDS 3 Channel Positive Signal for LCD Module (6Bit Unused)
4	Y3M	LVDS 3 Channel Negative Signal for LCD Module (6Bit Unused)
5	GND	Ground
6	CLKOUTP	LVDS Clock Positive Signal of Channel for LCD Module
7	CLKOUTM	LVDS Clock Negative Signal of Channel for LCD Module
8	GND	Ground
9	Y2P	LVDS 2 Channel Positive Signal for LCD Module
10	Y2M	LVDS 2 Channel Negative Signal for LCD Module
11	GND	Ground
12	Y1P	LVDS 1 Channel Positive Signal for LCD Module
13	Y1M	LVDS 1 Channel Negative Signal for LCD Module
14	GND	Ground
15	Y0P	LVDS 0 Channel Positive Signal for LCD Module
16	Y0M	LVDS 0 Channel Negative Signal for LCD Module
17	GND	Ground
18	GND	Ground
19	MOD_PWR	VDD For LCD Module
20	MOD_PWR	VDD For LCD Module

J802 : LCD interface board Connector for LVDS 2ch

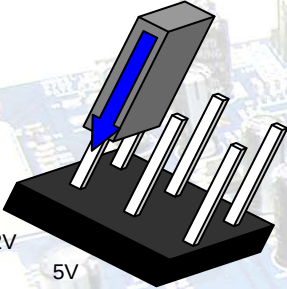
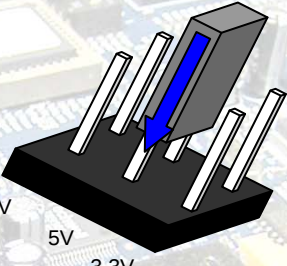
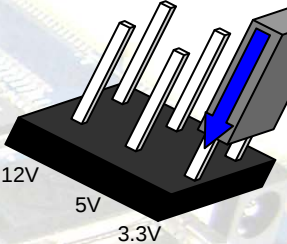
Pin No.	Symbol	Description
1	MOD_PWR	Panel Power
2	MOD_PWR	Panel Power
3	MOD_PWR	Panel Power
4	MOD_PWR	Panel Power
5	GND	Ground
6	NC	NC
7	GND	Ground
8	Y3P-EVEN	Positive(+) LVDS differential first 3 data(A port)
9	Y3M-EVEN	Negative(-) LVDS differential first 3 data(A port)
10	YCP-EVEN	Positive(+) LVDS differential first Clock(A port)
11	YCM-EVEN	Negative(-) LVDS differential first Clock(A port)
12	Y2P-EVEN	Positive(+) LVDS differential first 2 data(A port)
13	Y2M-EVEN	Negative(-) LVDS differential first 2 data(A port)
14	GND	Ground
15	Y1P-EVEN	Positive(+) LVDS differential first 1 data(A port)
16	Y1M-EVEN	Negative(-) LVDS differential first 1 data(A port)
17	YOP-EVEN	Positive(+) LVDS differential first 0 data(A port)
18	YOM-EVEN	Negative(-) LVDS differential first 0 data(A port)
19	GND	Ground
20	Y3P-ODD	Positive(+) LVDS differential second 3 data(B port)
21	Y3M-ODD	Negative(-) LVDS differential second 3 data(B port)
22	YCP-ODD	Positive(+) LVDS differential second Clock(B port)
23	YCM-ODD	Negative(-) LVDS differential second Clock(B port)
24	Y2P-ODD	Positive(+) LVDS differential second 2 data(B port)
25	Y2M-ODD	Negative(-) LVDS differential second 2 data(B port)
26	GND	Ground
27	Y1P-ODD	Positive(+) LVDS differential second 1 data(B port)
28	Y1M-ODD	Negative(-) LVDS differential second 1 data(B port)
29	YOP-ODD	Positive(+) LVDS differential second 0 data(B port)
30	YOM-ODD	Negative(-) LVDS differential second 0 data(B port)

9.3 Summary : jumpers setting

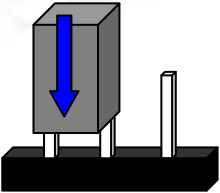
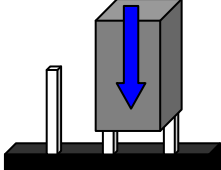
J10 : Out Power Jumper

