SWIT®

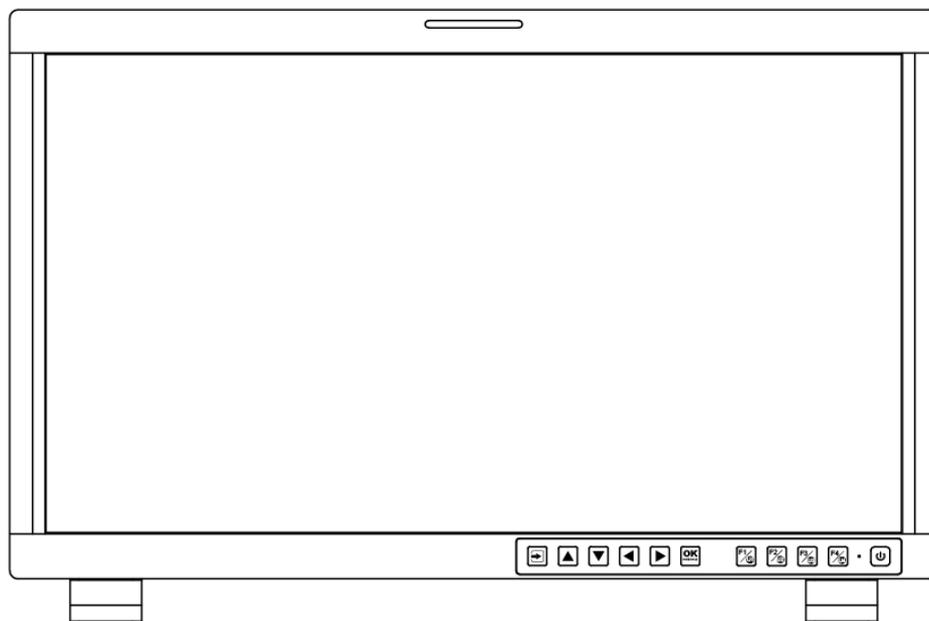## SWIT Electronics Co., Ltd.

Model: FM-21HDR

21.5" High Bright HDR Production Monitor

User Manual

Ver: A

Please read this User Manual
throughout before using.

Preface

1. All internal technologies of this product are protected, including device, software and trademark. Reproduction in whole or in part without written permission is prohibited.

2. All brands and trademarks of SWIT Electronics Co., Ltd. are protected and other relative trademarks in this user manual are the property of their respective owners.

3. Due to constant effort of product development, SWIT reserves the right to make changes and improvements to the product described in this manual without prior notice.

4. The warranty period of this product is 2 years, and does not cover the following:

   ⑴ Physical damage to the surface of the products, including scratches, cracks or other damage to the LCD screen or other externally exposed parts;

   ⑵ The LCD dot defects are not over three;

   ⑶ Any damage caused by using third-party power adaptors;

   ⑷ Any damage or breakdown caused by use, maintenance or storage not according to the user manual;

   ⑸ The product is disassembled by anyone other than an authorized service center;

   ⑹ Any damage or breakdown not caused by the product design, workmanship, or manufacturing quality, etc;

   ＊Any sales personnel have no rights to provide additional warranty.

5. For any suggestions and requirements on this product, please contact us through phone, fax, Email, etc.

Maintenance

Warning

1. In order to reduce the risk of fire and electrical shock, do not lay this product in rain or damp places.
2. Please keep away from the strong magnetic field; it may cause the noise of the video and audio signals.

The power

1. Please use the power adapter provided or recommended by the manufacturer in order to avoid damage.
2. For a third party power adapter, please make sure the voltage range, supplied power, and polarity of power lead are fit.
3. Please disconnect the power cable under the following situations:
(A). If you do not operate this monitor for a period of time;
(B). If the power cable or power adaptor is damaged;
(C). If the monitor housing is broken.

The monitor

1. Please don't touch the screen with your fingers, which would probably deface the screen.
2. Please don't press the screen; the LCD is extremely exquisite and flimsy.
3. Please don't lay this product on unstable place.

Cleaning

1. Please clean the screen with dry and downy cloth or special LCD cleanser.
2. Please do not press hard when cleaning the screen.
3. Please do not use water or other chemical cleanser to clean the screen. The chemical may damage the LCD.

Contents

1.Packing List

Standard Package:
1. Battery plate (V-mount)
2. Desktop Stand Feet
3. Sun hood
4. Protective Glass
5. Power cable

Optional accessries
1. C-Stand
2. Hanger

Features:

