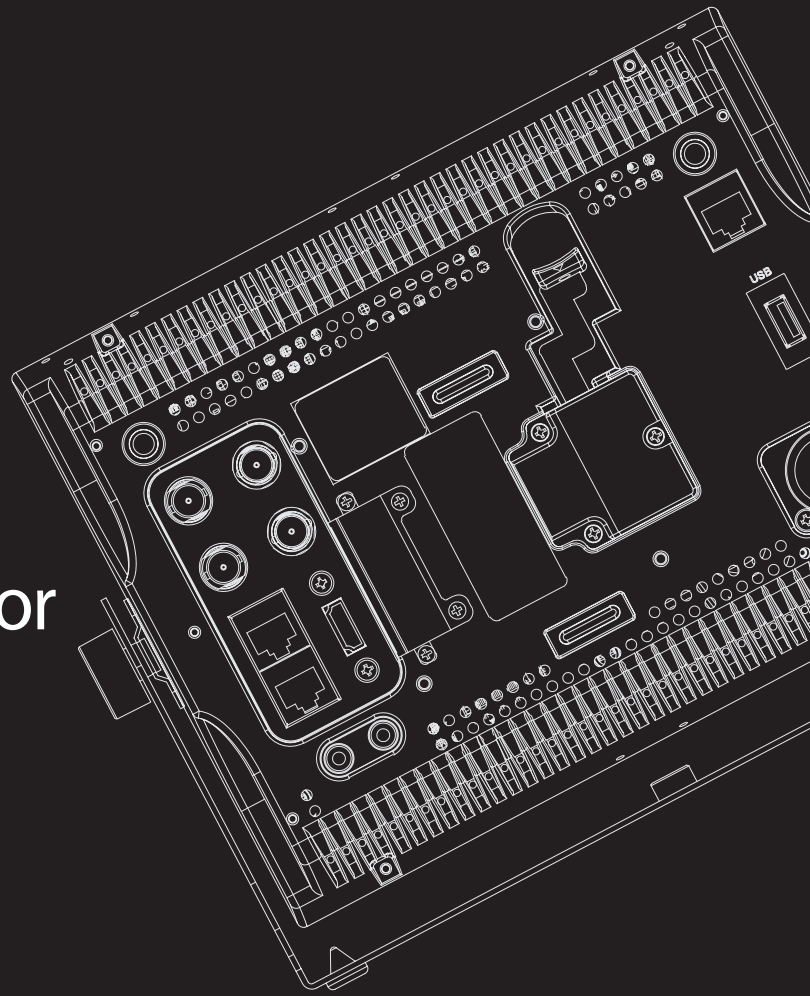


# LUM-095G

## 4K/UHD

### Multi-Purpose Monitor

Operation manual\_V1.1





### **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 to correct the interference at his own expense

**CAUTION:** Change or modifications not expressly approved by the manufacturer responsible for compliance 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.

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# 01 CAUTION

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- Make sure to connect the power supply of the specified voltage value: DC 12V/24V MAX 2.3A.
- When using a DC Adapter other than the one supplied by the manufacturer, please be advised that the adapter with DC 12V/24V MAX 2.3A can be compatible with the monitor.
- All operating instructions must be read and understood before the product is operated.
- These safety and operating instructions must be kept in safe place for future reference.
- All warnings on the product and in the instructions must be observed closely.
- All operating instructions must be followed.
- Do not use attachments not recommended by the manufacturer. Use of inadequate attachments can result in accidents.
- This product must be operated on a power source specified on the specification label.
- If you are not sure of the type of power supply used in your home, consult your dealer or local power company. For units designed to operate on batteries or another power source, refer to the operating instructions.
- The power cords must be routed properly to prevent people from stepping on them or objects from resting on them. Check the cords at the plugs and product.
- In case of using other 12V DC 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 DC outlets or extension cords. Overloading can cause or electric shock.
- Never insert an object into the product through vents or openings. High voltage in the product, and inserting an object can cause electric shock and/or short internal parts. For the same reason, do not spill water or liquid on the product.
- 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.
- If any of the following conditions occurs, unplug the power cord from the DC outlet, and request a qualified service person to perform repairs.
  - a. When the power cord or plug is damaged.
  - b. When a liquid was spilled on the product or when objects have fallen into the product.
  - c. When the product has been exposed to rain or water.
  - d. When the product does not operate properly as described in the operating instructions. Do not touch the controls other than those described in the operating instructions. Improper adjustment of controls not described in the instructions can cause damage, which often requires extensive adjustment work by a qualified technician.
  - e. When the product has been dropped or damaged.
  - f. When the product displays an abnormal condition. Any noticeable abnormality in the product indicates that the product needs servicing.
- In case 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 can result in fire, electric shock and/or other danger.
- Upon completion of service or repair work, request the service technician to perform safety checks to ensure that the product is in proper operating condition.
- When mounting the product on a wall or ceiling, be sure to install the product according to the method recommended by the manufacturer.
- Unplug the power cord from the DC outlet before cleaning the product. Use a damp cloth to clean the product. Do not use liquid cleaners or aerosol cleaners.
- Unplug the power cord from the AC outlet if you do not use the product for considerably long time.

# 01 CAUTION

- Do not use the product near water, such as bathtub, washbasin, kitchen sink and laundry tub, swimming pool and in a wet basement.
- Keep the product away from direct rays of the Sun-light.
- Do not place the product on an unstable cart, stand, tripod or table. Placing the product on an unstable base can cause the product to fall, resulting in serious personal injuries as well as damage to the product. Use only a cart, stand, tripod, bracket or table recommended by the manufacturer or sold with the product. When mounting the product on a wall, be sure to follow the manufacturer's instruction. Use only the mounting hardware recommended by the manufacturer.
- When relocating the product placed on a cart, it must be moved with the utmost care.
- The power cord plug shall be connected to a MAINS socket outlet with a protective earthing connection.
- Infrared devices can cause noise or malfunction under condition as below.
  - Parts of the body come into contact with the infrared transmitter or acoustic device.
  - Obstacles can cause electrical changes if there is a partition in the middle or in the wall.
  - Exposure to radio interference from medical equipment, microwave ovens, wireless LAN devices, etc. with the same frequency band.
- Unplug the power cord from the AC outlet when happening any problem in the product.
- Sudden stops, excessive force and uneven floor surface can cause the product to fall from the cart.
- The vents and other openings in the cabinet are designed for ventilation. Do not cover or block these vents and openings since insufficient ventilation can cause overheating and/or shorten the life of the product. Do not place the product on a bed, sofa, rug or other similar surface, since they can block ventilation openings. This product is not designed for built-in installation; do not place the product in an enclosed place such as a bookcase or rack, unless proper ventilation is provided or the manufacturer's instructions are followed.
- In case of installation the product on the rack, the inside of the product would be overheated due to heat from other devices near by and the decrease of air circulation, which could damage to the monitor. To prevent the damage, please have enough space for the monitors and use fan to avoid heat and maintain the operating temperature. (Refer to the specification of the product).
- The LCD panel used in this product is made of glass. Therefore, it can break when the product is dropped or applied with impact. Be careful not to be injured by broken glass pieces in case the LCD panel breaks.
- Keep the product away from heat sources such as radiators, heaters, stoves and other heat generating products (including amplifiers).
- If the still image is displayed on the screen in the same position for a long period of time, the permanent burn-in on the LCD panel may occur. So, do not display characters or markers continuously. If the video signals or image patterns are continuously displayed at the maximum or high level of luminance, the image smearing or flicker may occur on the screen because of the LCD panel's structure and characteristics of materials used. When the permanent burn-in, image smearing, or other damages happen on the LCD panel due to the improper use by the end user, the warranty service is not applied.

## WARNING



<Main Switch>

- | means Power on when pressing
- means Power off when pressing



<Beside critical components in circuit diagram>

To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.



<Near the main terminal block>

This mark indicates the possibility of injury or damage to property.

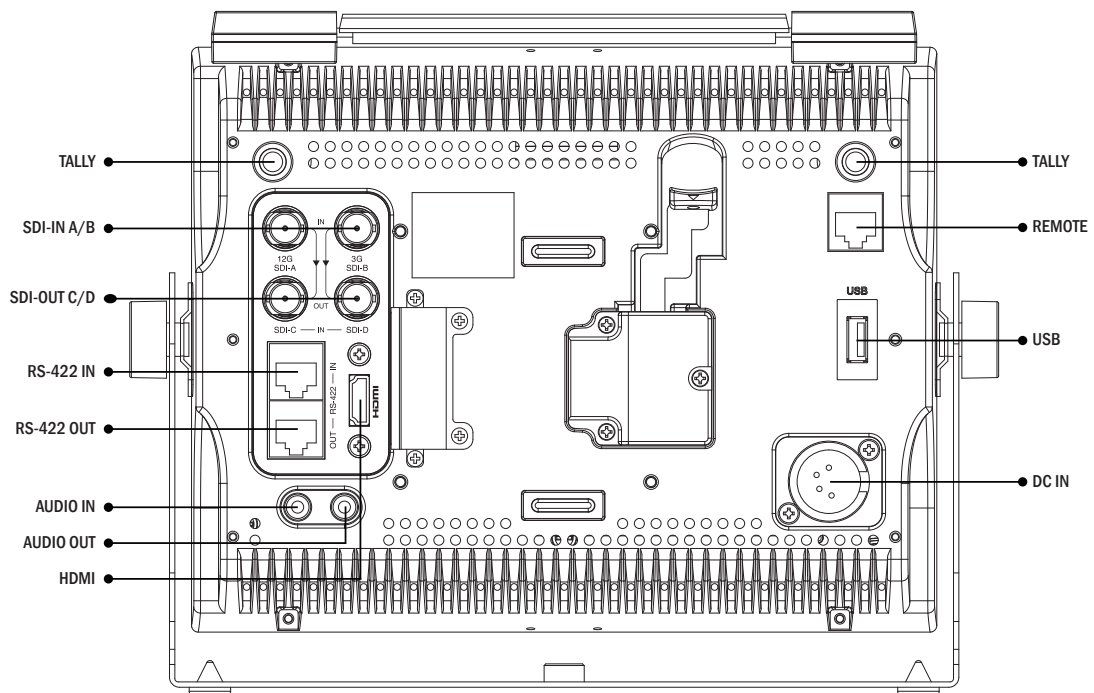
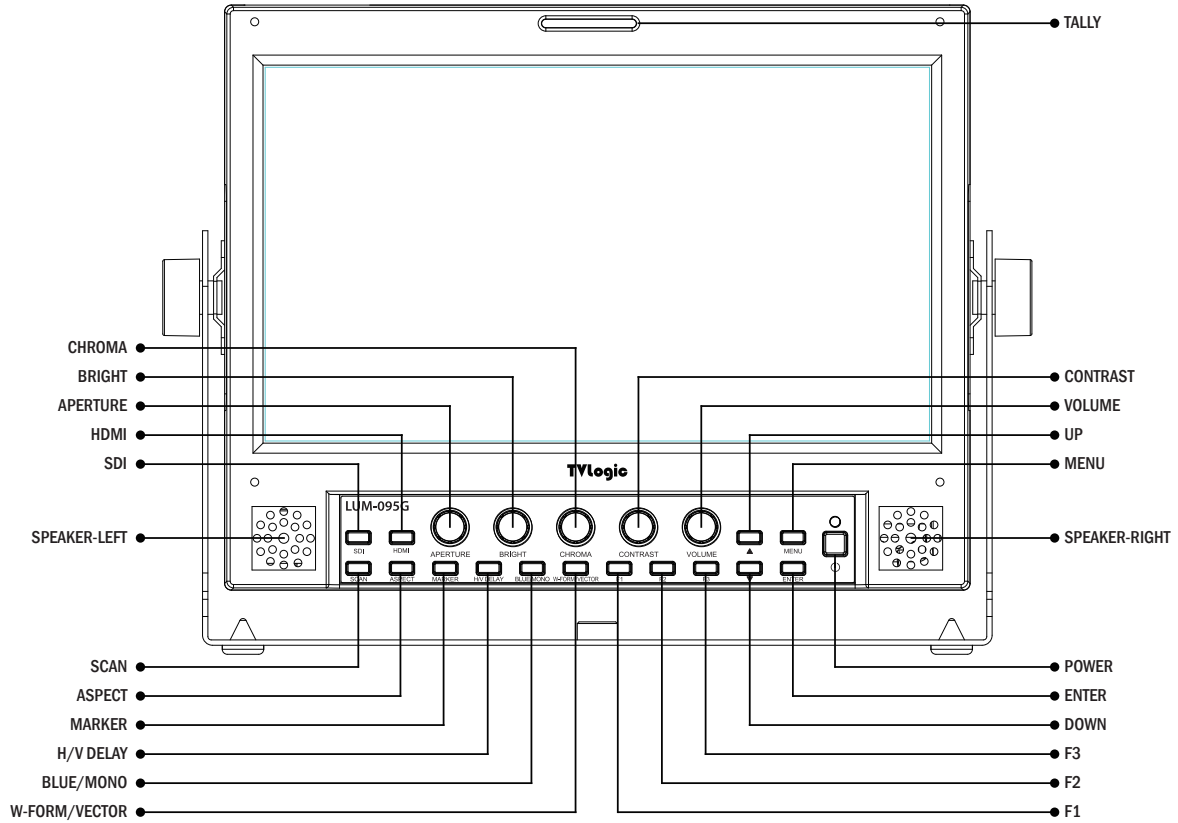
## 02 MAIN FEATURES

