SPECIFICATION FOR APPROVAL
(ANALOG RGB AND VIDEO INTERFACE CONTROLLER FOR TFT-LCD INTERFACE)

MODEL NO : DCMP-80X(Ver. 1.1)

APPROVED	REFERENCE

(PLEASE RETURN ONE OF THESE TO US IMMEDIATELY WITH YOUR SIGNATURE FOR APPROVAL)

Revised Ver. 1.0(April 25, 2002) DIGITAL CYNOS Co., Ltd.
Beck GmbH & Co. Elektronik Bauelemente KG Eltersdorfer Str. 7, D-90425 Nürnberg
Fon: (0911) 9 34 08 0, Fax (0911) 9 34 08 28

CONTENTS OF SPECIFICATION

Revised Ver. 1.0(April 25, 2002) DIGITAL CYNOS Co., Ltd.
Beck GmbH & Co. Elektronik Bauelemente KG Eltersdorfer Str. 7, D-90425 Nürnberg
Fon: (0911) 9 34 08 0, Fax (0911) 9 34 08 28

1. Product Overview

This board accepts standard analog RGB and SYNC(CRT like) signals from any VGA to XGA video controller and/or Composite PAL or NTSC signal. And also generates all the necessary control signals and the panel data to drive TFT-LCDs. This board supports to XGA resolutions at vertical refresh rate up to 85Hz. Lower resolution modes can be expanded to full-screen or centered through the On-Screen Menu user interface. The user interface includes Phase, Brightness, Contrast, Horizontal and Vertical Position adjustment etc. via on-screen programming.

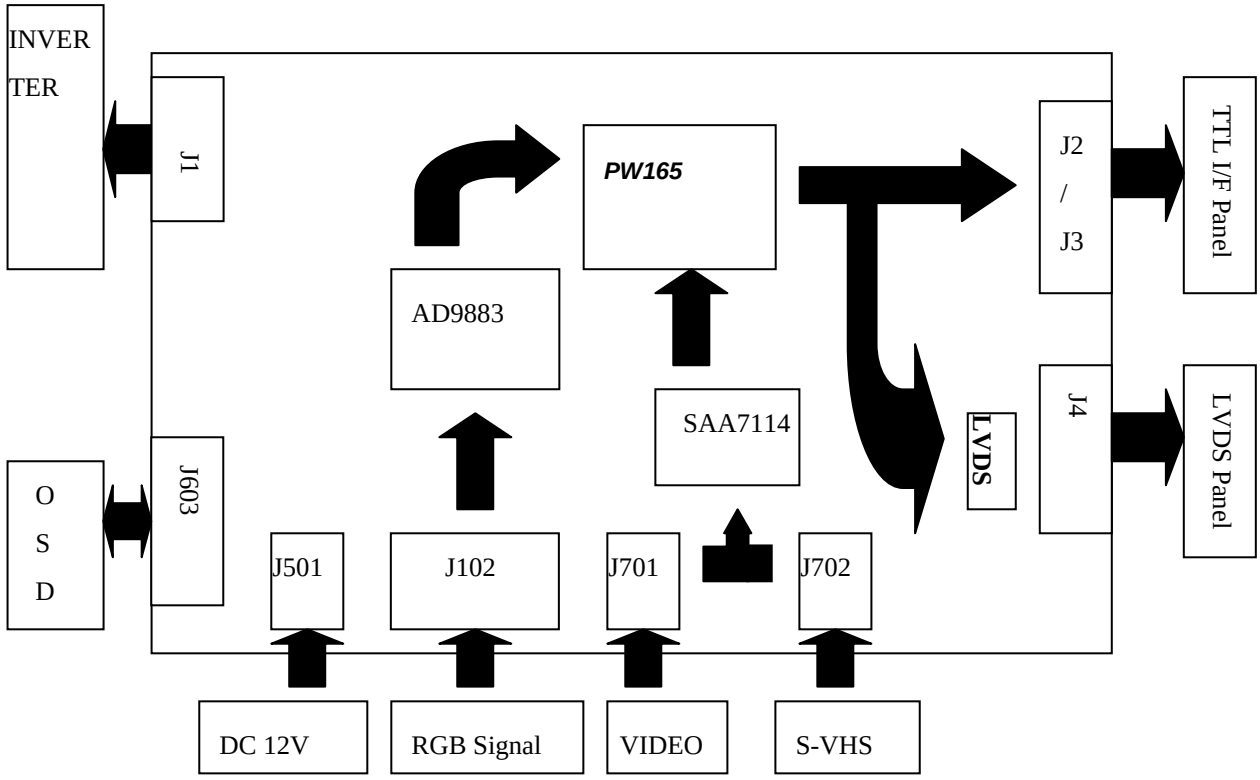
2. Features

- Support up to XGA(1024x768) resolution.
- Automatic Mode detection from VGA to XGA.
- Accept H-/V-Separate Sync, Csyn(LVDS 1 Port), Sync On Green, and Interlace mode
- PIP(Picture In Picture) supports at RGB and Video dual sources.
- Provides up to 1600k Colors.
- Flicker-free, sharp image/text data.
- Refresh rates up to 85Hz without external video memory.
- Full screen image expansion or centered-mode display for lower resolutions.
- User friendly On Screen Display Menu to control image
    - Auto-Adjust
    - Brightness
    - Contrast
    - RGB Control
    - Clock Phase
    - Geometry
    - Screen Zooming
    - Input Type Select
    - OSD Control
    - Default-Settings
- Power management support(DPMS - VESA compliant)
- VESA-DDC1/2B display ID for Plug and Play Operation (Option)

Revised Ver. 1.0(April 25, 2002) DIGITAL CYNOS Co., Ltd.
Beck GmbH & Co. Elektronik Bauelemente KG Eltersdorfer Str. 7, D-90425 Nürnberg
Fon: (0911) 9 34 08 0, Fax (0911) 9 34 08 28

