

*High-Definition Serial Digital Interface  
Multi Format 4K LCD Monitor*

# User Manual



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**Before operating the set, 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.

#### **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***

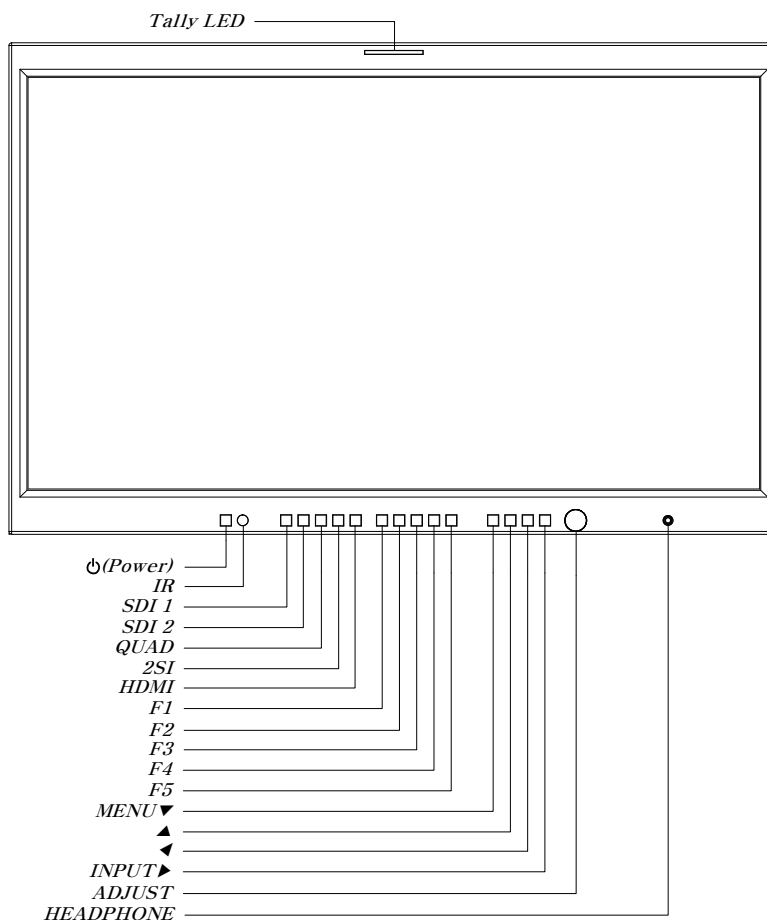
This set operates on an AC supply; the voltage is as indicated on the label on the Manual. This appliance must be earthed at all times through the chassis as well as through the power lead.

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

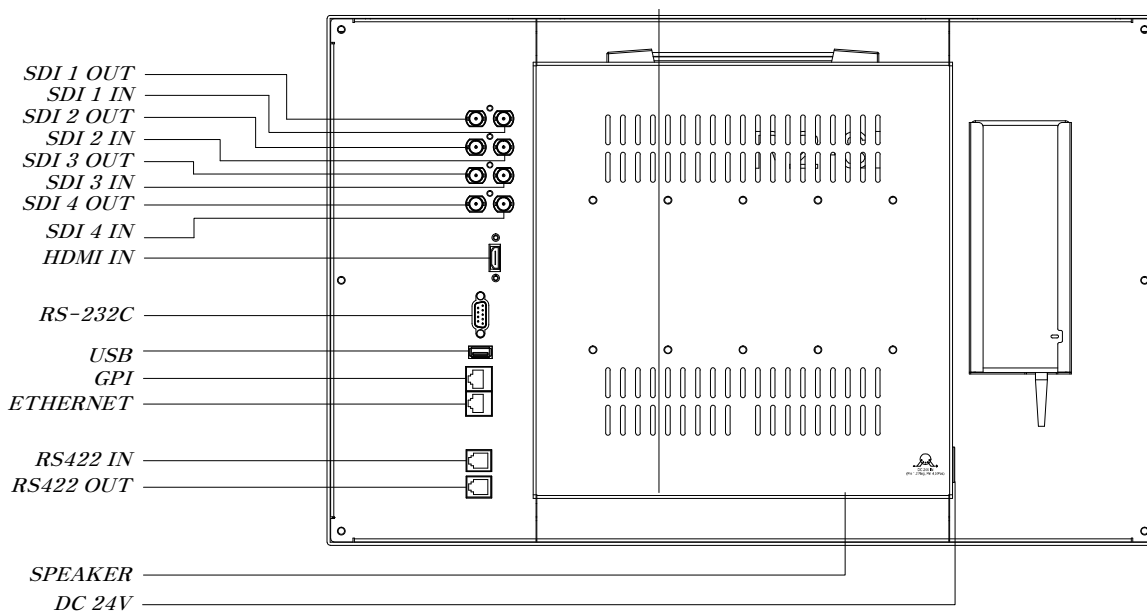
*This is also High Definition Broadcasting Monitor which can make it available to do output of stable video signal with the menu of considering convenient user interface and the easy control for brightness and color, and by EQ function of HD-SDI input part.*

