

*High-Definition Serial Digital Interface
12G SDI / High Dynamic Range Monitor*

User Manual

**BHB24HDR4
BHB24aHDR4
BHB24aHDR4_NE**



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Caution

Before operating, please read this manual carefully.

WARNING:

To reduce the risk of electric shock does not remove cover (or back). No user serviceable parts inside. Refer servicing to qualified service personnel. To prevent fire or shock hazard, do not expose the rear of the set to rain or moisture. Do not rub or strike the Active Matrix LCD with anything hard as this may scratch, mark, or damage the Active Matrix LCD permanently.

Unauthorized tampering with the inside of the monitor invalidates the warranty.

The manufacturer shall not warrant for any damage caused by improper maintenance and/or repair. Work by third parties.

Important safeguards for you and your new product:

Your product has been manufactured and tested with your safety in mind. However, improper use can result in potential electrical shock or fire hazards. To avoid defeating the safeguards that have been built into your new product, please read and observe the following safety points when installing and using your new product and save them for future reference.

Read Instructions

Follow Instructions

All operating and use instructions should be followed.

Retain Instructions

The safety and operating instructions should be retained for future reference.

Heed Warnings

All warnings on the product and in the operating instructions should be adhered to.

Cleaning

Disconnect the unit from the electricity supply before cleaning. Do not use abrasive cleaners. Use a damp cloth for cleaning.

Water and Moisture

Do not use this apparatus near water.

Transporting Product

A product and cart combination should be moved with care. Quick stops, excessive force and uneven surfaces may cause the product and cart combination to overturn.

Attachments

Do not use attachments not recommended by **Boland** as they may cause hazards.

Ventilation

Do not block any of the ventilation openings.

Install in accordance with the manufacturer's instructions.

Power Sources

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your supplying dealer.

Power Lead Polarization

This product is equipped with a three-wire grounding-type cord. This is a safety feature. Do not defeat the safety purpose of the grounding-type cord.

Power Cord Protection

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles and the point where they exit from the product.

Caution

Outdoor Cable Grounding

If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. A “face plate” also needs to be installed with an isolating capacitor to prevent any damage from static.

Lightning

For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent possible damage to the product due to lightning and power-line surges.

Power Lines

An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to avoid contact with such power lines or circuits, as contact with them might be fatal.

Earthing the product

This product must be earthed properly to comply with the safety regulations in the country of use. If you are unsure of these regulations, please consult a qualified electrician.

Servicing

Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltages or other hazards. Refer all servicing to qualified service personnel. If the Set does not operate properly, switch it off and call your dealer.

Damage Requiring Service

Isolate this product from the mains supply and refer servicing to qualified service personnel under the following conditions:

If the power-supply cord or plug is damaged.

If the glass front has been damaged.

If there is ingress of water between the glass and the LCD screen.

If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.

If the product has been dropped or the cabinet has been damaged.

If the product exhibits a distinct change in performance.

Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition and the front seal is intact.

Mounting

The product should be mounted on a wall only as recommended in the instructions.

Power

This set operates on an AC supply; the voltage is as indicated on the label on the Manual. This appliance must be earthed at all times through the chassis as well as through the power lead.

Features

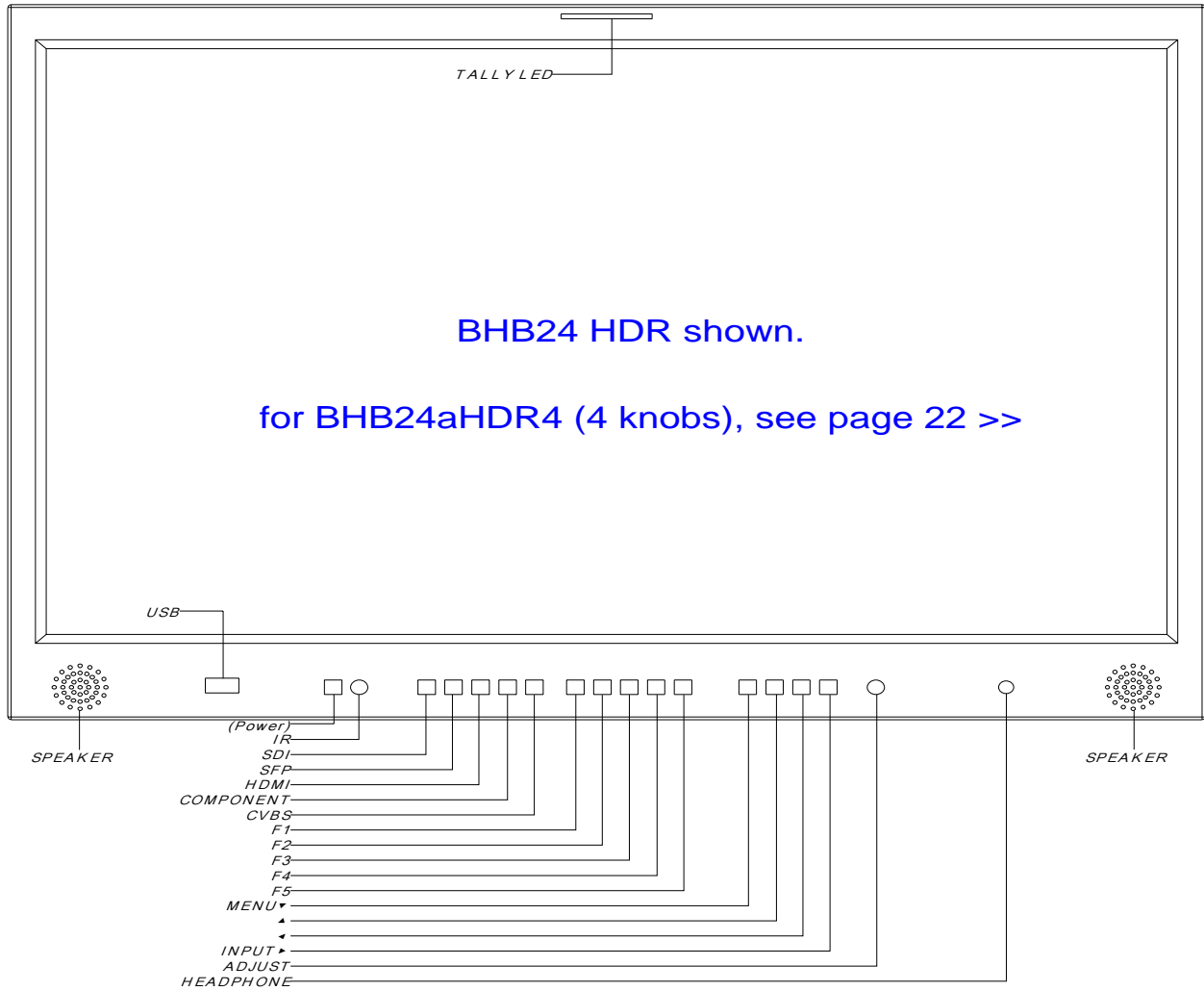
This product is the multi-format Digital LCD Panel to display various kinds of digital video input signal as 12G/HD/SD-SDI//HDMI/SFP Digital.

