Various Interfaces for 4K Video Input and Others

Three Types of 4K Video Input

The BT-4LH310 includes three interfaces for 4K video input as standard:
(1) 3G-SDI (BNC): 4 lines
(2) DisplayPort: 2 lines or 1 line
(3) HDMI: 2 lines or 1 line

These interfaces enable versatile system configuration with various 4K cameras and systems for broadcasting and cinema production (4K/2K/HD).

* Compatible interfaces vary depending on the resolution, color space, bit depth and frame frequency. For more information, see the table below.

RS-485, RS-232C and GPI Remote

RS-485 (RJ-45), RS-232C (9 pin) and GPI (9 pin) remote inputs allow remote control of the BT-4LH310.

Calibration Function

The built-in calibration function can be used to automatically adjust the white balance, which changes with time, by using a commercially available probe sensor and display analyzer (compatible models listed below).

RS-232C

BT-4LH310

Probe Sensor   Display Analyzer

[Compatible probe sensor and display analyzer models]
- Konica Minolta
  Probe sensor: CA-PU32/PU35/PSU32/PSU35
  Display analyzer: CA-310
  Konica Minolta, Inc. [http://www.konicaminolta.com/]
- Photo Research
  Probe sensor: PR-655*
  Photo Research, Inc [http://www.photoresearch.com/]
- Xrite
  Probe sensor: i1-Pro*
  X-Rite Inc. [http://www.xrite.com/]

* When the PR-655 or i1-Pro is used to make adjustments, a PC and the automatic adjustment application software (downloadable from the Panasonic website) are required (to be supported soon).

HDMI
HIGH-DEFINITION MULTIMEDIA INTERFACE

Specifications
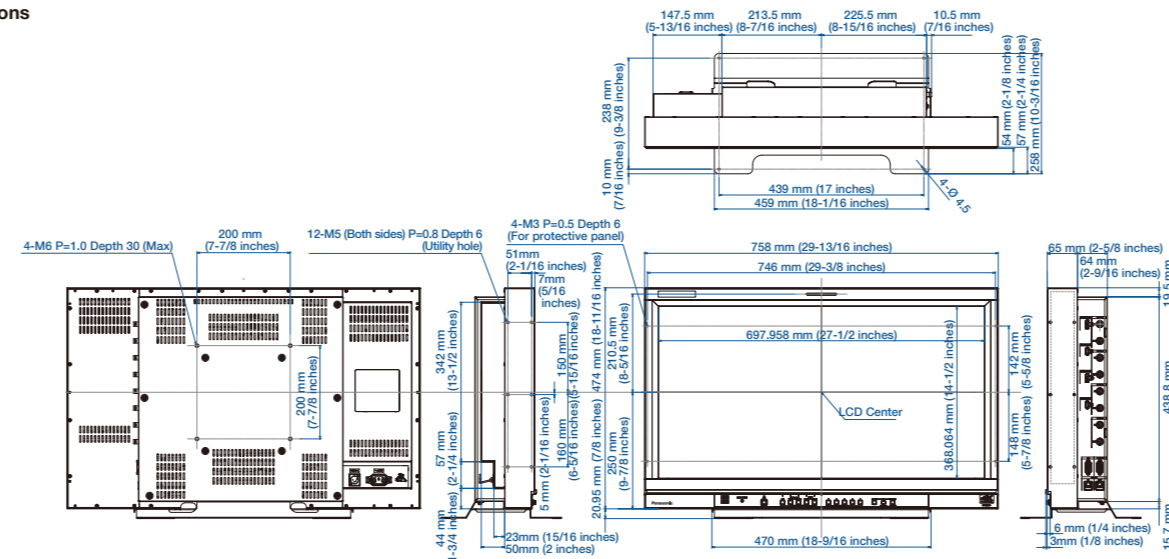
General

Power supply:	AC: 100 V - 240 V, 50 Hz/60 Hz / DC: 28 V (23.4 V - 30.0 V)
Power Consumption:	AC: 1.71 A - 0.67 A, DC: 4.59 A
Operating Temperature:	5 °C to 35 °C (41 °F to 95 °F) (up to 2 000 m above sea level)
Operating Humidity:	20% to 80% (non-condensing)
Storage Temperature:	−20 °C to 60 °C (−4 °F to 140 °F)
Weight:	Approx. 20.0 kg (44.1 lbs) (including stand) / Approx. 18.5 kg (40.8 lbs) (unit only, not including stand)
Dimensions: (W x H x D)	758 mm × 495 mm × 258 mm (including stand) (29-13/16 inches × 19-1/2 inches × 10-3/16 inches) / 758 mm × 474 mm × 132 mm (unit only, not including stand) (29-13/16 inches × 18-5/8 inches × 5-3/16 inches)

