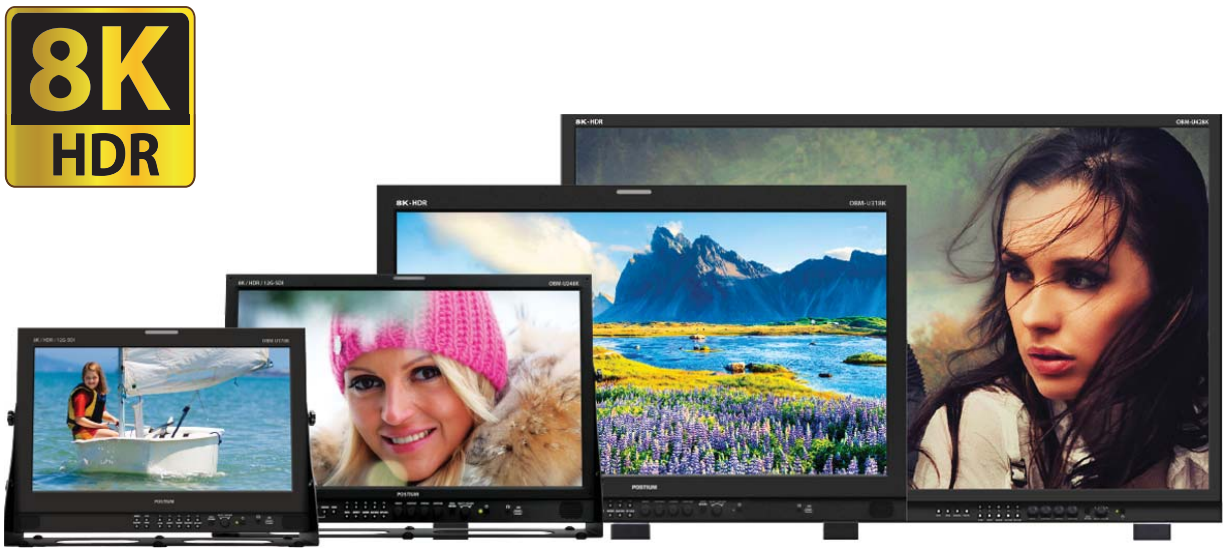
User Manual

OBM-8K Series

Professional Video 8K Monitor



Operational Instructions

OBM-U178K
OBM-U248K
OBM-U318K
OBM-U428K

postium®
www.postium.com

Ver.23.2

Table of Contents

1. Precaution

Always use set voltage.
AC 100 ~ 230V, 50/60Hz
DC 24V(OBM-U178K, OBM-U248K, OBM-U318K), U428K cannot be connected to DC.

All these instructions should be read and understood before operating the unit.

If liquid is spilled on or impacts this product, please disconnect the product immediately and seek professional help before continued use.

Unplug the product from the wall outlet if it is not to be used for several days or more.

Keep the product in a well-ventilated place to prevent overheating.

Do not install the product near any heat-generating equipment. Also, keep the product out of direct sunlight or dusty areas.

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
When using other DC 24V(OBM-U178K, OBM-U248K, OBM-U318K) adapters instead of the standard adapter provided by the manufacturer, please check the proper load capacity or current capacity and use an adapter with stable voltage.

Do not overload AC outlets or extension cords. Overloading can cause fire or electric shock.

A very small proportion of pixels may be stuck, either always off (black), always on (red, green, or blue), or flashing. In addition, over a long period of use, because of the physical characteristics of the liquid crystal display, such stuck pixels may appear spontaneously. These problems are not a malfunction.

If a fixed picture such as a frame of a divided picture or time code, or a still picture is displayed for a long time, an image may remain on the screen and be superimposed as a ghosting image.

The permanent burn-in may occur for LCD panel if still images are displayed in the same position on the screen continuously, or repeatedly over extended periods.
To reduce the risk of burn-in,
a. Turn off the character displays.
b. Turn off the power when not in use.
c. Turn off the power if the monitor is not to be used for a prolonged period of time.

Do not attempt to service the product yourself. Removing covers can expose you to high voltage and other dangerous conditions. Request a qualified service person to perform servicing.

When the product needs replacement parts, make sure that the service person uses replacement parts specified by the manufacturer, or those with the same characteristics and performance as the original parts. Use of unauthorized parts may result in fire, electric shock and/or other danger.

Only clean the product with a noncommercial, mild and neutral detergent.

Do not throw away the carton and packing materials. When transporting the product, make use of its original packaging for safer carriage.

FCC (Federal Communications Commission)

This equipment has been tested and found to comply with the limits for class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

⚠ Warning!! : Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Disposal of Old Electrical & Electronic Equipment

(Applicable in the European Union and other European countries with separate collection systems)

This symbol on the product or on its packing indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequence for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources.

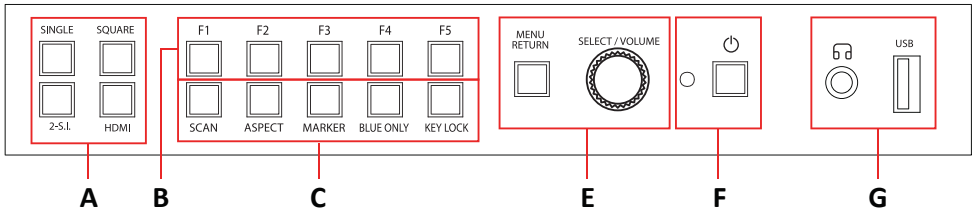
2. Main Features

8K/4K professional monitor OBM-8K Series unit has the following features:

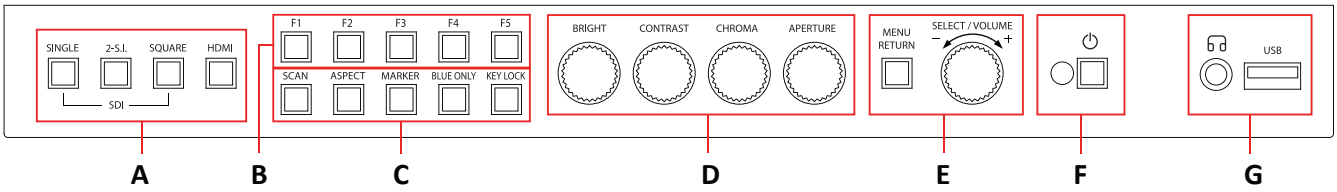
· 12G SDI Quad Link 8K / 12G-SDI Single Link 4K
· 6G-SDI Dual Link 2-S.I. 4K
· 3G-SDI Quad Link Square Division 4K / 3G-SDI Quad Link 2-Sample Interleave (2-S.I.) 4K
· Dual SFP Module Inputs (ST 2022-6 Support)
· HDMI 2.0 Input
· HDR(High Dynamic Range) Display supporting PQ (ST 2084), Hybrid Log Gamma, S-Log3
· Wide Color Gamut Supporting ITU-R BT.709, SMPTE-C, EBU, Native, DCI-P3, ITU-R BT.2020
· Internal color processing 72bit(24bitx3) + Native 33x33x33 30bit 3D-LUT
· 1.073 Billion Colors
· Gamut Error
· Black stretch
· Camera Log Conversion
· Custom 3D LUT file Import Through USB
· Gamma Selection (1.0 ~ 3.0)
· SDR EOTF- BT.1886 (Gamma 2.4)
· Color Temperature (3200K, 5500K, 6500K, 9300K, USER 1/2/3, D-CINEMA)
· Monitor Control via Ethernet, RS-422
· Image Division & Link Order Auto Detection
· Waveform, VectorScope (Wave + Vector)
· HDR Waveform
· Various Markers (EBU, 4:3, 16:9, 1.85:1, 2.35:1, Variable Custom)
· Zero Scan
· Time Code Display
· De-embedded 8~16ch Audio Level Meter
· Internal Pattern Display for Color Test (Black ~ 100% White, Color Bar)
· Remote Control via GPI(RJ-45) Port
· False Color : Zebra, Color Pattern, ARRI
· Easy Firmware Update by USB
· System Data Copy
· H/V Delay
· Blue/Mono Only
· Focus Assist
· 3 Color TALLY Lamp
· HDR Auto Setting
· Aspect
· Freeze

3. Location and Function of Parts and Controls

Front Panel (OBM-U178K)



Front Panel (OBM-U248K / U318K / U428K)



A : Input select Buttons/Lamp

Press to monitor the signal input to each connector.

[SINGLE] Button/Lamp

- Press the button to select SDI input or SFP input for one channel.
- Mode changes in the order of [12G SDI-1], [12G SDI-2], [3G SDI-3], [3G SDI-4], [SFP]*.([SFP-1],[SFP-2]*)

*SFP input is set deactivated in the default setting. Change the menu setting to activate SFP input.
MENU > User Configuration > [2/7] > SFP Enable > Enable

**Note

How to make a quick input change: When you push [SINGLE] button and the current input indicator is displayed, turn the [SELECT/VOLUME] knob to select another input and push the knob, then you can go to another input directly.

[2-S.I.] Button/Lamp

- Press the button to select 2-Sample Interleave SDI input signal through two or four SDI input connectors.
- Mode changes in the order of [Dual-Link 2-S.I.], [Quad-Link 2-S.I.].[Dual-Link 2-S.I.(SFP)*]

[SQUARE] Button/Lamp - Press the button to select [Quad-Link Square Division] mode.

[HDMI] Button/Lamp - Press the button to select HDMI input.

B : F1 ~ F5 Button/Lamp

Press to adjust or turn on/off the assigned function.
The following functions are assigned at the factory.

[F1]: Color Temp
[F2]: Audio Level Meter
[F3]: Time Code
[F4]: Zebra & False Color
[F5]: Focus Assist

C : Function Button/Lamp

Press to adjust or turn/off each function.

[SCAN] Button - Press the button to adjust the scan mode. (Zero Scan, 1:1 Scan).

[ASPECT] Button

- Press the button to select the Aspect Ratio of the signal.
- Mode changes in the order of [16:9], [4:3], [2.35:1] ,[1.85:1], [15:9], [16:10], [AUTO].

[MARKER] Button- Press the button to activate and deactivate the Marker.

[BLUE ONLY] Button

- Press the button to activate and deactivate the Blue Only function.
- You may remove R(red) and G(green) from the input signal and display the screen only with B(blue) signal. This function is convenient to adjust Chroma and Phase and to observe the signal noise.
- The button may be pressed twice to change the screen to MONO mode. (This mode uses only Luminance value.)

[KEY LOCK] Button- Press the button to lock all buttons except Power/Menu.

D : Rotary encoder

[BRIGHT] knob

Press this knob to display the adjustment screen and adjust the picture brightness. Press again to hide the adjustment screen. Turn the knob right to increase the brightness and turn left to decrease it.

[CONTRAST] knob

Press this knob to display the adjustment screen and adjust the picture contrast. Press again to hide the adjustment screen. Turn the knob right to increase the contrast and turn left to decrease it.

[CHROMA] knob

Press this knob to display the adjustment screen and adjust the color intensity. Press again to hide the adjustment screen. Turn the knob right to increase the color intensity and turn left to decrease it.

[APERTURE] knob

Press this knob to display the adjustment screen and adjust the picture sharpness. Press again to hide the adjustment screen. Turn the knob right to make the picture sharper and turn it left to make the picture softer.

**Note: If you push the knob for 2 seconds, the adjusted value returns to the default value.

E : Menu Operation Buttons

Displays or sets the on-screen menu.

[MENU/RETURN]

- Activates and deactivates the display of the Main Menu.
- When the on-screen menu is not displayed, if this button is pressed the main menu is displayed. When the menu is displayed, press the button to return to the previous menu.

[SELECT/VOLUME] knob (Menu selection control)

- When the menu is displayed, turn the knob to select a menu item or a setting value, and then press the knob to confirm the setting.
- If this knob is pressed when the menu is not displayed, the adjustment screen of [VOLUME] is displayed to adjust the audio volume.
- Press this knob to change the modes in the order of [Focus Frequency], [Zebra Level], [Line Position], [Variable Marker] and adjust each mode's value.
  [Focus Frequency]: When Focus Assist function is activated, this mode is displayed.
  [Zebra Level]: When Zebra function is activated, this mode is displayed.
  [Line Position]: When WFM/Vector function and Line Select function is activated, this mode is displayed.
  [Variable Marker]: When Marker function is activated and Aspect Marker is set Variable, this mode is displayed.

F : ⏻ (Standby) Switch and Indicator

- Press to turn the power on when this monitor is in standby mode. After being turned on, the monitor performs initialization and the indicator flashes in green.
- Press the switch again for a second to set the monitor in standby mode. Then, the indicator flashes in orange and then turns red. The indicator in orange means that the monitor goes into the standby mode.

When the indicator flashes in orange, this button doesn't work.

G : (headphone) Jack and USB Connector

Headphone Jack

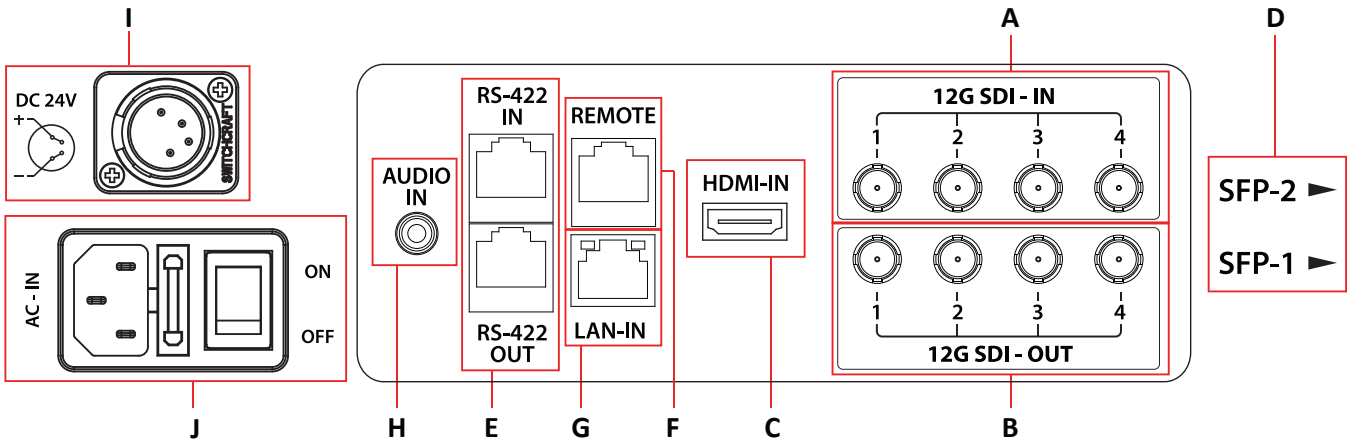
- The audio signal which is selected using the input select button is output in stereo sound form speakers.
- When SDI signals are input, the audio signals of the channels selected with SDI Audio Setting in the User Configuration menu are output.
- When the headphone is connected to the jack, audio signals will not be output from speakres.

[USB] Connector

- To update CPU, GPU, FPGA program.
- To connect the monitor with the Color Calibration program provided by the manufacturer and perform the color calibration.
- To connect the monitor with the control program provided by the manufacturer and control functions remotely.
- To impot the custom 3D LUT file(*.cube, 32^³, 33^³, 64^³ and 65^³).

Rear Panel (OBM-U178K / OBM-U248K / U318K),

(U428K cannot be connected to DC)



A : SDI IN (SDI Input) connectors (BNC)

Input connectors for SDI signals. For details. Connecting the SDI Signals" (page 28).