■ 21.5-inch, 1920x1080, 8-bit LCD, 12-bit process,1000 nits high bright

■ 3G/HD/SD-SDI, HDMI, CVBS monitoring

■ HDR: HLG/BT.2100& SMPTE ST 2084/Dolby vision PQ

■ Built-in multi cameras De-log LUTs and DIT LUTs upload by USB

■ Waveform / Vector / Histogram / 16-ch Audio meters / Timecode

■ Peaking / Focus assist / Exposure assist / Zebra / Blue only

■ Anamorphic de-squeeze / Multiple markers

■ Portable, light weight and C-stand setup

2.Installation Dimension

Front Panel	Side View

Rear Panel	Top View

3.Installation instructions of accessories

Desktop Stand Feet

Right Stand **Pan Head Screw4 -M4*10** **Left Stand**

Pan Head Screw4 -M4*10

Insert the stands into the case

Sun hood

Sunhood

Sunhood Parts
A total of 4

Pan Head Screw4-M3*6

Potective Glass

Wrap Angles

Protective Screen Cover

Type C Wrap Angle
A total of 4

Close to the screen

Pan Head Screw4-M3*6
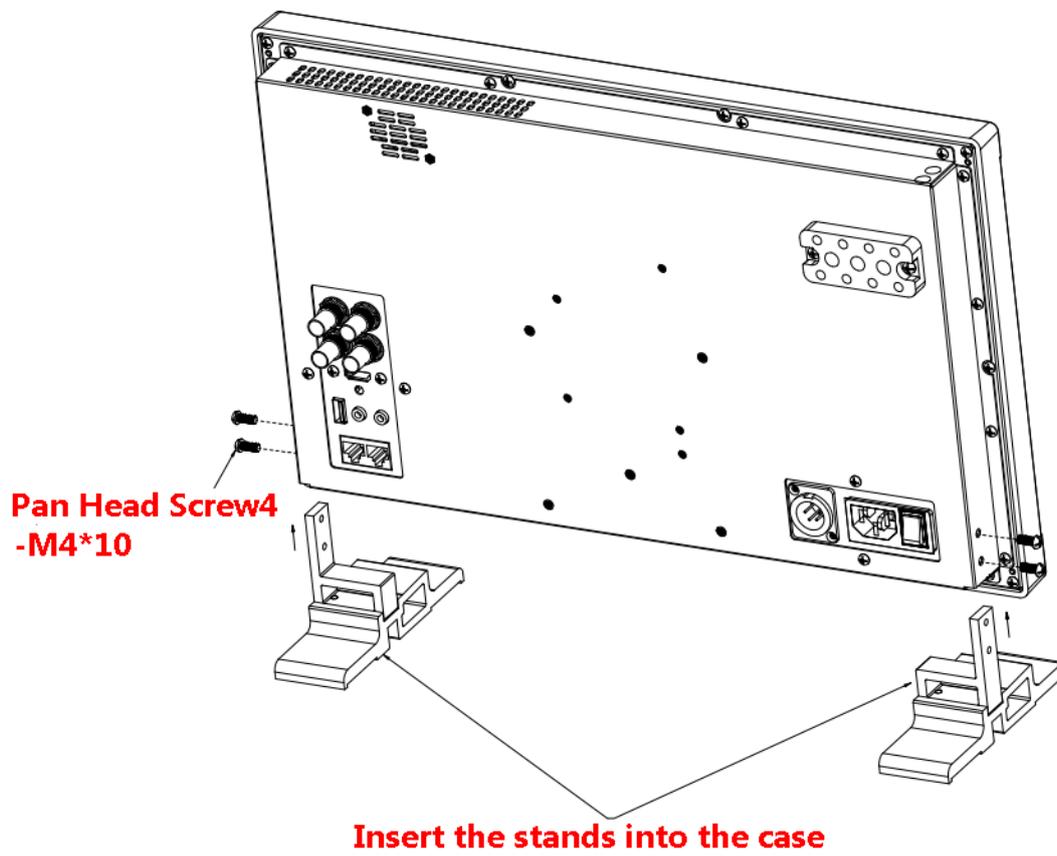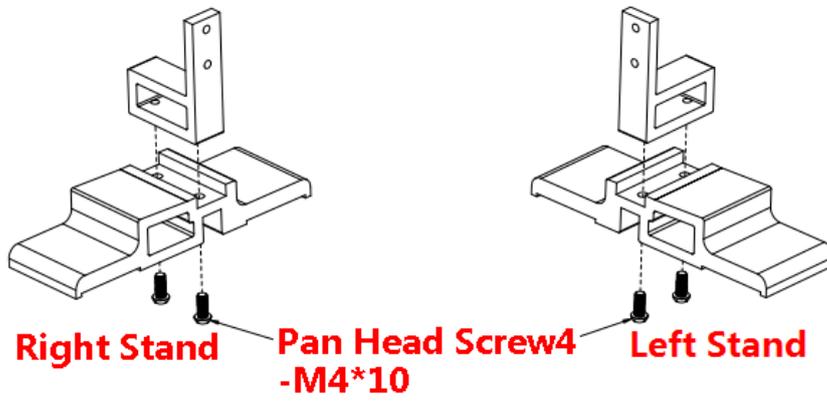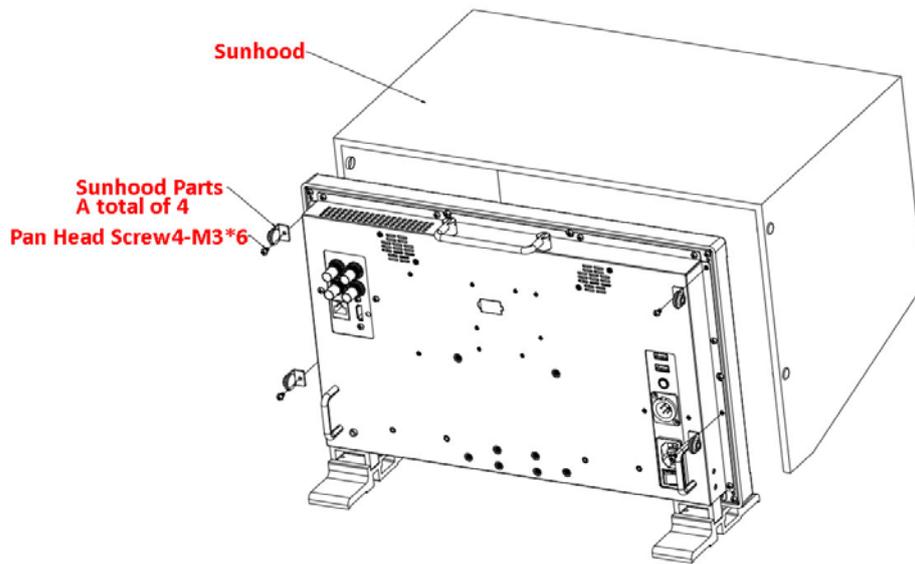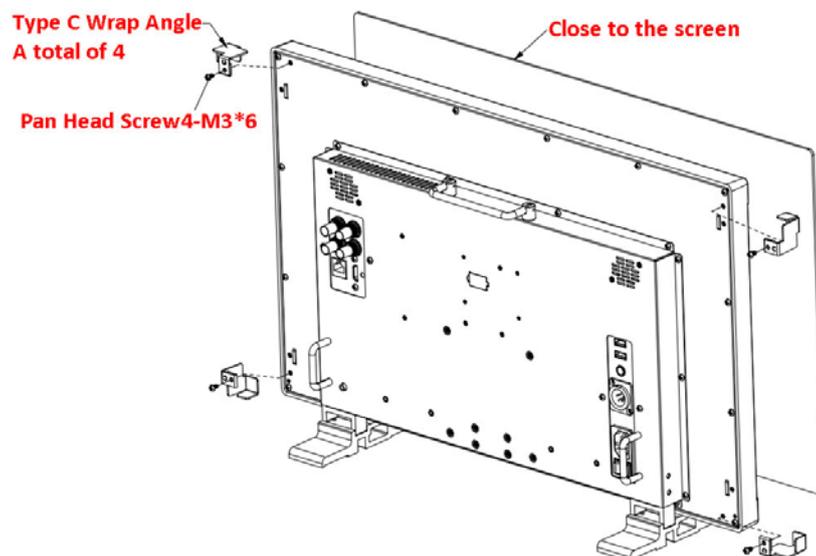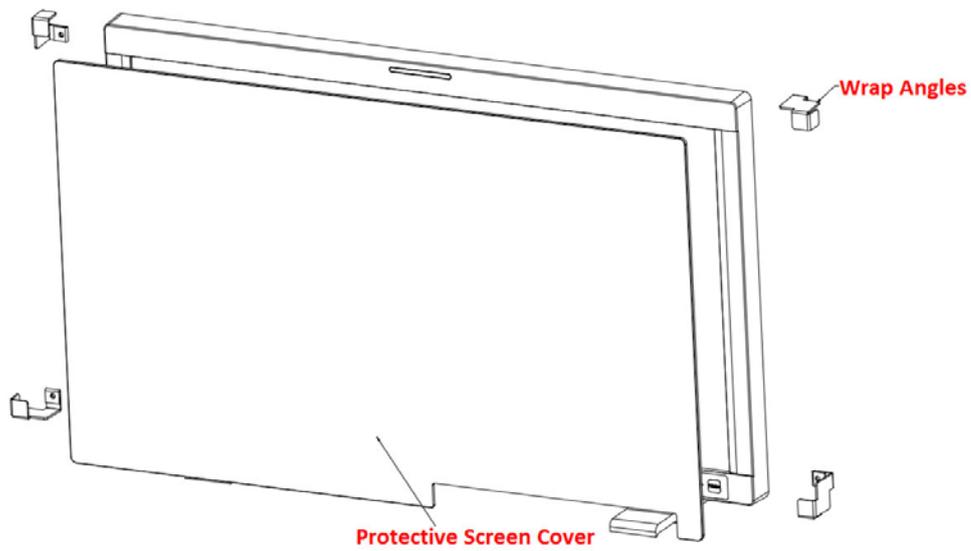
C-Stand
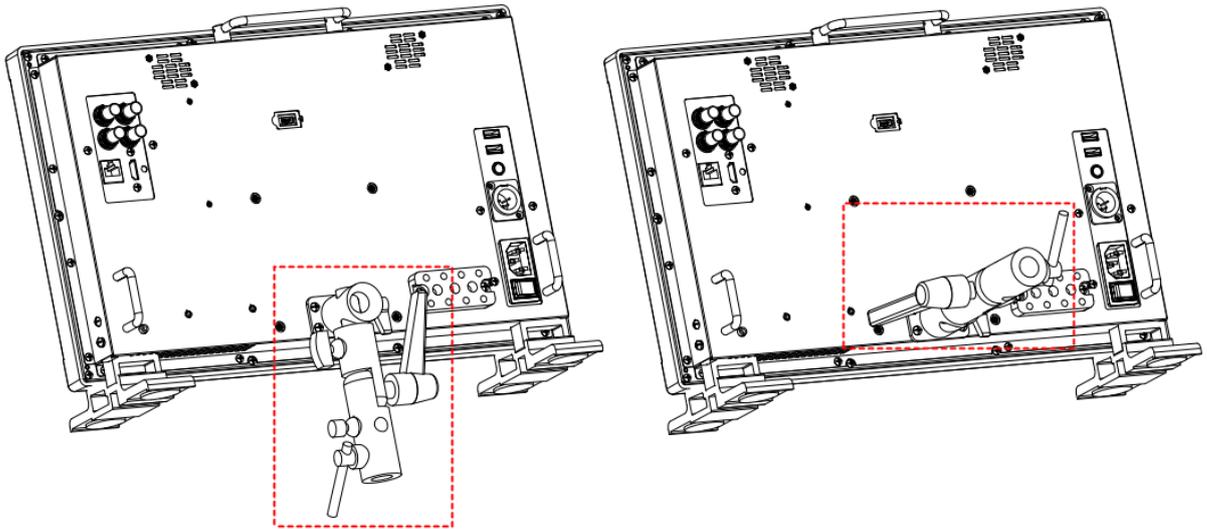
Hanger

It provides an inch screw thread hanger as an optional accessory. The hanger provides two sorts of screw thread: 3/8 inch screw thread, a total of 4; 1/4 inch screw thread, a total of 8.

M4*10, Pan Head Screw, A total of 2

Inch Screw Thread Hanger

3/8 Inch Screw Thread, a total of 4

1/4 Inch Screw Thread, a total of 8
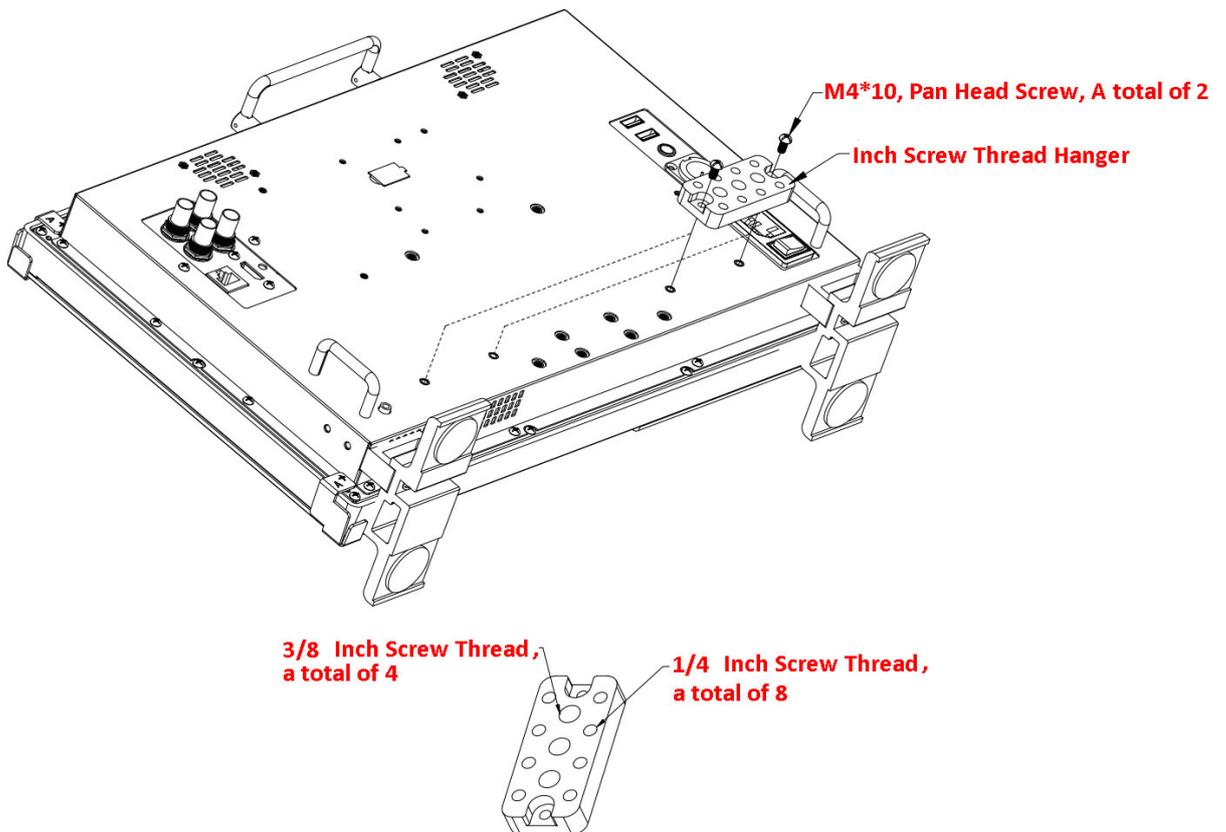
4.Operation Instructions

·Front Panel
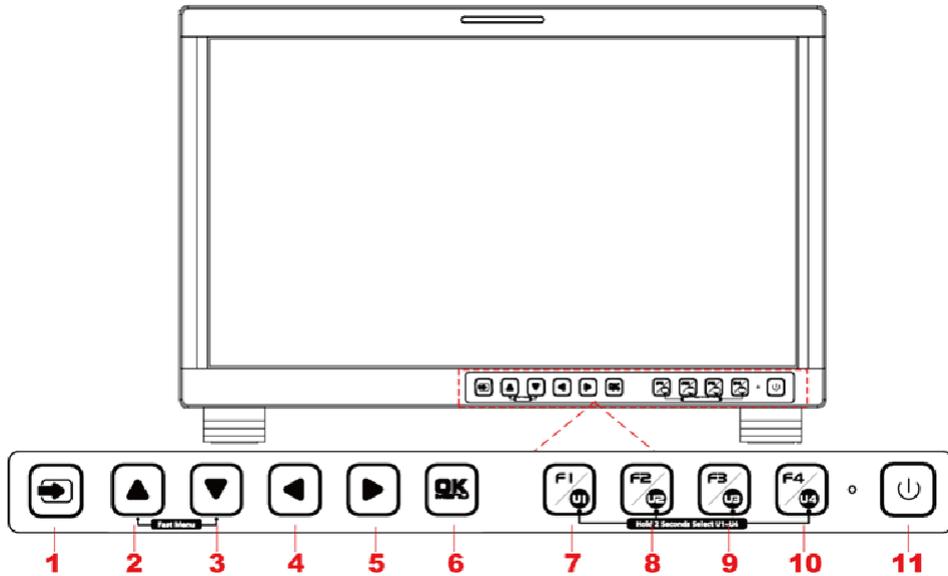
BUTTON	FUNCTION	BUTTON	FUNCTION
⊕	Input selection	F1/U1	Function button F1
▲	Adjust upward	F2/U2	Function button F2
▼	Adjust downward	F3/U3	Function button F3
◄	Return/Exit	F4/U4	Function button F4
►	Select next	⏻	Power on/off
OK menu	Save/Return/Main menu		

- All of these buttons have light indicators.

