User Manual

OBM U Series

Professional Video 4K Monitor

Operational Instructions

OBM-U090

OBM-U170

OBM-U240

OBM-U310

OBM-U550L

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Ver.18.1

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1. Precaution

Always use set voltage.
AC 100 ~ 230V, 50/60Hz
DC 12V(OBM-U090/U170) or DC 24V(OBM-U240/U310)

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 12V(OBM-U090/U170) or DC 24V(OBM-U240/310) 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.

1. Precaution

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.

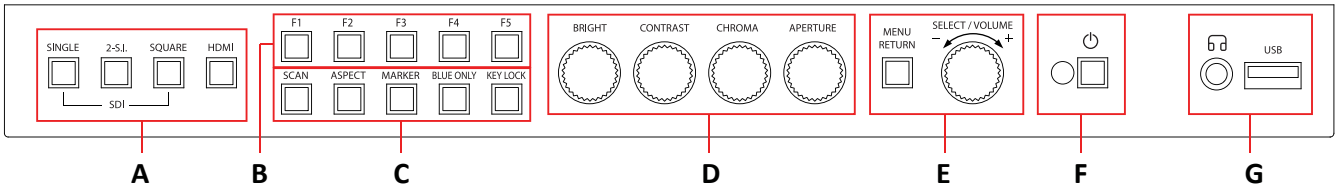
2. Main Features

4K professional monitor OBM U Series unit has the following features:

- Versatile 4K/QFHD Input Capability
  This monitor is equipped with standard 12G-SDI input interface(x2), 3G/HD-SDI input interface(x2) and support 4K 2-sample interleave signals and 4K square division signals.
  This monitor accepts up to 3840x2160 23.98/24/25/29.97/30/50/59.94/60p and 4096x2160 23.98/24/25/29.97/30/50/59.94/60p
- Supporting 12G/6G-SDI(4K) 2 Channel, 3G/HD-SDI (Level A/B) 2 Channel
- 6G-SDI Dual Link 4K/UHD supporting SMPTE ST 2081-11
- 3G-SDI Quad Link Square Division
- 3G-SDI Quad Link 2 Sample Interleave (2-S.I.)
- HDR(High Dynamic Range) display supporting PQ EOTF(ST 2084), Hybrid Log Gamma, S-Log3
- 3D-LUT for Accurate Color Reproduction
- Wide Color Space Supporting ITU-R BT.709, SMPTE-C, EBU, Native, D-CINEMA, ITU-R BT.2020
- Camera Log Conversion
- Custom 3D LUT file Import through USB
- Gamma Selection (1.0 ~ 3.0)
- Color Temperature(3200K, 5500K, 6500K, 9300K, USER 1/2/3, D-CINEMA)
- Support 4096x2160 Aspect
- Color Space / HDR / Gamma Comparison (Side by side, Wipe position)
- Monitor Update/Control via Ethernet, USB / RS-422
- Focus Assist
- False Color (Zebra, False Color ARRI, False Color Variable)
- False Color Comparison
- Black Stretch
- Gamut Error
- Waveform, VectorScope (Wave + Vector, Waveform Wide)
- HDR Waveform
- Firmware Update via USB Flash Memory
- Various Markers (EBU, 4:3, 16:9, 1.85:1, 2.35:1, Variable etc.)
- Zero Scan / Over Scan / 1:1 Scan
- Time Code Display(Position/Size Selection)
- De-embedded 8~16ch Audio Level Meter
- SFP optical connector(*OBM-U090 is not supported)
- Internal Patterns Display for Color Test (Black ~ 100%, Color Bar)
- Remote Control via GPI(RJ-45) Port
- UMD(TSL 5.0)
- H/V Delay
- Blue/Mono
- 3 Color TALLY Lamp
- Rack & VESA Mount (Option)
- Closed Caption (608,708)
- System Data Copy
- Various Preset Mode
- Key Lock & Password Lock
- Fast Mode (OBM-U090/U170)
- HDR Auto Setting
- HDMI 2.0 Support
- Analog(YPbPr, CVBS) Input Support (OBM-U090)
- Aspect
- Freeze
- Camera Log Mapped SDI Loopout
- Easy Firmware Update by USB

3. Location and Function of Parts and Controls

Front Panel (OBM-U170/240/310/550L)



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 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.].

[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 Space Compare
[F2]: H/V Delay
[F3]: Color Temp
[F4]: Audio Level Meter
[F5]: Time Code

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.

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

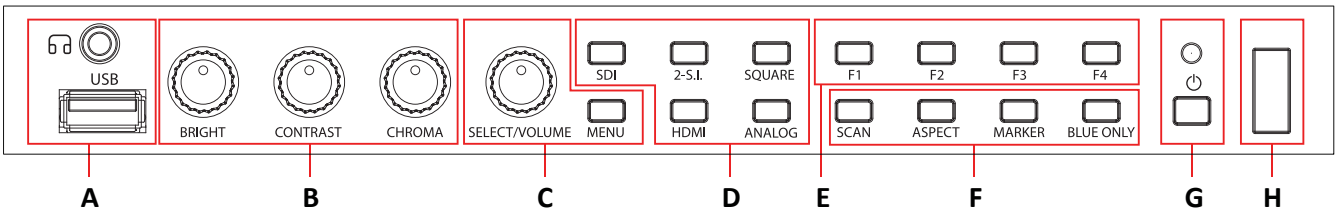
Headphone Jack

- 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).

Front Panel (OBM-U090)



A : (headphone) Jack and USB Connector

Headphone Jack

- The audio signal which is selected using the input select button is output in stereo sound.
- 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 speakers.

[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.
- To impot the custom 3D LUT file(*.cube, 32^³, 33^³, 64^³ and 65^³).

B : 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.

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

C : 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.

D : Input select Buttons/Lamp

Press to monitor the signal input to each connector.

[SDI] 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].

**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.].

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

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

[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.].

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

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

[ANALOG] Button/Lamp

- Press the button to select Analog Input.
- Mode changes in the order of [Composite] [Component].

E : F1 ~ F4 Button/Lamp

Press to adjust or turn on/off the assigned function.

The following functions are assigned at the factory.

[F1]: Color Space Compare

[F2]: H/V Delay

[F3]: Color Temp

[F4]: Audio Level Meter

F : 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.

G : ⏻ (Standby) switch and indicator

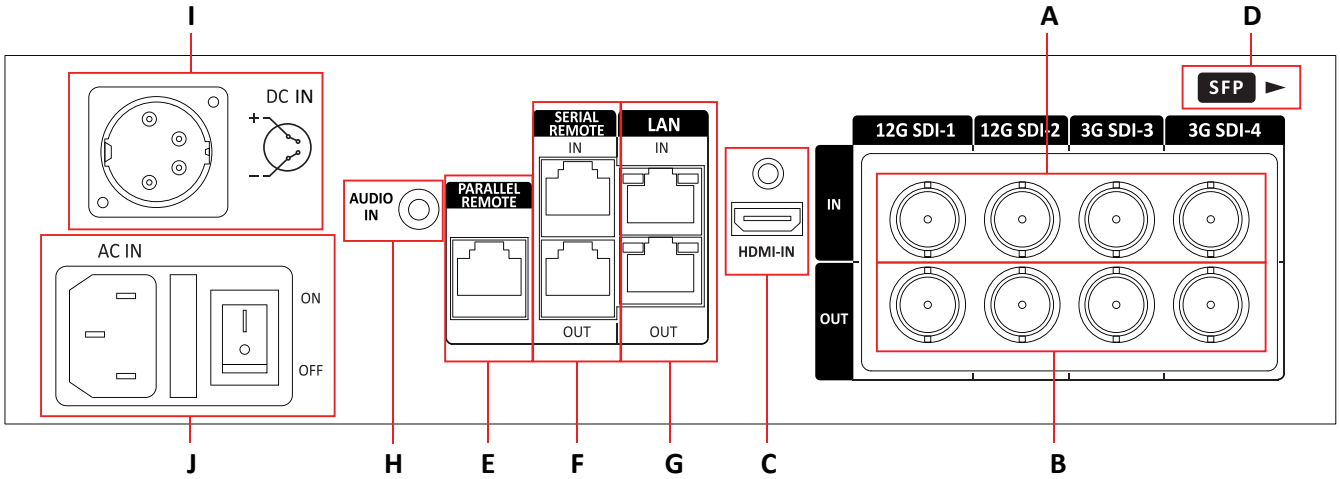
- Press to turn the power on when this monitor is in standby mode. After being turned on, the monitor performs initialization and the indicator flashes in green.
- Press the switch again for a second to set the monitor in standby mode. Then, the indicator flashes in orange and then turns red. The indicator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

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

H : IR Receiver

- Receives signals from the remote control

Rear Panel (OBM-U170/240/310/550L)



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

Input connectors for SDI signals. For details, see “9. Connecting the SDI Signals” (page 32).

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

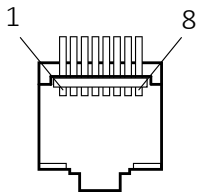
Input connector for SFP optical signal.

E : 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]



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

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

F : 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.

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)

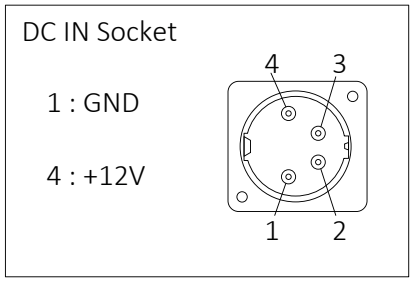
Connector for analog audio input.
Analog input can be selected with SDI Audio Setting in User Configuration menu.

I : DC IN terminal

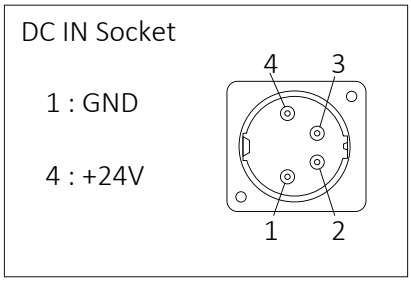
Connects the DC power supply to the monitor.
- OBM-U170: 12V
- OBM-U240/U310: 24V

Make sure to use DC 12V power supply for OBM-U170 and DC 24V power supply for OBM-U240/U310.