B : SDI OUT (SDI Output) connectors (BNC)

Output connectors for SDI signals.

Each connector outputs the signal which is input to the corresponding SDI IN connector.

***Note* - Output is activated only when the power is on. Output is not activated in standby mode.

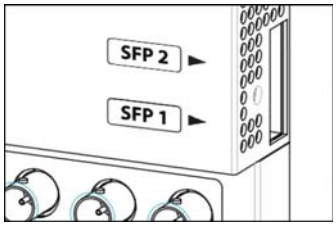
C : HDMI Input connector

Input connector for HDMI signals.

- For an HDMI cable, High Speed HDMI Cable with the cable type logo or HDMI 2.0 Cable is recommended.
- When inputting 4K resolution(3840 x 2160 or 4096 x 2160) signal, use a cable of 3m or less.

D : SFP Input connector

Input connector for SFP optical signal.



E : SERIAL REMOTE IN/OUT connector (RJ-45)

Used for the future function expansion.

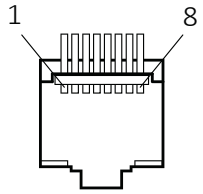
Connects the monitor to control the program provided by the manufacturer by using RS-422/485 communication or the external UMD(IMD) equipment and controls the monitor.

F : PARALLEL REMOTE connector(RJ-45, 8-pin)

Forms a parallel switch and controls the monitor externally.

***Note* - For safety, do not connect the connector for peripheral device wiring that might have excessive voltage to this port. Follow the instructions about this port.

[Pin Assignment]



Pin Number	Function
1	12G SDI-1
2	12G SDI-2
3	12G SDI-3
4	12G SDI-4
5	Dual-Link 2-S.I.
6	Quad-Link 2-S.I.
7	Power
8	GND

Functions can be changed in [Remote] section of the menu.

G : LAN(10/100) IN/OUT connector

Used for the future function expansion.
Connects to the LAN (10/100) connector of the network by using 10BASE-T/100BASE-TX LAN cable.
A daisy chain connection using the LAN input/output connectors enables the control of multiple monitors in sequence.

H : AUDIO IN connector (Stereo mini jack)

Connector for analog audio input.
Analog input can be selected with SDI Audio Setting in User Configuration menu.

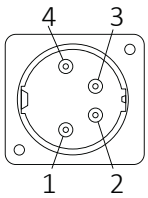
I : DC IN terminal

Connects the DC power supply to the monitor.

DC IN Socket

1 : GND

4 : +24V



J : AC IN terminal

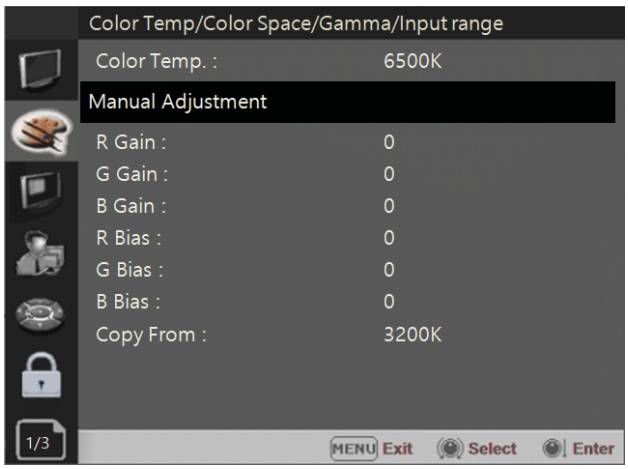
AC power input connector.
Connects the provided AC power cord.

4. Using the Menu

This monitor is equipped with an OSD menu to make various adjustments and settings such as picture control, input setting, set setting change, etc.

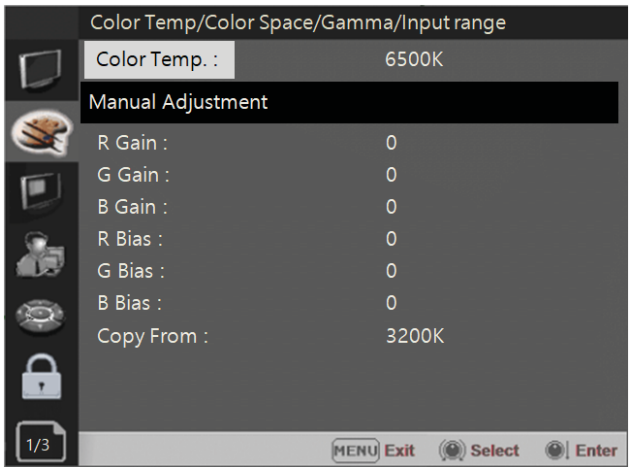
1. Press the MENU button.

The menu appears.
The menu presently selected is shown in gray.



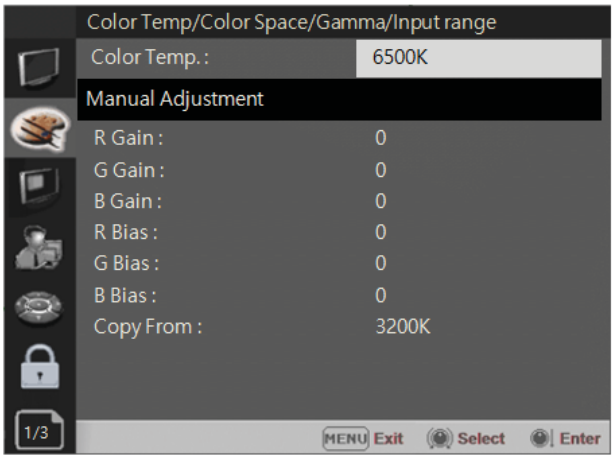
2. Turn SELECT/VOLUME knob to select a menu, then press the knob.

The menu icon presently selected is shown highlighted.



3. Select an item.

Turn SELECT/VOLUME knob to select the item, then press the knob.
The item to be changed is shown highlighted, and the sub menu is displayed on the right.



4. Make the setting or adjustment on an item.

How to change the adjustment level:

To increase the level, turn the SELECT/VOLUME knob right.
To decrease the level, turn the SELECT/VOLUME knob left.

How to change the setting:

Turn the SELECT/VOLUME knob to change the setting, then press the knob to confirm the setting.

***Note* - The item displayed in gray cannot be accessed. The item is accessible if it is displayed in white.

To return the display to the previous screen:

Press the MENU button.

To clear the menu:

Press the MENU button.

5. Adjustment Using the Menus

The OSD menu of this monitor consists of the following items.

Status menu (To indicate the current settings)

- Format

- Color Temp
- Brightness
- Contrast
- Chroma
- Aperture
- Color Space
- Gamma

- User Preset
- RGB Range
- WFM/Vector
- Audio Level Meter
- Focus Assist
- Time Code
- Volume

- SDI Input
- SDI Payload ID
- Identifier
- Sampling
- Picture Rate
- Scanning Method
- Bit Depth
- Link Assignment
- Transfer Characteristic
- Colorimetry

- Model Name Serial Number
- Board Version
- Operation Time
- Last Calibration Time
- Board Temp

Color Temp./Color Space/Gamma menu

- Color Temp
- Manual Adjustment
  - R Gain
  - G Gain
  - B Gain
  - R Bias
  - G Bias
  - B Bias
  - Copy From
- Color Space
- HDR-EOTF
  - Type
- Gamma
- Backlight
- Camera Log
  - Default Log Sel.
  - User Log Sel.
- RGB/YCC Range
- HDR Auto Setting

Camera Assist menu

- Zebra & False Color Setting
  - Zebra & False Color
    - Zebra Level Adj.
    - Zebra Range
    - Variable White Clipping
    - Variable Pink Level
    - Variable Green Level
    - Variable Black Clipping
  - False Color Comparison
    - Wipe Position
  - Focus Assist Setting
    - Focus Assist
      - Color
      - Frequency
  - Black Stretch Setting
    - Black Stretch
      - Max
  - Gamut Error Setting
    - Gamut Error
      - Type
      - Color Space
      - Y Maximum
      - Y Minimum
      - Chroma Maximum
      - Chroma Minimum
      - RGB Maximum
      - RGB Minimum

User Configuration menu

- User Preset Setting
  - Load
  - Save
- Function Button Setting
  - F1 Button
  - F2 Button
  - F3 Button
  - F4 Button
  - F5 Button
- Input Setting
  - 3G Signal Format
  - SFP Enable
  - 12G Image Division
  - Image Division & Link
- Audio Delay Setting
  - Audio Delay(Lip Sync)
- Speaker Out / Audio Level Meter Setting
  - SDI L-Speaker Out
  - SDI R-Speaker Out
  - HDMI L/R Speaker Out
  - Audio Level Meter
    - Display
    - Reference
    - Size/Transparency
    - Peak Hold Time
- Marker Setting 1/2
  - Marker
    - Aspect Marker
      - Variable Aspect
    - Center Marker
    - Area Marker Color
    - Aspect Mat
    - Fit
    - Thickness
- Marker Setting 2/2
    - Custom H1
    - Custom H2
    - Custom V1
    - Custom V2

- WFM/Vector Setting
  - WFM/Vector
    - Type
    - Intensity
    - Transparency
    - Color
    - Line Select
      - Line Position
    - Position
- System Setting
  - Internal Signal
  - Key LED
  - OSD Time
  - OSD position
  - System Data
  - Time Code

Remote menu

- Parallel Remote
  - 1 Pin
  - 2 Pin
  - 3 Pin
  - 4 Pin
  - 5 Pin
  - 6 Pin
  - 7 Pin
  - 8 Pin
- Monitor ID
- In-Monitor Display Setting
  - IMD Type
  - User Text
  - Transparency
  - Text Color
  - L-Tally Color
  - R-Tally Color
- Network Setting
- DHCP
- IP Address
- Subnet Mask
- Gateway
- Port No.

Security Setting

- Key Lock
- Password
  - User Parameter Lock
  - Change Password

6. OSD Menu Operations

Status Menu

The Status menu displays the current status of the monitor. The following items are displayed.

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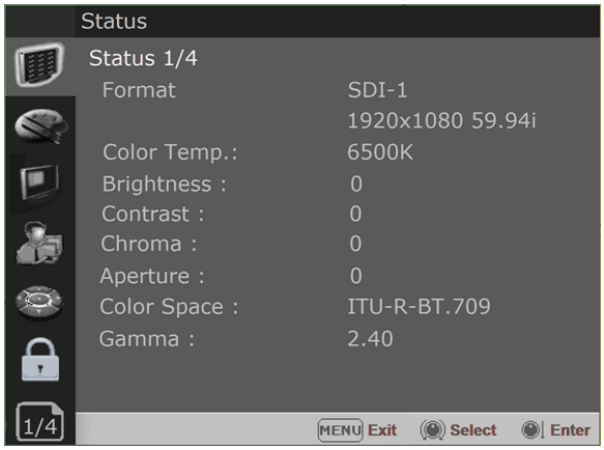

- Format
- Color Temp
- Brightness
- Contrast
- Chroma
- Aperture
- Color Space
- Gamma

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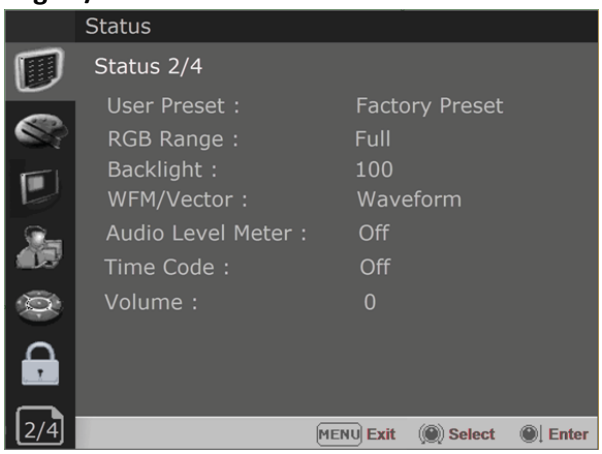

- User Preset
- RGB Range
- Back Light
- WFM/Vector
- Audio Level Meter
- Time Code
- Volume

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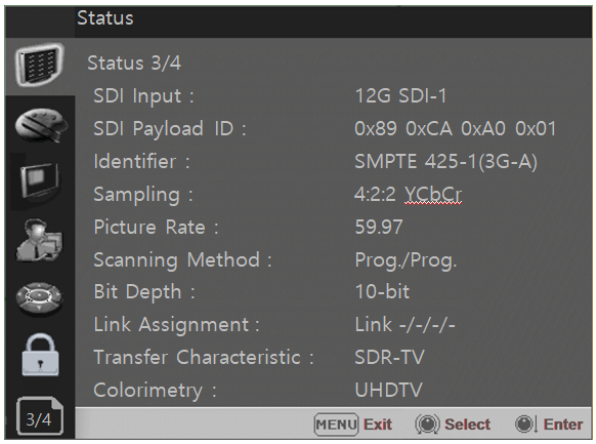

- SDI Input
- SDI Payload ID
  - Identifier
  - Sampling
  - Picture Rate
  - Scanning Method
  - Bit Depth
  - Link Assignment
  - Transfer characteristics
  - Colorimetry

*** When the SDI signal is connected, these items are displayed.

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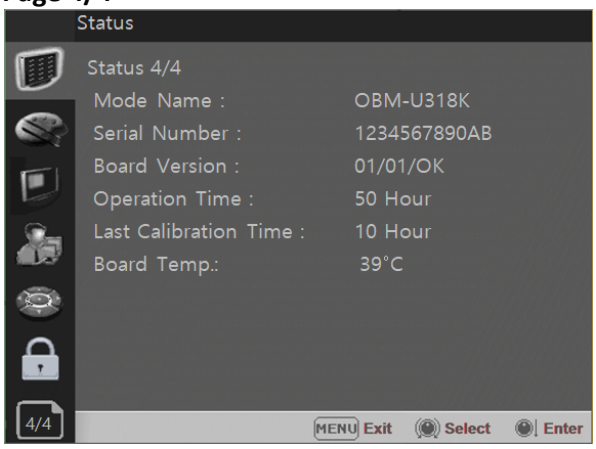

- Model Name
- Serial Number
- Board Version
- Operation Time
- Last Calibration Time
- Board Temp.

Color Temp/Color Space/Gamma Menu

These menus are used for adjusting or setting the color temperature, color space or gamma of the picture.

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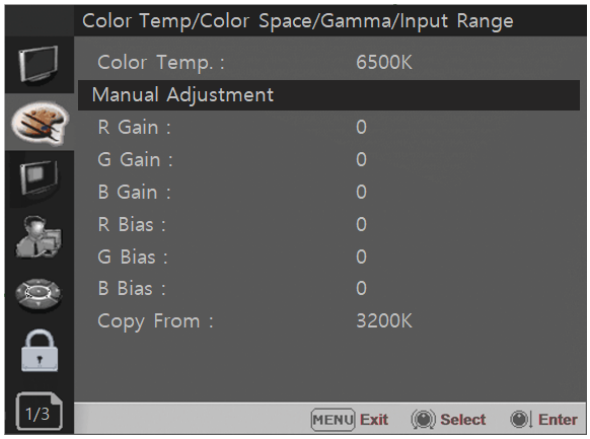

Color Temp.

- Selects the color temperature from among [3200K], [5500K], [6500K], [9300K], [User1], [User2], [User3], [DCI-P3].

***Note - If Color Space is set to [DCI-P3], Color Temp. is fixed to [DCI-P3].*

R/G/B Gain

- Displays the R/G/B Gain of the current Color Temperature.

