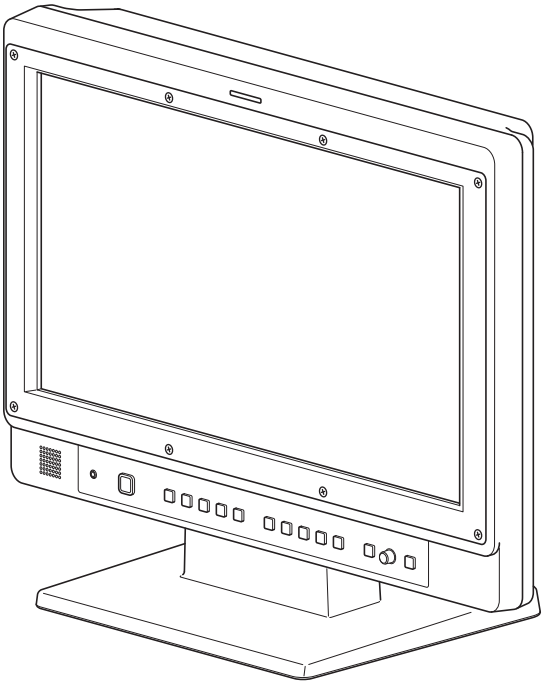
Panasonic

Operating Instructions

LCD Video Monitor

Model No. BT-LH1850P

Model No. BT-LH1850E



DEUTSCH	Für Erlauterungen in Deutsch, konsultieren Sie bitte die mitgelieferte CD-ROM.
FRANÇAIS	Pour des explications en français, veuillez vous reporter au CD-ROM fourni.
ITALIANO	Per le istruzioni in italiano, vedere il CD-ROM in dotazione.
ESPAÑOL	Para la explicación en español, consulte el CD-ROM suministrado.

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

Before operating this product, please read the instructions carefully and save this manual for future use.

SS0112KT1065 -PS
Printed in Japan

ENGLISH

VQT4F03-1

Read this first ! (for BT-LH1850P)

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 lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "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:
This equipment must be grounded.
To ensure safe operation, the three-pin plug must be inserted only into a standard three-pin power outlet which is effectively grounded through normal household wiring. Extension cords used with the equipment must have three cores and be correctly wired to provide connection to the ground. Wrongly wired extension cords are a major cause of fatalities. The fact that the equipment operates satisfactorily does not imply that the power outlet is grounded or that the installation is completely safe. For your safety, if you are in any doubt about the effective grounding of the power outlet, please consult a qualified electrician.

WARNING:
- To reduce the risk of fire or electric shock, do not expose this equipment to rain or moisture.
- To reduce the risk of fire or electric shock hazard, keep this equipment away from all liquids. Use and store only in locations which are not exposed to the risk of dripping or splashing liquids, and do not place any liquid containers on top of the equipment.

WARNING:
Always keep the tilt stand screws and protective panel mounting screws out of the reach of infants and small children.

WARNING:
Installation should only be performed by qualified installation personnel.
Improper installation may result in the entire apparatus falling down and causing injury.

CAUTION:
The mains plug of the power supply cord shall remain readily operable.
The AC receptacle (mains socket outlet) shall be installed near the equipment and shall be easily accessible. To completely disconnect this equipment from the AC mains, disconnect the power cable plug from the AC receptacle.

CAUTION:
In order to maintain adequate ventilation, do not install or place this unit in a bookcase, built-in cabinet or any other confined space. To prevent risk of electric shock or fire hazard due to overheating, ensure that curtains and any other materials do not obstruct the ventilation.

CAUTION:
To reduce the risk of fire or electric shock and annoying interference, use the recommended accessories only.

CAUTION:
This apparatus can be operated at a voltage in the range of 100 - 240 V AC. Voltages other than 120 V are not intended for U.S.A. and Canada.

CAUTION:
Excessive sound pressure from earphones and headphones can cause hearing loss.