Display Panel

Dimensions:	789 mm (31.1 inches) (effective display area)
Aspect Ratio:	17:9
Pixel Number:	4 096 × 2 160
Display Colors:	Approx. 1 070 000 000
Viewing angle:	178° of horizontal, 178° of vertical (contrast > 10:1)

Connectors

SDI Inputs:	BNC x 4, SMPTE ST424/425-1/274/296 compliant, embedded audio supported / 3G-SDI: SMPTE ST299 compliant, 48 kHz, synchronous supported, audio16 channel supported / HD SDI: SMPTE ST299 compliant, 48 kHz, synchronous supported, audio 8 channel supported
HDMI Inputs:	HDMI (Type A) x 2, HDCP supported, embedded audio supported, VIERA Link not supported
DisplayPort Inputs:	DisplayPort x 2, HDCP supported embedded audio supported
SDI Output:	BNC x 4, with active through-out
GPI:	D-SUB, 9 pin x 1
RS-232C:	D-SUB, 9 pin x 1
RS-485:	RJ-45 x 2 (Input and Output)
Headphones:	Stereo mini jack (M3) x 1, 32 Ω, level adjustable

Other Connectors

Speaker Output:	Monaural, 0.5 W
Tally Output:	Red, green and amber

*HDMI and the HDMI logo are trademarks or registered trademarks of HDMI Licensing, LLC.
*DisplayPort is a trademark or a registered trademark of the Video Electronics Standards Association.

Dimensions

*When the unit will be permanently installed in one place, we recommend securing it in place using the screw holes at the bottom of the stand.
Weight and dimensions shown are approximate. Specifications are subject to change without notice.

Please refer to the latest information, etc., at the following Panasonic web site.   **http://pro-av.panasonic.net/**

4K (3840 x 2160 Resolution) Video Inputs   *The numerical value in a parenthesis shows the number of the cables simultaneously connected to each terminal.

color space	YCbCr 4:2:2						YCbCr 4:4:4 / RGB 4:4:4			
Max. bit	8 bit		10 bit		12 bit		8 bit		10 bit	
Frame frequency (Hz)	24, 25, 30	50, 60	24, 25, 30	50, 60	24, 25, 30	50, 60	24, 25, 30	50, 60	24, 25, 30	50, 60
HDMI	√ (1)	√ (2)		√ (1)	√ (2)		√ (1)	√ (2)		
DisplayPort							√ (1)	√ (2)	√ (1)	√ (2)
3G–SDI	√ (4)	√ (4)	√ (4)	√ (4)	√ (4)		√ (4)		√ (4)	

4K (4096 x 2160 Resolution) Video Inputs   *The numerical value in a parenthesis shows the number of the cables simultaneously connected to each terminal.

color space	YCbCr 4:2:2								YCbCr 4:4:4 / RGB 4:4:4							
Max. bit	8 bit			10 bit			12 bit			8 bit			10 bit			12 bit		
Frame frequency (Hz)	24	25	50, 60	24	25	50, 60	24	25	50, 60	24	25	50, 60	24	25	50, 60	24	25	50, 60
HDMI	√ (1)		√ (2)		√ (1)		√ (2)		√ (1)		√ (2)							
DisplayPort								√ (1)		√ (2)	√ (1)		√ (2)					
3G–SDI	√ (4)	√ (4)	√ (4)	√ (4)	√ (4)	√ (4)	√ (4)	√ (4)	√ (4)	√ (4)	√ (4)		√ (4)	√ (4)		√ (4)	√ (4)	

Panasonic

BT-4LH310
787.4 mm (31 inches) 4K LCD Monitor

4K PROFESSIONAL
BT-4LH310

A Professional Reference Monitor Supporting 4K Image Production for Broadcasting and Cinema

4K PROFESSIONAL
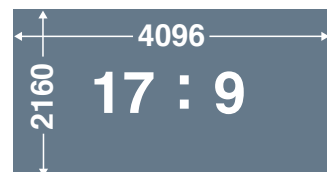PROFESSIONAL
4K (4096 X 2160) MONITOR

PROFESSIONAL 4K (4096 X 2160) MONITOR

Picture simulated

Panasonic introduces the BT-4LH310 787.4 mm (31 inches) 4K LCD monitor, to provide powerful support for 4K and 2K/HD image production for broadcasting and cinema applications. The BT-4LH310 boasts stunning display resolution in both 4K (4096 x 2160) and QFHD (3840 x 2160). Its reference-level image quality and excellent color reproduction meet the DCI (P3) color gamut standards. Its new LUT (Look Up Table) upload function (To be supported soon) also allows high-precision color management in a digital cinema workflow. In addition, this LCD monitor comes with a variety of display functions to assist video production, such as Zoom, Focus-in-Red and Y Map, as well as other handy functions that streamline production activities, including Frame Grab and Error Indication. The rugged aluminum frame and AC/DC power capability ensure high mobility.

