JVC
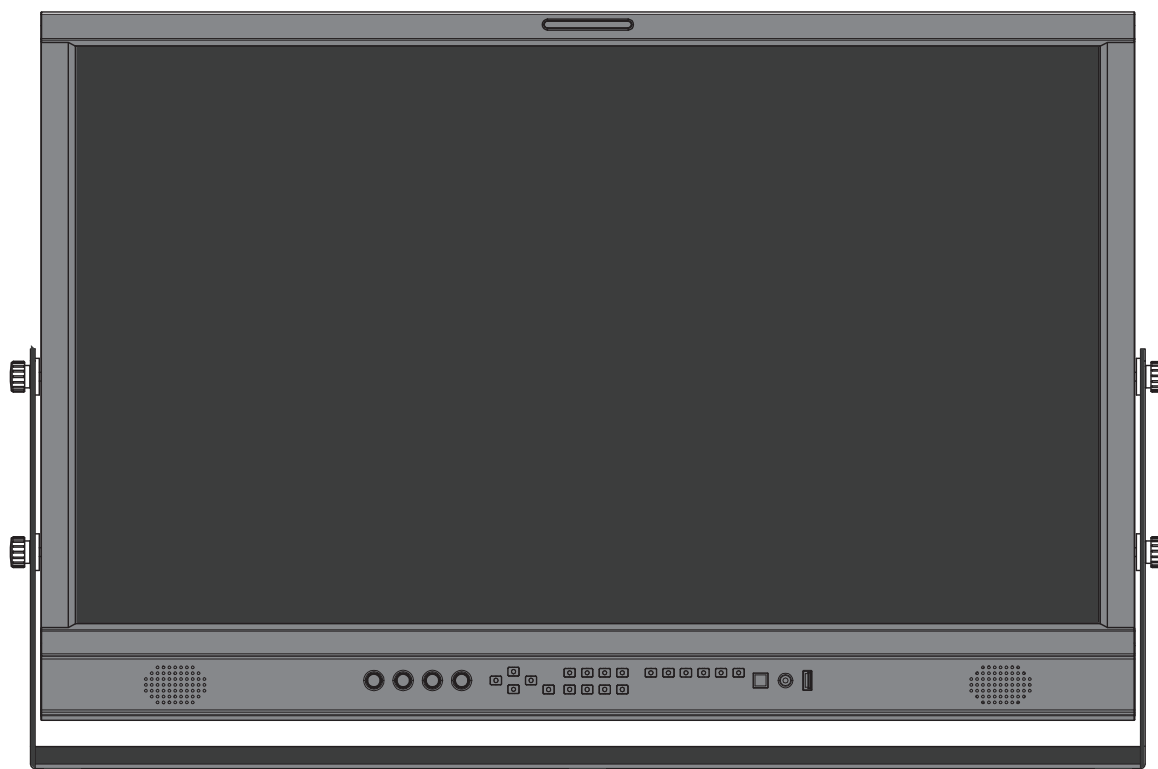
MULTI FORMAT LCD MONITOR

DT-U31
DT-U27HB
DT-U31PRO
INSTRUCTIONS

For Customer Use:
Please read the Instruction Manual carefully
and retain this information for future reference.

Version: B

Safety Precautions

CAUTION
RISK OF ELECTRICAL SHOCK DO NOT OPEN
CAUTION: To reduce the risk of electric shock. Do not remove cover (or back). No user serviceable parts inside. Refer servicing to qualified service personnel.

The lighting flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulared "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE. NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

IMPORTANT SAFEGUARDS

Electrical energy can perform many useful functions. This unit has been engineered and manufactured to assure your personal safety. But **IMPROPER USE CAN RESULT IN POTENTIAL ELECTRIC SHOCK OR FIRE.**
In order not to defeat the safeguards incorporated into this product, observe the following basic rules for its installation, use, and service. Please read these "IMPORTANT SAFEGUARDS" carefully before use.
- All the safety and operating instructions should be read before the product is operated.
- The safety and operating instructions should be retained for future reference.
- All warnings on the product and in the operating instructions should be adhered to.
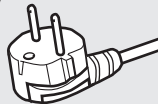- All operating instructions should be followed.

POWER CONNECTION
The power supply voltage rating of this product is AC 120 V (For U.S.A. and Canada) and AC 220 – 240 V (For European countries, Asian countries, and United Kingdom).
The power cord attached conforms to the following power supply voltage and countries. Use only the power cord designated to ensure safety and EMC regulations of each countries.

For U.S.A. and Canada: AC 120 V   For European and Asian countries: AC 220 – 240 V   For United Kingdom: AC 220 – 240 V
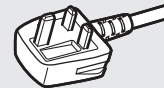
This plug will fit only into a grounded power outlet. If you are unable to insert the plug into the outlet, contact your electrician to install the proper outlet. Do not defeat the safety purpose of the grounded plug.

• This product should be operated only with the type of power source indicated on the label. If you are not sure of the type of power supply of your home, consult your product dealer or local electric power company.

Warning:
• Do not use the same power cord for AC 120 V as for AC 220 – 240 V. Doing so may cause malfunction, electric shock or fire.

Safety Precautions (cont.)

Under the following conditions,
1. Turn off the power.
2. Unplug this product from the wall outlet.
3. Refer service to qualified service personnel.
a) When the product emits smoke or unusual smell.
b) When the product exhibits a distinct change in performance —for example, no picture or no sound.
c) If liquid has been spilled, or objects have fallen on the product.
d) If the product has been exposed to rain or water.
e) If the product has been dropped or damaged in any way.
f) When the power supply cord or plug is damaged.

• Make enough room for inserting or removing the power plug. Place the product as close to an AC outlet as possible. The main power supply for the product is controlled by inserting or removing the power plug.
• When you install the product in a place where you cannot easily insert or remove the power plug from an AC outlet, do not use the provided power cord holder, and insert or remove the power cord from the AC inlet on the product.
• When the product is left unattended and unused for a long period of time, unplug it from the wall outlet and disconnect the cable system.
• Do not overload wall outlets, extension cords, or convenience receptacles on other equipment as this can result in a risk of fire or electric shock.
• Use only the accessory cord designed for this product to prevent shock.

• Do not install this product in the following places:
 – in a damp or dusty room
 – where the product is exposed to soot or steam, such as near the cooking counter or a humidifier
 – near heat sources
 – where condensation easily occurs, such as near the window
• Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product.
 The product should be mounted according to the manufacturer's instructions, and should use a mount recommended by the manufacturer.
• Do not use this product near water.
• Be sure to install the product in the place where proper temperature and humidity are kept.
 This product becomes hot during its use. Take enough care when handling the product.

Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltages and other hazards. Refer all service to qualified service personnel.

• When the product is left unattended and unused for a long period of time, unplug it from the wall outlet and disconnect the cable system.
• Do not overload wall outlets, extension cords, or convenience receptacles on other equipment as this can result in a risk of fire or electric shock.

Do not use the product for a long time if the sound is distorted.

• Slots and openings in the cabinet are provided for ventilation. These ensure reliable operation of the product and protect it from overheating. These openings must not be blocked or covered.
• Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-circuit the parts, which could result in a fire or electric shock.
• Never spill liquid of any kind on the product.
• Never place anything on the product. (Placing liquids, naked flames, cloths, paper, etc. on the product may cause a fire.)
• Do not apply any strong shock to the LCD panel. (Do not hit any object against it or push it with a sharp-pointed tool.)
• Do not put heavy objects on the product.
• Do not step on or hang on the product.

• Before connecting other products such as VCR's and personal computers, you should turn off the power of this product for protection against electric shock.
• Do not use attachments not recommended by the manufacturer as they may be hazardous.
• When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or equivalents. Unauthorized substitutions may result in fire, electric shock, or other hazards.
• Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

Operating Precautions

IMPORTANT SAFETY INSTRUCTIONS

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings.
4) Follow all instructions.
5) Do not use this apparatus near water.
6) Clean only with dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong.The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11) Only use attachments/accessories specified by the manufacturer.
12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13) Unplug this apparatus during lightning storms or when unused for long periods of time.
14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15) Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
16) Batteries shall not be exposed to excessive heat such as sunshine, fire or the like.
17) When discarding batteries, environmental problems must be considered and the local rules or laws governing the disposal of these batteries must be followed strictly.

The LCD panel and backlight have life expectancy. Due to the basic characteristics of the LCD panel, an afterimage or uneven display may occur. It is recommended that you change images occasionally, activate the power saving function, or often turn off the power to reduce the load on the LCD panel. Continuous operations of the LCD panel may accelerate the deterioration.

● Maintenance

Unplug this product from the wall outlet before cleaning.

LCD panel

To avoid irreparable change in appearance of the screen such as uneven color, discoloration, scratches, be careful about the following:
- Do not paste or stick anything using any glues or adhesive tapes.
- Do not write anything on the screen.
- Do not strike the screen with a hard object.
- Avoid condensation on the screen.
- Do not wipe the screen with any liquid such as water. In addition, wiping the screen with water-diluted neutral detergent or solvent such as alcohol, thinner, or benzine may affect the anti-reflection treatment of the screen.
- Do not wipe the screen forcefully.

Wipe stains off the LCD panel with a soft cloth. If the screen gets heavily stained, wipe it with a soft cloth soaked in water-diluted neutral detergent and wrung well, then wipe with a soft dry cloth.

Cabinet

To avoid the deterioration or damages of the cabinet such as its paint's peeling away, be careful about the following:
- Do not wipe the cabinet using solvent such as alcohol, thinner, or benzine.
- Do not expose the cabinet to any volatile substance such as insecticides.
- Do not allow any rubber or plastic in contact for a long time.
- Do not wipe the cabinet forcefully.

Wipe stains off the cabinet with a soft cloth. If the cabinet gets heavily stained, wipe it with a soft cloth soaked in water-diluted neutral detergent and wrung well, then wipe with a soft dry cloth.