### LUM-095G Monitor contains the following features

- **Various 4K/UHD Video Input Interface**
  - 12G-SDI Single Link Input
  - 3G-SDI Quad Link Square Division Input
  - 3G-SDI Quad Link 2-Sample Interleave Input
  - HDMI 2.0 Input
- **HDR Emulation**
  - Supports various HDR EOTF such as PQ, HLG, S-Log3
- **IPS LCD Panel**
  - Offers the wide viewing angle with IPS technology
- **Easy & Simple Control**
  - Various OSD Key buttons and Input Signal Indicators on the front panel
- **Custom 3D LUT Import**
  - Allows the users to load their own created 3D LUT files generated by color grading tools and apply them to the monitor.
- **Integrated Camera LUT**
  - LUTs for every major camera manufacturers are integrated to the LUM-095G, and they can be applied to the live input video.
  - Log-C, C-Log, S-Log1, S-Log2, S-Log3, RED Gamma 3, RED Gamma 4
- **Advanced Color Adjustment OSD**
  - Provides various color adjustment menus which enable the user to monitor the video signal in the optimal settings.
- **Waveform & VectorScope**
  - Provides various modes: Waveform, VectorScope, Waveform Wide, Waveform YCbCr, Waveform RGB, Waveform&VectorScope, Waveform YCbCr&VectorScope, Waveform Full, VectorScope Full
- **Audio Level Meter**
  - Displays the level of the embedded audio signal together with the video signal input through SDI and HDMI.
  - Level Meter channel number(16ch, 8ch, 4ch) and direction(horizontal, vertical) adjustable
  - Level Meter grouping available
  - Audio channel Pair or Group selectable
  - Level Meter size(Small, Large) changeable
- Video Range Adjustment: Limited 109%, Full
- Various Marker
- Grid Display: 3x3, 4x4, 5x5, 6x6
- Timecode Display: LTC, VITC
- ARRI Camera Status: LDS Info, Index Letter
- Scan: Zero Scan, Over Scan, 1:1 Scan
- User Aspect
- H Flip, V Flip, H/V Flip: Manual, Auto
- Focus Assist
- Dynamic UMD Display
- H/V Delay
- Blue/Mono Only
- Various Aspect: 16:9, 4:3, 2.35:1, 1.85:1, 15:9, 16:10
- Anamorphic: 1.3X, 1.5X, 1.8X
- Luma(Y') Zone Check
- Range Error
- Closed Caption: CC-608, CC-708
- Zoom: 10%, 20%, ..., 90%
- Zoom Split: Left-Top, Right-Top, Left-Bottom, Right-Bottom, Center
- Freeze
- Internal Pattern Display
- Tally Lamp and Screen Tally
- Remote Control via RS-422(RJ-45)
- GPI Control via REMOTE port
- Firmware Update & Calibration via USB(A Type)
- DC 12V to 24V supported

# 03 CONTROLS & FUNCTIONS

## LUM-095G ALL PART (FRONT / REAR)



## 03 CONTROLS & FUNCTIONS

### FRONT

- **[SDI] Button/Lamp**
  - Used to select SDI-A/B input.
- **[HDMI] Button/Lamp**
  - Used to select HDMI input.
- **[SCAN] Button/Lamp**
  - Used to change the scan mode.
  - Press the button to activate through the scan modes: [ZERO SCAN] -> [OVER SCAN] -> [1:1 SCAN] -> [USER ASPECT]
  - \* [USER ASPECT]: User can adjust width and height of the display.
  - \* Check "7. Other Functions [1] User Aspect" for more information.
- **[ASPECT] Button/Lamp**
  - Used to change the various display ratio.
  - Activates in order of [16:9] -> [4:3] -> [2.35:1] -> [1.85:1] -> [15:9] -> [16:10] -> [ANAMORPHIC 1.3X] -> [ANAMORPHIC 1.5X] -> [ANAMORPHIC 1.8X] -> [AUTO]
- **[MARKER] Button/Lamp**
  - Used to activate/deactivate the Marker.
  - The type of marker at work can be selected on the main menu.
- **[H/V DELAY] Button/Lamp**
  - Used to check horizontal sync and vertical sync simultaneously by moving the display left, right, up and down.
  - In this mode, the brightness of the image automatically increase for easy verification of synchronized signals.
- **[BLUE]/[MONO] Button/Lamp**
  - Activates in the order of [Off]-[Blue Only]-[Mono]-[Off]
  - Press the button to remove red and green from the input signal and display the screen only under a blue signal. Press the button again to activate mono mode.
- **[W-FORM/VECTOR] Button/Lamp**
  - Used to activate/deactivate the Waveform.
  - The type of Waveform at work can be selected on the main menu.
- **[F1][F2][F3] Button/Lamp**
  - Used to activate the [F1]~[F3] function.
  - \* Check "6. Button Functions [5] Function Key Set Button" for more information.



## 03 CONTROLS & FUNCTIONS

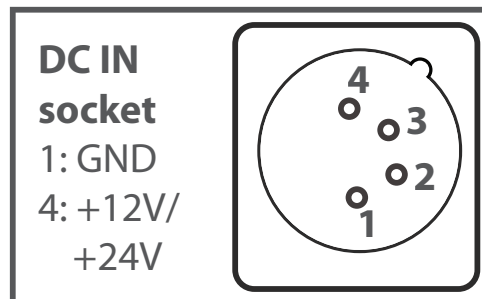
### FRONT

- **[MENU] Button**
  - Used to activate the OSD menu.
  - When the OSD menu is activated, press this button to exit from the menu.
- **[UP] / [DOWN] Button**
  - Used to move within the menu when the OSD menu is activated and is also used to increase or decrease the value of selected feature.
- **[ENTER] Button**
  - Used to select the feature of main menu and the sub menus.
- **[POWER] Switch**
  - Used to turn the power on and off.
- **[POWER INDICATOR] Lamp**
  - Indicates condition and power status of unit.
  - Light turns off when the power is disconnected.
  - Standby mode is indicated by a red LED light.
  - Normal (active) mode is indicated by a Green LED light.
  - The Green light turns off when the monitor is Normal(active) mode without input signal.
- **[TALLY] Lamp**
  - Tally lamp that can be toggled in green or red using the REMOTE(RJ-45) port or RS-422 serial communication.
- **[APERTURE] Knob**
  - Used to adjust the picture sharpness.
  - The value is selectable between -12 ~ 12.
- **[BRIGHT] Knob**
  - Used to adjust the degree of brightness.
  - The value is selectable between -100 ~ 100.
- **[CHROMA] Knob**
  - Used to adjust the saturation of the image.
  - The value is selectable between -50 ~ 50.
- **[CONTRAST] Knob**
  - Used to adjust the contrast.
  - The value is selectable between -100 ~ 100.
- **[VOLUME] Knob**
  - Used to adjust the volume for internal speaker and external output.
  - The value is selectable between 0 ~ 30.

## 03 CONTROLS & FUNCTIONS

### REAR

- **[SDI IN-A (12G)] (BNC)**  
- 12G/HD/SD SDI signal input
- **[SDI IN-B (3G)] (BNC)**  
- HD/SD SDI signal input
- **[SDI IN-C / SDI OUT] (BNC)**  
- HD/SD SDI signal input(for Quad-Link 4K/UHD input) or 12G/HD/SD SDI Through Out for SDI A input
- **[SDI IN-D / SDI OUT] (BNC)**  
- HD/SD SDI signal input(for Quad-Link 4K/UHD input) or 12G/HD/SD SDI Through Out for SDI B input
- **[HDMI IN]**  
- HDMI signal input
- **[RS-422 IN/OUT]**  
- Used for the control of the monitor with protocol provided by TVLogic or for Dynamic UMD function by TSL protocol.
- **[AUDIO IN] (Phone Jack)**  
- Insert the external stereo audio signal.
- **[AUDIO OUT] (Phone Jack)**  
- The audio signal which is disembedded from SDI or HDMI input signal or the external audio signal which is inserted to [AUDIO IN] is output through the phone jack.
- **USB**  
- This terminal is used to upgrade the firmware or color calibration made by TVLogic.
- **REMOTE (RJ-45)**  
- Used to form a parallel switch and control the monitor externally.  
- Features can be changed in the [SYSTEM / GPI / UMD] section of OSD menu.
- **DC IN (XLR, 4 pins)**  
- DC power input terminal for DC 12V/24V.  
\* When using a DC Adapter other than the one supplied by the manufacturer, please be advised that the adapter with DC 12V/3A ~ 6A can be compatible with the monitor.



#### <WARNING!!>

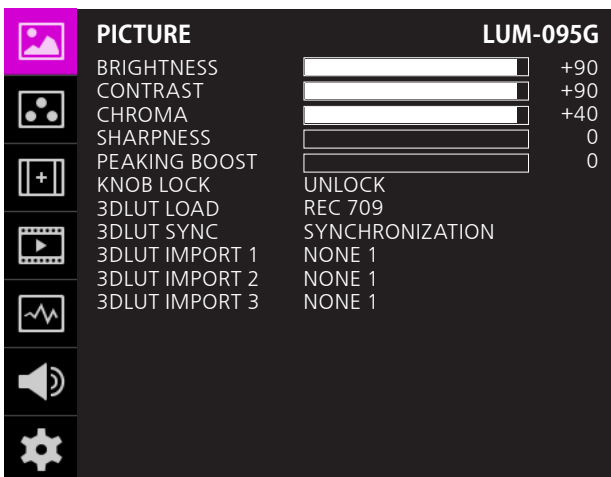
When using the product make sure to ground, whenever possible, before connecting the input signal cable in order to prevent any possible damage to the product or connected devices. The damage may include signal noise, malfunction of main board or display panel. And the connected devices such as camera or video source player may also be influenced through signal cable. Please check if the AC power source and the power extender or power distributor is grounded.

# 04 MENU TREE & ADJUSTMENT

## MENU TREE & MENU CONTROL & MENU CONTROL SEQUENCE

### [1] MENU TREE

- OSD(On-Screen Display) Menu helps to use various different functions.
- This Picture is the menu structure for LUM-095G.



### [2] MENU CONTROL

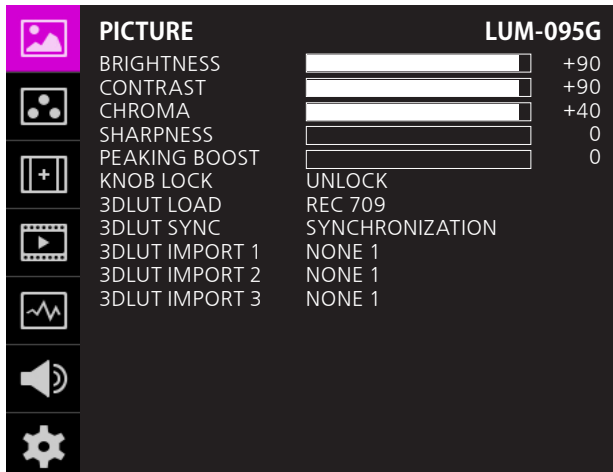
- User may control various functions using the MENU button and the Knob on the top of the monitor.

### [3] MENU CONTROL SEQUENCE

- Menu control sequence follows the order below.
  1. Press MENU button to activate the OSD menu.
  2. Move to a desired menu using the Knob.
  3. Press the Knob to select a menu and move to select a sub-menu by scrolling the Knob.
  4. Press the Knob to select the desired sub menu. (The selected sub-menu will be highlighted)
  5. Press the ENTER button or the MENU button to save the new value after adjusting the value by scrolling the Knob.
  6. Press MENU button to return to previous menu and if there is no previous menu, the OSD menu will be removed from the screen.

# 05 MENU OPERATIONS

## [1] PICTURE



- BRIGHTNESS**
  - Used to set the brightness(=offset) level from -100 to 100.
  - \* Brightness can be adjusted by using [UP] and [DOWN] button on the front of the monitor.
- CONTRAST**
  - Used to set the contrast(gain) level from -100 to 100.
  - \* Contrast can be adjusted by using [UP] and [DOWN] button on the front of the monitor.
- CHROMA**
  - Used to set the saturation level from -50 to 50.
  - \* Chroma can be adjusted by using [UP] and [DOWN] button on the front of the monitor.
- SHARPNESS**
  - Used to set the Sharpness level from 0 to 24.
  - \* Sharpness can be adjusted by using [UP] and [DOWN] button on the front of the monitor.
- PEAKING BOOST**
  - Used to set the Peaking Boost level from 0 to 24.
  - \* Peaking Boost can be adjusted by using [UP] and [DOWN] button on the front of the monitor.
- KNOB LOCK**
  - Locks the Knob control.
- 3DLUT LOAD**
  - Used to apply the internally stored 3DLUT.
  - Maximum 3 x 3DLUT files can be stored.
  - The file name can be set up to 20 characters including the extension.
- 3DLUT SYNC**
  - Used to load a list of available 3DLUT files currently stored in the FLASH MEMORY.
  - Available 3DLUT formats are Cube, GV Lut, Quantel, Davinci and Assimilate Scratch.
  - Available sizes of the 3DLUT are 17 or 33.
- 3DLUT IMPORT 1/2/3**
  - Used to save the 3DLUT stored in the external memory to the internal memory 1/2/3 area.
  - Once saved, the 3DLUT can be maintained even when the power is turned ON/OFF.
  - The file name can be set up to 20 characters including the extension.