CAUTION:
This Monitor is for use only with Panasonic Wall Mount Adaptor, BT-WMA17G. Use with other Wall Mount or Rack Mount Adaptor is capable of resulting in instability causing possible injury.

CAUTION:
Check the installation at least once a year.
An improper installation could cause the monitor to fall off resulting in personal injury.

CAUTION:
Remove the wall mount adaptor when not used.
Otherwise people moving in the vicinity of the monitor could get caught on the bracket and be injured.

[ ] indicates safety information.

Notice (U.S.A. only):
Disposal may be regulated in your community due to Environmental considerations. For disposal or recycling information, please visit Panasonic website: http://www.panasonic.com/environmental or call 1-888-769-0149.

FCC NOTICE (USA)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

CAUTION:

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

Warning:

To assure continued FCC emission limit compliance, the user must use only shielded interface cables when connecting to external units. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate it.

indicates safety information.

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 cable 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.

Read this first ! (for BT-LH1850E)

WARNING:
This equipment must be earthed.
To ensure safe operation, the three-pin plug must be inserted only into a standard three-pin power point which is effectively earthed through normal household wiring.
Extension cords used with the equipment must have three cores and be correctly wired to provide connection to the earth. Wrongly wired extension cords are a major cause of fatalities. The fact that the equipment operates satisfactorily does not imply that the power point is earthed or that the installation is completely safe. For your safety, if you are in any doubt about the effective earthing of the power point, please consult a qualified electrician.

WARNING:
- To reduce the risk of fire or electric shock, do not expose this equipment to rain or moisture.
- To reduce the risk of fire or electric shock hazard, keep this equipment away from all liquids. Use and store only in locations which are not exposed to the risk of dripping or splashing liquids, and do not place any liquid containers on top of the equipment.

WARNING:
Always keep the tilt stand screws and protective panel mounting screws out of the reach of infants and small children.

WARNING:
Installation should only be performed by qualified installation personnel.
Improper installation may result in the entire apparatus falling down and causing injury.

CAUTION:
Do not remove panel covers by unscrewing them.
To reduce the risk of electric shock, do not remove covers.
No user serviceable parts inside.
Refer servicing to qualified service personnel.

CAUTION:
The mains plug of the power supply cord shall remain readily operable.
The AC receptacle (mains socket outlet) shall be installed near the equipment and shall be easily accessible. To completely disconnect this equipment from the AC mains, disconnect the power cable plug from the AC receptacle.

CAUTION:
To reduce the risk of fire or electric shock and annoying interference, use the recommended accessories only.

CAUTION:
In order to maintain adequate ventilation, do not install or place this unit in a bookcase, built-in cabinet or any other confined space. To prevent risk of electric shock or fire hazard due to overheating, ensure that curtains and any other materials do not obstruct the ventilation.

CAUTION:
Excessive sound pressure from earphones and headphones can cause hearing loss.

CAUTION:
This Monitor is for use only with Panasonic Wall Mount Adaptor, BT-WMA17G. Use with other Wall Mount or Rack Mount Adaptor is capable of resulting in instability causing possible injury.

CAUTION:
Check the installation at least once a year.
An improper installation could cause the monitor to fall off resulting in personal injury.

CAUTION:
Remove the wall mount adaptor when not used.
Otherwise people moving in the vicinity of the monitor could get caught on the bracket and be injured.

indicates safety information.

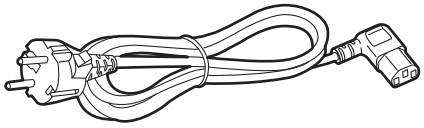
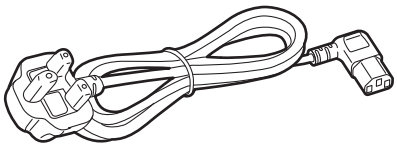
AEEE Yönetmeliğine Uygundur.
AEEE Complies with Directive of Turkey.