Ventilation openings

Use a vacuum cleaner to get rid of the dust around the intakes (all the openings). If a vacuum cleaner is not available, use a cloth and wipe it off. Leaving the dust around the intakes may prevent proper temperature control and cause damage to the product.

Table of Contents

Installation

● Do not rest your arm on the monitor or lean against the monitor.
● Do not touch the LCD panel when installing the monitor.
● Be sure to install the monitor securely to prevent the monitor from falling over, which may cause damage to the monitor or injury.

Using the monitor on U-stand

The monitor package provides a U shape rotatable desktop stand to be installed.
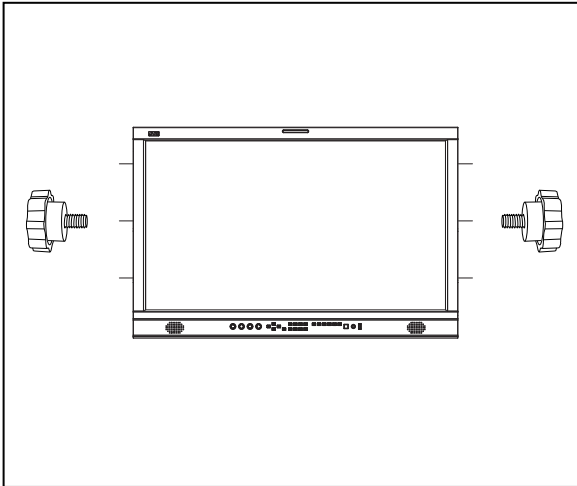
Fix 2 screws to the center screw holes of left and right side.
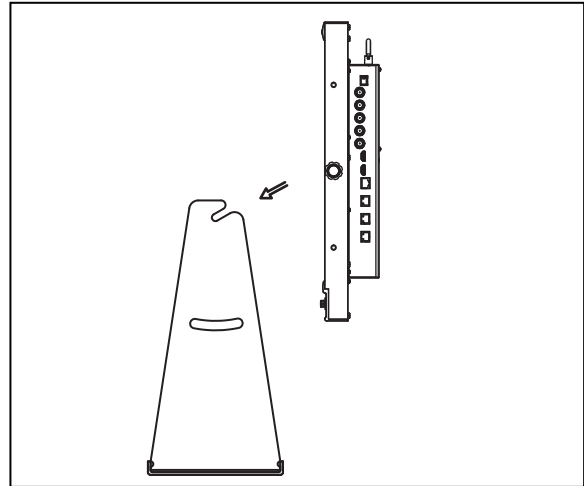
Slide the monitor into the top mouth of U shape stand.
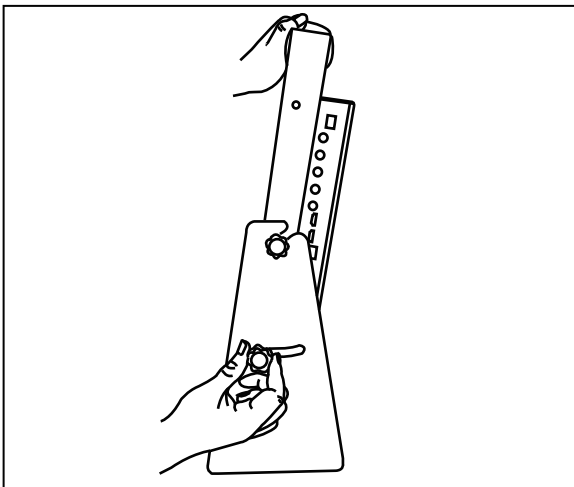
Fix the other 2 screws to the downside screw holes.
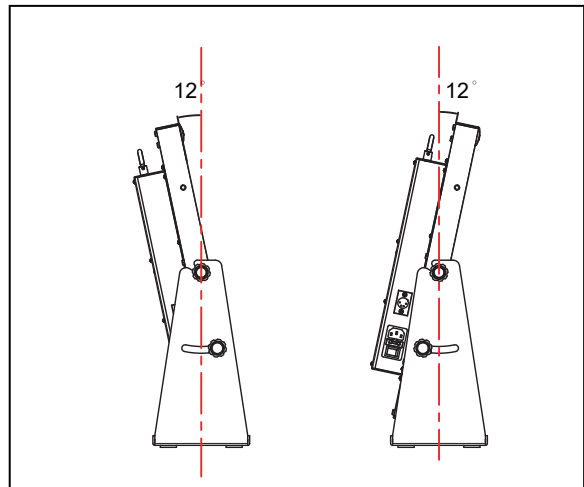
Adjust monitor angle of ±12° by the downside screws.

Caution:

● Be careful not to pinch your fingers in the moving parts.
● The Max tilt angle is down 12° and up 12°, please make sure the setup location is stable, to prevent the monitor falling down.
● Place the monitor on a mat to avoid scratching the table surface.

Index of Parts and Functions

Rear panel
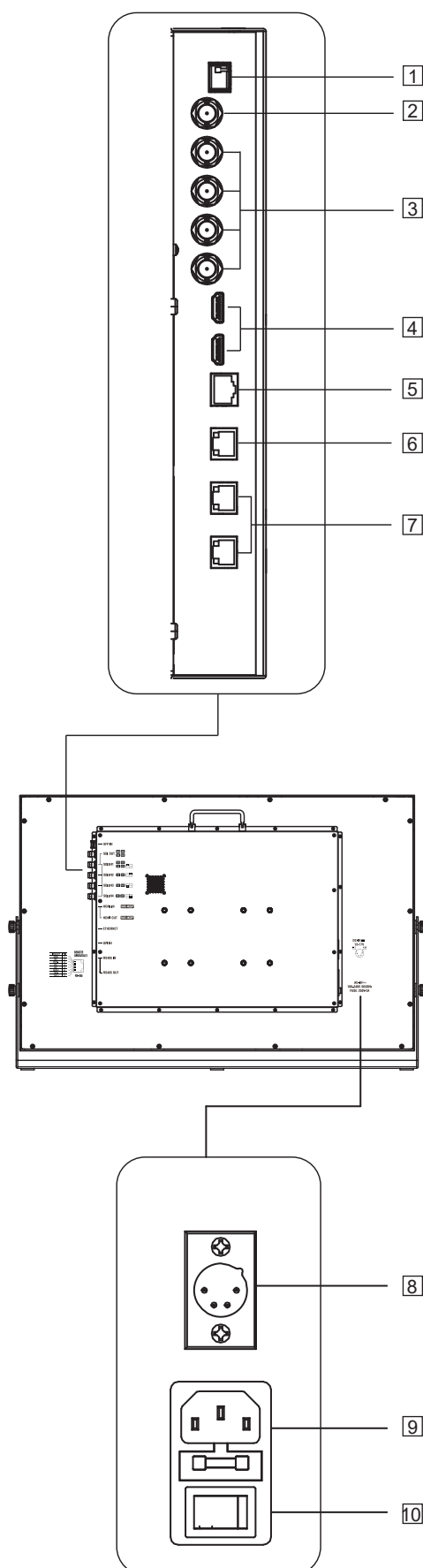
1. **SFP terminal**

   Input terminal for 12G/6G/3G/HD/SD-SDI SFP optical fiber receiver adaptor.
   - The SFP adaptor is optional purchased.

2. **E. AUDIO SDI (OUT) terminal (BNC)**
   Output terminal for the SDI IN1 or SFP IN signal,
   supports 12G/6G/3G/HD/SD.

3. **E. AUDIO SDI (IN) terminals (BNC)**
   Input terminals for the SDI signals:
   SDI IN1: 12G/6G/3G/HD/SD
   SDI IN2/3/4: 3G/HD/SD

   - The SDI terminals accept also EMBEDDED AUDIO signals including up to 16 audio channels with a sampling frequency of 48 kHz.

4. **HDMI terminal**
   Input / Output terminal for HDMI signals.
   - Will not display or output HDCP protected contects.

5. **ETHERNET**
   1000M high speed RJ45 ethernet port, for webserver IP external control. (☞page 17)

6. **GPI terminal**

   Terminal for controlling the monitor by GPI remote. (☞ Page 16.)

7. **RS485 UMD terminal**

   Terminal for controlling the monitor by TSL UMD Tallyman system.
   (☞ Page 17.)

8. **DC-IN terminal**
   Connect with DC12V-17V 4-pin XLR power adapter.
   (Pin 1: Negative, Pin 4: Positive)
   - Make sure the DC adaptor load matches with the power consumption of the monitor.

9. **AC-IN terminal**

   Connect the provided AC power cord to an AC outlet, support AC 100-240V, 50/60Hz, with 250V fuse.

10. **AC Switcher**

    Switch to OFF will cut off AC power completely.

Note for connections

- Before making any connections, turn off all the equipment.
- User a cord whose plugs correctly match the terminals on this monitor and the equipment.
- Plugs should be firmly inserted; poor connections could cause noise.
- When unplugging a cord, be sure to grasp its plug and pull it out.
- DO NOT connect the power cord until all connections are complete.
- Refer also to the user manual of each piece of equipment.

Front panel

Tally lamp
This lamp is controlled by the tally function of the Make contact terminal. (☞ Page 16.)

You can select the color of the tally lamp from "Green", "Red", or "Yellow".

1 **Speaker:**
For SDI/HDMI embedded audio monitoring.
● The speaker will not work if earphone is plugged in.

2 **Rotary knobs** :
VOLUME: Adjust the sound volume from 0-100.
● Press down the VOLUME knob, the volume will be 0 (mute).
CHROMA: Adjusts the picture chroma from -100 to +100.
BRIGHT: Adjusts the picture brightness from -100 to +100.
CONTRAST: Adjusts the picture contrast from -100 to +100.
● Press down the BRIGHT/CONTRAST/SATURATION knobs, the parameters will recover to default value 0.

3 **Direction Keys:**
Includes Up, Down, Left, Right 4 direction keys for Menu operation. (☞ page 10.)