	
12V 5V	12V 5V
On board +12V logic power enable	On board +5V logic power enable

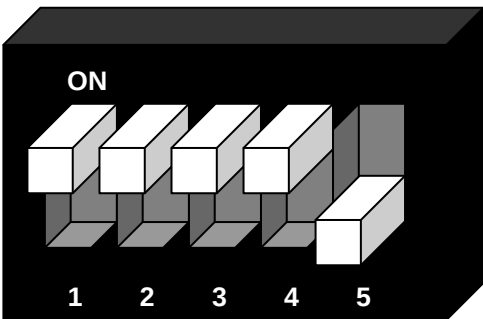
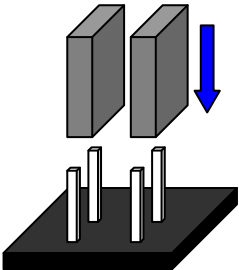
J19 : Panel Power Jumper

		
12V 5V 3.3V	12V 5V 3.3V	12V 5V 3.3V
12V panel power CAUTION: Incorrect setting can damage panel	5V panel power CAUTION: Incorrect setting can damage panel	3.3V panel power CAUTION: Incorrect setting can damage panel

J26 : Inverter Dimming Reverse Jumper

	
DIMADJ1 DIMADJ2	DIMADJ1 DIMADJ2
Inverter Dimming Setting 0V	Inverter Dimming Setting 3.3V

9.4 Summary : Panel jumpers setting

	
J5(Standard panel setting)	J401/J402(Special panel setting)

Standard Panel Jumper Setting

Resolution setting			Mode setting					
1	2	resolution	3(LVDS map)		4(Color depth)		5(Signal type)	
ON	ON	VGA	ON	Shift	ON	6bit	ON	LVDS
ON	OFF	SVGA						
OFF	ON	XGA	OFF	Normal	OFF	8bit	OFF	TTL
OFF	OFF	SXGA						

Special Panel Jumper Setting

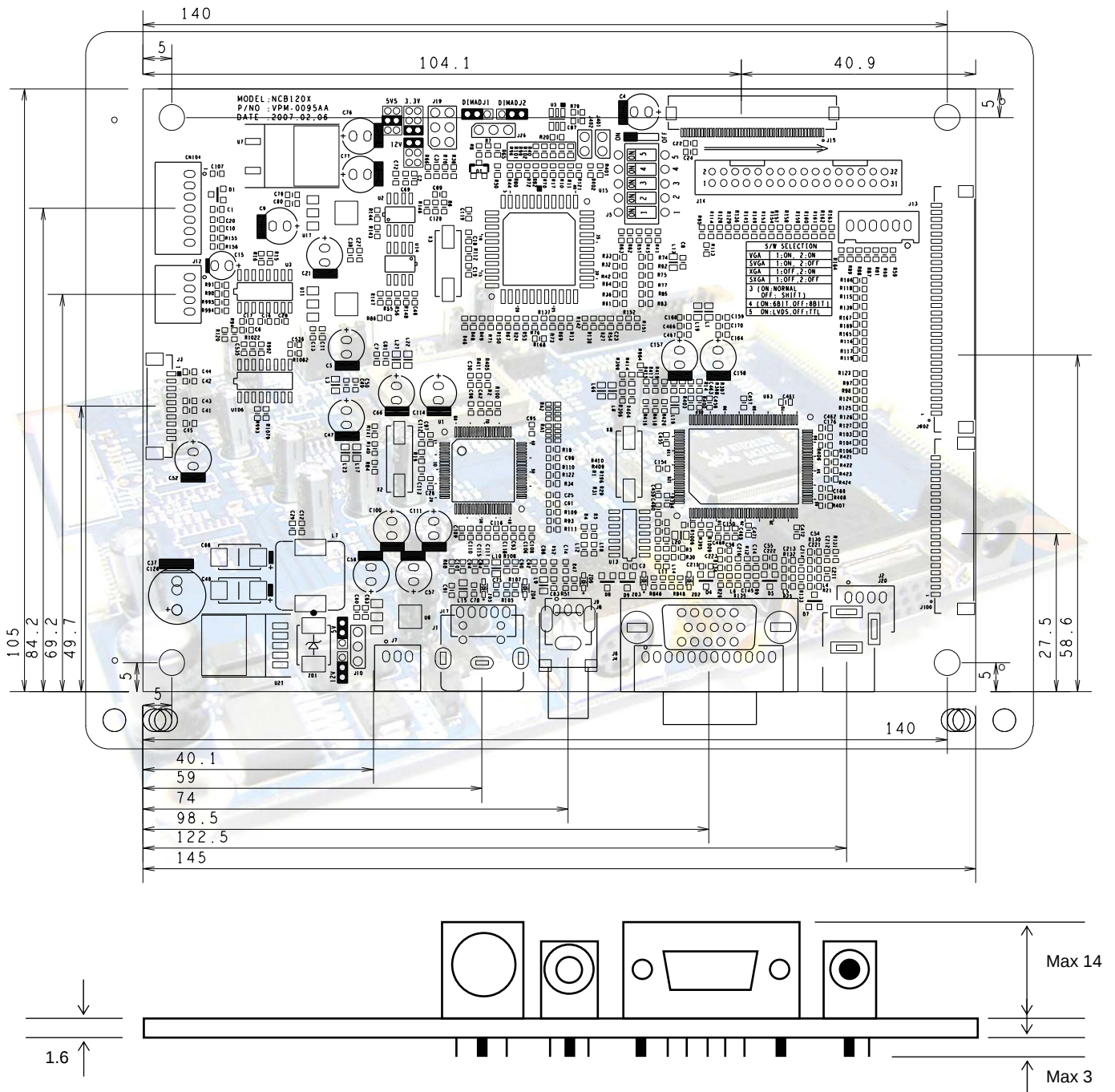
If any certain display can not be driven as per Standard Panel Jumper Setting, then please check below different panel setting per each panel and re-set the jumper to drive properly