OBM-U170

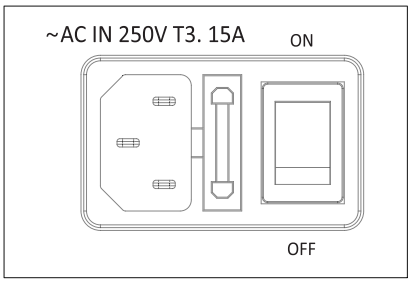


OBM-U240/U310

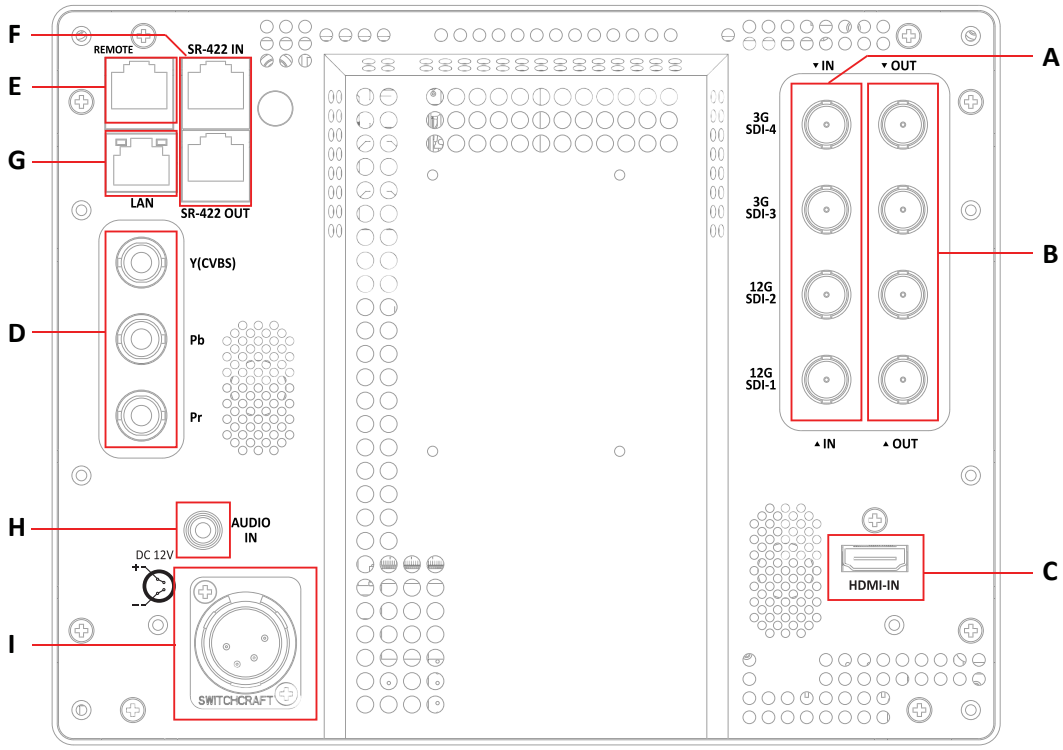


J : AC IN terminal

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



Rear Panel(OBM-U090)



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

Input connectors for SDI signals. For details, see “9. Connecting the SDI Signals” (page 32).

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 : Analog Input connector

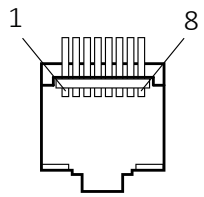
Input connectors for analog signals (CVBS, Component).

E : 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	Single SDI
2	2-S.I. SDI
3	Square SDI
4	HDMI
5	Analog
6	1:1 Scan
7	Power
8	GND

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

F : 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.

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.

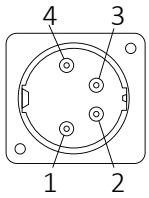
I : DC IN terminal

Connects the DC power supply to the monitor.
- OBM-U090: 12V

DC IN Socket

1 : GND

4 : +12V

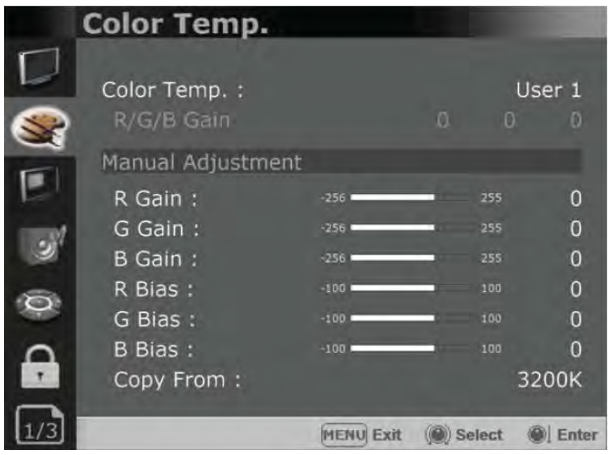


4. Using the Menu

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

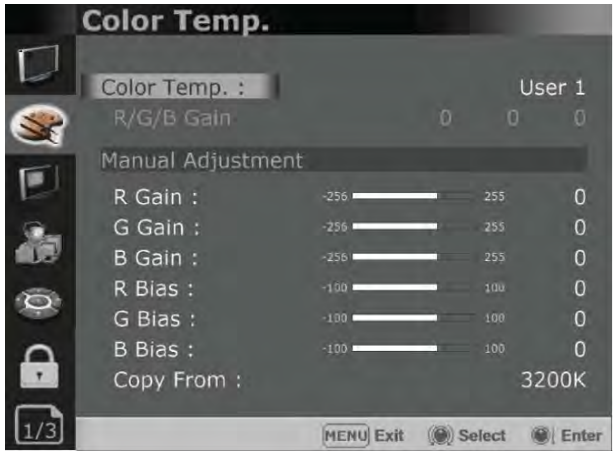
1. Press the MENU button.

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



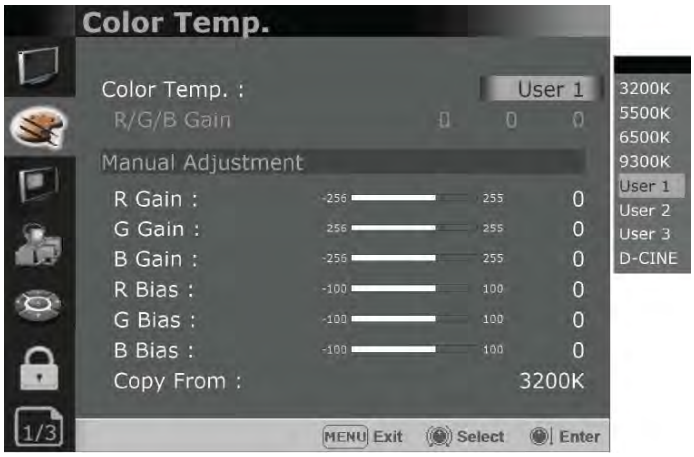
2. Turn SELECT/VOLUME knob to select a menu, then press the knob.

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:

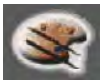
Press the MENU button.

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 characteristics
  - Colorimetry
- Model Name
- Serial Number
- Board Version
- Operation Time
- Last Calibration Time



Color Temp./Color Space/Gamma menu

- Color Temp. —— R/G/B Gain
- Manual Adjustment
  - R Gain / G Gain / B Gain / R Bias
  - G Bias / B Bias / Copy From

(OBM-U170/240/310/550L)

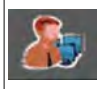
- Color Space
- OBM-HDR
  - Type
- Gamma
- Color Space Comparison
  - Left Color Space
  - Right Color Space
  - Right Gamma
  - Wipe Position

- Back Light
- Camera Log
  - Default Log Sel.
  - User Log Sel.
- HDR Auto Setting
- Black Stretch Setting
- Black Stretch - Max

(OBM-U090)
- Color Space
- OBM-HDR
  - Type
- Gamma
- Camera Log
  - Default Log Sel.
  - User Log Sel.
- Back Light
- HDR&Cam.Log Comparison - Wipe Position
- Black Stretch - Max

Camera Assist menu

- Zebra & False Color
  - Zebra Level Adjustment
  - Zebra Range
  - Variable White Clipping
  - Variable Pink Level
  - Variable Green Level
  - Variable Black Clipping
- False Color Comparison
  - Wipe Position
- Focus Assist
  - Color
  - Frequency
- Gamut Errror
  - 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
  - *-(U170/240/310/550L)*
- Input Setting
  - 3G Signal Format
  - RGB Range
  - SFP Enable
  - 12G Image Division
  - *-(U170/240/310/550L)*
- Output Setting
  - Camera Log Mapped SDI Loopout
- Speaker Out / Audio Level Meter Setting
  - SDI Left Speaker Out
  - SDI Right Speaker Out
  - HDMI L/R Speaker Out
  - Audio Level Meter
    - Display
    - Reference
    - Size/Transparency
    - Peak Hold Time

- Marker Setting
- Marker
  - Aspect Marker — Variable Aspect
  - Center Marker
  - Area Marker
  - Color
  - Aspect Mat
  - Fit
  - Thickness (OBM-U090/U170)
- WFM/Vector Setting
- WFM/Vector
  - Type
  - Intensity
  - Transparency
  - Color
  - Line Select - Line Position
  - Position
- Closed Caption Setting
  - Closed Caption
  - Type
  - 708
  - 608
- Fast Mode Setting *(OBM-U090/U170)*
  - Fast mode
- System Setting
  - Internal Signal
  - Key LED
  - OSD Time
  - OSD Position
  - System Data
- Time Code
- Time Code Position/Size *(OBM-U170)*
- Fan Enable *(OBM-U310)*

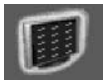
Remote menu

- Parallel Remote — 1 Pin ~ 8 Pin
- Monitor ID
- In-Monitor Display Setting
  - IMD Type
  - Transparency
  - Text Color
  - Left Tally Color
  - Right Tally Color
- Network Setting
  - DHCP
  - IP Address
  - Subnet Mask
  - Gateway
  - Port No.

Security Setting

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

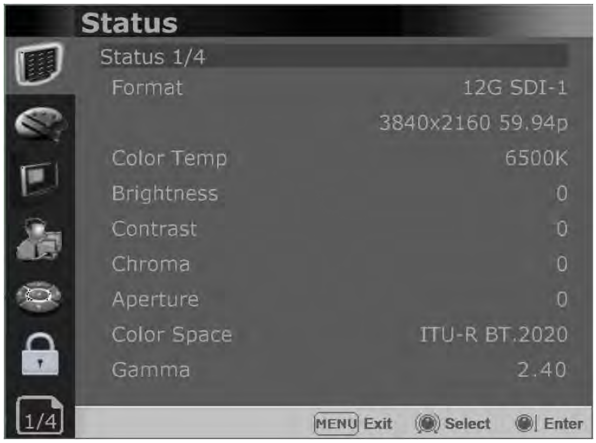
6. OSD Menu Operations



Status Menu

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

Page 1/4



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

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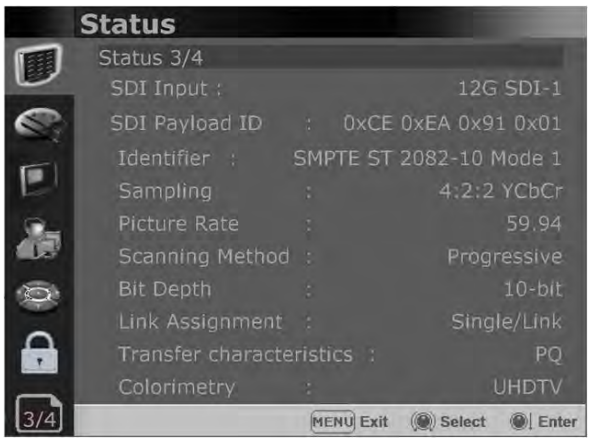
- User Preset
- RGB Range
- Back Light
- WFM/Vector
- Audio Level Meter
- Focus Assist
- Time Code
- Volume

