SWIT®

SWIT ELECTRONICS CO., LTD.

User Manual

Please read this user manual throughout before using

Ver：A

Preface

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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.

The warranty period of this product is 2 years, and does not cover the following:
(1) Physical damage to the surface of the products, including scratches, cracks or other damage to the LCD screen or other externally exposed parts;
(2) The LCD dot defects are not over three;
(3) Any damage caused by using third-party power adaptors;
(4) Any damage or breakdown caused by use, maintenance or storage not according to the user manual.
(5) The product is disassembled by anyone other than an authorized service center.
(6) 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.

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

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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

Packing list

No.	Standard package	details
1	Monitor	x 1
2	Stands with screws	x 2
3	Power cord	x 1
4	User manual	x 1
5	Warranty card	x 1
6	Protective glass	x 1
7	Battery plate (Gold mount or V-mount mount)	x 1
8	D-tap to 4-pin XLR Cable	x 1
9	C-stand	x 1
10	BS screw-socket connection plate	x 1
11	Carrying case	x 1

Note: When leaving the factory, the battery plate, C-stand, protective glass and BS screw-socket connection plate shall be installed on the product. The monitor shall be installed in the carrying case. The inner lining of the carrying case is unfolded, and can be used as the sun hood.

Introduction

FM-16B adopts TFT-LCD panel, with resolution of 1920x1080 and 178° x 178° wide viewing angle. It supports 2 x 3G/HD/SD-SDI, 1x HDMI, 1x VIDEO , and 1 x SDI, 1x HDMI loop through, plus earphone and speaker out.

Features:
- Prevailing slim bezel design
- 178-degree omnidirectional visual angle
- Having multi format input including 3G/HD/SD-SDI,VIDEO and HDMI
- Adopting full HD , wide viewing angle TFT glass
- Using 10-bit signal processing technology
- Support HDR technology and wide range color space
- Support multiple color space: SMPTE-C , EBC , ITU709 , ITU2020 , P3
- Powerful audio and video analysis function
- Support a variety of audio and video auxiliary analysis functions
- Colorful marker selection(Marker , Safety area)
- Support IMD long-range control
- Support Marker , Time Code , MET display
- Support presetting the color temperature using customized values

The main body (in mm)
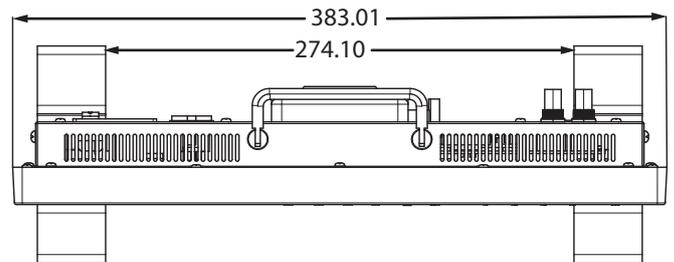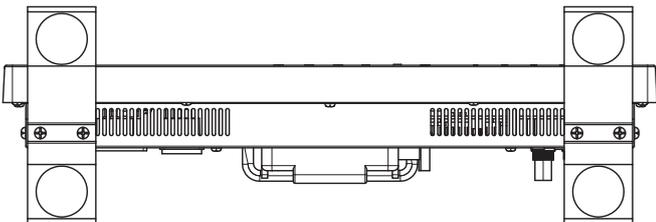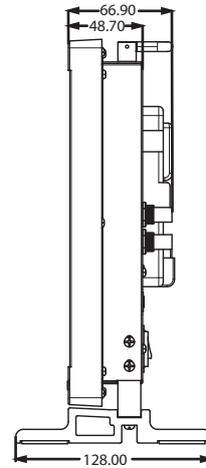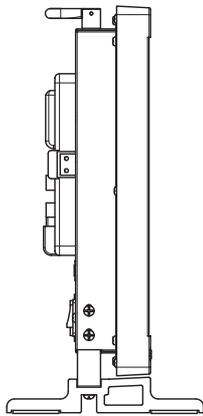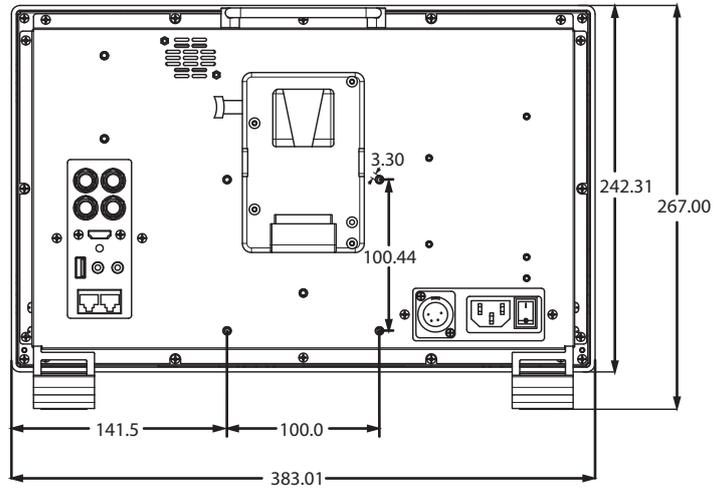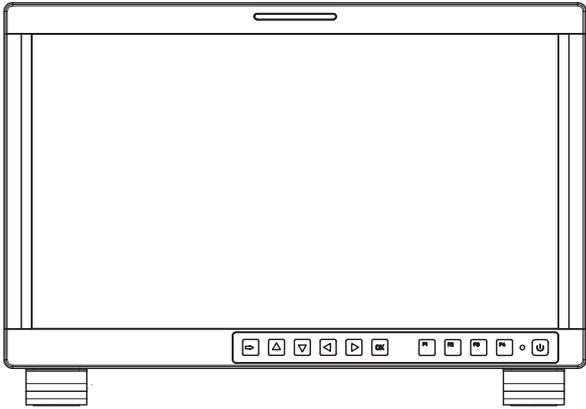
The monitor can be mounted to a standard rack or mounted at the foot.