# 05 MENU OPERATIONS

## [2] COLOR

COLOR		LUM-095G
STANDARD		UHD
VIDEO RANGE		LIMITED109
PEAK LUMINANCE		100
BLACK LEVEL		0.001
COLOR GAMUT		BT.2020
COLOR TEMP		6500K
EOTF		2.4
LOCAL DIMMING		OFF
EETF		OFF
HLG SG		OFF
SG		
CAM LUT		OFFc

PAGE (1/2)

- **STANDARD**

  - Used to select the color and dynamic range of the screen.
  - Available options are HD, UHD, DCI-P3, PQ, HLG, SLog3 and User1/2/3.
- **VIDEO RANGE**

  - Used to select the range of digital video signal.
  - [FULL]: Input signal 1~254(8bit), 4~1019(10bit)
  - [LIMITED109]: Input signal Y': 16~254, CbCr: 16~240(8bit) / Y': 64~1019, CbCr: 64~1019(10bit)
  - \*Activates only in [STANDARD - USER 1/2/3] mode.
- **PEAK LUMINANCE**

  - Used to select the Peak Luminance of the monitor.
  - Selectable levels are [100] ~ [1000] with 100 increment, [1000] ~ [10000] with 1000 increment.
  - \*Activates only in [STANDARD - USER 1/2/3] mode.
- **BLACK LEVEL**

  - The minimum black level of the video signal can be set differently depending on the performance of the monitor or the lighting environment.
  - Available modes are from [0.000] to [0.010] with 0.001 increment, from [0.010] to [0.100] with 0.010 increment, from [0.100] to [0.900] with 0.100 increment.
  - \* Activates only in the User1/2/3 mode.
- **COLOR GAMUT**

  - Used to select the standard color gamut.
  - Available options are BT709, DCI, BT2020, NATIVE.
  - \* Activates only in [STANDARD - USER 1/2/3] mode.
- **COLOR TEMP (Color Temperature)**

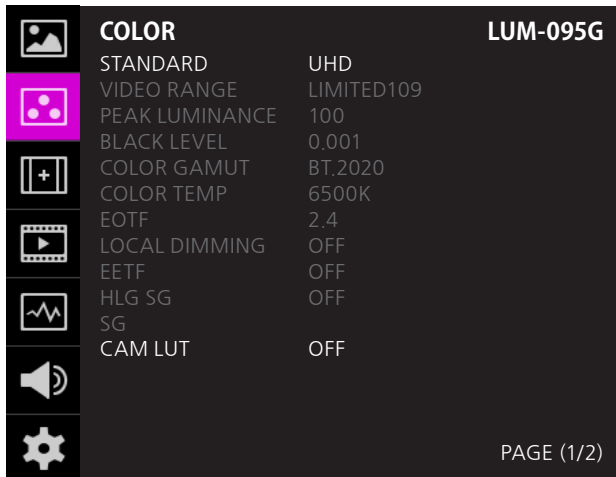
  - Controls the color temperature.
  - Available options are 6500K, 9300K, USER 1/2/3.
  - \* Activates only in [STANDARD - USER 1/2/3] mode.
- **EOTF (Electro-Optical Transfer Function)**

  - Electrophotonic conversion Functions(ex: Gamma or HDR curve).
  - Available modes are 2.2, 2.4, 2.6, PQ, HLG and SLOG3.
  - \* Activates only in [STANDARD - USER 1/2/3] mode.
- **LOCAL DIMMING (\* Not Supported)**

  - Used to set the Local Dimming Backlight mode.
  - This mode is supported by the local dimming backlight model and does not support F-7HS.

# 05 MENU OPERATIONS

## [2] COLOR



- EETF (Electrical-Electrical Transfer Function)**
  - Used to display the HDR image(without clipping) within the actual luminance range (black level and peak luminance) that the monitor can express. In the ON mode, the HDR image is converted within the range of set peak luminance and black level. In the OFF mode, the video signal outside of the set range is clipped.
  - Available modes are OFF and ON.
  - Available only when the EOTF is set to PQ or SLOG3.
  - \* Activates only in [STANDARD - USER 1/2/3] mode.
- HLG SG (HLG System Gamma)**
  - Used to set the System Gamma of HLG mode.
  - In the ON mode, the value of the System Gamma changes automatically according to the previously set peak luminance. When it is OFF, the value is set to default value of 1.2.
  - \* Activates only when the EOTF is set to HLG. and STANDARD is set to USER 1/2/3.

- SG (System Gamma)**

- The System Gamma of HLG is automatically calculated and displayed according to the set [PEAK LUMINANCE].
- Activates only when the EOTF is set to HLG and the HLG SG is ON.

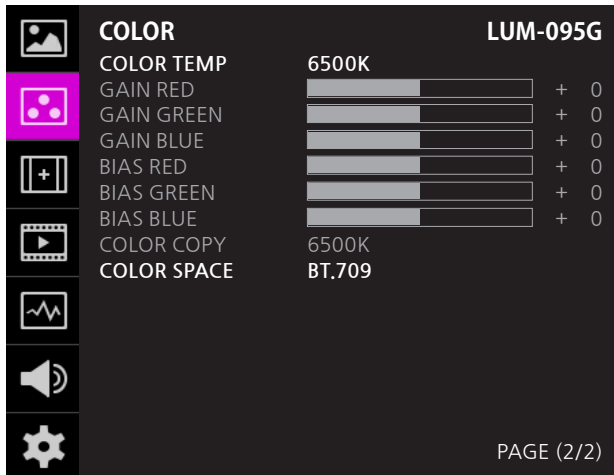
PEAK LUMINANCE	SG (System Gamma)
100	0.78
200	0.91
300	0.98
400	1.03
500	1.07
600	1.11
700	1.13
800	1.16
900	1.18
1000	1.20
2000	1.33
3000	1.40
4000	1.45
5000	1.49
6000	1.53
7000	1.55
8000	1.58
9000	1.60
10000	1.62

- CAM LUT (Camera LUT)**

- Used to change the Camera LUT.
- Available LUTs are LOG-C, C-LOG, S-LOG1, S-LOG2, S-LOG3, REDGAMMA3, REDGAMMA4.
- \* Activates only when STANDARD is set to USER 1/2/3], and EOTF is set to 2.2, 2.4, 2.6.

# 05 MENU OPERATIONS

## [2] COLOR



### • COLOR COPY

- Used to copy the R/G/B Gain value of pre-stored color temperature settings.
- In User mode, find and select the color temperature and press the Knob to copy and apply the Gain value to GAIN RED, GAIN GREEN, GAIN BLUE.
- \* Available only in User 1/2/3 mode.

### • COLOR SPACE

- Used to select the standard color space.
- Available options are BT.709, DCI, BT.2020, NATIVE.

### • COLOR TEMP

- Controls the color temperature and allows instant access to preset the color temperature settings.
- Available color temperatures are 6500K, 9300K and User1/2/3.
- \* In User 1/2/3 modes, user can define custom RGB GAIN, BIAS (=Offset) and Color Copy values.

### • GAIN RED / GREEN / BLUE

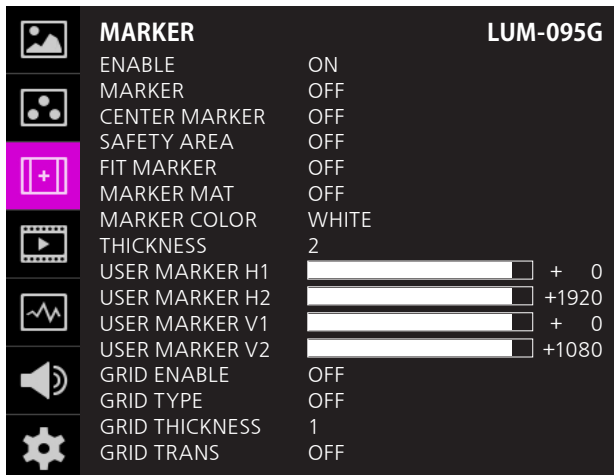
- Used to set Red/Green/Blue Gain (or Picture, Contrast) level from -256 to 255.
- \* Available only in User 1/2/3 mode.

### • BIAS RED / GREEN / BLUE

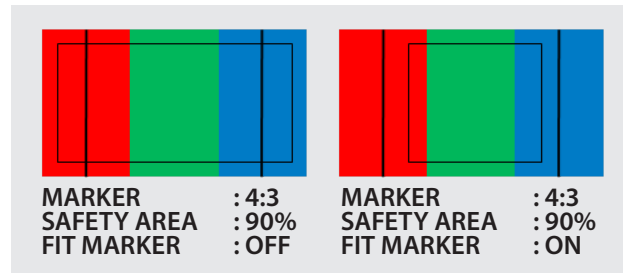
- Used to set Red/Green/Blue Bias (or Offset, mainly affects on Black level) from -100 to 100.
- \* Available only in User 1/2/3 mode.

# 05 MENU OPERATIONS

## [3] MARKER



- **ENABLE**
  - Used to activate the Marker function.
- **MARKER**
  - Available Marker types are OFF, 16:9, 4:3, 4:3 ON AIR, 15:9, 14:9, 13:9, 1.85:1, 2.35:1, 1.85:1& 4:3 and USER.
- **CENTER MARKER**
  - Displays the Center Marker on the screen.
- **SAFETY AREA**
  - Used to select and controls the size and availability of the Safety Area.
  - Available sizes are 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 and EBU GRAPHIC 4:3.
- **FIT MARKER**
  - Used to activate or inactivate the Fit Marker function.
  - When the Marker type is selected in the Marker menu, a border line of the Safety Area will be displayed inside the Marker. Images below show the difference between Fit Marker ON and OFF.
- **MARKER MAT**
  - Used to set the darkness level outside of the MARKER area from OFF(transparent) to 7(Black).
  - The bigger the value, the darker the color.

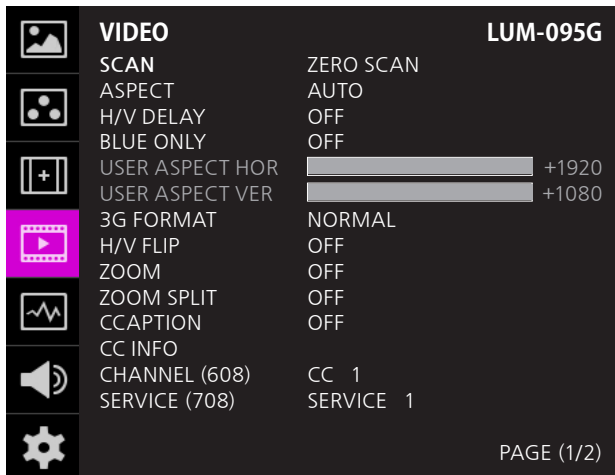


- **MARKER COLOR**
  - Used to set the color of the MARKER lines.
  - Available colors are WHITE, YELLOW, CYAN, GREEN, MAGENTA, RED, BLUE, BLACK.
- **THICKNESS**
  - Used to set the thickness of the MARKER lines.
  - Thickness level is from 1 to 7 by the pixel unit.
- **USER MARKER H1**
  - Used to set the position of the first horizontal marker line.
  - Displayed when the MARKER menu is set to USER.
- **USER MARKER H2**
  - Used to set the position of the second horizontal marker line.
  - Displayed when the MARKER menu is set to USER.
- **USER MARKER V1**
  - Used to set the position of the first vertical marker line.
  - Displayed when the MARKER menu is set to USER.
- **USER MARKER V2**
  - Used to set the position of the second vertical marker line.
  - Displayed when the MARKER menu is set to USER.
- **GRID ENABLE**
  - Used to activate the GRID lines.
- **GRID TYPE**
  - Available grid types are 3X3, 4X4, 5X5, 6X6.
- **GRID THICKNESS**
  - Used to set the thickness of the grid lines.
  - Thickness level is from 1 to 5 by the pixel unit.
- **GRID TRANS**
  - Used to set the transparency level of the grid lines.
  - [ON]: transparent
  - [OFF]: opaque



# 05 MENU OPERATIONS

## [4] DISPLAY / VIDEO



### • SCAN

- Used to change the Scan mode.
- Available modes are ZERO SCAN, OVER SCAN, 1 : 1 SCAN, USER ASPECT

\* [1 : 1 SCAN] : When the UHD(3840x2160) or 4K(4096 x 2160) image is fed, this function displays the image pixel to pixel on the screen whose panel resolution is 1920 x 1080. See section "7. Other Functions [1] 1 : 1 SCAN

\* [USER ASPECT] : User can control the aspect ratio by adjusting width and height of the display.

### • ASPECT

- Used to change the Aspect Ratio.
- Regardless of the original Aspect ratio of the input signal, the Aspect Modes are changed as follow sequence. : [Auto][16:9][4:3][2.35:1][1.85:1][15:9][16:10][Anamorphic1.3x][Anamorphic1.5x][Anamorphic1.8x]

\* [Auto] mode enables the Aspect Ratio of the output signal to be synchronized to the original Aspect Ratio of the input signal.