Manual Adjustment

- If you set the Color Temp. to User 1/2/3, the item is changed from black to white, which enables you to adjust the color temperature.

R/G/B Gain/Bias

- Adjusts the color balance(Gain, Bias).

Copy From

- The Gain and Bias data of each Color Temp. are restored to User adjustment.

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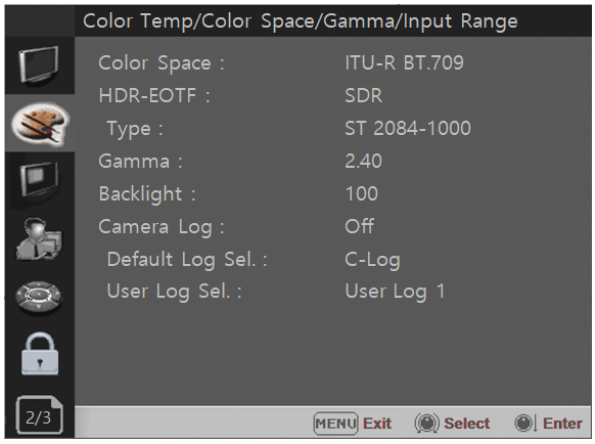


Color Space

Selects the color space from among [ITU-R BT.709], [SMPTE-C],[EBU], [DCI-P3], [ITU-R BT.2020], [Native],[ACES Proxy].

HDR-EOTF

Selects the color space from among [SDR],[HDR], [ITU-R BT.1886].

Type

Selects 4 modes of HDR gamma.

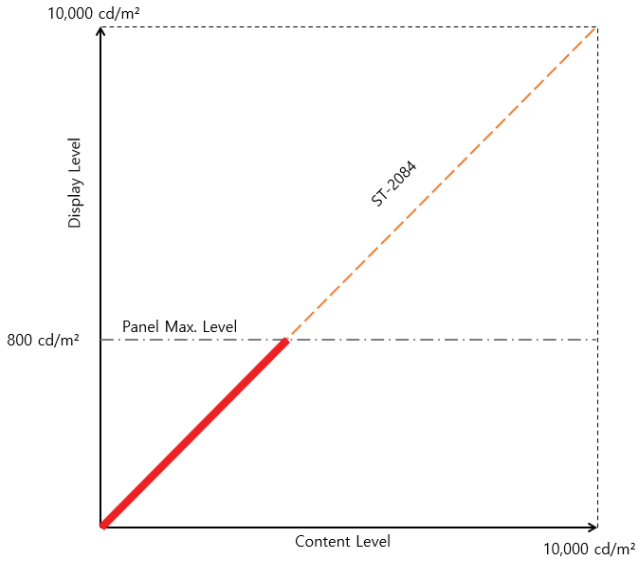
- ST-2084 800 * * : This mode displays the absolute brightness up to 800cd/m². So, the highlights over 800cd/m² are clipped.
- ST-2084 1000 : This mode displays the relative brightness up to 1000cd/m². The part exceeding 1000cd/m² is clipped.
- ST-2084 10000 : The characteristics of LCD panel doesn't allow to produce the ideal brightness required by this standard, so the gamma is displayed in the relative brightness
- HLG-1.15(800) * * (Hybrid Log Gamma) : This mode can be selected when the White is 300 cd/m² in HLG..
- HLG-1.0 / 1.1 / 1.2 / 1.3 / 1.4 / 1.5 : These modes allow the user to apply HLG from 1.0 up to 1.5.
- HLG –SG(1.2): HLG gamma is applied to 1.2 and then displayed in the absolute value up to 300cd/m².
- S-Log3: Select the S-Log3(HDR) gamma.
- ST-2084 4000 : This mode displays the relative brightness up to 4000cd/m². The part exceeding 4000cd/m² is clipped.

Color Temp/Color Space/Gamma Menu

- ToneMappingPQ-1,000/4,000/10,000:
  Tone mapping mode can be set to 1,000, 4,000, or 10,000.

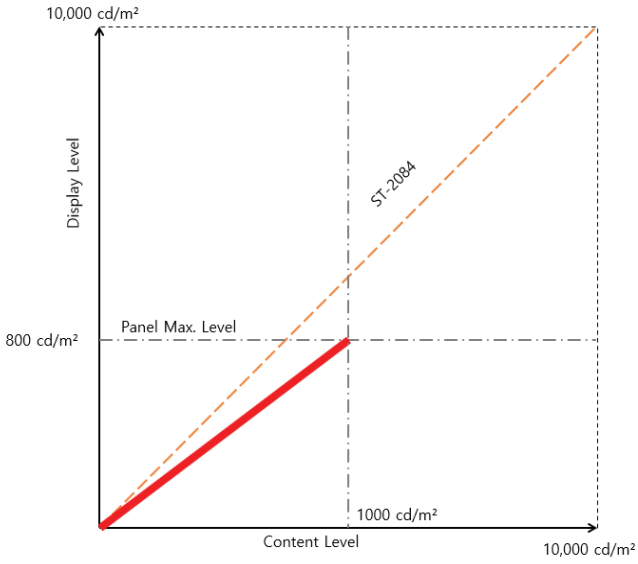
ST-2084 800 * ***

As shown in the graph below, only the expression according to the maximum panel brightness level of the model is clipped.



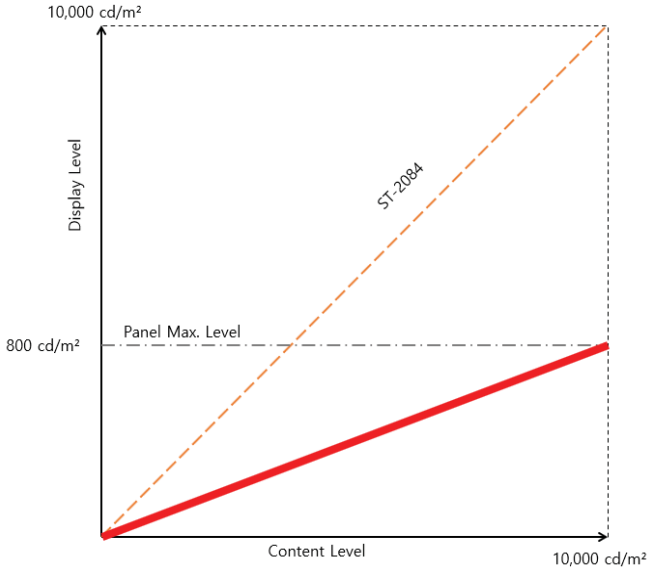
ST-2084 1,000

As shown in the graph below, within the panel maximum brightness level 800 cd/m2 section of the model, the data level is only expressed up to 1,000 cd/m² and then clipped



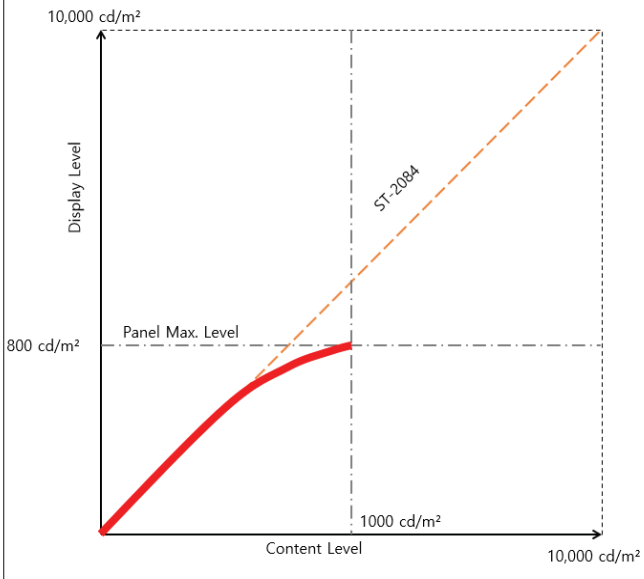
ST-2084 10,000

As shown in the graph below, within the panel maximum brightness level 800 cd/m2 section of the model, the data level is only expressed up to 10,000 cd/m² and then clipped.



Tonemapping PQ 1,000

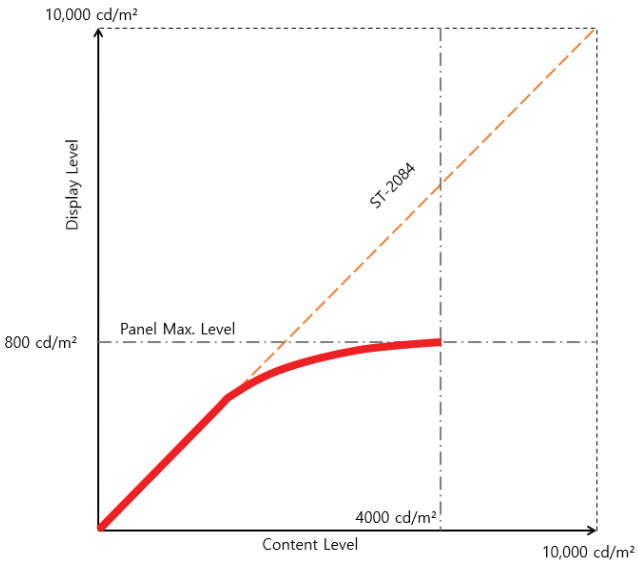
As shown in the graph below, within the panel maximum brightness level 800 cd/m2 section of the model, the data level is only expressed up to 1000 cd/m² and then clipped. And the section below is expressed according to the standard level.



Color Temp/Color Space/Gamma Menu

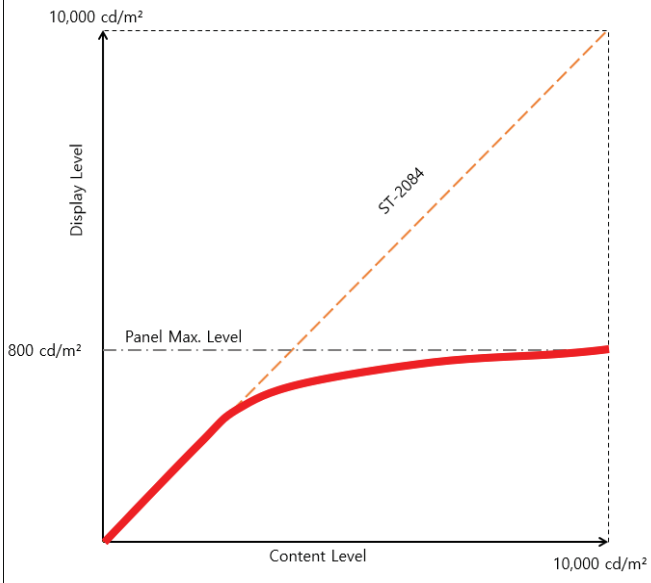
Tonemapping PQ 4,000

As shown in the graph below, within the panel maximum 800 cd/m2 section of the model, the data level is only expressed up to 4000 cd/m² and then clipped. And the section below is expressed according to the standard level.



Tonemapping PQ 10,000

As shown in the graph below, within the panel maximum 800 cd/m2 section of the model, the data level is only expressed up to 10,000 cd/m² and then clipped. And the section below is expressed according to the standard level.



Color Temp/Color Space/Gamma Menu

** 1) OSD Menu of this mode is different, depending on each model's HDR maximum luminance.

HDR maximum luminance

OBM-U178K : 1000 cd/m²
OBM-U248K : 400 cd/m²
OBM-U318K : 700 cd/m²
OBM-U428K : 400 cd/m²

2) PQ and HLG gamma is different, depending on each model's luminance.

OBM-U178K : ST 2084-1000- HLG-1.2(1000)
OBM-U248K : ST 2084-400- HLG-1.03(400)
OBM-U318K : ST 2084-700- HLG-1.13(700)
OBM-U428K : ST 2084-400- HLG-1.03(400)

Gamma

Selects the appropriate gamma mode from 1.00 to 3.00.

**Note- When the HDR-EOTF is set [SDR], this menu becomes activated.- When the color space is set to [Native] or [ACES Proxy], this menu becomes deactivated.

When the color space is set to Native, this menu becomes deactivated.

Back Light

Adjusts the level of the back light level.
If the back light value is increased, the screen becomes brighter.

** If the setting in Color Temp. menu and Color Space menu is changed, the value of Back Light returns to the default value of the color calibration in the factory.

Camera Log

Selects a camera log for the input signal.
[Off]: Sets off the camera log.
[Default]: The log which is selected in [Default Log Sel.] menu is applied.
[User]: The log which is selected in [User Log Sel.] menu is applied.
[Import Log Data]: Allows the user to save the Log LUT in USB memory stick to the monitor. The saved LUT can be used in User Log.

Default Log Sel

Allows the user to select a camera log among C-Log, Log-C EI 160~3200, S-Log2 To LC-709, S-Log2 To LC-709TypeA, S-Log2 To Slog2-709, S-Log2 To Cine+709, S-Log2 To LC-709, S-Log3 To LC-709TypeA, S-Log3 To Slog2-709, S-Log3 To Cine+709, J-Log1.

User Log Sel

Selects User Log 1 to 4.

***Note*
- 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 file name of the user log data is displayed on the OSD up to 15 characters, and the log data file should be placed on the top folder of the USB memory stick.

Ex) If the file name is 'S-log3 to LC709_A.cube', it is displayed as 'S-log3 to LC709' on the OSD.

Color Temp/Color Space/Gamma Menu

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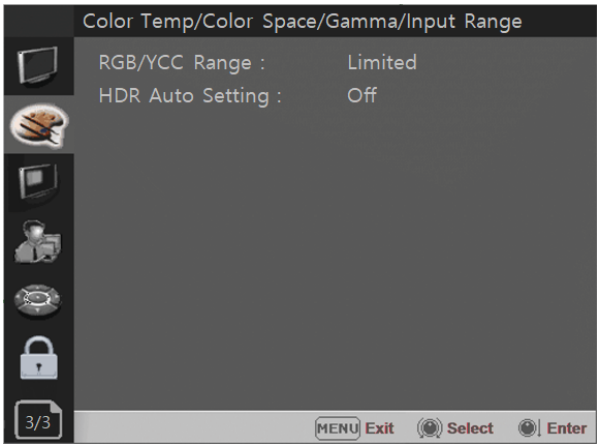

RGB/YCC Range

- Selects Black Level and White Level of RGB/YCC format.

SDI :

Limited : 64(10bit)/256(12bit)~ 1023(10bit)/4095(12bit)

Full : 4/16(Black Level) ~ 1023(10bit)/4095(12bit)

HDMI :

Limited : 64(10bit)/256(12bit)~ 1023(10bit)/4095(12bit)

Full : 0(Black Level) ~ 1023(10bit)/4095(12bit)

HDR Auto Setting

This function allows the monitor to read the Transfer Characteristics and Colorimetry information of Payload identifiers of the ST2082-10 12G SDI signal and adjust HDR automatically.