No.	J401/J402	J5(ON=1,OFF=0)					Panel name	Vendor	Resolution	Remark
1	On/Off	0	0	0	0	0	M170XW01	AUO	WXGA	1280x768
2		0	0	0	0	1	HT12X12-100	Hydis	XGA	
3		0	0	0	1	0	7"	NEC	VGA	
4		0	0	0	1	1	LB064V02	LPL	VGA	
5		0	0	1	0	0	HT10X21-100	Hydis	XGA	
6		0	0	1	0	1	LTM190M2-L31	LPL	WXGA+	1440x900
7		0	0	1	1	0	LQ104S1DG21	Sharp	SVGA	
8		0	0	1	1	1	LQ064V3DG01	Sharp	VGA	
9		0	1	0	0	0	LTN170X3	SamSung	WXGA+	1440x900
10		0	1	0	0	1	LTN190W1	SamSung	WSXGA+	1680x1050
11										
12										
13										
14										
⋮						⋮				

Final Update : Mar.,28,'07

10. CONTROLLER DIMENSIONS

To be further updated (unit : mm)



11. APPLICATION NOTES

USING THE CONTROLLER WITHOUT BUTTONS ATTACHED

This is very straightforward:

- Firstly setup the controller/display system with the buttons. With the attached controllers and display system active make any settings for color, contrast and image position as required then switch everything off.
- Remove the control switches, the 7-way (CN104) cable.
- Refer to inverter specifications for details as to fixing brightness to a desired level, this may require a resistor, an open circuit or closed circuit depending on inverter

INVERTER CONNECTION

There are 3 potential issues to consider with inverter connection:

- Power
- ON/OFF
- Brightness (DIM-ADJ)

Inverter power: This should be matched with the inverter specification.

Inverter ON/OFF: This is a pin provided on some inverter for ON/OFF function and is used by this panel controller for VESA DPMS compliance. If the inverter does not have on/off pin or the on/off pin is not used DPMS will not operate. Pin 5 should be matched to the inverter specification for the ON/OFF pin.

Brightness Dimming control: NCB120 controller boards are analog dimming control method. And it is important to consider the specifications for the inverter to be used.

12. TROUBLESHOOTING

General

A general guide to troubleshooting of a flat panel display system, worthy of considering the system as separate elements, such as:

- ▶ Controller (jumpers, PC settings)
- ▶ Panel (controller, cabling, connection, panel, PC settings)
- ▶ Backlight (inverter, cabling, connection, panel, Pc settings)
- ▶ Cabling
- ▶ Computer system (display settings, operating system)

Through checking the system step-by-step cross with instruction manuals and a process of elimination to isolate the problem it is usually possible to clearly identify the problem area.

No image:

- ▶ If the panel backlight is not working it may still be possible to see just some image.
- ▶ A lack of image is most likely to be caused by incorrect connection, lack of power, failure to provide a signal or incorrect graphic card settings.

Image position:

If it is impossible to position the image correctly, the image adjustment controls will not move the image far enough, then test using another graphics card. This situation can occur when a graphic card is not close to standard timing or when something is in the graphics line that may affect the signal such as a signal splitter (please note that normally a signal splitter will not have any adverse effect).