3. System Configuration

- *Figure 1. System Block Diagram*



4. Electrical Specifications

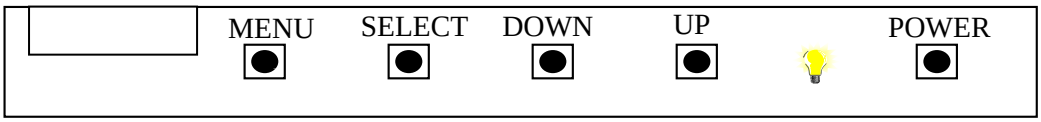
- Video input timing;
  - Supported vertical refresh rates for each modes are as follow:
    - 640x350 70Hz
    - 640x400 70Hz
    - 720x400 70Hz
    - 640x480 56~85Hz
    - 800x600 56~85Hz
    - 1024x768 56~85Hz
  - Sync. : H/V Separate, Sync On Green, Interlace
  - Video - RGB Analog(750 Ohm, 0.7Vp-p)
    - Composite Video(NTSC or PAL), S-video (Option)

- Electrical Characteristics;

Item	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Supply Voltage		------	11.4	12.0	12.6	Vdc
Absolute Max.Rating		------		12.0	13.0	Vdc
Current Consumption		Board Only	0.4	0.5	0.55	A
		With LM151X04		1.8	2.4	A
Note : Test was performed with the LG's LCDs and inverters which are made by Power Net Inc..						

5. Operational Setup

Push button switches are provided for fine tuning of various functional Parameters.
Visual feedback is provided in the form of an On-Screen-Menu.
The functionality of these switches are also passed to a header for Connection of remote faceplate-mounted user interface buttons



There are 6 tick switch to control the screen on OSD PCB board And the functions are as follows ;
<Table 1> Function of each OSD key

No.	Button name	Switch Function
1	Menu	1. First click : Appears the OSD Main Menu 2. Second click : Change the value of OSD sub-menu to be able to control (toggle key)
2	Select	1. Move between main menu 2. Move between sub-menu inside main-menu
3	Power	1. put on a power, put off a power
4	Up	1. The adjustment of sub-menu value inside main-menu (Selected value increase)
5	Down	1. The adjustment of sub-menu value inside main-menu (Selected value decrease)

◈ Hot key

- Auto adjust : down key
- Source change(analog RGB, Composite Video, S-Video) : up key
- Brightness & Contrast : Select key

Revised Ver. 1.0(April 25, 2002) DIGITAL CYNOS Co., Ltd.
Beck GmbH & Co. Elektronik Bauelemente KG Eltersdorfer Str. 7, D-90425 Nürnberg
Fon: (0911) 9 34 08 0, Fax (0911) 9 34 08 28

1) On-Screen Display

If buttons remain untouched for seconds while displaying a menu, the firmware shall save the current adjustments and exit. Menu Key is used for menu display and to be able to change sub-menu while OSD On.

Select Key is used for down shifting main-menu and sub-menu while OSD On. Auto key is used for making a screen the most suitable state.

Power key is used for power on or power off. Up and Down key is used for changing value, increase

or decrease. <Table 2> shows OSD menu for analog RGB and Composite Video, respectively.

.

<Table 2> Structure of On-screen Menu for analog RGB

MAIN MENU	SUB MENU	RANGE OF CONTROL
Picture	Brightness	0 ~ 100
	Contrast	0 ~ 100
	h position	0 ~ 100
	v position	0 ~ 100
	Phase	0 ~ 31
	Frequency	1550 ~ 1650
	Scaling	fill all, fill aspect ratio, one to one
Advanced	Sharpness	1 ~ 5
	Gamma	linear, crt
	color temp	5000, 7300, 9300, user
	user red	0 ~ 100
	user green	0 ~ 100
	user blue	0 ~ 100
PIP	Size	Off small medium Large
	Position	
	Source	Auto comp. S-Video
	Brightness	0 ~ 100
	Contrast	0 ~ 100
	Color	0 ~ 31

	Tint	1550 ~ 1650
	sharpness	0 ~ 100
Adv PIP	H position	0 ~ 100
	v-position	0 ~ 100
	Video format	Auto NTSC PAL SECAM
	Video type	DVD VCR
Options	OSD	Position of OSD on screen
	OSD h pos	0 ~ 100
	OSD v pos	0 ~ 100
	Language	English, German, Japan
Utilities	OSD time out	1 ~ 60 second
	OSD back ground	opaque, translucent
	Factory reset	press <UP> to select
	Auto adjust	Press <UP> to select
	Source	Analog Video S-Video

<Table 3> Structure of On-screen menu for Composite Video

MAIN MENU	SUB MENU	RANGE OF CONTROL
Picture	brightness	0 ~ 100
	contrast	0 ~ 100
	h position	0 ~ 100
	v position	0 ~ 100
	color	0 ~ 31
	tint	1550 ~ 1650
	sharpness	0 ~ 100
	scaling	Fill aspect ratio, normal, wide, zoom, zoom2, anamorphic,
advanced	sharpness	1 ~ 5
	gamma	linear, crt
	color temp	5000, 7300, 9300, user
	user red	0 ~ 100

	user green	0 ~ 100
	user blue	0 ~ 100
video	video format	auto, ntsc, pal, secam
	video type	dvd, vcr
options	osd	
	osd h pos	0 ~ 100
	OSD v pos	0 ~ 100
	Language	English, German
Utilities	OSD time out	1 ~ 60 second
	OSD back ground	opaque, translucent
	Freeze frame	on , off
	Factory reset	press <right> to select
	Auto adjust	Press <UP> to select
	Source	Analog Video S-Video

1) Name of OSD Menu and operation method

■ Analog RGB

(1) Main-Menu Screen Description & Sub menu of “Picture”

Figure 5.1 shows the main menu and sub menu for each main menu.