4.1 Operation of Front Panel

The functionality and usage of the buttons at the front panel are as follows:

⊕ **: Input Selection**

Select the input signal from each input interface. Press this button to display the input source menu at the top right corner of the screen, as shown in Figure 4.1-2. Use it to select an input signal source, press it again to toggle among these input signal items, or after the input source menu displayed, use the UP or DOWN button

to toggle among these input signal items.
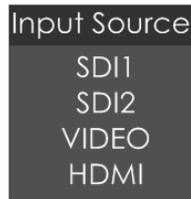
Figure 4.1-1   Source Menu

: **UP ARROW**

- It is **UP** button when working with the main menu. Toggle this button to select the next item or increase the number.

- Without the Main menu: when not displaying the Main menu, press **LEFT** button to display the **Fast Menu** list, as shown in Figure 4.1-3, toggle among these menu items: **Volume, Brightness, Contrast**, **Saturation, Backlight** and **Sharpness**.

Figure 4.1-2   Fast Menu List

After displaying the **Fast Menu**, press **LEFT** or **RIGHT** arrow button to adjust the menu value.

The limitations of these items are shown in Table 4.1-1:

Table 4.1-1   The Description of Fast Menu Items

Adjust Menu	Description	Range	Default
Volume	Adjust the volume	0~31	16
Brightness	Adjust the image brightness	0~100	50
Contrast	Adjust the image contrast	0~100	50
Saturation	Adjust the image color intensity	0~100	50
Backlight	Adjust the backlight	0~10	5
Sharpness	Adjust the image sharpness	0 ~ 63	8

Tips

- After you have loaded the adjust menu list, it will be closed automatically if you do nothing operation on it within the **Osd Time**.

- The main menu, the fast menu, the function menu and the input signal selection list of a screen may not be shown all simultaneously.

▼: DOWN ARROW

■ It is **DOWN** button when working with the main menu. Toggle this button to select the next item or decrease the number.

■ Without the Main menu: when not displaying the Main menu, press **DOWN** button to display the **Fast Menu** list, refer to the details in the above description as in UP arrow button.

◀: LEFT ARROW

Press this button to do the following operations:

■ With the Main menu: when working with the Main menu, LEFT button achieve the following functions:

  □ Back to the higher level menu

  □ Back to the higher level menu and not save the setting of the menu item value

  □ Quit the Main menu

■ With the Fast menu: when displaying the Fast menu, press **LEFT** button to decrease the item value.

▶: RIGHT ARROW

Press this button to do the following operations:

■ With the Main menu:

  □ Enter into the next level menu.

  □ Turn Page: when the current selection in the sub-menu list is **Next Page**, press this button to turn to the next page circularly.

■ With the Fast menu: when displaying the Fast menu, press RIGHT button to increase the item value.

OK/MENU

It is used to activate the Main menu. Press this button to do some operations with the Main menu, it includes the following operations:

■ Display the Main menu: press **OK/MENU** button, it will display the main menu at the center of the screen.

■ Save/Back: confirm the selection and back to the higher level menu.

■ Turn Page: when the current selection in the sub-menu list is **Next Page**, press this button to turn to the next page circularly.

F1/U1

This button is a **FUNCTION** and **User Preset** button.

■ **F1 function:** The F1 function can be assigned via the CONFIG menu. Press the function button to activate or deactivate the assigned function. Press **F1** to display the function menu list in the center of the screen, as shown in Figure 4.1-4. Toggle **F1** button to change the value related to this function.

Figure 4.1-3   Function Menu List

■ **USER1:** Switch to **User Preset USER1** directly. Hold 2 seconds to select the current user preset to be User1. The name of the current user preset will be prompted on the left center of the screen. Refer to "5.1.4.1 FUNCTION KEY and User Preset Menu" for the setting of **User Preset.**

Tips

• If the value related to the function button can't be modified, the value shows in gray.

• For **F2/U2~F4/U4** function buttons, the operations are as the same as F1/U1's.

• Use **FUNCTION KEY** menu to assign F1~F4. You can assign the function from among: Camera LUT, Undef, Blue Only, Mono, Marker, Audio Meter, Time Code, Waveform Type, Vectorscope, Histogram, Scan, Aspect, Native, Mute, IMD Display, False Color, Focus Assist, Peak, Zebra. Refer to "5.1.4 USER CONFIG Menu" for the details.

Power

Used to power on or standby, and the light in the button will indicate the status of the power. When the monitor is powered on, the light is green, press the power button and hold 2 seconds, it will enter into standby mode, the light is red.

Rear Panel Features

It will introduce the arrangement and the operations of the interfaces in rear of the panel

in the following.

Arrangement of Rear Panel

For the arrangement of the rear panel of FM-17 is shown in Figure 4.2-1, there are various input and output interfaces at the rear panel, and build-in speakers in the top.
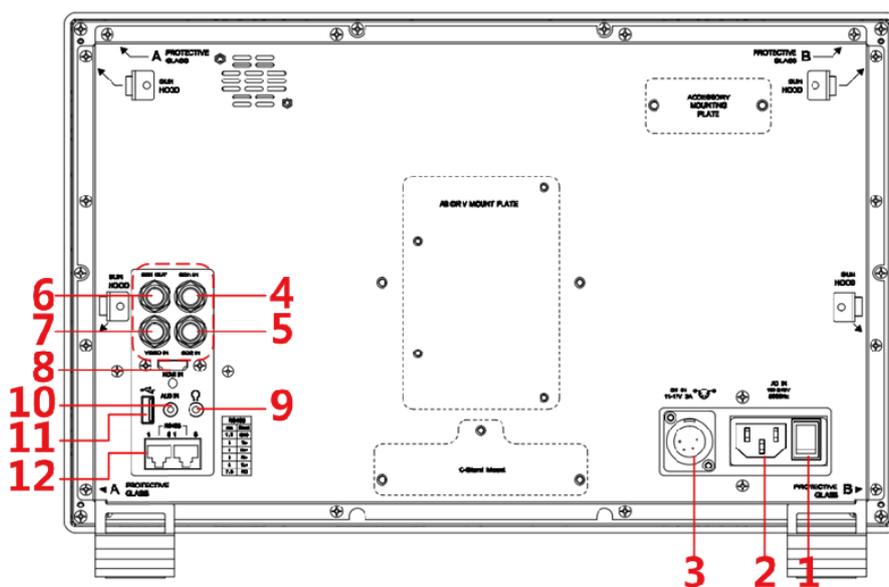
Figure 4.2-1   The Rear Panel of LMW-215 Monitor

The interfaces numbered in red are described as follows:

1. Power Switch	**7.** Video Input: VIDEO IN
2. AC Power Input	**8.** HDMI Input: HDMI IN
3. DC Power Input	**9.** Audio Input: AUD IN
4. Video Input: SDI1 IN	**10.** Headphone
5. Video Input: SDI2 IN	**11.** USB
6. Video Output: SDI1 OUT	**12.** RS485 X2

4.2 Operations of Rear Panel

The details of these interfaces at the rear panel are described as follows:

Power Switch

It provides one power switch to switch on or switch off. As shown in Figure 4.2-2, push the button to the direction "-" to switch on the power, or push the button to the direction "O" to switch off the power.
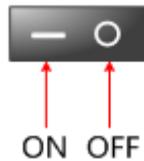
Figure 4.2-2   Power Switch

AC Power Input

It provides one AC power input interface, the specification is 100 ～ 240V50/60HzAC.

- The power indicator is on the power button at the front panel. If the light is green, the monitor is powered on, and if the light is red, the monitor is standby.

DC Power Input

It provides one DC power input interface, the specification is 11～17V 3A DC.

- Only use the adapter and the power cord specified by the manufacture for your safety！

Video Input Interface (BNC) SDI1 IN~SDI2 IN

It provides two SDI input interfaces, labeled as **SDI1 IN, SDI2 IN**.

Video Output Interface (BNC) SDI1 OUT

It provides one SDI output interface, labeled as **SDI1 OUT**.

Video Input(BNC): VIDEO IN

HDMI Input: HDMI IN

It provides one HDMI input interface, HDMI Type-A connector with a fastener.

Audio Output**(3.5mm jack)**: it provides one headphone.

Audio Input**(3.5mm jack)**: AUD IN**, it provides one audio input interface.**

USB: it is used for LUT input and firmware upgrading.