Image appearance:

- ▶ A faulty panel can have blank lines, failed sections, flickering or flashing display.
- ▶ Incorrect graphic card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, to scroll to, flicker badly or possibly even no image.
- ▶ Incorrect jumper settings on the controller may cause everything from incorrect image viewing to total failure.

CAUTION: Do not set the panel power input incorrectly.

- ▶ Sparkling on the display: faulty panel signal cable.

Backlight:

Items to check include: Power input, controls, inverter and Tubes generally in this order.

If half the screen is dimmer than the other half:

- ▶ Check cabling for the inverter.

Also:

- ▶ If system does not power down when there is a loss of signal.

13. ACCESSORY

This board requires several accessories to build a complete display unit. **KORDIS** can provide standard accessory for this board as below.

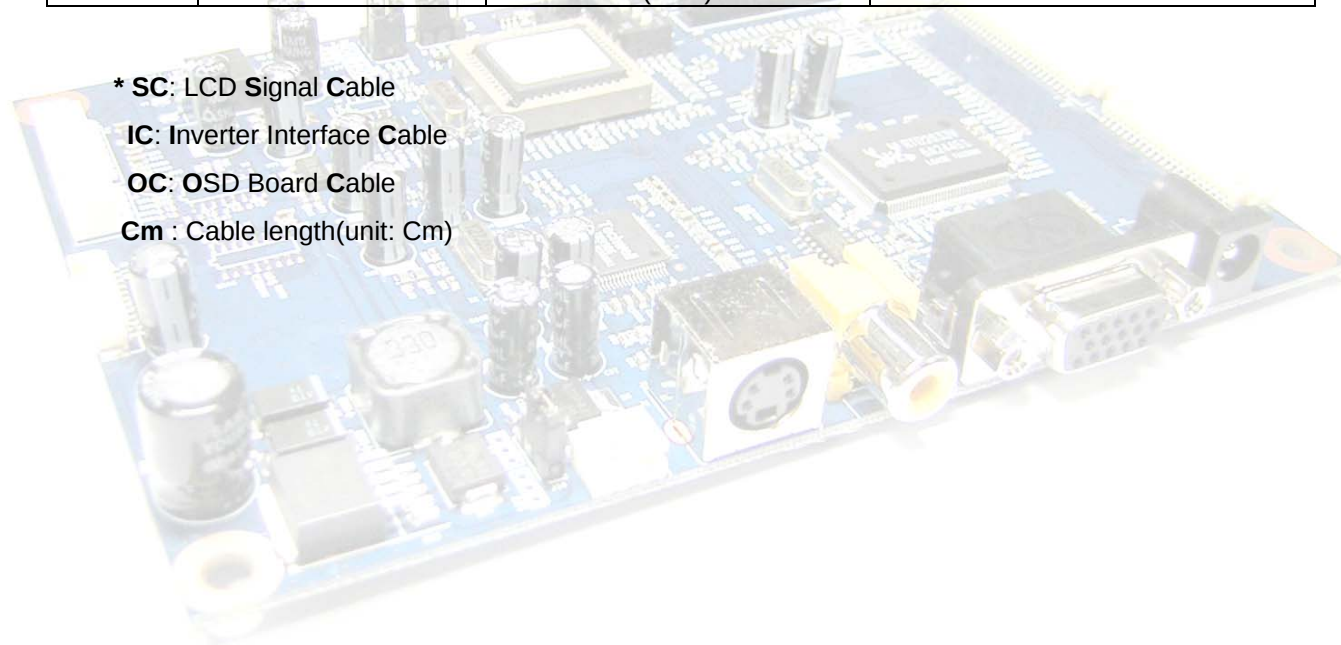
No.	Items	Part No.	Ex) LG Philips LB064V2
1	LCD signal cable	SC-Panel Part No.-Cm	SC-LB064V2-20
2	Inverter	Part no. of Manufacturer	GH025
3	Inverter cable	IC-Panel Part No.-Cm	IC-GH025-20
4	OSD Board	NOB005P	NOB005P
5	OSD Cable	OC-NID01-Cm	OC-NID01-20
6	Remote Control	(TBD)	

