

MVM230
Quad Split LCD
Monitor

USER MANUAL

Product Information

Model: MVM230 Quad Split LCD Monitor
Version: V010004
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Company

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Content

Chapter 1 Overview	2
Introduction	2
Feature	2
Chapter 2 Safety Precaution for Use	4
Chapter 3 Unpackaging and installation	6
Chapter 4 Description of product structure	7
Chapter 5 Usage	9
5.1 Description for Display status	9
5.2 Signal Format	11
5.3 Supported Format:	11
5.4 Interface of rear panel	12
5.4 Interface of front panel	13
Chapter 6 Menu Description	14
6.1 Main menu	14
6.2 Function menu	23
6.3 Adjustment menu	24
6.4 Screen mode	24
Chapter 7 Specification	25
7.1 Description for Specification	25
7.2 Input signal format	25
7.3 Specifications	25
7.4 Input/Output Resolution, Frame Refresh Rate and Color Matrix:	26

MVM230 Quad Split LCD Monitor

Chapter 1 Overview

Introduction

The MVM230 Quad Split LCD Monitor is a high-performance 23" professional LCD monitor featuring quad split display. It supports high quality quad split displays and is designed to tailor the extensive needs for programming, concentrated on download and upload, broadcast master control, studio, centralized monitoring and so on.

The MVM230 Quad Split LCD Monitor supports the advanced 10-bit digital processing technology and also supports 3D comb filter and de-interlace, accurate scaling engine, GAMMA correction and color temperature adjustment function, in order to achieve the best possible image display. Each display screen of the MVM230 is an independent professional monitor. So it can achieve the various professional parameters and can be adjusted independently, including GAMMA, color temperature, brightness, and so on.

The MVM230 Quad Split LCD Monitor supports 4ch 3G/HD/SD-SDI/CVBS signal and 1-way HDMI / DIV-D signal input. It can simultaneously display four signal inputs, with three typical display modes (including one full screen display, one - big with three - small screen display and four uniform size screen display). Each display screen can achieve professional monitor display functions, including embedded audio solution, audio monitoring, audio meter display, TC code display, IMD, various Markers and so on.



Feature

- ◆ 178-degree viewing angle
- ◆ Multi-format analog and digital audio signals
- ◆ Support select 4 from 5 input signals to display
- ◆ Support a single screen display as a professional monitor
- ◆ Support the independent adjustment of the parameters for single screen
- ◆ With all the important functions of multi-view processor

- ◆ Support high-quality waveform, vector monitoring
- ◆ Support HDMI output or HD-SD display, can achieve the cascade and copy output of devices
- ◆ MARKER, Time Code, MET display
- ◆ Pre-set the color temperature, user-adjustable color temperature

Chapter 2 Safety Precaution for Use

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: 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 interference 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 different from that to which the receiver is connected.

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

Read and keep these instructions. Heed all warnings. Follow all instructions.

 **About the Position**

1. Do not block any ventilation openings.
2. Do not use this unit near water.
3. Do not expose the unit to rain or moisture.
4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
5. A nameplate indicating operating voltage, etc., is located on the rear panel. Install only in accordance with the instructions in the section entitled, "Unpacking and Installation" on page 3.
6. The socket-outlet shall be installed near the equipment and shall be easily accessible.

 **About the Power-supply Cord**

7. Do not defeat the safety purpose of the polarized or grounding-type plug.
8. Do not damage the power cord, place the heavy objects on the power cord, stretch the power cord, or bend the power cord.
9. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the unit.
10. If the power cord is damaged, turn off the power immediately. It is dangerous to use the unit with a damaged power cord. It may cause fire or electric shock.
11. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. Disconnect the power cord from the AC outlet by grasping the plug, not by pulling the cord.
13. Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.

 **Monitor**

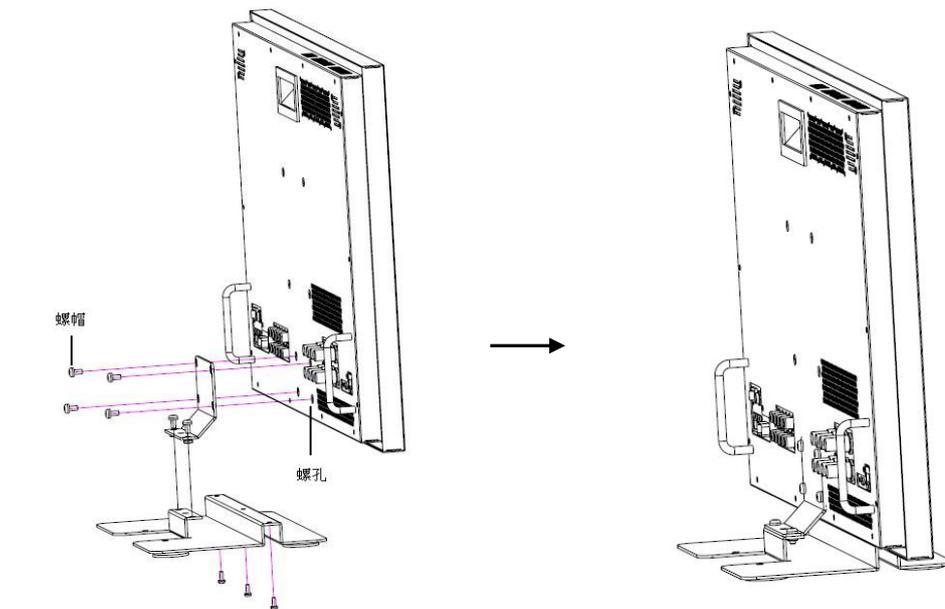
14. Do not beat with a hard object or scratch the LCD display.
15. Do not make the freeze picture displaying on the screen time too long, otherwise, it will leave the afterimage on the screen.
16. Install in accordance with the manufacturer's instructions
17. If the brightness is adjusted to the minimum, then it might be hard to see the display screen.
18. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:
 - The unit has been exposed to rain or moisture.
 - Liquid had been spilled or objects have fallen onto the unit.
 - The unit has been damaged in any way, such as when the power-supply cord or plug is damaged.
 - The unit does not operate normally.
19. Clean only with dry cloth.
20. Specifications are subject to change without notice.

Chapter 3 Unpackaging and installation

Opening the box, please check whether the device has been damaged during transport. Check all the things listed on the packing list are received. If there is any missing, contact your distributors or OSEE for it.

We recommend that you should save the packing materials for future needs.

1. Install the base.



Installation

2. Put the MVM230 on the position you need for installing, and connect the power. Please make sure the place you put is safety.
3. Connect a standard signal lines to the corresponding input port. All BNC connector impedance must be 75Ω.

Note: Please use the power adapter supplied to avoid unnecessary trouble.

4. Use the power adapter and cord to connect single-phase three-wire AC power or following the local power supply conditions. Make sure the power cord grounding well.
5. Finally, turn on the power switch, so that the device will be ready for work.