4 **Menu Key:**
Press to switch on Menu system and operate by direction keys.

5 **WFM Key:**
Press to swtich on/off the Waveform scope.

6 **INFO Key**
Press to switch on/off all the on screen overlay informations, includes video scopes, audio meters, UMD, timecode, markers etc.
● Press INFO can quit Menu system at any time.

7 **FUNCTION Keys**
Provide F1 / F2 / F3 / F4 / F5 / F6 function keys to assign monitor functions and switch on/off quickly. (☞ page 19.)

8 **INPUT SELECTION keys**
Select input sources directly:
- SDI 1 / SFP: Press to switch to the SDI IN-1 terminal input, Press again to switch to SFP terminal input.
- SDI 2: Press to switch to the SDI IN-2 terminal input.
- SDI 3: Press to switch to the SDI IN-3 terminal input.
- SDI 4: Press to switch to the SDI IN-4 terminal input.
- 4x3G: Press to switch to Quad-link 4x3G SDI 2SI interleave mode, Press again to switch to 4x3G SDI Quad split mode.
● The 4x3G source requires inputs of all SDI IN1,2,3,4.
- HDMI: Press to switch to HDMI terminal input.
● The key light will indicate the current input source.

9 **POWER ON/OFF**
Press to switch on or swich off the monitor.
● The standby power consumption is less than 0.5W, comply with ErP rules. To complete cut off power, please switch off the AC input switcher or disconnect DC cable.

10 **PHONE jack**
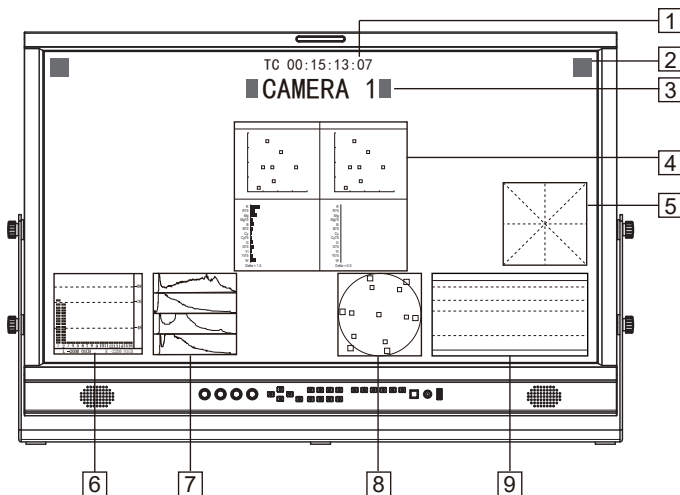3.5mm earphone socket, for SDI/HDMI embedded audio monitoring.

11 **USB LUT**

1. Firmware upgrade:
Plug in USB stick with firmware, operate Menu to upgrade the monitor. (☞ page 19.)
2. User 3DLUT upload:
Plug in USB stick with user created LUTs, operate Menu to upload to the monitor. (☞ page 11.)
3. Auto calibration:
Plug in color sensor probe into the USB port, operate Menu to start auto calibration. (☞ page 12.)

Showing Input Signals

On the Information Display

On the Status Display

Main Menu		Status		
Exit&Status	>	Channel	XXX	1
Picture Adjustment	>	Format	XX	2
Signal and Color	>	Video Lumina Range	XXXX	3
Signal Scanning	>	YUV Color Matrix	XXXX	4
Tool & Information	>	Processing Color Space	XXX	5
Audio	>	Color Temperature	XXX	6
External Control	>	Scanning	XXX	7
System Setting	>	Loaded Profile	XXX	8
		Firmware Version	XXX	9

1 **Time code (SDI)**
Under SDI input, the monitor can display Time code information (LTC, VITC1&2). If no Time code info is detected, it will display "TC UNLOCKED".

2 **On screen TALLY**
Display TALLY signal from GPI port. (☞page 16.)

3 **UMD**
Display TSL 3.1/4.0 UMD or User input Source ID. (☞ page 17.)

4 **Color Checker**
Display color gamut chart and Delta chart for last calibrated value and current messured value. (☞ page 12.)

5 **Lissajous**
Display audio Lissajous pattern. (☞ page 15.)

6 **Audio VU/PPM meters**
Display meters of SDI/HDMI embedded audio The audio meter on screen positions, markers and background colors are adjustable. (☞ page 15.)

7 **Histogram**
Parallel display R/G/B/Y histogram for SDI and HDMI video. (☞ page 14.)

8 **Vector scope**
Display vector scope with 100% and 75% markers for SDI and HDMI video. The vector scope pattern display positions, colors, background are adjustable. (☞page 14.)

9 **Waveform**
Display waveform scopes for SDI and HDMI video with markers. The display waveform can be selected from Y/Cb/Cr/ R/G/B types, and single line display mode selectable. The waveform display positions, colors, background are adjustable. (☞ page 14.)

Press "MENU" button, the main menu will pop up from the left top of the screen, and display the current working status, including:

1 **Channnel**
Display the current displayed input source.

2 **Format**
Display the video format of current input source.
● If no video detected in current input source, it will display "No Signal".

3 **Video Lumina Range**
Display the current set of video lumina level range value.

4 **YUV Color Matrix**
Display the current set of YUV color matrix.

5 **Processing Color Space**
Display the current set of color space.

6 **Color Temperature**
Display the current set of color temperature.

7 **Scanning**
Display the current set of scan mode.

8 **Loaded Profile**
Display the current loaded user profile.

9 **System Version**
Display the current firmware version.

Menu Configuration

The Operation Procedure

1 Press the "MENU" button to display the Main Menu.

2 Press " ▲ " and " ▼ " to select submenu, the selected submenu highlights in yellow; Press " ▶ " to apply and enter into the selected submenu item.

3 Press " ▲ " and " ▼ " to select the item to be set from the submenu; Press " ▶ ", the selected item and its parameters will be highlighted in yellow.

4 Press " ▲ " and " ▼ " to adjust the selected item; Press " ▶ " or "MENU" to apply and save the settings.

5 Press " ◀ " to quit submenu; Press " ◀ " again to quit the Main Menu.

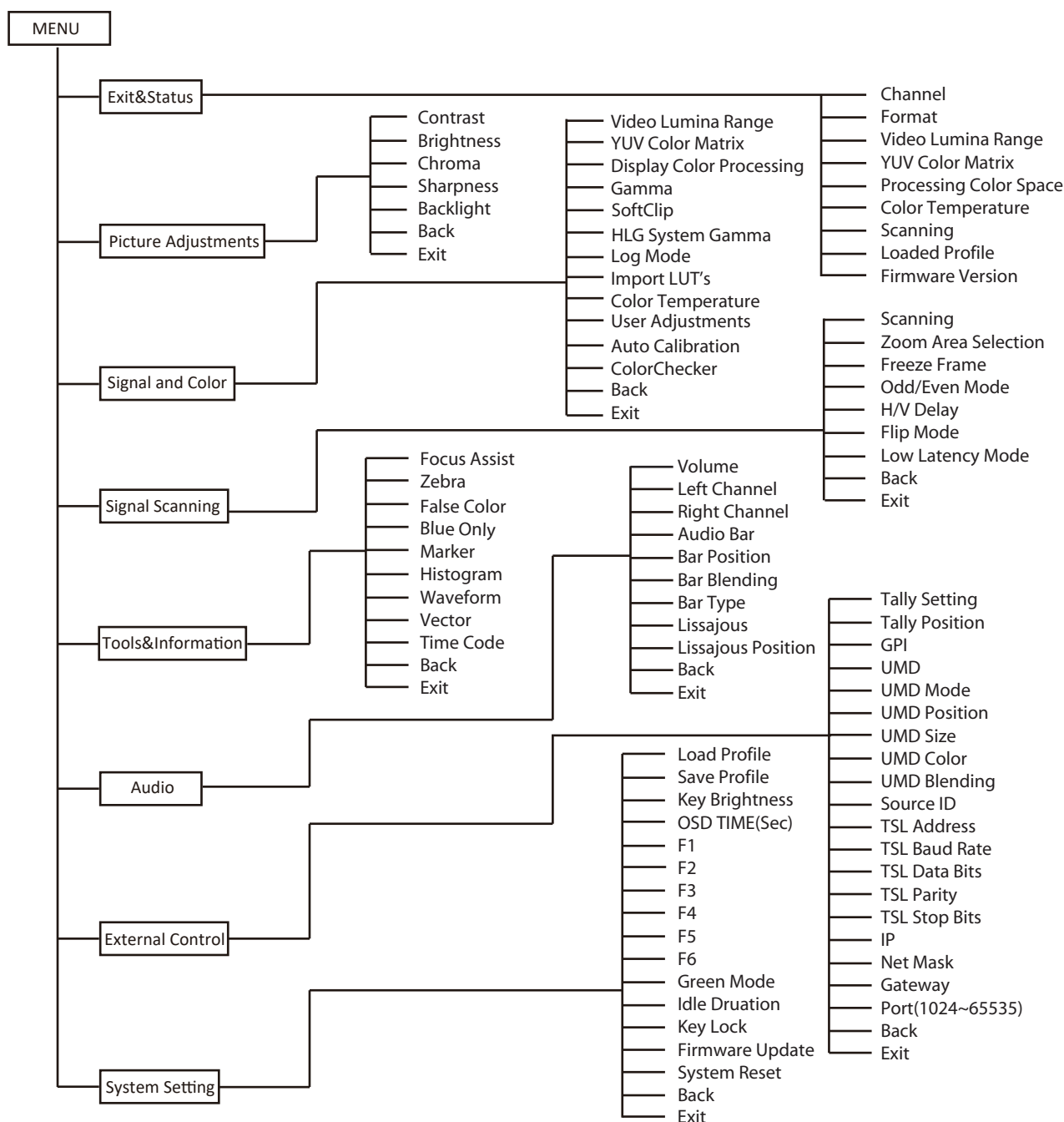**6** Press "INFO" can quit Menu system at any time.