RS485 Interface (RJ-45)
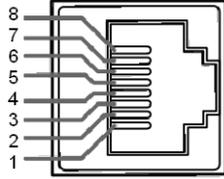
It provides two RS485 interfaces, loop out. Support for cascade connection and IMD remote control. The comparison of pins and Input connectors for RS485 is shown as in Table 4.2-1:

Table 4.2-1 The Comparison of Pins and Input connectors for RS485

PIN No.	RS485 IN Terminal Signal
1,2	GND
3	Tx-
4	Rx+
5	Rx-
6	Tx+
7,8	NC

Supported Signal Format

The supported signal format for this device is as shown in Table 4.3-1:

Table 4.3-1 Supported Signal Format

Signal			SDI	HDMI	VIDEO
NTSC					✓
PAL					✓
SD	480I60	4:2:2 YCbCr 10 BIT	✓		
	576I50		✓		
HD	720P24/23.98		✓		
	720P25		✓		
	720P30/29.97		✓		
	720P50		✓	✓	
	720P60/59.94		✓	✓	
	1080SF24/23.98		✓	✓	
	1080SF25		✓	✓	

Signal			SDI	HDMI	VIDEO
	1080SF29.97		✓	✓	
	1080SF30		✓	✓	
	1035I60/59.94		✓		
	1080I50		✓	✓	
	1080I60/59.94		✓	✓	
	1080P24/23.98		✓	✓	
	1080P25		✓	✓	
	1080P30/29.97		✓	✓	
3G	1080I50	4:2:2 YCbCr 12 BIT 4:4:4 YCbCr 10 BIT 4:4:4 YCbCr 12 BIT 4:4:4 RGB 10 BIT 4:4:4 RGB 12 BIT 4:4:4_XYZ_10BIT 4:4:4_XYZ_12BIT	✓		
	1080I60/59.94		✓		
	1080P24/23.98		✓		
	1080P25		✓		
	1080P30/29.97		✓		
	1080P50	4:2:2 YCbCr 10 BIT	✓		
	1080P60/59.94		✓		
3G-2K	1080SF24/23.98	4:2:2 YCbCr 12 BIT 4:4:4 YCbCr 10 BIT 4:4:4 YCbCr 12 BIT 4:4:4 RGB 10 BIT 4:4:4 RGB 12 BIT 4:4:4_XYZ_10BIT 4:4:4_XYZ_12BIT	✓		
	1080SF25		✓		
	1080SF29.97		✓		
	1080SF30		✓		
	1080P24/23.98		✓		
	1080P25		✓		
	1080P30/29.97		✓		
	1080P48/47.95	4:2:2 YCbCr 10 BIT	✓		
	1080P50		✓		
	1080P60/59.94		✓		

5. Functionality of the Main Menu

This chapter describes the structure and functionality of the main menu, and introduces how to modify and customize the menu settings.

The main menu includes the following menu items, as shown in Figure5-1.
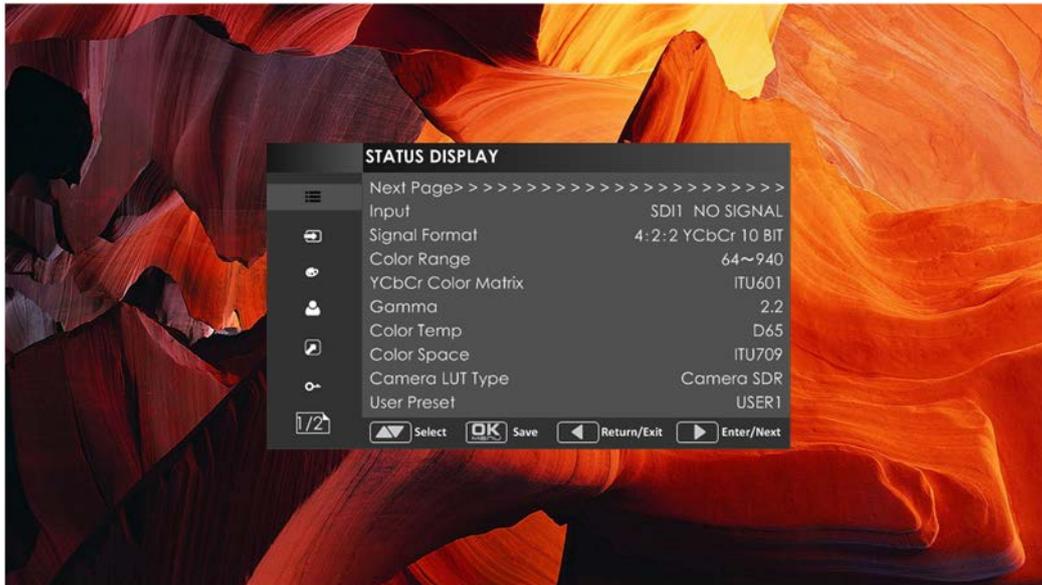
Figure 5-1   Main Menu

Main Menu

Press the **OK/MENU** button at the bottom of the front panel, the main menu is displayed at the center of the screen, as shown in Figure 5.1-1:
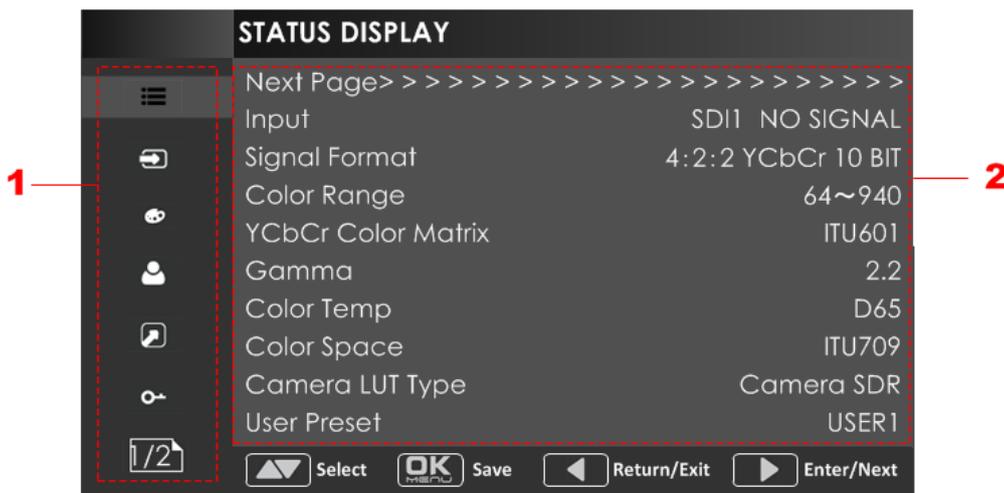
Figure 5.1-1   the Structure of the Main Menu

The menu interface is divided into three parts:

Main Menu List

It contains the menu list of the Main menu. Press **UP** or **DOWN** to access the corresponding menu item.

Sub-menu list

Press right arrow button to enter into the next level of menu list, as shown in Figure 5.1-2, it lists the title of the **Sub-menu**, the sub-menu item and the value of the item. Then, press **arrow** buttons and **OK/MENU** button to modify the value of the sub-menu.

Figure 5.1-2   the Sub-menu Value List

■ **Control Icon**

There is a white control icon when you select the menu or its value in the sub-menu list.

■ **Next Page Selection**

There is a white control icon when you select the menu or its value in the sub-menu list.

When there are more than one page items in a menu list, there will be a **Next Page** item at the first line in every pages. Press right arrow button or press the **OK/MENU** button to turn page.

Tips

• The sub-menu item is selected when the control icon which is in white highlight is at the back of the item name.

The following will introduce the contents and functionality of these sub-menu items in sorts.

STATUS Menu

The STATUS menu items are used to describe the current status information of the monitor, the menu items are as shown in Figure 5.1-3:

Figure 5.1-3   STATUS Menu

There are two pages in **STATUS** menu. The relationship of Items, Default Value, Domain Range and Description of the sub-item is shown in Table 5.1-1:

Table 5.1-1   The Description of STATUS Menu Items

Items	Default Value	Description
Page1		
Input	SDI1 1080I50	Show the input interface and its format
Signal Format	4:2:2 YCbCr 10 BIT	Show the format of the input signal
Color Range	64~940	Show current color range
YCbCr Color Matrix	ITU-R BT.709	Show YCbCr color matrix
Gamma	2.2	Show Gamma
Color Temp	D65	Show color temperature
Color Space	P3	Show color space
Camera LUT Type	Camera SDR	Show the type of camera LUT
User Preset	USER1	Show the user preset name
Page2		
Model	--	Show the production model.
Serial Number	--	Show the serial number.

Items	Default Value	Description
Firmware Version	--	Show the firmware number.

Tips

- The sub-menu values in **STATUS** menu can't be modified, they are displayed the actual status of the monitor.

INPUT CONFIG Menu

The INPUT CONFIG menu items are used to set the source of the input signals, the menu items are as shown in Figure 5.1-4:

Figure 5.1-4   INPUT CONFIG Menu

There is one page in **INPUT CONFIG** menu. The relationship of Items, Default Value, Domain Range and Description of the sub-item is shown in Table 5.1-2:

Table 5.1-2   The Description of INPUT CONFIG Menu Items

Items	Default Value	Domain Range	Description
Page1			
SDI IN1	ON	ON/OFF	Enable/Disable SDI1 input
SDI IN2	ON	ON/OFF	Enable/Disable SDI2 input
VIDEO	ON	ON/OFF	Enable/Disable VIDEO input
HDMI	ON	ON/OFF	Enable/Disable HDMI input

Items	Default Value	Domain Range	Description
NTSC Phase	0	-50~50	Set the NTSC phase level, and this item is available only when NTSC format signal is input.
Signal Format	Auto	As shown in Table 5.1-3	signal format for the inputs
Color Range	64 ~ 940	• 64~940 • 64~1023 • 0~1023	Set color range
YCbCr Color Matrix	Auto	• Auto • ITU-R BT.709 • ITU-R BT.2020	Set YCbCr color matrix

1. Signal Format Setting

The device provides four inputs: SDI IN1, SDI IN2. Set the input format through **INPUT CONFIG→ Signal Format** menu item.