Page 3/4



- 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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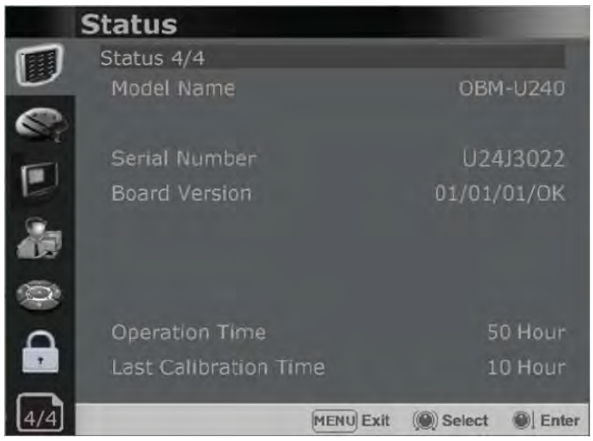

- Model Name
- Serial Number
- Board Version
- Operation Time
- Last Calibration Time

Color Temp/Color Space/Gamma Menu (OBM-U170/240/310/550L)

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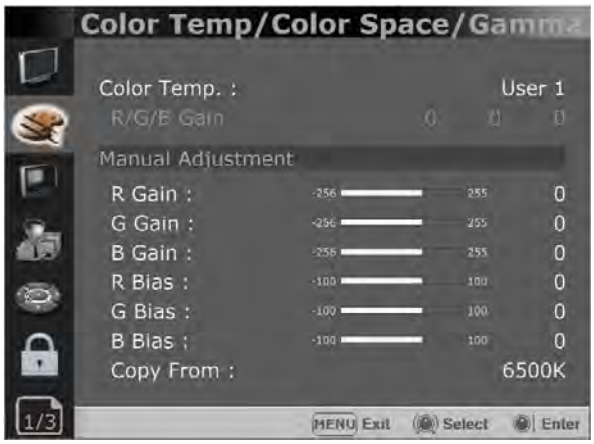

Color Temp.

- 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].

OBM-HDR

Selects whether to enable or disable the OBM-HDR setting.

Type

Select the mode of HDR gamma.

- ST 2084-300**: This mode displays the absolute brightness up to 300 cd/m². So, the highlights over 300 cd/m² are clipped.
- ST 2084-1000: This mode displays the relative brightness up to 1000 cd/m². The part exceeding 1000 cd/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-1000 (Hybrid Log Gamma): This mode can be selected when the White is 1000 cd/m² in HLG-gamma.
- HLG-0.98(300)** (Hybrid Log Gamma) : This mode can be selected when the White is 300 cd/m² in HLG gamma.
- HLG-1.0 / 1.1 / 1.2 / 1.3 / 1.4 / 1.5 : These modes allow the user to apply HLG gamma 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 300 cd/m².
- S-Log3: Select the S-Log3(HDR) gamma.

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

HDR maximum luminance

OBM-U170/240 : 300 cd/m²

OBM-U310 : 700 cd/m², OBM-U550L : 400 cd/m²

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

OBM-U170/240 :

- ST 2084-300 - HLG-0.98(300)

OBM-U310 :

- ST 2084-700 - HLG-1.13(700)

OBM-U550L :

- ST 2084-400 - HLG-1.03(400)

Color Temp/Color Space/Gamma Menu (OBM-U170/240/310/550L)

Gamma

- Selects the appropriate gamma mode from 1.00 to 3.00.

***Note - When the OBM-HDR is set Off, this menu becomes activated.*

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

Color Space Comparison

- Allows the user to divide the picture side by side, adjust the color space and gamma on the right half of the picture, and compare the color space and gamma between right half and left half.

Left Color Space

- Displays the color space which is set in Color Space menu.

Right Color Space

- Selects the color space of the right half which will be compared with the left half of the picture.

Right Gamma

- Adjusts the gamma of the right half which will be compared with the left half of the picture.

Wipe Position

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

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.

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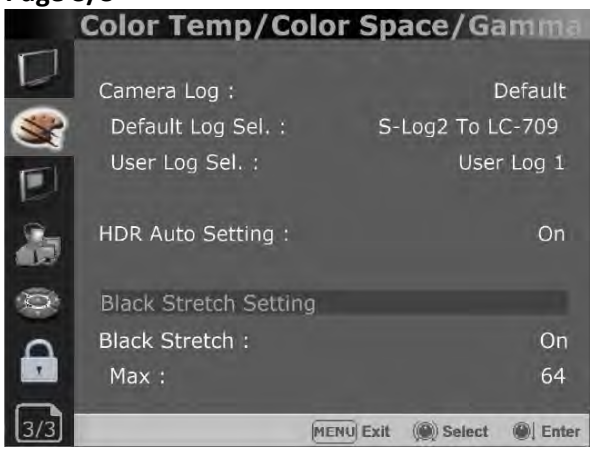

Camera Log

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.

HDR Auto Setting

This function allows the monitor to read the Transfer Characteristics and Colorimetry information of Payload identifier of the ST 2082-10 12G SDI signal and adjust HDR automatically.
(Transfer Characteristics : SDR, ST 2084-1000, HLG-1.2
Colorimetry : Rec709, Rec2020)

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.

Color Temp/Color Space/Gamma Menu (OBM-U090)

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

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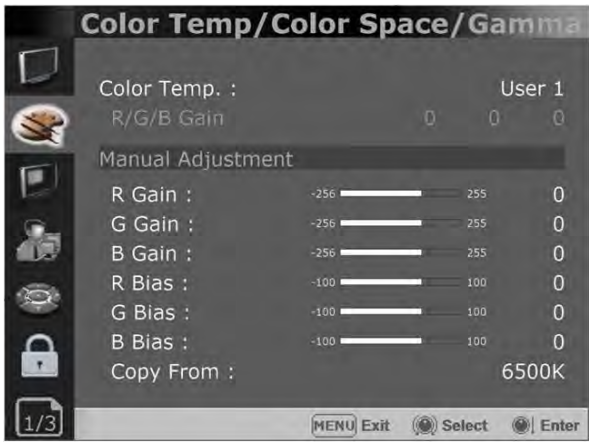

Color Temp.

- 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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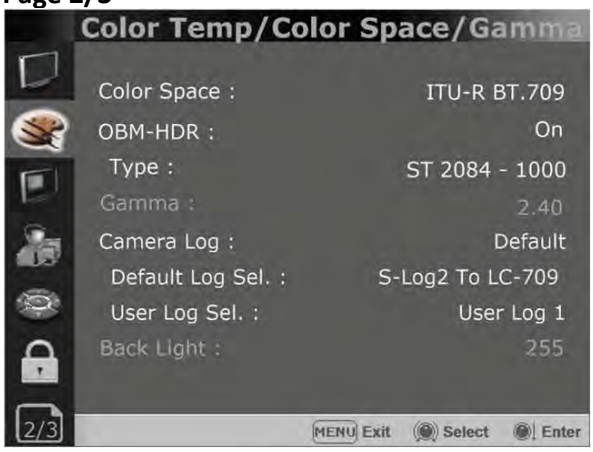

Color Space

- Selects the color space from among [ITU-R BT.709], [Native].

OBM-HDR

Selects whether to enable or disable the OBM-HDR setting.

Type

Selects the mode of HDR gamma.

- ST 2084-300 : This mode displays the absolute brightness up to 300 cd/m². So, the highlights over 300 cd/m² are clipped.
- ST 2084-1000 : This mode displays the relative brightness up to 1000 cd/m². The part exceeding 1000 cd/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- 0.98(300) (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 300 cd/m².
- S-Log3: Select the S-Log3(HDR) gamma.

Gamma

- Selects the appropriate gamma mode from 1.00 to 3.00.

***Note* - When the OBM-HDR is set Off, this menu becomes activated.
- When the color space is set to Native, this menu becomes deactivated.

Color Temp/Color Space/Gamma Menu (OBM-U090)

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.

Back Light

Adjusts the level of the back light.
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.

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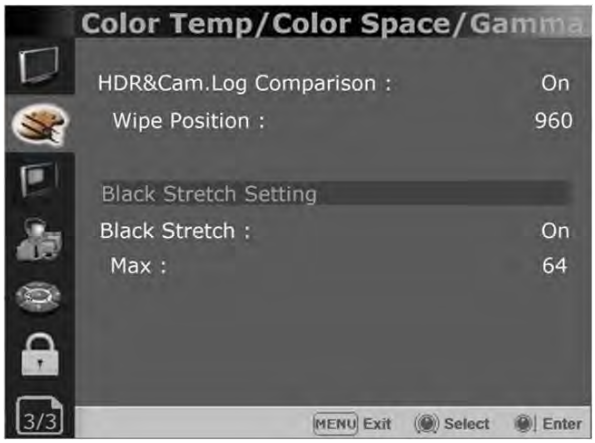

HDR&Cam.Log Comparison

Splits the screen side-by-side to apply HDR or Camera log to the left side and compare it with the right side.

Wipe Position

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

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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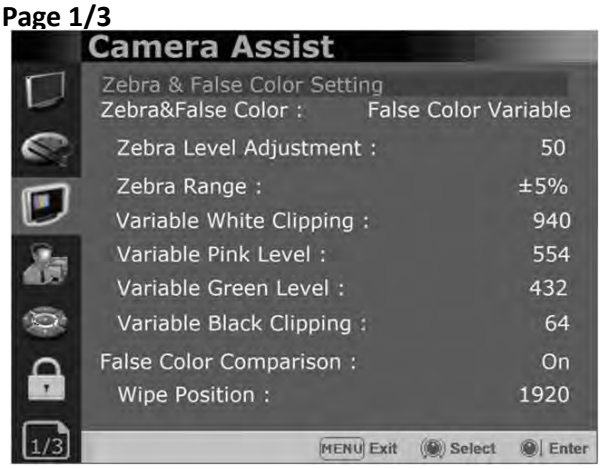

Zebra & False Color

- 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.

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%.

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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 portions outside of the adjusted values are displayed as Black Zebra.
- Black & White Zebra: The portions over Y Maximum, Chroma Maximum, RGB Maximum are displayed as Black Zebra, and the portions below Y Minimum, Chroma Minimum, RGB Minimum are displayed as White Zebera.
- Mono: The portions inside of the adjusted values are displayed as Mono, and the portions outside of the adjusted values are displayed as the color. In this type, black and white area is not recognized.

Color Space

Selects the target color space among [ITU-R BT.601], [ITU-R BT.709], [ITU-R BT.2020].
The default values of Y Maximum/Minimum, Chroma Maximum/Minimum, RGB Maximum/ Minimum are in compliance with EBU R 103 standard.
And, the values can be adjusted by the user.