Note

The items in gray means not available to set up.

If there is no operation in a period of time, the menu will automatically save settings and quit. The menu quit time can be set from OSD submenu.

If Key Inhibit is turned on, except the Key Inhibit submenu, all other items are not available to operate. Please turn off the key inhibit to enable the Menu operation.

Menu Transition Diagram

```
MENU
  ├─ Exit&Status ────────────────────────────────────── Channel
  │                                                       Format
  ├─ Picture Adjustments ── Contrast    Video Lumina Range   Video Lumina Range
  │                         Brightness  YUV Color Matrix     YUV Color Matrix
  │                         Chroma      Display Color Processing  Processing Color Space
  │                         Sharpness   Gamma                Color Temperature
  │                         Backlight   SoftClip             Scanning
  │                         Back        HLG System Gamma     Loaded Profile
  │                         Exit        Log Mode             Firmware Version
  │                                     Import LUT's
  ├─ Signal and Color ──────────────── Color Temperature
  │                                     User Adjustments    Scanning
  │                                     Auto Calibration    Zoom Area Selection
  │                                     ColorChecker        Freeze Frame
  │                                     Back                Odd/Even Mode
  │                                     Exit                H/V Delay
  │                                                          Flip Mode
  ├─ Signal Scanning ────── Focus Assist                    Low Latency Mode
  │                         Zebra                            Back
  │                         False Color  Volume              Exit
  │                         Blue Only    Left Channel
  │                         Marker       Right Channel
  │                         Histogram    Audio Bar
  │                         Waveform     Bar Position
  │                         Vector       Bar Blending
  ├─ Tools&Information ──── Time Code    Bar Type
  │                         Back         Lissajous           Tally Setting
  │                         Exit         Lissajous Position  Tally Position
  │                                      Back                GPI
  │                                      Exit                UMD
  │                                                          UMD Mode
  │                                                          UMD Position
  ├─ Audio ──────────────────────────── Load Profile        UMD Size
  │                                     Save Profile         UMD Color
  │                                     Key Brightness       UMD Blending
  │                                     OSD TIME(Sec)        Source ID
  │                                     F1                   TSL Address
  │                                     F2                   TSL Baud Rate
  │                                     F3                   TSL Data Bits
  │                                     F4                   TSL Parity
  │                                     F5                   TSL Stop Bits
  ├─ External Control ───────────────── F6                   IP
  │                                     Green Mode           Net Mask
  │                                     Idle Druation        Gateway
  │                                     Key Lock             Port(1024~65535)
  │                                     Firmware Update      Back
  └─ System Setting ─────────────────── System Reset        Exit
                                        Back
                                        Exit
```

10

◾ Main Menu

Picture Adjustment
Setting for the picture preference.

Item	To do	Setting value
Contrast	Adjusts the contrast of the display.	-100 to +100
Brightness	Adjusts the brightness of the display.	-100 to +100
Chroma	Adjusts the saturation of the display.	-100 to +100
Sharpness	Adjusts the sharpness of the display.	-100 to +100
Backlight	Adjusts the backlight of the display.	0 to 100
Back	Return to previous menu	
Exit	Exit Main Menu	

Signal and Color
Settings about video colors

Item	To do		Setting value
Video Lumina Range	Select a range to match with input video *1		0-1023, 4-1019, 64-940, 64-1023
YUV Color Matrix	Select the input YUV color matrix		Auto, BT.601, BT.709, BT.2020
Display Color Processing	Select the color gamut to display		LCD Panel, DCI-P3, Rec.709, Rec.2020
Gamma	Select the Gamma correction value		1.0, 1.8, 2.2, 2.4, 2.6, PQ1000, HLG1000
SoftClip*2	Turn on/off SoftClip for PQ1000 HDR		OFF,ON
HLG System Gamma*3	Select the HLG System Gamma correction value		1.0,1.1,1.2,1.3,1.4,1.5
Log Mode*4	Select a camera log LUT to convert to Rec.709		OFF, J-Log1, Log-C, S-Log2, C-Log, V-Log, RedLogFilm, S-Log3, User-Log
Import LUT's *5	Select a LUT position to upload User created 3DLUT cube		None, 3DLut.cube, J-Log1.cube, Log-C.cube, S-Log2.cube, S-Log3.cube, C-Log.cube, V-Log.cube, RedLogFilm.cube, User-Log.cube, PQ1000.csv, HLG1000.csv
Color Temperatrue	Select a display color temperature		2000K-10000K (take a step of 100K), USER 1, USER 2
User Adjustments	Adjusts the RGB Gain/Bias value (Only available when Color temperature is set to USER1 or USER2)		Red Gain: 0~255 Red Bias: 0~255 Green Gain: 0~255 Green Bias: 0~255 Blue Gain: 0~255 Blue Bias: 0~255
Auto Calibration *6	Probe Select *7	Select a probe to use	X-rite I1 Pro OEM, Jeti Specbos 1211
	Type	Set calibration time	Quick mode, Precise mode
	Start Calibration *8	Start Calibration	No, Yes
	Measure *9	Measure current color	No, Yes
	Back	Return to previous menu	
	Exit	Exit Main Menu	
Color Check	Switch on the color gamut and delta value display		OFF, ON
Back	Return to previous menu		
Exit	Exit Main Menu		

---

*1 Video Lumina Range

The default lumina range is 64-940 for broadcast application.

*2 SoftClip

The SoftClip is for DT-U31 and DT-U31PRO to simulate PQ1000 HDR image :

SoftClip Off

---------- SoftClip On
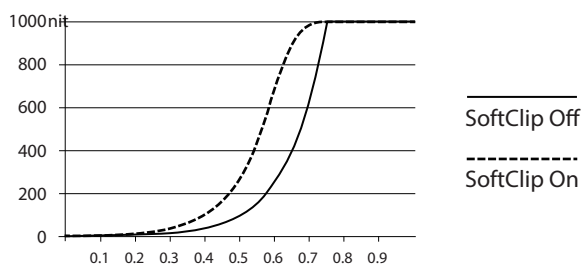
*3 HLG System Gamma

Adjust HLG System Gamma from 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, according to the different monitoring environments. The default system gamma is 1.2.

*4 Log Mode

Select a Camera log or User log to convert to Rec. 709. Only available under Rec. 709 color gamut.

3DLut.cube	Re-calibrated 3DLUT cube
Log cubes	Camera Logs to Rec709 3DLUT cube
User-Log.cube	User uploaded 3DLUT cube
PQ1000.csv	PQ1000 HDR LUT
PQ1000.csv	HLG1000 HDR LUT

*5 Import LUT's

The monitor has built-in calibrated 3DLUT cube, De-log 3DLUT cube, User 3DLUT cube and PQ1000, HLG1000 HDR LUTs.
To upload user LUT or over write the built-in LUTs:
1. Make sure the 3DLUT format should be 17x17x17 cube, and the 1DLUT format should be csv.
2. Rename the LUT to the same file name as the built-in LUTs (attention to cap letters), and copy to USB disk root directory.
3. Insert the USB disk into monitor front USB port, select the corresponding upload position to import the new LUT.

*6 Auto Calibration

The monitor has 3DLUT calibration software built-in, and support the following color sensor probe to directly plug into front USB port.
When start calibration, the monitor will generate standard colors and the color sensor will read the colors one by one and upload result to the monitor by USB connection.
The monitor will comparing the generated colors and sensor read colors, to work out 3DLUT cube and calibrate itself automatically.

*7 Probe Select

The monitor support the following probe models:

Brand	Model
X-rite	i1 DISPLAY EODIS3-DCOE (JVC dedicated version)
JETI	Specbos 1211

*8 Start Calibration

Steps:
(1) Place the monitor into a dark room. Switch on the monitor.
(2) Plug the color sensor (X-rite i1 or Jeti Specbos 1211) into front USB port of the monitor.
(3) Enter Auto Calibration - Probe Select to select the corrent used color sensor probe.
(4) Enter Auto Calibration - Type to select quick mode or precise mode.

Calibration time

Sensor probe	Quick mode	Precise mode
X-rite i1	15 min	30 min
JETI Specbos 1211	45 min	90 min

(5) Enter Auto Calibration - Start Calibration, and the monitor will display information and probe position mark.
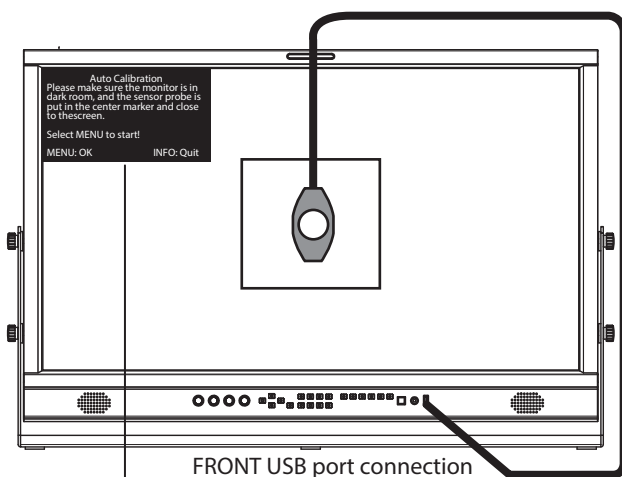
Auto Calibration
Please make sure the monitor is in dark room, and the sensor probe is put in the center marker and close to thescreen.
Select MENU to start!
MENU: OK   INFO: Quit

FRONT USB port connection

Auto Calibration
Please make sure the monitor is in dark room, and the sensor probe is put in the center marker and close to the screen.

Select MENU to start!

MENU: OK   INFO: Quit

(6) Select "YES", the auto calibration will start. The monitor will generate different color patterns one by one, and display the calibration progress in percentage.

Auto Calibration
Progress   37%
Please wait...

Select INFO to Cancel!