Table 5.1-3   The Relationship of Signal Format and Signal Type

Signal Type	SDI	HDMI
Signal Format	AUTO 4:2:2 YCbCr 10 BIT 4:2:2 YCbCr 12 BIT 4:4:4 YCbCr 10 BIT 4:4:4 YCbCr 12 BIT 4:4:4 RGB 10 BIT 4:4:4 RGB 12 BIT 4:4:4 XYZ 10 BIT 4:4:4 XYZ 12 BIT	AUTO 4:4:4 XYZ 10/12 BIT

COLOR MANAGEMENT Menu

The COLOR MANAGEMENT menu items are used to adjust the color temperature parameters and the color balance, the menu items are as shown in Figure 5.1-5:
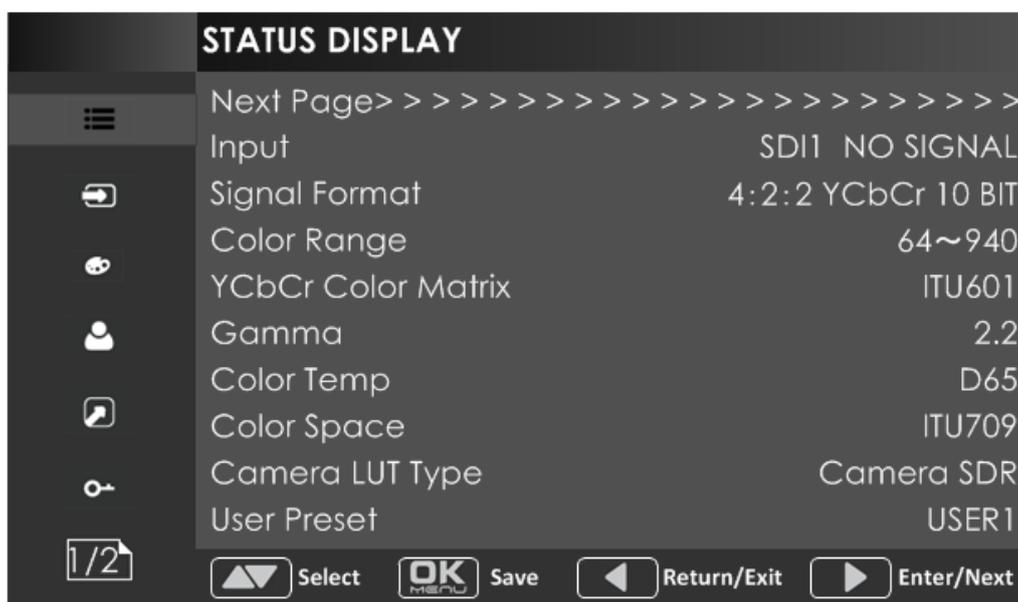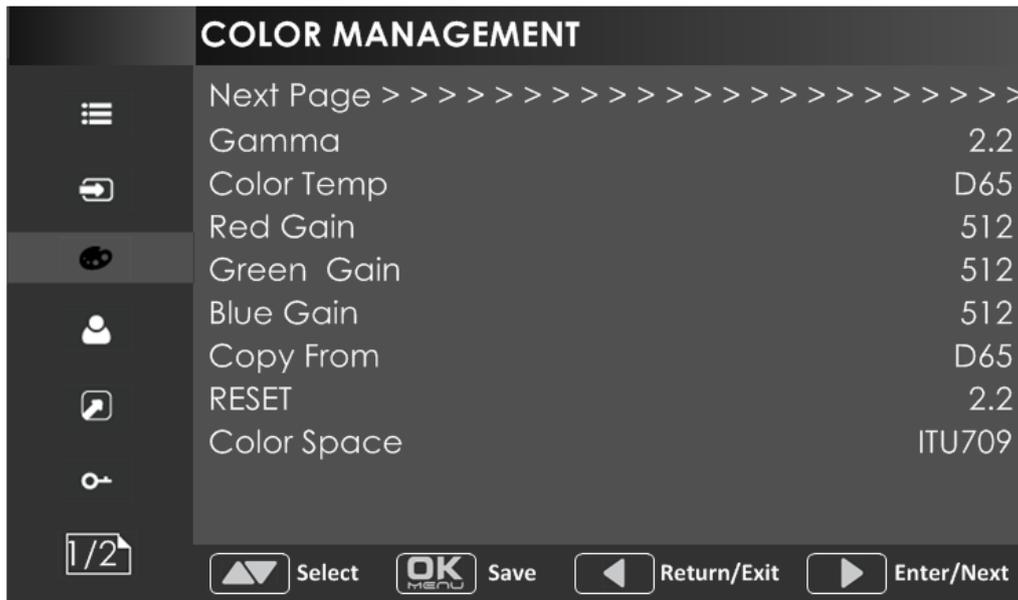
Figure 5.1-5   COLOR MANAGEMENT Menu

There are two pages in **COLOR MANAGEMENT** menu. The relationship of Items, Default Value, Domain Range and Description of the sub-item is shown in Table 5.1-4:

Table 5.1-4   The Description of COLOR MANAGEMENT Menu Items

Items	Default Value	Domain Range	Description
Gamma	2.2	1.8/2.2/2.4/2.6/2.8/ BT.1886/PQ/HLG	Adjust Gamma
Color Temp	D65	D93/D65/D61/D55/ DCI/USER1/USER2	Set the color temperature
Red Gain	512	0~512	Adjust the Red Gain
Green Gain	512	0~512	Adjust the Green Gain
Blue Gain	512	0~512	Adjust the Blue Gain
Copy From	D65	D93/D65/D61/D55/ DCI	Copy this parameter value to USER
Reset	--	--	Reset the Gain and Offset values to the product originals
Color Space	EBU	• Native • SMPTE-C • EBU • ITU709 • ITU2020 • P3	Set the color space for the first channel
Page2			
Camera LUT	ON	ON/OFF	Enable/disable camera LUT

Items	Default Value	Domain Range	Description
Camera LUT Type	Camera SDR	• Camera SDR • Camera HDR • User	Set a LUT from the corresponding list
Camera SDR	2.2	Refer to Table 5.1-5	Load the selected SDR LUT
Camera HDR	---	Refer to Table 5.1-5	Load the selected HDR LUT
User	User1	User1~User16	Load a customized LUT file
Load LUT File	---	---	To load a LUT file from the U disk

Camera LUT

The LMW-173 supports multiple camera LUTs, as shown in Table 5.1-5:

Table 5.1-5　The Relationship Between EOTF and HDR

Camera LUT	LUT Name	Company
SDR	ARRI_LogC_Rec709	ARRI
	BMD_4.6KFilm_Rec709	BlackMagic
	BMD_4.6KFilmV3_Rec709	
	BMD_4KFilm_Rec709	
	BMD_4KFilmV2_Rec709	
	BMD_4KFilmV3_Rec709	
	BMD_CCFilm_Rec709	
	BMD_CCFilmV2_Rec709	
	Canon_CLog1Cine_Rec709_FF_V1.1	Canon
	Canon_CLog2Cine_Rec709_FF_V1.1	
	Canon_CLog3Cine_Rec709_FF_V1.1	
	DJI_Phantom3DLog_Rec709_Improv	DJI
	DJI_Phantom4DLog_Rec709	
	DJI_Phantom4Dlog_Rec709_Improv	
	DJI_X5DLog_Rec709_Improv	
	FUJI_FLogFGamut_FLogRec709_V1	FUJIFILM
	FUJI_FLogFGamut_WDRRec709_V1	
	GoPro_Protune_Rec709	GoPro
	JVC_JLog1_Rec709_Daylight	JVC
	JVC_JLog1_Rec709_Tungsten	
	Panasonic_VLog_V709_V1	Panasonic
	RED_L3G10RWG_Rec709_ R1_V1.13	RED

Camera LUT	LUT Name	Company
	RED_L3G10RWG_Rec709_ R2_V1.13	
	RED_L3G10RWG_Rec709_ R3_V1.13	
	RED_L3G10RWG_Rec709_ R4_V1.13	
	RED_RedLogFilm_RG3	
	Sony_SLog2SGamut_LCRec709	Sony
	Sony_SLog2SGamut_LCRec709A	
	Sony_SLog3SG3Cine_LCRec709	
	Sony_SLog3SG3Cine_LCRec709A	
HDR	ARRI_LogC_HLG_Rec2020	SWIT
	ARRI_LogC_PQ_Rec2020	
	Canon_Clog2Cin_HLG_Rec2020	
	Canon_Clog2Cin_PQ_Rec2020	
	Canon_Clog3Cin_HLG_Rec2020	
	Canon_Clog3Cin_PQ_Rec2020	
	Panasonic_VLog_HLG_Rec2020	
	Panasonic_VLog_PQ_Rec2020	
	RED_L3G10_HLG_Rec2020	
	RED_L3G10_PQ_Rec2020	
	Sony_SLog3_Cin_HLG_Rec2020	
	Sony_SLog3_Cin_PQ_Rec2020	
	Sony_SLog3_SG3_HLG_Rec2020	
	Sony_SLog3_SG3_PQ_Rec2020	

When setting **Camera LUT Type** item as **Camera SDR**, **Camera HDR** or **User**, the following corresponding **Camera SDR, Camera HDR, User** item will be activated, and the available ranges of Gamma are diverse, as shown in the following table:

Camera LUT Type	Gamma
Camera SDR	1.8/2.2/2.4/2.6/2.8/BT.1886
Camera HDR	PQ/HLG
User or OFF	1.8/2.2/2.4/2.6/2.8/BT.1886/PQ/HLG

Load a user LUT from disk

First, load a LUT file to the designated user LUT. Set **COLOR Management→ Load LUT File**, it will pop up the **USB LUT Files** selection window as shown in Figure 5.1-6. Select **USER** item, and when detecting USB disk, it will pop up a file selection window, press the arrow button to select a LUT file, press **OK/MENU** button to confirm the

selection, and it will pop up a USER file selection window, press the arrow button to choose from **User1~ User16** to set the storage path for the selected LUT. For example, select **User1**, and press **OK/MENU** button to confirm the setting.
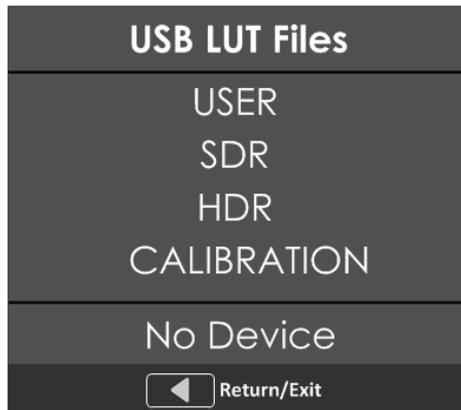
Figure 5.1-6   USB LUT Files

Second, power off the device, and restart it to affect the settings above.

At lase, set **COLOR Management→ Camera LUT** as **User** item, and set **COLOR Management→ User** as **User1** selected as above. The LUT file will take effect.

Tips

- Make sure to restart the device to effect the selected user LUT file after loading it to a designated user LUT through the USB disk.

- The items about RED/GREEN/BLUE GAIN are available only in USER1 and USER2 mode. If the COLOR TEMP is set to **USER1** or **USER2** with customized settings, you can select the menu item **COLOR TEMP→RESET** command to restore product originals for Gains, and press **OK/MENU** button to confirm the reset operation.

USER CONFIG Menu

The USER CONFIG menu items are used to adjust the parameters defined by customers, the menu items are as shown in Figure 5.1-7:

Figure 5.1-7   CONFIG Menu

There are six pages in **USER CONFIG** menu. The relationship of Items, Default Value, Domain Range and Description of the sub-item is shown in Table 5.1-6:

Table 5.1-6   The Description of USER CONFIG Menu Items

Items	Default Value	Domain Range	Description
Page1			
User Preset	USER1	USER1/USER2/ USER3/USER4	Set the settings as a user preset
F1 Button	Scan	Camera LUT/Undef/ Blue Only/Mono/ Marker/Audio Meter/ Time Code/ Waveform Type/ Vectorscope/Histogram/ Scan/Aspect/Native/ Mute/IMD Display/ False Color/ Focus Assist/ Peak/Zebra	Assign a function to F1 button
F2 Button	Marker	the same as F1	Assign a function to F2 button
F3 Button	Audio Meter	the same as F1	Assign a function to F3 button
F4 Button	Blue Only	the same as F1	Assign a function to F4 button
Page2			
Audio Source	EBD	• EBD: embedded	Select the audio source.