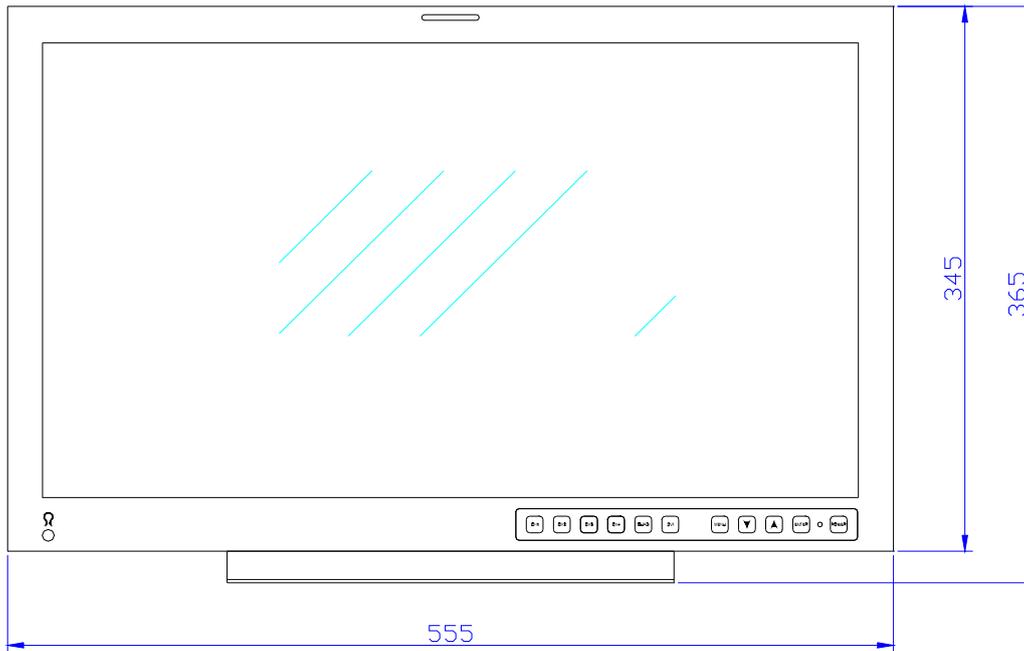
Packing List:

NO.	Detail list		Quantity
1	Host		1
2	Base		1
3	Accessory	warranty card	1
		the base installation instruction	1
		User manual	1

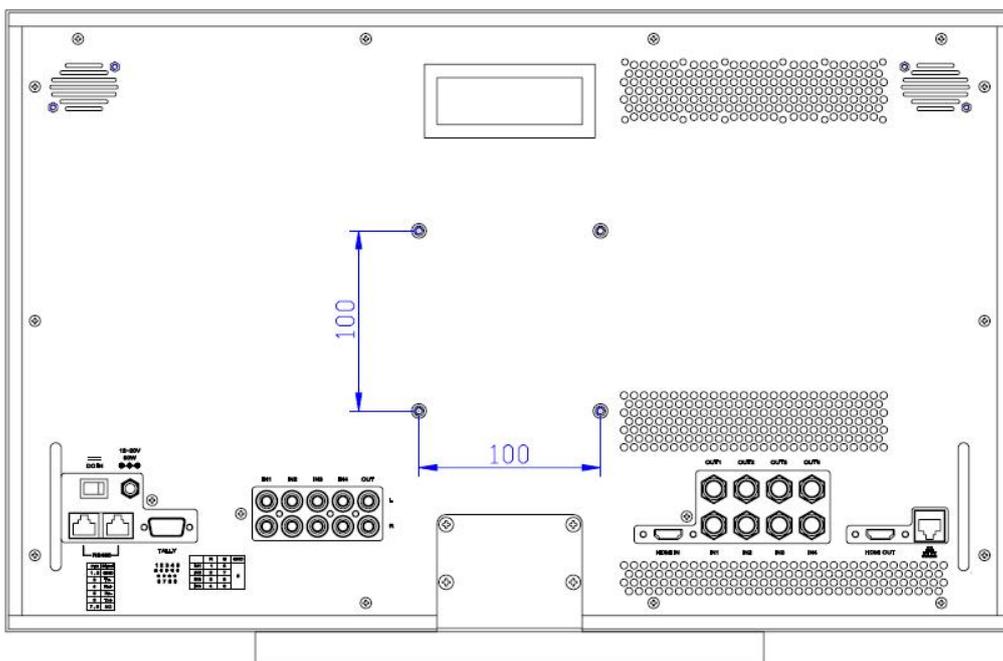
4	The electric accessory	19V adapter	1
		Power cord	1
		Base board with screws	1

Chapter 4 Description of product structure

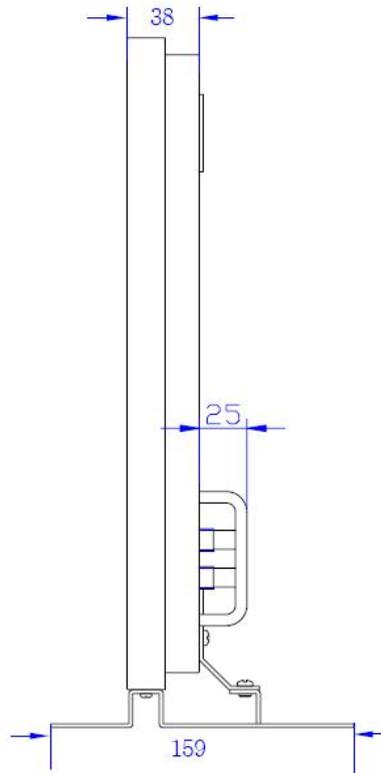
Front panel (Unit: mm)



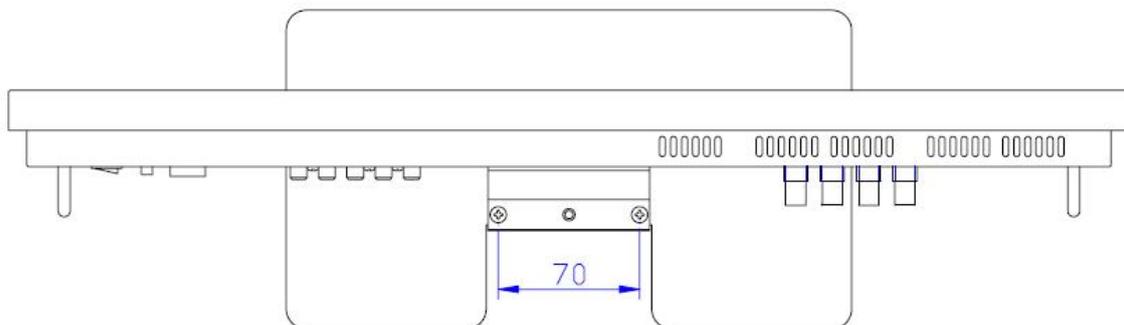
Rear panel (Unit: mm)



Side view (Unit: mm)

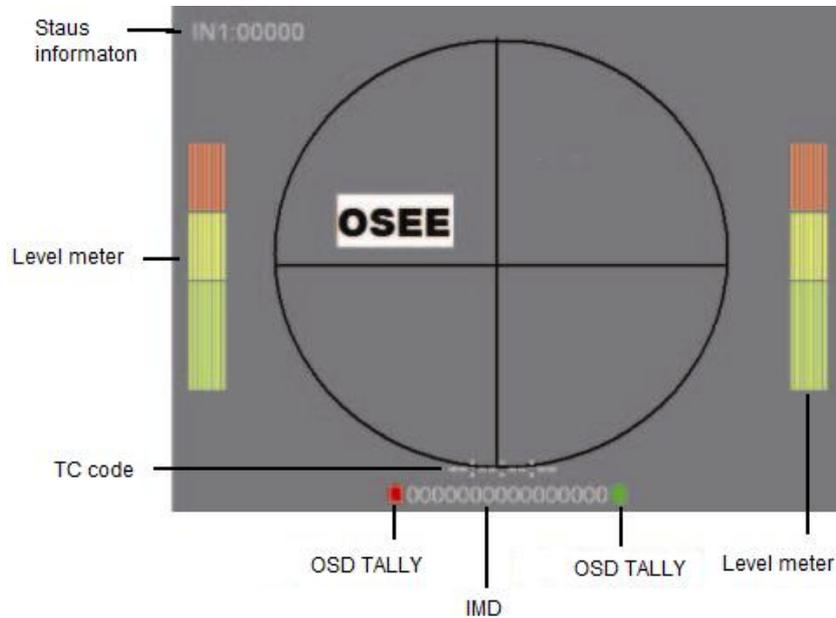


Top view (Unit: mm)



Chapter 5 Usage

5.1 Description for Display status



- ❖ **Status information:** Displayed in the upper left corner of each window, including the input channel number and signal format.
- ❖ **TC code:** Display Format: HH: MM: SS: FF and if there is no TC code, display ---:--:--:--.
- ❖ **IMD:** 16 characters can be displayed. Support the character color change (red, green, yellow, white).
- ❖ **OSD TALLY:** Display OSD TALLY. Supports color change (red, green, yellow, white).
- ❖ **Level meter:** Display audio meter. Support for semi-transparent display, can reduce the impact for the image.