This is also High Definition Broadcasting Monitor which can make it available to do output of stable video signal with the menu of considering convenient user interface and the easy control for brightness and color, and by EQ function of HD-SDI input part.

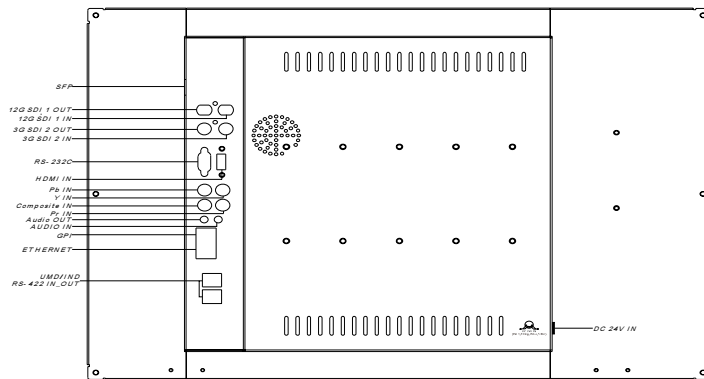
- 4K includes 1x input / 1x output
- 3G includes 1x input / 1x output & SFP x1
- HDMI input accepts up to 2160/30p 1x port
- HDMI 1.4 support (supported HDCP 1.2)
- SFP Module inputs (supported non MSA)
- High Dynamic Range(HDR) display function, PQ(2084), Hybrid Log Gamma. S-Log3
- Waveform & Vector Scope.(YPbPr,RGB, Waveform+Vector)
- 16 ch Audio Level Meter Display. (SDI only)
- Supported 3D LUT
- Custom 3D LUT File Import Through USB
- Color Temperature – User, VAR, 9300K, 6500K, 5400K, 3200K
- USB Firmware Upgrade
- Monitor Control via Ethernet/RS422/RS232
- Aspect Ratio. (Full Screen, 16:9, 4:3,14:9,1.85:1,2.85:1,Pixel to Pixel)
- Closed Caption 608, 708
- Focus Assist / Peaking filter
- Time code •Marker
- H / V Flip •H / V Delay
- UMD •Blue/Mono Only
- Supported External GPI Control (RJ-45).
- Auto Calibration: CA-210, CA-310 (Minolta), K-10 (Klein)

Controls, Indicators and Connections


BHB24HDR4 Front



BHB24HDR4 Rear



Front Keys Operations

-  (Power)

Power ON/OFF Button.

- SDI

Select SDI 1/ SDI 2 input signal.

- SFP

Select SFP 1/ SFP 2 input signal.

- HDMI

Select HDMI input signal.

- COMPONENT

Select Component input signal.

- CVBS

Select CVBS input signal

- FUNCTION 1 ~ 5

Executes functions of user selected

(Undefined, Aspect, Color Only, Level Meter, Audio Group, Audio Channel, Audio mute, H/V Delay, Flip, Marker on/off, Aspect/Area Marker, Waveform)

- MENU ▼ (Down)

Activates main OSD menu

Navigates higher menu in main OSD menu

- ▲ (Up)

Executes function (by OSD help commands) in main OSD menu

Navigates higher menu in main OSD menu

- ◀ (Left)

Decreases sound volume of speaker

Decreases values of user menu in main OSD menu

Executes function (by OSD help commands) in main OSD menu

Exits OSD menu

- INPUT ▶ (Right)

Increases sound volume of speaker.