### • H/V DELAY

- Used to monitor the Blanking area of H sync and V sync.

### • BLUE ONLY

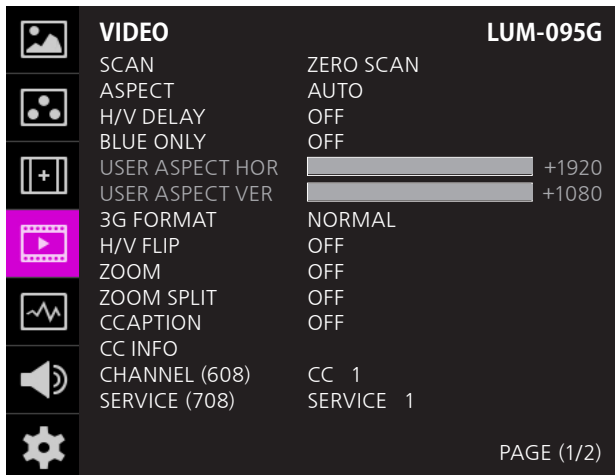
- Available modes are [OFF] [BLUE ONLY] [MONO].
- [BLUE ONLY] : Removed red and green components from the input signal and display blue component only.
- [MONO] : Used to remove the color(Chroma) from the input signal and display the monochrome component only.

### • USER ASPECT HORIZONTAL/USER ASPECT VERTICAL

- Activated only when the [SCAN] mode is set to [User Aspect].
- User can adjust the Horizontal and Vertical size of the screen.
- See section "7. Other Functions [2] User Aspect" for more information.

# 05 MENU OPERATIONS

## [4] DISPLAY / VIDEO



- **ZOOM SPLIT**

  - Used to magnify the image.
  - Used to zoom the specified area sequentially.
  - Designable areas are Left-Top, Right-Top, Left-Bottom, Right-Bottom and Center.
- **CCAPTION (Closed Caption)**

  - This function controls the Closed Caption.
  - Available modes are ANC(608), LINE21(60.8), ANC(708).
  - Captions which meet the standard of '608 : CEA-608-B' and '708 : CEA-708-C' are only displayed on the screen.
- **CC INFO (Closed Caption Information)**

  - Displays the Closed Caption information which the monitor currently receives.
- **CHANNEL (608)**

  - Sets the channel of Closed Caption 608.
  - Available modes are CC 1 to CC 4.
- **SERVICE (708)**

  - Sets the service of Closed Caption 708.
  - Available modes are SERVICE 1 to SERVICE 6.
- **3G FORMAT**

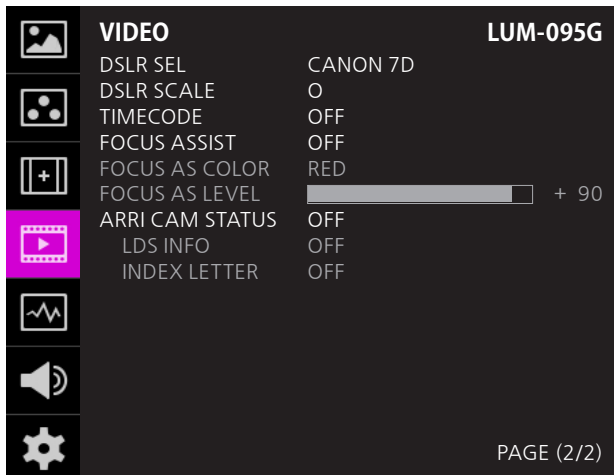
  - Used to select 3G-SDI A/B input format.
  - [NORMAL]
  - [A 444 10BIT YCbCr], [A 444 10BIT RGB]
  - [A 444 12BIT YCbCr], [A 444 12BIT RGB]
  - [A 422 12BIT YCbCr], [B 444 10/12BIT YCbCr]
  - [B 444 10/12BIT RGB], [B 422 12BIT YCbCr]
  - [B 422 10BIT YCbCr 60P]
  - In NORMAL MODE, automatically detected when Payload signal is contained.
- **H/V FLIP**

  - Allows the displayed image to be flipped horizontally or vertically.
  - This feature provides flexible mounting options for camera operators.
  - Activates in the order : [H Flip]-[V Flip]-[H/V Flip]-[AUTO]
  - In the [AUTO] mode, the vertical FLIP operates automatically according to the position of the unit.
- **ZOOM**

  - Used to magnify the image up to 90% on a pixel basis and display on full screen.
  - ZOOM range is 10% to 90% by 10% increment.
  - \* ex) 10% Zoom : If the input signal's resolution is 1920 x 1080, only 90% (1728(H) x 972(V)) of the image would be shown on full screen without the remaining 10% (192(H) x 108(V)) of the image.
  - \* See section "7. Other Functions [5] Zoom" for more information.

# 05 MENU OPERATIONS

## [4] DISPLAY / VIDEO



- **DSLR SEL**

  - Select the DSLR camera to be used with the monitor. Available mode is [CANON 7D].
  - \* DSLR cameras' screen size and aspect ratio of Live / Record / Playback modes vary depending to their manufacturer.
- **DSLR SCALE**

  - This is a special function for CANON/NIKON DSLR cameras.
  - Used to scale the image with the different resolution as to the operation mode of the camera to fill the screen fully.
  - Available modes are LIVE/REC FULL, LIVE/REC 16:9, PLAYBAKC.
- **TIMECODE**

  - Used to set the Time Code.
  - Available modes are VITC (UP), VITC (DOWN), LTC (UP), LTC (DOWN).
- **FOCUS ASSIST**

  - Focus Assist helps the shooters to easily find out the exact area in the picture with good focus, simply by adding colors on the shape or boundaries of the object in the picture.
  - Activates in order of [Mono On]-[Color On]-[Off].
  - \* [Color On] : Only the boudary of the area with good focus is displayed with the designated color.
  - \* [Mono On] : The boundary of the area with good focus is colored with the designated color, while the rest of the areas(pixels) have only Y'(Luma) signals to be black & white image.
  - \* See section "7. Other Functions [7] Focus Assist" for more information.
- **FOCUS AS COLOR (Focus Assist Color)**

  - Used to select a color for Focus Assist among RED, GREEN, BLUE, WHITE.
  - This feature is available only when the Focus Assist mode is activated.
- **FOCUS AS LEVEL (Focus Assist Level)**

  - Used to set the edge difference value between the edges in an image.
  - Available values are from 0 to 100. Larger the value the more sophisticated the detail detection.
  - Designated color is displayed when the difference of the edges exceeds the previously set value.
  - This feature is available only when the FOCUS ASSIST mode is activated.
- **ARRI CAM STATUS (ARRI Camera Status)**

  - Used to display the camera status information provided by ARRI ALEXA camera on the OSD.
  - When the Arri Cam Status is activated, the screen is squeezed to the 1742 x 980 resolution.
- **LDS INFO (Lens Data System Information)**

  - Used to se set the information display of the Lens Data System.
- **INDEX LETTER**

  - Used to set the monitor identification character notation in the upper right corner of the screen.

# 05 MENU OPERATIONS

## [5] WAVEFORM

WAVEFORM		LUM-095G
ENABLE	OFF	
TYPE	OFF	
INTENSITY	<input type="text"/>	1
TRANS	OPAQUE	
SIZE	SAMLL	
LINE WAVEFORM	OFF	
SEL LINE POS	<input type="text"/>	0
LUMA CHECK	OFF	
LUMA ADJUST	<input type="text"/>	0
RANGE ERROR	OFF	
Y MAX	<input type="text"/>	0
Y MIN	<input type="text"/>	0
C MAX	<input type="text"/>	0
C MIN	<input type="text"/>	0
Y PICTURE BLINK	OFF	
C PICTURE BLINK	OFF	

### • ENABLE

- Used to activate/ deactivate the Waveform which is selected in the Type menu.

### • TYPE

- This function sets the Waveform and Vectorscope.
- Available options are different according to the Input signal.
- Activates in the order: Waveform
- Vectorscope - Waveform Wide - Waveform YCbCr
- Waveform RGB - Wave Vector - YCbCr Vector
- Full Waveform - Full Vector - Off.

### • INTENSITY

- Used to set the brightness level of the Waveform/ Vectorscope display from 1 to 63.
- The higher the number the brighter the waveform will be.

### • TRANS (Transparency)

- Used to select the transparency option of the Waveform/ Vectorscope between OPAQUE and TRANS.
- Even though the option is set to [Opaque], it will automatically turn to [Trans] when the main OSD overlaps the waveform/vectorscope. And turns back to [Opaque] when the main OSD disappears.

### • SIZE

- Adjust the size of the Waveform or Vectorscope.
- Available options are [SMALL] and [LARGE].
- \* See section "7. Other Function [2] Waveform / Vectorscope" for more information.

### • LINE WAVEFORM

- This item is utilized to display one line data on the Waveform.

### • SEL LINE POS (Select Line Position)

















- Used to select specific horizontal line for Waveform / Vectorscope.
- This is available when LINE Waveform is activated.
- Use the Up and Down button to select a desired vertical line.
- Control range varies according to the resolution of the input SDI signal.
  - \* PAL : Min. 1, Max. 625
  - \* NTSC : Min. 1, Max. 525
  - \* 720p : Min. 1, Max. 750
  - \* 1080i : Min. 1, Max. 1125
  - \* 1080p : Min. 1, Max. 1125

### • LUMA CHECK

- Analyzes the Luma(Y') level of the input image and displays the selected zone on the screen.
- Available modes are [Color Pattern] and [Zebra Pattern].
- After each pixel's Y' level is analyzed, it is displayed as a certain color or zebra pattern according to the Index on the right side of the screen.
- When a pixel's Y' level is under 0%(16), the pixel is displayed as green color or green diagonal lines, and over 100%(235) as red color or red diagonal lines.
- When the Y' level of a pixel is between 0~100%, the pixel is displayed as Gray level, except for selected Luma Zone.
- In the [Color Pattern] mode, the zone the user adjusted is displayed as Yellow (10% lower zone), Pink ( $\pm 2.5\%$ ), Cyan (10% upper zone).
- In the [Zebra Pattern] mode,  $\pm 5\%$  of the selected Y' Level will be displayed as diagonal lines.

# 05 MENU OPERATIONS

## [5] WAVEFORM

WAVEFORM		LUM-095G
	ENABLE	OFF
	TYPE	OFF
	INTENSITY	<input type="range" value="1"/> 1
	TRANS	OPAQUE
	SIZE	SAMLL
	LINE WAVEFORM	OFF
	SEL LINE POS	<input type="range" value="0"/> 0
	LUMA CHECK	OFF
	LUMA ADJUST	<input type="range" value="0"/> 0
	RANGE ERROR	OFF
	Y MAX	<input type="range" value="0"/> 0
	Y MIN	<input type="range" value="0"/> 0
	C MAX	<input type="range" value="0"/> 0
	C MIN	<input type="range" value="0"/> 0
	Y PICTURE BLINK	OFF
	C PICTURE BLINK	OFF

### • LUMA ADJUST

- Used to set the Y' level to be colored Yellow, Pink and Cyan in [Color Pattern] mode, or to set Y' level zone to be displayed with diagonal lines in [Zebra Pattern] mode simply by pushing the Up and Down button.
- Available values are 0% ~ 100%.
- \* See section "7. Other Function [6] Luma(Y') Zone Check" for more information.

### • RANGE ERROR

- Used to set whether or not to activate Y MAX, Y MIN, C MAX, C MIN, Y PICTURE BLINK and C PICTURE BLINK functions.
- The values of Y MAX, Y MIN, C MAX, C MIN are indicated in Waveform/Vectorscope.
- If [Y PICTURE BLINK] or [C PICTURE BLINK] is enabled, the section of image that exceeds the selected values of Y MAX, Y MIN, C MAX and C MIN shall blink.
- \* See section "7. Other Function [8] Range Error" for more information.

### • Y MAX

- Used to set the maximum Luma(Y') level from 0 to 255.
- Pixels with values exceeding the maximum luma(Y') level blink on the screen, and are displayed in red on the Waveform.

### • Y MIN

- Used to set the minimum Luma(Y') level from 0 to 255.
- Pixels with values below the minimum luma(Y') level blink on the screen, and are displayed in red on the Waveform.

### • C MAX

- Used to set the maximum chroma(C') level from 0 to 255.
- Pixels with values exceeding the maximum chroma(C') level blink on the screen, and are displayed in red on the Waveform.

### • C MIN

- Used to set the minimum chroma(C') level from 0 to 255.
- Pixels with values below the minimum chroma(C') level blink on the screen, and are displayed in red on the Waveform.

### • Y PICTURE BLINK

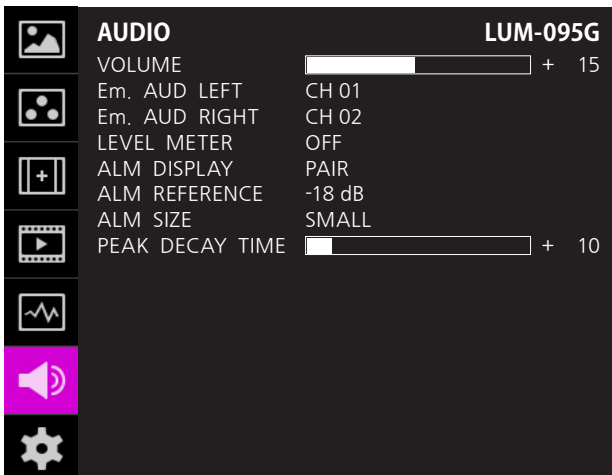
- Used to set whether or not to blink pixels with values exceeding Y MAX and Y MIN.