- *4K includes 2x input / 2x output (Not Supported Dual link/ SD Timing)*
- *Quad Link Display (Square Division, 2 Sample interleave)*
- *HDMI input accepts up to 2160p 1x port (Not Supported 4:2:0 Color Format)*
- *HDMI 2.0 support (Not supported HDCP)*
- *ETHERBET (System Control) / Firmware Upgrade*
- *3D LUT*
- *Color Temperature – User, VAR, 9300K, 6500K, 5400K, 3200K*
- *USB Firmware Upgrade*
- *16 ch Audio Level Meter Display. (SDI only)*
  - *Lever Meter Position display selectable*
- *Focus Assist / Peaking filter*
- *Time code*
- *H / V Flip*
- *H / V Delay*
- *Marker*
- *Aspect Ratio*
- *Over Scan/Zero Scan/Under Scan/Pixel to Pixel*
  - *Auto Calibration: CA-210, CA-310 (Minolta), K-10 (Klein)*
- *Supported External GPI Control (RJ-45).*
- *UMD*
- *Supported RS-232C, RS-422.*


## BVB4K-24 Front



## BVB4K-24 Rear



## Front Keys Operations

-  (Power)

Power ON/OFF Button.

- SDI 1 / SDI 2 Input

Select SDI 1/ SDI 2 input signal.

- QUAD

Select QUAD-SDI input signal.

- 2SI

Select 2-SAMPLEINT-SDI input signal.

- HDMI

Select HDMI 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, Scan, Flip, Marker on/off, Aspect/Area Marker, Gamma Select)

- 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)

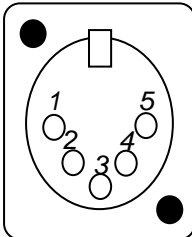
Turn Right (with 'Right' button is same)

Turn Left (with 'Left' button is same)



## REAR Panel

- **SDI 1/SDI 2 IN\_OUT**  
12G/HD SDI / SD SDI Input\_ Loop Out
- **SDI 3/SDI 4 IN**  
SDI 3, SDI 4 Only Quad Input
- **SDI 3/4 OUT**  
SDI 3/4 Loop Out
- **HDMI**  
High Definition Multimedia Input
- **RS-232C**  
Auto color calibration
- **USB**  
Firmware Upgrade
- **GPI**  
GPI 1 ~ 7 Control Port
- **ETHERNET**  
Network System Control/ Firmware Upgrade
- **RS422 IN/OUT**  
Monitor System Control
- **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

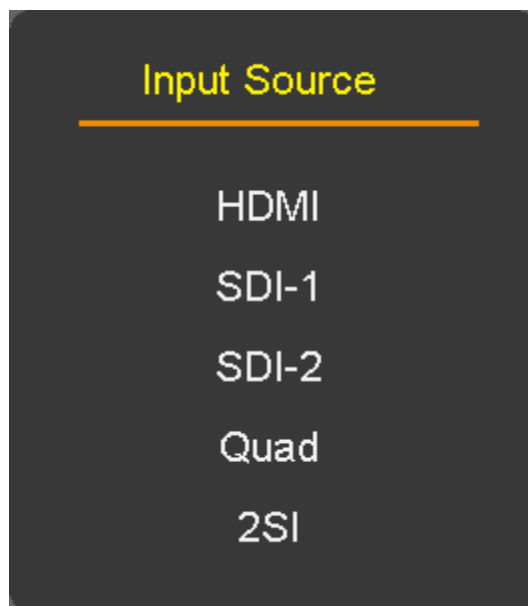
1. First, connect power cord correctly. At this moment, the monitor switches to standby or power on mode. In standby mode, in order to turn monitor on, press the **Power** button.
2. Select the viewing source by using **INPUT** button on Keypad in front of monitor