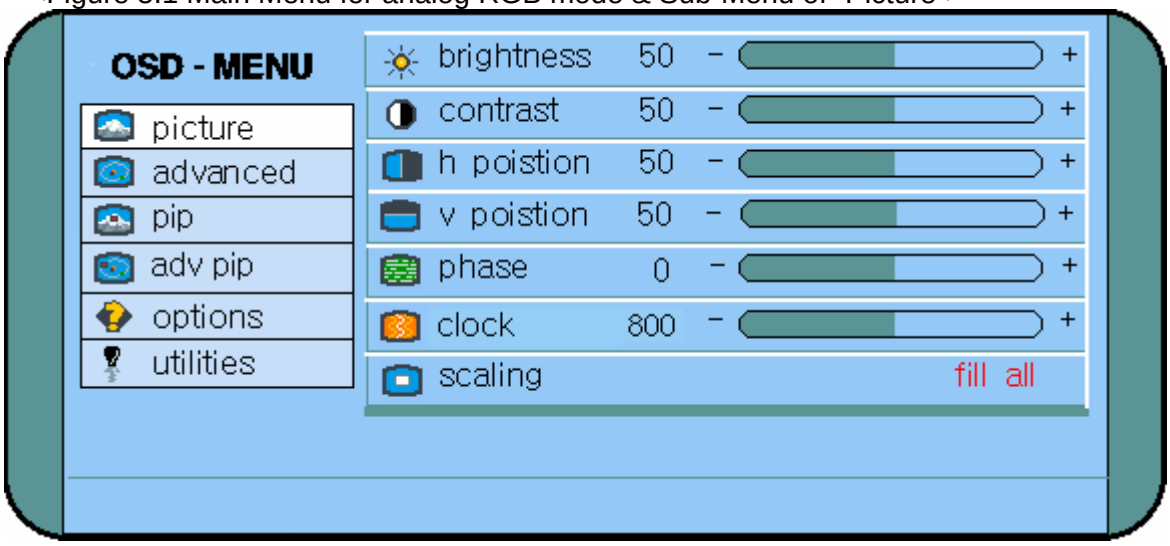
Left side menu bar shows main menu and right menu is sub-menu for selected main menu.

Figure 5.1 shows sub menu of “picture”.

Each sub menu can be selected by "menu key"

To select next sub menu(brightness, contrast, h position, v position, phase, frequency, scaling), push the "select” key of OSD PCB. And to adjust the selected menu, push "Up" and/or "Down” key.

<Figure 5.1 Main Menu for analog RGB mode & Sub-Menu of “Picture”>

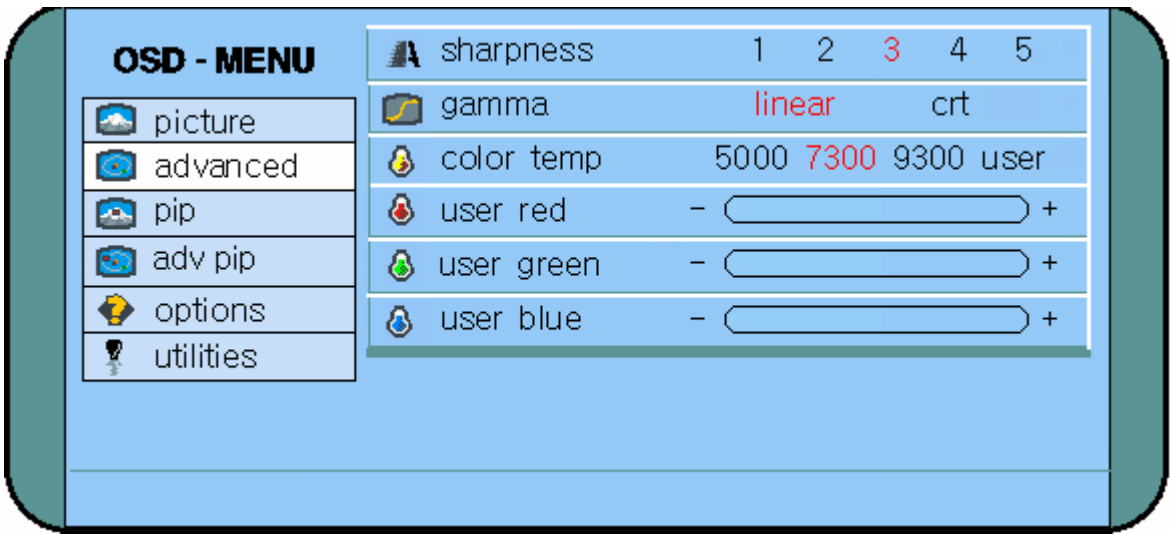


(2) Sub Menu of “advanced”

Figure 5.2 shows sub menu of “advanced”.