Single-screen, full 16-channel audio meter

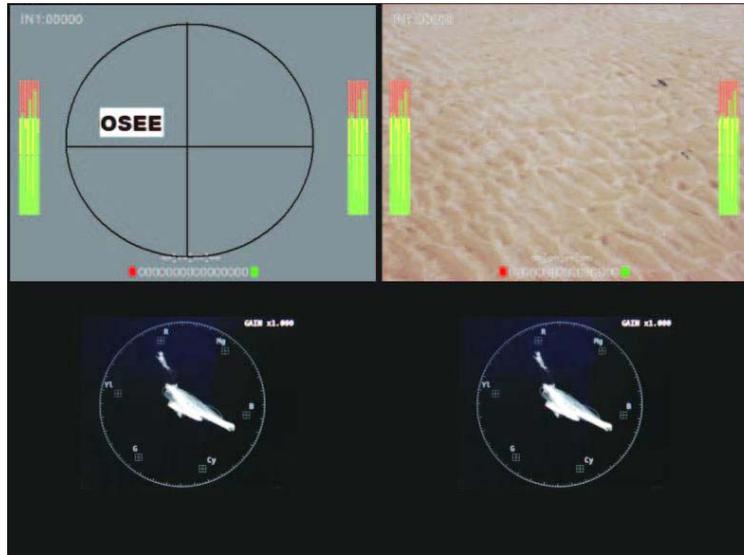


Four-screen, full 16-channel audio meter



One-big and with three-small screen, full 16-channel audio meter

- ☞ **Waveform and vector display:** Display in the screen. (Only for CH1 and CH2.)
As below.



5.2 Signal Format

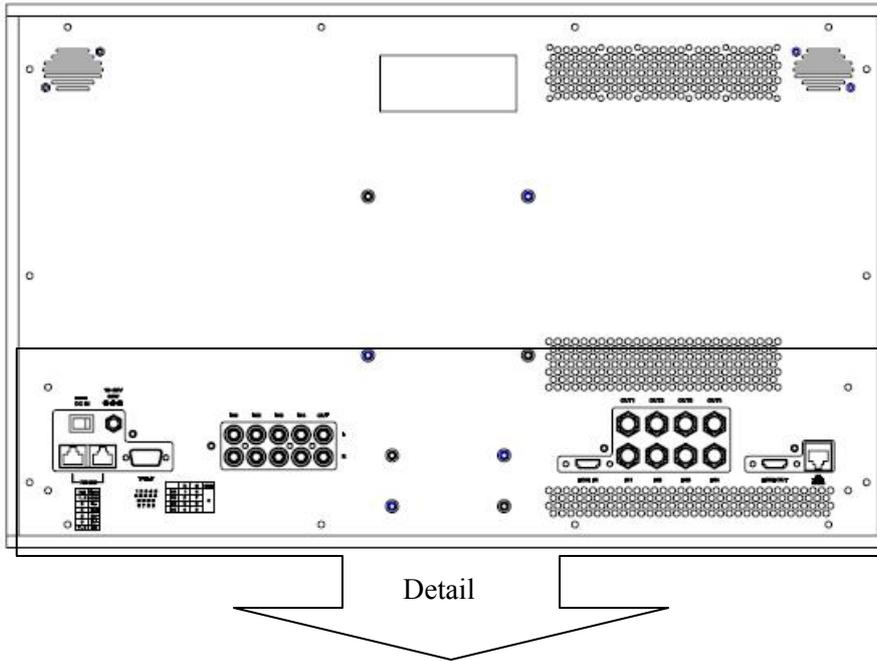
- Video input signal: 4 adaptive CVBS, SD/HD/3G-SDI video (supports embedded audio) and one DVI -D/ HDMI (as the same as IN1).
- Audio input signal: Four pairs of stereo analog audio.
- Video output signal: 1 DVI-D/HDMI (with audio).
- Audio output signal: 1 audio monitor output and 1 headphone output.
- Other: RS-485, GPIO, LAN, etc.

5.3 Supported Format:

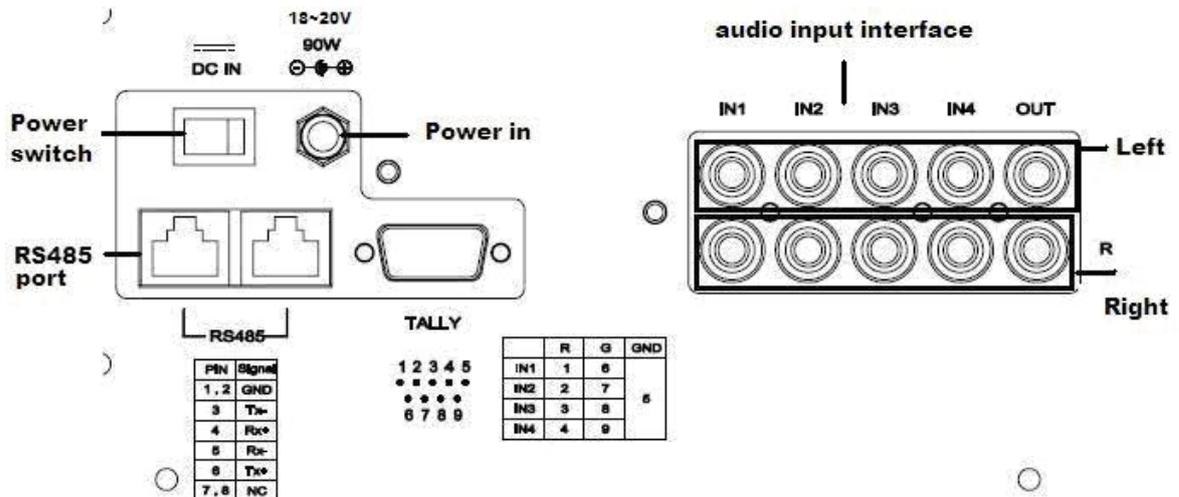
Format	SDI	Video	HDMI	DVI
NTSC		YES		
PAL		YES		
SECAM		YES		
NTCS-4.43		YES		
PAL-M		YES		
480I60	YES		YES	
576I50	YES		YES	
480P60			YES	
576P50			YES	
720P24			YES	
720P25			YES	
720P30			YES	
720P50	YES		YES	
720P60	YES		YES	
1035I60	YES		YES	
1080I60	YES		YES	
1080I50	YES		YES	
1080P24	YES		YES	
1080P25	YES		YES	
1080P30	YES		YES	
1080P50	YES		YES	
1080P60	YES		YES	