Increases values of user menu in main OSD menu

Executes function (by OSD help commands) in main OSD menu

Activates OSD menu of input source selecting

Changes input source by selecting

- ADJUST

Adjust Picture Menu (Volume -> Backlight Adjust -> Brightness -> Contrast -> Color -> Tint -> Sharpness)

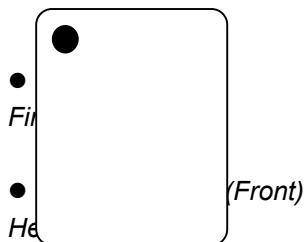
Turn Right (with 'Right' button is same)

Turn Left (with 'Left' button is same)

Controls, Indicators and Connections

REAR Panel

- 12G SDI IN_OUT
12G/3G/HD/SD SDI Input_ Loop Out
- 3G SDI IN_OUT
3G/HD/SD SDI Input_ Loop Out
- SFP IN
SFP Module IN
- HDMI
High Definition Multimedia Input
- Y/Pb/Pr
Component Y/Pb/Pr Input
- Composite
Composite (CVBS) Input
- RS-232C
Auto color calibration
- GPI
GPI 1 ~ 7 Control Port
- ETHERNET
Network System Control
- RS422 IN/OUT
Monitor System Control
- Audio IN/OUT
Y/Pb/Pr, CVBS Sound Input / AUDIO MONITOR OUT
- DC 24V IN



PIN NO	Description
1,2	GND
3	
4,5	+ 24V

MENU Basic Operation

In this menu system, there are several ways to customize the menu settings provided.

Most menus consist of three levels to set up the options, but some require greater depth for the variety of settings. If you press the **MENU** button, only the first and second level of the menu system will appear on the monitor screen. The third level can be displayed by pressing **INPUT** ▶. If a menu has more than three levels, the pop-up dialogue box will be displayed as the fourth or fifth level.

To show and remove the Menu

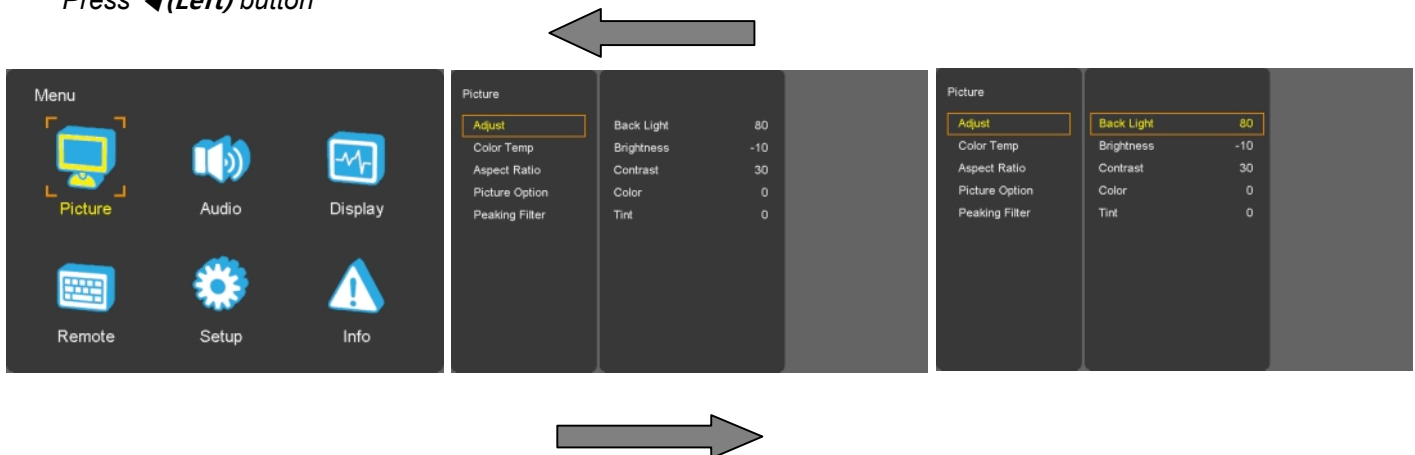
Press the **MENU** button to display the menu. A second press of the **MENU** button will take you back to monitor viewing.

To go to the next level

Press **INPUT** ▶ button.

To go back to the previous level

Press ◀ (Left) button



Typical Menu Operation

1. Press **MENU** button: The main menu will appear.
2. Use **UP/DOWN** button to select the desired menu option (icon).
3. While the desired menu option is selected, press **INPUT** to move to the second level.
4. Use **UP/DOWN** button to select the second menu option.
5. Press **INPUT** to move to the third level: Some menu options require additional steps.
6. Press **MENU** to return to the previous menu to return to monitor viewing.

Turning On the Monitor

1. First, connect power cord correctly. At this moment, the monitor switches to standby or power on mode. In standby mode, in order to turn monitor on, press the **Power** button.
2. Select the viewing source by using **INPUT** button on Keypad in front of monitor

Volume Adjustment

1. Press the **ADJUST** button on Keypad.
2. If you want to switch the sound off, press the **FUNCTION (Audio mute)** button.
3. You can cancel this function by pressing the **FUNCTION (Audio mute)** or volume control button.

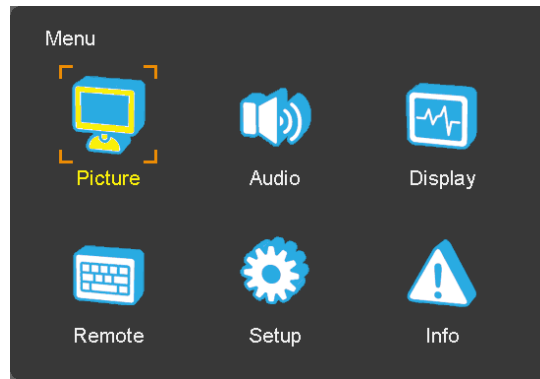
MENU Basic Operation

How to Select Video Source by OSD

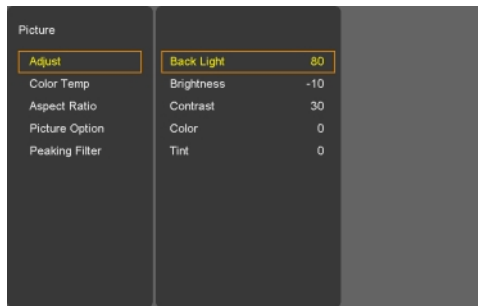
1. Press the **INPUT** button and then **UP/DOWN** button to select each video source.
2. Press the **INPUT** button to go to desired video source.
3. If Input Name is enabled, The **INPUT** button goes into input name edit mode instead of selecting source.