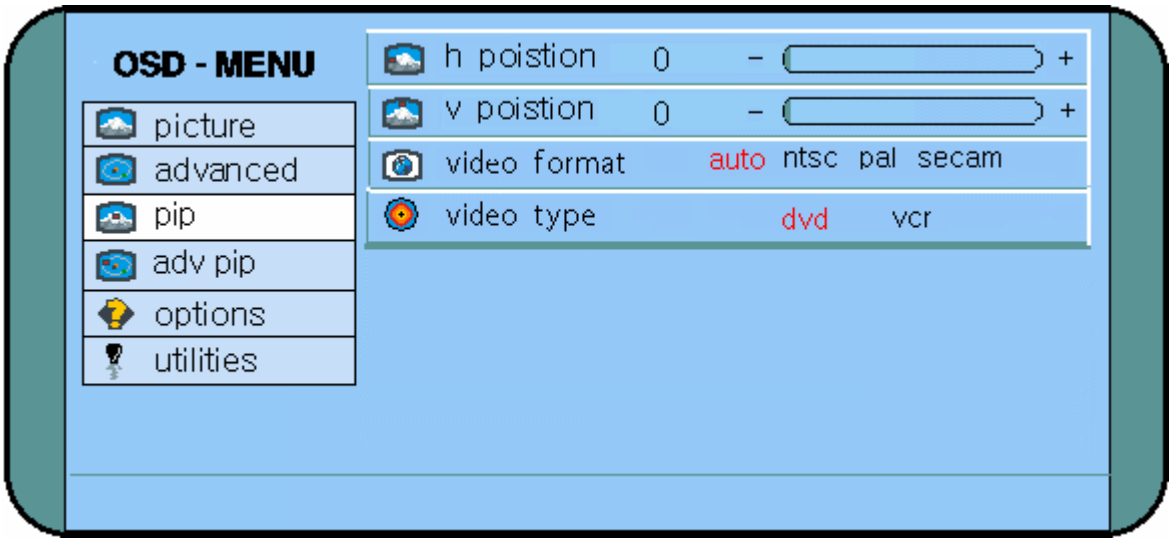
To return of main menu, just one time push the menu key button.

To select next sub menu(sharpness, gamma, color temp), push the "select” key of OSD PCB. To control them, push the "Up" and/or "Down” key.



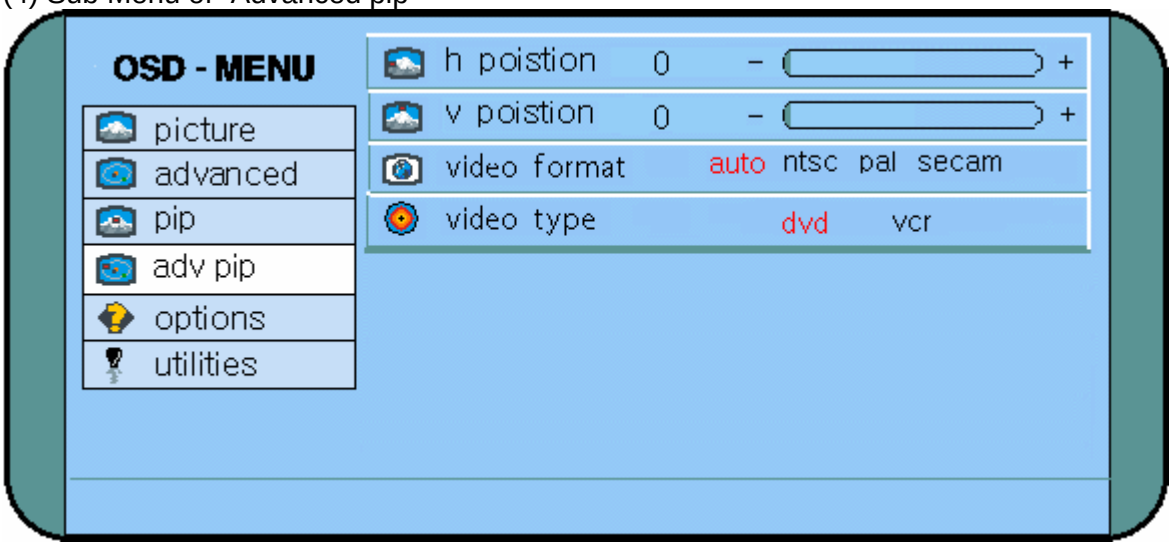
<Figure 5.2 Sub Menu of “advanced”>

(3) Sub Menu of “pip”



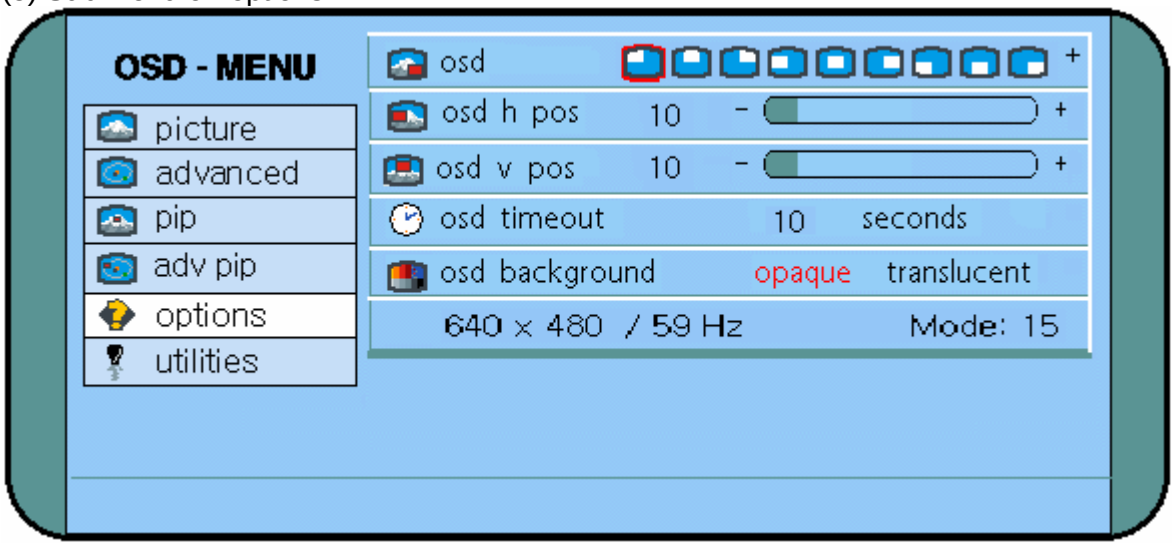
<Figure 5.3 Sub Menu of “pip”>

(4) Sub Menu of “Advanced pip”