1. Foot mounting instructions: There are screw holes at the rear panel of the monitor, which are labeled in the following figures. Assemble the parts of the stands, then insert the stands into the case, and fasten it with the screws provided. The installation is as follows:

Right Stand   Pan Head Screw 4-M4*8   Left Stand

Figure 1

Pan Head
Screw 4-M4*8

Insert the
stands into the case
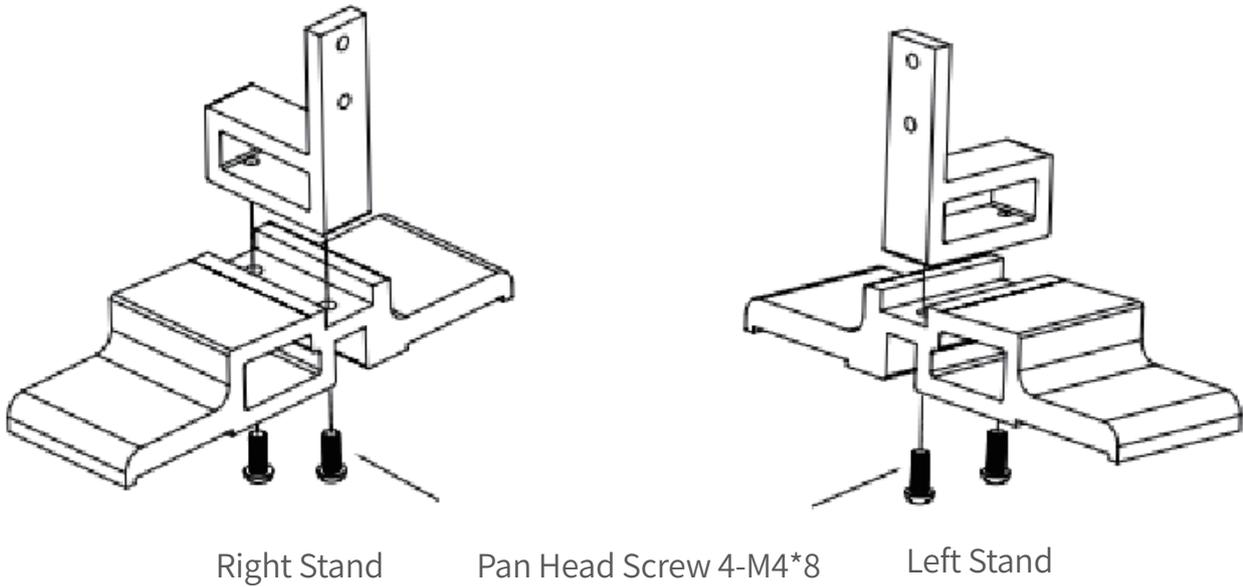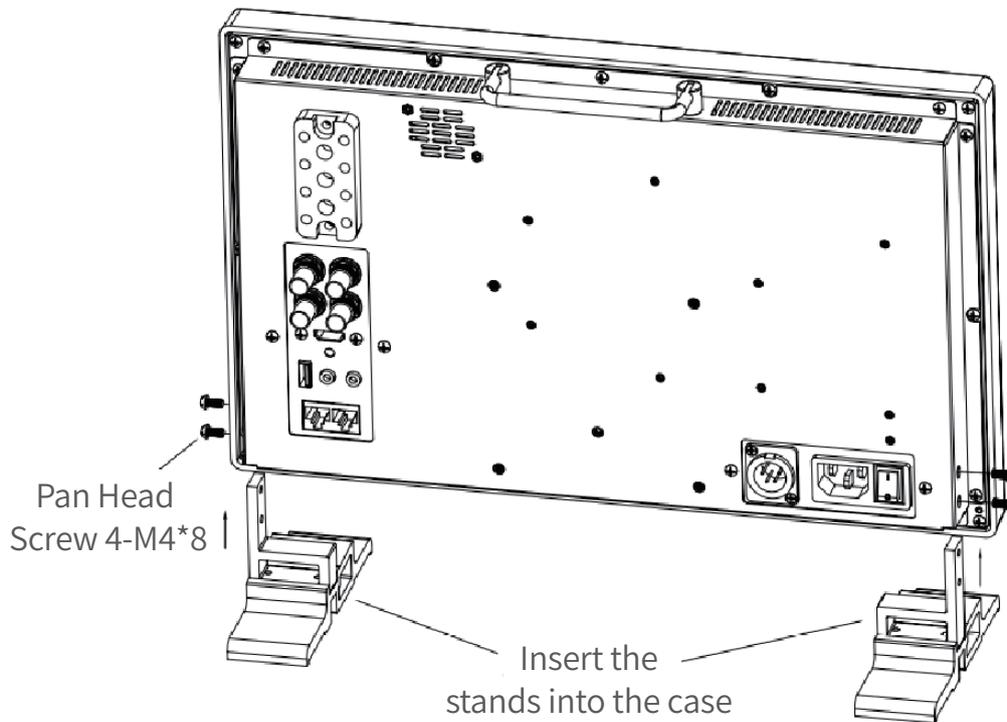
Figure 2

· **Front Panel**
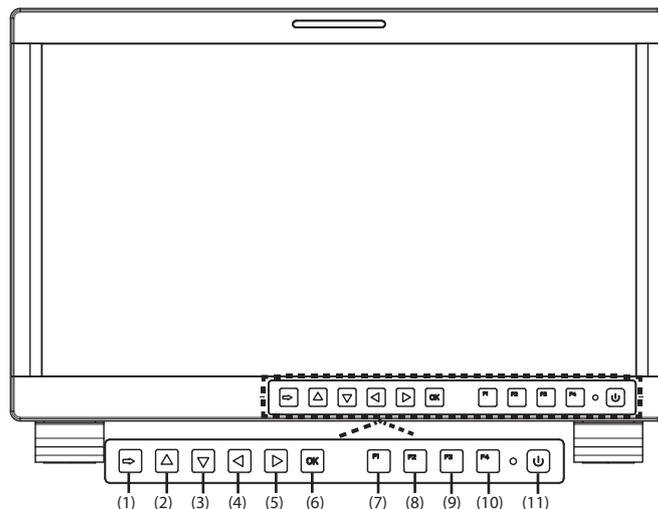
(1) **Input selection**: Used to switch an input signal

(2) **Adjust upward**

    When working with main menu, toggle this button to select the next item or increase the number

    When not displaying the Main menu , display the Fast menu

(3) **Adjust downward**

    When working with main menu, toggle this button to select the next item or decrease the number

    When not displaying the Main menu, display the Fast menu

(4) **Return/Exit**

    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.

(5) **Select next**

    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.