PICTURE MENU

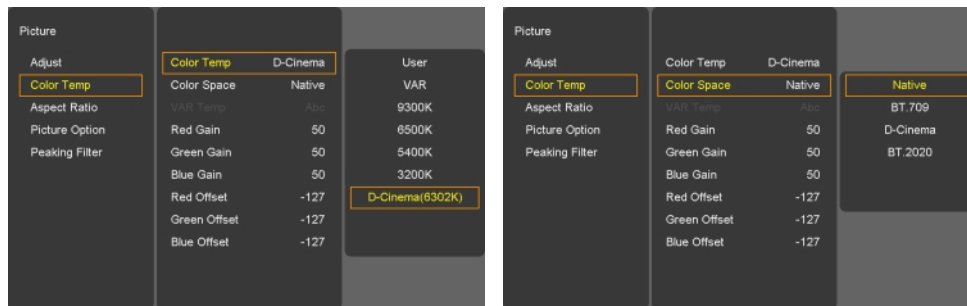


Adjust



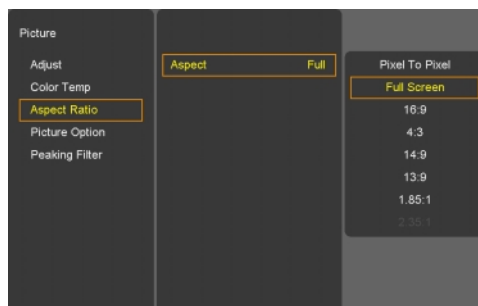
- Back Light: Inverter dimming Level select (0~100)
- Adjust the values of Brightness, Contrast, Color, and Tint directly from -50 to 50

Color Temperature Control



- For Setting the Color temperature or adjusting RGB Gain/Offset value directly
- User (User setting RGB gain value), VAR(3200K ~ 9300K), Often used value(9300K, 6500K, 5400K,3200K) and 3D LUT Calibration value(D-Cinema – 6302K)
- Color Space: Native/BT.709/D-Cinema/BT.2020 (D-Cinema & BT.2020 is not used depending on the model)

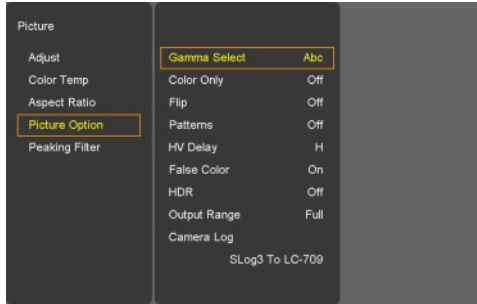
Aspect Ratio



- Pixel to Pixel – Display size is an input size. If input resolution is bigger than panel size, fit the panel size
- For setting the aspect ratio.
- Full Screen: The images are displayed with a panel size.
- Full Screen, 16:9, 4:3, 14:9, 13:9 & 1.85:1 : The images are displayed with each aspect ratio.
- Function-key operate Rotation, Full Screen, 16:9, 4:3, 14:9, 13:9 & 1.85:1.

PICTURE MENU

Picture Option



- **Gamma Select**

→Gamma Level Select (0.8 ~ 3.0)

- **Color Only**

→Mono Color/Blue only Function on/off

- **Flip**

→ H-Flip / V-Flip / H+V-Flip (without OSD)

- **Patterns**

→Auto Run, White, Red, Green, Blue, Yellow, Cyan, Magenta

- **HV Delay**

→Off / H / V / H+V

- **False Color**

→False Color on/off

- **HDR**

→ST 2084-300 / ST 2084-1000 / ST 2084-10000 / HLG

- **Output Range**

→Normal (16~235)/Full (0~255)

- **Camera Log**

→Select a camera log for the input signal.

[Off, SLog3 To LC-709, Slog3 To LC-709TypeA, Slog3 To Slog2-709, Slog3 To Cine+709, Slog2 To LC-709, Slog To LC-709TypeA, Slog2 To Slog2-709, Slog2 To Cine+709, User]

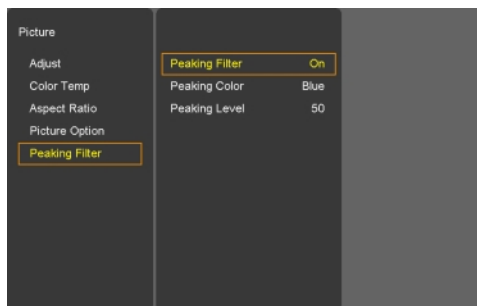
→Import User Log: Allows the user to save the Log LUT in USB memory stick to the monitor.

The saved LUT can be used in User Log.

If you insert the USB memory stick which contains the user log data to the monitor and push Enter in [Import Log Data] menu, the data is saved to the monitor.

The extension name of the LUT file is " ***.cube".