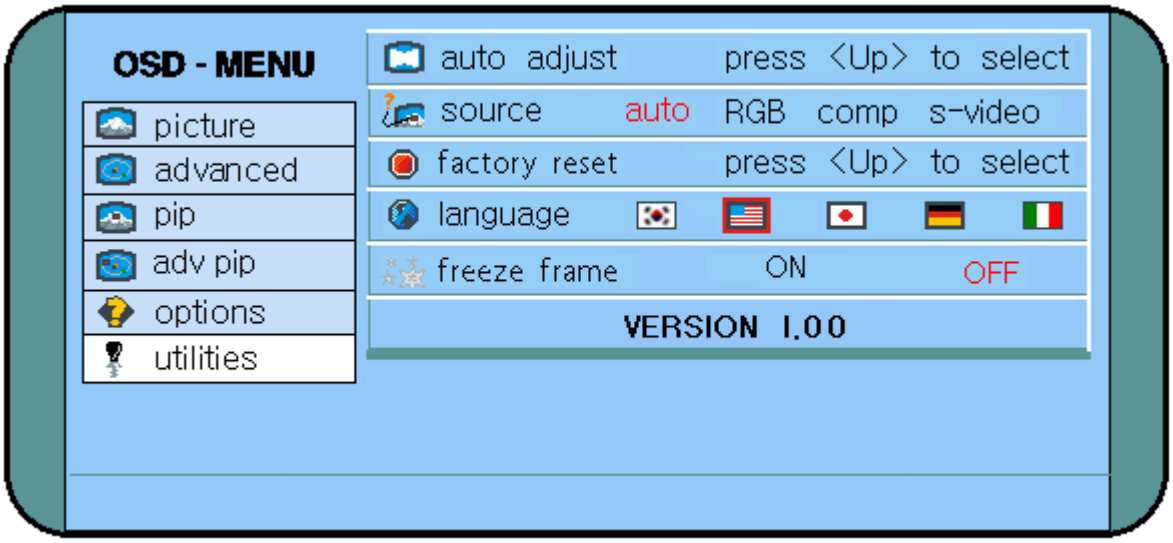
<Figure 5.4 Sub Menu of “advanced”>

(5) Sub Menu of “options”



<Figure 5.4 Sub Menu of “options”>

(6) Sub Menu of “Utilities”



<Figure 5.5 Sub Menu of “Utilities”>

■ Video

(1) Video Main-Menu Screen Description

Figure 5.6 shows the Video main menu and sub menu for each main menu.

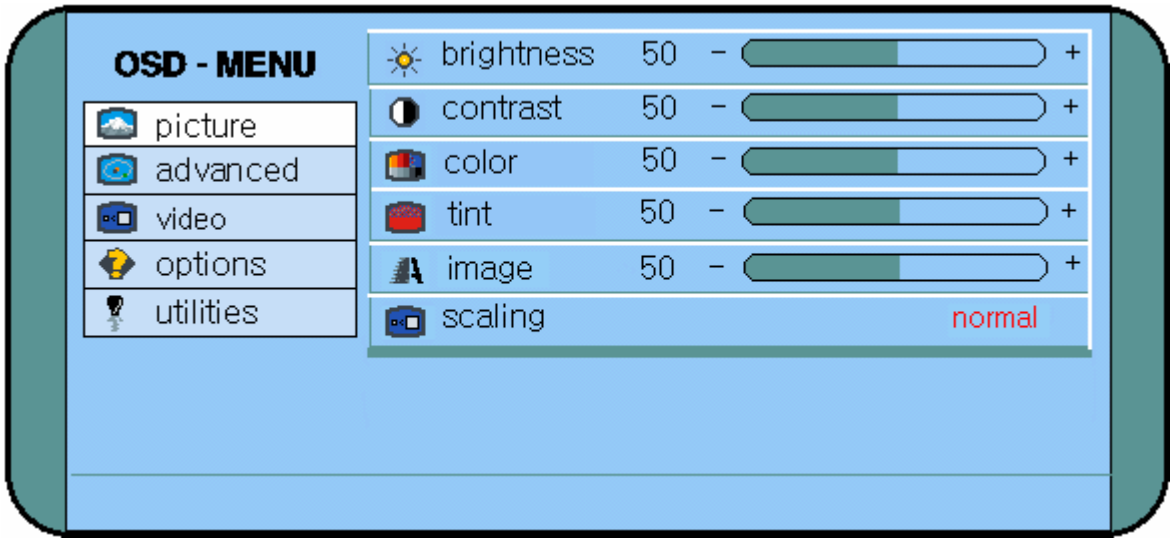
Left side menu bar shows main menu and right menu is sub-menu for selected main menu.

(2) Structure of sub menu

Each sub menu can be selected by "menu key"

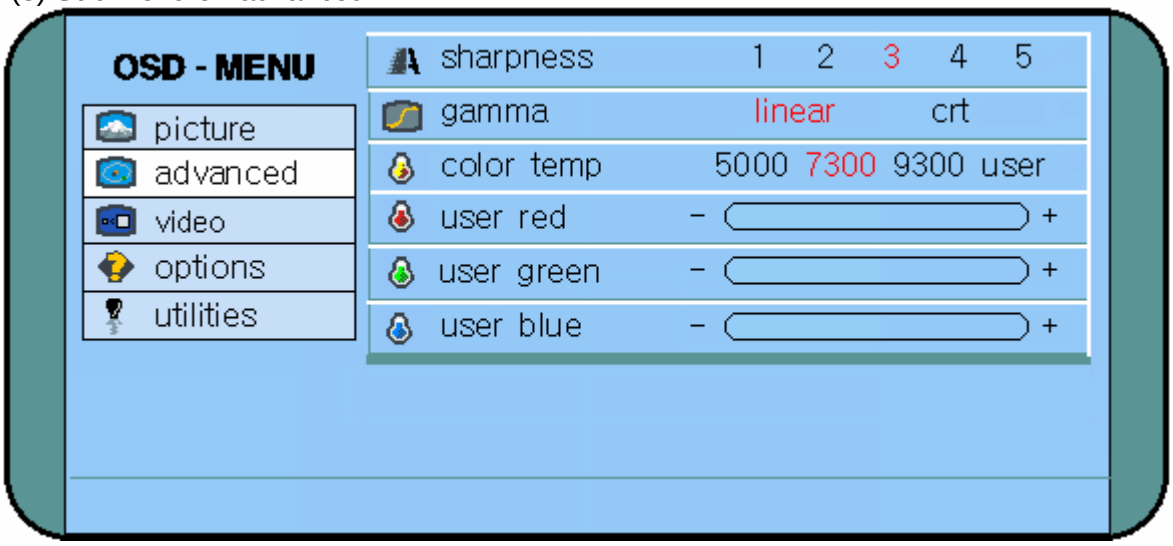
To select next sub menu(brightness, contrast, color, tint, sharpness, scaling), push the "select" key of OSD PCB. And to adjust the selected menu,