### • C PICTURE BLINK

- Used to set whether or not to blink pixels with values exceeding C MAX and C MIN.

# 05 MENU OPERATIONS

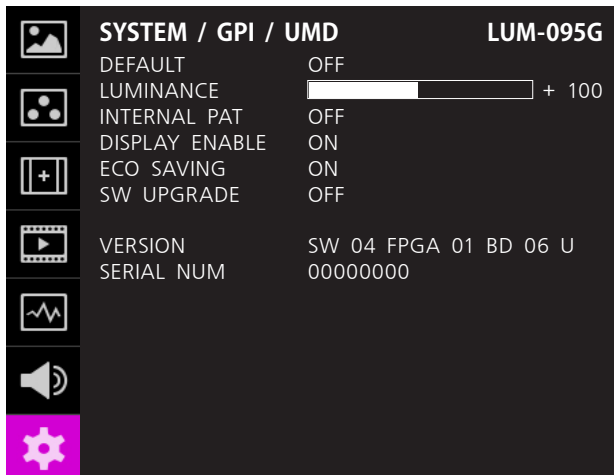
## [6] AUDIO



- VOLUME**
  - Used to control the output volume for the stereo speakers on the front of the monitor and Audio Out(phone jack) on the back of the monitor.
  - Control range is from 0 to 30.
- Em. AUD LEFT (Audio Left)**
  - Used to set the embedded audio channel for the left speaker on the front or the left audio out of Audio Out terminal on the back of the monitor.
  - Available options are CH01 to CH16.
  - \*In the HDMI mode, LEFT is set to CH01.
- Em. AUD RIGHT(Audio Right)**
  - Used to set the embedded audio channel for the right speaker on the front or the right audio out of Audio Out terminal on the back of the monitor.
  - Available options are CH01 to CH16.
  - \*In the HDMI mode, RIGHT is set to CH02.
- LEVEL METER**
  - Used to set the Level Meter for the embedded audio.
  - Available options are :
    - SDI Input : [Off]-[16CH(Hor.)]-[16CH(Ver.)]
    - HDMI Input: [Off]-[2CH(Hor.)]-[2CH(Ver.)]
  - \* 16CH(HOR.) : Displays 8 channels on top left and 8 channels on top right of the screen horizontally.
  - \* 16CH(VER.) : Displays 8 channels on center left and 8 channels on top right of the screen vertically.
  - \* In the HDMI mode, only 2 channels are displayed.
- ALM DISPLAY (Audio Level Meter Display)**
  - Used to set the display method for audio level meter.
  - Available modes are GROUP and PAIR.
  - \* In the HDMI mode, the mode is set to PAIR.
- ALM REFERENCE (Audio Level Meter Reference)**
  - Display the default audio level meter value,
  - Available options are -18dB and -20dB.
  - Audio level meter within selected value turns to green and exceeded audio level is displayed in yellow.
  - Audio level exceeding -4dB is displayed in red.
- ALM SIZE (Audio Level Meter Size)**
  - Used to control the size of the audio level meters.
  - Available options are SMALL and LAGRE.
- PEAK DECAY TIME**
  - Sets the reduction time for max value indication of audio signals.
  - Control range is from MIN 0 to MAX 100. Bigger number means a longer display time for max value.

# 05 MENU OPERATIONS







## [7] SYSTEM / GPI / UMD



- DEFAULT**
  - Used to initialize OSD values to factory default.
  - Available modes are DEFALUT and FACTORY.
  - In the DEFALUT mode, except for the stored 3D LUT, all values are initialized.
  - In the FACTORY mode, all values are initialized to factory default.
- LUMINANCE**
  - Used to indicate the current Luminance value .
  - In the case of System Default, the value returns to factory default(after color calibration).
  - Available values are from 1 to 200.
- INTERNAL PAT (INTERNAL PATTERN)**
  - Generates Color Bar+Pludge and Grayscale Pattern internally.
  - Selectable range for Gray Pattern is from 0% to 100% with 5% increment.
  - \* See section "7. Other Function -> [8] Internal Pattern" for more information.
- DISPLAY ENABLE**
  - Used to set the LUMINANCE to the minimum value when the time set in the still image output is exceeded.
  - When video is output or the MENU button is pressed, the LUMINANCE is reset to the original value.
  - Settable options are ON, 5MIN, 10MIN, 20MIN and 30MIN.
  - In the Function Key, the screen can be turned ON/OFF immediately by user's choice.
- ECO SAVING**
  - Used to save power consumption automatically when there is no monitor signal.
  - When the signal is supplied, the brightness of the monitor will be changed to the set value.
- S/W UPGRADE**
  - Used to upgrade the firmware using USB (Thumb drive).
  - \* See section "7. Other Functions -> [9] Firmware Upgrade" for more information.
- VERSION**
  - Displays current firmware version.
- SERIAL NUM (Serial Number)**
  - Displays the serial number of the monitor.

# 05 MENU OPERATIONS

## [7] SYSTEM / GPI / UMD

SYSTEM / GPI / UMD		LUM-095G
	GROUP ID	0
	MONITOR ID	0
	RS-422 BAND	9600
	PIN 1	HDMI
	PIN 2	SDI A
	PIN 3	SDI B
	PIN 4	TALLY RED
	PIN 5	TALLY GREEN
	PIN 6	BLUE ONLY
	PIN 7	POWER ON / OFF
	PIN 8	GND

### • GROUP ID

- Used to group the monitors and control the monitors by group when you control the monitors with the protocol provided by TVLogic, using RS-422/485 communication.
- Available setting is [0] to [98].

### • MONITOR ID

- Sets the ID of each monitor for the TVLogic control protocol or DYNAMIC UMD using RS-422/485 communication.
- Available setting is [0] to [98].

### • RS-422 BAUD

- Sets the monitor control program that TVLogic provides and Baud rate.
- Available setting is [9600], [14400], [19200], [38400], [115200].

### • PIN 1 to PIN 8

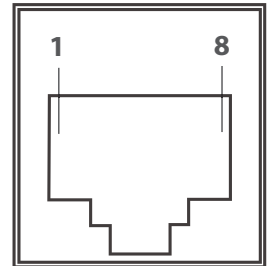
- This item activates and inactivates the REMOTE function.
- The user can designate a function to each pin, and each pin's default setting is as follows.

PIN 1: HDMI  
 PIN 2: SDI A  
 PIN 3: SDI B  
 PIN 4: TALLY RED  
 PIN 5: TALLY GREEN  
 PIN 6: BLUE ONLY  
 PIN 7: POWER ON / OFF  
 PIN 8: GND

PIN NO.	Settable Functions
PIN 1~6	NONE
	HDMI
	SDI A
	SDI B
	TALLY RED
	TALLY GREEN
	BLUE ONLY
	MONO
	ASPECT
	H/V DELAY
	MARKER 16:9
	MARKER 15:9
	MARKER 14:9
	MARKER 13:9
	MARKER 4:3
	MARKER 4:3 ON AIR
	MARKER 1.85:1
	MARKER 2.35:1
	MARKER 1.85:1 & 4:3
	MARKER CENTER
	SAFETY AREA 80%
SAFETY AREA 88%	
SAFETY AREA 90%	
SAFETY AERA 93%	
SAFETY AERA 100%	

### REMOTE (RJ-45)







- 1: Pin1
- 2: Pin2
- 3: Pin3
- 4: Pin4
- 5: Pin5
- 6: Pin6
- 7: Pin7
- 8: GND





# 05 MENU OPERATIONS

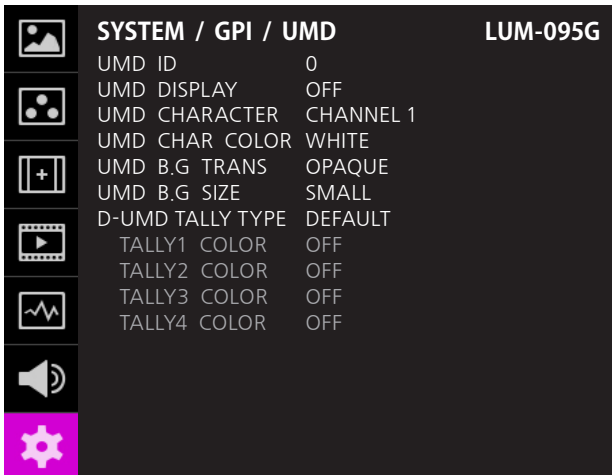
## [7] SYSTEM / GPI / UMD

SYSTEM / GPI / UMD		LUM-095G
	UMD ID	0
	UMD DISPLAY	OFF
	UMD CHARACTER	CHANNEL 1
	UMD CHAR COLOR	WHITE
	UMD B.G TRANS	OPAQUE
	UMD B.G SIZE	SMALL
	D-UMD TALLY TYPE	DEFAULT
	TALLY1 COLOR	OFF
	TALLY2 COLOR	OFF
	TALLY3 COLOR	OFF
	TALLY4 COLOR	OFF
		
		

- UMD ID**
  - Sets the ID of the UMD.
  - Available setting is [0] to [125].
- UMD DISPLAY**
  - Sets the UMD mode among UMD, ANC and DYNAMIC UMD.
  - \*UMD: Displays user customized characters on screen.
  - \*ANC: Displays characters embedded in SDI signal.
  - \*D-UMD(TSL-S8C): Displays the tally signal and 8 letters that are input by TSL protocol (V3.1) on the screen.
  - \*D-UMD(TSL-S16C): Displays the tally signal and 16 letters that are input by TSL protocol (V3.1) on the screen.
  - \*D-UMD(TSL-D8C): Displays a pair of tally signal and a pair of 8 letters that are input by TSL protocol (V3.1) on the screen.
- UMD CHARACTER**
  - Used to customize the characters for [UMD].
  - Alphabets, numbers and special symbols are available.
  - Maximum of 8 characters.
- UMD CHAR COLOR**
  - Sets the color of the UMD letter.
  - Available mode is [WHITE], [RED], [GREEN], [BLUE], [YELLOW], [CYAN], [MAGENTA]
- UMD B.G TRANS**
  - Sets the transparency of UMD letter box.
  - The selectable modes are [OPAQUE], [50%], [85%], [100%].
- UMD B.G SIZE**
  - Sets the font size of UMD and the size of UMD letter box.
  - The selectable modes are [SMALL] and [LARGE].
- D-UMD TALLY TYPE**
  - Allows for adjusting the various modes of tally operation.
  - The operation of sub menus varies depending on the settings in [UMD DISPLAY]
    - \*DEFAULT: Original TVLogic managing method (VRT)
    - \*USER COLOR: The user can set each tally color.
    - \*CHARACTER: Shows tally in the letter color. The operation is the same as [DEFAULT].
    - \*B.G. COLOR: Show tally in the letter background color. The operation is the same as [DEFAULT].
    - \*USER TALLY: This mode receives the signal fed as bit0 and bit1 of TSL Protocol control byte, adjusts the color the user wants, and then shows the tally. Available modes are Off, White, Red, Green, Blue, Yellow, Cyan, Magenta.
    - \*USER CHARACTER: Shows tally in letter color. The method is the same as USER TALLY.
    - \*USER B.G.: Show tally in letter background color. The method is the same as USER TALLY.
- TALLY1 COLOR ~ TALLY4 COLOR**
  - This menu sets the color of Tally1, Tally2, Tally3, Tally4 respectively.
  - The selectable colors are Red, Green, Yellow.
- B0:0 B1:0 ~ B0:1 B0:1**  
**B0:00 B3:00 ~ B0:11 B3:11**
  - This menu sets the color of the input condition for byte0, byte1 in TSL Protocol Control Byte.
  - The selectable colors are Off, White, Red, Green, Blue, Yellow, Cyan, Magenta.