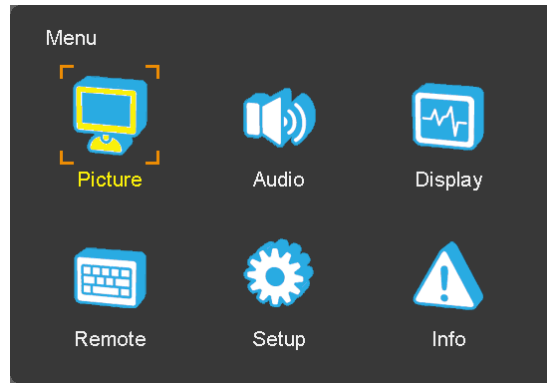
## Volume Adjustment

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.

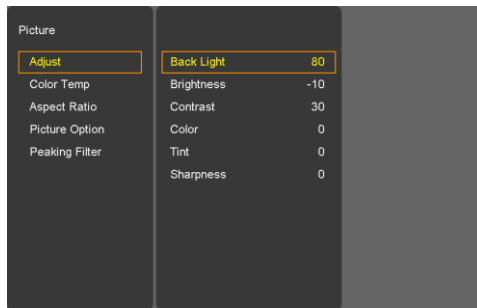
## How to Select Video Source by OSD

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.



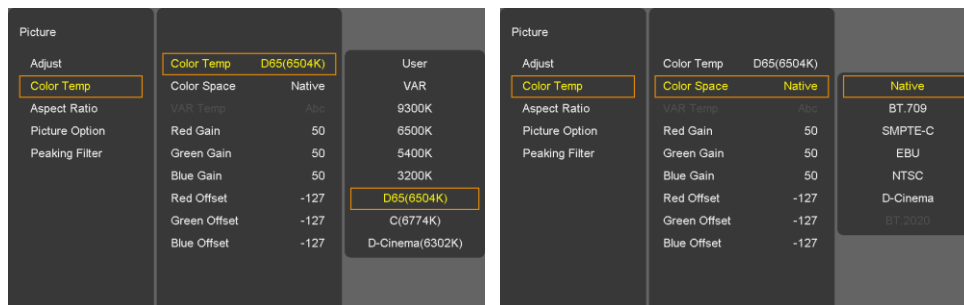


## Adjust



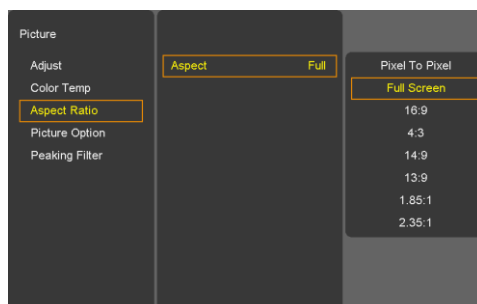
- Back Light: Inverter dimming Level select (0~100)
- Adjust the values of Brightness, Contrast, Color, Tint and Sharpness directly from -50 to 50

## Color Temperature Control



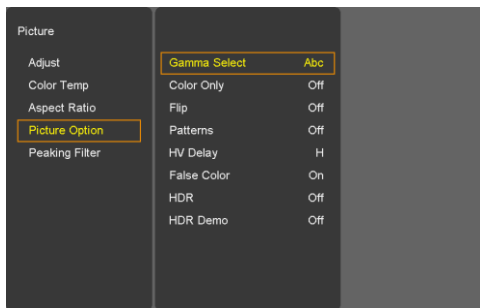
- For Setting the Color temperature or adjusting RGB Gain/Offset value directly
- User (User setting RGB gain value), VAR(3200K ~ 9300K), Often used value( 9300K, 6500K, 5400K,3200K) and 3D LUT Calibration value(D65 – 6504K/C–6774K/D-Cinema – 6302K)
- Color Space: Native/BT.709/SMPTE-C/EBU/NTSC/D-Cinema