    Fast Menu: When not displaying the Main menu, press **UP** ▲ or **DOWN** ▼ button to display the **Fast Menu** list, toggle among these menu items: **Volume, Brightness, Contrast, Saturation, Backlight** and **Sharpness.**

    Volume: 0~31 value adjustment and the default value is 16

    Brightness: 0~100 value adjustment and the default value is 50

    Contrast: 0~100 value adjustment and the default value is 50

    Saturation: 0~100 value adjustment and the default value is 50

    Backlight: 0~10 value adjustment and the default value is 5

    Sharpness: 0~63 value adjustment and the default value is 8

⑹ **Save/Return/Main menu**

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.

⑺ **Function button F1:** F1 FUNCTION and U1 User Preset button

⑻ **Function button F2:** F2 FUNCTION and U2 User Preset button

⑼ **Function button F3:** F3 FUNCTION and U3 User Preset button

⑽ **Function button F4:** F4 FUNCTION and U4 User Preset button

Click the function key to enter the key operation item of the corresponding function key, and continuously click the key to switch the associated operation item value. Long press the function key seconds to switch to the user preset "user 1", and the preset name is displayed on the left side of the screen.

⑾ **Power on/off**: Used to power on or standby

·Real Panel
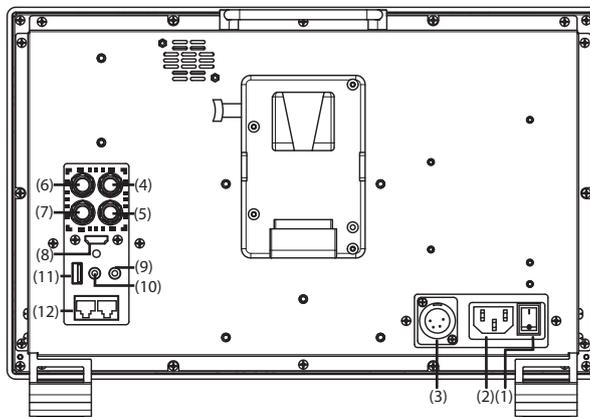
⑴ **Power Switch**: Push the button to the direction "-" to switch on the power, or push the button to the direction "O" to switch off the power

⑵ **AC Power Input**: AC IN, 100~240V 50/60HzAC

⑶ **DC Power Input**: DC IN, XLR 3pin, 11~17V 3ADC

⑷ **SDI Input**: SDI1 IN, BNC

⑸ **SDI Input**: SDI2 IN, BNC

⑹ **SDI Output**: SDI1 OUT, BNC

⑺ **VIDEO Input**: VIDEO IN, BNC

⑻ **HDMI IN** : HDMI IN, HDMI Type-A, support HDCP, compatible with dvi1.0

⑼ **Headphone:** 3.5mm Stereo Jack

⑽ **Audio Input**: AUD IN, 3.5mm Stereo Jack

⑾ **USB**: Used for LUT input and firmware upgrading

⑿ **RS485X2**: RS485-1, RS485-2, RJ45 connector, support for cascade connection and IMD remote control
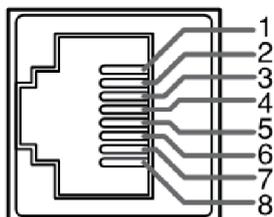
Pin	RS485
1,2	GND
3	Tx-
4	Rx+
5	Rx-
6	Tx+
7, 8	NC