1080SF24			YES	
VGA				YES
SVGA				YES
XGA				YES
SXGA				YES
UXGA				YES
WVGA				YES
WXGA				YES

5.4 Interface of rear panel

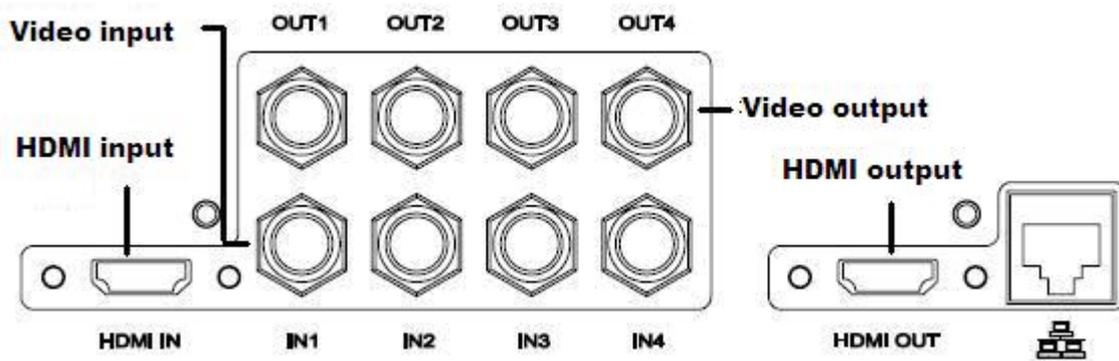


Left of the rear panel:

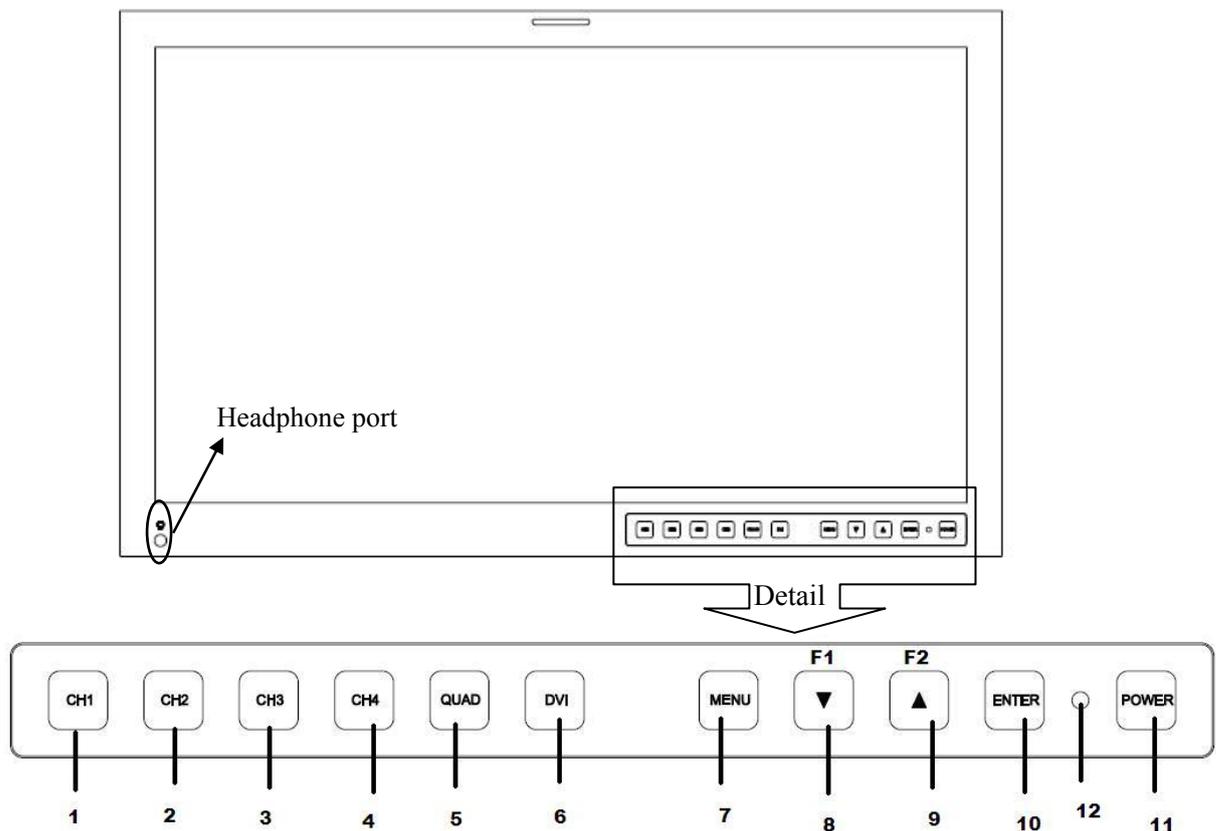


Note: The specs are subject to change without prior notice.

Right of the rear panel:



5.4 Interface of front panel



1~4: Channel 1-4, switch to full screen for CH, and press the key again, the screen will return to quartered screen.

5: Layout, there are two modes to choose: quartered screen and one add trisection screen.

6: DVI input, there are two formats: HDMI or IN1. And it is for CH1. And press this

key for a moment, the settings will restore to default settings.

7: MENU, enter the menu item. Or press this key for a moment; the startup logo setup menu will appear.

8: DOWN/F1, function key and DOWN. And the function key is only active for the selected channel.

9: UP/F2, function key and UP. And the function key is only active for the selected channel.

10: ENTER, save the setup or enter the item selected.

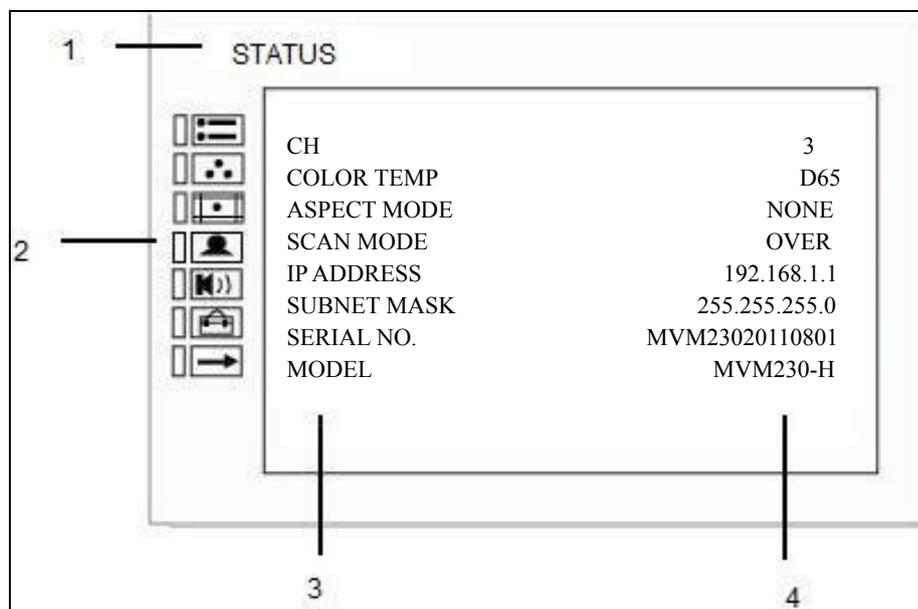
11: Power switch

12: Power indicator, Red: standby, Green: normal.

Chapter 6 Menu Description

6.1 Main menu

It displays by pressing the MENU button.



Menu

1- MENU name, it shows the menu item.

2- Main menu item selection part and it shows the menu item icons. It includes the main menu items.