## 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, 2.35:1: 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 & 2.35:1

## 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**

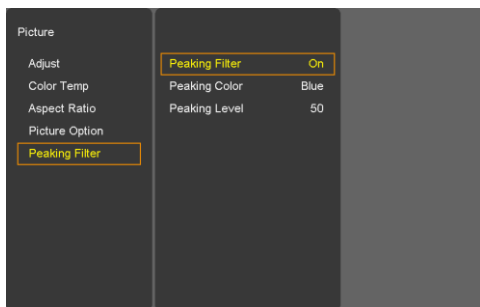
→False Color on/off

- **HDR**

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

→HDR Demo on/off

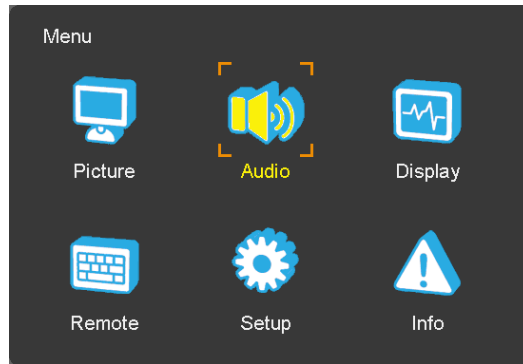
## Peaking Filter



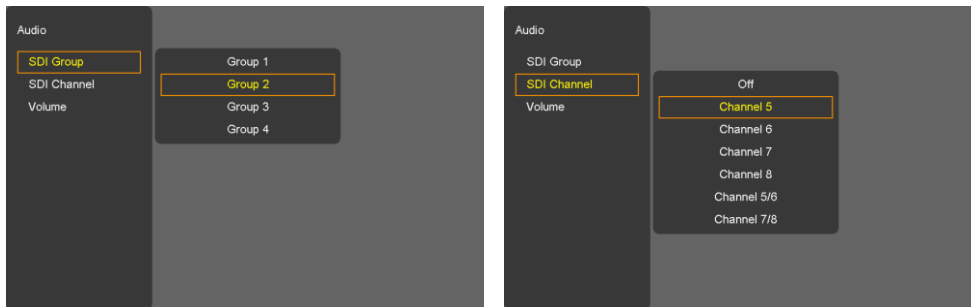
-Peaking Filter: Peaking Filter On/Off.

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

-Peaking Level: 0~100.