Peaking Filter

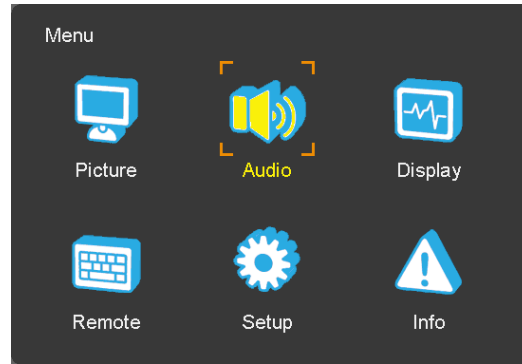


-Peaking Filter: Peaking Filter On/Off.

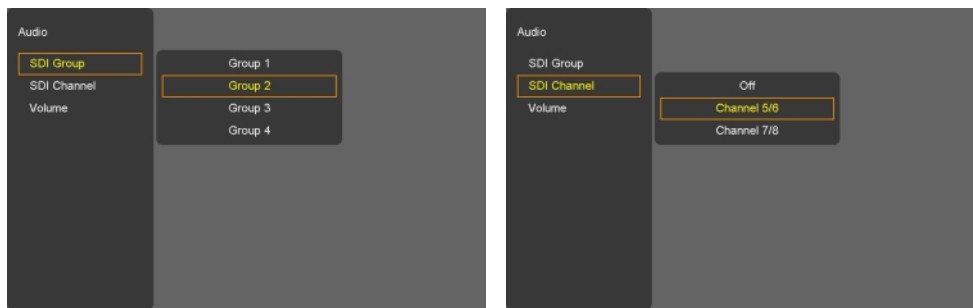
-Peaking Color: Red/Blue/White/Violet.

-Peaking Level: 0~100.

AUDIO MENU

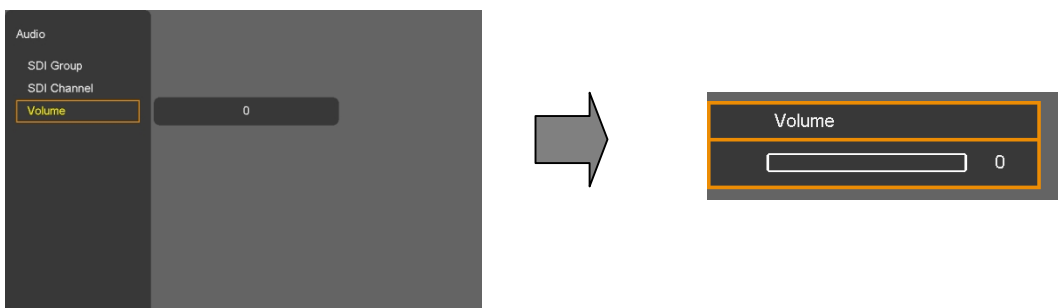


SDI Group/Channel



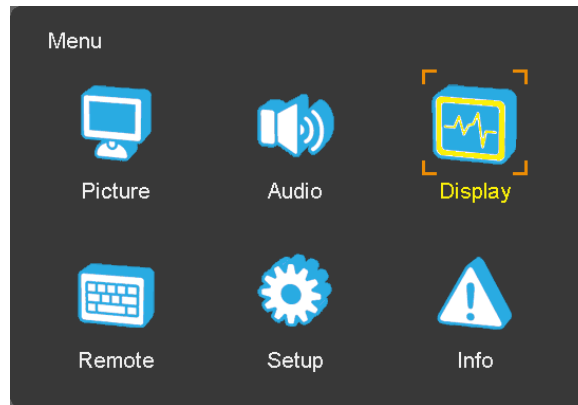
- SDI Audio output Group & Channel source select
- Group 1 : Channel 1/2, 3/4
- Group 2 : Channel 5/6, 7/8
- Group 3 : Channel 9/10, 11/12
- Group 4 : Channel 13/14, 15/16

Volume

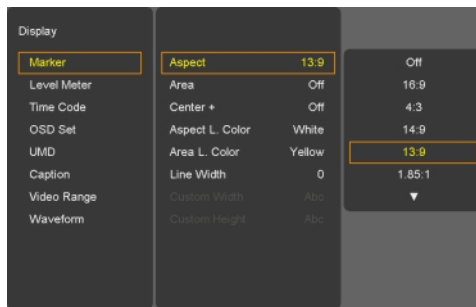


- Adjust the speaker or headphone Volume level.

DISPLAY MENU



Marker



- **Aspect**

- 16:9, 4:3, 14:9, 13:9, 1.85:1, 2.35:1, 1.85:1&4:3, Custom fitted panel size marker on screen.

- **Area**

- Area: Draw dotted line Marker on screen in case of images.
(16:9 95/93/90/88/80%, 4:3 95/93/90/88/80%, EBU Action 16:9/14:9/4:3, EBU Graphic 16:9/14:9/4:3)

- **Center Maker**

- "+" Marker on center of screen

- **Aspect L. Color**

- Marker Line Color Select. (WHITE, YELLOW, BLUE, RED, BLACK)

- **Area L. Color**

- Area Line Color Select. (WHITE, YELLOW, BLUE, RED, BLACK)

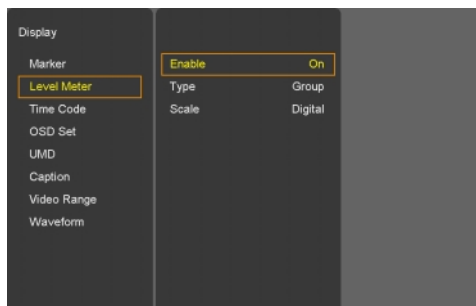
- **Line Width**

- Marker line thickness setting. (0~10)

- **Custom Marker**

- The user wants Marker size setting. (Below panel size)

Level Meter



- Display the audio level meter on screen in all input.