# 05 MENU OPERATIONS

## [7] SYSTEM / GPI / UMD



### • UMD DISPLAY / • D-UMD TALLY TYPE

[Sub Menu Combination Table]

		UMD DISPLAY				
		UMD	ANC	D-UMD(TSL-SBC)	D-UMD(TSL-S16C)	D-UMD(TSL-D8C)
D-UMD TALLY TYPE	DEFAULT	N/A	N/A	N/A	N/A	N/A
	USER COLOR	TALLY1 COLOR TALLY2 COLOR	TALLY1 COLOR TALLY2 COLOR	TALLY1 COLOR TALLY2 COLOR	TALLY1 COLOR TALLY2 COLOR	TALLY1 COLOR TALLY2 COLOR TALLY3 COLOR TALLY4 COLOR
	CHARACTER	N/A	N/A	N/A	N/A	N/A
	B.G. COLOR	N/A	N/A	N/A	N/A	N/A
	USER TALLY	TALLY1 COLOR TALLY2 COLOR TALLY3 COLOR TALLY4 COLOR	TALLY1 COLOR TALLY2 COLOR TALLY3 COLOR TALLY4 COLOR	B0-B1 : 00 B0-B1 : 01 B0-B1 : 10 B0-B1 : 11	B0-B1 : 00 B0-B1 : 01 B0-B1 : 10 B0-B1 : 11	B0-B3 : 0000 B0-B3 : 0101 B0-B3 : 1010 B0-B3 : 1111
	USER CHARACTER	TALLY1 COLOR TALLY2 COLOR TALLY3 COLOR TALLY4 COLOR	TALLY1 COLOR TALLY2 COLOR TALLY3 COLOR TALLY4 COLOR	B0-B1 : 00 B0-B1 : 01 B0-B1 : 10 B0-B1 : 11	B0-B1 : 00 B0-B1 : 01 B0-B1 : 10 B0-B1 : 11	B0-B3 : 0000 B0-B3 : 0101 B0-B3 : 1010 B0-B3 : 1111
	USER B.G.	TALLY1 COLOR TALLY2 COLOR TALLY3 COLOR TALLY4 COLOR	TALLY1 COLOR TALLY2 COLOR TALLY3 COLOR TALLY4 COLOR	B0-B1 : 00 B0-B1 : 01 B0-B1 : 10 B0-B1 : 11	B0-B1 : 00 B0-B1 : 01 B0-B1 : 10 B0-B1 : 11	B0-B3 : 0000 B0-B3 : 0101 B0-B3 : 1010 B0-B3 : 1111

## 05 MENU OPERATIONS

### [7] SYSTEM / GPI / UMD

#### <Dynamic UMD Protocol (TSL V3.1)>

\* Transmission (18 Byte) (PC or Device -> Monitor)

HEADER (1 BYTE)	CONTROL BYTE(1 BYTE)	DISPLAY DATA (16 BYTE)
--------------------	-------------------------	---------------------------

\* [HEADER] : Display address (0~126) + 80 hex.

\* [CONTROL BYTE]

- bit 0 : Tally 1 (1=on, 0=off)
- bit 1 : Tally 2 (1=on, 0=off)
- bit 2 : Tally 3 (1=on, 0=off)
- bit 3 : Tally 4 (1=on, 0=off)
- bit 4 : bright data (Not used)
- bit 5 : bright data (Not used)
- bit 6 : reserved (Not used)
- bit 7 : cleared to 0 (Not used)

\* [DISPLAY DATA] : 16 displayable ASCII characters.

Tally1

CHANNEL1

Tally2

Tally3

CHANNEL1





Tally4

# 05 MENU OPERATIONS





## [7] SYSTEM / GPI / UMD

### • Tally Type - Default

- TSL\_S8C(Single 8 Characters) & TSL\_S16C(Single 16 Character)

Bit 1 (Tally2)	Bit 0 (Tally1)	Operation
0	0	
0	1	
1	0	
1	1	

- TSL\_D8C(Dual 8 Character)

Bit 3 (Tally4)	Bit 2 (Tally3)	Operation
0	0	
0	1	
1	0	
1	1	

### • D-UMD Tally Type - USER COLOR

- Allows to set the color of TALLY1 to TALLY4.

When [UMD DISPLAY] is set to [D-UMD(TSL-D8C)] and [D-UMD TALLY TYPE] and [TALLY1 to TALLY4 COLOR] are set as follows, tallies are displayed like the image below.

D-UMD TALLY TYPE  
TALLY1 COLOR  
TALLY2 COLOR  
TALLY3 COLOR  
TALLY4 COLOR

USER COLOR  
RED  
GREEN  
RED  
YELLOW



# 06 BUTTON FUNCTIONS

## INPUT BUTTON

### SOURCE INPUT

SDI A  
SDI B  
SDI 2SI  
SDI QUAD  
HDMI  
3840 x 2160 50p\*

\*Current Input Signal Format

- **The LUM-095G supports 12G/HD/SD SDI input.**

1. If you push [MENU] button for more than a second, the OSD window for the input selection appears.  
You can move to the desired input mode using [UP] and [DOWN] button and then select it by pushing [ENTER] button.
2. The current input signal format is displayed at the bottom of the OSD window.
3. If you push [MENU] button once again, the OSD window disappears.

\*If the video is not displayed after the input is selected, please check the video source and the input cable.

### SDI

SDI A  
3840 x 2160 50p\*

\*Current Input Signal Format

- **The LUM-095G has the four SDI inputs.**

1. If you push [SDI] button, the input mode is changed in the order of SDI A, SDI B, SDI 2SI, SDI QUAD.
2. The current input signal format is displayed at the bottom of the OSD window.

\*If the video is not displayed after the input is selected, please check the video source and the input cable.

### HDMI

HDMI  
1920 x 1080 50p\*

\*Current Input Signal Format

- **The LUM-095G has an HDMI input.**

1. Please push [HDMI] button to display the HDMI signal.
2. The current input signal format is displayed at the bottom of the OSD window.

\*If the video is not displayed after the input is selected, please check the video source and the input cable.

# 06 BUTTON FUNCTIONS

## INPUT BUTTON

### SCAN BUTTON

- The LUM-095G supports the various SCAN modes
1. If you push [SCAN] button, the mode is changed in the order of ZERO SCAN → OVER SCAN → 1 : 1 SCAN → USER ASPECT.
- Over Scan: Zooms in and out of the image to 96% of its original size without changing the aspect ratio.
  - Zero Scan: Zooms in/out of the image without changing the aspect ratio.
  - 1:1 SCAN: Display the input video by 1:1 pixel mapping on the screen.  
This feature is activated only when the resolution of the input image is bigger than the resolution of the LCD panel.

### ASPECT BUTTON

- The LUM-095G supports the various Aspect ratio.
1. Press [ASPECT] button on the front of the monitor to activate various aspect ratio.
  2. If you push [ASPECT] button, the mode is changed in the order of 16 : 9 → 4:3 → 2.35:1 → 1.85:1 → 15:9 → 16:10 → ANAMORPHIC 1.3X → ANAMORPHIC 1.5X → ANAMORPHIC 1.8x → AUTO.

### FUNCTION(F1/F2/F3) BUTTON

- The Function buttons allow for making a quick setting on each button.
1. Press the Function button(F1 to F3) on the front of the monitor for more than 2 seconds, and the OSD menu pops up on the screen.
  2. Move to a desired function using [UP] and [DOWN] button and press the [ENTER] button to select.
  3. Once the function is set, press the Function button (F1~F3) to activate the assigned function.

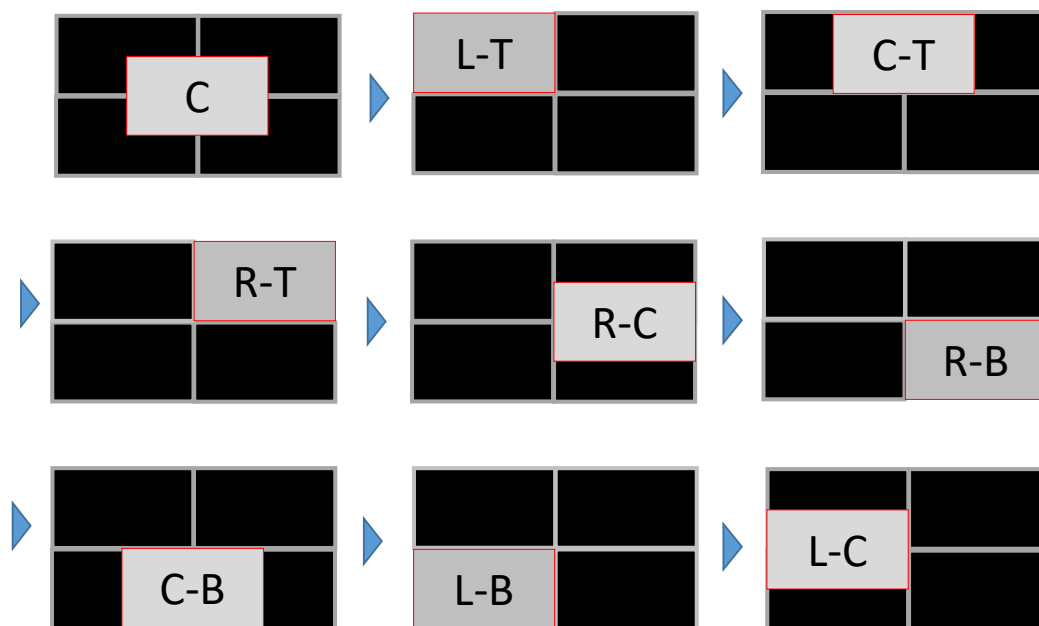
#### F1 FUNC. SEL

SCAN  
 ASPECT  
 MARKER  
 H/V DELAY  
 BLUE ONLY  
 ZOOM  
 ZOOM SPLIT  
 FREEZE  
 AUDIO LVM  
 TIME CODE  
 FOCUS ASSIST  
 WAVEFORM  
 LUMA(Y) ZONE  
 RANGE ERROR  
 H/V FLIP  
 MAX BRIGHTNESS  
 CAMERA LUT  
 DISPLAY ENABLE  
 INPUT SELECT  
 ARRI METADATA  
 GRID  
 EXTERNAL FAN

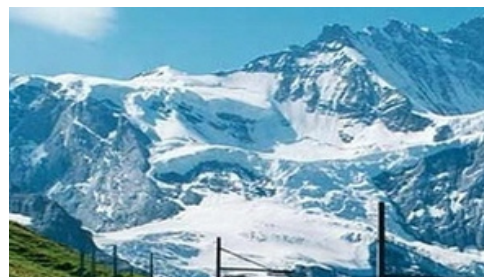
## 07 OTHER FUNCTIONS

### [1] 1 : 1 SCAN

- The resolution of the LCD panel of the LUM-095G is 1920 x 1080. When the UHD(3840x2160), 4K(4096 x 2160), or SD image is fed, this function displays the image pixel to pixel on the screen.
- You can navigate the UHD or 4K image with pixel to pixel over the 9 divided parts by pushing [UP] and [DOWN] button.



<Original Image>



<Left - Top>



<Left - Center>



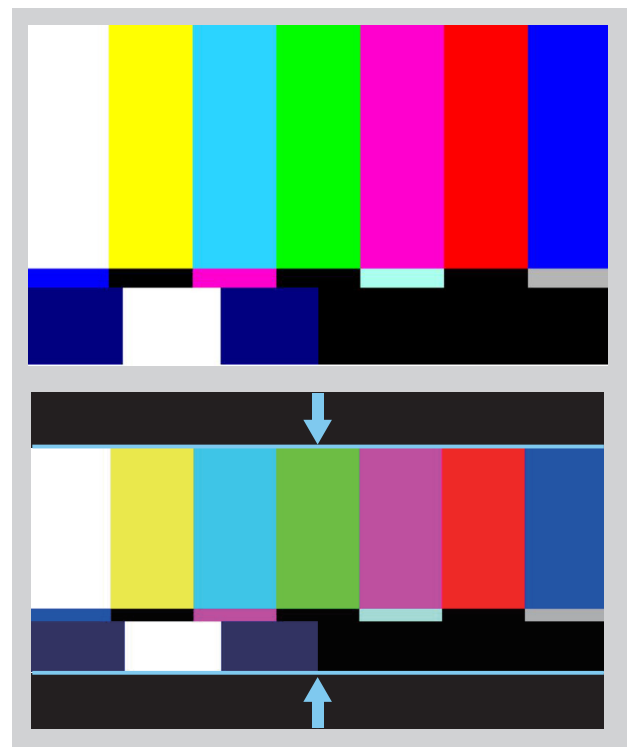
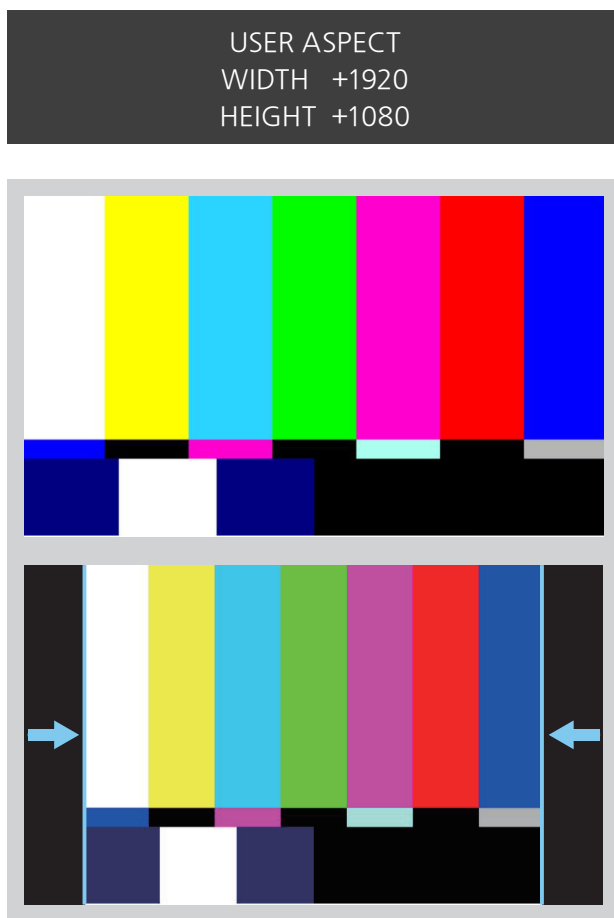
<Right - Bottom>

## 07 OTHER FUNCTIONS

### [2] USER ASPECT

- Used to adjust the Width /Height display ratio.