- Default Values

YCbCr

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

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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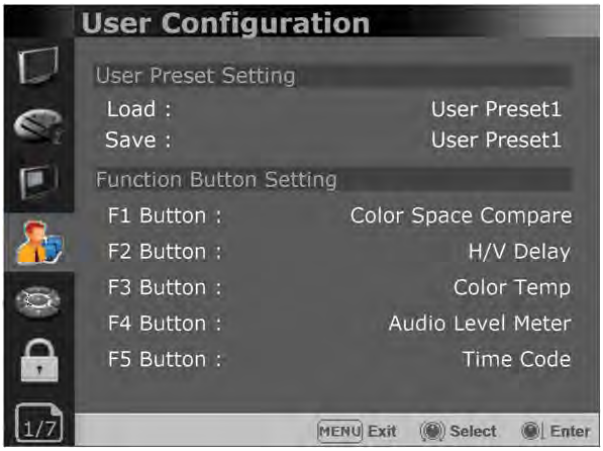

User Preset Setting

[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. :
*[Color Space Compare],[H/V Delay],[Color Temp.], [Audio Level Meter],[Time Code],[Zebra],[Focus Assist],[WFM/Vector],[Camera Log],[Closed Caption], [OBM-HDR],[Freeze],[Fast Mode] (OBM-U170/U090 only), [Black Stretch],[False Color Compare],[Gamut Error], [Camera Log Mapped SDI-Out],[ITU-R BT.709], [ITU-R BT.2020]

* [HDR&Cam.Log Compare] function is allocated to OBM-U090.

User Configuration Menu

- The following functions are assigned in the factory.
  [F1 Button] : Color Space Compare (OBM-U170/240/310/550L)
  [F1 Button] : HDR&Cam.Log Compare(OBM-U090)
  [F2 Button] : H/V Delay
  [F3 Button] : Color Temp
  [F4 Button] : Audio Level Meter
  [F5 Button] : Time Code (OBM-U090 is not supported)

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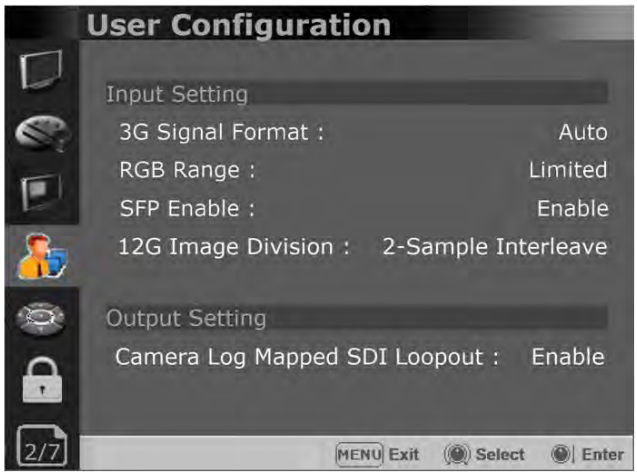

Input Setting

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]

RGB Range

- Selects Black Level and White Level of RGB format.
  *Limited : 64(10bit)/256(12bit) ~ 1023(10bit)/4095(12bit)
  *Full: 0(Black Level) ~ 1023(10bit)/4095(12bit)

SFP Enable (OBM-U090 is not supported.)

- 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].

Output Setting

Camera Log Mapped SDI Loopout

This function enables the camera log to be loaded to the original image and then sends the camera log mapped image to another monitor through SDI loop out.

User Configuration Menu

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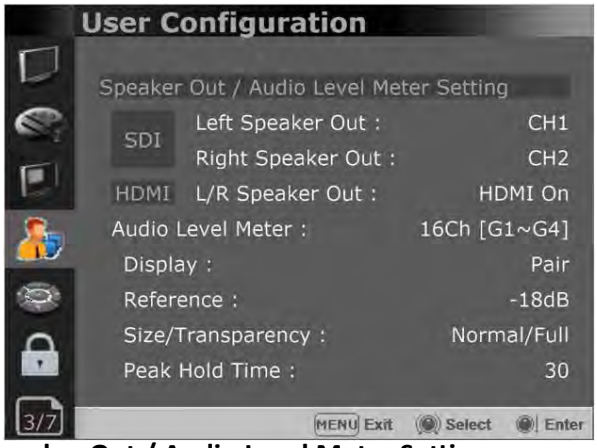

Speaker Out / Audio Level Meter Setting

- 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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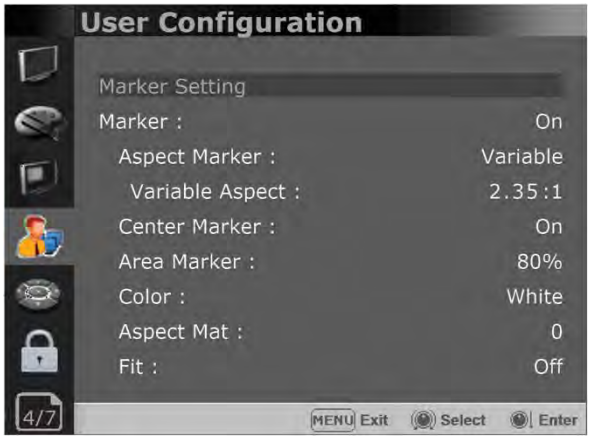

Marker Setting

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].

***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.
** This menu is activated in OBM-090 and OBM-U170 model only.

User Configuration Menu

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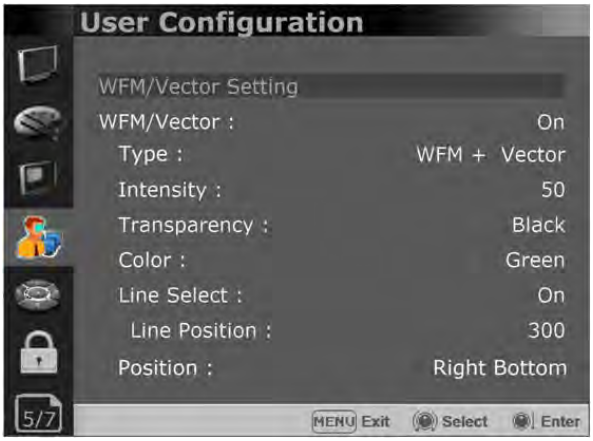

WFM/Vector Setting

WFM/Vector

- Sets to activate and deactivate Waveform monitor and Vectorscope.
  You can select from among [WFM], [VectorScope], [WFM+Vector], [WFM Wide].
  *This function doesn't work when RGB format signal is input.
  *[WFM Wide] is supported for OBM-090 and OBM-U170 model only.

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

Position

- Sets the display position of the [WFM/Vector]. Select [Right Bottom], [Left Bottom],[Left Top], or [Right Top].

** When type is [WFM Wide], [Position] dose not function.

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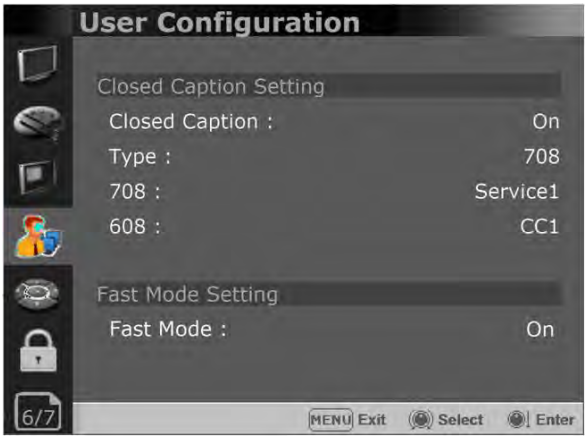

Closed Caption Setting

Closed Caption

Selects [On] to display the Closed Caption and [Off] not to display.

Type

Sets the Closed Caption type

[708]: Selects this mode to display 708 when HD-SDI signal is input.

[608(VBI)]: Selects this mode to display 608(VBI) when SD-SDI signal is input.

[608(708)]: Selects this mode to display 608(708) when HD-SDI signal is input.

708

Sets the Closed Caption type for 708. Selects from [Service1] to [Service6].

608

Sets the Closed Caption type for 608(708) and 608(VBI). Selects from [CC1] to [CC4].

Fast Mode Setting

(This function is applied to OBM-U090/U170 only.)

- This function minimizes the internal video processing time from the signal input to the display on the screen.

Fast Mode

Selects [On] to activate Fast Mode and [Off] to turn it off.

Fast Mode

	Input Signal	Fast Mode Off	Fast Mode On
SD-SDI	480i(59.94)/576i(50)	1 frame	1 frame
HD/3G-SDI	720p(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	1080i(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	1080psf(30/29.97/25/24/23.98)	1 frame	Zero Delay(0.02 frame)
	1080p(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	1080p(30/29.97/25/24/23.98)	1 frame	1 frame
12G-SDI	2160p(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	2160p(30/29.97/25/24/23.98)	1 frame	1 frame
2-S.I.	2160p(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	2160p(30/29.97/25/24/23.98)	1 frame	1 frame
SQUARE	2160p(60/59.94/50)	2 frame	1 frame
	2160p(30/29.97/25/24/23.98)	2 frame	2 frame
HDMI	480p(59.94)/576p(50)	1 frame	1 frame
	720p(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	1080i(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	1080p(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	1080p(30/29.97/25/24/23.98)	1 frame	1 frame
	2160p(60/59.94/50)	1 frame	Zero Delay(0.02 frame)
	2160p(30/29.97/25/24/23.98)	1 frame	1 frame
Example	1080/60p	1 frame * (1/60 sec) = 17ms	0.02 frame * (1/60 sec) = 0.33ms
	1080/50p	1 frame * (1/50 sec) = 20ms	0.02 frame * (1/50 sec) = 0.40ms
	1080/60i	2 field * (1/60 sec) = 34ms	0.02 field * (1/60 sec) = 0.33ms
	1080/50i	2 field * (1/50 sec) = 40ms	0.02 field * (1/50 sec) = 0.40ms
	1080/24psf	2 field * (1/48 sec) = 42ms	0.02 field * (1/48 sec) = 0.42ms

User Configuration Menu

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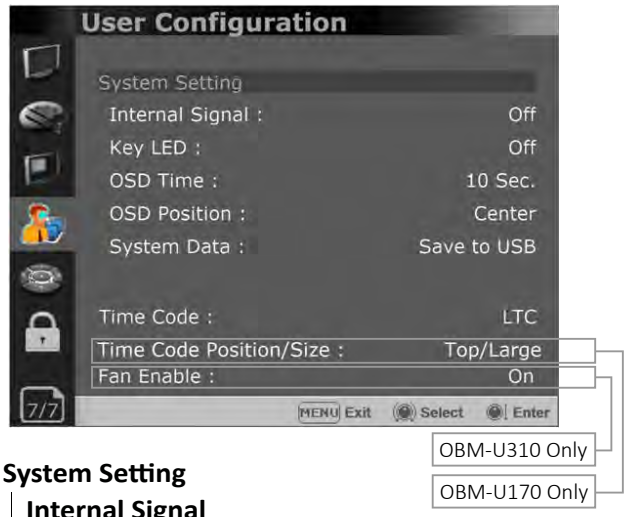

System Setting

Internal Signal

Generates the White Pattern and Color Bar internally. The selectable range for the white Pattern is from 100%(White) to 0%(Black).

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 [Center] to [Left Bottom].

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.
- Saves and adjusts the settings of User 1 of User Preset.

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

Time Code Position/Size (OBM-U170 Only)

- Adjusts the size and position of the Time Code among [Top/Large], [Top/Small], [Bottom/Large], [Bottom/Small].

Fan Enable(This function is applied to OBM-U310 only)

[On]: Turn on the fan. [Off]: Turn off the fan.