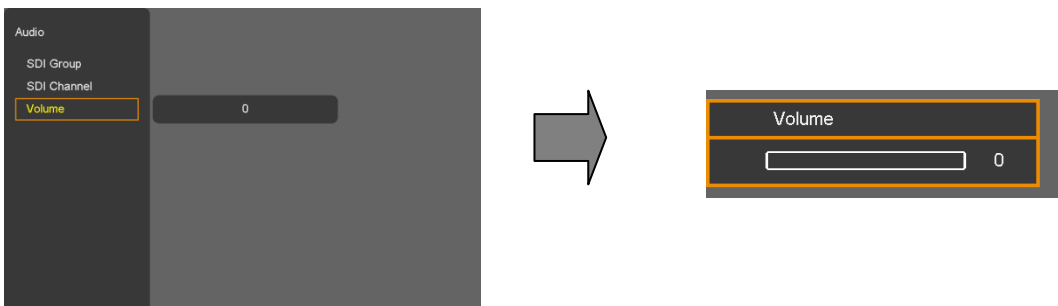


## SDI Group/Channel

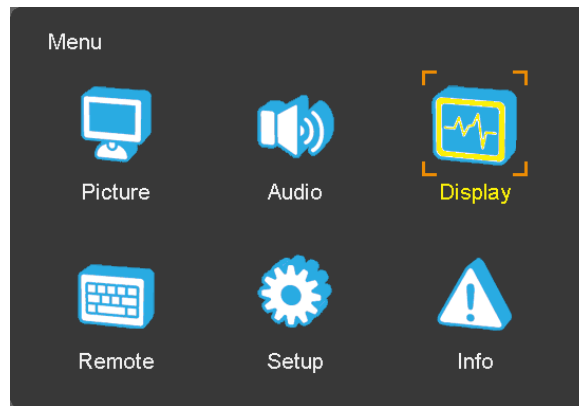


-SDI Audio output Group & Channel source select

## Volume

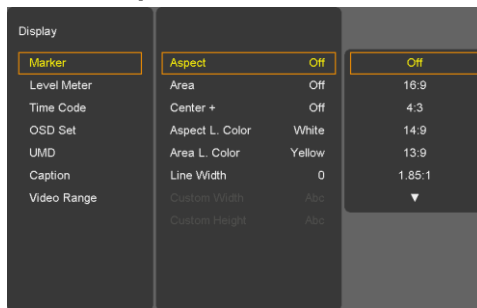


- Adjust the speaker or headphone Volume level.



## 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)

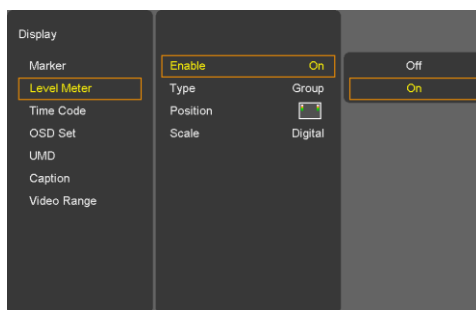
- **Line Width**

- 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 SDI/HDMI input.

- Audio level meter cannot display with OSD.

- **Type**

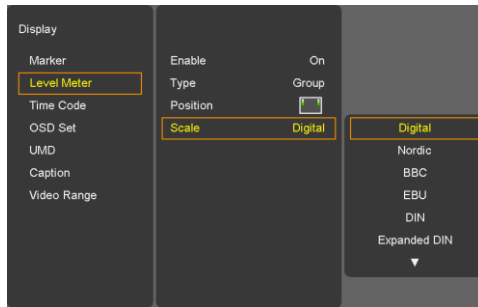
-Pair: Respectively Channel with right and left display

-Group: Respectively group display

- **Position**

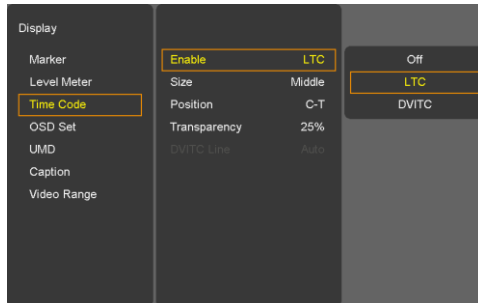
- Level Meter Position selects. ( )

## ● Scale



- Level Meter Scale mode selects.  
(Digital/Nordic/BBC/EBU/DIN/Expanded DIN/SMPTE VU/EBU VU/France VU)

## Time Code



### ● Enable

- Time code Display (off/LTC/DVITC, SDI 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)

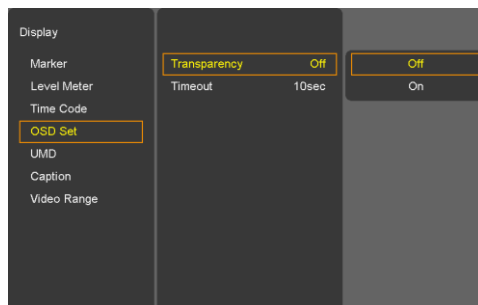
### ● Transparency

- Disable blending Time code background with video image. (0%, 25%, 50%, 75%, 100%)