-Transfer Characteristics : SDR, ST2084-1000, HLG1.2

- Colorimetry : Rec709, Rec 2020

Camera Assist Menu

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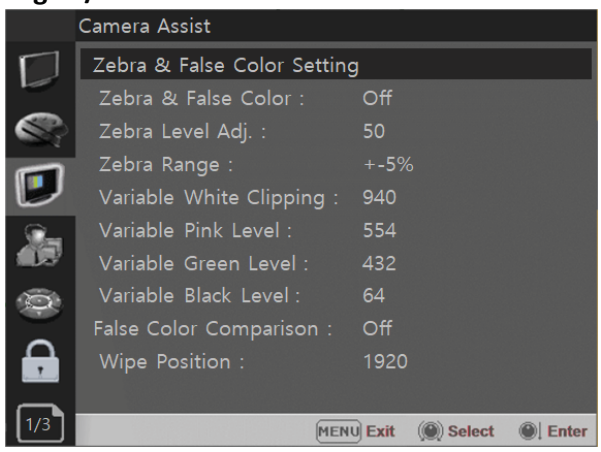

Zebra & False Color

- Evaluates the Luma(Y') level of the input image. If the certain Y' level is set, the pixels with the designated Luma(Y') level are displayed in zebra pattern.

Zebra

Pixels with Y' level over 100% turn to red zebra pattern, and pixels with Y' level under 0% turn to green zebra pattern.

Zebra Level Adjustment

- Adjusts the Y' level as the user wants.

Zebra Range

- Adjusts the Y' level as the user wants.

False Color ARRI

The color pattern is displayed with ARRI camera standard.

Color	Level	Description
red	99~100%	White clipping
yellow	97~99%	Just below white clipping/white shoulder
pink	52~56%	One stop over medium gray (Caucassian skin)
green	38~42%	18% neutral gray
blue	2.5~4.0%	Just above black clipping/black slope
purple	0~2.5%	Black clipping

False Color Variable

This mode allows the user to adjust White clipping, Pink level, Green level, Black Clipping.

Variable White Clipping

- Adjusts White Clipping from 0 to 1023.

Variable Pink Level

- Adjusts Pink level from 0 to 1023.

Variable Green Level

- Adjusts Green level from 0 to 1023.

Variable Black Clipping

- Adjusts Black Clipping from 0 to 1023.

Camera Assist Menu

False Color Comparison

Allows the user to divide the picture side by side, and compare the original image on the left half and the False Color image on the right half.

Wipe Posion

Adjusts the boundary line of the left and right area. Allowed to adjust the boundary line by using the [SELECT/VOLUME] knob.

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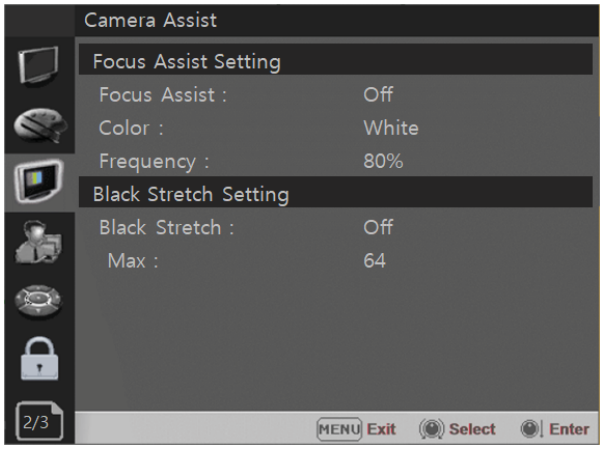

Focus Assist

- Controls the aperture level of a video signal and displays images on screen with sharpened edges to help camera focus operation.

Available types are [Color On] and [Mono On].

- [Color On]: The background image is the original color type.
- [Mono On]: The background image is the mono type.

Color

- Selects a color for Focus Assist among [RED], [Green], [Blue], [White], [Yellow], [Cyan].

Frequency

- Adjusts the edge difference level between the edges in an image.
- Available values are from 0% to 100%.

Black Stretch

This mode can be used to increase shadow detail without changing the absolute black level, and without affecting mid-tones. The Black Stretch increases the visibility of subjects in dark areas, not degrading image quality in bright areas.

Max

Adjusts the maximum range to apply the Black Stretch. The range is adjustable from 0 to 1023.

Camera Assist Menu

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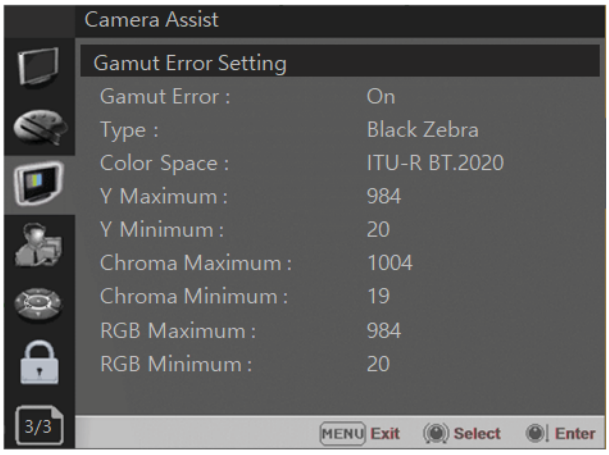

Gamut Error

Turns the Gamut Error [On]/[Off]. Zebra pattern or Color is displayed on the portion whose Y, Cb, Cr and R, G, B are out of the range of the adjusted values based on the color space selected below in [Color Space].

Type

- Black Zebra:
  The error part is displayed as Black Zebra.
- Black & White Zebra:
  The dark error part is displayed as White Zebra, Bright error areas are marked with Black Zebra.
- Mono:
  The error part is displayed in color.
- Default Values

YCbCr

Y Maximum : 984
Y Minimum : 20
Chroma Maximum : 1004
Chroma Minimum : 19

Color	Level	Description
red	99~100%	White clipping
yellow	97~99%	Just below white clipping/white shoulder
pink	52~56%	One stop over medium gray (Caucassian skin)
green	38~42%	18% neutral gray
blue	2.5~4.0%	Just above black clipping/black slope
purple	0~2.5%	Black clipping

RGB

Maximum : 984
Minimum : 20

User Configuration Menu

User Configuration consists of the adjustment menus such as[User Preset Setting],[Function Button Setting],[Input Setting], [Output Setting], [Speaker Out / Audio Level Meter Setting], [Marker Setting],[WFM/Vector Setting], [Closed Caption Setting], [System Setting].

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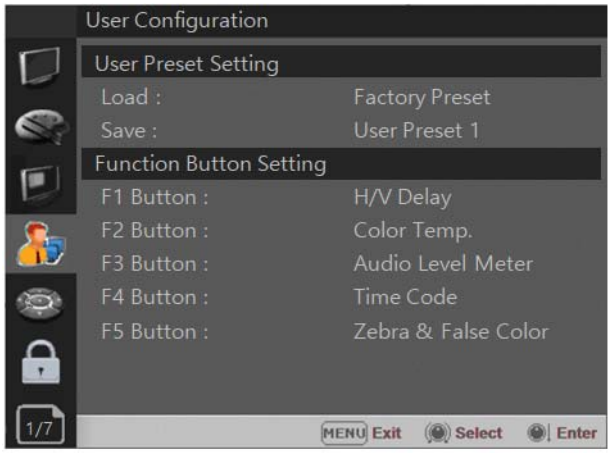

User Preset Setting

[Load] : Load the saved settings in [User Preset1], [User Preset2], [User Preset3], [User Preset4], [User Preset5] and [Factory Preset].
[Save] : Save the current setting status to [User Preset1], [User Preset2], [User Preset3], [User Preset4], or [User Preset5].

** When [User Preset Lock] of [Password] is set [On], [User Preset 1] setting values are protected by password. If you want to save the changed setting values to [User Preset 1], you can enter the password first to set [User Preset Lock] to [Off] and then save the values.

Function Button Setting

- Assigns the function for F1 to F5 buttons on the front panel.

The following functions can be assigned. :
*[H/V Delay],[Color Temp.],[Audio Level Meter], [Time Code],[Zebra & False Color], [Focus Assist], [WFM/Vector],[Camera Log],[HDR-EOTF],[Freeze], [Black Stretch] ,[False Color Comparison] , [Gamut Error] , [Cam.log Mapped SDI-Out] , [ITU-R BT.709],[ITU-R BT.2020],[DCI-P3] [ST-2084-1000], [ST-2084-4000], [Backlight], [User Preset 1], [User Preset 2], [User Preset 3], [User Preset 4], [User Preset 5].

User Configuration Menu

- The following functions are assigned in the factory.
  [F1 Button] : Color Temp
  [F2 Button] : Audio Level Meter
  [F3 Button] : Time Code
  [F4 Button] : Zebra & False Color
  [F5 Button] : Focus Assist

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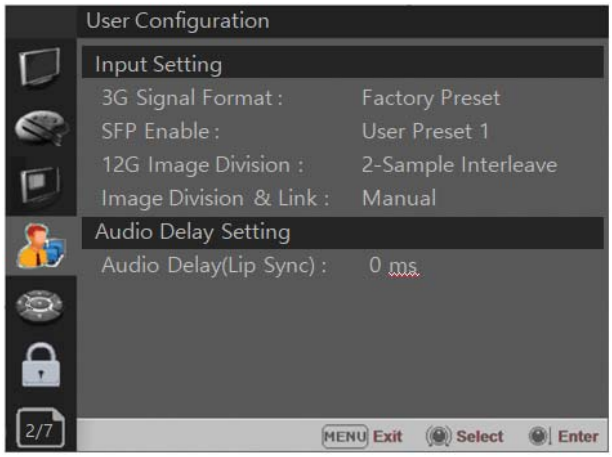

Input Setting

3G Signal Format

- Selects the format of 3G SDI input signal.
  [Auto],[A 4:4:4 YUV 10b],[A 4:4:4 GBR 10b],
  [A 4:4:4 YUV 12b],[A 4:4:4 GBR 12b],
  [A 4:2:2 YUV 12b],[B DL 4:4:4 YUV 10/12b],
  [B DL 4:4:4 GBR 10/12b],[B DL 4:2:2 YUV 12b],
  [B DL 4:2:2 YUV 10b 60p]

SFP Enable

- Allows for SFP input to be selected by pushing [SINGLE] button on the front panel.

12G Image Division

- Selects the image division of the 12G-SDI Single Link signal between [2-Sample Interleave] and [Square]

**Payload ID of 12G-SDI 2-Sample Interleave signal and 12G-SDI Square division signal is the same. So, Image Division cannot be detected automatically, and the user has to select it. The default setting is [2-Sample Interleave].

Image Division & Link Order

- Select from [Manual] or [Auto].

[Auto]:
Square / 2-S.I. The input automatically recognizes the VPID (Video Payload ID) embedded in the SDI signal when it is normally present, and even if the input is not connected properly, it splits the image or links in order to reduce user error.
Set automatically.
Also, when 12 signals are input, it automatically switches to single mode.
* Quad-Link Squre / 2-S.I in single mode.
In mode It does not change automatically.

Audio delay setting

Audio delay (lip sync)

-Set the delay time between the video and audio signals. (0ms to 170ms). 17 steps.

User Configuration Menu

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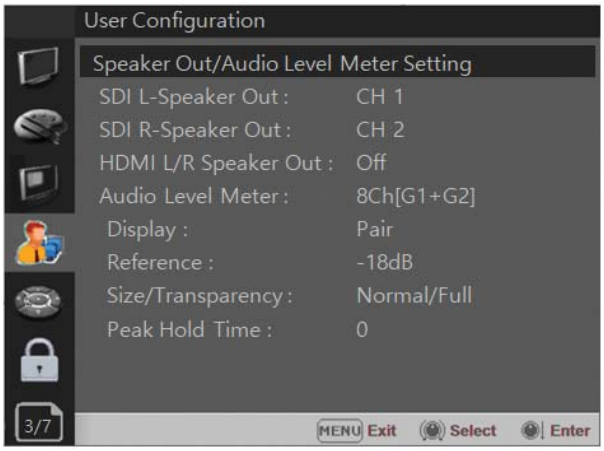

Speaker Out / Audio Level Meter Setting

- Selects the audio channel of the SDI & HDMI input signal.

SDI : Left Speaker Out / Right Speaker Out

- Selects the embedded audio channel for the left and right audio out of the Headphone jack on the front panel of the monitor.
  Audio channel can be selected among Ch1 ~ Ch16, Analog.

HDMI : L/R Speaker Out

- Selects the embedded audio channel of the HDMI signal. The available modes are [Off], [HDMI On], [Analog On].

Audio Level Meter

Selects the embedded audio mode.
: [Off], [8Ch [G1+G2]], [8Ch [G2+G3]], [8Ch [G3+G4]],[8Ch [G1+G3]], [8Ch [G1+G4]], [8Ch [G2+G4]],[16Ch [G1~G4]]
** In HDMI input, either [Off] or [HDMI 2Ch] can be selected.

Display

Selects the display method for Audio Level Meter.
Available modes are [Group] and [Pair].
** In HDMI input, the mode is fixed to [Pair].

Reference

Selects the default value of Audio Level Meter.
Available options are [-18dB] and [-20dB].

Size/Transparency

Selects the size and transparency of Audio Level Meter.
Available options are [Normal/Full], [Normal/Half], [Large/Full], [Large/Half].

Peak Hold Time

Controls the speed rate of Peak Hold Decay Time occurring when the audio volume decreases.

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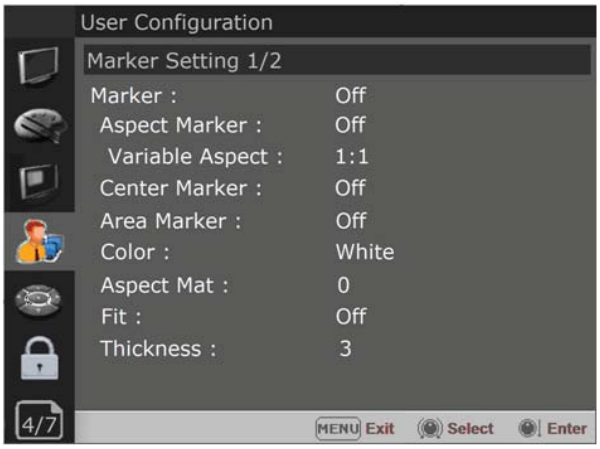

Marker Setting

Marker

- Selects On to display the marker, and Off to deactivate it.

Aspect Marker

Selects the aspect ratio of the marker.
You can select from among [Off], [16:9], [4:3], [4:3 ON AIR], [15:9], [14:9], [13:9], [1.85:1], [2.35:1], [2.39:1], [1.85:1 & 4:3], [1.66:1], [1.896:1], [Variable], [Custom].

***Variable Aspect**

Allows the user to select the aspect ratio from the range between 1.00:1 and 3.00:1.

Center Marker

Selects On to display the center marker and Off not to display it.

Area Marker

Selects the size of the area marker.
You can select from among [Off], [80%], [85%], [88%], [90%], [93%], [100%], [EBU Action 16:9], [EBU Graphic 16:9], [EBU Action 14:9], [EBU Graphic 14:9], [EBU Action 4:3], [EBU Graphic 4:3].

Color

Selects the color of the marker.
You can select from among [White], [Gray], [Red], [Green], [Blue], [Yellow], [Cyan], [Magenta].

Aspect Mat

Darkens the outside of the area of the Aspect Marker. You can select from 0 to 7.

Fit

With Fit On, the Area Marker is displayed relative to the Aspect Marker in use.
With Fit Off, the Area Marker is displayed relative to the incoming video source.

Thickness

Adjusts the thickness of the marker lines.
You can select it from 1 to 7.