INFO: Quit

● Press "INFO" to quit the calibration process at any time. The monitor will not be calibrated until process reaches 100%.
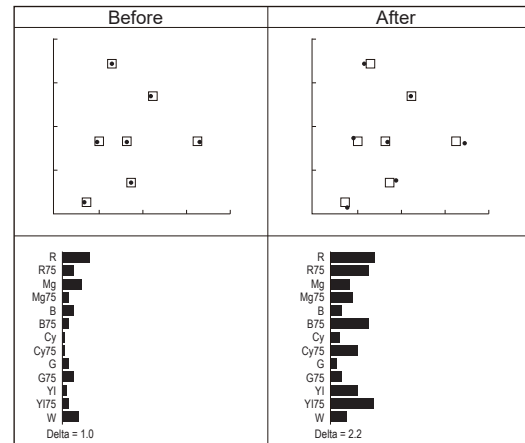
*9 Measure

The monitor has been calibrated in factory. And may need to be re-calibrated after a period of time.
Before re-calibrated, the measure function can check the current color to compare with the last time calibrated color, to decide if the monitor need to be re-calibrated.

Connector with the sensor probe and place the sensor probe onto the right position like calibration step.
Enter Auto Calibration - Measure.
The monitor will generate several colors and finish measure within 30 seconds. And display the result as:

Before	After

R
R75
Mg
Mg75
B
B75
Cy
Cy75
G
G75
Yl
Yl75
W
Delta = 1.0

R
R75
Mg
Mg75
B
B75
Cy
Cy75
G
G75
Yl
Yl75
W
Delta = 2.2

Color Gamut and Delta E Result of last calibration

Color Gamut and Delta E Result of new measured

● The color chart can be switched on/off at:
Menu - Signal and Color - Color Checker - ON/OFF.

Menu Configuration (cont.)

Signal Scanning

Setting for picture scan, zoom, flip, etc.

| Item	To do	Setting value
Scanning	Select a mode to fit video to LCD panel	Panel Fit, Pixel to Pixel, Native *1
Zoom Area Selection	Select an area to zoom-in	OFF, Top Left, Top, Top Right, Left, Center, Right, Bottom Left,Bottom, Bottom Right *2
Freeze Frame	Select a freeze frame mode	OFF, Top Half, Bottom Half, Full *3
Odd/Even Frame *4	Switch on odd or even lines display mode	OFF, Odd Mode, Even Mode
H/V Delay *5	Switch on/off the H/V delay mode	OFF, ON
Flip Mode *6	Switch on/off the up/down flip mode	OFF, ON
Low Latency Mode*7	Switch on/off the low latency mode	OFF, ON
Back	Return to previous menu	
Exit	Exit Main Menu	

*1 Scan modes

Panel Fit: stretch the video to fit the full screen.
Pixel to Pixel: Display the original resolution pixels in the center.
Native: Fit the video to either horizontal or vertical of the screen, and keep the original video ratio.

*2 Zoom Area

Top Left	Top Right
Bottom Left	Bottom Right

Top
Bottom

Left	Right

Center
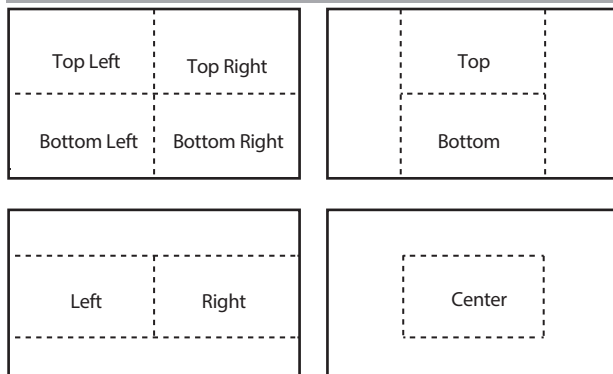
● The Zoom mode is not available under Quadlink SDI, 480i60, 576i50, 720p23.98/24/25/29.97/30/50/59.94/60.

*3 Freeze Frame

Top Half
Bottom Half

Full
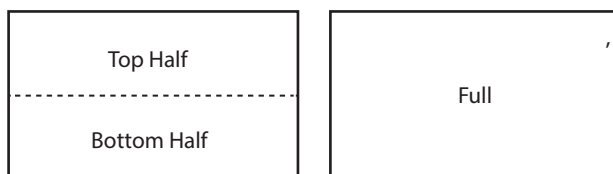
● The Freeze Frame is not available under Quadlink SDI input.

*4 Odd/Even Frame

● Odd/Even Frame is not available under Progressive formats.

*5 H/V Delay

● H/V Delay is not available under HDMI input.

*6 Flip Mode

● Flip Mode is not available under Quadlink SDI input.

*7 Low Latency Mode

Low Latency Mode is a special image processing mode for lip-sync monitoring.
For Progressive (p) formats, the monitor is low latency itself, whether Low Latency Mode is on or off.
For Interlace (i) or Progressive Segmented Frame (psf) formats, turn on Low Latency Mode will get lower latency.

Video/Audio latency chart:

| SDI formats	Low latency mode OFF	Low latency mode ON
4096x2160 60p	0.01 frame	0.01 frame
4096x2160 50p	0.1 frame	0.1 frame
4096x2160 30p	0.51 frame	0.51 frame
4096x2160 25p	0.6 frame	0.6 frame
4096x2160 24p	0.6 frame	0.6 frame
3840x2160 60p	0.01 frame	0.01 frame
3840x2160 50p	0.1 frame	0.1 frame
3840x2160 30p	0.51 frame	0.51 frame
3840x2160 25p	0.6 frame	0.6 frame
3840x2160 24p	0.6 frame	0.6 frame
2048x1080 60p	0.01 frame	0.01 frame
2048x1080 50p	0.1 frame	0.1 frame
2048x1080 30p	0.51 frame	0.51 frame
2048x1080 25p	0.6 frame	0.6 frame
2048x1080 24p	0.6 frame	0.6 frame
1080 60p	0.01 frame	0.01 frame
1080 50p	0.1 frame	0.1 frame
1080 30p	0.51 frame	0.51 frame
1080 25p	0.6 frame	0.6 frame
1080 24p	0.6 frame	0.6 frame
1080 30psf	2 frames	0.51 frame
1080 25psf	2 frames	0.6 frame
1080 24psf	2 frames	0.6 frame
1080 60i	2 frames	0.01 frame
1080 50i	2 frames	0.1 frame
720 60p	0.01 frame	0.01 frame
720 50p	0.1 frame	0.1 frame

Menu Configuration (cont.)

Tools & Information

Setting for video/audio analysis functions

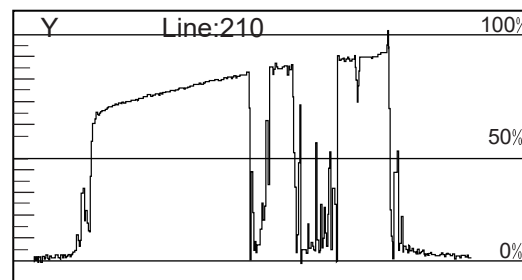| Item		To do	Setting value
Focus Assist		Switch on focus assist mode and select color	OFF, Blue, Red
Zebra		Switch on zebra stripes for over exposed image	OFF, ON
False Color		Switch on false color mode	OFF, ON
Blue Only		Switch on blue only mode	OFF, ON
Marker	Marker	Switch on the marker display	OFF, ON
	Marker Select	Select the marker ratio	16:9, 15:9, 13:9, 4:3, 2.35:1, 1.85:1
	Safety Area	Set safety area percentage	80%~99%
	Fit Marker	Set safety area to fit marker ratio or not	OFF, ON
	Center Marker	Switch on the center cross marker	OFF, ON
	Marker Color	Select a color for marker	White, Red, Green, Blue, Black, Gray
	Marker Outside	Marker outside color setting	OFF, Black, Gray
	Back	Return to previous menu	
	Exit	Exit Main Menu	
Histogram	Histogram	Turn on/off the Histogram pattern	OFF, ON
	Histogram Blending	Histogram background transparency selection	OFF, High, Low
	Back	Return to previous menu	
	Exit	Exit Main Menu	
Waveform	Waveform	Switch on the Waveform pattern	OFF, ON
	WFM Type	Waveform type select	Y, Cb, Cr, R, G, B
	WFM Position	Waveform on screen display position setting	Bottom Left, Bottom Right, Top Left, Top Right
	WFM Blending	Waveform background transparency selection	OFF, High, Low
	WFM Color	Waveform pattern color setting	White, Green, Color
	WFM Single Line *1	Switch on single line waveform mode	OFF, ON
	WFM Line Count	Select a line for the single line waveform	1-1080
	Back	Return to previous menu	
	Exit	Exit Main Menu	
Vector	Vector	Switch on vector scope pattern	OFF, ON
	Vector Position	Vector scope on screen display position setting	Bottom Left, Bottom Right, Top Left, Top Right
	Vector Blending	Vector scope background transparency selection	OFF, High, Low
	Vector Color	Vector scope pattern color setting	White, Green, Color
	Back	Return to previous menu	
	Exit	Exit Main Menu	
Time Code		Switch on Time code display	OFF, ON
Back		Return to previous menu	
Exit		Exit Main Menu	

*1: WFM Single Line

Turn on the Waveform single line mode, the monitor will display waveform for only 1 line video. (Only available under SDI input) Select a line at WFM Line Count by " ▲ " and " ▼ ".
● Under WFM single line mode, out of Menu system, directly press " ▲ " and " ▼ " can select lines.
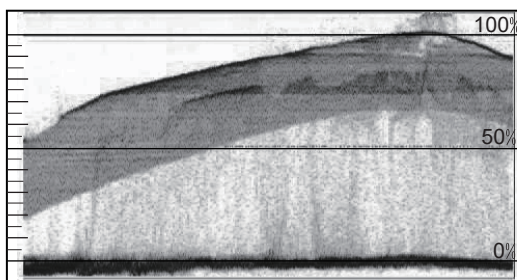
WFM Single Line: Off

WFM Single Line: On

Audio

Setting for Vector scope and Histogram patterns

Item	To do	Setting value
Volume	adjust volume	0~100
Left Channel	Select an audio channel to output left	Channel 1~Channel 16
Right Channel	Select an audio channel to output right	Channel 1~Channel 16
Audio Bar	Switch on the audio meter display	OFF, ON
Bar Position	Change on screen display position of the audio bar.	Bottom Right, Top Left Top Right, Bottom Left
Bar Blending	Adjust the audio bar pattern background transparency.	OFF, Low, High
Bar Type	Switch on the mark and alert info of audio meter pattern.	TYPE1, TYPE2 *1
Lissajous	Switch on the audio Lissajous pattern display	OFF, ON
Lissajous position	Change on screen display position of the Lissajous pattern.	Top Left, Top Right, Bottom Left, Bottom Right,
Back	Return to previous menu	
Exit	Exit Main Menu	

*1: Bar Type

The audio bar displays up to 16 channels audio level meters.
The TYPE1 displays audio dB mark, audio alert info, and left channel and right channel selection.
The TYPE2 displays audio meters only.