High Image Quality to Meet 4K Image Production Needs
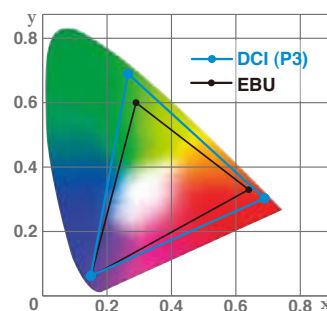
4096 x 2160 Resolution
Supports both 4096 x 2160 resolution (17:9 aspect ratio) and 3840 x 2160 QFHD resolution (four times the resolution of Full-HD). The LCD panel can be used for 4K image production for broadcasting and movies.
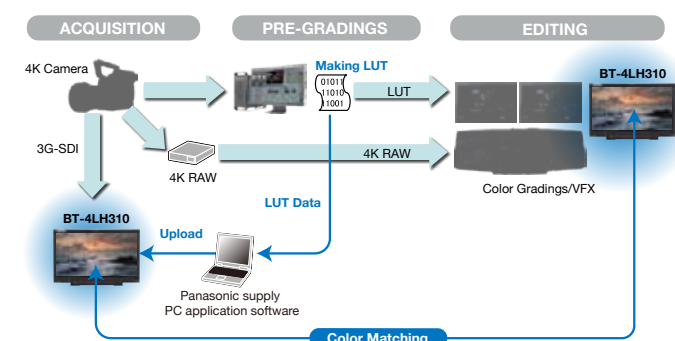

DCI (P3) Color Gamut
Surpasses the EBU TV color gamut, and covers 96% (u', v' conversion) of the DCI (P3) color gamut for digital cinema use. The LCD monitor displays colors accurately. It has a 100% color gamut coverage for BT709, EBU and SMPTE-C.

New LUT Upload Function*
Capable of LUT (look-up table) uploading. Brings high-precision color management to the digital cinema workflow. When shooting, images can be checked on the LCD monitor with the same color setting as that used for editing.

* A PC and LUT upload application software are required (to be supported soon). For more information, visit the Panasonic website [http://pro-av.panasonic.net/].
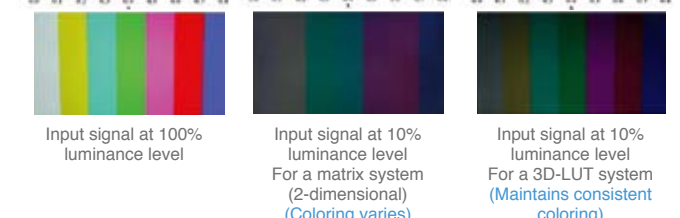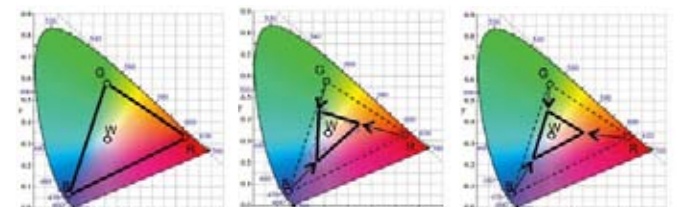

IPS Panel with High Contrast, 10 bit and Wide Viewing Angle
• 1450:1 High Contrast: Delivers sharp, clear 4K images.
• 10 bit Panel: 10 bit processing produces 1,070,000,000 display colors for extremely smooth gradation.
• 178° Wide Viewing Angle: Wide 178° viewing angle in both horizontal and vertical directions. The high-quality image display shows practically no color shift even when viewed at an angle of 45°.

3D-LUT and 6-Pole Color Correction
Eliminates color phase shifts (drift) in the LCD panel caused by luminance level differences. By providing a look-up table for each luminance level and applying 12 bit image processing to each RGB color, it balances the six coordinate poles of the three primary colors (RGB) and their complementary colors (CMY). This helps to reproduce the intermediate shades of extremely fine colors.