- **Type**

- Pair / Group

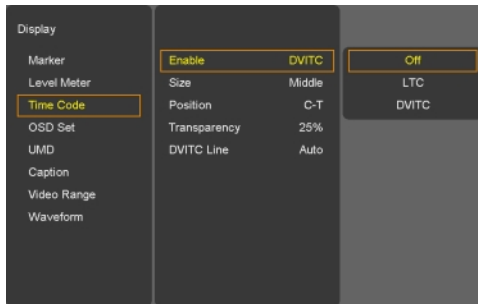
- **Scale**

- Level Meter Scale mode selects.

(Digital/Nordic/BBC/EBU/DIN/Expanded DIN/SMPTE VU/EBU VU/France VU)

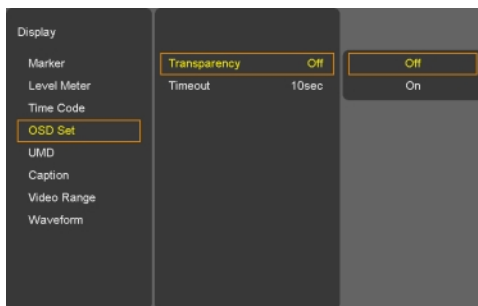
DISPLAY MENU

Time Code



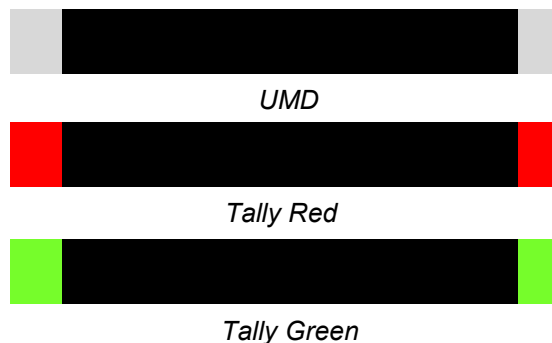
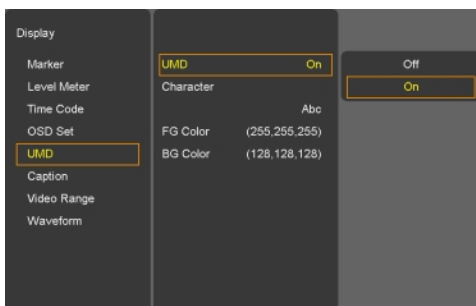
- **Enable**
 - Time code Display (off/LTC/DVITC_SD1 only)
- **Size**
 - Time code size select. (Small, Middle, Large)
- **Position**
 - Time code display position selects (L-T, C-T, R-T, L-B, C-B, R-B)
- **Transparency**
 - Disable blending Time code background with video image. (0%, 25%, 50%, 75%, 100%)
- **DVITC Line**
 - Auto, Line 1 ~ 31

OSD Set



- **Transparency**
 - Disable blending OSD background with video image.
- **Timeout**
 - OSD gone time setting. (On/5/10/20/30/40/50/60 sec)

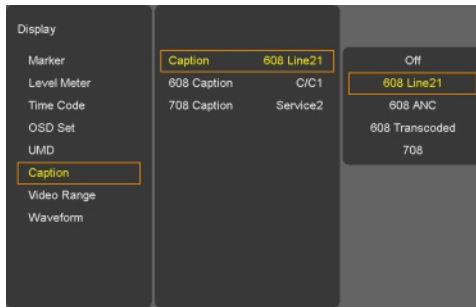
U.M.D



- **UMD**
 - UMD display on/off
- **Character**
 - UMD Character Select
- **FG Color**
 - UMD Character color Select (RGB_255_192_128_0_Transparent)
- **BG Color**
 - UMD BG color Select (RGB_255_192_128_0_Transparent)

DISPLAY MENU

Caption



- **Caption**

-608 Line21, 608 ANC, 608 Transcoded, 708 mode Select

- **608 Caption**

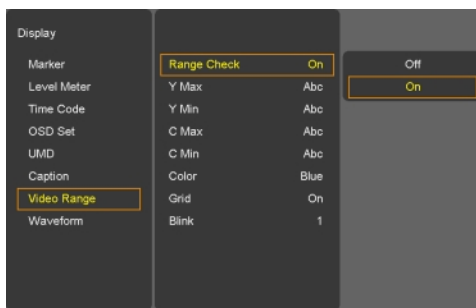
-608 Caption mode Select. (C/C1, C/C2, C/C3, C/C4, TEXT1, TEXT2, TEXT3, TEXT4, OFF)

- **708 Caption**

-708 Service mode Select. (Service 1/Service 2)

* Caption data cannot display with OSD.

Video Range



-Range Check: Range Check on/off.

-Y Max: Maximum luminance level.

-Y Min: Minimum luminance level.

-C Max: Maximum chroma level.

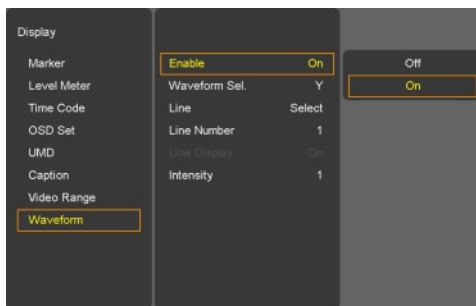
-C Min: Minimum chroma level.