TYPE1

TYPE2

Audio alert info

Left Channel:1 Green

Right Channel:2 Red

15
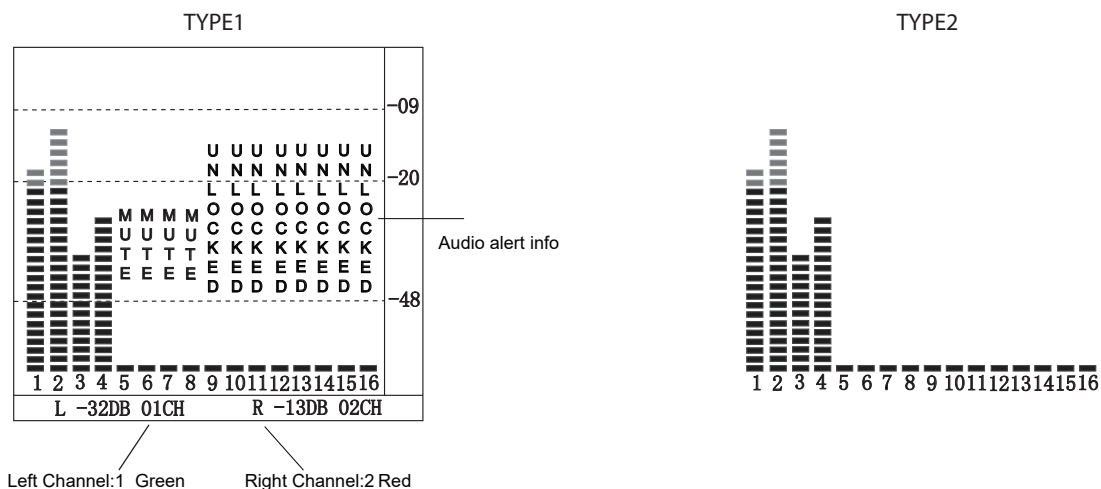
Menu Configuration (cont.)

External Control
Setting for TALLY, UMD, IP control to the monitor

| Item		To do	Setting value
Tally Setting		Set on-screen tally display mode	OFF, ON, Blinking
Tally Position		Select the display position of on-screen tally	Top, Bottom
GPI *1	GPI Control	Enable GPI control	OFF, ON
	1 Pin	Assign functions to the GPI terminals	SFP, SDI1,SDI2, SDI3, SDI4, 4xSDI(2SI), 4xSDI(SQ), HDMI, Red Tally, Green Tally, Yellow Tally, Time code, Color Temp, Flip mode, Freeze Frame, WFM Single Line, UMD, Marker, H/V Delay, Audio bar, Zebra, Vector, Low Latency Mode, Histogram Odd/Even Frame, Lissajous, Focus Assist, False color
	2 Pin		
	3 Pin		
	4 Pin		
	5 Pin		
	6 Pin		
	Back	Return to previous menu	
	Exit	Exit Main Menu	
UMD *2		Switch on the UMD display	OFF, ON
UMD Mode		Select the UMD source	Internal, External
UMD Position		Select the display position of UMD	Top, Bottom
UMD Size		Select UMD display size	Large, Small
UMD Color		Select UMD display color	White, Red, Green, Blue, Black, Gray
UMD Blending		Select UMD background transparency	OFF, Low, HIGH
Source ID		Edit internal UMD letters	A-Z, a-z, 0-9, Space, &()*+,-./:<>_
TSL Address		TSL UMD setting	1~126
TSL Baud Rate			115200
TSL Data Bits			8
TSL Parity			None
TSL Stop Bits			1
IP *3		Set monitor IP address for webserver remote control	192.168.001.200
Net Mask			255.255.255.000
Gateway			192.168.001.001
Port(1024~65535)			08080
Back		Return to previous menu	
Exit		Exit Main Menu	

*1 GPI control

Connect GPI remote controller with "GPI" port of the monitor rear panel,
Switch on the "GPI Control".
Assign functions for GPI 1-6.
Control the GPI 1-6 pin terminals to short-circuit with the GND pin terminal, to enable the assigned function, and disconnecting (opening) to disable the functions.

The GPI controlled TALLY signal will display both front TALLY light and on-screen TALLY:
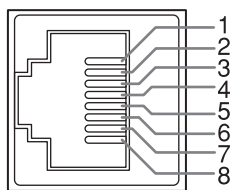
Pin No	Pin name
1	GPI 1
2	GPI 2
3	GPI 3
4	GPI 4
5	GPI 5
6	GPI 6
7	NC
8	GND

GPI

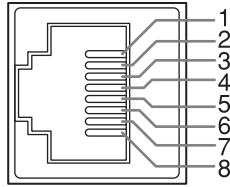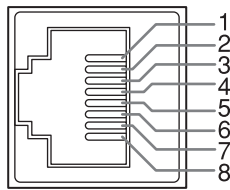On screen TALLY Green   TALLY light Green/Red/Yellow   On screen TALLY Red
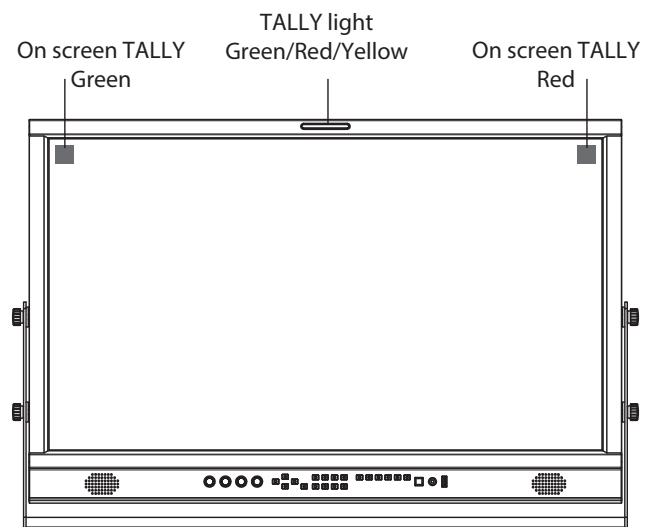
*2 UMD control

Select UMD mode to "External" will enable TSL UMD control.
TallyMan system connection:

RS485 IN

RS485 OUT
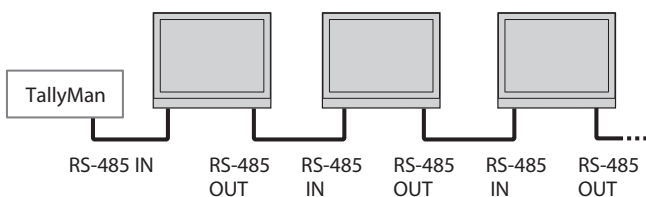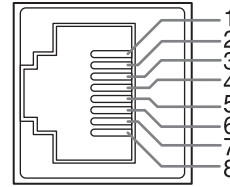
They are female terminals.

Pin No	RS 485 IN	RS 485 OUT
1	GPI 1	GPI 1
2	GPI 2	GPI 2
3	GPI 3	GPI 3
4	GPI 4	GPI 4
5	GPI 5	GPI 5
6	GPI 6	GPI 6
7	NC	NC
8	GND	GND

Serial connections:

*3 Webserver IP Control

Connect the monitor ETHERNET port into LAN, and the monitor can be remote controlled by webpage.
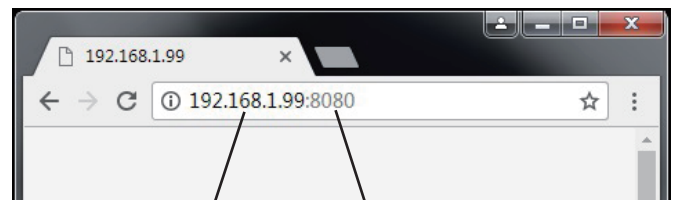

ETHERNET

Pin No	Pin name
1	TX+
2	TX-
3	RX+
4	
5	
6	RX-
7	
8	

Enter Menu- External Control - IP/Net Mask/Gateway/Port to set the monitor addresses.
Set the computer Ethernet IP address at the same LAN environment as the Monitor.
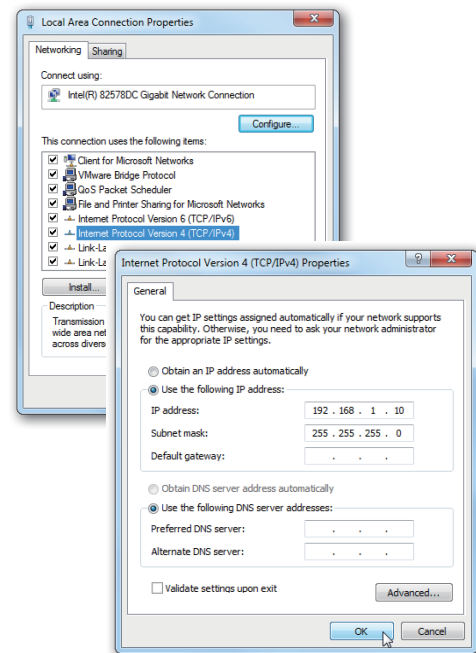
2) Launch any of a web browser on the computer, and enter URL: Monitor IP + port (for example 192.168.1.99:8080). The webserver control page will be displayed.