User Configuration Menu

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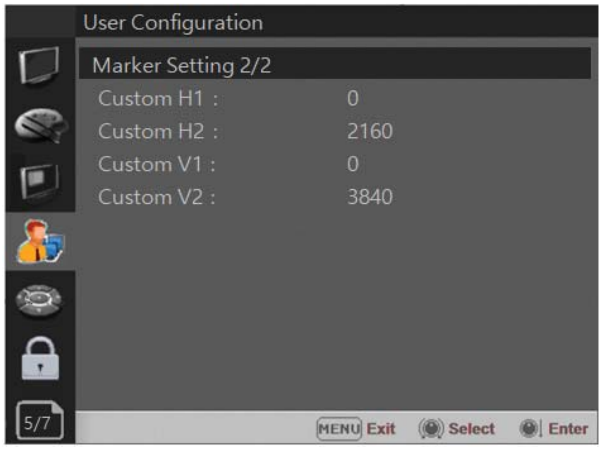

Marker Setting 2/2

This function is activated when the “Aspect Marker” is set [Custom].
Menu > User Configuration 4/8 > Marker > Aspect Marker > Custom

Custom H1
- Sets the position of the first horizontal marker line.

Custom H2
- Sets the position of the second horizontal marker line.

Custom V1
- Sets the position of the first vertical marker line.

Custom V2
- Sets the position of the second vertical marker line.

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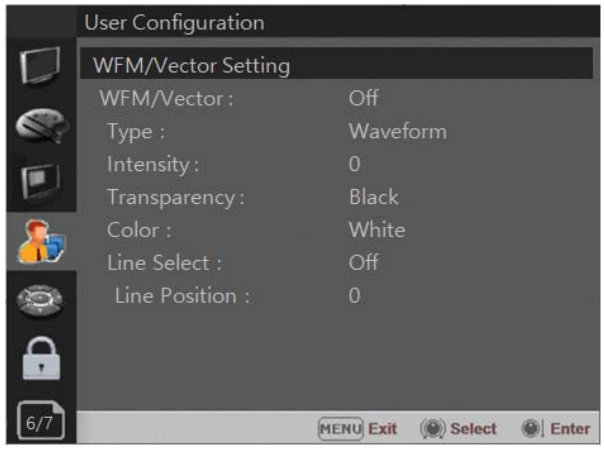

WFM/Vector Setting

WFM/Vector
- Select [On] to display the [WFM/Vector] and [Off] not to display.

Type
- You can select from among [WFM], [VectorScope], [WFM+Vector]

*This function doesn’t work when RGB format signal is input.

Intensity

Adjusts the brightness of Waveform and Vectorscope display.
You can select from 1 to 64.

Transparency

Adjusts the transparency level of Waveform and Vectorscope.
[Black]: The background is black. Displayed image is hidden behind the background.
[Half]: The background is transparent. Displayed image can be seen indistinctly behind the Waveform and Vectorscope display.

Color

Selects the color of Waveform monitor.
Available colors are [Green] and [White].

Line Select

Selects [On] to display the Waveform of the line assigned in [Line Position] below.

***Line Position**

Selects the specific horizontal line for Waveform and Vectorscope.
Increases the value to move the line upwards and decreases the value to move the line downwards.

User Configuration Menu

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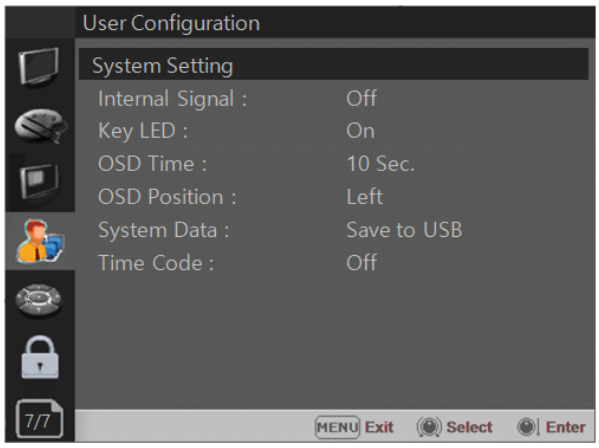

System Setting

Internal Signal

Generates the White Pattern internally.
The selectable range is from 100%(White) to 0%(Black), ColorBar.

Key LED

Sets On to turn on the LED of the keys, and sets Off to turn off the LED of the keys.

OSD Time

Adjusts the display time of the OSD menu.
[10 Sec.]: The OSD menu will be disappeared after 10 seconds.
[20 Sec.]: The OSD menu will be disappeared about 20 seconds.
[30 Sec.]: The OSD menu will be disappeared about 30 seconds.
[On]: The OSD menu will not be disappeared.

OSD Position

Sets the position of OSD.
Selects [Left] or [Left Top].

System Data

-[Save to USB]
Saves the current settings of the monitor to the USB memory.
-[Copy from USB]
Recalls the settings saved in the USB memory, and load them to the monitor.
(User preset settings are also saved as values loaded from USB memory.)
- The R/G/B gain obtained by color calibration is not saved in USB memory or loaded to the monitor.
- If User Preset Lock is turned on in Security, User Preset 1 among the set values retrieved from USB memory is not saved in the monitor and retains the existing values.

Time Code

- Selects the type of the time code to be displayed.
[VITC]: To display the VITC time code
[LTC]: To display the LTC time code

Remote Menu

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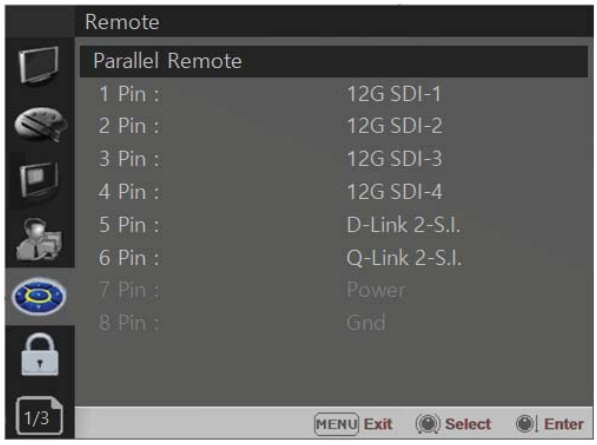

Parallel Remote

Selects the Parallel Remote connector pins for which you want to change the function.
Various functions can be assigned to pin 1 to 6.
The following is the lists of the functions which can be assigned to the pins.

[--]
[12G SDI-1]
[12G SDI-2]
[12G SDI-3]
[12G SDI-4]
[D-Link 2-S.I.]
[Q-Link 2-S.I.]
[D-Link SFP]
[Square SDI]
[Quad SDI]
[HDMI]
[SFP-1]
[SFP-2]
[Zero Scan]
[1:1 Scan]
[4:3 Aspect]
[16:9 Aspect]
[Auto Aspect]
[H/V Delay]
[Blue Only]
[Blue Only Mono]
[Marker]
[Tally R]
[Tally G]
[User Preset 1]
[User Preset 2]
[User Preset 3]
[User Preset 4]
[User Preset 5]
[ITU-R BT.709]
[ITU-R BT.2020]
[HDR-EOTF]
[C.Log Default]
[C.Log User]

** [--]: No function is assigned
*7 Pin: For Power On and Off only
*8 Pin: For Ground only

Remote Menu

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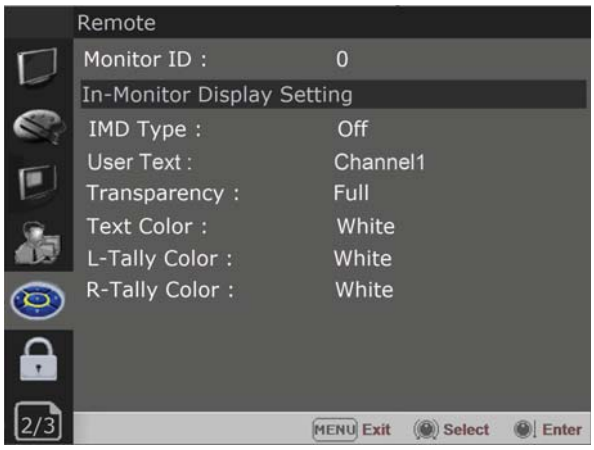

Monitor ID

Sets the ID of the monitor to control the monitor through Serial Remote or Network.

In-Monitor Display Setting

The monitor supports "TSL UMD Protocol – V3.1 & V5.0" provided by Television System Ltd. [Transparency], [Text Color], [Left Tally Color], [Right Tally Color] can be set in the setting menu.

** The monitor displays English alphabet, numbers, Symbolic codes.

** Up to 16 characters can be displayed in English.

IMD Type

- Selects the In-Monitor Display type. Available modes are [Off],[TSL V3.1],[TSL V5.0], [User].

User Text

-If the IMD type is User, the user can set the ASCII character table up to 8 characters arbitrarily.

Transparency

- Selects [Full] or [Half] for the background of IMD.
-[Full]: The background is black. Displayed image is hidden behind the background.
-[Half]: The background is transparent. Displayed image can be seen indistinctly behind the IMD display.

Text Color

- Selects the color of text displayed in IMD.
- The user can select from among [White], [Gray], [Red], [Green], [Blue], [Yellow], [Cyan], [Magenta].

Left Tally Color

- Selects the color of left tally lamp displayed in IMD.
- The user can select from among [White], [Gray], [Red], [Green], [Blue], [Yellow], [Cyan], [Magenta].

Right Tally Color

- Selects the color of right tally lamp displayed in IMD.
- The user can select from among [White], [Gray], [Red], [Green], [Blue], [Yellow], [Cyan], [Magenta].

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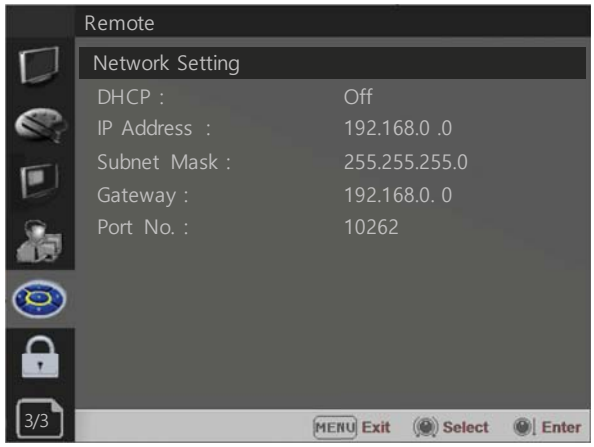


Network Setting

DHCP

- Toggle DHCP On or Off. DHCP allows your monitor to receive an IP address from your network for remote control via various programs.

IP Address, Subnet Mask & Gateway

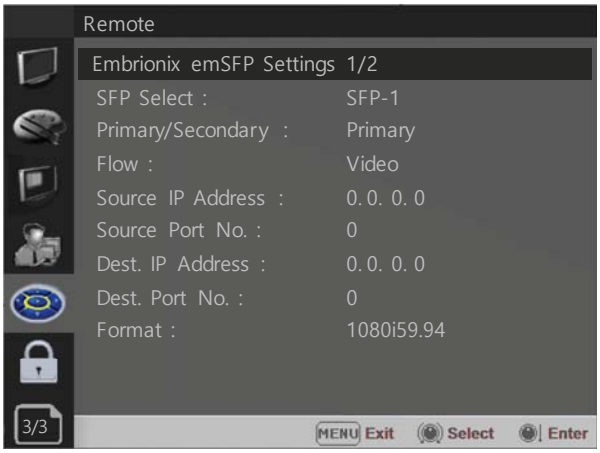
- The user can manually configure network settings when DHCP is disabled.

Port No.

- Sets the port number.

Remote Menu

**Note
SFP module support is activated only when the module is first connected and the monitor power is turned on.



Embrionix emSFP Setting 1/2

SFP Select
- Select the optical module to be used. (SFP-1, SFP-2)

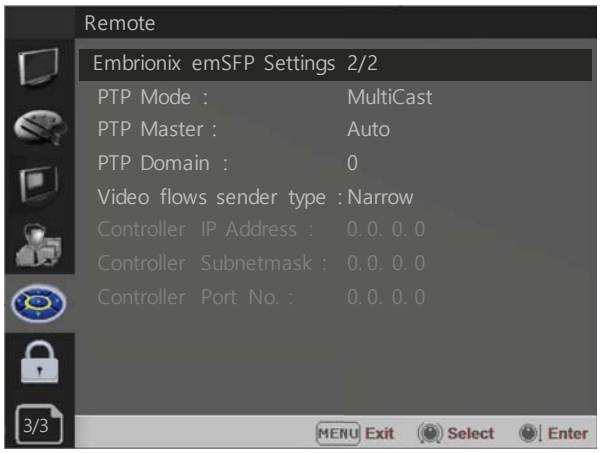
Primary/Secondary
- Select the page of emSFP flow. (Primary/Secondary)

Flow
- Select emSFP flow. (Video/Audio1/Audio2/Audio3/Audio4/Anciallary)

Source IP Address/Port No.
- Set Source IP/Port.

Dest. IP Address/Port No.
- Set the destination IP/Port.

Format
- Set the video signal format. (720p50,720p59.94,720p60,720p23.98,720p24,720p25, 720p29.97,720p30,1080p23.98,1080p24,1080p25, 1080psf25,1080psf29.97,1080psf30,1080p30,1080psf30, 1080i50,1080i59.94,1080i60,3GA 1080p50, 3GA 1080p59.94,3GA 1080p60,2048x1080p23.98, 2048x1080p24,2048x1080p25,2048x1080p29.97, 2048x1080p30,3GA 2048x1080p48,3GA 2048x1080p50, 3GA 2048x108p59.94, 3GA 2048x1080p60)



Embrionix emSFP Setting 2/2

PTP Mode
- Set the Precision time protocol (PTP) mode. (Multicast, Hybrid, Unicast)

PTP Master
- Set the UUID (Universally Unique IDentifier) mode. (Auto, Manual)

PTP Domain
- Set the domain number of the PTP Master. (0-255)

Video flows sender type
- Set the sender type of the emSFP video flow. (Narrow, Narrow linear, Wide)

Controller IP Address, Subnetmak, Port No.
- Shows emSFP's control IP/Subnetmask and Port No.

Security Menu

Page 1/1

Security Setting

Key Lock

When Key Lock function is set On, the change of the menu settings and functions doesn't work.
** The same function as [Key Lock] button on the front panel.

Password

-This function allows the user to protect the setting values through password.
-When the Password lock is applied, the functions and the setting values can be changed, but they are not saved.
-When you protect the setting values with a password, set a four-digit number.
-The initial password is 0000.
-When you use [Password], change the initial password first.

User Parameter Lock

Selects [On] to protect the setting values.
Selects [Off] to not protect by the password.
When [On] is selected, OSD background is displayed with the lock image as shown below.

Change Password

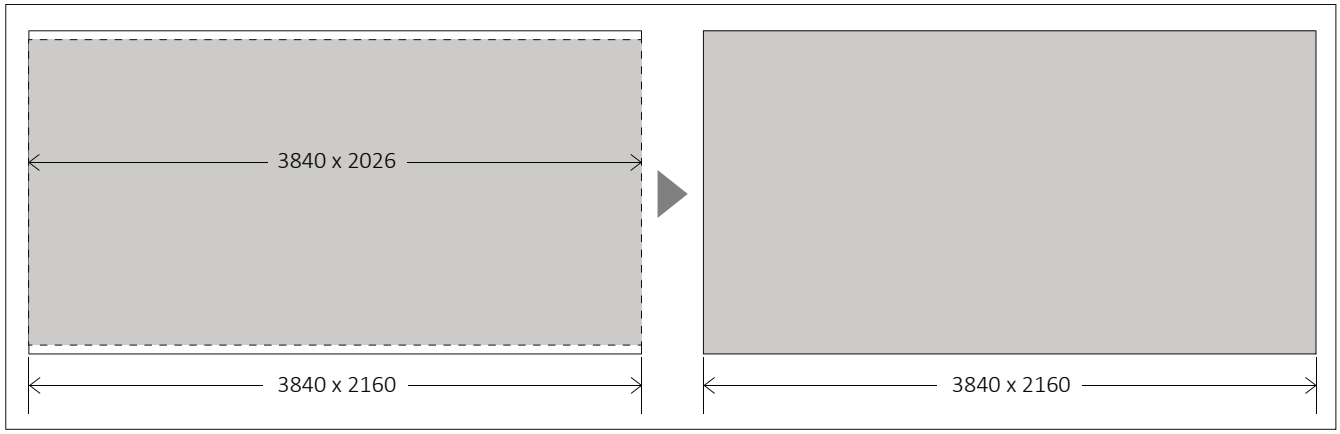
Changes the password.