### ● DVITC Line

-Auto, Line 1 ~ 31

## OSD Set



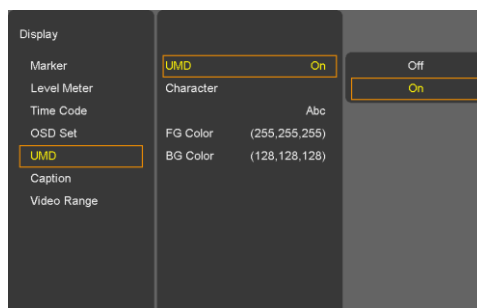
### ● Transparency

- 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



Tally Red



Tally Green

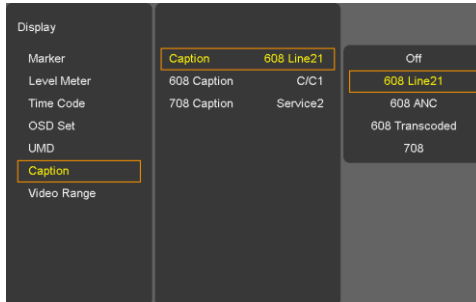
### ● UMD

- UMD display on/off



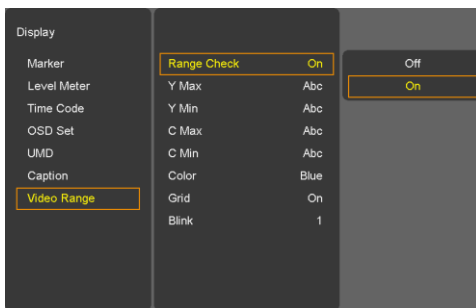
- **Character**
- UMD Character Select
- **Position**
- UMD display position select. (L-T, C-T, R-T, L-B, C-B, R-B)
- **FG Color**
- UMD Character color Select (RGB\_255\_192\_128\_0\_Transpareut)
- **BG Color**
- UMD BG color Select (RGB\_255\_192\_128\_0\_Transpareut)

## Caption

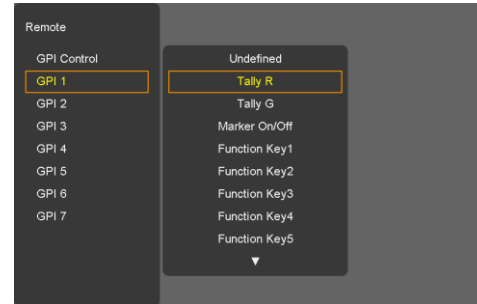
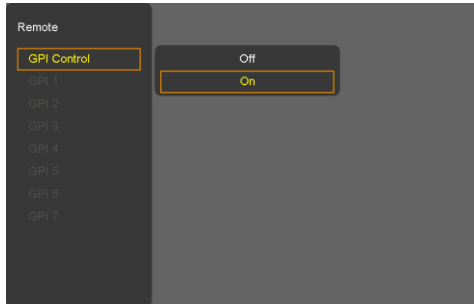
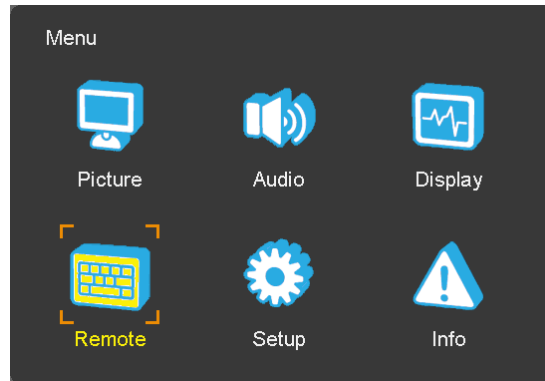


- **Caption**
- 608 Line21, 608 ANC, 608 Transcoded, 708 mode Select
- **608 Caption**
- 608 Caption mode Select. (C/C1, C/C2, C/C3, C/C4, TEXT1, TEXT2, TEXT3, TEXT4, OFF)
- **708 Caption**
- 708 Service mode Select. (Service 1/Service 2)

## Video Range



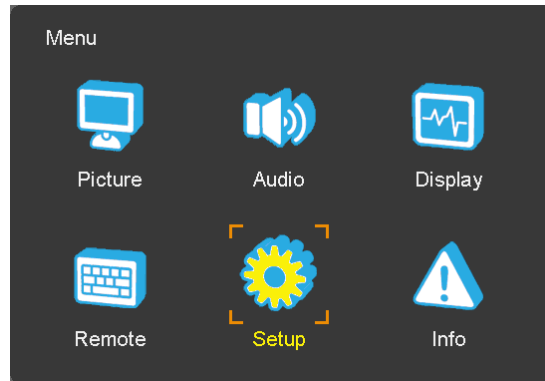
- Range Check: Range Check on/off.
- Y Max: Maximum luminance level.
- Y Min: Minimum luminance level.
- C Max: Maximum chroma level.
- C Min: Minimum chroma level.
- Color: Black/Blue/Red/Green
- Grid: Grid line on/off
- Blink: Y/C Min-Max to blink. (0~7)