Monitor IP address   Monitor port address

● Use crossed wired cable for computer-monitor directly connection.
● Use straight-through wired cable for Router connection.
● Please seek help from your webmaster for any network connections.

17

Webserver page control interface

After changing settings, please click the Refresh button to see the new status.

System Setting
User profile saving, firmware update

Item		To do	Setting value
Load Profile *1	Global	Select a user profile for all input sources	User 1-8, OFF
	SFP	Select a user profile for SFP input only	User 1-8
	SDI1	Select a user profile for SDI 1 input only	
	SDI2	Select a user profile for SDI 2 input only	
	SDI3	Select a user profile for SDI 3 input only	
	SDI4	Select a user profile for SDI 4 input only	
	4xSDI(SQ)	Select a user profile for Quad split 4x3GSDI input only	
	4xSDI(2SI)	Select a user profile for 2SI interleave 4x3GSDI input only	
	HDMI	Select a user profile for HDMI input only	
	Back	Return to previous menu	
	Exit	Exit Main Menu	
Save Profile		Save all the current menu settings to User profile, Support rename user profile when saving.	User 1-8
Key Brightness		Set front key board light brightness	OFF, LOW, HIGH
OSD TIME (SEC)		Select a time to quit menu if there's no operation	5-180
F1		Assign functions to the function keys F1 - F6 on the front key board	Time code, Color Temp, Flip mode, Freeze Frame, WFM type, WFM Single Line, UMD, Marker, H/V Delay, Blue Only, Audio bar, Zebra, Vector, Low Latency Mode, Histogram, Odd/Even Frame, Lissajous, Focus Assist, False color
F2			
F3			
F4			
F5			
F6			
Green Mode		Turn down or switch off the LCD backlight to save energy	Black Backlight, Gray Backlight
Idel Duration		Select a time to enter Green mode if there's no operation	30Sec, 1Hour, 2Hour, 4Hour, OFF
Key Lock *2		Select a key lock mode	OFF, Lock All, Lock Rotary Knobs, Lock Key Buttons
Firmware Update *3		Enter firmware update	NO, YES
System Reset		Reset all the monitor settings	NO, YES
Back		Return to previous menu	
Exit		Exit Main Menu	

*1 Load Profile

Select "Global" to "User 1-8", to assign the user profile to all the input sources;
Select "Global" to "OFF", the user profiles can be assigned to each input source individually.

*2 Key Lock

Select different keys to lock:

Rotary knobs   Key buttons

All
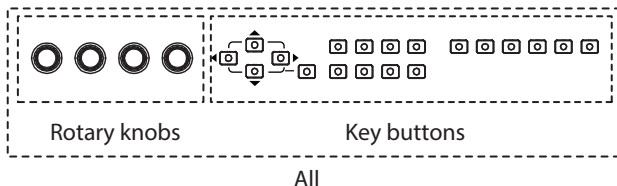
- The MENU button can be operated when Key locked.
- Press the locked buttons or knobs, the screen will display:

Key Locked

*3 Firmware Update

The monitor firmware can be updated by front USB port.
Update steps:
(1) Download latest firmware file (DT-UXX Vxx YYMMDD.zip) to USB disk, root directory.
(2) Switch on the monitor, and plug USB disk into front USB port.
(3) Operate MENU - System Setting - Firmware Update, and the monitor will update automatically.
(4) When updating succeed, switch the monitor off by front POWER button and switch on again.

UPDATE

Do you want to update now?
Select MENU to start!

MENU: OK   INFO: Quit
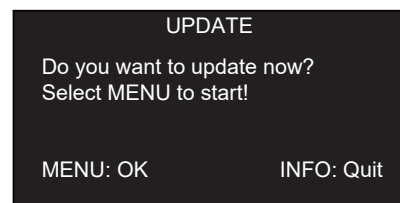
- Please copy only 1 firmware for 1 model monitor into USB root directory.
- Caution! DO NOT cut off power during firmware update.

Specifications

General

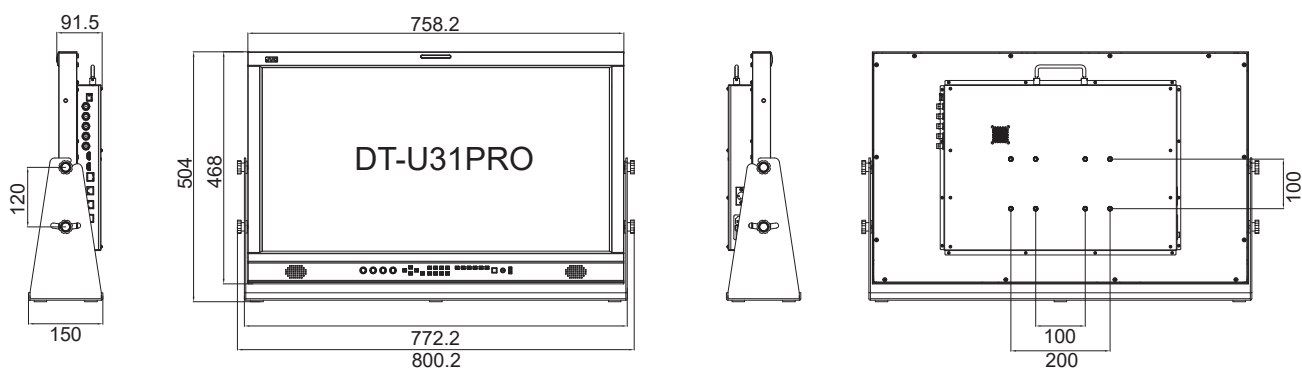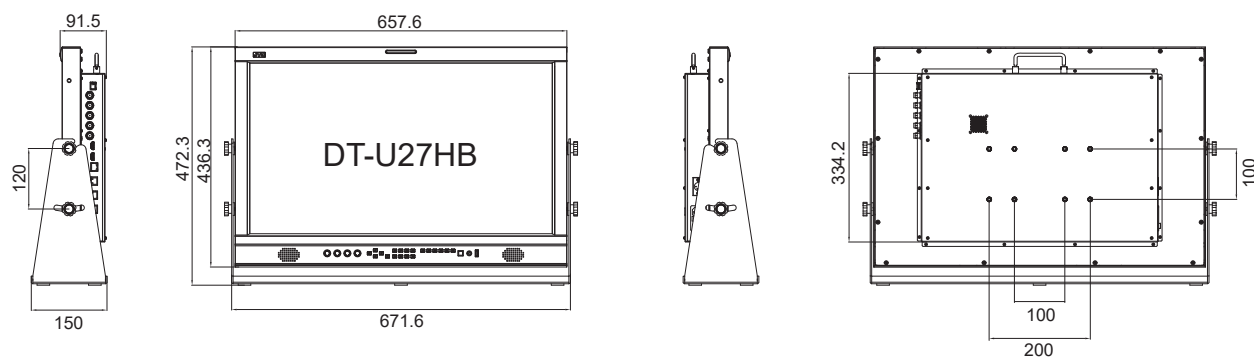| Model name	DT-U31	DT-U27HB	DT-U31PRO
Type	Multi format LCD monitor	Multi format LCD monitor	Multi format LCD monitor
Screen size	31.5″	27″	31.1″
Aspect ratio	16:9	16:9	17:9
Horizontal/vertical frequency (computer signal)	H: 61.93kHz – 92.9 kHz V: 50 Hz – 75 Hz	H: 61.93kHz – 92.9 kHz V: 50 Hz – 75 Hz	H: 64kHz – 83kHz V: 50 Hz – 75 Hz
	* Some signals within this frequency range may not be displayed		
Compliant video signal format	☞ "Available signals" on page 22		
Format	12G SDI: SMPTE ST2080 6G SDI: 3840x2160 30/25/24p 3G SDI: SMPTE-425M-A/B HD SDI: BTA S-004C, SMPTE292M, SMPTE-425M-A/B, SMPTE-274M, SMPTE-RP211, SMPTE-296M SD SDI: SMPTE-125M, ITU-R BT.656 2K: SMPTE ST 2048-1: 2011 EMBEDDED AUDIO: SMPTE299M, SMPTE272M		
Audio output	Internal speaker: 1.25W+1.25W(8Ω)		
Operating conditions	Operating temperature: 0℃ – 40℃ (41°F – 95°F) Operating humidity: 20% – 80% (non-condensing) (Slightly variable depending on ambient conditions for installation.)		
Power requirements	AC 120 V / AC 220 – 240 V, 50 Hz/60 Hz; DC12 - 17V		
Rated current	1A (AC 100V-240V) 8.5A (DC12-17V)	1.5A (AC 100V-240V) 10A (DC12-17V)	1.5A (AC 100V-240V) 11A (DC12-17V)
External dimensions (with the stand) (excluding protruding parts)	Width: 759.1 mm (29 7/8″) Height: 529.3mm (20 13/16″) Depth: 150 mm (5 7/8″)	Width: 657.6 mm (25 7/8″) Height: 472.3mm (18 9/16″) Depth: 150 mm (5 7/8″)	Width: 758.2mm (29 7/8″) Height: 504mm (19 7/8″) Depth: 150 mm (5 7/8″)
External dimensions (without the stand) (excluding protruding parts)	Width: 759.1 mm (29 7/8″) Height: 493.3mm (19 7/16″) Depth: 94 mm (3 11/16″)	Width: 657.6 mm (25 7/8″) Height: 436.3mm (17 3/16″) Depth: 94 mm (3 11/16″)	Width: 758.2mm (29 7/8″) Height: 468mm (18 7/16″) Depth: 94 mm (3 11/16″)
Weight(without the stand)	12.7 kg (28 lbs)	11.3 kg (24.9 lbs)	12.2 kg (26.9 lbs)
Weight(with the stand)	16.5 kg (36.4 lbs)	13.8kg (30.4 lbs)	15.5 kg (34.2 lbs)
Accessories	AC power cord x 1, Monitor U shape stand x 1		