push "Up" and/or "Down" key.



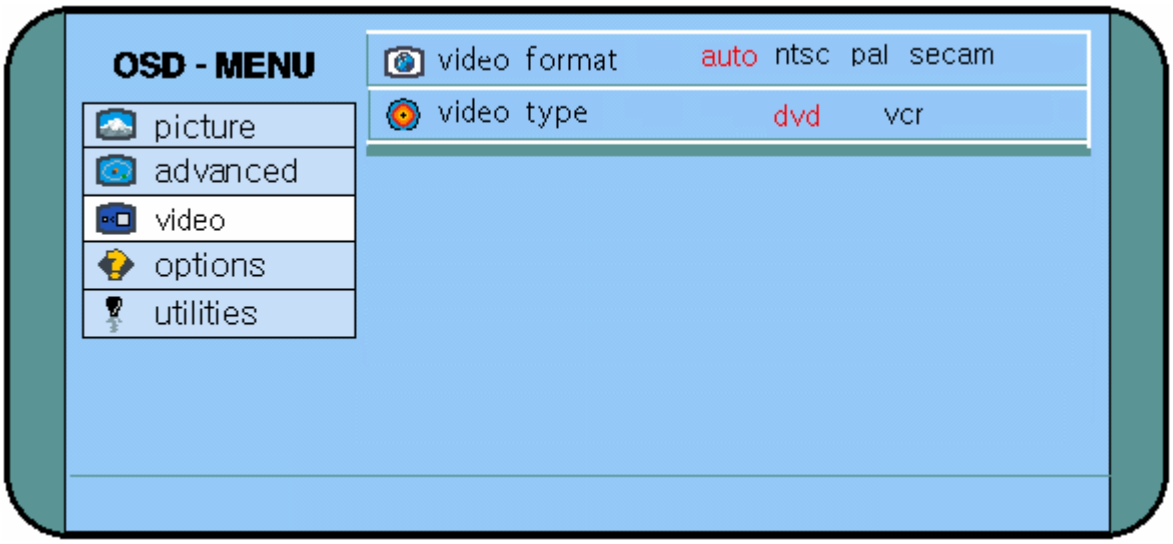
<Figure 5.6 Main Menu and sub menu of “picture” for Video mode>

(3) Sub Menu of “advanced”



<Figure 5.7 Sub Menu of “advanced”>

(4) Sub Menu of “video”



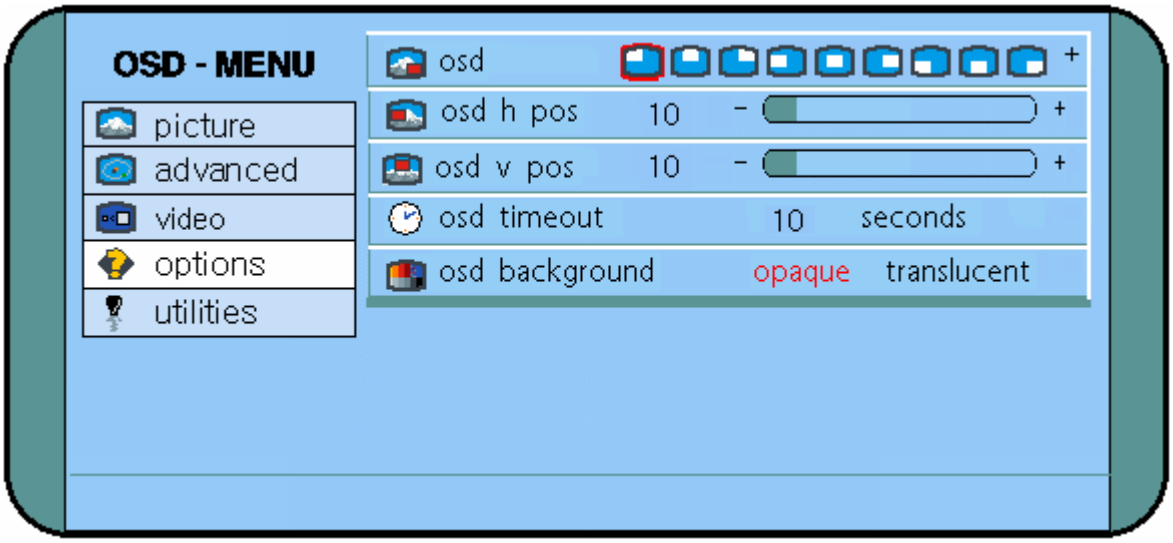
<Figure 5.8 Sub Menu of “video”>

(5) Sub Menu of “options”

Figure 5.9 shows sub menu of options menu.