[India Only]

For the purpose of recycling to facilitate effective utilization of resources, please return this product to a nearby authorized collection center, registered dismantler or recycler, or Panasonic service center when disposing of this product.
Please see the Panasonic website for further information on collection centers, etc.
http://www.panasonic.co.in/wps/portal/home

Caution for AC Mains Lead

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.
This product is equipped with 2 types of AC mains cable. One is for continental Europe, etc. and the other one is only for U.K.
Appropriate mains cable must be used in each local area, since the other type of mains cable is not suitable.

FOR CONTINENTAL EUROPE, ETC.	FOR U.K. ONLY
Not to be used in the U.K. 	

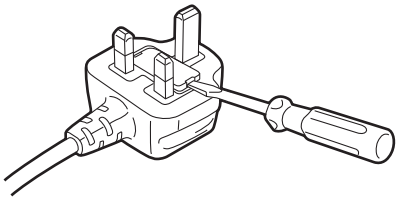
FOR U.K. ONLY

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 13 amp fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 13 amps and that it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark or the BSI mark on the body of the fuse.

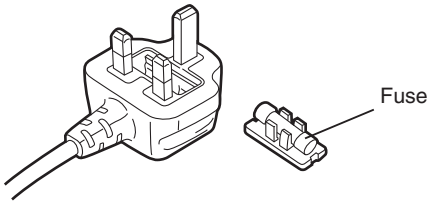
If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

How to replace the fuse

1. Open the fuse compartment with a screwdriver.



2. Replace the fuse.



indicates safety information.

Note regarding the Power Management function specified under COMMISSION REGULATION (EC) No 1275/2008 implementing Directive 2009/125/EC of the European Parliament and of the Council.

This device is designed and manufactured for use at a broadcasting station and/or in a similar environment.
This device is not equipped with a Power Management function or the Power Management function is set to OFF as it will prevent the device from fulfilling its intended purpose for the reasons below.

1. If the device is a Studio Camera, a Weather Camera, a Mixer or other processor:
   A Power Management function may cause the device to suddenly stop during recording or while On Air.
2. If the device is a Studio Monitor:
   A Power Management function may cause video for the confirmation of whether a signal is normal, or whether the signal has been lost, to be un-viewable.
3. If the device is a Camera Recorder:
   A professional camera recorder must be able to start quickly at any time, but a Power Management function will cause an increase in the time taken to resume from Stand-by mode.

Pursuant to at the directive 2004/108/EC, article 9(2)
Panasonic Testing Centre
Panasonic Service Europe, a division of Panasonic Marketing Europe GmbH
Winsbergring 15, 22525 Hamburg, F.R. Germany

EMC NOTICE FOR THE PURCHASER/USER OF THE APPARATUS

1. Applicable standards and operating environment

The apparatus is compliant with:

- standards EN55103-1 and EN55103-2 2009, and
- electromagnetic environments E1, E2, E3 and E4.

2. Pre-requisite conditions to achieving compliance with the above standards

<1> Peripheral equipment to be connected to the apparatus and special connecting cables

- The purchaser/user is urged to use only equipment which has been recommended by us as peripheral equipment to be connected to the apparatus.
- The purchaser/user is urged to use only the connecting cables described below.

<2> For the connecting cables, use shielded cables which suit the intended purpose of the apparatus.

- Video signal connecting cables
  Use double shielded coaxial cables, which are designed for 75-ohm type high-frequency applications, for SDI (Serial Digital Interface).
  Coaxial cables, which are designed for 75-ohm type high-frequency applications, are recommended for analog video signals.
- Audio signal connecting cables
  If your apparatus supports AES/EBU serial digital audio signals, use cables designed for AES/EBU.
  Use shielded cables, which provide quality performance for high-frequency transmission applications, for analog audio signals.
- Other connecting cables (IEEE1394, USB)
  Use shielded cables, which provide quality performance for high-frequency applications, as connecting cables.
- When connecting to the DVI signal terminal, use a cable with a ferrite core.
- If your apparatus is supplied with ferrite core(s), they must be attached on cable(s) following instructions in this manual.