· OSD

- Status Information
- Aspect Marker
- Area Marker
- Center Marker
- KEY INHIBIT
- Wave Form
- Timecode
- Audio Meter
- IMD
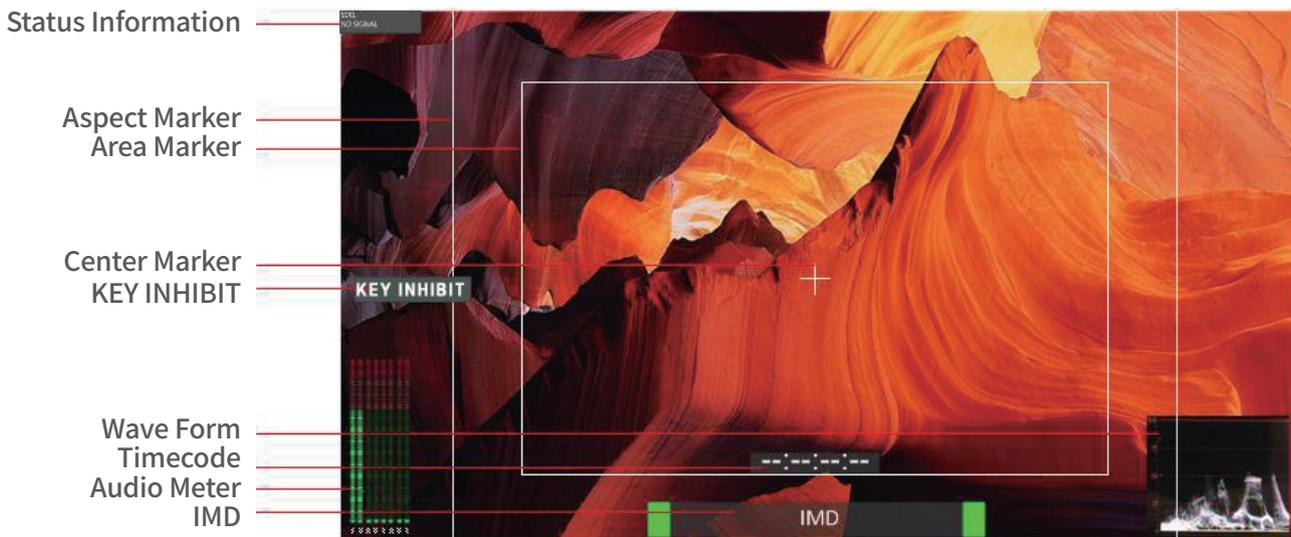
(1) **Status Information**

The **Status Information** is displayed in the top left corner of the screen, and includes the input channel and signal format. You can define it in **USER CONFIG** menu.

Signal Source → SDI1
Signal Format → 1080I50

The **Status Information** usually displays as the following situations:
◇ "UNKNOW" appears if an unsupported signal is input.
◇ "NO SIGNAL" appears if no signal is input
◇ The signal is normal, for example: 1080i59.94, 720P50, etc.

(2) **Waveform and Vector**

This is effective only for SDI signal. The waveform and vector of the input signal are configurable in the MAIN Menu.

(3) **Aspect Marker**

It is used to mark different area of the image. You can set whether to display it or not and their displaying mode in **USER CONFIG** menu.

(4) **Area Marker**

It is used to mark different area of the image. You can set whether to display it or not and their displaying mode in **USER CONFIG** menu

(5) **Center Marker**

It is displayed in the center of the screen, and marks the center of the image. You can set whether to display it or not in **USER CONFIG** menu.

(6) **Audio Meter**

It is displayed for audio monitoring. You can set its groups, position and mode in **USER CONFIG** menu.

(7) **Time Code**

It is displayed at the bottom of the image, the format is HH:MM:SS:FF, if there is no timecode available, the monitor will display --:--:--:--.

(8) **IMD**

The IMD text displays at the bottom of the screen, the length can't exceed 16 characters, and you can choose letter, number or other character for it. The color of IMD can be setted for three colors: RED、GREEN and YELLOW.

Introduction of audio and video functions

◆ **8-ch embedded audio meters**
Under SDI and HDMI, it displays 8 channels embedded audio meters. The audio meter is green, and will turn yellow when audio exceeds -20dB, and turn red when audio exceeds -9dB.

◆ **Time code (SDI)**
Under SDI input, it can display the SMPTE time code (VITC1, VITC2 or LTC) on the top of the screen, which is used extensively for synchronization, and for logging and identifying material in recorded media. If no Timecode information is detected, it will be displayed as "TC UNLOCKED".

◆ **Waveform (Y, Cb, Cr, R, G, B)**
Under SDI and HDMI input, totally 6 kinds of waveforms which are Y, CB, CR, R, G and B can be selected so as to check the brightness and chroma distribution.

◆ **Vector**
The displayed vector scope pattern is available under both SDI and HDMI, represents saturation as distance from the center of the circle, and hue as the angle, in standard position, around it.

◆ **Histogram (R, G, B)**
The histogram is a bar graph that shows the distribution of luminance values in the picture. There're R, G, B histograms that individually displayed simultaneously, available under both SDI and HDMI.

◆ **Peaking focus assist (red/blue/white switch)**
The Peaking focus assist function is to mark the sharpest edges of the image with red or blue color under SDI and HDMI input, for users to check if the subjects are focused.
User can set function Keys F1～F4 to turn on or off this function.