Input signal at 100% luminance level

Input signal at 10% luminance level
For a matrix system (2-dimensional)
(Coloring varies)

Input signal at 10% luminance level
For a 3D-LUT system
(Maintains consistent coloring)

Top: 3-Poles (RGB) Coordinate Correction
Left: 6-Poles (RGB/CMY) Coordinate Correction

Functions to Assist 4K/2K/HD Video Shooting

Focus Assist
Equipped with Focus-in-Red and Zoom functions to help achieve precise focusing when shooting with a 4K/2K/HD camera.
• Focus-in-Red: Emphasizes the sharply focused area of the image by showing it in an easily visible red.
• Zoom (4K): Enlarges (4x normal size) the center section of the image or one of the quarter sections and displays it on the full screen for accurate, easy focusing.

Focus-in-Red Display

Enlarges the center section of the image or one of the quarter sections

Zoom Display (Center)

Luminance, Zebra and RGB Display Modes
• Y Map: Allows quick visual confirmation of scene luminance levels via means of assigning a simple color code for each luminance step, includes reference chart.
• Zebra: Can be operated in the same way as the Zebra function of a camera viewfinder.
• RGB Color: The display of each RGB color can be turned on and off individually.

Y Map Display

Zebra Display

Markers and Grid
• Aspect Marker: Capable of indicating an image area in one of up to eight aspect ratios (16:9 (only when 17:9 is set), 4:3, 13:9, 14:9, CNSCO2.39, CNSCO2.35, 2:1 and VISTA).
• Safe Area Marker (17:9/16:9/4:3): 95%, 93%, 90%, 88%, 80%, USER, DOT/LINE or VAR marker (selectable)
• Center Marker: Can be displayed together with another marker.
• Cross Hatch Grid: Allows easy checking of camera tilt.

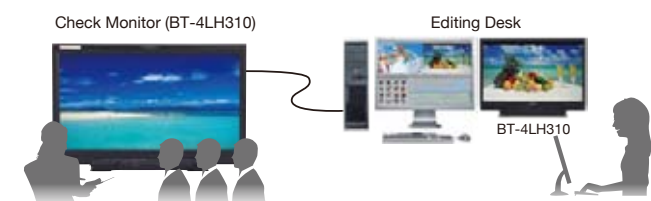
Diverse Functions for Easier Operation

New Quad Display (2K/HD)
Taking advantage of 4K resolution, the Quad Display function displays a waveform monitor (WFM) and a vector scope (VSC) as well as one of the Focus-in-Red, Y Map and Zebra assist functions simultaneously with a full-pixel image from a 2K (2048 x 1080) or HD input source. This function also allows a single BT-4LH310 to be used as four 2K/HD monitors. It displays full-pixel images without resizing.

* WFM/VSC cannot be displayed with a 4K signal input.

New Frame Grab
Frame grab allows for a still image to be captured from video and displayed on the monitor. This function is useful for comparing camera angles or colors between takes or scenes.

Check Monitor (BT-4LH310)   Editing Desk   BT-4LH310

New Error Indication
Transmission and other errors are detected during SDI input, and the error status is displayed and logged.

(example) Transmission Error   BT-4LH310

Audio Level Meter
The audio level meter can be overlaid on the displayed image. Up to eight channels can be simultaneously displayed. A peak hold function is included. For 3G-SDI input, channels 1-8, or channels 9-16 can be selected.

Time Code/Closed Caption (2K/HD) Display
The time code display shows the UB value on one line and VTC/UB or LTC/UB simultaneously on two lines. The closed caption function supports EIA/CEA-708 in compliance with HD SDI CC standards.

Sample display of the input source image (upper left), Focus-in-Red (lower left), WFM (upper right) and VSC (lower right)
(All images are simulated.)

Sample display of images from four 2K (2048 x 1080) or HD input sources.
(All images are simulated.)

Specifications and Functions for Mobility

Rugged Aluminum Frame
The rugged aluminum frame ensures durability and allows the BT-4LH310 to be used for in-the-field use.

Aluminum Frame

28 V DC Power
AC/DC power supply compatibility (AC takes priority when connected simultaneously). The 28 V DC power supply supports battery use.

DC Input Connector/AC Input Connector

Fanless
Fanless for quiet operation, the BT-4LH310 is ideal for use in studios, on production sets or in edit rooms.

Mercury Free, LED Backlight
Backlight contains no mercury as an environmental protection measure.

Broadcast and Image Production Functions
• Tally lamp (red/green/amber).
• Speakers and headphone jack on the front panel.
• Stand included as standard equipment (detachable).
• Key Lock function disables front panel operation/control functions, except for the power switch, menu operation and audio level adjustment.
• Functions can be allocated to five function keys for one-touch operation.
• Energy-saving Auto Power Down (when there is no signal input or operation)