Remote Menu

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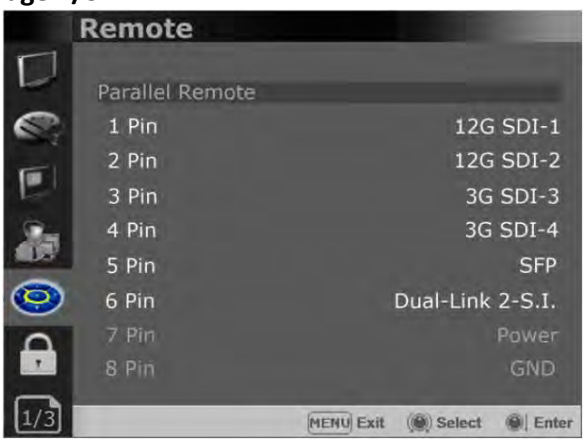

Parallel Remote

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.

(OBM-U170/240/310/550)	***(OBM-U090)***
[--]	[--]
[12G SDI-1]	[12G SDI-1]
[12G SDI-2]	[12G SDI-2]
[3G SDI-3]	[3G SDI-3]
[3G SDI-4]	[3G SDI-4]
[SFP]	[Analog]
[Dual-Link 2-S.i.]	[Dual-Link 2-S.i.]
[Quad-Link 2-S.i.]	[Quad-Link 2-S.i.]
[Square SDI]	[Square SDI]
[HDMI]	[HDMI]
[Zero Scan]	[Zero Scan]
[1:1 Scan]	[1:1 Scan]
[4:3 Aspect]	[4:3 Aspect]
[16:9 Aspect]	[16:9 Aspect]
[Auto Aspect]	[Auto Aspect]
[H/V Delay]	[H/V Delay]
[Blue Only]	[Blue Only]
[Mono]	[Mono]
[Marker]	[Marker]
[TALLY R]	[TALLY R]
[TALLY G]	[TALLY G]
[User Preset1]	[User Preset1]
[User Preset2]	[User Preset2]
[User Preset3]	[User Preset3]
[User Preset4]	[User Preset4]
[User Preset5]	[User Preset5]
[ITU-R BT.709]	[ITU-R BT.709]
[ITU-R BT.2020]	[Native]
[OBM-HDR]	[OBM-HDR]
[Cam. Log Default]	[Cam. Log Default]
[Cam. Log User]	[Cam. 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].

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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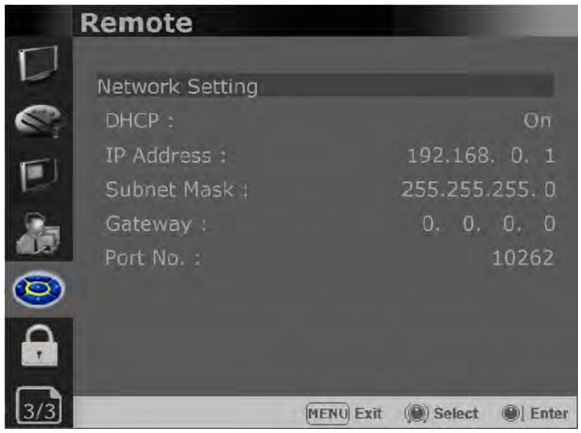


Network Setting

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.

Security Menu

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.

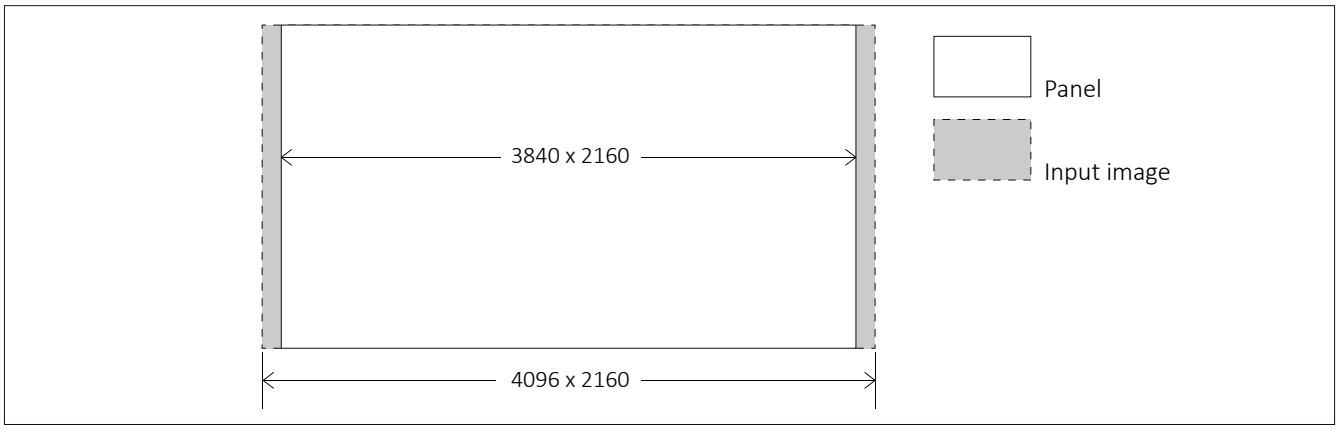
Change Password

Changes the password.

7. Scan Mode Image (OBM-U240/U550L)

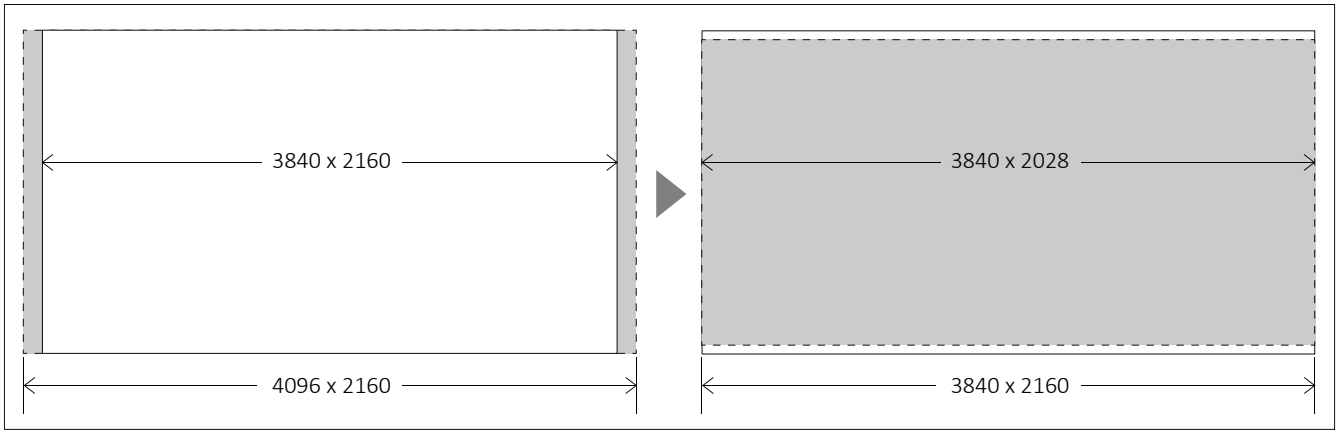
OBM-U240/U550L

4K/QFHD Mode



The LCD panel resolution of OBM-U240/U550L is QFHD(16:9) 3840x2160, so if the input signal is 3840x2160, 1:1 mapping is supported. If the input signal is DCI 4K(1.89:1) 4096x2160, 1:1 mapping is not supported.

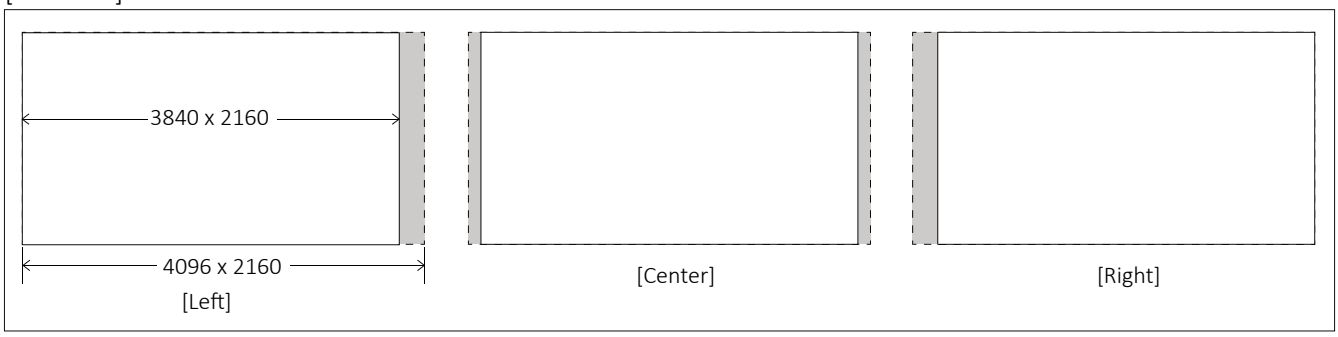
[Zero Scan]



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 3840x2048 resolution with maintaining 1.89:1 ratio.

If you press [Scan] button once more, [1:1 Scan] mode is selected.
To see the image on the right-end and the left-end area, the location of the image can be moved by rotating the [SELECT/VOLUME] knob.

[1:1 Scan]