◆ **Zebra stripes**
Zebra Stripes are used to check if the image is over exposed or not by showing black and white lines on the monitor. It is considered over exposed when luminance value exceeds 90%.
User can set function Keys F1～F4 to turn on or off this function.

◆ **False Color**
The false color is used to aid in the setting of camera exposure. Under false color mode, there's a color chart on the bottom of screen for reference. The color from the dark to the bright will be displayed as blue, cyan, green, yellow, orange and red in a consecutive way. User can set function Keys F1～F4 to turn on or off this function.

◆ **IMD**
When using external control unit, it can display the video source ID and tally information on the screen.

Main Menu

FM-16B has OSD to adjust the parameters and settings, for example: Status Information, Input Selection, Color Management etc.

1、Press the **OK/MENU** button at the bottom of the front panel, the main menu is displayed at the center of the screen, the selected item is in white highlight is at the back of the item name. Press LEFT [◄] button to quit the displayed Main menu.
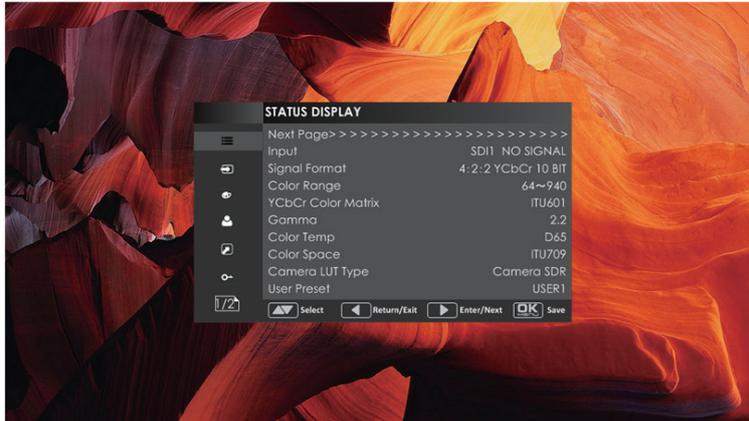
The menu interface is divided into two parts:
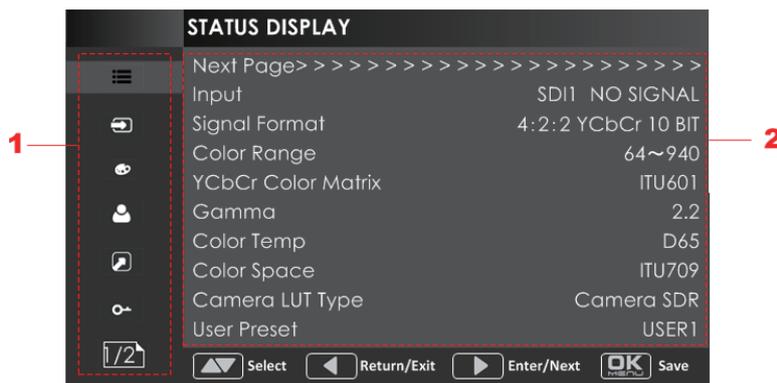
Main Menu List：It contains the menu list of the Main menu. Press UP or DOWN to access the corresponding menu item.

Sub-menu List: Press right arrow button to enter into the next level of menu list, it lists the title of the Sub-menu, the sub-menu item and the value of the item.

2、Press arrow buttons and **OK/MENU** button to modify the value of the sub-menu.

Submenu introduction
1.Status Menu

The STATUS menu items are used to describe the current status information of the monitor, the menu items are shown in following figure:

Input: Show the input interface and its format

Signal Format: Show the format of the input signal

Color Range: Show current color range

YCbCr Color Matrix: Show YCbCr color temperature

Gamma: Show Gamma

Color Temp: Show color space

Camera LUT Type: Show the type of camera LUT

User Preset: Show the user preset name

Model: Show the production model

Serial Number: Show the serial number

Firmware Version: Show the firmware number

2.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 following figure:

SDI IN1: Enable/Disable SDI1 input

SDI IN2: Enable/Disable SDI2 input

VIDEO: Enable/Disable VIDEO input

HDMI: Enable/Disable HDMI input

NTSC Phase: Set the NTSC phase level, and this item is available only when NTSC format signal is input.