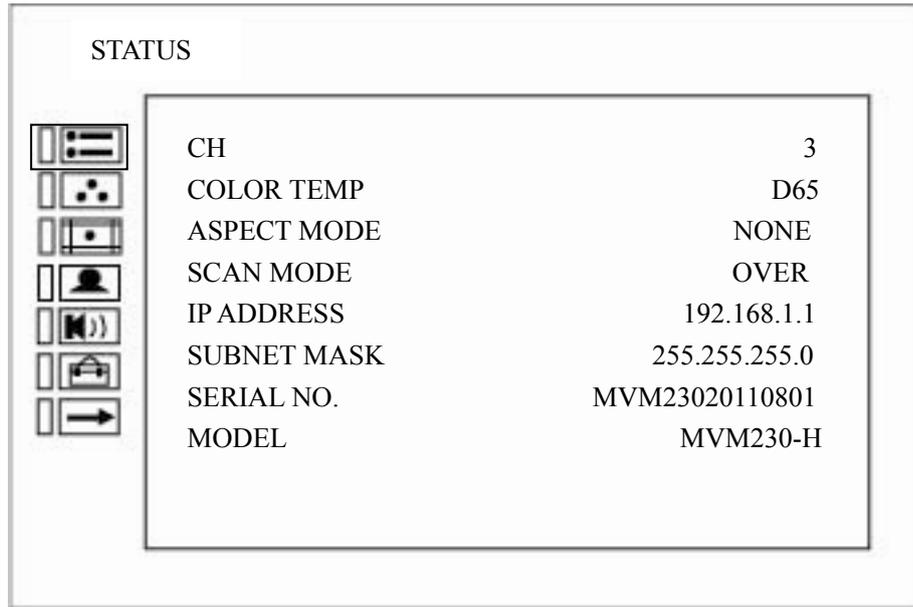
3- Menu setup item, it shows the setup parameter of main menu items. Press ENTER and UP/DOWN to select the items.

- 4- Parameter information of the items. Changes the item setup parameter of the item you selected, press ENTER and it will also save your setup. If you don't want to change the parameter, press MENU to turn back to the previous menu. The item selected will be yellow and when the character is white it can be changed and when the character is blue it cannot be changed.

Menu item	Icon	Detail
STATUS		
COLOR TEMP		
MARKER		
AUDIO CONFIG		
USER CONFIG		
OSD CONFIG		
-		Not being

Detail information of the menu is as follow:

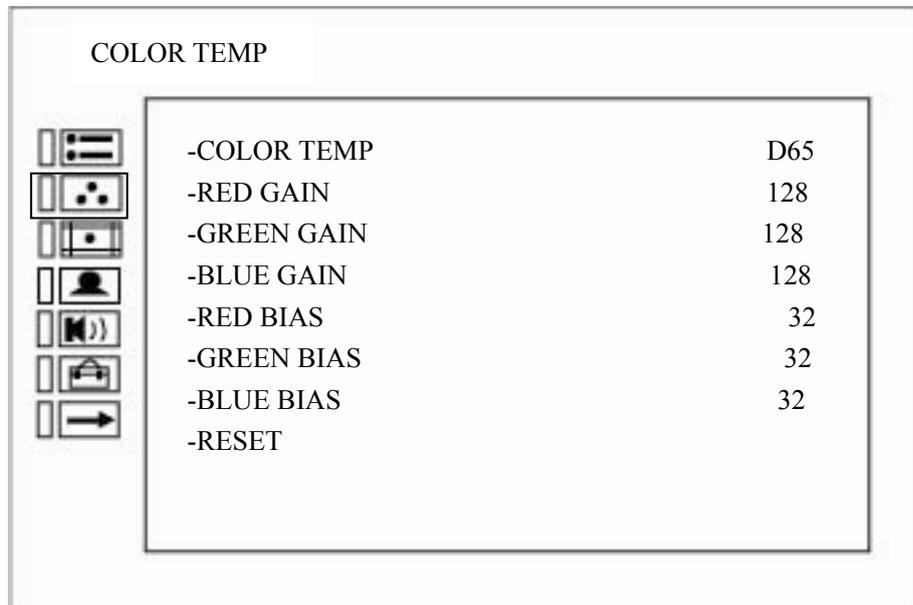
(1) STATUS



This item displays the monitor information, and the parameters cannot be adjusted.

And maximum 9 items in one page.

(2) COLOR TEMP



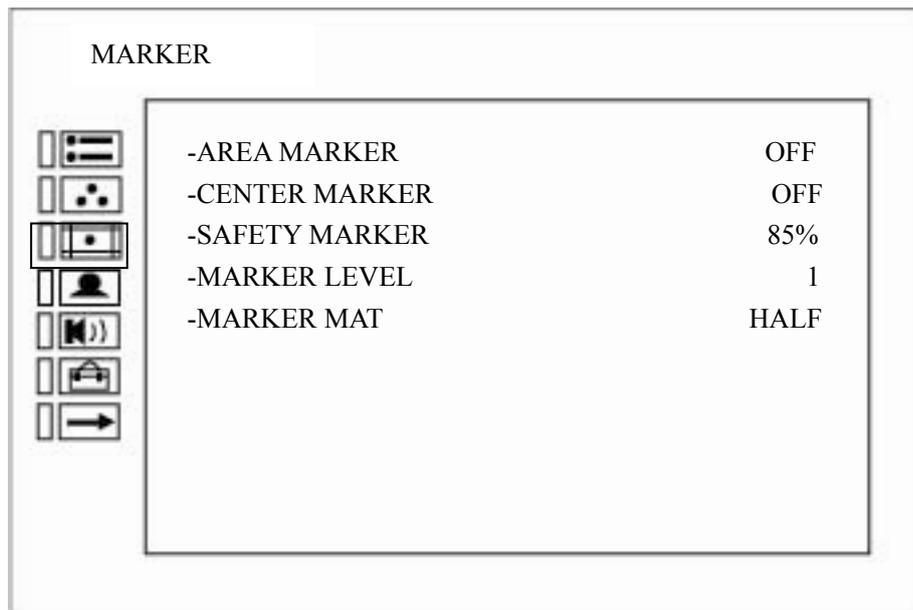
The COLOR TEMP menu is used for adjusting the picture white balance.

Sub Menu	Settings	Explanation
COLOR TEMP		
COLOR TEMP	D65	Setting the color temperature <D93> <D65> <D56> <USER> (User setup), In USER, RED GAIN,

		GREEN GAIN, BLUE GAIN, RED BIAS, GREEN BIAS, BLUE BIAS and RESET can be adjusted.
RED GAIN	128	<0-255>
GREEN GAIN	128	<0-255>
BLUE GAIN	128	<0-255>
RED BIAS	32	<0-64>
GREEN BIAS	32	<0-64>
BLUE BIAS	32	<0-64>
RESET		Color temperature reset, when enabled, RED GAIN, GREEN GAIN, BLUE GAIN, RED BIAS, GREEN BIAS and BLUE BIAS will return to the default values.

When adjusting the GAIN and BIAS settings, the item display moves to the lower part of the screen.

(3) MARKER



The MARKER menu is used for setting the marker.

Only when one single screen displays as full-screen, MARKER is enabled. The current state is NATIVE or DVI input, MARKER is disenabled.