Items	Default Value	Domain Range	Description
		signal • EXT: external signal • OFF: no signal	
Speak Out L	EBD CH1	When the audio source is EBD, the range of this item is EBD CH1~ EBD CH16.	Left speaker, select a channel according to the type of audio source.
Speak Out R	EBD CH2	When the audio source is EBD, the range of this item is EBD CH1~ EBD CH16.	Right speaker, select a channel according to the type of audio source.
Meter Display	OFF	OFF/ON	Set whether to display the audio meter.
Meter Select	CH1-2	CH1-2/ G1/G2/G3/G4/ G1+G2/G1+G3/ G1+G4/G2+G3/ G2+G4G3+G4/ G1-G4	Select a meter display mode. Each G* contains four channels, and each CH* means a channel with number.
Meter Position	LEFT	LEFT/RIGHT	Select the displayed position of audio meter.
Display Mode	Mode1	Mode1: simple audio meter Mode2: audio meter with channel number and frame	Used to set the displayed mode for audio meter.
Meter Opacity	0	• 0: 100% • 1: 50%	Set the transparency for audio meter.
Page 3			
Marker	OFF	OFF/ON	Set whether to show all of the markers. It is the main switch for area marker, center marker and safety marker.
Aspect Marker	OFF	• 16:9 • 4:3 • 15:9 • 14:9 • 13:9 • 1.85:1 • 2.35:1 • Variable • OFF	Select the aspect marker according to the display aspect ratio.
Variable Aspect	3.00	1.00~3.00, the step is 0.01	When set the Aspect Marker as Variable, set the aspect ratio at this item
Center Marker	OFF	OFF/ON	Set whether to show the center marker
Area Marker	OFF	• OFF	Set the safety area size

Items	Default Value	Domain Range	Description
		• 80% • 85% • 88% • 90% • 93% • 95%	according to the aspect ratio and scan mode.
Marker Fit	OFF	• OFF: the safety marker is based on the current input source • ON: the safety marker is based on the image within the current aspect marker	Whether to set connection between Aspect MARKER and Safety Marker.
Marker Level	1	• 1: 50% • 2: 75% • 3: 100%	Set the luminance of marker line, including safety marker, center marker, area marker and cross hatch.
Marker Mat	OFF	• OFF: Normal background, use line for area marker edge only • HALF: 50% Background brightness • BLACK: all black	Darkens the outside of the area of the Aspect Marker, and set its transparency.
Cross Hatch	OFF	OFF/ON	Set whether to show the cross hatch.
Page 4			
Waveform Type	OFF	• WAVEFORM • VECTOR • WFM WIDE • HDR WFM • OFF	Set the display type of WFM
Waveform Size	Small	Small/Middle/Large	Set the waveform display size
Waveform Location	TOP RIGHT	• Small: Left Up/Center Up/Right Up/Right Center/Right Down/Center Down/Left Down/Left Center	Set the location of the waveform

Items	Default Value	Domain Range	Description
		• Middle: Right Down/Center Down/Left Down • Small: Center Down	
Vectorscope	OFF	OFF/ON	Enable/Disable vectorscope display
Vectorscope Location	TOP RIGHT	• Left Up • Center Up • Right Up • Right Center • Right Down • Center Down • Left Down • Left Center	Set the location of the vectorscope
Histogram	OFF	OFF/LUMA/RGB	Enable/Disable histogram display, and set the histogram mode
Histogram Location	TOP RIGHT	• Left Up • Center Up • Right Up • Right Center • Right Down • Center Down • Left Down • Left Center	Set the location of the histogram
Opacity	0	• 0: 100%(opaque) • 1: 75% • 2: 50% • 3: 25%	Set the transparency of WFM, vectorscope and histogram
Page 5			
Focus Assist	OFF	• OFF • GRAY: Turn the image into gray mode, and displays the edge of images with color selected in FOCUS COLOR. • COLOR: Displays the edge of images with color selected in FOCUS COLOR.	Enable/Disable the focus assist function, and set focus assist mode. When the difference of the edges exceeds the reference value (FOCUS LEVEL), the edge detected will be in colorful feature set by FOCUS COLOR.
Focus Assist Color	Red	Red/Green/Blue	Set the color for the detected edge of images.
Focus Assist	50	0~100	Set the edge difference

Items	Default Value	Domain Range	Description
Level			value between the edges in an image, and take this value as the reference value. Larger value means more detail detection.
Peak	OFF	ON/OFF	Enable/Disable peak function. Over sharpen the image.
Peak Level	1	1~8	Set the sharpness level of the image. The higher the value, the sharpener the image.
False Color	OFF	OFF/ON	Enable/Disable false color function
False Color Type	Spectrum	Spectrum/SONY Slog3/ SONY Slog2/ARRI LogC/ Canon Clog2/ Canon Clog3/ Panasonic Vlog/ RED RedLogFilm/ RED RL3G10/ BMD/BMD 4K/ ARRI Rec709/ SONY LC709A/ SONY LC709/ Panasonic V709/ RED G3/RED G4	Set the type of the false color display
Zebra	OFF	ON/OFF	Enable/Disable the zebra function that will compare the signal luminance with the ZEBRA LEVEL, and fill the relevant image area whose luminance is higher than the ZEBRA LEVEL with a zebra pattern.
Zebra Level	50	0~100	Set the reference level of detecting luminance.
Page 6			
Internal Signal	OFF	OFF/ON	Enable/Disable the internal color bar
OSD Time	ON	ON/10s/30s/60s	Set the display time of the OSD menu
Time Code	OFF	OFF/ON	Enable/Disable time code display
Status Display	OFF	OFF/ON/AUTO	Set the display time of the Status information menu
Language	ENGLISH	ENGLISH/中文	Select a language mode

Items	Default Value	Domain Range	Description
Monitor Reset	--	--	Set whether to restore the factory settings
Firmware Upgrade	--	--	Upgrade the firmware

FUNCTION KEY and User Preset Menu

1. User Preset

The user preset provides a series of menu settings customized as a User Preset, up to 4 presets could be defined in this device.

Set **USER CONFIG→User Preset** as User1, User2, User3 or User4 to switch among these various preset settings for current menu display. Or press [F1/01] ~ [F4/04] button and hold 2s to select the related user presets, and there will be a prompt displaying the current user preset name at the left center of the screen.

The FUNCTION KEY menu items(F1 Button~F4 Button) are used to assign function to the function key (F1~F4) on the front panel, and adjust the value of the function parameter. The menu items of FUNCTION KEY are as shown in ***Table 5.1-7***:

Table 5.1-7   Functionalities for the Function Key

Items	Default Value	Range	Description
Camera LUT	OFF	OFF/ON	Enable/Disable Camera LUT
Blue Only	OFF	OFF/Red/Green/Blue	Enable/Disable blue only
Mono	OFF	OFF/ON	Enable/Disable Mono
Marker	OFF	OFF/ON	Enable/Disable the master marker switch
Audio Meter	OFF	OFF/ON	Enable/Disable audio meter display
Time Code	OFF	OFF/ON	Enable/Disable time code display
Waveform Type	OFF	LUMA/RGB/ PARADE/OFF	Set the waveform type
Vectorscope	OFF	OFF/ON	Enable/Disable Vectorscope display
Histogram	OFF	OFF/LUMA/RGB	Enable/Disable Histogram display
Scan	OFF	Normal/Over	Enable/Disable scan function
Aspect	---	As shown in Table 5.1-8	Set aspect ratio
Native	OFF	OFF/Left/Center/Right	Enable/Disable native function, and set its mode
Mute	OFF	OFF/ON	Enable/Disable mute
IMD Display	OFF	OFF/ON	Enable/Disable IMD display

Items	Default Value	Range	Description
False Color	OFF	OFF/ ON	Enable/Disable false color function
Focus Assist	OFF	OFF/Mono/ Focus Assist Color	Enable/Disable Focus Assist function and set its mode
Peak	OFF	OFF/ON	Enable/Disable Peak
Zebra	OFF	OFF/ON	Enable/Disable Zebra

2. ASPECT

Set the aspect ratio of the screen, it is different from the formats of the input signals, and the details are as shown in *Table 5.1-8*:

Table 5.1-8 The Relationship of Input Signal Formats and Its Aspects

Input Signal	Default	Value Range	Input Signal Formats	
SD	4:3	• 4:3 • 16:9	480I60 576I50	
HD	16:9	• 16:9 • 2.39:1	720P24/23.98 720P25 720P30/29.97 720P50 720P60/59.94 1080SF24/23.98 1035I60/59.94	1080I50 1080I60/59.94 1080P24/23.98 1080P25 1080P30/29.97 1080P50 1080P60/59.94
2K	1.896:1	• 1.896:1 • 2.39:1	2048X1080PSF24/23.98 2048X1080PSF25 2048X1080PSF30/29.97 2048X1080P24/23.98 2048X1080P25	2048X1080P30/29.97 2048X1080P48/47.95 2048X1080P50 2048X1080P60/59.94

3. Mute

Active this function to adjust the volume to 0, press the function button again to release the volume to the last value.

4. BLUE ONLY

It is to activate BLUE ONLY mode that will remove colors from the input signal and display the screen only under a red, green or blue signal.

5. MONO

It is to activate MONO mode that will display the screen in monochrome presentation, inactivate this mode to display the screen in color mode.

i Tips

- Press F1~F4 button to activate the assigned function and adjust the parameter value.

AUDIO Menu

The AUDIO menu items are displayed on Page2 in **USER CONFIG** menu, and they are used to adjust the audio parameters:

Figure 5.1-8   CONFIG Menu-Page2

The appearance of Meter is as shown in Figure 5.1-9:

Figure 5.1-9   Audio Meter

Audio Meter Display Mode

Meter Select controls the amount of channels displayed in an audio meter, and each group(G*) contains four channels. As shown in Figure 5.1-10, the meter displays at the left bottom of the screen vertically.

For example: the **Meter Select** is **G1+G2,** and the **Display Mode** is **Mode2**. There is a white rectangle frame with two white level lines in the meter, the upper is the over level line, and the lower is the reference level line. If the audio value is higher than the reference level, the audio bar over the reference level line will display yellow, and if the audio value is higher than the over level, the audio bar over the

over level line will display red.