Signal Format: Signal format for the inputs

Color Range: Set color range

YUV Color Matrix: Set YCbCr color matrix.

3. 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 following figure:

Gamma: Adjust Gamma

Color Temp: Set the color temperature

Red Gain: Adjust the Red Gain

Green Gain: Adjust the Green Gain

Blue Gain: Adjust the Blue Gain

Copy From: Copy this parameter value to USER

Reset: Reset the Gain and Offset values to the product originals

Color Space: Set the color space for the first channel

Camera LUT: Enable/disable camera LUT

Camera LUT Type: Set a LUT from the corresponding list

Camera SDR: Load the selected SDR LUT

Camera HDR: Load the selected HDR LUT

User: Load a customized LUT file

Load LUT File: To load a LUT file from the U 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.

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

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

4、User Config Menu

The USER CONFIG menu items are used to adjust the parameters defined by customers, the menu items are as shown in following figure:

USER CONFIG (Function&Preset)

Next Page >	
User Preset	USER1
F1 Button	Blue Only
F2 Button	Scan
F3 Button	Waveform Type
F4 Button	Mono

1/6   △▽ Select   ◁ Return/Exit   ▷ Enter/Next   OK Save

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/U1] ~ [F4/U4] 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.

2、**Function Key**(F1 Button~F4 Button)

F1-F4can be setted as the down below functions: Camera LUT, Blue Only, Mono, Marker, Audio Meter, Time Code, Waveform Type, Vector scope, Histogram, Scan, Aspect, Native, Mute, IMD Display, False Color, Focus assist, Peak, Zebra.

Audio Menu

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

USER CONFIG (Audio)

Next Page >	
Audio Source	EBD
Speak Out L	EBD CH1
Speak Out R	EBD CH2
Meter Display	ON
Meter Select	CH1-CH2
Meter Position	Left
Display Mode	Mode1
Meter Opacity	0

2/6   △▽ Select   ◁ Return/Exit   ▷ Enter/Next   OK Save

Audio Source: Select the audio source.

Speak Out L: Left speaker, select a channel according to the type of audio source.

Speak Out R: Right speaker, select a channel according to the type of audio source.

Meter Display: Set whether to display the audio meter.

Meter Select: Select a meter display mode. Each G* contains four channels, and each CH* means a channel with number.

Meter Position: Select the displayed position of audio meter.

Display Mode: Used to set the displayed mode for audio meter.

Meter Opacity: Set the transparency for audio meter.

Marker Menu

The MARKER menu items are displayed on Page3 in USER CONFIG menu, and they are used to adjust the marker parameters.

Marker: Set whether to show all of the markers. It is the main switch for area marker, center marker and safety marker.

Aspect Marker: Select the aspect marker according to the display aspect ratio.

Variable Aspect: When set the Aspect Marker as Variable, set the aspect ratio at this item

Center Marker: Set whether to show the center marker

Area Marker: Set the safety area size according to the aspect ratio and scan mode.

Marker Fit: Whether to set connection between Aspect MARKER and Safety Marker.

Marker Level: Set the luminance of marker line, including safety marker, center marker, area marker and cross hatch.

Marker Mat: Darkens the outside of the area of the Aspect Marker, and set its transparency.

Cross Hatch: Set whether to show the cross hatch.

| Center Marker | Aspect Marker | Area Marker | Cross Hatch |

Display Location

The Display Location menu items are displayed on Page4 in USER CONFIG menu.

Set the location of waveform, vector scope and histogram by **USER CONFIG → Waveform Location/ Vector scope Location/ Histogram Location separately**, the available locations on the screen are as shown in following figure:

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.

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

Vector Scope

Vector Scope: Set **USER CONFIG → VECTORSCOPE** item to display or hide the vector scope.
Vector Scope Location: Set the location of the vector scope

Histogram :Assists in judging the distribution of luminance in the image.
Histogram: Enable/Disable histogram display, and set the histogram mode
Histogram Location: Set the location of the histogram
Opacity: Set the transparency of WFM, vector scope and histogram

Focus and Exposure Menu

Focus Assist

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.

Sharpness

Peak: Enable/Disable peak function. Over sharpen the image.

Peak Level: Set the sharpness level of the image. The higher the value, the sharpener the image.

False Color –Exposure Assist

False Color: 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.