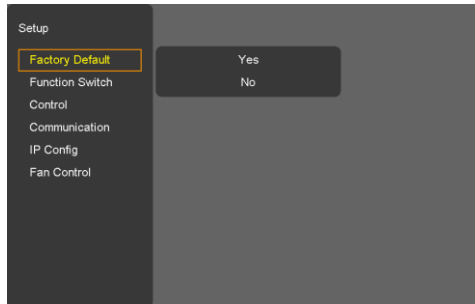
## GPI Control & GPI#

- 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	Sets the aspect ratio of the images
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)	

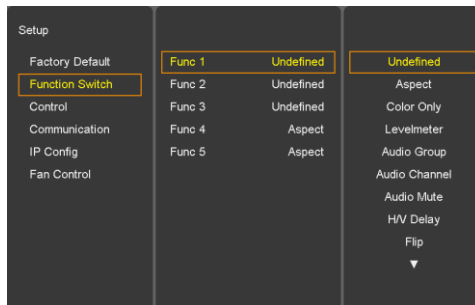


## Factory Default



- Factory Default: User Reset.

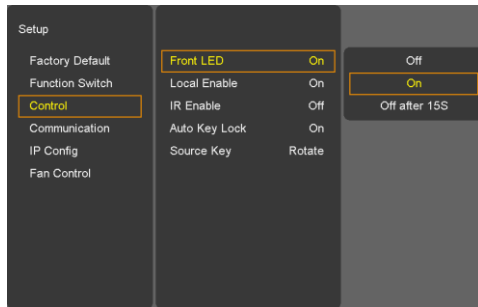
## Function Switch



- Function 1~5: Select the function to be allocated to the FUNCTION 1~5 buttons

Function1&2 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
Gamma Select	Gamma Select

## Control



- **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.

- **Auto Key Lock**

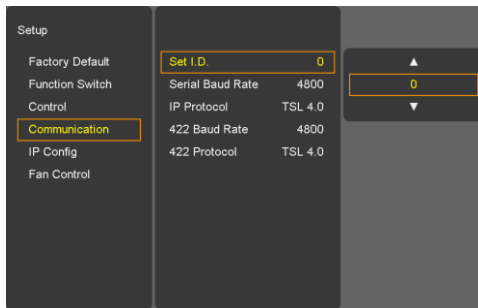
- If it does not work 10 minutes to lock automatically. Key button is operated after being pressed about 2 seconds

- **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.