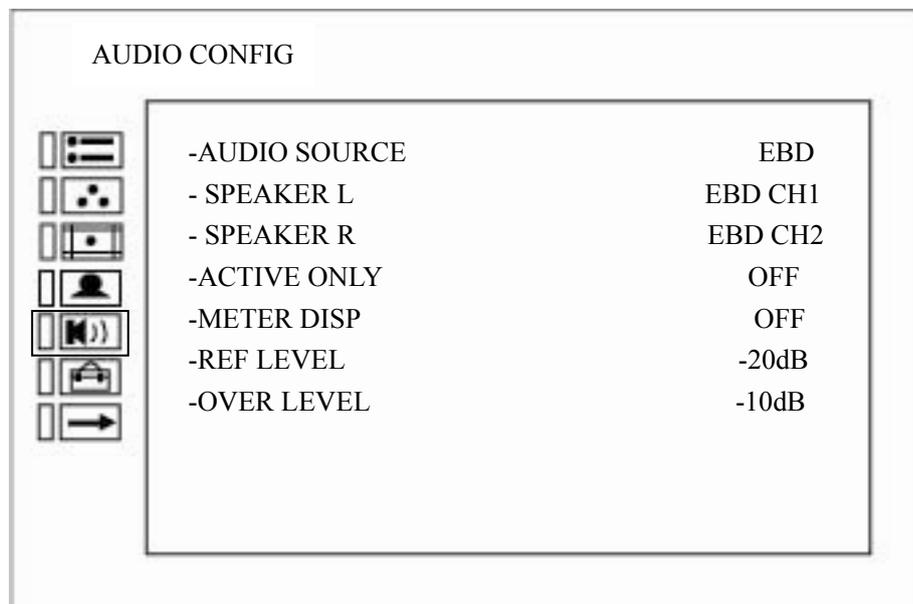
Sub Menu	Settings	Explanation
MARKER		
AREA MARKER	OFF	Setting the area marker aspect ratio, for 16:9 only. <OFF> <4:3> <15:9> <14:9> <13:9> <1.85:1>

		<2.35:1>
CENTER MARKER	OFF	<ON> marker displayed <OFF> marker not displayed
SAFETY MARKER	OFF	Setting the picture safe area marker which is in the area of AREA MARKER. <OFF> <80%> <85%> <88%> <90%> <93%> <95%>
MARKER LEVEL	<1>	Sets the luminance to display SAFTY, CENTER and AREA MARKER line. <1>: 50% white level <2>: 75% white level <3>: 100% white level
MARKER MAT	<OFF>	Sets the area marker mat transparency. <OFF>Normal background, only use line for area marker edge indication <HALF> 50% background brightness <BLACK> Black

16:9 and 4:3 area marker settings should be stored in E2PROM separately. Use 16:9 setting if display aspect is 16:9; Use 4:3 setting if display aspect is 4:3

Marker is disabled when SCAN is NATIVE, input is DVI.

(4) AUDIO CONFIG

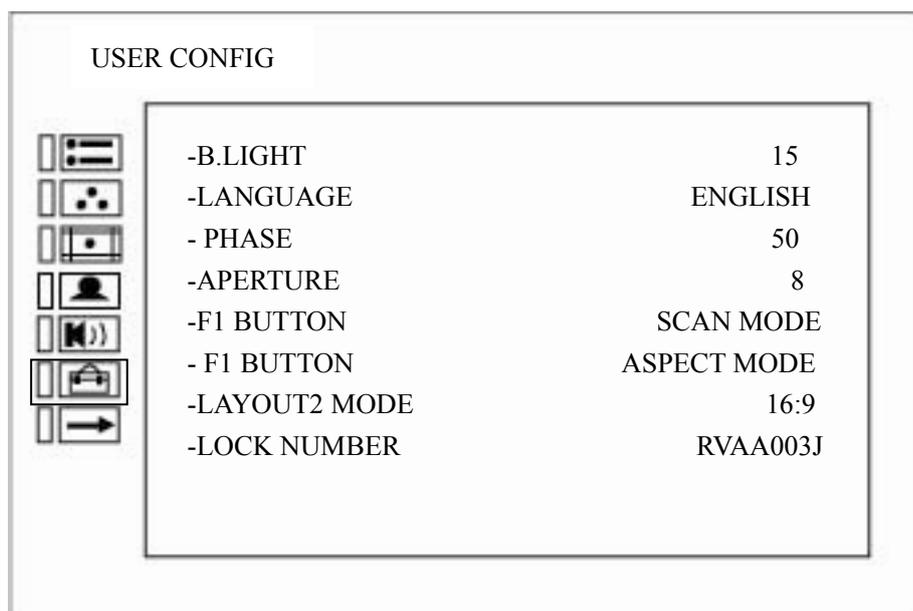


Sub Menu	Settings	Explanation
AUDIO CONFIG		
AUDIO SRC	OFF	Select external audio source <OFF>

		<EXT> <EBD>
SPEAKER L	EBD CH1	Select the embedded audio channel to the left speaker and line out <OFF> <EBD CH1 – CH16>
SPEAKER R	EBD CH2	The same as above
METER DIS	OFF	<OFF> <2CH> <4CH> <6CH> <8CH> <10CH> <12CH> <14CH> <16CH>
ACTIVE ONLY	OFF	Display the active embedded audio group only <OFF> <ON>
REF LEVEL	-20dB	<-20dB> <-18dB>
OVER LEVEL	-10dB	<-10dB> <-8dB > <-6dB > <-4dB > <-2dB >

The SDI embedded audio outputs are selected by these items, the HDMI outputs and analog audio outputs are fixed.

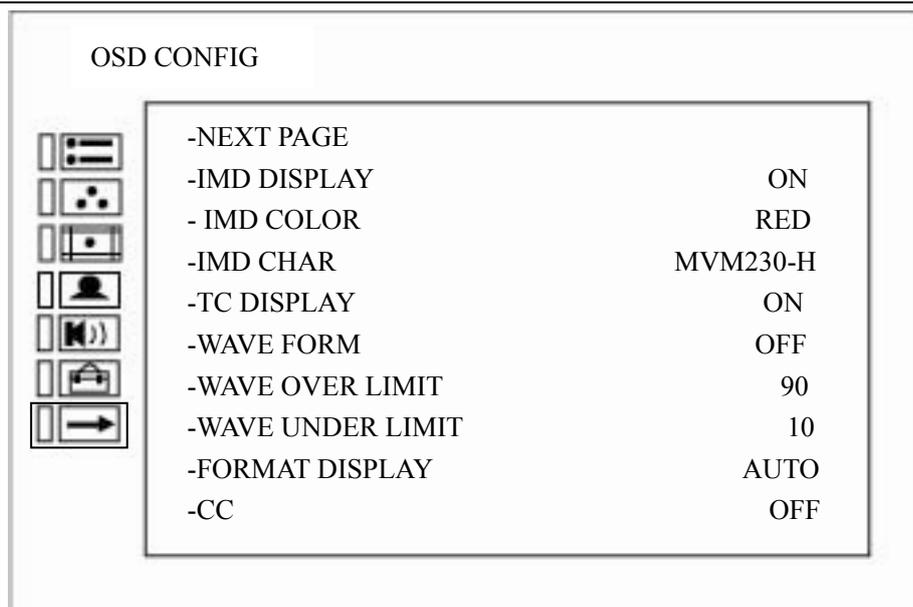
(5) USER CONFIG



Sub Menu	Settings	Explanation
USER CONFIG		
BACKLIGHT	13	Adjusts the backlight <0 ... 30>
LANGUAGE	ENGLISH	<ENGLISH>: English <中文>: Chinese
PHASE (NTSC only)	50	<0 ... 100>
APPERTURE	20	<0 ... 63>
F1 BUTTON	MARKER	<MARKER>: Control all MARKERS. ON-OFF <AUD METER>: Control all audio meter display, ON-OFF <WAVEFORM>: ON-OFF <H/V DELAY>: OFF-H-V-H/V <NATIVE>: ON-OFF <BLUE ONLY>: ON-OFF <MONO>: ON-OFF <ASPECT>:For SD Signal,16:9-4:3 adjust <SCAN>:NORMAL-OVER <NONE>: no settings
F2 BUTTON	SCAN	<MARKER>: Control all MARKERS. ON-OFF <AUD METER>: Control all audio meter display, ON-OFF <WAVEFORM>: ON-OFF <H/V DELAY>: OFF-H-V-H/V <NATIVE>: ON-OFF <BLUE ONLY>: ON-OFF <MONO>: ON-OFF <ASPECT>:For SD Signal,16:9-4:3 adjust <SCAN>:NORMAL-OVER <NONE>: no settings
LOCK NUMBER	-	Function lock code input, 8 characters. Each character can input number or letter. Note: Be careful to adjust this option to avoid unnecessary mistakes.