7. Scan Mode Image

4K/QFHD Mode

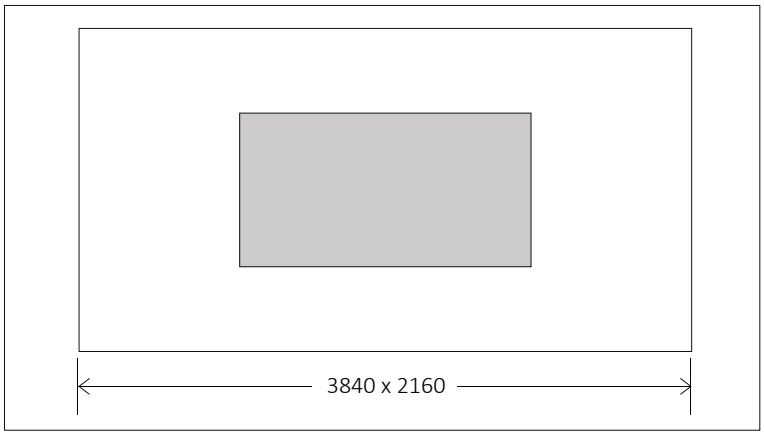
The LCD panel resolution of OBM-U178K/U248K/U318K/U428K is QFHD(16:9) 3840x2160, so if the input signal is 3840x2160 1:1 mapping is supported. If the input signal is DCI 4K(4096x2160), 1:1 mapping is not supported.

[Zero Scan]



When the 4096x2160 signal is fed, if you select Zero Scan using [Scan] button on the front panel, the picture is scaled to be displayed on the panel of 3840x2026 resolution with maintaining 1.89:1 ratio.

[1:1 Scan]



When 1:1 Scan mode is selected with the [Scan] button in 1920x1080, 1280x720 mode, etc., it is placed in the center of the screen as above. A 1:1 mapped image is output.

8. Connecting the SDI Signals

Single Link 12G/6G/3G/HD-SDI, Dual-Link 6G/3G-SDI, Quad Link 12G/6G/3G/-SDI signals can be Input to the SDI In connectors of this monitor.
Up to 4-channel Single Link 12G/6G/3G/HD-SDI signals, 1-channel Dual-Link 6G/3G-SDI or 1-channel Quad-Link 12G/6G/3G-SDI signals can be input. Use the appropriate input connectors depending on the input signal, referring to the table below.

Single-Link Signal

Connector	Input signal
12G SDI-1	12G/6G/3G/HD
12G SDI-2	12G/6G/3G/HD
12G SDI-3	12G/6G/3G/HD
12G SDI-4	12G/6G/3G/HD

Dual-Link 3G –SDI Signal

* 2-sample interleave division signals

Connector	Input signal
12G SDI-1	6G/3G SDI Link1
12G SDI-2	6G/3G SDI Link2

Quad-Link Signal

* 2-sample interleave division signals

Connector	Input signal
12G SDI-1	12G/3G Link1
12G SDI-2	12G/3G Link2
12G SDI-3	12G/3G Link3
12G SDI-4	12G/3G Link4

Quad-Link Square Signal

Connector	Input signal
12G SDI-1	12G/3G/HD Link1
12G SDI-2	12G/3G/HD Link2
12G SDI-3	12G/3G/HD Link3
12G SDI-4	12G/3G/HD Link4

Image of Square division signals

Sub-Image1 (upper-left screen)	Sub-Image2 (upper-right screen)
Sub-Image3 (lower-left screen)	Sub-Image4 (lower-right screen)

* Only progressive signals are supported in Dual-Link and Quad-Link modes.

9. Available Signal Formats

This monitor is applicable to the following signal formats

Single HD-SDI

Signal System	Signal Format
1920 x 1080 / 23.98, 24, 25, 29.97, 30p/Psf, 50, 59.94, 60i	4:2:2 YCbCr 10bit
2048 x 1080 / 23.98, 24, 25, 29.97, 30p/Psf	4:2:2 YCbCr 10bit
1280 x 720 / 23.98, 24, 25, 29.97, 30, 50, 59.94, 60p	4:2:2 YCbCr 10bit

Single 3G-SDI

Signal System	Signal Format	
1920 x 1080 / 47.95, 48, 50, 59.94, 60p	4:2:2 YCbCr 10bit	Level A / Level B-DL
1920 x1080 / 23.98, 24, 25, 29.97, 30p/Psf, 50, 59.94, 60i	4:4:4 RGB 10bit 4:4:4 YCbCr 10bit 4:4:4 RGB 12bit 4:4:4 YCbCr 12bit	Level A / Level B-DL
2048 x1080 / 47.95, 48, 50, 60p	4:2:2 YCbCr 10bit	Level A / Level B-DL
2048 x 1080 / 23.98, 24, 25, 29.97, 30p/Psf	4:4:4 RGB 10bit 4:4:4 YCbCr 10bit 4:4:4 RGB 12bit 4:4:4 YCbCr 12bit	Level A / Level B-DL
1280x 720 / 23.98, 24, 25, 29.97, 30, 50, 59.94, 60p	4:4:4 RGB 10bit 4:4:4 YCbCr 10bit	Level A

Single 6G-SDI

Signal System	Signal Format
3840 x2160 / 23.98, 24, 25, 29.97, 30p	4:2:2 YCbCr 10bit
4096 x2160 / 23.98, 24, 25, 29.97, 30p	4:2:2 YCbCr 10bit

Single 12G-SDI

Signal System	Signal Format
3840 x2160 / 23.98, 24, 25, 29.97, 30, 47.95, 48, 50, 59.94, 60p	4:2:2 YCbCr 10bit
4096 x2160 / 23.98, 24, 25, 29.97, 30, 47.95, 48, 50, 59.94, 60p	4:2:2 YCbCr 10bit

Dual-Link (4K) 3G-SDI

Signal System	Signal Format	
3840 x2160 / 23.98, 24, 25, 29.97, 30p	4:2:2 YCbCr 10bit	Level B-DS 2-sample interleave division
4096 x2160 / 23.98, 24, 25, 29.97, 30p	4:2:2 YCbCr 10bit	Level B-DS 2-sample interleave division

Dual-Link (4K) 6G-SDI

Signal System	Signal Format	
3840 x2160 / 50, 59.94, 60p	4:2:2 YCbCr 10bit	2-sample interleave division
4096 x2160 / 50, 59.94, 60p	4:2:2 YCbCr 10bit	2-sample interleave division

Quad-Link (4K) HD-SDI

Signal System	Signal Format	
3840 x2160 / 23.98, 24, 25, 29.97, 30p	4:2:2 YCbCr 10bit	2-sample interleave division/ Square division
4096 x2160 / 23.98, 24, 25, 29.97, 30p	4:2:2 YCbCr 10bit	2-sample interleave division/ Square division

Quad-Link (4K) 3G-SDI

Signal System	Signal Format		
3840 x2160 / 50, 59.94, 60p	4:2:2 YCbCr 10bit	Level A / Level B-DL	2-sample interleave division/ Square division
3840 x2160 / 23.98, 24, 25, 29.97, 30p	4:4:4 RGB 10bit 4:4:4 YCbCr 10bit 4:4:4 RGB 12bit 4:4:4 YCbCr 12bit	Level A / Level B-DL	
4096 x 2160 / 47.95, 48, 50, 59.94, 60p	4:2:2 YCbCr 10bit	Level A / Level B-DL	2-sample interleave division/ Square division
4096 x 2160 / 23.98, 24, 25, 29.97, 30p	4:4:4 RGB 10bit 4:4:4 YCbCr 10bit 4:4:4 RGB 12bit 4:4:4 YCbCr 12bit	Level A / Level B-DL	

Quad-Link (4K) 12G-SDI

Signal System	Signal Format	
3840 x2160 / 50, 59.94, 60p	4:2:2 YCbCr 10bit	2-sample interleave division
4096 x2160 / 50, 59.94, 60p	4:2:2 YCbCr 10bit	2-sample interleave division

HDMI

Signal System	
640 x 480p@59.94 / 60	4:4:4 RGB 8 / 10 / 12bit 4:4:4 YCbCr 8 / 10 / 12bit 4:2:2 YCbCr 12bit
720 x 480p@59.94 / 60	
720 x 576p@50	
1280 x 720p@50 / 59.94 / 60	
1920 x 1080i@50 / 59.94 / 60	
1920 x 1080p@23.98 / 24 / 25 / 29.97 / 30 / 50 / 59.94 / 60	
2048 x 1080p@23.98 / 24 / 25 / 29.97 / 30 / 47.95 / 48 / 50 / 59.94 / 60	
3840 x 2160p@23.98 / 24 / 25 / 29.97 / 30 / 50* / 59.94* / 60*	4:4:4 RGB 8bit 4:4:4 YCbCr 8bit 4:2:2 YCbCr 12bit *Supports 4:4:4 RGB 8bit only
4096 x 2160p@23.98 / 24 / 25 / 29.97 / 30 / 50* / 59.94* / 60*	
800 x 600p@60	4:4:4 RGB 8 / 10 / 12bit 4:4:4 YCbCr 8 / 10 / 12bit 4:2:2 YCbCr 12bit
1024 x 768p@60	

10. Key Functions

Versatile 4K/QFHD Input Capability

The OBM-U**8K series is equipped with standard 12G-SDI input interface(x4) and support 4K/8K Quad Link 2-sample interleave signals and 4K Quad Link Square Division signals.

The OBM-U**8K Series can accept up to 7680x4320/23.98,24,25,29.97,30,50,59.94,60p and 8192x4320/23.98,24,25,29.97,30,50,59.94,60p

4K Waveform Monitor and Vector Scope Display

These features enable users to monitor sources using the internal Waveform and Vector Scope. Waveform Wide mode is supported, and both Waveform and Vector Scope can be displayed simultaneously.

High Dynamic Range(HDR) Display Function

The OBM U**8K series provides the function to display the High Dynamic Range footage.

Postium HDR function allows users to view both highlights and shadow detail of scenes at tha same time, thus resulting in more natural and realistic images.

The OBM U**8K series supports PQ EOTF (SMPTE ST 2084), Hybrid Log Gamma and S-Log3.

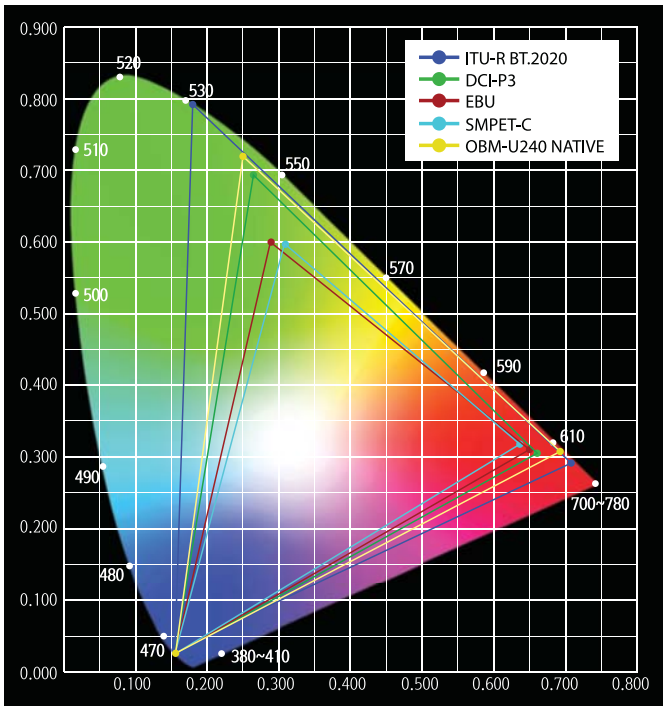
HDR Mode SDR Mode

OBM-HDR provides the function of comparing HDR and SDR(Standard Dynamic Range) on the displayed image on the OBM series simultaneously.

HDR SDR

Wide Color Space Supporting DCI-P3 and ITU-R BT.2020

The wide color gamut and the advanced 3D LUT function enable the OBM U**8K series to reproduce various color spaces accurately and the excellent grayscale. You can select from color gamuts such as DCI-P3, ITU-R BT.2020, ITU-R BT.709, SMPTE-C, EBU, Native.



Adjustable Gamma
Gamma value is adjustable from 1.0 to 3.0 as user's preference to monitor in the dark area of the picture. Any pictures taken in either light or dark environment can be easily watched or analyzed.

Gamma 1.8 Gamma 2.4

Remote Control via Ethernet

The OBM U**8K series can be connected via Ethernet connection and controlled remotely on the network.

Focus Assist
This function controls the aperture level of a video signal, and displays images on screen with sharpened edges to help camera focus operation.

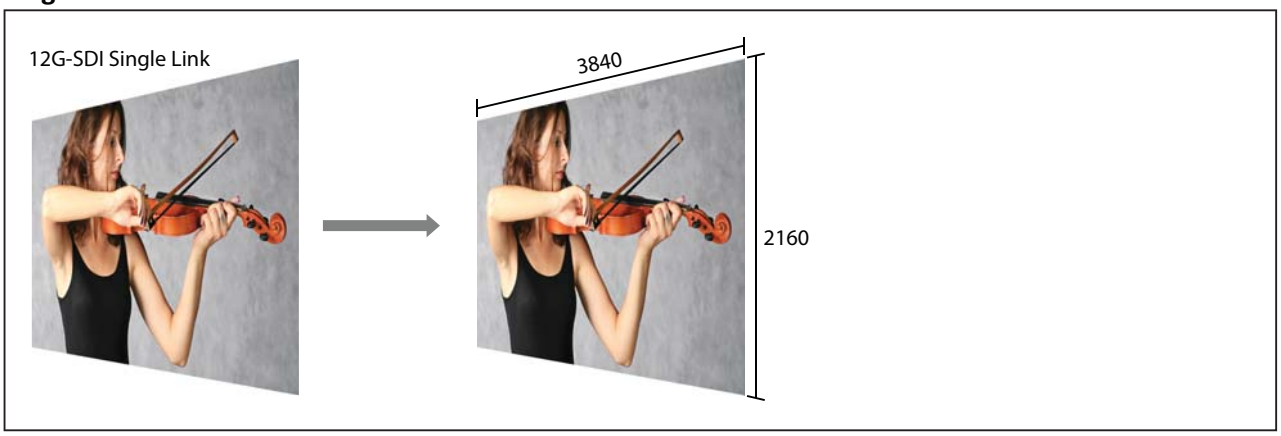
Camera Log Selection
The OBM-U**8K series have the built-in camera LUT of the various camera manufacturers. It allows users to load the following camera logs. Log-C, C-Log / S-Log2, S-Log3 / J-Log1
The more camera LUTs will be updated.