## Communication



- **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

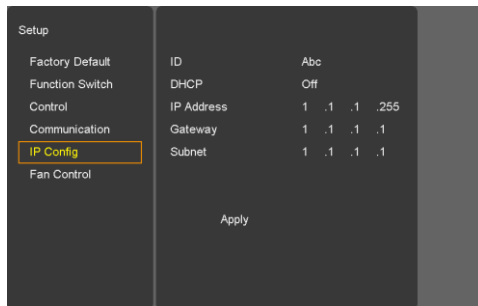
- **IP Protocol**

- Remcon / TSL 4.0, /TSL 5.0

- **422 Protocol**

- Remcon / TSL 4.0 / RDU

## IP Config



- **ID**

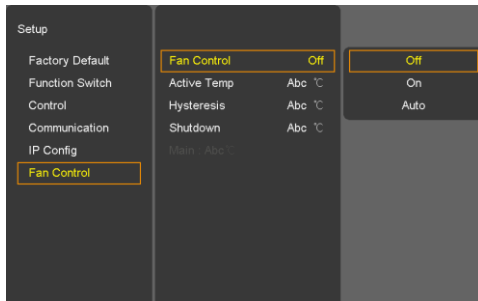
-Network ID Character Select

- **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**

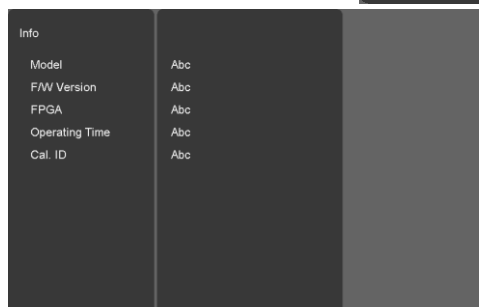
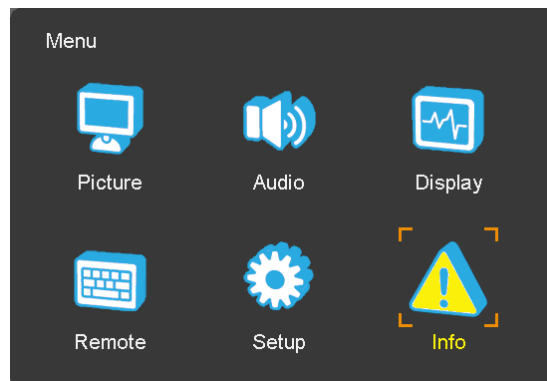
- Adjusts fan driving temperature by Celsius degree. It works only when the Fan Control setting is Auto.

- **Hysteresis**

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

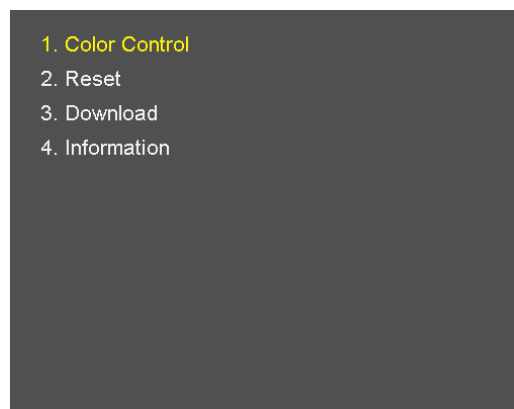
- **Shutdown**

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



- Model, F/W Version, FPGA, Operating Time, Cal. ID

# Factory MENU



## Factory mode menu entry

-Front key: "Menu" + "UP" for about 5 seconds. (Until the menu OSD disappears)

-IR: Press ATTENTION button (Input source OSD On)

Press 0 + 0 + 7 + 8

## Color Control



- Adjust the values SUB Brightness/Contrast/Red/Green/Blue.  
(0~255)

## Reset

### Factory RESET!

Press Enter To Reset Factory Default  
Press Enter To Reset Operating Time  
Press Enter To Reset Calibration Data

- **Reset Factory Default**  
- All setting values are initialized.  
(Except Operating Time/Calibration Data)

- **Reset Operating Time**  
- Operating Time reset.

- **Reset Calibration Data**  
- Calibration Data reset.

## Download

### Download

Press Enter To FW Download  
Press Enter To FPGA Download  
Press Enter To OSD Download

- Used to upgrade the firmware using the USB memory.  
-Do not turn off the monitor while the upgrade is conducting.

- **FW Download**  
-Insert the USB memory containing the file ("Thetis733.bin") into the USB port.  
-Select the "FW Download" menu to start the firmware upgrade  
-Time required: about 10 seconds

- **FPGA Download**  
-Insert the USB memory containing the file ("Thetis.pof") into the USB port.  
-Select the "FPGA Download" menu to start the FPGA upgrade  
-Time required: About 3 to 4 minutes

- **OSD Download**  
-Insert the USB memory containing the file ("Boland\_OSD.dat / Boland\_Font.dat") into the USB port.  
-Select the "FPGA Download" menu to start the OSD upgrade  
-Time required: About 5 to 6 minutes

## Version

### Version

Version	Abc
Release day	Abc
Release time	Abc
Panel on Time	Abc

- Version / Release day / Release time / Panel on Time

# Input Support Mode

## Support Signals

Items		Specifications
Supported Signals	Serial Digital Interface	12G 3G HD SDI (Not Supported Dual link/ SD Timing)
	HDMI	720p / 1080p / 2160p (Not Supported 4:2:0 Color Format)

## Support Timings

- SDI Input

SMPTE ST 2082	3840x2160(50/59.94/60p),
SMPTE-428.1M	2048x1080P(24/25)
SMPTE-425M(3G)	1920x1080P(50/60)
SMPTE-260M	1920x1035i(60/59.94)
SMPTE-259M	1920x1080i(50)
SMPTE-274M	1920x1080i (50/59.94/60)
	1920x1080P (30Psf/25Psf/24Psf/30)
SMPTE-296M	1280x720P (50/59.94/60)

# Mechanical Dimension

## BVB4K-24