3. Performance level

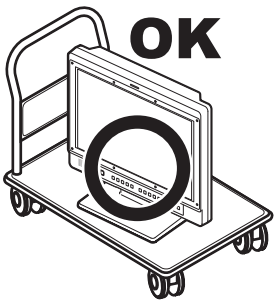
The performance level of the apparatus is equivalent to or better than the performance level required by these standards. However, the apparatus may be adversely affected by interference if it is being used in an EMC environment, such as an area where strong electromagnetic fields are generated (by the presence of signal transmission towers, cellular phones, etc.). In order to minimize the adverse effects of the interference on the apparatus in cases like this, it is recommended that the following steps be taken with the apparatus being affected and with its operating environment:

1. Place the apparatus at a distance from the source of the interference.
2. Change the direction of the apparatus.
3. Change the connection method used for the apparatus.
4. Connect the apparatus to another power outlet where the power is not shared by any other appliances.

Transportation precautions

Do not try to lift the monitor by grabbing the LCD panel.

Do not place the monitor face down during transportation to prevent damaging it. Keep it upright.



Do not expose the LCD panel to strong pressure or pressure from pointed objects. Take care especially during transportation. Exposing the LCD panel to strong pressure may result in blurring or other damage.

About this instruction manual

- This instruction manual refers to BT-LH1850P/1850E as “this unit.”
- The illustrations, explanatory drawings, and other figures included in this instruction manual are for illustrative purposes only and may differ from actual display.
- HDMI, the HDMI logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing, LLC in the United States and/or other countries.
- Adobe® Reader® is a trademark of Adobe Systems Incorporated.
- In this manual, references to pages are indicated as (→page 00).

Precautions for Use

- The LCD monitor is manufactured with high-precision technology and has an effective pixel count of over 99.99 %. However, less than 0.01 % of pixels may be stuck or dead in some cases. This is not a malfunction and has no effect on the recorded images.
- Due to the characteristics of LCD monitors, prolonged display of bright still images or prolonged operation in high-temperature or high-humidity environments may result in residual images, luminance reduction, burn-in, banding, or panel defects and degradation that result in areas of permanently changed brightness.
  In particular, avoid prolonged continuous display of the following types of images.
  - Bright still images
  - Images that include logomarks or graphics in fixed positions
  - Windows from a computer and similar bright displays
  - Images with aspect ratios different from that of the monitor (e.g., letterboxed images)

  In addition, avoid prolonged continuous use in the following types of environments.
  - Confined areas with high temperature and humidity
  - Near the exhaust vent of air conditioning equipment, etc.

  Prolonged use involving the images and environments described above will accelerate deterioration of the LCD panel over time.
  To prevent accelerated deterioration and its related phenomena, we recommend the following.
  - Do not display bright still images for prolonged periods.
  - Lower the brightness.
  - Turn off the power when the monitor is not in use.

  Residual images will gradually disappear as different images are displayed.
- The response speed and brightness of liquid crystal vary with ambient temperatures.
- Do not install the unit in a place exposed to direct sunlight, as it may damage the cabinet and the LCD screen.
- Do not install the unit in locations where enough space cannot be provided around it as heat may build up inside preventing normal operation. Be sure to provide enough space around the unit.
- Exposing the LCD screen to intense light sources will impair its characteristics and lower image quality.
- In an environment exposed to drastic temperature fluctuations, condensation may build up on and inside the LCD screen. This may lower the quality of the screen and may damage it.
- Some video images may appear blurred on the screen.
- Leaving the unit in a location exposed to high temperature or humidity for an extended period of time may damage the LCD screen and cause blurring.
- Streaks of light may be seen in the area between the edge of the screen and the frame; this is normal and not a malfunction.
- The front panel is fitted with a packaging material to prevent damage to the LCD panel when taking it out of the packing case or transporting it. Remove the panel before use.
- This unit does not support VIERA Link. If the unit is connected to a VIERA-Link-compatible device via an HDMI cable, VIERA Link functions on the other device may not operate properly.
- Using the unit near a wireless transmitter, high-voltage equipment, a speaker, large motors or other devices or exposing it to static electricity could cause electromagnetic interference and distort audio and video reception.