To select next sub menu(OSD position, language),

push the "select” key of OSD PCB. And to control them, push the "Up" and "Down key"



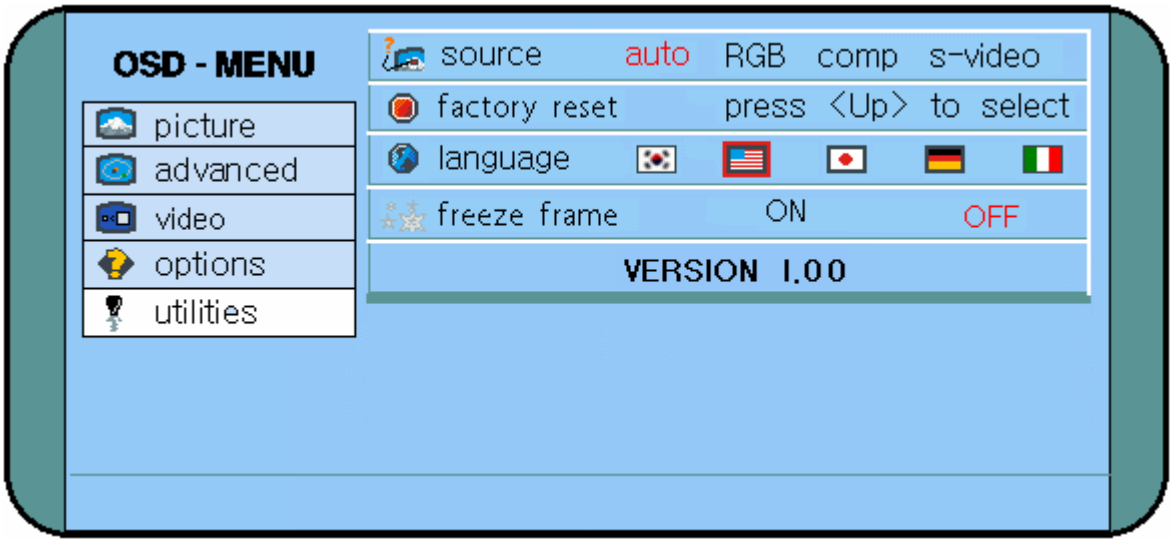
<Figure 5.9 Sub Menu of “options”>

(6) Sub Menu of “Utilities”

Figure 5.10 shows sub menu of “Utilities”.

To select next sub menu (osd timeout, osd background, factory reset, source), push the "select”

of OSD PCB. And to adjust the value, push the "Up" and "Down” key.



<Figure 5.10 Sub Menu of “Utilities”>

6. Input Connectors

- Power Input connector(J501)
  - Connector : DC12 Jack(J501)

Pin No.	Symbol	Description
1	Vin	+12Vdc
2	GND	GND

- Analog RGB Input connector(J301)
  - Connector : Mini D_Sub 15pin

Pin	Symbol	Signal Name	Pin No.	Symbol	Signal Name
1	RED	Analog Red	9	+5V	+5Vdc
2	GREEN	Analog Green	10	SGND	Sync GND
3	BLUE	Analog Blue	11	ID0	Reserved
4	ID2	Reserved	12	SDA	DDC Serial Data
5	GND	Digital GND	13	HSYNC	Horizontal Sync
6	RGND	Red Return	14	VSYNC	Vertical Sync.
7	GGND	Green Return	15	SCL	DDC Data Clock
8	BGND	Blue Return			

- CVBS input connector for Composite Video (J701)

Pin No.	Symbol	Description
1	CVBS	Composite video signal
2	GND	GND

- S-Video input connector (J702)

Pin No.	Symbol	Signal Name
1	GND1	GND1
2	GND2	GND2
3	S-VIDEO	LUMINANCE
4	S-VIDEO	COLOR
5	GND3	GND3

Revised Ver. 1.0(April 25, 2002) DIGITAL CYNOS Co., Ltd.
Beck GmbH & Co. Elektronik Bauelemente KG Eltersdorfer Str. 7, D-90425 Nürnberg
Fon: (0911) 9 34 08 0, Fax (0911) 9 34 08 28

- OSD, LED Interface Connector(J603)
  - Connector : 53015-1010 made by Molex

Pin No.	Symbol	Description
1	Menu On/Off	OSD Menu control
2	MENUSEL	OSD menu selection
3	GND	
4	MENU UP	Increase
5	Menu Down	Decrease
6	LED	Red
7	NC	No connection
8	LED	Green
9	GND	
10	Power	On/Off

7. Output Connectors for LCD Interface

7-1 TTL interface(J2, J3)

Pin No	J2 (for Single Port)	J3 (For Dual Port)	Pin No.	J2 (for Single Port)	J3 (For Dual Port)
1	GND	GND	22	B3	GND
2	CLOCK	R0	23	B4	G'2
3	GND	R1	24	B5	G'3
4	HSYNC	G0	25	B6	G'4
5	VSYNC	G1	26	B7	G'5
6	GND	B0	27	GND	G'6
7	R2	B1	28	DTMG	G'7
8	R3	GND	29	GND	GND
9	R4	R'0	30	VCC	B'2
10	R5	R'1	31	VCC	B'3
11	R6	G'0	32	VCC	B'4
12	R7	G'1	33		B'5
13	GND	B'0	34		B'6
14	G2	B'1	35		B'7
15	G3	GND	36		GND
16	G4	R'2	37		NC

17	G5	R'3	38		3.3V
18	G6	R'4	39		3.3V
19	G7	R'5	40		3.3V
20	GND	R'6			
21	B2	R'7			

7-2 LVDS Interface(J1)

Used cnt : F1-WEB20S-HF(JAE), Mating Cnt : F1-SEB20P-HF Flatlink : THC63LVDM83A

Pin No	Description	Pin No.	Description
1	VCC(+3.3V)	11	A2M
2	VCC(+3.3V)	12	A2P
3	GND	13	GND
4	GND	14	CLKM
5	A0M	15	CLKP
6	A0P	16	GND
7	GND	17	A3M
8	A1M	18	A3P
9	A1P	19	GND
10	GND	20	GND