LCD panel

Model name		DT-U31	DT-U27HB	DT-U31PRO
Effective screen size	Width	698.4 mm (27 1/2″)	596.736mm (23 1/2″)	697.958 mm (27 1/2″)
	Height	392.85 mm (15 1/2″)	335.664 mm (13 3/16″)	368.064 mm (14 1/2″)
	Diagonal	800.1 mm (31 1/2″)	685.8 mm (27″)	789.9 mm (31 1/8″)
Number of pixels displayed		3840 x 2160	3840 x 2160	4096 x 2160
Number of colors displayed		1.073G	1.073G	1.073G
Viewing angle (TYP.)		178° (H), 178° (V)	178° (H), 178° (V)	178° (H), 178° (V)
Brightness (TYP.)		350 cd/m2	750 cd/m2	350 cd/m2
Contrast ratio (TYP.)		3000:1	1400:1	1500:1

Input/output terminals

Video	HDMI	HDMI connector x 2(IN and OUT)
	E. AUDIO 12G/6G/3G/HD/SD SDI	Digital signal input (compatible with EMBEDDED AUDIO signals): auto detection, 2 line, BNC connector x 2
	E. AUDIO 3G/HD/SD SDI	Digital signal output (compatible with EMBEDDED AUDIO signals): auto detection, 2 line, BNC connector x 2
Audio	AUDIO (MONITOR OUT)	Speaker: 1.25W+1.25W(8Ω) 3.5mm phone
External control	GPI (MAKE)	☞ "GPI control" on page 16.
	UMD (RS-485) IN&OUT	☞ "UMD control" on page 17.
	Ethernet IP (RJ-45)	☞ "Webserver IP control" on page 17&18.

◆ Dimensions   Unit: mm

DT-U31

91.5
759.1
529.3
493.3
120
150
773.1
801.1
100
100
200

DT-U27HB

91.5
657.6
472.3
436.3
120
150
671.6
334.2
100
100
100
200

DT-U31PRO

91.5
758.2
504
468
120
150
772.2
800.2
100
100
200
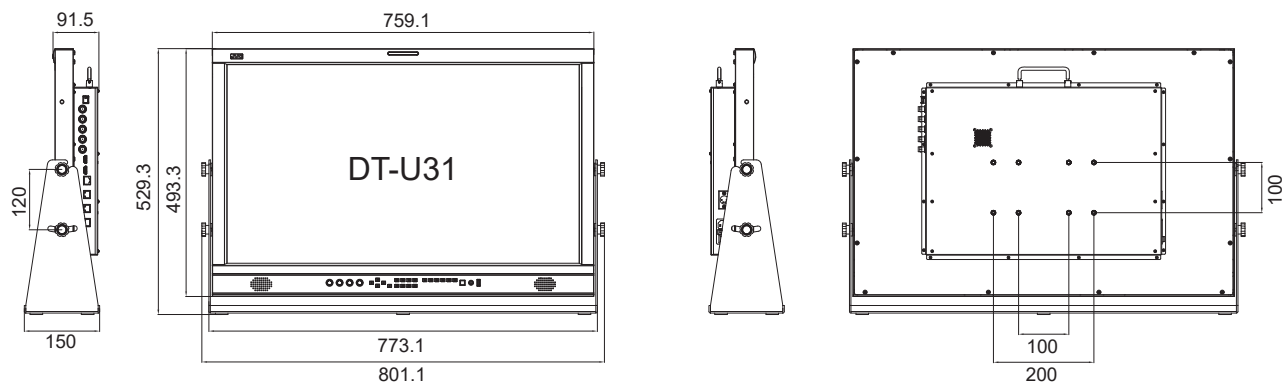
Specifications (cont.)

Available signals

The following signals are available for this monitor. √: Acceptable —: Not acceptable

No.	Formats	Input terminal				Signal format shown in the Status Display as	
		SDI 1 & SFP	SDI 2/3/4	Quadlink SDI	HDMI	SDI & SFP	HDMI
1	720×480/60I	√	√	—	—	720*480I60	720*480I60
2	720×480/60P	—	—	—	√	720*480P60	720*480P60
3	720×576/50I	√	√	—	—	720*576I50	720*576I50
4	720×576/50P	—	—	—	√	720*576P50	720*576I50
5	1280×720/23.98P	√	√	—	√	1280*720P23.98	1280*720P24
6	1280×720/24P	√	√	—	√	1280*720P24	1280*720P24
7	1280×720/25P	√	√	—	√	1280*720P25	1280*720P25
8	1280×720/29.97P	√	√	—	√	1280*720P29.97	1280*720P30
9	1280×720/30P	√	√	—	√	1280*720P30	1280*720P30
10	1280×720/50P	√	√	—	√	1280*720P50	1280*720P50
11	1280×720/59.94P	√	√	—	√	1280*720P59.94	1280*720P60
12	1280×720/60P	√	√	—	√	1280*720P60	1280*720P60
13	1920×1080/50I	√	√	—	√	1920*1080I50	1920*1080I50
14	1920×1080/59.94I	√	√	—	√	1920*1080I59.94	1920*1080I60
15	1920×1080/60I	√	√	—	√	1920*1080I60	1920*1080I60
16	1920×1080/23.98PSF	√	√	—	√	1920*1080PSF23.98	1920*1080PSF24
17	1920×1080/24PSF	√	√	—	√	1920*1080PSF24	1920*1080PSF24
18	1920×1080/23.98P	√	√	—	√	1920*1080P23.98	1920*1080P24
19	1920×1080/24P	√	√	—	√	1920*1080P24	1920*1080P24
20	1920×1080/25P	√	√	—	√	1920*1080P25	1920*1080P25
21	1920×1080/29.97P	√	√	—	√	1920*1080P29.97	1920*1080P30
22	1920×1080/30P	√	√	—	√	1920*1080P30	1920*1080P30
23	1920×1080/48P	√	√	—	√	1920*1080P48	1920*1080P48
24	1920×1080/50P	√	√	—	√	1920*1080P50	1920*1080P50
25	1920×1080/59.94P	√	√	—	√	1920*1080P59.94	1920*1080P60
26	1920×1080/60P	√	√	—	√	1920*1080P60	1920*1080P60
27	2048×1080/23.98PSF	√	√	—	√	2048*1080PSF23.98	2048*1080PSF24
28	2048×1080/24PSF	√	√	—	√	2048*1080PSF24	2048*1080PSF24
29	2048×1080/25PSF	√	√	—	√	2048*1080PSF25	2048*1080PSF25
30	2048×1080/29.97PSF	√	√	—	√	2048*1080PSF29.97	2048*1080PSF30
31	2048×1080/30PSF	√	√	—	√	2048*1080PSF30	2048*1080PSF30
32	2048×1080/23.98P	√	√	—	√	2048*1080P23.98	2048*1080P24
33	2048×1080/24P	√	√	—	√	2048*1080P24	2048*1080P24
34	2048×1080/25P	√	√	—	√	2048*1080P25	2048*1080P25
35	2048×1080/29.97P	√	√	—	√	2048*1080P29.97	2048*1080P30
36	2048×1080/30P	√	√	—	√	2048*1080P30	2048*1080P30
37	2048×1080/47.94P	√	√	—	√	2048*1080P47.94	2048*1080P50
38	2048×1080/48P	√	√	—	√	2048*1080P48	2048*1080P48
39	2048×1080/50P	√	√	—	√	2048*1080P50	2048*1080P50
40	2048×1080/59.94P	√	√	—	√	2048*1080P59.94	2048*1080P60
41	2048×1080/60P	√	√	—	√	2048*1080P60	2048*1080P60
42	3840×2160/23.98P	√	—	√	√	3840*2160P23.98	3840*2160P24
43	3840×2160/24P	√	—	√	√	3840*2160P24	3840*2160P24
44	3840×2160/25P	√	—	√	√	3840*2160p25	3840*2160p25
45	3840×2160/29.97P	√	—	√	√	3840*2160P29.97	3840*2160P30
46	3840×2160/30P	√	—	√	√	3840*2160P30	3840*2160P30
47	3840×2160/47.94P	√	—	√	√	3840*2160P47.94	3840*2160P50
48	3840×2160/48P	√	—	√	√	3840*2160P48	3840*2160P48
49	3840×2160/50P	√	—	√	√	3840*2160P50	3840*2160P50
50	3840×2160/59.94P	√	—	√	√	3840*2160P59.94	3840*2160P60
51	3840×2160/60P	√	—	√	√	3840*2160P60	3840*2160P60
52	4096×2160/23.98P	√	—	√	√	4096*2160P23.98	4096*2160P24
53	4096×2160/24P	√	—	√	√	4096*2160P24	4096*2160P24
54	4096×2160/25P	√	—	√	√	4096*2160P25	4096*2160P25
55	4096×2160/29.97P	√	—	√	√	4096*2160P29.97	4096*2160P30
56	4096×2160/30P	√	—	√	√	4096*2160P30	4096*2160P30
57	4096×2160/47.94P	√	—	√	√	4096*2160P47.94	4096*2160P48
58	4096×2160/48P	√	—	√	√	4096*2160P48	4096*2160P48
59	4096×2160/50P	√	—	√	√	4096*2160P50	4096*2160P50
60	4096×2160/59.94P	√	—	√	√	4096*2160P59.94	4096*2160P60
61	4096×2160/60P	√	—	√	√	4096*2160P60	4096*2160P60

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