(6) OSD CONFIG

➤ **PAGE 1: OSD DISPLAY**

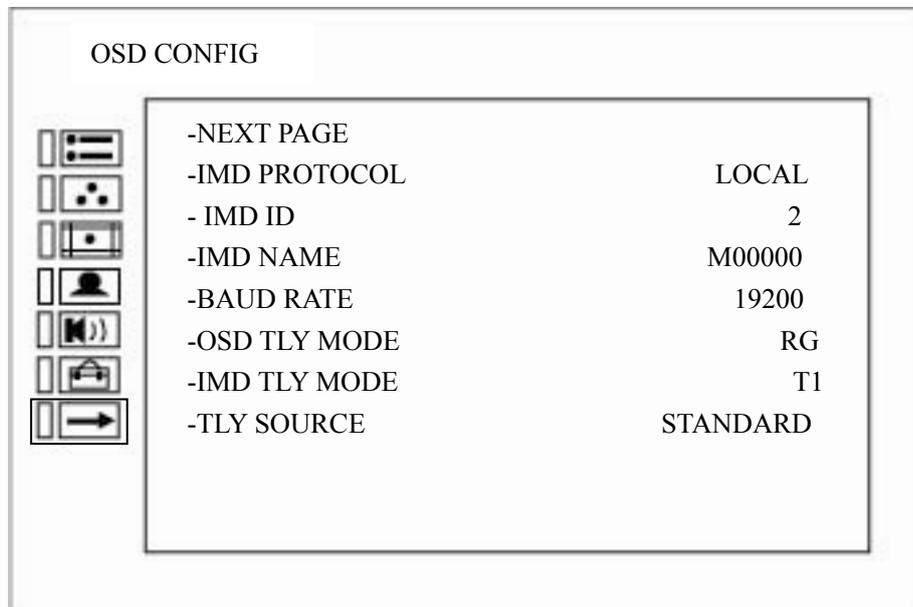


Sub Menu	Settings	Explanation
OSD CONFIG		
NEXT PAGE	-	For turning to the next page.
IMD DISPLAY	OFF	<OFF> <ON>
IMD COLOR	RED	<RED> <GREEN> <YELLOW> <WHITE>
IMD CHARACTER	LM170 HD MONITOR	16 characters
TC DISPLAY	OFF	<OFF> <LTC> <VITC>
WAVE FORM	OFF	<OFF> <WAVE FORM> <VECTOR 75> <VECTOR 100>
WAVE OVER LIMIT	50	<0-100>
WAVE UNDER LIMIT	50	<0-100>
STATUS DISPLAY	AUTO	<OFF> the display is hidden <AUTO> the input source and format are displayed for about 10 seconds when the input of the signal changes <ON> the input source and format are always displayed

CC	OFF	<OFF> <CC1> <CC2> <CC3> <CC4> <TEXT1> <TEXT2> <TEXT3> <TEXT4> <XDS>
----	-----	--

1. Only channel 1 and 3 have wave form and vector functions.
2. CC is inactive.

➤ **PAGE 2: IMD DISPLAY**



Sub Menu	Settings	Explanation
OSD CONFIG		
NEXT PAGE	-	For turning to the next page.
IMD PROTOCOL	LOCAL	LOCAL/TSL3.1/TSL4.0/IMAGE VIDEO LOCAL: Use IMD setting to control. TSL3.1: Use the TSLV3.1 protocol setting to control. TSL4.0: Use the TSLV4.0 protocol setting to control. IMAGE VIDEO: Use the Image video protocol setting to control.
IMD ID	0	<0 – 255>
IMD NAME	M00000	16 Characters for Option, the character range is 0x10 to 0x7e of ASCII encoding Use this setting to assign a name to the Remote

		Display. Press ENTER to edit the IMD name, Use UP and DOWN to select characters, Press ENTER to go to next cursor, Press MENU to exit editor.
BAUD RATE	19200	9600/19200/38400 TSL V3.1 and TSL V4.0 is 38400, Image video is one of the 9600/19200/38400.
LED TLY	OFF	ON/OFF Set the LED Tally ON or OFF.
OSD TLY MODE	OFF	RG/GR/RGY/OFF Use this setting to choose OSD Tally Mode, Only the TALLY SOURCE is STANDARD or STANDARD+IV422, the setting is available.
IMD TLY MODE	T1	T1/T2/T1T2/T2T1/T1-/T2-/T1T2-/T2T1- Use this setting when using the Image Video tally control; this setting will determine the state which is selected.
TLY SOURCE	STANDARD	STANDARD/ IMAGE VIDEO 422/TSL STANDARD: Use the Standard setting to control tally via contact closure on GPI tally. IMAGE VIDEO 422: Use the setting to control tally state via 422 ports, GPI toggle is no available. TSL: Use the TSL 422 setting to control OSD and LED tally via the TSL serial protocol.

6.2 Function menu

*F1/F2

When the main menu does not appear, pressing F1 or F2 key it will display the shortcuts menu. About F1/F2 key setup please refers to the **USER CONFIG** of the main menu item.

Press F1 or F2 to enter the function menu. It displays as follow:



*DVI

Press the DVI key for 5s above, it will enable reset function to restore all settings to factory default settings.

6.3 Adjustment menu

Press ENTER to enter the adjustment menu. It includes VOLUME, BRIGHTNESS, CONTRAST, and CHROMA. It displays as follow:



Press UP and DOWN to adjust the parameter of the current item and press ENTER to enter the next item of the adjustment menu. Press MENU to esc the adjustment menu.

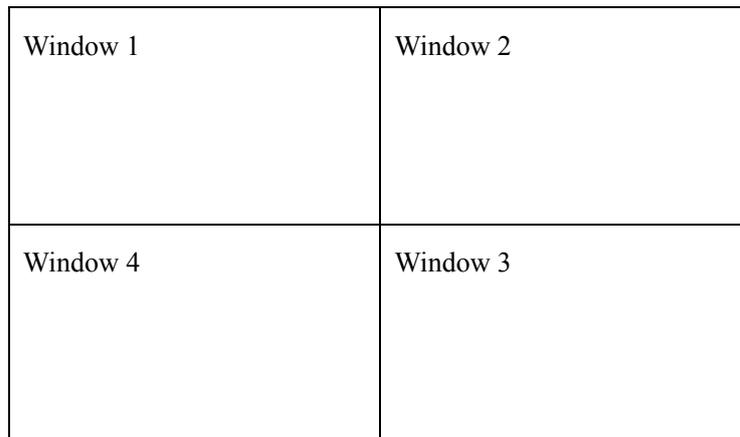
6.4 Screen mode

The screen can be displayed as one full screen display, one-big with three-small screen display and four uniform size screen display.