Figure 5.1-10   The Position of the Audio Meter On Screen

Audio Meter Display Position

The position of Meter is controlled by **Meter Position** item, the position of the meter on the screen is as follows: **Left**, **Right**. For example, the illustrations of the positions are as shown in Figure 5.1-11:

Figure 5.1-11   the Positions of Meter

![i Tips]

• The prerequisite for the available settings of the display mode and the position of audio meter is that the **Meter Display** is **ON**.

MARKER Menu

The MARKER menu items are displayed on Page3 in **USER CONFIG** menu, and they are used to adjust the marker parameters, the menu items are as shown in Figure 5.1-12:

Figure 5.1-12   USER CONFIG Menu-Page3

Markers

Marker	Illustration	Description
Center Marker		This marker enables easier checking the center portion's focus.
Aspect Marker		This marker displays two lines to identify an area with a specified ratio.
Area Marker		This marker displays a rectangle to identify the safety area with a specified percentage.
Cross Hatch		This marker displays multiple vertical and horizontal lines to help when users check the composition of a picture.

MARKER MAT

The marker mat marks the outside area of the marker display with the appointed transparency.

For example, set **ASPECT** as 16:9, **Aspect Marker** as 4:3, and **Area Marker** as 95%, then, the comparison of the three **Marker Mats** are as shown in Figure 5.1-13:

Figure 5.1-13   MARKER MAT

MARKER FIT

The **USER CONFIG → Marker Fit** item is used to whether set up the connection between area marker and safety marker.

Set **Marker Fit** item as OFF, the safety area is based on the whole current image display, while Set **Marker Fit** item as ON, the safety area is in the range of area marker, the comparisons are as shown in Figure 5.1-14
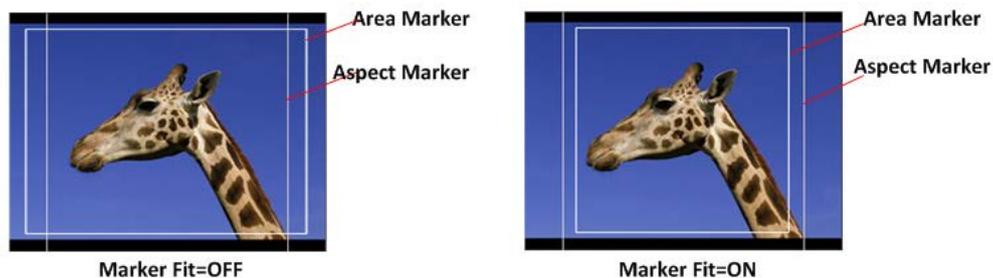

Figure 5.1-14   MARKER FIT

ⓘ Tips

- The **Aspect Marker**, **Center Marker** and **Area Marker** feature are available only when the **Marker** item is set to **ON**.

- The safety marker area will change with the area marker when setting **Marker Fit** item to be **ON**.

- The cross hatch lines will display only in the single image or in PIP mode when **Cross Hatch** is **ON**.

DISPLAY Menu

The DISPLAY menu items are displayed on Page4 in **USER CONFIG** menu, and they are used to adjust the parameters displayed on the screen, the menu items are as shown in Figure 5.1-15:

Figure 5.1-15   USER CONFIG Menu-Page4

Display Location

Set the location of waveform, vectorscope and histogram by **USER CONFIG** → **Waveform Location/ Vectorscope Location/ Histogram Location separately**, the available locations on the screen are as shown in Figure 5.1-16:

Figure 5.1-16   Display Location

Waveform

■ **Waveform Display Mode**

Set various waveform through **USER CONFIG → Waveform Type** item, and display the following three kinds of waveform as LUMA, RGB, PARADE, shown in Figure 5.1-17:
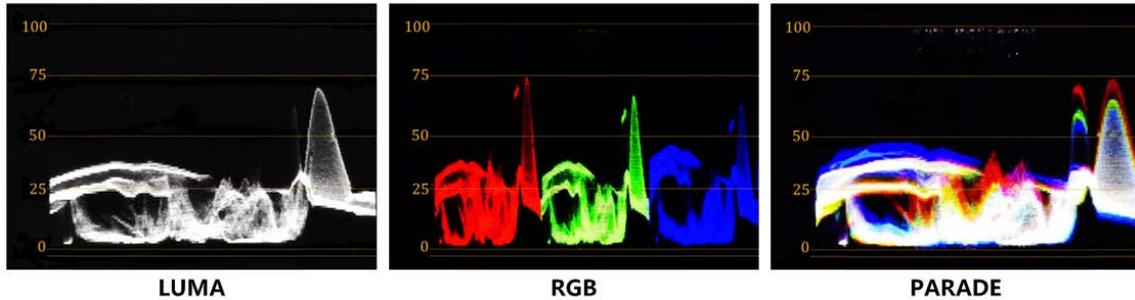

Figure 5.1-17   LUMA Waveform and RGB Waveform and PARADE Waveform

■ **Waveform Size**

Set **USER CONFIG → Waveform SIZE** item to adjust the size of the waveform, there are three kinds of sizes for waveform:

☐ Small size waveform: set **Waveform SIZE** item as **Small,** and this kind of waveform could be located in any one of the 8 positions listed in **LOCATION** item;

☐ 75% waveform: set **Waveform SIZE** item as **Middle,** and this kind of waveform is located in the bottom of the screen, and it can be moved;

☐ Full size waveform: set **Waveform SIZE** item as **Large,** and this kind of waveform is located in the bottom of the screen, and it can't be moved.

Vectorscope

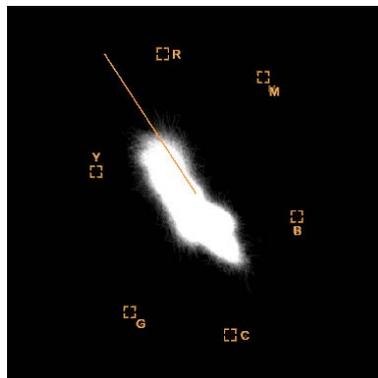Set **USER CONFIG → VECTORSCOPE** item to display or hide the vectorscope.

Figure 5.1-18   VECTORSCOPE

Histogram

Histogram assists in judging the distribution of luminance in the image.

■ Histogram Type

Set **USER CONFIG** →**HISTOGRAM** item to open or close the histogram display, and set the histogram display mode as LUMA or RGB, the two histogram types are as shown in Figure 5.1-19:

RGB　　　　　　　　　**LUMA**

Figure 5.1-19　RGB Histogram and LUMA Histogram

Focus and Exposure Menu

There are some assistant settings on Page5 in **USER CONFIG** menu, they are zebra, focus assist, peak and false color.

Figure 5.1-20　USER CONFIG Menu-Page5

Focus Assist

The FOCUS ASSIST function is used to display images on the screen with intensified

edge to help camera focus operation.

Set **USER CONFIG** →**Focus Assist** item to enable the focus assist function. The intensified edges are those areas whose difference value exceeds the reference focus level (**SENSITIVITY**), and the intensified edge are displayed in the designated color set by **Focus Assist Color**.

■ **FOCUS ASSIST MODE**

☐ **Color Mode**: Set **USER CONFIG** → **Focus Assist** item as **Color**, the image is in color mode, then set **USER CONFIG** → **Focus Assist Color** to color the intensified edge.

☐ **Gray Mode**: Set **USER CONFIG** → **Focus Assist** item as **Mono**, the image is in black and white mode, that is removing all colors and only leaving the luminance data of the signal.

Figure 5.1-21   Illustration for FOCUS ASSIST Function

Figure 5.1-22   Illustration for FOCUS ASSIST Function

FALSE COLOR-Exposure Assist

FALSE COLOR is also known as EXPOSURE ASSIST, this function generates an artificial luminance map of the input signal that can be useful to identify over exposed areas(exposure). This is a quick way to gauge the exposure levels of an image in a clear way.

Choose the **False Color** tool to activate the FALSE COLOR function. It provides multiple types of FALSE COLOR types: Spectrum, SONY Slog3, SONY Slog2, ARRI LogC, Canon Clog2, Canon Clog3, Panasonic Vlog, RED RedLogFilm, RED RL3G10, BMD, BMD 4K, ARRI Rec709, SONY LC709A, SONY LC709, Panasonic V709, RED G3, RED G4.

For example: Set **USER CONFIG** →**False Color** item as **ON** and **False Color Type** item as **ARRI LogC**, as shown in Figure 5.1-23:
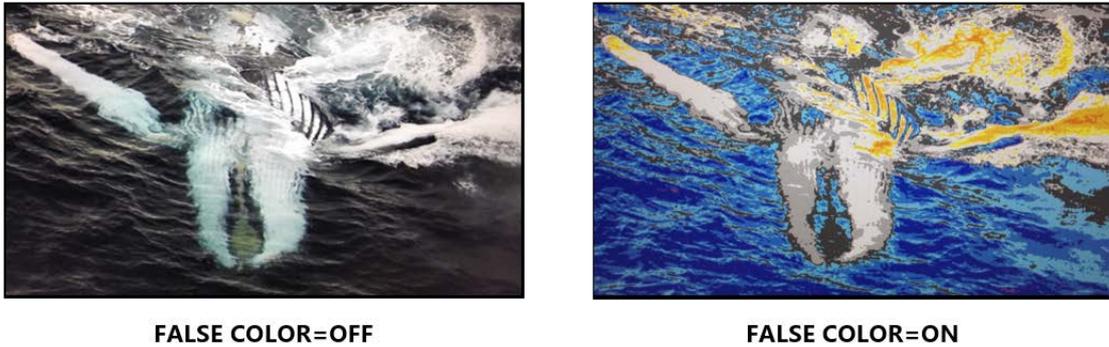

FALSE COLOR=OFF   FALSE COLOR=ON

Figure 5.1-23   Comparison Mode- Original Image and Normal Mode Image

ZEBRA

The **ZEBRA** function is used to display images on the screen with a zebra pattern to adjust the camera exposure parameter. It will compare the signal luminance with the **Zebra Level**, and fill the relevant image area whose luminance is higher than the **Zebra Level** with a zebra pattern.

For example, set the **Zebra Level** as 80, the compared results are as shown in ***Figure 5.1-24***, the special area is filled with a zebra pattern.

ORIGINAL IMAGE   ZEBRA CHCEK

Figure 5.1-24   Illustration for LUMA ZOOM CHECK Function

Other Menu

There are some system settings on Page6 in **USER CONFIG** menu.