1. Select the [USER ASPECT] mode in the OSD menu or by pressing [SCAN] button on the front.
2. After the activation, press [UP] and [DOWN] buttons to adjust the aspect ratio.



- Adjust the ratio using the Knob (UP/DOWN).
- Control range for width: 0~1920.
- Control range for height : 0~1080.
- The size-adjusted picture always stays in the center of the screen.
- The size can be adjustable with 2 increment and decrement.

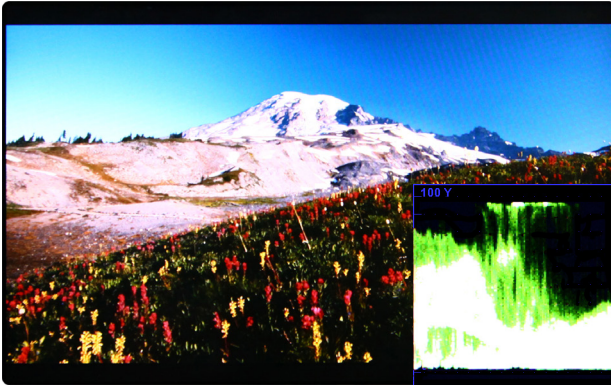


# 07 OTHER FUNCTIONS

## [3] WAVEFORM / VECTORSCOPE

### • WAVEFORM Y

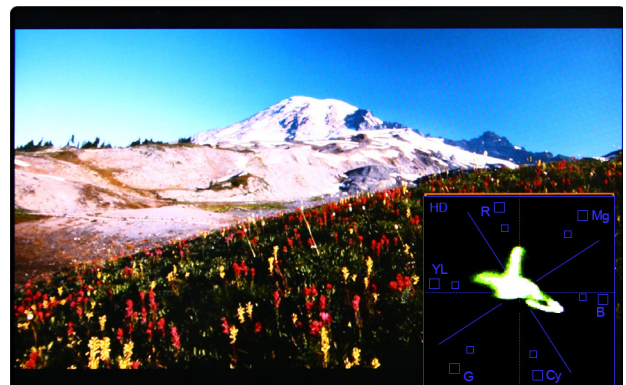
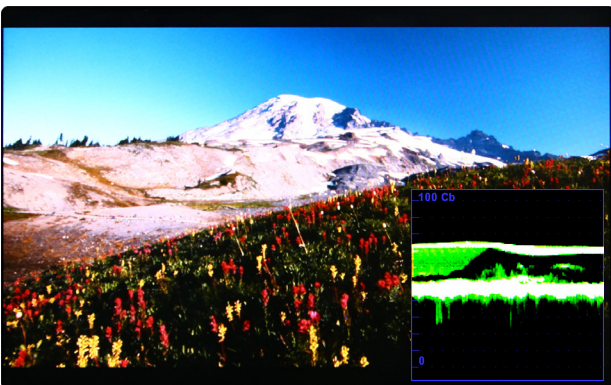
- Displays the Luma(Y') component of the input signal into waveform.



- The Waveform/ Vectorscope function can be used only when the input signal is YUV.
- In the case of RGB input, Waveform RGB is supported.
- Available modes in the YUV signal:
  - Waveform
  - Vectorscope
  - Waveform Wide
  - Waveform YCbCr
  - Waveform RGB
  - Wave\_Vector
  - YCbCr Vector
  - Full Waveform
  - Full Vector

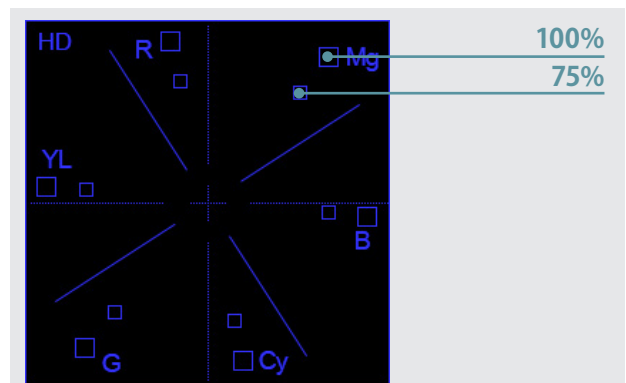
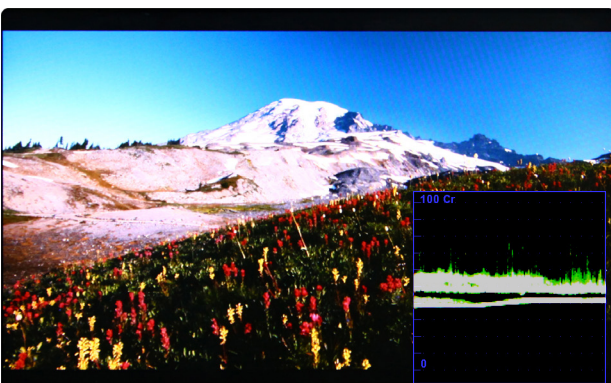
### • WAVEFORM Cb, Cr

- Displays the Cb, Cr components of the input signal into waveform.



### • VECTORSCOPE

- Displays the color components 'B-Y' and 'R-Y' of the input signals onto the X-Y axis.
- Two different types of Vectorscopes are displayed according to SD or HD input signals.
- 100% and 75% scales are indicated on the Vectorscope.rm.

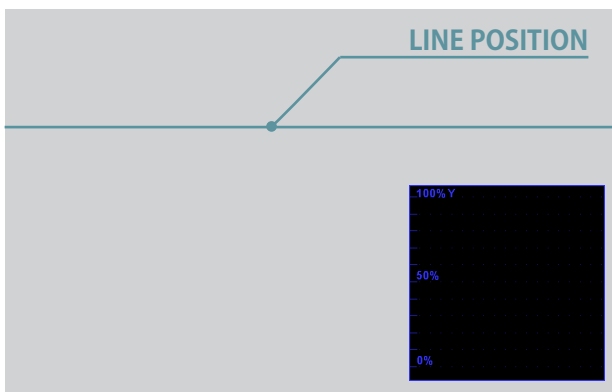


# 07 OTHER FUNCTIONS

## [4] LINE SELECT (WAVEFORM / VECTORSCOPE)

- **Used to select specific Vertical Line for WaveForm/VectorScope.**

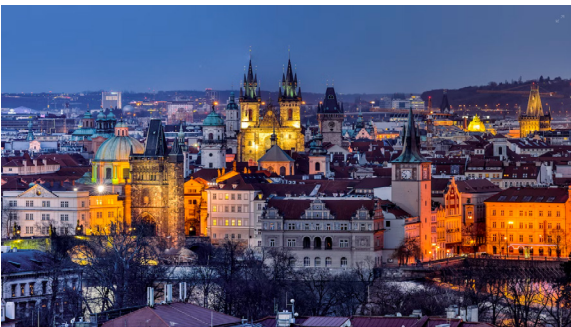
- This is available when LINE WaveForm is activated.
- To activate this feature, set [WAVEFORM] - [LINE WAVEFORM] - [ON], and select the desired horizontal line using [UP] and [DOWN] button in [SEL LINE POS].
- Selected line is indicated in White on the screen.
- Control range varies according to the resolution of the input SDI signal.
  - \* PAL : 0~625
  - \* NTSC : 0~525
  - \* 720p : 0~750
  - \* 1080 i/p : 0~1125
- Control range for HDMI signal varies according to the output resolution of the signal.
- \* Selected line is indicated on the screen.



# 07 OTHER FUNCTIONS

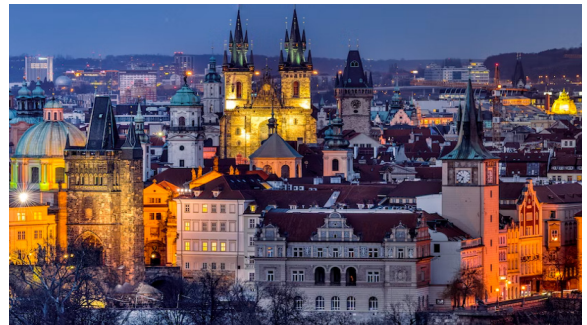
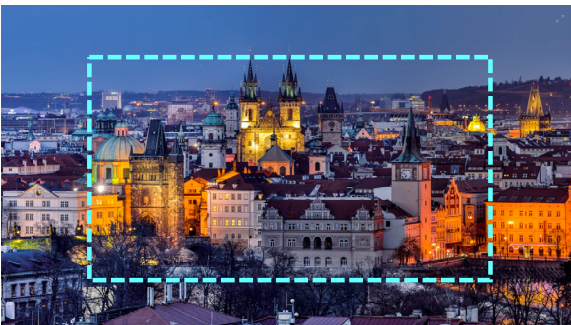
## [5] ZOOM

- Used to magnify the input signal from 0% to 90%.
- Supports Zoom Width Scroll / Zoom Height Scroll function.
- Zooms IN/OUT focused on the scrolled area.



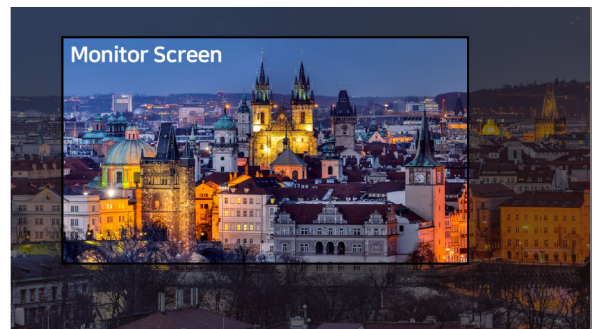
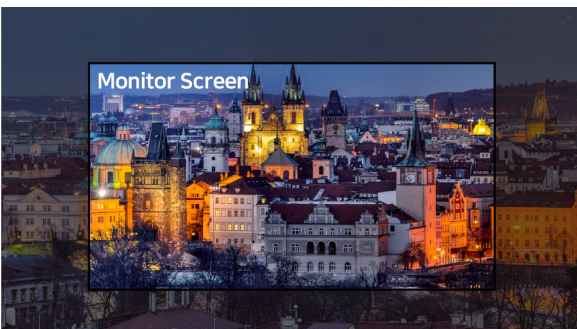
<ZOOM OFF>

ZOOM	OFF
WIDTH	+ 0
HEIGHT	+ 0



<ZOOM 30%>

- When the image is zoomed up, you can move the zoomed image vertically and horizontally with the zoom-up rate maintaining.



ZOOM	<b>30%</b>
WIDTH	+ 0
HEIGHT	+ 0

ZOOM	<b>30%</b>
WIDTH	- 70
HEIGHT	- 100

## 07 OTHER FUNCTIONS

### [6] LUMA (Y') ZONE CHECK

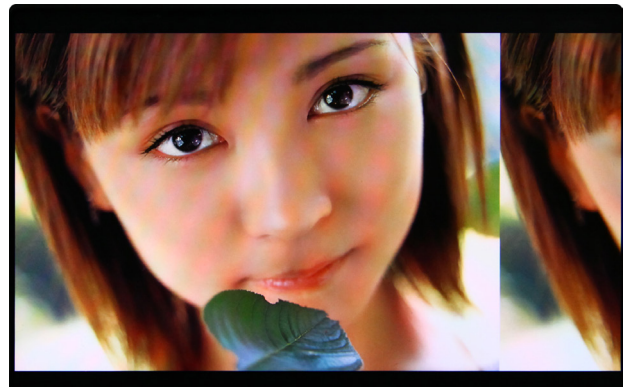
#### • COLOR PATTERN TYPE

- Displays the pixels with the designated Luma(Y') levels of the input image in colors. Pixels whose Y' level is over 100% are displayed as Red. Pixels whose Y' level is below 0% are displayed as Green.
- Pixels with Y' levels which are designated by the user are displayed in following colors - yellow, pink, cyan.
- Factory Default Y' (Border line between pink and yellow) level is 70%. The upper 2.5% and lower 2.5% zone from the Y' level set in [LUMA(Y') ZONE ADJUST] menu is displayed in Pink. The upper 10% zone from the Pink zone is displayed in Yellow, and the lower 10% zone from the Pink zone is displayed in Cyan. So, 25% zone is displayed in colors and the other 75% zone is displayed mono and white.

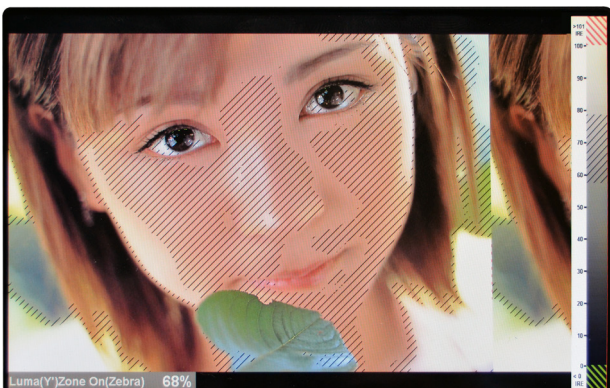
- LUMA(Y') ZONE CHECK function is convenient to set the exposure or the lighting so that the skin tone or the specific color tone is correctly shot.