SFP Optical Connector
The OBM U**8K series has the SFP interface, which allows to use the various SFP modules which can fit any possible broadcast applications.

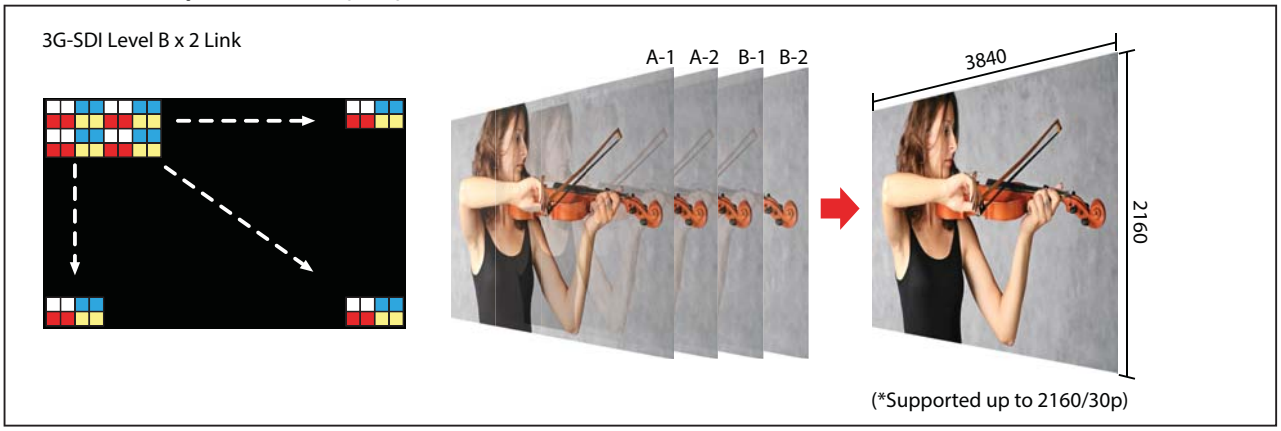
Custom 3D LUT File Import
The OBM-U**8K Series allow the user to import 3D Look-up Table for accurate and consistent color matching between indivisual displays as well as using customized 'looks' that have been created by 3rd party color-grading applications. 32^³, 33^³, 64^³ and 65^³ cube file is supported.

Various 4K/12G Display Modes

Single Link 12G-SDI

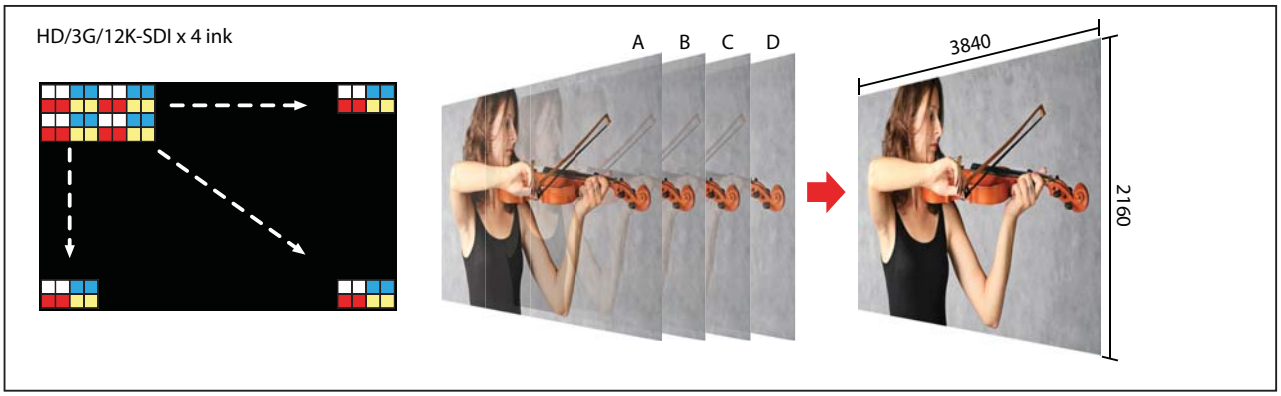


Dual Link 2-Sample Interleave(2-SI)



Quad Link 2 Sample Interleave (2SI)

Each link contains a full image at 1/4 resolution. 2SI mode uses four Sub-image and alternates the samples every two pixels and every line instead of slitting the image into four quadrants.



Black Stretch

The Black Stretch increases the visibility of subjects in dark areas, not degrading image quality in bright areas. This mode can be used to increase shadow detail without changing the absolute black level, and without affecting mid-tones.

Black Stretch Off

Black Stretch On

False Color

This function evaluates the Luma(Y') level of the input image. If the certain Y' level is set, the pixels with the designated Luma(Y') level are displayed with the zebra pattern or the color pattern.
There are three modes in OBM False Color.

Zebra

This mode displays the Luma(Y') level of the input image in zebra pattern.

False Color Variable

This mode allows the user to adjust White clipping, Pink level, Green level, Black Clipping.

False Color ARRI

The color pattern is displayed with ARRI camera standard.

False Color Comparison

This function enables the user to divide the picture side by side, and compare the original image on the left half and the False Color image on the right half.

Gamut Error

The total range of the SDI 10bit signal is 0 to 1023. The range 0 to 3 and 1020 to 1023 are the reserved values for Sync, and the total video signal range is 4 to 1019.
In a video signal, each primary component should lie between 0 and 100% of the video range between black level and peak level (R and G and B). Ideally, video levels should lie within the specified limits so that programs can be distributed without adjustment.
100% White pattern: Y- 940, Cb- 512, Cr- 512. 0% Black pattern: Y- 64, Cb- 512, Cr- 512
Expected Video Range: 64 to 940
In practice, it is difficult to avoid generating signals slightly out of range, and it is considered reasonable to allow a small tolerance. Therefore, the EBU recommends that the RGB components and the corresponding Luminance (Y) signal should not normally exceed the “preferred minimum/maximum” range of digital sample levels in the table below.

System Bit Depth	Range in Digital Sample (Code) Values		
	Expected Video Range	Preferred Min. / Max.	Total Video Signal Range
10 bit	64 - 940	20 - 984	4 - 1019

*References: EBU R 103 Version 2.0 page 4, Annex 1

Type 1: Black Zebra

When the targeted color space is selected as BT.709, the pixels outside of the targeted color space are displayed as Black Zebra.
The pxels over Y Maximum, Chroma Maximum, RGB Maximum are displayed as Black Zebra, and the pixels below Y Minimum, Chroma Minimum, RGB Minimum are also displayed as Black Zebra.

Type 2: Black & White Zebra

When the targeted color space is selected as BT.709, the pixels outside of the targeted color space are displayed as Black or White Zebra. The pxels over Y Maximum, Chroma Maximum, RGB Maximum are displayed as Black Zebra, and the pixels below Y Minimum, ChromaMinimum, RGB Minimum are displayed as White Zebra.

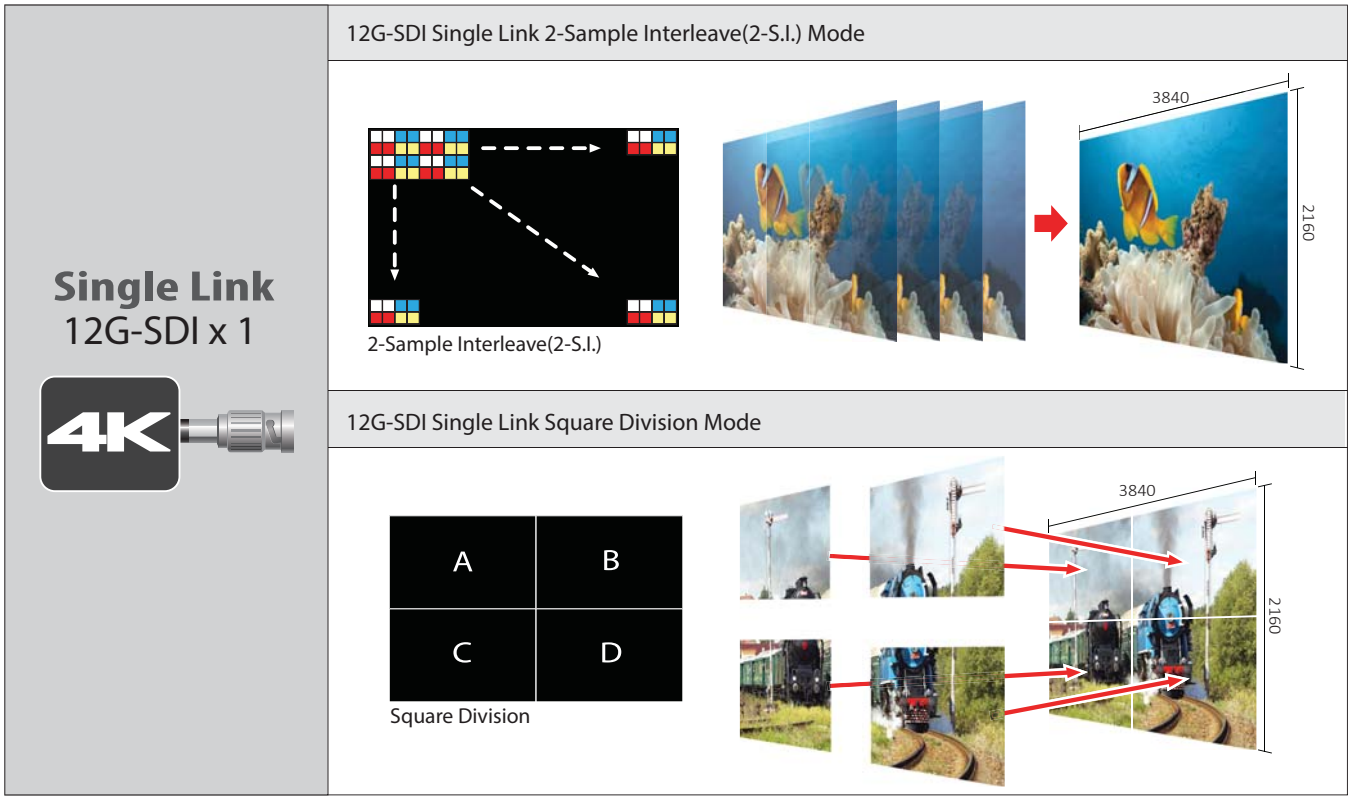
Type 3: Mono

When the targeted color space is selected as BT.709, the pixels inside of the targeted color space are displayed as Mono, and the pixels outside of the targeted color space are displayed as the color. In this type, black and white area is not recognized.

*Simulated image

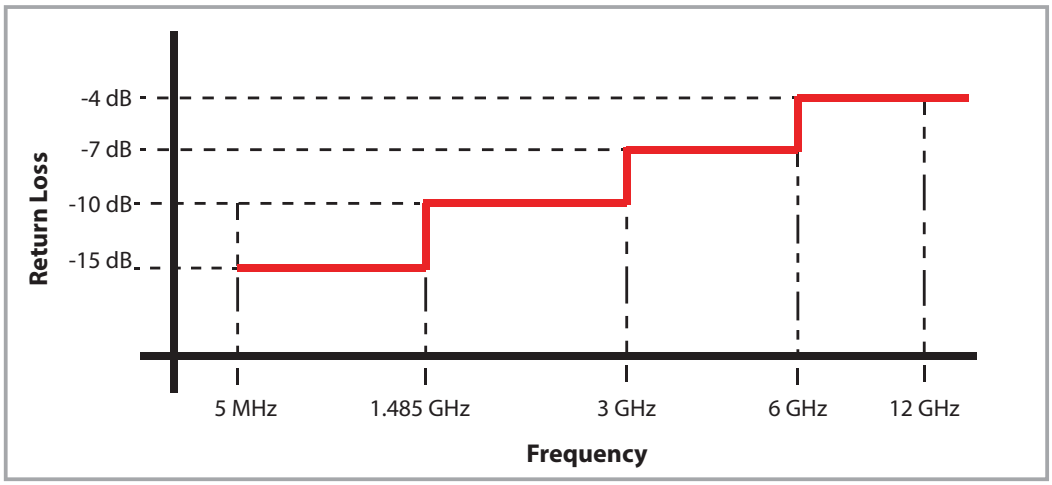
Supports 12G-SDI Single Link Square Division signal format

The OBM-U**8K series can display 12G-SDI Single Link 4K/UHD signals as well as 3G-SDI Quad Link signals. This is already a very useful feature, compared to competitors' monitors.
Most of the single link 12G-SDI signals are displayed as 2-S.I. format on the screen. But, the single link 12G-SDI signals with Square Division format are increasing. In order to meet this requirement in the location and studio, the OBM-U**8K series support both 12G-SDI Single Link 2-S.I. mode and 12G-SDI Single Link Square Division mode.



Meets the Return Loss Standard, SMPTE ST 2082-1:2015

In the professional broadcasting video industry, Return Loss is an important parameter that measures the reflected signal that bounces back from a terminated device. If the broadcast monitor has the poor return loss, the level of reflected signal negatively impacts the signal integrity of the loop-out signal.
The OBM-U**8K monitors meets the requirements of Return Loss specified in SMPTE ST 2081-1:2015, so that the OBM-U**8K monitors provides the high signal fidelity.



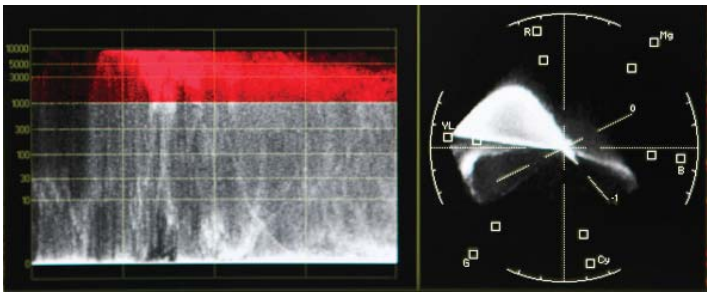
<SMPTE ST 2082-1:2015 Requirements>

HDR Waveform

When HDR more is set on, HDR Waveform is displayed on screen.

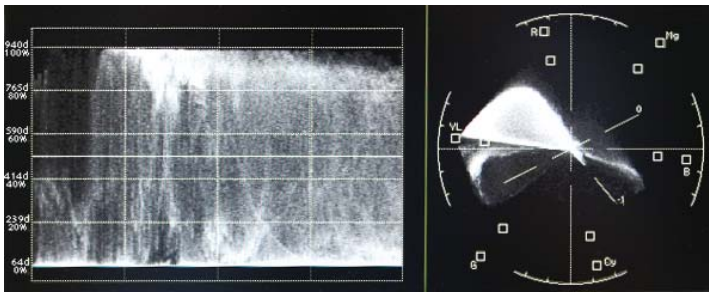
HDR Mode + HDR Waveform

HDR Waveform



SDR Mode + SDR Waveform

SDR Waveform



In-Monitor Display(IMD) Function

The image source names and tally information can be displayed on the screen, with an external remote function via Ethernet. The TSL system protocol is supported. The color of the source name and tally color can be selectable among White, Red, Green, Blue, Yellow, Cyan, Magenta.