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Standard accessories · Optional units

■ **Standard accessories**

Power cable x 1(BT-LH1850P)
Power cable x 2(BT-LH1850E)
CD-ROM x 1

- The unit is shipped with the following accessories attached.
  Tilt stand x 1
  Tilt stand screws x 4
  Protective panel mounting screws x 8, M3, 8 mm long
  (The customer can use these screws for permanent attachment of a protective panel designed for the monitor.)
  (Tighten the screws to a tightening torque not exceeding 30 N cm)

- After unpacking the monitor, dispose of the AC cord cap (BT-LH1850E only) and packaging material in an appropriate manner.

■ **Optional units**

- BT-WMA17G wall mount adapter (Leave installation of the wall mount adaptor to authorized personnel.)

About PDF manuals

Supplied CD-ROM is provided with Operating Instructions which are in the form of a PDF(Portable Document Format) file.
• You need to have the Adobe® Reader® installed to open and view PDF files.
• Download the Adobe® Reader® properly to your computer from the Adobe web site(http://www.adobe.com/).
• Refer to the Help menu for details about Adobe® Reader®.

Opening the Operating Instructions

1. Insert the CD-ROM disc into the CD-ROM drive.

2. If the software installation screen opens, click [Cancel] to cancel the installation. To open the CD-ROM, double-click the My Computer icon, right click the CD-ROM drive icon, and then click [Open] in the displayed shortcut menu.

3. Double-click on the [INDEX.pdf] file on the CD-ROM.
• The Adobe® Reader® will start up, and a list of contents for the Operating Instructions will be displayed.

4. Click on a desired document name.
• The Operating Instructions selected will open.

Outline

The BT-LH1850P/1850E is a compact, flat panel LCD monitor for broadcast and industrial applications, equipped with a 47 cm (18.5 in.)*1 liquid crystal display.

*1 Effective display area measured diagonally.

■ High Performance Liquid Crystal Panel

This product incorporates a wide WXGA (1366 x 768) LCD panel. It offers excellent color reproduction, a wide viewing angle, and a fast response time.