#### • ZEBRA PATTERN TYPE

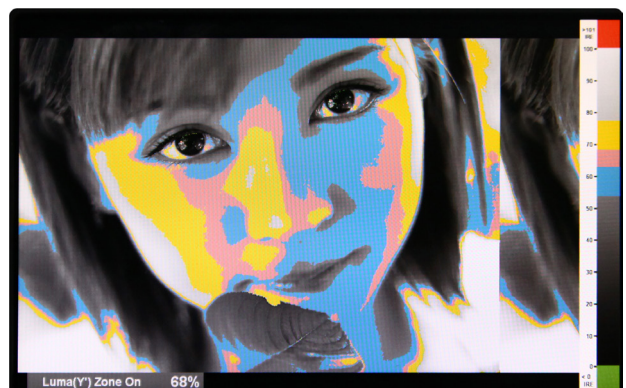
- Displays the pixels with the designated Luma(Y') levels of the input image in zebra pattern. Pixels whose Y' level is over 100% are displayed as red diagonal stripes. Pixels whose Y' level is below 0% are displayed as green diagonal stripes.
- Pixels with Y' levels which are designated by the user are displayed as black diagonal stripes.
- Factory Default Y' level is 70%. The pixels with Y' level from 65% to 75% are displayed as black zebra pattern. So, totally 10% zone is displayed as black diagonal stripes.



<Luma Zone Check OFF>



<Luma Zone Check ON\_Zebra Pattern Type>



<Luma Zone Check ON\_Color Pattern Type>

## 07 OTHER FUNCTIONS

### [7] FOCUS ASSIST

• **Focus Assist function assigns a color on the pixels of the shape or boundary of the image, which helps the user easily see which part of the image is in focus or out of focus.**

- With this function, the user can easily differentiate the focused area from the out-focused area especially when shooting with a shallow depth of field.

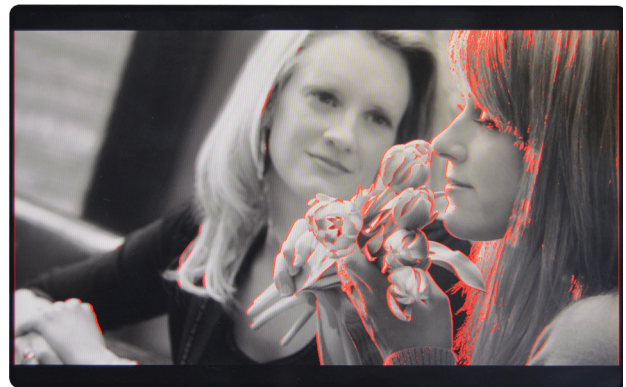
- Available types are [COLOR ON] and [MONO ON].

• [COLOR ON]: Background image is original color type.

• [MONO ON]: Background image is mono type.



<FOCUS ASSIST - COLOR ON>



<FOCUS ASSIST - MONO ON>

## 07 OTHER FUNCTIONS

### [8] FIRMWARE UPGRADE

- **The USB (Thumb drive) which contains the F/W file is needed for Firmware Upgrade.**
  
- **Select the S/W UPGRADE in the SYSTEM menu.**
  1. Connect the USB to the USB Slot on the bottom of the monitor.
  2. Go to [MENU] → [SYSTEM / GPI / UMD] → [SW UPGRADE], and select what to update among ALL, CPU, FPGA, IMAGE.
  3. When the USB connection is completed, the S/W upgrade starts and the progress displays on the bottom left side of the screen.
  4. If the USB doesn't connect properly or there is no file in the specified location, the error message will be displayed on the bottom left side of the screen and the upgrade won't start.
  5. In that case, check the USB or the file location and try again.
  
- **After USB connection, turn off and then on the monitor.**

# 08 VIDEO SUPPORT RESOLUTION - SDI

Input Signal Interfaces	Signal Format (SD-SDI)	
SD-SDI Single Link	720x487 (59.94i) 720x576 (50i)	YCbCr 4:2:2 10bit
Input Signal Interfaces	Signal Format (HD-SDI)	
HD-SDI Single Link	1280x720 (50/59.94/60P)	YCbCr 4:2:2 10bit
	1920x1080 (23.98/24/25/29.97/30p) (50/59.94/60i) (24/25/29.97/30psf)	YCbCr 4:2:2 10bit
Input Signal Interfaces	Signal Format (3G-SDI)	
3G-SDI (A/B) Single Link	1920x1080 (60p/59.94p/50P)	YCbCr 4:2:2 10bit
	1920x1080 (30/29.97/25/24/23.98p) (30sF/29.97sF/25sF/24sF/23.98sF) (60/59.94/50i)	YCbCr 4:2:2 12bit RGB 4:4:4 10bit / 12bit YCbCr 4:4:4 10bit / 12bit
	1280x720 (50/59.94/60P)	RGB 4:4:4 10bit YCbCr 4:4:4 10bit
	2048x1080 (60/59.94/50/30/29.97/25/24/23.98 30sF/29.97sF/25sF/24sF/23.98sF)	RGB 4:4:4 8bit / 10bit / 12bit YCbCr 4:4:4 8bit / 10bit / 12bit YCbCr 4:2:2 8bit / 10bit / 12bit
Input Signal Interfaces	Signal Format (Single Link 6G/12G SDI)	
6G/12G-SDI (A) Single Link	3840x2160 (30/29.97/25/24/23.98p) 4096x2160 (30/29.97/25/24/23.98p)	YCbCr 4:2:2 10bit
	3840x2160 (30/29.97/25/24/23.98p) 4096x2160 (30/29.97/25/24/23.98p)	YCbCr 4:2:2 10bit
Input Signal Interfaces	Signal Format (Quad Link 6G/12G SDI)	
3G-SDI Quad Link Square Division 2-Sample Interleave	3840x2160 (23.98/24/25/29.97/30p)	YCbCr 4:4:4 10bit / 12bit RGB 4:4:4 10bit / 12bit
	3840x2160 (50/59.94/60p)	YCbCr 4:2:2 10bit
	4096x2160 (23.98/24/25/29.97/30p)	YCbCr 4:4:4 10bit / 12bit RGB 4:4:4 10bit / 12bit
	4096x2160 (50/59.94/60p)	YCbCr 4:2:2 10bit

# 08 VIDEO SUPPORT RESOLUTION - HDMI

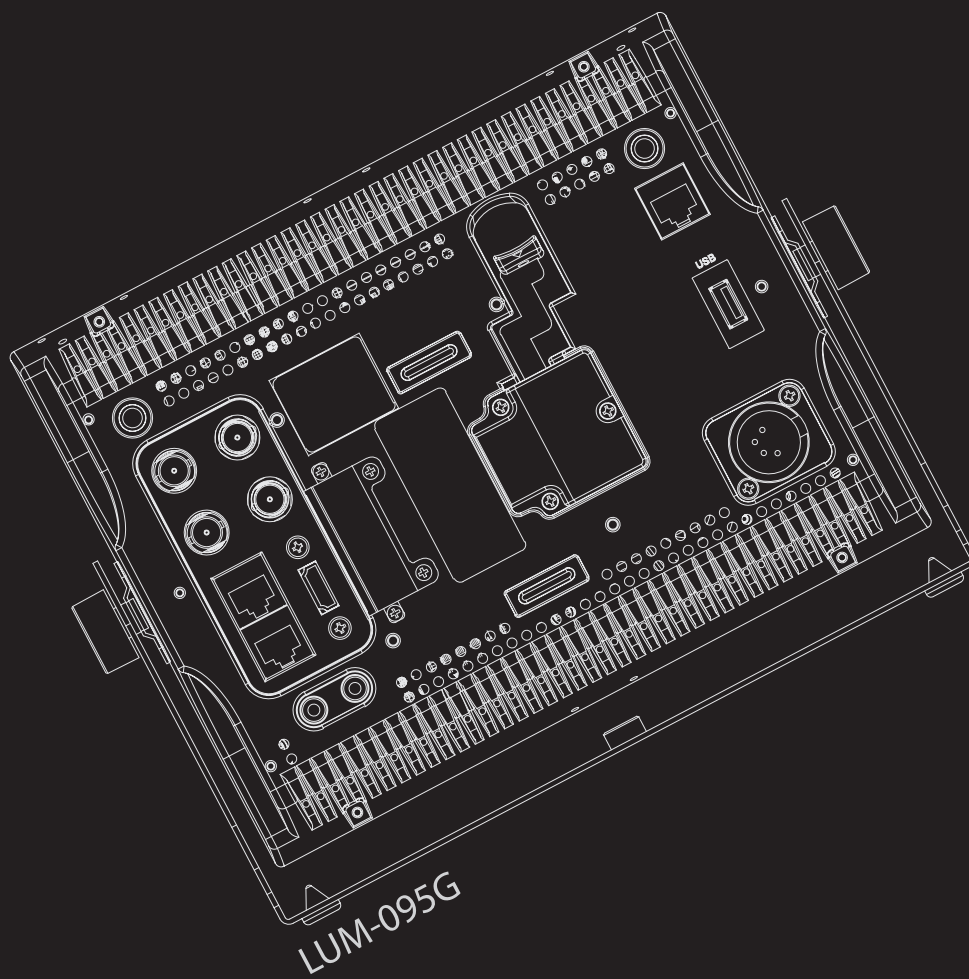
Input Signal Interfaces	Signal Format (HDMI/DP)	
HDMI Single Link	480i(60) / 576i(50) 480p(60) / 576p(50) 1280x720(50/59.94/60p) 1920x1080(50/59.94/60p) 1920x1080(23.98/24/25/29.97/30p, 60i/59.94i/50i )	* HDMI RGB 4:4:4 8bit YCbCr 4:4:4 8bit YCbCr 4:2:2 8bit
	3840x2160 (23.98/24/25/29.97/30p/50/59.94/60p)	RGB 4:4:4 8bit / 10bit / 12bit YCbCr 4:4:4 8bit / 10bit / 12bit YCbCr 4:2:2 8bit / 10bit / 12bit YCbCr 4:2:0 8bit / 10bit / 12bit
	4096x2160 (23.98/24/25/29.97/30p/50/59.94/60p)	RGB 4:4:4 8bit / 10bit / 12bit YCbCr 4:4:4 8bit / 10bit / 12bit YCbCr 4:2:2 8bit / 10bit / 12bit YCbCr 4:2:0 8bit / 10bit / 12bit



# 09 PRODUCT SPECIFICATIONS

Specifications		LUM-095G
LCD	Size	9.0"
	Resolution	1920 x 1080 (16:9)
	Pixel Pitch	0.1035 x 0.1035 mm
	Color Depth	16.7M Colors (True 8 bit)
	Viewing Angle	178°(H) / 178°(V)
	Luminance of white	400 cd/m <sup>2</sup>
	Contrast	750 : 1
	Display Area	198.72 x 111.78 mm
Input & Output	SDI-A	12G/6G/3G/HD-SDI Input
	SDI-B	3G/HD/SD-SDI Input
	SDI-C	3G/HD-SDI Input (For Quad-Link 4K/UHD Input only) or 12G/6G/3G/HD-SDI Output (Passive Through Out)
	SDI-D	3G/HD-SDI Input (For Quad-Link 4K/UHD Input only) or 3G/HD/SD-SDI Output (Passive Through Out)
	1 x HDMI	HDMI 2.0
Input Signal	12G-SDI	12Gb/s
	6G-SDI	6Gb/s
	3G-SDI	2.970Gb/s
	HD-SDI	1.485Gb/s
	SD-SDI	270Mbps
	HDMI	480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 2160p
SDI Input Signal Formats	SMPTE ST-2082	2160p (60/59.94/50) (*RGB 4:4:4 not supported.)
	SMPTE ST-2081	2160p (30/29.97/25/24/23.98) (*RGB 4:4:4 not supported.)
	SMPTE ST-425M-A/B	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-274M	1080i (60/59.94/50)
		1080p (30/29.97/25/24/24sF/23.98/23.98sF)
	SMPTE ST-296M	720p (60/59.94/50)
	SMPTE ST-260M	1035i (60/59.94)
SMPTE ST-125M	480i (59.94)	
ITU-R BT.656	576i (50)	
Remote Control & Update	1 x REMOTE	RJ-45 Input, GPI Control
	2 x RS-422	RJ-45 Input & Output, Control by TVLogic Protocol
	1 x USB	USB A type, Firmware Upgrade
Audio In	Embedded Audio / Analog Stereo (Phone Jack)	
Audio Out	Internal Speaker(Mono) / Analog Stereo (Phone Jack)	
Power	12V DC/24V DC	
Power Consumption (Approx.)	30 Watts(DC)/Max 2.6A	
Operating Temperature	-20 °C to 40 °C (-4 °F to 104 °F)	
Storage Temperature	-30 °C to 50 °C (-22 °F to 122 °F)	
Dimensions	Main Body	223 x 175 x 60 mm / 8.78 x 6.89 x 2.36 inch
	With Stand	260 x 194.2 x 90 mm / 10.24 x 7.65 x 3.54 inch
	Shipping Box	330 x 180 x 250 mm / 12.99 x 7.09 x 9.84 inch
Weight (with stand)	2.14Kg / 4.72lb	
Basic Accessories	AC Power Cord, DC Power adaptor, Handle, Stand, Camera mount	
Optional Accessories	Acrylic Protector, Rack Mount Kit(Single, Dual), Carrying Bag with Hood, Sun Hood, HDMI Bracket	

\*The specifications above may be changed without notice.



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