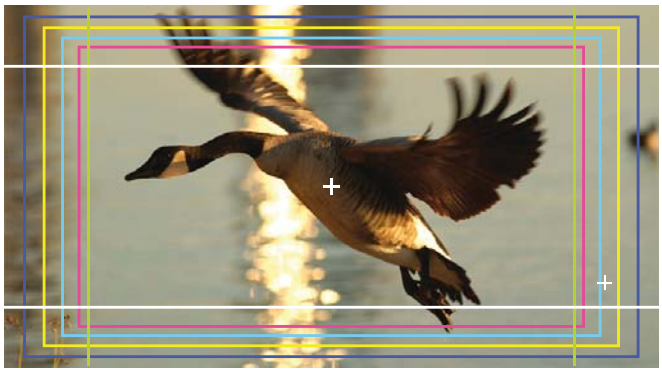
Custom 3D LUT File Import

The OBM series allow the user to import 3D Look-up Table for accurate and consistent color matching between indivisual displays. as well as using customized 'looks' that have been createcl by 3rd party color-grading applications. 32^3, 33^3, 64^3 and 65^3 cube file is supported.

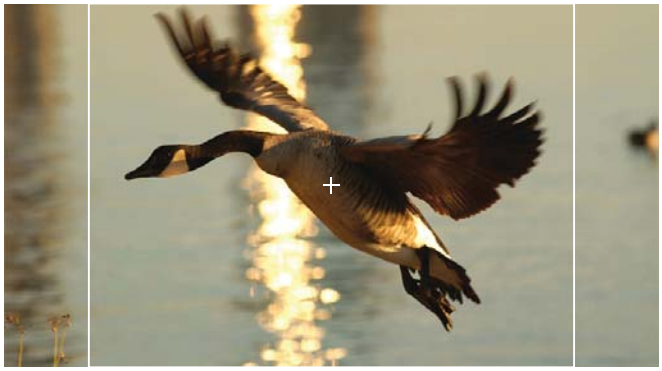
Various Markers

The OBM U/X series can display various markers, including aspect marker, area marker, and center marker. In addition, the detailed display settings of each marker are allowed. For example, the color, brightness, horizontal/vertical position, and thickness of aspect markers can all be adjusted.

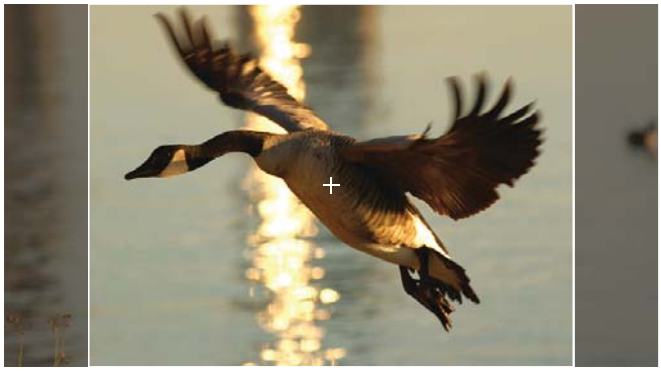
Display various markers



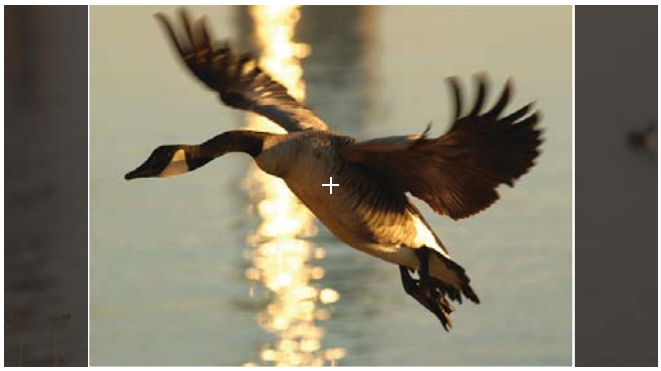
Display Color markers



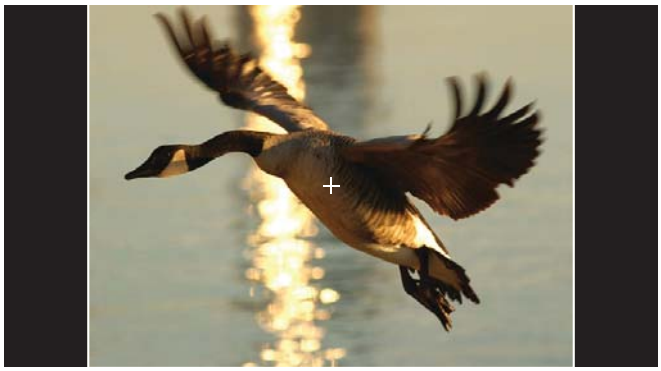
Aspect Mat 0



Aspect Mat 2



Aspect Mat 5



Aspect Mat 7

11. Product Specifications

Specifications (OBM-U178K)

ITEM		OBM-U178K
Input	4 x BNC	12G/6G/3G/HD
	1 x HDMI	HDMI 2.0
	2 x SFP	SFP
Output	4 x BNC	12G/6G/3G/HD/4 Active Loop Output
Input Signal Format	SMPTE ST 2082-12(12G Quad 8K)	4320p(60/59.94/50)
	SMPTE ST 2082-10(12G Single)	2160p(60/59.94/50/30/29.97/25/24/23.98)
	SMPTE ST 2081-11(6G Dual)	2160p(60/59.94/50)
	SMPTE ST 2081-10(6G Single)	2160p(30/29.97/25/24/23.98)
	SMPTE ST 425-AB	1080p(60/59.94/50/30/29.97/25/24/23.98/30sF/29.97sF /25sF/24sF/23.98sF) / 1080i (60/59.94/50)
	SMPTE ST 274	1080p(30/29.97/25/24/23.98/24sF/23.98sF)
		1080i (60/59.94/50)
	SMPTE ST 296	720p(60/59.94/50)
	SMPTE ST 260	1920 x 1035i(60/59.94)
	SMPTE ST 2048	2048 x 1080p(24/23.98/24sF/23.98sF)
	HDMI 2.0	~ 2160p(60)
	SFP	12Gbps, 6Gbps, 2.970Gbps, 1.485Gbps, 270Mbps
Audio In/Out	1 x Phone Jack In	Line In(Stereo)
	1 x Phone Jack Out	H/P Out(Front, Stereo)
	2 x Speaker Out	Stereo
Display	Size	17.3” LCD
	Resolution	3840 x 2160 (16:9)
	Pixel Pitch	0.09945mm
	Color	1.064B Colors(8bit+Hi FRC)
	Viewing Angle	178(H), 178(V)
	Luminance of White	1500cd/m² (HDR Maximum 1000cd/m²)
	Contrast	1000 : 1
	Display Area (H x V)	381.89 x 214.81 (mm)
General	2 x Ethernet	Control/Update, RJ-45P Input / Output
	1 x GPIO	GPI-7 Port, RJ-45P Jack
	2 x Serial	RS-422 Jack, RJ-45P Input / Output
	1 x USB	For Firmware Update, Color Calibration
	Power Requirements	AC(100-230V, 50/60Hz)/DC 24V
	Power Consumption	75W
	Operating Temperature	0°C ~ 40°C(32°F~104°F)
	Operating Humidity	20% ~ 80% RH
	Weight	Main Body : 6.6kg / 14.55lbs (With Stand : 7.7kg / 16.97lbs)
	Dimensions (WxHxD)	Main Body : 436 x 310 x 81 mm(With Stand : 445 x 329 x 120mm)
		Main Body : 17.16 x 12.20 x 3.18inch (With Stand : 17.51 x 12.20 x 4.72 inch)
	Accessories	Power Cable
	Option	Wall Mount Kit/ Carrying Case

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Specifications (OBM-U248K)

ITEM		OBM-U248K	
Input	4 x BNC	12G/6G/3G/HD	
	1 x HDMI	HDMI 2.0	
	2 x SFP	SFP	
Output	4 x BNC	12G/6G/3G/HD/4 Active Loop Output	
Input Signal Format	SMPTE ST 2082-12(12G Quad 8K)	4320p(60/59.94/50)	
	SMPTE ST 2082-10(12G Single)	2160p(60/59.94/50/30/29.97/25/24/23.98)	
	SMPTE ST 2081-11(6G Dual)	2160p(60/59.94/50)	
	SMPTE ST 2081-10(6G Single)	2160p(30/29.97/25/24/23.98)	
	SMPTE ST 425-AB	1080p(60/59.94/50/30/29.97/25/24/23.98/30sF/29.97sF /25sF/24sF/23.98sF) / 1080i (60/59.94/50)	
	SMPTE ST 274	1080p(30/29.97/25/24/23.98/24sF/23.98sF)	
		1080i (60/59.94/50)	
	SMPTE ST 296	720p(60/59.94/50)	
	SMPTE ST 260	1920 x 1035i(60/59.94)	
	SMPTE ST 2048	2048 x 1080p(24/23.98/24sF/23.98sF)	
	HDMI 2.0	~ 2160p(60)	
	SFP	12Gbps, 6Gbps, 2.970Gbps, 1.485Gbps, 270Mbps	
Audio In/Out	1 x Phone Jack In	Line In(Stereo)	
	1 x Phone Jack Out	H/P Out(Front, Stereo)	
	2 x Speaker Out	Stereo	
Display	Size	23.74” LCD	
	Resolution	3840 x 2160 (16:9)	
	Pixel Pitch	0.1369mm	
	Color	1.073B Colors, 10Bit	
	Viewing Angle	178(H), 178(V)	
	Luminance of White	540cd/m² (HDR Maximum 400cd/m²)	
	Contrast	1200 : 1	
	Display Area (H x V)	525.65 x 295.70 (mm)	
General	2 x Ethernet	Control/Update, RJ-45P Input / Output	
	1 x GPIO	GPI-7 Port, RJ-45P Jack	
	2 x Serial	RS-422 Jack, RJ-45P Input / Output	
	1 x USB	For Firmware Update, Color Calibration	
	Power Requirements	AC(100-230V, 50/60Hz)/DC 24V	
	Power Consumption	80W	
	Operating Temperature	0°C ~ 40°C(32°F~104°F)	
	Operating Humidity	20% ~ 80% RH	
	Weight	10.5kg / 23.14lbs	
	Dimensions (WxHxD)	605 x 400 x 140mm	
		23.81 x 15.74 x 5.51inch	
	Accessories	Power Cable	
	Option	Wall Mount Kit/ Carrying Case	

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Specifications (OBM-U318K)

ITEM		OBM-U318K
Input	4 x BNC	12G/6G/3G/HD
	1 x HDMI	HDMI 2.0
	2 x SFP	SFP
Output	4 x BNC	12G/6G/3G/HD/4 Active Loop Output
Input Signal Format	SMPTE ST 2082-12(12G Quad 8K)	4320p(60/59.94/50)
	SMPTE ST 2082-10(12G Single)	2160p(60/59.94/50/30/29.97/25/24/23.98)
	SMPTE ST 2081-11(6G Dual)	2160p(60/59.94/50)
	SMPTE ST 2081-10(6G Single)	2160p(30/29.97/25/24/23.98)
	SMPTE ST 425-AB	1080p(60/59.94/50/30/29.97/25/24/23.98/30sF/29.97sF /25sF/24sF/23.98sF) / 1080i (60/59.94/50)
	SMPTE ST 274	1080p(30/29.97/25/24/23.98/24sF/23.98sF)
		1080i (60/59.94/50)
	SMPTE ST 296	720p(60/59.94/50)
	SMPTE ST 260	1920 x 1035i(60/59.94)
	SMPTE ST 2048	2048 x 1080p(24/23.98/24sF/23.98sF)
	HDMI 2.0	~ 2160p(60)
	SFP	12Gbps, 6Gbps, 2.970Gbps, 1.485Gbps, 270Mbps
Audio In/Out	1 x Phone Jack In	Line In(Stereo)
	1 x Phone Jack Out	H/P Out(Front, Stereo)
	2 x Speaker Out	Stereo
Display	Size	32” LCD
	Resolution	3840 x 2160 (16 : 9)
	Pixel Pitch	0.1845mm
	Color	1.073B Colors, 10Bit
	Viewing Angle	178(H), 178(V)
	Luminance of White	1000cd/m² (HDR Maximum 700cd/m²)
	Contrast	1500 : 1
	Display Area (H x V)	708.48 x 398.52 (mm)
General	2 x Ethernet	Control
	1 x GPIO	GPI-7 Port, RJ-45P Jack
	2 x Serial	RS-422 Jack, RJ-45P Input / Output
	1 x USB	For Firmware Update, Color Calibration
	Power Requirements	AC(100-230V, 50/60Hz)/DC 24V
	Power Consumption	120W
	Operating Temperature	0°C ~ 40°C(32°F~104°F)
	Operating Humidity	20% ~ 80% RH
	Weight	Main Body : 14.8kg / 32.62lbs
	Dimensions (WxHxD)	762 x 512 x 190mm (with stand)
		30 x 20.15 x 7.48inch
	Accessories	Power Cable
	Option	Wall Mount Kit/ Carrying Case

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Specifications (OBM-U428K)

ITEM		OBM-U428K
Input	4 x BNC	12G/6G/3G/HD
	1 x HDMI	HDMI 2.0
	2 x SFP	SFP
Output	4 x BNC	12G/6G/3G/HD/4 Active Loop Output
Input Signal Format	SMPTE ST 2082-12(12G Quad 8K)	4320p(60/59.94/50)
	SMPTE ST 2082-10(12G Single)	2160p(60/59.94/50/30/29.97/25/24/23.98)
	SMPTE ST 2081-11(6G Dual)	2160p(60/59.94/50)
	SMPTE ST 2081-10(6G Single)	2160p(30/29.97/25/24/23.98)
	SMPTE ST 425-AB	1080p(60/59.94/50/30/29.97/25/24/23.98/30sF/29.97sF /25sF/24sF/23.98sF) / 1080i (60/59.94/50)
	SMPTE ST 274	1080p(30/29.97/25/24/23.98/24sF/23.98sF)
		1080i (60/59.94/50)
	SMPTE ST 296	720p(60/59.94/50)
	SMPTE ST 260	1920 x 1035i(60/59.94)
	SMPTE ST 2048	2048 x 1080p(24/23.98/24sF/23.98sF)
	HDMI 2.0	~ 2160p(60)
	SFP	12Gbps, 6Gbps, 2.970Gbps, 1.485Gbps, 270Mbps
Audio In/Out	1 x Phone Jack In	Line In(Stereo)
	1 x Phone Jack Out	H/P Out(Front, Stereo)
	Speaker Out	-
Display	Size	42.5” LCD
	Resolution	3840 x 2160 (16:9)
	Pixel Pitch	0.2451mmx0.2451mm
	Color	1.07Billion Colors(True 10bit)
	Viewing Angle	178(H), 178(V)
	Luminance of White	700cd/m² (HDR Maximum 400cd/m²)
	Contrast	1000 : 1
	Display Area (H x V)	941.184 x 529.416 (mm)
General	2 x Ethernet	Control/Update, RJ-45P Input / Output
	1 x GPIO	GPI-7 Port, RJ-45P Jack
	2 x Serial	RS-422 Jack, RJ-45P Input / Output
	1 x USB	For Firmware Update, Color Calibration
	Power Requirements	AC(100-230V, 50/60Hz)
	Power Consumption	150W
	Operating Temperature	0°C ~ 40°C(32°F~104°F)
	Operating Humidity	20% ~ 80% RH
	Weight	32kg / 70.54lbs
	Dimensions (WxHxD)	990 x 639 x 210 mm
		38.97 x 25.15 x 8.26inch
	Accessories	Power Cable
	Option	Wall Mount Kit/ Carrying Case

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