-Color: Black/Blue/Red/Green

-Grid: Grid line on/off

-Blink: Y/C Min-Max to blink. (0~7)

Waveform



-Enable: Waveform, Vector Display on/off. (only SDI)

-Waveform Sel: Waveform Mode select. (Y, VT, Y+VT, YCbCr, GBR)

-Line All: Waveform & Vector Scope display.

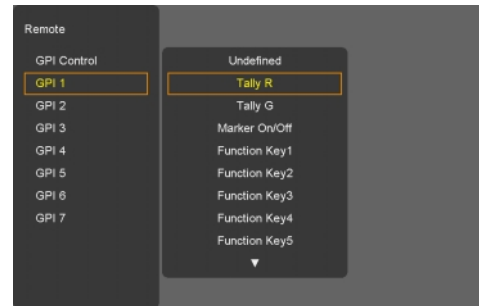
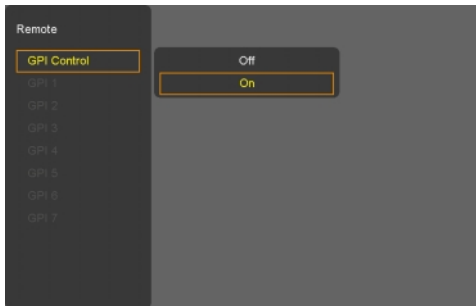
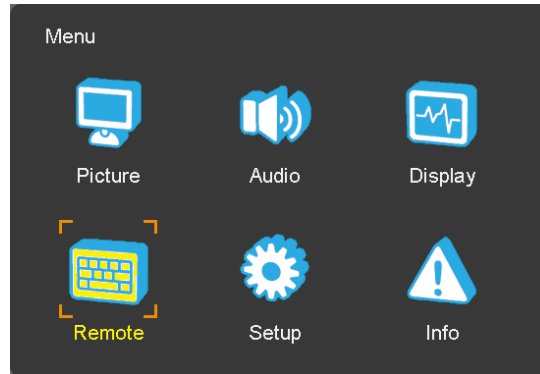
-Line Select: Used to select specific Vertical Line for Waveform/Vector scope.

-Line Number select: In WAVEFORM/VECTOR, use the Up/Down button or Adjust Turn Right/ Left to select User's desired line.

-Line Display: off/on/5 sec

-Intensity: 1~63

Remote MENU

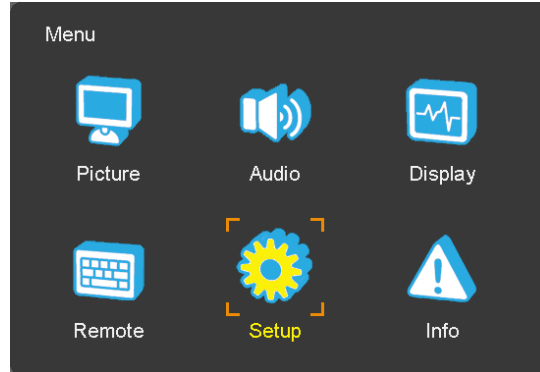


GPI Control & GPI#

- For allocating functions to particular GPI pins.
- When remote control operations are to be performed using the GPI Controller.
- GPI Control: GPI function Enable/Disable
- GPI 1 ~ 7

GPI Function	Description
Undefined	Not set (no function allocated)
Tally R, Tally G	For lighting up the Red or Green tally lamp.
Marker On/Off	Displays the marker.
Function 1~5	Activates FUNCTION 1~6 buttons
Aspect Marker	Marker size Select.
Area Marker	Area Marker size Select.
Center Marker	Displays the center marker.
Input SDI1, Input SDI 2, Input Quad, Input 2SI, Input HDMI	Switches the input source.
Menu Key, Enter Key, Up Key, Down Key Left Key, Right Key	Use the key function by GPI.
H/V Delay	H/V Delay On/Off
GPI 7 : Power Key(Fixed)	

SETUP MENU

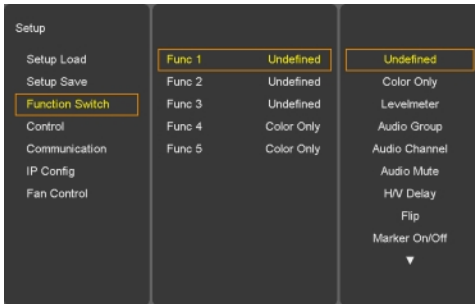


Setup Load & Setup Save



- *Factory: User Reset.*
- *Setup Load: Load user saved values or default value*
- *Setup Save: Save user setting values at user 1, 2, 3.*

Function Switch

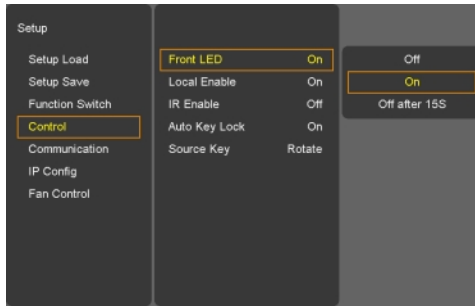


- *Function 1~5: Select the function to be allocated to the F1~F5 buttons*

Function1~5 button	Description
Undefined	Not set (no function allocated)
Aspect	Sets the aspect ratio of the images
Color Only	Execute Mono color or Blue Only
Level Meter	Level Meter on/off
Audio Group	Select the extract the embedded audio group in SDI input.
Audio Channel	Select the extract the embedded audio channel in SDI input.
Audio Mute	Toggles sound status of speaker/headphone in mute.
H/V Delay	H Delay -> V Delay -> HV Delay -> off
Flip	H -> V -> H+V -> off
Marker	Marker on/off
Aspect / Area Marker	Aspect/ Area Marker Select
Waveform	Waveform on/off

SETUP MENU

Control



- **Auto Key Lock**

- If it does not work 10 minutes to lock automatically. Key button is operated after being pressed about 2 seconds

- **Source Key (Front “Input” Button/ Remote Controller “Source” Button)**

-Menu: Select the input signals to the input menu OSD.