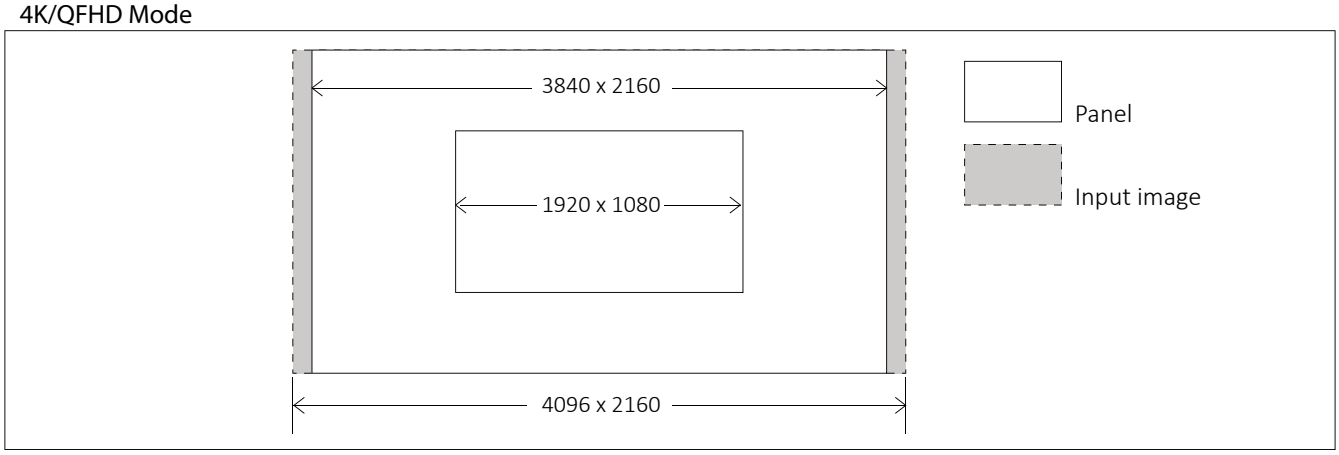


***Note* -When QFHD/DCI 4K signal is fed, [Aspect] button is not activated.

8. Scan Mode Image (OBM-U090/U170)

OBM-U090/U170

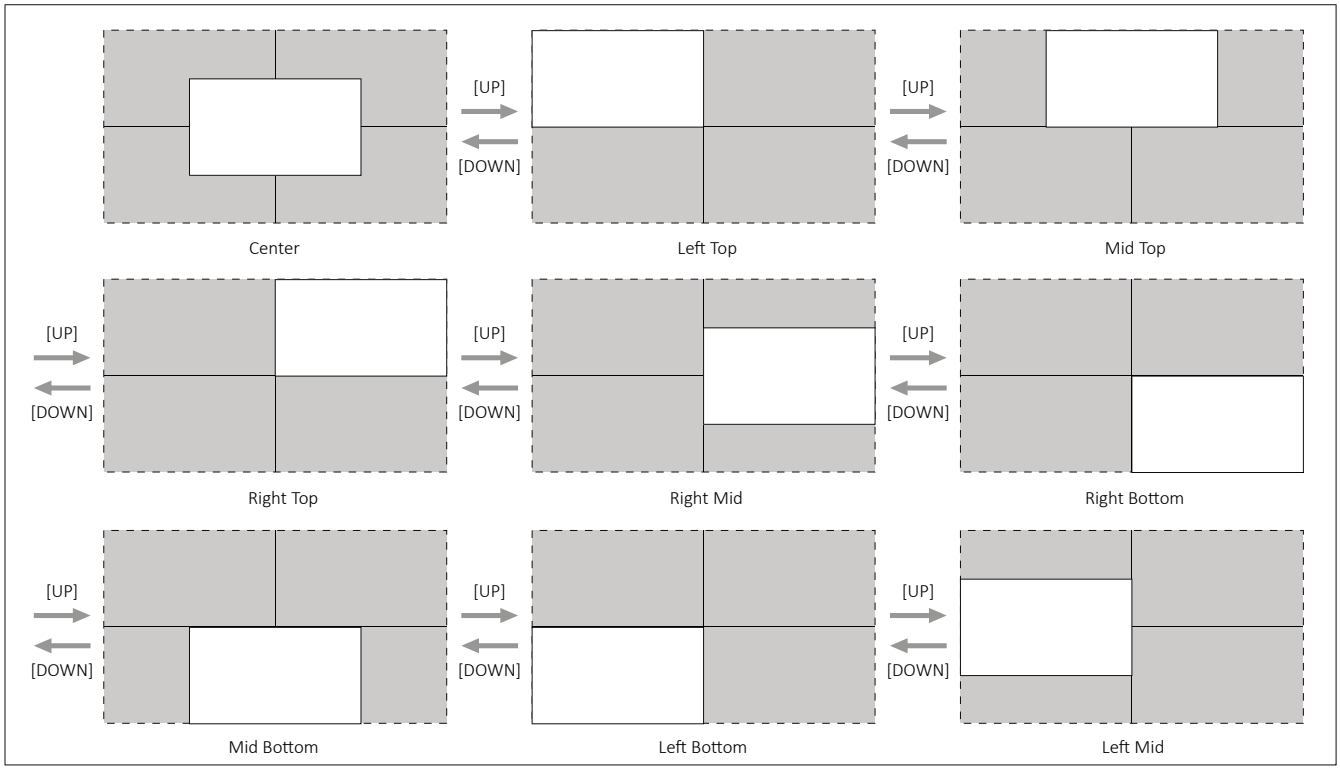
4K/QFHD Mode



The LCD panel resolution of OBM-U090/U170 is FHD(16:9) 1920x1080. So, when Zero Scan is selected, if the input signal is QHD(3840x2160) it is scaled to 1920x1080(16:9), and if the input signal is DCI 4K(1.89:1) 4096x2160 it is scaled to1920x1012(1.89:1).

If you press [Scan] button and select [1:1 Scan] mode, 1:1 pixel mapping of the original image is displayed. The location of the image can be changed by rotating the [SELECT/VOLUME] knob.

[Position change in 1:1 Scan]



***Note* -When QFHD/DCI 4K signal is fed, [Aspect] button is not activated.

9. Connecting the SDI Signals

Single Link 12G/6G/3G/HD-SDI, Dual-Link 3G-SDI, and Quad-Link 3G-SDI signals can be input to the SDI IN connectors of this monitor.
Up to 2-channel Single Link 12-SDI signals, up to 4-channel 3G/HD-SDI signals, 1-channel Dual-Link 3G-SDI or 1-channel Quad-Link 3G-SDI signals can be input. Use the appropriate input connectors depending on the input signal, referring to the tables below.

Single-Link 12G –SDI Signal

Connector	Input signal
12G SDI-1	12G SDI
12G SDI-2	12G SDI

Dual-Link 3G –SDI Signal
* 2-sample interleave division signals

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

Quad-Link 3G/HD –SDI Signal
* 2-sample interleave division signals

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

* Square division signals

Connector	Input signal
12G SDI-1	Sub-Image 1 (upper-left screen)
12G SDI-2	Sub-Image 2 (upper-right screen)
3G SDI-3	Sub-Image 3 (upper-left screen)
3G SDI-4	Sub-Image 4 (upper-right screen)

Image of Square division signals

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

10. Available Signal Formats

This monitor is applicable to the following signal formats

HD-SDI

Signal System	Signal Format
1920x1080 / 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
1280x 720 / 23.98, 24, 25, 29.97, 30, 50, 59.94, 60p	4:2:2 YCbCr 10bit

3G-SDI

Signal System	Signal Format	
1920 x1080 / 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
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
2048 x1080 / 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

6G-SDI

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

12G-SDI

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

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	
3840 x2160 / 23.98, 24, 25, 29.97, 30Psf	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	Square division
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	
4096 x 2160 / 23.98, 24, 25, 29.97, 30Psf	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	Square 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
4096 x 2160p@23.98 / 24 / 25 / 29.97 / 30	
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	

11. Key Functions

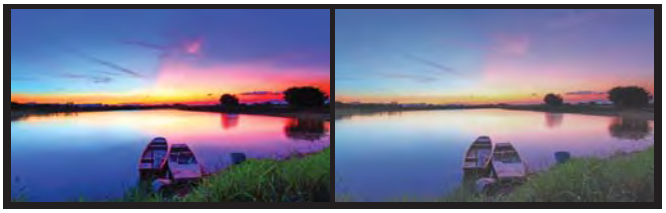
Versatile 4K/QFHD Input Capability
The OBM U series is equipped with standard 12G-SDI input interface(x2) , 3G/HD-SDI input interface(x2) and support 4K Quad Link 2-Sample Interleave signals and 4K Quad Link Square Division signals.
The OBM U series can accept up to 3840x2160/24,25,30,50,60p and 4096x2160/24.25.30,50,60p signals.

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.

*OBM-U170 model is only supported.

High Dynamic Range(HDR) Display Function
The OBM U 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 series supports PQ EOTF (SMPTE ST 2084), Hybrid Log Gamma and S-Log3.

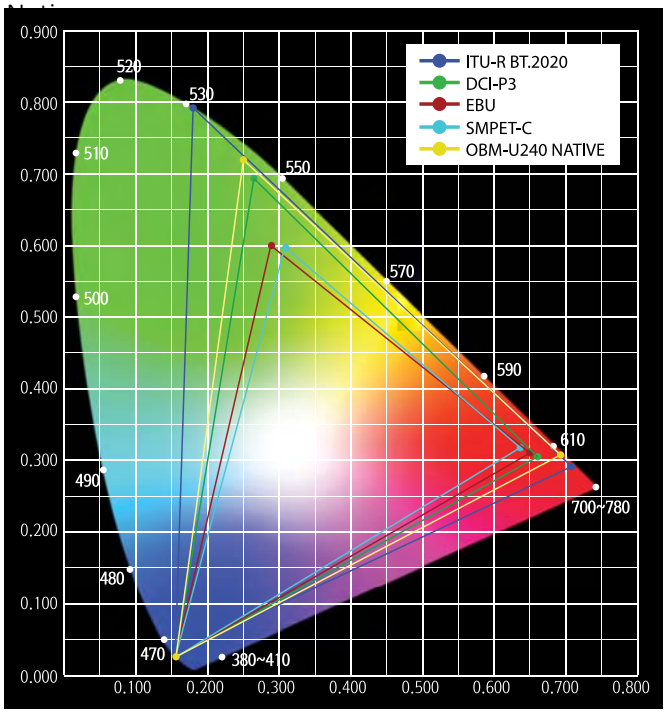
HDR Mode SDR Mode



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

Fast Mode
This function minimizes the interlaced video processing time delay. This mode is also useful when displaying fast-motion interlaced video content and when reducing the delay between video and audio.

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 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,



Color Space & Gamma Comparison (Side by Side, Wipe position)

This unique function allows users to compare the two different color spaces, gammas, color temperature, camera logs and any other color settings side by side simultaneously. The area of the two pictures to be displayed can be selected using a vertical WIPE pattern.

HDR Mode | SDR Mode

HDR-ST 2084

SDR-(ITU-R BT.709)

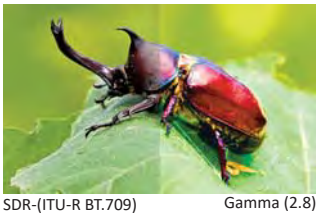
HDR-ST 2084 Color Space (ITU-R BT.709)

SDR-(ITU-R BT.709) Color Space (ITU-R BT.2020)

HDR-ST 2084 Gamma (1.5)

SDR-(ITU-R BT.709) Gamma (1.5)

HDR-ST 2084 Gamma (2.8)


SDR-(ITU-R BT.709) Gamma (2.8)

HDR-ST 2084 Wipe Position (2500)

SDR-(ITU-R BT.709) Wipe Position (2500)

Camera Log Selection

The OBM U series has 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.

Closed Caption

The OBM U series can display closed captions with an SDI input. It supports the CEA-708(HD-SDI closed captioning standard) and CEA-608(SD-SDI closed captioning standard).

Adjustable Gamma

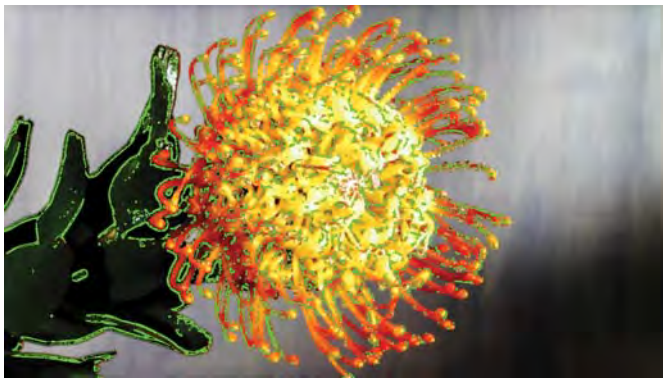
Gamma value is adjustable from 1.0 to 3.0 as user's preference to monitor in the dark area of the picture.
Any pictures taken in either light or dark environment can be easily watched or analyzed.