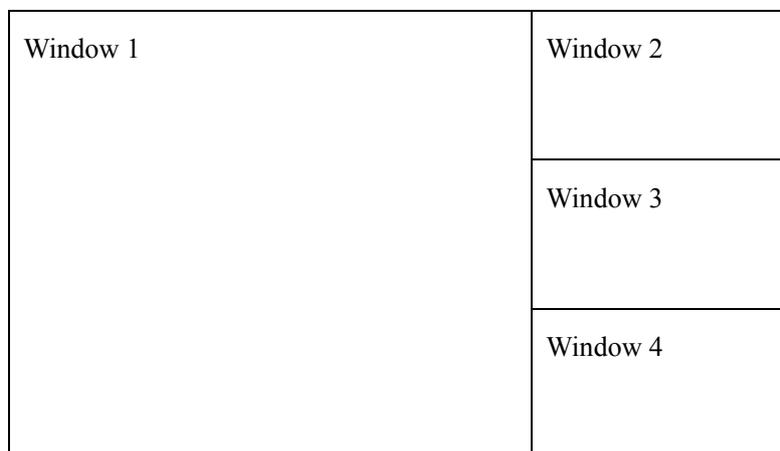
Press key (**CH1**, **CH2**, **CH3**, and **CH4**) can enter one full screen display.

Press key (**QUAD**) can switch within one-big with three-small screen display and four uniform size screen display.

Mode 1: Four uniform size screen display



Mode 2: three-small screen display layout as 16:9 or 4:3



All images show the biggest screen in center under the premise of keeping the same aspect ratio.

IMD, audio level meter and other kinds of information show in the window without affecting the image display.

Window and the enter channel is correspondence. Channel 1 corresponds to window 1 and channel 2 corresponds to window 2, etc. And the windows serial number cannot change.

Chapter 7 Specification

7.1 Description for Specification

LCD Dimension	23"
Screen Scale	4:3/16:9
Resolution	1920 (H) x 1080 (V)
Color Depth	16.7M, 24-bit
Viewing Angle	178° (H/V)
Brightness	250 cd/m ²
Contrast Ratio	1000:1
Video Input	BNC x 4, SDI/ CVBS; HDMI x 1, HDMI/DVI-D
Video Output	HDMI x 1, HDMI/DVI (composite signal, 1080p50 or 1080p60)
Audio Input	RCA x 8, 4 analog stereo, SDI embedded audio
Audio Output	RCA x 2, analog stereo(monitoring signal)

7.2 Input signal format

Analog Composite:	PAL, NTSC
SD-SDI:	480i、576i
HD-SDI:	1080i50、1080i 59.94、 1080i 60、 720p50、 720p 59.94、 720p 60、 1035i59.94、 1035i 60
3G-SDI:	1080p50、 1080p 59.94、 1080p 60

7.3 Specifications

CVBS Input/ Output:

Signal Type	NTSC, PAL
Signal Amplitude	1Vp-p±3dB

Impedance	75 ohms
Return Loss	>40 dB 到 5 MHz
DC Offset	0V±0.05 V
Frequency Response	±0.2 dB to 5 MHz
Differential Gain	<1%
Differential Phase	<1.5°

3G-SDI /HD-SDI /SDI-SDI Input/ Output:

Signal Type	SMPTE 424M, SMPTE 292M, SMPTE 259M, SMPTE 297M
Connector	BNC per IEC 169-8
Impedance	75 ohms
Return Loss	>18 dB 5 to 270 MHz >15 dB 270 MHz to 1.5 GHz >10 dB up to 3 GHz
Maximum Signal Level	800 mV pk-pk 10%
Signal Amplitude	800 mV pk-pk 10%
DC Offset	0 V ±0.5 V
Overshoot	<10%
Total Jitter	<0.2 UI
Rise and Fall Time	<700 ps for SD <270 ps for 1.5 Gb/s HD <135 ps for 3 Gb/s HD
Wavelength	1310 nm +/-30 nm FP, 1270 nm, 1290 nm, 1310 nm, 1330 nm, 1350 nm, 1370 nm, 1430 nm, 1450 nm, 1470 nm, 1490 nm, 1510 nm, 1530 nm, 1550 nm, 1570 nm, 1590 nm, 1610 nm DFB
Extinction Ratio	>8
Back Reflection	<-14 dB

7.4 Input/Output Resolution, Frame Refresh Rate and Color Matrix:

	OVERSCAN		NATIVE		FULL NORMAL		Frame Rate	Color Matrix
	INPUT	OUTPUT	INPUT	OUTPUT	INPUT ALL	OUTPUT NORMAL		
NTSC	684X462	1366X768 1024X768	720X487	720X487	720X487	1366X768 1024X768	60	601
PAL	684X548	1366X768 1024X768	720X576	720X576	720X576	1366X768, 1024X768	50	601
SECAM	684X548	1366X768 1024X768	720X576	720X576	720X576	1366X768, 1024X768	50	601
NTCS-4.43	684X462	1366X768 1024X768	720X487	720X487	720X487	1366X768, 1024X768	60	601
PAL-M	684X462	1366X768 1024X768	720X487	720X487	720X487	1366X768, 1024X768	60	601
480I60	684X462	1366X768 1024X768	720X487	720X487	720X487	1366X768, 1024X768	60	601/709
576I50	684X548	1366X768 1024X768	720X576	720X576	720X576	1366X768, 1024X768	50	601
480P60	684X462	1366X768	720X487	720X487	720X487	1366X768,	60	601/709

		1024X768				1024X768		
576P50	684X548	1366X768 1024X768	720X576	720X576	720X576	1366X768, 1024X768	50	601
720P24	1216X684	1366X768,	1280x720	1280x720	1280x720	1366X768,	48	709
720P25	1216X684	1366X768,	1280x720	1280x720	1280x720	1366X768,	50	709
720P30	1216X684	1366X768,	1280x720	1280x720	1280x720	1366X768,	30	709
720P50	1216X684	1366X768,	1280x720	1280x720	1280x720	1366X768,	50	709
720P60	1216X684	1366X768,	1280x720	1280x720	1280x720	1366X768,	60	709
1035I60	1824X984	1366X768,	1920X1035	1920X1035	1920X1035	1366X768,	60	709
1080I60	1824X1026	1366X768,	1920X1080	1920X1080	1920X1080	1366X768,	60	709
1080I50	1824X1026	1366X768,	1920X1080	1920X1080	1920X1080	1366X768,	50	709
1080P24	1824X1026	1366X768,	1920X1080	1920X1080	1920X1080	1366X768,	48	709
1080P25	1824X1026	1366X768,	1920X1080	1920X1080	1920X1080	1366X768,	50	709
1080P30	1824X1026	1366X768,	1920X1080	1920X1080	1920X1080	1366X768,	60	709
1080P50	1824X1026	1366X768,	1920X1080	1920X1080	1920X1080	1366X768,	50	709
1080P60	1824X1026	1366X768,	1920X1080	1920X1080	1920X1080	1366X768,	60	709
1080SF24	1824X1026	1366X768,	1920X1080	1920X1080	1920X1080	1366X768,	48	709
VGA					640X480	1366X768	60-75	
SVGA					800X600	1366X768	60-75	
XGA					1024x768	1366X768	60-75	
SXGA					1280x1024	1366X768	60-75	
UXGA					1600x1200	1366X768	60	
WXGA					1360X768	1360X768	60	
WUXGA					1920x1200	1366X768	60	

*Don't display all OSD except FORMAT when SCAN is NATIVE.

*Don't display MARKER when SCAN is NATIVE.

Note: The specs are subject to change without prior notice!