-Rotate: Press Button to rotate the input source.

- **Front LED**

- Front LED on/off/off after 15s

- **Local Enable**

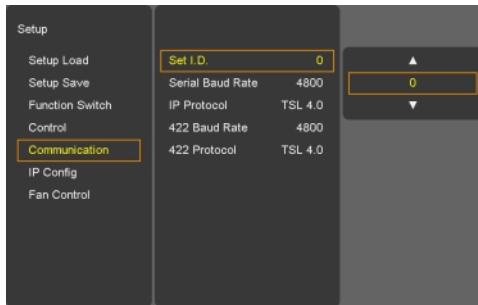
-Power, up and down key is only worked, if Local enable is off.

- **IR Enable**

- Select the controller of local or remote. If remote controller is selected, both local (front key) and remote are worked.

However select local, local key only operated.

Communication



- **Set ID (01~99)**

- If control each Board, must set ID numbers of each Board

- **Serial Rate _ 422 Baud Rate**

- 2400/4800/9600/19200/38400/57600/115200

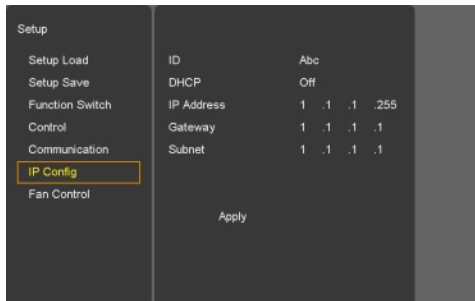
- **IP Protocol**

- Remcon / TSL 4.0, /TSL 5.0

- **422 Protocol**

- Remcon / TSL 4.0 / RDU

IP Config



- **ID**

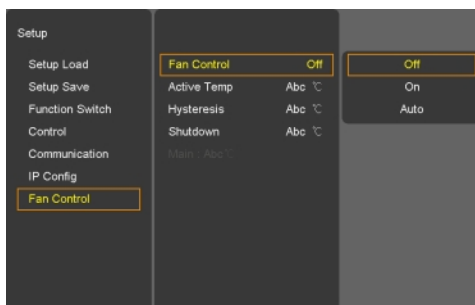
-Network ID Character Select

- **DHCP**

-DHCP on/off (Manual IP settings – DHCP on)

* “Apply” enter all settings after.

Fan Control



- **Fan Control**

- Internal Fan Controls driving option by temperature sensor
Auto / force on / force off

- **Active Temp**

- Adjusts fan driving temperature by Celsius degree. It works only when the Fan Control setting is Auto.

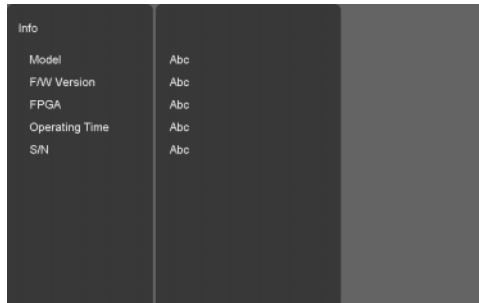
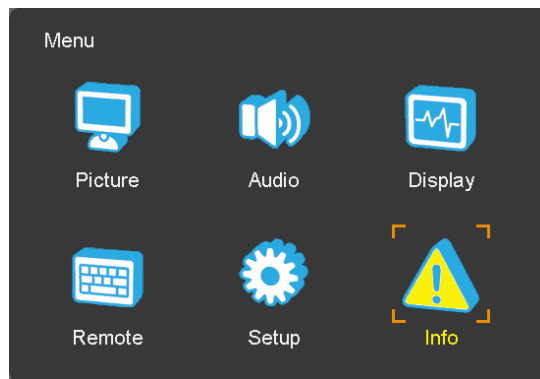
- **Hysteresis**

- Adjusts fan driving hysteresis temperature by °C. (1~10°C)

- **Shutdown**

- For a monitor protection is above of 85°C, Power Off.

Info MENU



- Model, F/W Version, FPGA, Operating Time

Input Support Mode

Support Signals

Items		Specifications
Supported Signals	Serial Digital Interface	12G 3G HD SD SDI (Not Supported Dual link)
	HDMI	720p / 1080p / 2160p(30hz)

Support Timings

- SDI Input

SMPTE ST 2082	3840x2160(50/59.94/60p), 4096x2160(50/59.94/60p)
SMPTE-428.1M	2048x1080P(24/25)
SMPTE-425M(3G)	1920x1080P(50/60)
SMPTE-259M	1920x1080i(50)
SMPTE-274M	1920x1080i (50/59.94/60)
	1920x1080P (30Psf/25Psf/24Psf/30)
SMPTE-296M	1280x720P (50/59.94/60)
SMPTE-125M	480i(59.94)
ITU-R BT.601	576i(50)