Figure 5.1-25   USER CONFIG Menu-Page7

Display Test Pattern

Set **USER CONFIG→ Internal Signal** item as ON, it will display the color test pattern on the screen.

Set Menu Show Time

Set **USER CONFIG→Osd Time** as 10s, 30s or 60s. After you have loaded the menu, it will be closed automatically if you do nothing operation within the OSD Time.

TIME CODE

Select **USER CONFIG →Time Code** item to enable the display of embedded timecode on screen, only valid for SDI input signal.

Timecode is displayed as the format of "HH:MM:SS:FF" at the bottom center of the screen, and if there is no available timecode, it will not appear.

Figure 5.1-26   Timecode

Display Status Menu

Set **USER CONFIG→Status Display** item as ON, the status menu will be displayed in the top left corner of the screen, and it includes the input channel and signal format.

Switch Menu Language

Set **USER CONFIG→Language** item as Chinese or English, and the default menu language is English.

Monitor Reset Defaults Setting

Select **USER CONFIG→Monitor Reset** item, it will pop up a prompt, as shown in Figure 5.1-27:
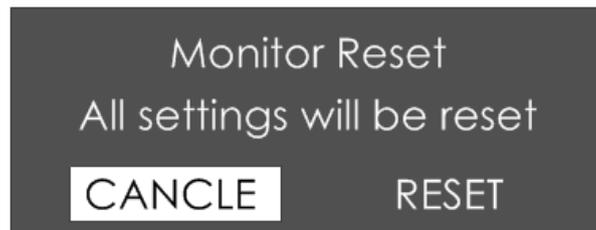

Figure 5.1-27   Prompt for Monitor Reset

Press right arrow(➤) button to select **RESET** command, and click **OK/MENU** button to confirm the selection, the menu settings will restory to factory defaults.

Firmware Upgrade

Select **USER CONFIG→Firmware Upgrade** item, it will pop up a prompt, as shown in Figure 5.1-28:
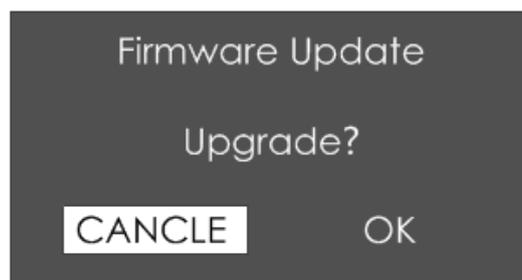

Figure 5.1-28   Prompt for Firmware Upgrade

Press right arrow(>) button to select **OK** command, and click **OK/MENU** button to confirm the selection, it will read the new firmware files from your USB drive and update your firmware. Make sure you have inserted your USB disk with the stored firmware files into the USB interface of the monitor, or it will inform you a "**Can't Detect USB**" error.

Figure 5.1-29   Warning for Firmware Upgrading

- Please keep the monitor are well powered on, and don't remove the USB drive during the firmware upgrading.

- It is recommended to use a 3.0 USB drive!

- Restart the monitor after successful firmware update, and the new files will take effect.

IMD CONFIG Menu

The IMD CONFIG menu items are used to adjust the parameters defined for IMD display, the menu items are as shown in Figure 5.1-30:
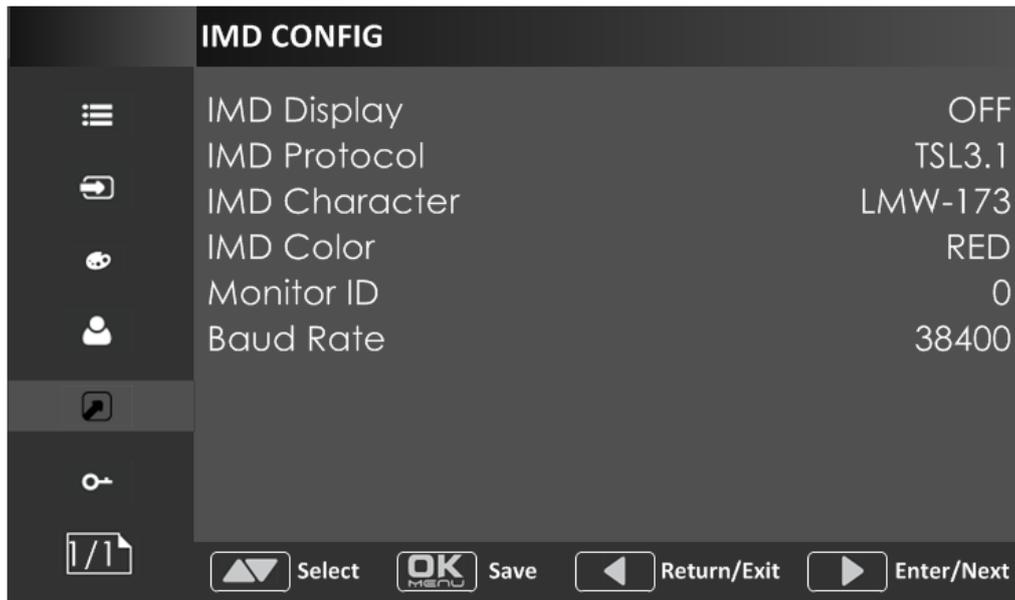
Figure 5.1-30   IMD Menu

The relationship of Items, Default Value, Domain Range and Description of the sub-item is shown in Table 5.1-9:

Table 5.1-9   The Description of IMD Menu Items

Items	Default Value	Domain Range	Description
IMD Display	ON	OFF/ON	Set whether to display IMD Characters on screen.
IMD Protocol	Local	TSL3.1/TSL4.0/ Local	Select an IMD protocol
IMD Char	---	---	Set the IMD characters, only available in Local IMD protocol
IMD Color	Red	Red/Green/Yellow	Set the IMD character color
Monitor ID	0	0~255	Set the ID number for each monitor
Baud Rate	38400	2400/4800/9600/19200 /38400/57600/115200	Select a baud rate for communication.

Tips

- If **IMD Display** item is ON, the IMD character in the black bar will display on the bottom of the screen.

- When the **IMD Protocol** is set to be Local, it displays IMD characters set in **IMD Char** item, and the **IMD Char** could be composed of up to 16 characters or up to 12 Chinese characters. For other values of **IMD Protocol**, the IMD character abides by the

corresponding protocol.

KEY INHIBIT Menu

The KEY INHIBIT menu item is used to lock the setting so that they can't be changed by an unauthorized user, and the menu item is as shown in Figure 5.1-31:

Figure 5.1-31   KEY INHIBIT Menu

The relationship of Items, Default Value, Domain Range and Description of the sub-item is shown in Table 5.1-10:

Table 5.1-10   The Description of KEY INHIBIT Menu Items

Items	Default Value	Domain Range	Description
Key Inhibit	OFF	OFF/ON	Enable/Disable the key.

Tips

- When the KEY INHIBIT is ON, KEY INHIBIT is enabled and press the POWER key, the device would turn on or off. MENU, UP, DOWN, **OK/MENU** key can be enable but only to set the KEY INHIBIT item, or there is a "KEY INHIBIT" prompt displayed on the screen when using other keys.

Menu Settings

When checking or modifying the value of the menu item, cooperating with the following buttons:

◀ (LEFT), ▼ (DOWN), ▲ (UP), ▶ (RIGHT), **OK/MENU**.

■ **Display the Main Menu**

Press **OK/MENU** button to enter into the main menu, it displays at the center of the screen.

■ **Switch menu items**

After displaying the main menu, press LEFT, DOWN, UP, RIGHT button to choose a menu item.

■ **Back to the Main menu**

After entering to a sub-menu item or a sub-menu item value, press LEFT button to back to the upper level menu area.

■ **Close the Main menu**

Press LEFT button to close the Main menu when the control icon is in the Main menu item.

Tips

• Set the show time of the Main menu by **USER CONFIG→Osd Time** item.

1. Operations to sub-menu item

■ **Display the sub-menu item**

After display the Main menu, press RIGHT button to displays the sub-menu items.

■ **Switch sub-menu items**

Press DOWN or UP button to choose or switch a sub-menu item.

■ **Back to menu item**

Press LEFT button to back to high level menu item.

■ **Turn Page**

Press RIGHT button or **OK/MENU** button to turn to the next page when selecting the **Next Page** item.

2. Operations to sub-menu item value

■ Switch sub-menu item value

When the control icon is in sub-menu item value, press DOWN or UP button to switch among its value list.

■ Confirm the modification to sub-menu item value

Press **OK/MENU** button to confirm the selection of a value, and the control icon is back to the corresponding sub-menu item.

■ Abandon the modification to sub-menu item value

Press LEFT button to give up the modification to sub-menu item value, and the control icon is back to the corresponding sub-menu item.

3. Operations to Fast menu

■ Display fast menu

Press UP or DOWN button to enter into the fast menu when not in the main menu.

■ Adjust fast menu item value

Press LEFT or RIGHT button to adjust the fast menu item value.

Tips

• The value in white color is modifiable, and the value in gray color is unmodifiable.

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6.Specification

Specification	Values
Dimension	21.5"
Dimension(WxHxD)	517.0x319.0x 74.3mm (without stand)
Pixel Pitch (WxH)	0.24825×0.24825mm
Aspect Ratio	16:9
Display Area (WxH)	476. 64×268.11mm
Viewing Angle (HxV)	178°x178°
Color Depth	16.7M colors
Resolution	1920×1080
Contrast (Typ.)	1000:1
Luminance (cd/m^2)	1000
Backlight	WhiteLED
Backlight Life(Hrs)	15000(Min.)
Work Temperature	0°C~50°C
Power Supply	AC :100～240V50/60Hz DC :11～17V 3A
Power Consumption	d48W
Net weight	5.7Kg
Video Input Interface	3G/HD/SD-SDI(X2)
	VIDEO(X1)
	HDMI(X1)
Video Output Interface	3G/HD/SD-SDI(X1)
Audio Input Interface	3.5mm Jack
Audio Output Interface	3.5mm Jack(Headphone)
Control Interface	RS485(cascade RJ45 X2)
	USB
Signal Formats	SD-SDI: 480i60, 576i50
	HD-SDI: 1080i50, 1080i 59.94, 1080i 60, 720p50, 720p 59.94, 720p 60, 1035i59.94, 1035i 60
	3G-SDI: 1080p50, 1080p60
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©
Return Loss	>18 dB 5 to 270 MHz

Specification	Values
	>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%
Jitter	<0.2 UI
Rise/Fall Time	<700 ps for SD <270 ps for 1.5 Gb/s HD <135 ps for 3 Gb/s HD
Extinction Ratio	>8
Back Reflection	<-14 dB

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