Zebra

Zebra: The **ZEBRA** function is used to display images on the screen with a zebra pattern to adjust the camera exposure parameter.

Zebra Level: Set the reference value for brightness amplification.

Other Menu

Display Test Pattern: Set whether to display the test color bar.

Set Menu Show Time : Set menu display duration

Time code: Set whether to display the time code

Display Status Menu: Set whether to open/close the Display Status.

Switch Menu Language: Set menu display language

Monitor Reset Defaults Setting: Set whether to restore factory settings.
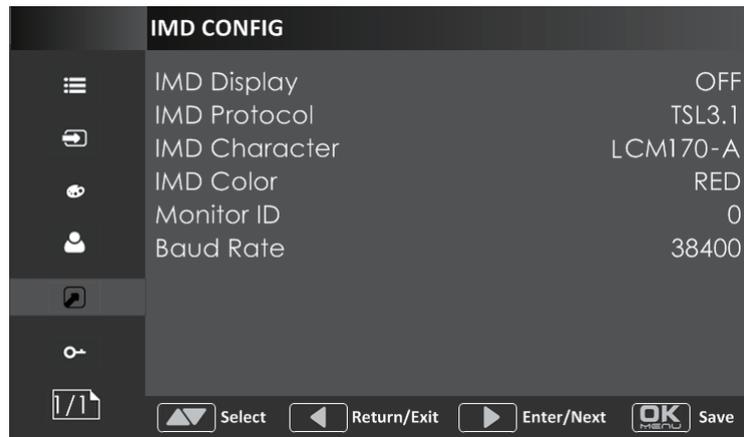
Firmware Upgrade

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 following figure:

IMD Display: Set whether to display IMD Characters on screen.

IMD Protocol: Select an IMD protocol

IMD Char: Set the IMD characters, only available in Local IMD protocol

IMD Color: Set the IMD character color

Monitor ID: Set the ID number for each monitor

Baud Rate: Select a baud rate for communication.

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 following figure:

Key Inhibit: Enable/Disable the key.

Specification

LCD Performance	
Dimension	15.6 inches
Dimension(W x H x D mm)	383.0×242.3 ×68.4mm
Pixel Pitch(W x H mm)	0.179×0.179
Aspect Ratio	16:9
Display Area(W x H mm)	344.16×193.59mm
Viewing Angle(H x V)	178°／178°
Color Depth	1.073G colors
Resolution	1920×1080
Contrast(Typ.)	700:1
Luminance(cd/m2)	300
Response Time(ms)	15
Backlight	RGB LED
Backlight Life(Hrs)	15000(Min.)
Input/output	
Input	3G/HD/SD-SDI×2
	VIDEO×1
	HDMI×1
Output	3G/HD/SD-SDI×1
Video Format	
HDMI	1080i（60／59.94／50／30／29.97／25／24／23.98）
	720p（60／59.94）
	1080psf（30／29.97／25／24／23.98）
SDI	1080p（60／59.94／50）
	1080i（60／59.94／50）
	1080p（30／29.97／25／24／23.98）
	1080psf（30／29.97／25／24／23.98）
	1035i（60／59.94）
	720p（60／59.94／50／30／29.97／25／24／23.98）
	480i（60）
	576i（50）

Trouble-shooting

Symptom	Possible Causes	Solution
No display	The power is not turned on	Please check if the power is connected, and then press "POWER" button to turn on the monitor
	Unstable power voltage	Reconnect to power supply
	BNC or HDMI cable loose contact or not correctly connected	Check and correctly connect the BNC or HDMI cable
	The attached battery is no power	Change battery
	Using DIY power supply but the polarity is reversed	Refer to the provided power supply, reconnect the power.
Image or color abnormal	Bad contact of BNC or HDMI cable	Change cable
	Video signal has Interference	Remove the interference source(s)
	Improper adjustment of the color parameters	Adjust the "Recall profile" to "Factory" under "System" submenu
	Distortion of the image	Reset the Aspect ratio
	Set to Blue only or Mono	Turn the Blue only /Mono off
	Turn on the "Focus Assist" function	Turn off the "Focus Assist" function
	Turn on the "False Color" function	Turn off the "False Color" function
No audio output	Bad contact of signal cable	Change signal cable
	Wrong connection or bad contact of Audio cable	Connect to the correct input socket.

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