* **SC**: LCD Signal Cable

IC: Inverter Interface Cable

OC: OSD Board Cable

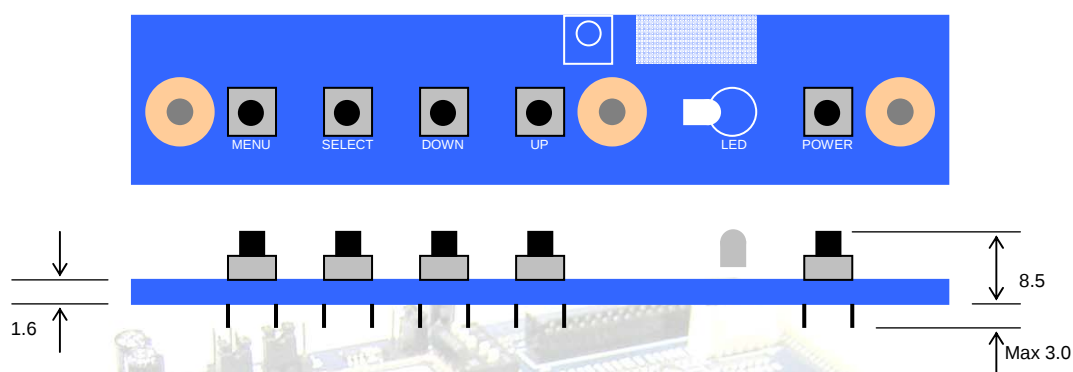
Cm : Cable length(unit: Cm)



13.1 OSD Board

The OSD (On Screen Display) provides certain functions to have clear image and others. This board supports 4 buttons OSD operation as a standard. The control functions defined on OSD operation are as below. (unit: mm)

Appearance



Button	Function	Status	HOT Key
Power	Power on/off	On/Off	
Menu	Activate menu		
Select	Menu Select		Auto setting
LED	Indicates operation status	Green/ Off/ Amber	
DOWN, UP ▼ ▲	Cursor control (Value Control) Down (Decrement)/Up (Increment)		UP: Source change

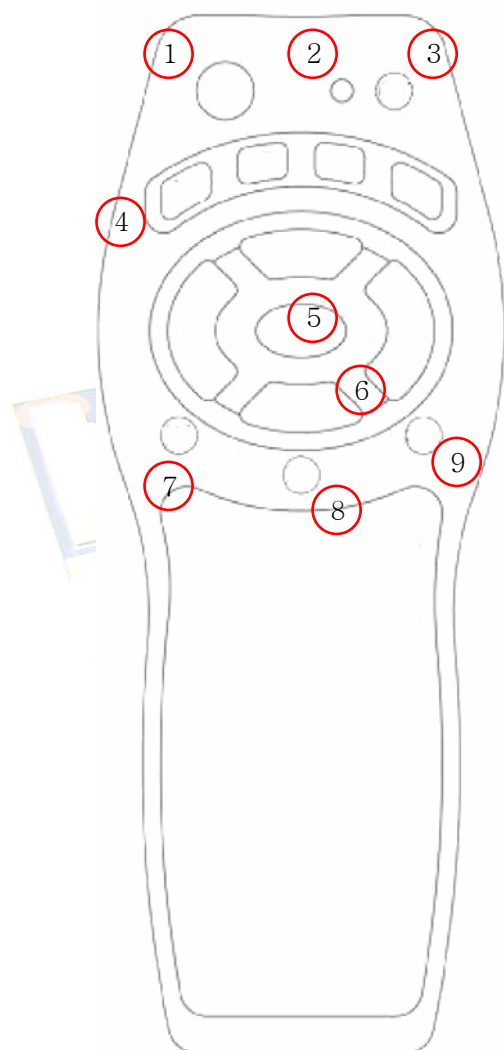
The chosen OSD settings will be stored in memory. The OSD menu can be cleared from the screen by pressing **MENU** icon otherwise it will be automatically cleared after a few second of non-use

J1 : OSD control connector

Pin No.	Symbol	Description
1	KEY0	Menu, Select, Down
2	KEY1	Up, Power
3	GND	Ground
4	LED1	GREEN LED
5	LED2	RED LED
6	IRQ	Infrared rays signal line.
7	VCC	+5V power for IR sensor

13.2 REMOTE CONTROL (TBD)

Use a remote control up to 7 meters distance and 30 degree (left/right) within the receiving unit scope.



1. Power On Button
2. LED
3. Power Off Button
4. Direct Source Change Button
(RGB, DVI, Video, S-Video)
5. Select Button
6. Menu Up/ Down/ Left /Right Button
7. Menu Button
8. Source Change Button
9. Auto Adjustment Button

Size : 44 x 115 x 14 (mm)

Battery type : CR2025



13.3 RS232C CONTROL (TBD)