Gamma 1.8

Gamma 2.4

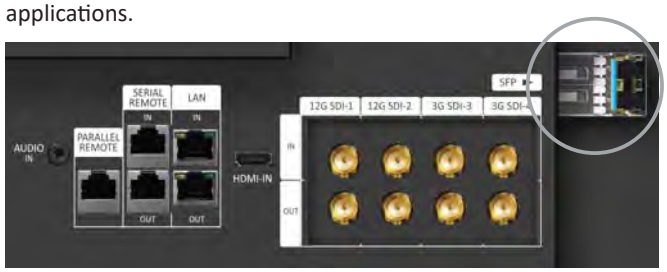
Focus Assist

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



SFP Optical Connector

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

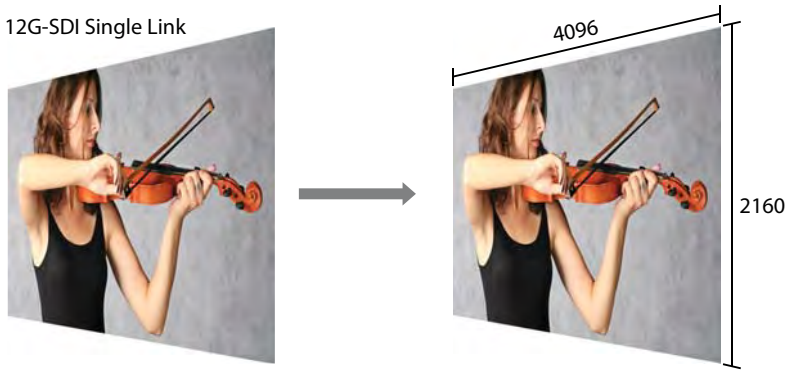


Remote Control via Ethernet

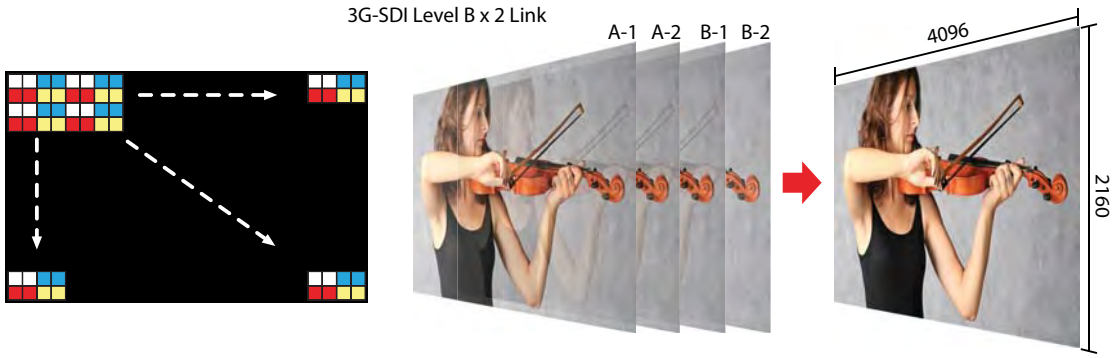
The OBM U series can be connected via Ethernet connection and controlled remotely on the network.

Various 4K/12G Display Modes

Single Link 12G-SDI



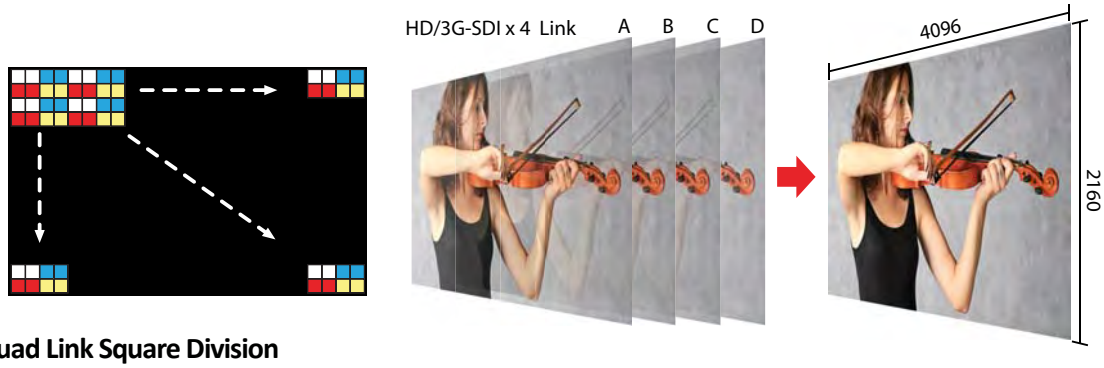
Dual Link 2-Sample Interleave(2-SI)



(*Supported up to 2160/30p)

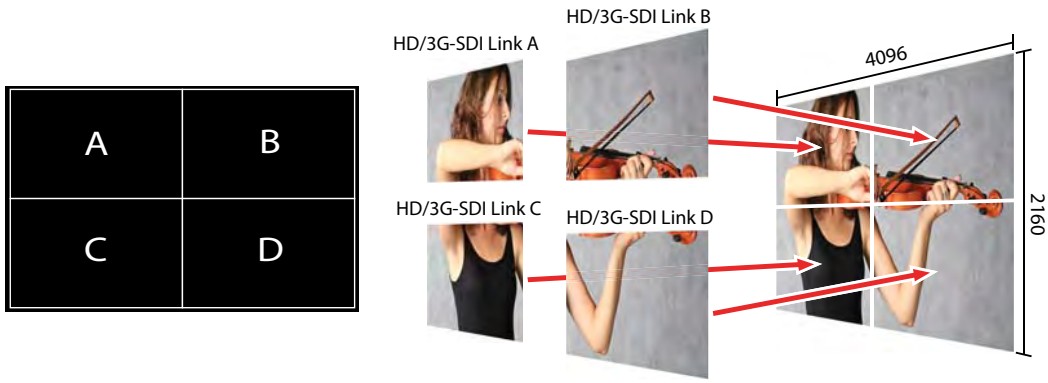
Quad Link 2 Sample Interleave (2SI)

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.



Quad Link Square Division

Each link contains one square of the original image.



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

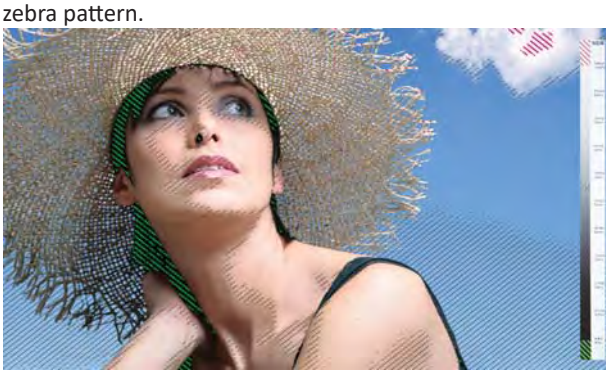
Black Stretch On

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.

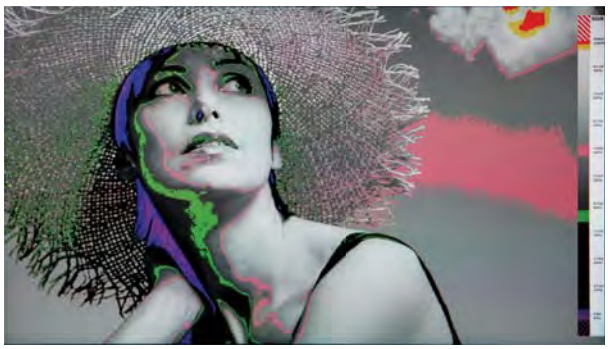
Zebra

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.

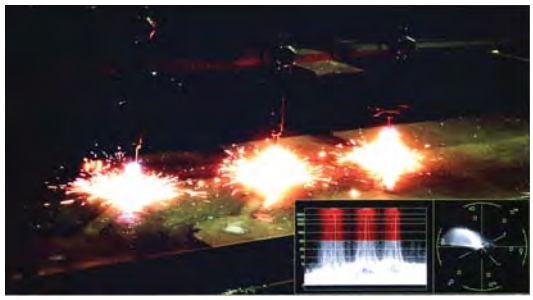
False Color Comparison

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.

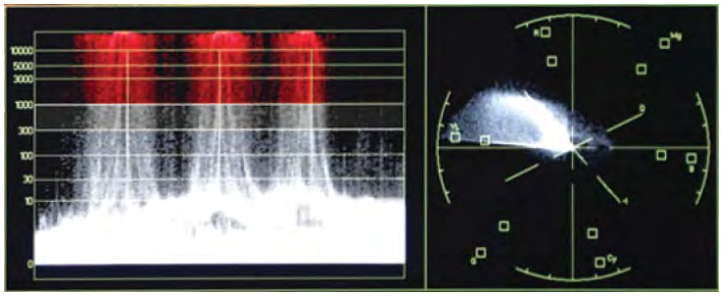
HDR Waveform

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

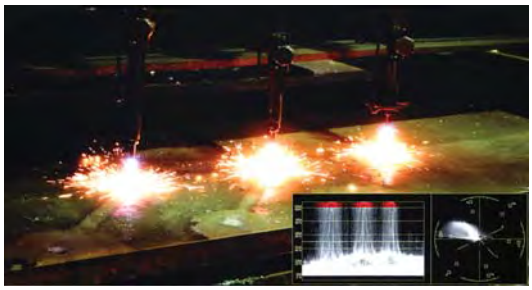
HDR Mode + HDR Waveform



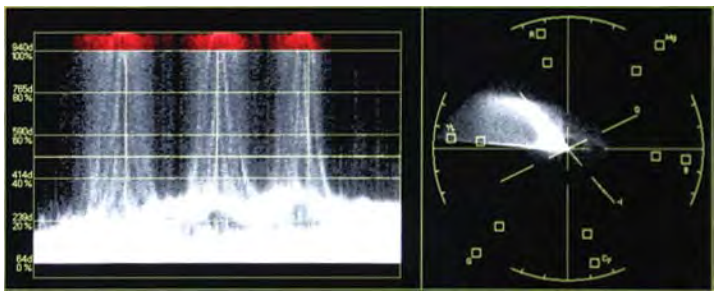
HDR Waveform



SDR Mode + SDR Waveform



SDR Waveform

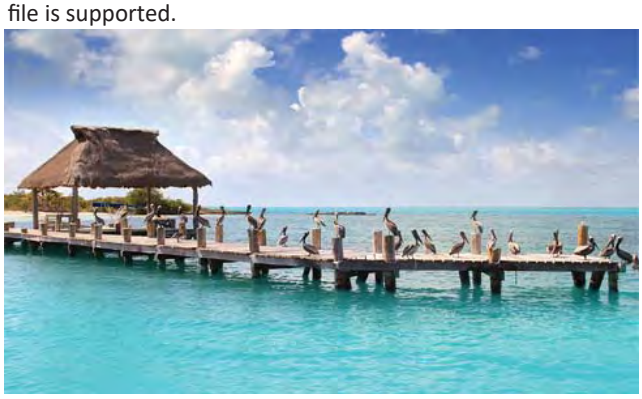


In-Monitor Display(IMD) Function (OBM-U090 only)

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.