- Backlight Power Connector(J503)
  - Connector : 53015-0710 made by Molex

Pin No.	Symbol	Description
1	GND	Ground
2	GND	Ground
3	GND	Ground
4	Vbr	0.0 ~ 5Vdc
5	On/Off	0/5Vdc(High Active)
6	Vin	+12Vdc Input
7	Vin	+12Vdc Input

RS232 Connector

Pin No.	Symbol	Description
1	GND	Ground
2	TxD	Transmit Data TTL Level
3	RxD	Receive Data TTL Level
4	+5 V	

8. Jumpers

Resolution adjustment:

TYPE	X502	JMP503	JMP504
VGA	12MHZ	OPEN	OPEN
SVGA	12MHZ	1, 2 SHORT	OPEN
XGA	16MHZ	2, 3 SHORT	2, 3 SHORT
WSXGA	27MHZ	2, 3 SHORT	2, 3 SHORT

Panel voltage:

JMP 501

12 = 12 V

5 = 5 V

3 = 3,3 V

R9 mounted = Panel Voltage fixed to 3,3 V

Flash programming:

FB4 or wire should be mounted

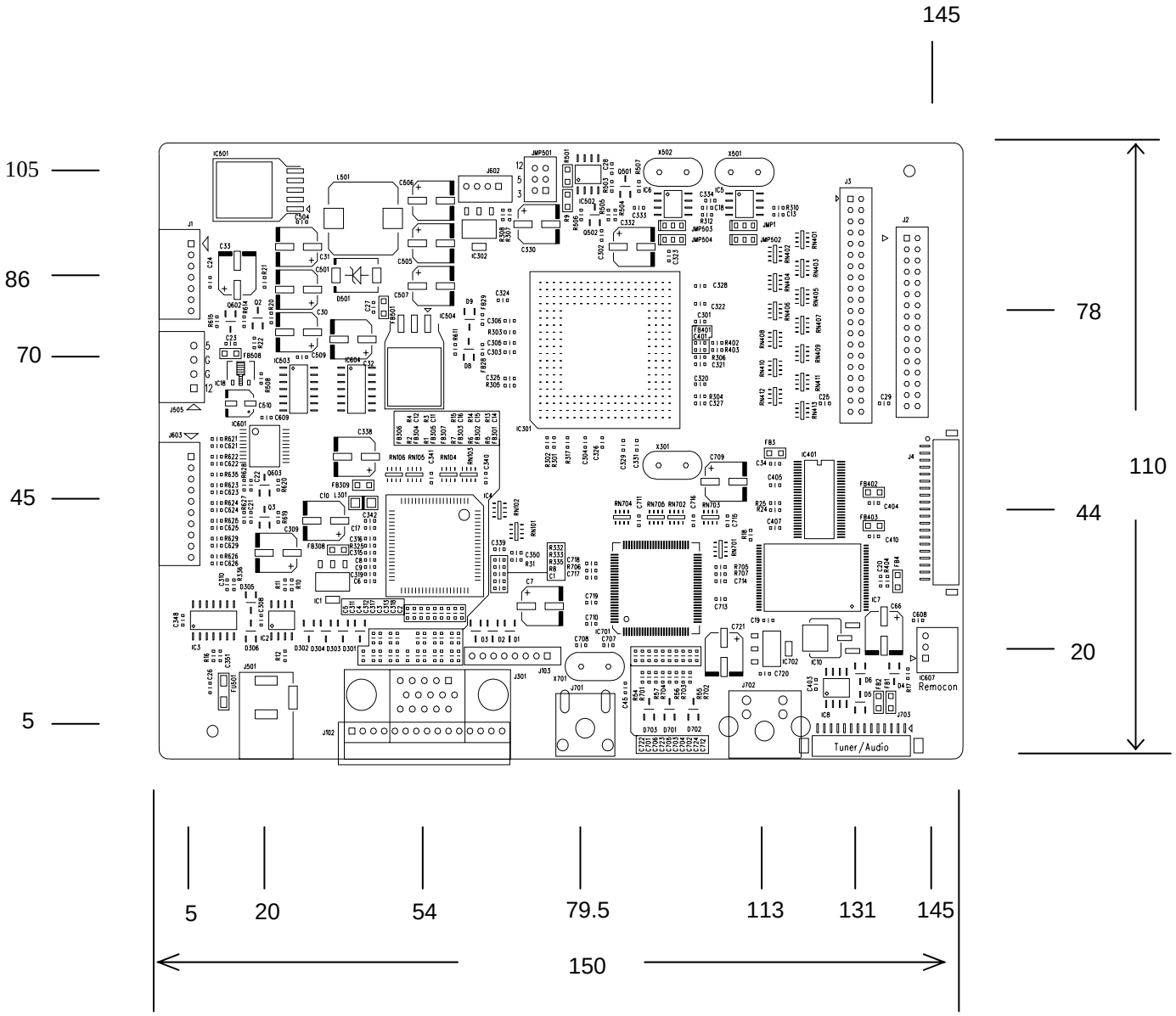
Factory use:

JMP1 do not change

JMP 502 do not change

R 501 do not change

9. Mechanical Dimension



10 Caution

- Never touch the inverter(dc-ac) while power is connected. Inverter should be properly mounted in the system. All transformers on the inverter should be covered with non-conductive heat-resistant material.
- Inverter is a source of very high voltages. Precaution must be taken to avoid electrical shocks.
- When preparing a cable for a specific flat panel, always refer to appropriate cable pin-out and flat panel specification. Always check the flat panel signals before connecting the cable. Any incorrect pin connection may damage the flat panel permanently.
- Should you need any technical help, please contact Beck GmbH & Co. Elektronik Bauelemente KG