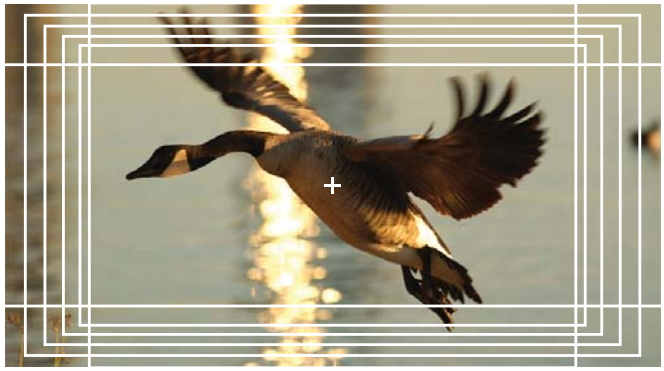
Custom 3D LUT File Import

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. $32^{\wedge 3}$, $33^{\wedge 3}$, $64^{\wedge 3}$ and $65^{\wedge 3}$ cube file is supported.

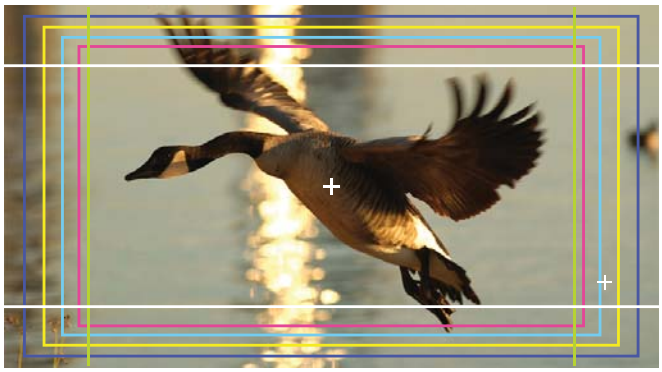


Various Markers

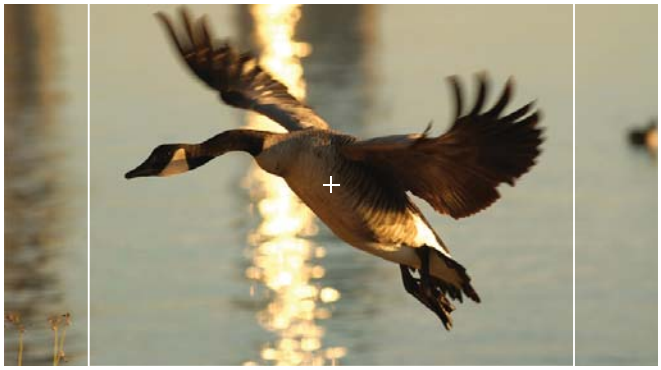
The OBM U series can display various markers, including aspect marker, area marker, and center marker. In addition, the detailed display settings of each marker are allowed. For example, the color, brightness, horizontal/vertical position, and thickness of aspect markers can all be adjusted.



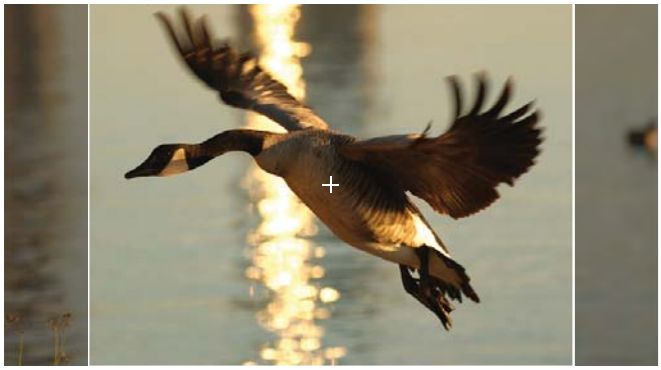
Display various markers



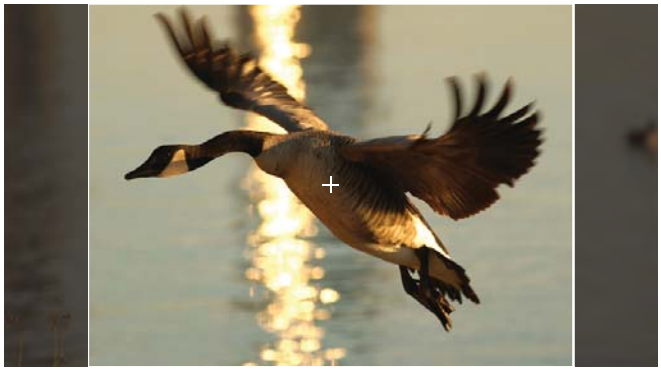
Display Color markers



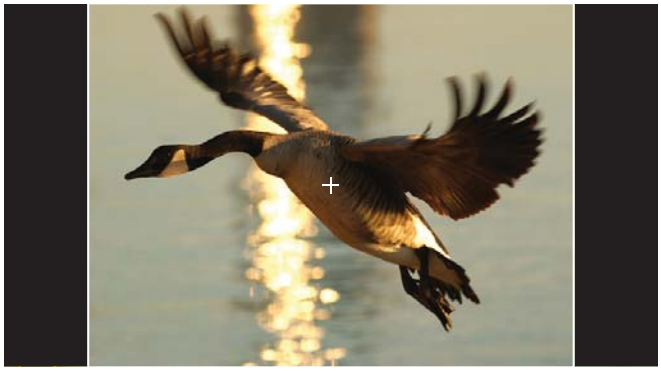
Aspect Mat 0



Aspect Mat 2



Aspect Mat 5



Aspect Mat 7

12. Product Specifications

Specifications (OBM-U090/170)

ITEM		OBM-U090	OBM-U170
Input	4 x BNC	12G/6G/3G/HD/SD-SDI-1/2, 3G/HD/SD-SDI-3/4	
	1 x HDMI	HDMI 2.0	
	1 x SFP	-	Optical
	3 x BNC(YPbPr)	Analog(YPbPr)	-
	1 x BNC(CVBS)	Composite	-
Output	4 x BNC	12G/6G/3G/HD/SD-SDI-1/2, 3G/HD/SD-SDI-3/4 Active Loop Output	
Input Signal Format	SMPTE ST 2082	2160p(60/59.94/50)	
	SMPTE ST 2081	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)	
	SMPTE ST 125	480i(59.94)	
	ITU-R BT.656	576i(50)	
	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	9” LCD	17.3” LCD
	Resolution	1920 x 1080 (16:9)	1920 x 1080 (16:9)
	Pixel Pitch	0.1035mm	0.199mm
	Color	1.064B Colors(8bit+2bit FRC)	1.064B Colors(10bit+2bit FRC)
	Viewing Angle	176(H), 176(V)	178(H), 178(V)
	Luminance of White	400cd/m²	350cd/m²
	Contrast	700 : 1	1000 : 1
General	Display Area (H x V)	198.72 x 111.78 (mm)	381.9 x 214.8 (mm)
	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 12V	AC(100-230V, 50/60Hz) / DC 12V
	Power Consumption	18W	40W
	Operating Temperature	0°C ~ 40°C(32°F~104°F)	
	Operating Humidity	20% ~ 80% RH	
	Weight	2.8kg / 6.17lbs	6.5kg / 14.33lbs
	Dimensions (WxHxD)	260 x 205 x 90mm (with stand)	447 x 318 x 120mm (with stand)
		10.23 x 8.07 x 3.54inch	17.59 x 12.51 x 4.72inch
	Accessories	Power Cable	
	Option	Rack Mount Kit / Carrying Case / Sun Hood / Acrylic Protector / V-Mount	

* Specifications are subject to change without prior notice for the product quality improvement.

Specifications (OBM-U240/310)

ITEM		OBM-U240	OBM-U310
Input	4 x BNC	12G/6G/3G/HD/SD-SDI-1/2, 3G/HD/SD-SDI-3/4	
	1 x HDMI	HDMI 2.0	
	1 x SFP	Optical	
Output	4 x BNC	12G/6G/3G/HD/SD-SDI-1/2, 3G/HD/SD-SDI-3/4 Active Loop Output	
Input Signal Format	SMPTE ST 2082	2160p(60/59.94/50)	
	SMPTE ST 2081	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)	
	SMPTE ST 125	480i(59.94)	
	ITU-R BT.656	576i(50)	
	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	23.8” LCD	31” LCD
	Resolution	3840 x 2160 (16:9)	4096 x 2160 (17:9)
	Pixel Pitch	0.137mm	0.1704mm
	Color	1.073B Colors(10bit+2bit FRC)	1.073B Colors(10bit+2bit FRC)
	Viewing Angle	178(H), 178(V)	178(H), 178(V)
	Luminance of White	350cd/m²	850cd/m²
	Contrast	1000 : 1	1450 : 1
	Display Area (H x V)	527 x 296 (mm)	698 x 368 (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	AC(100-240V, 50/60Hz) / DC 24V
	Power Consumption	100W	180W
	Operating Temperature	0°C ~ 40°C(32°F~104°F)	
	Operating Humidity	20% ~ 80% RH	
	Weight	10.5kg / 23.14lbs	28kg / 61.72lbs
	Dimensions (WxHxD)	606 x 403 x 140mm (with stand)	762 x 515 x 210mm (with stand)
		23.85 x 15.86 x 5.51inch	30 x 20.27 x 8.26inch
	Accessories	Power Cable	
	Option	Rack Mount Kit / Carrying Case Sun Hood / Acrylic Protector	Wall Mount Kit Carrying Case

* Specifications are subject to change without prior notice for the product quality improvement.

Specifications (OBM-U550L)

ITEM		OBM-U550L
Input	4 x BNC	12G/6G/3G/HD/SD-SDI-1/2, 3G/HD/SD-SDI-3/4
	1 x HDMI	HDMI 2.0
	1 x SFP	Optical
Output	4 x BNC	12G/6G/3G/HD/SD-SDI-1/2, 3G/HD/SD-SDI-3/4 Active Loop Output
Input Signal Format	SMPTE ST 2082	2160p(60/59.94/50)
	SMPTE ST 2081	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)
	SMPTE ST 125	480i(59.94)
	ITU-R BT.656	576i(50)
	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	55”
	Resolution	3840 x 2160 (16:9)
	Pixel Pitch	0.315mm
	Color	1.073B Colors(8bit+2bit FRC)
	Viewing Angle	178(H), 178(V)
	Luminance of White	450cd/m²
	Contrast	4000 : 1
	Display Area (H x V)	1209.6 x 680.4 (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(100-240V, 50/60Hz)
	Power Consumption	220W
	Operating Temperature	0°C ~ 40°C(32°F~104°F)
	Operating Humidity	20% ~ 80% RH
	Weight	37kg / 81.57lbs
	Dimensions (WxHxD)	1258 x 815 x 270mm (with stand)
		49.52 x 32.08 x 10.62inch
	Accessories	Power Cable
	Option	Wall Mount Kit / Carrying Case

* Specifications are subject to change without prior notice for the product quality improvement.

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