■ Superb Moving Image Quality Achieved by New Image Processing Engine

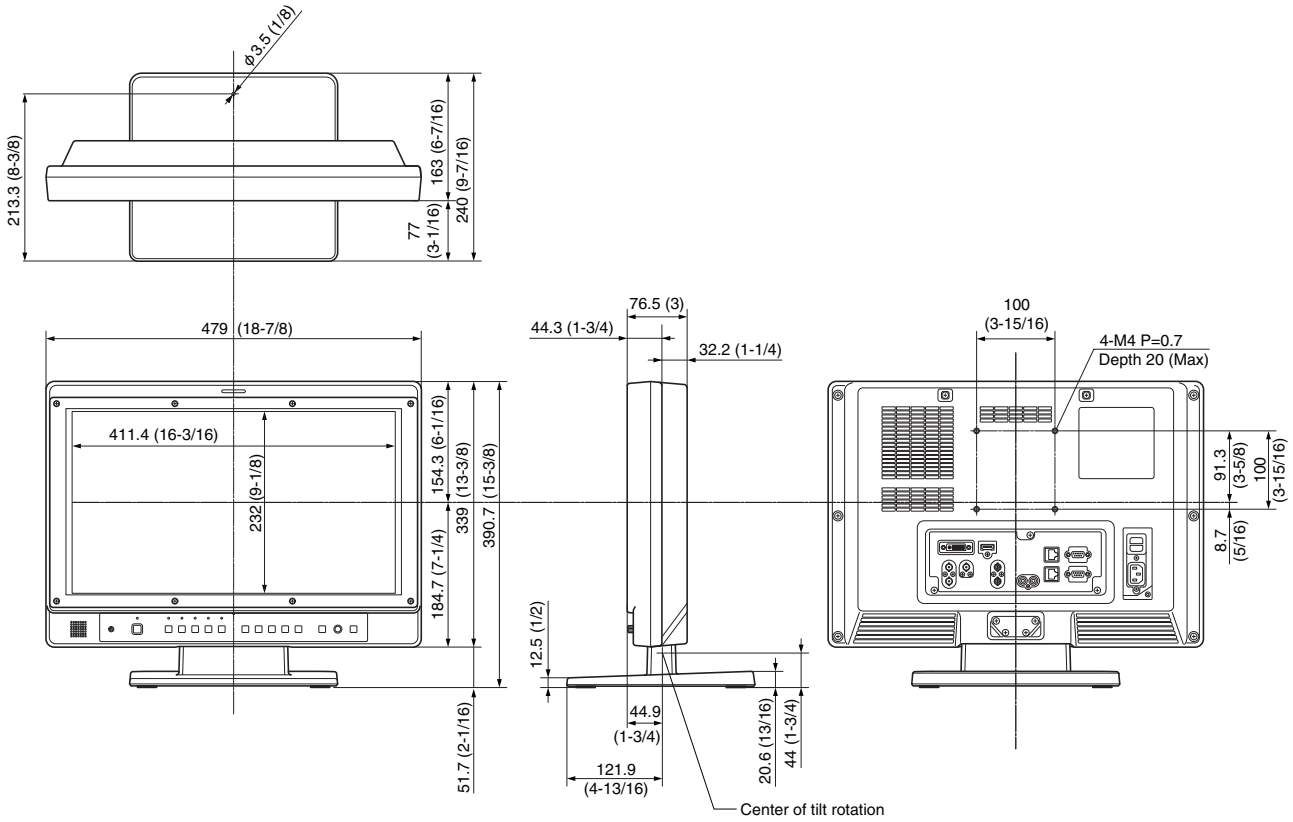
• A 3D Look Up Table (LUT) and a 10-bit image processing engine facilitate accurate and smooth gradation from low to high brightness levels.
• The incorporation of an I/P conversion circuit with a low delay of less than one field minimizes the delay time between signal input and monitor display.
• The incorporation of diagonal line compensation circuit reduces image degradation in the vertical direction and jagged noise on diagonal lines.
• The high-speed moving image response time provides vivid and clear image display.
• Gamma compensation is performed for each monitor.

■ Wide Variety of Functions and Interfaces

• Equipped with SDI (HD/SD compatible), HDMI, VIDEO, and DVI-I inputs.
• FOCUS-IN-RED function (Displayed abbreviated to F-IN-R in the picture adjusting knob status display.)
Making camera focus adjustments is extremely easy because the section of the image in focus is displayed in red to make it easy to understand what is in focus.
• WFM (Y/R/G/B) and vectorscope display functions
Capable of input signal Y/R/G/B waveform display (when SDI, HDMI, VIDEO, or DVI-I input) and vectorscope display (when SDI input).
• Audio level meter display function
There are level displays for embedded SDI and HDMI audio signals and analog audio signals. Furthermore, support is also included for reference point setting, peak hold, and overrange display.
The incorporation of a speaker and a HEADPHONES output jack means you can check the audio. The channel can also be selected in a menu.
• Closed caption function
The captions added to video signals can be displayed during SDI and VIDEO input.
• 2-screen display function
The screen can be split into two to allow you to make a screen comparison for the same input connectors and same format.
• PIXEL TO PIXEL function
This function makes camera focus adjustment extremely easy because the input signals are displayed without being resized.
When resizing is not performed, the 1080/60i signals can be expanded to the equivalent of an approximately 26-inch wide monitor, and then checked.
• Cross hatch display function
This function displays markers at regular vertical and horizontal intervals to facilitate easy composition.
• External remote control
RS-485, RS-232C and GPI remote control terminals are provided.
A loop-through connection using the RS-485 input and output terminals allows control of multiple monitors (up to 32 monitors).
• In monitor display function
The RS-485 interface allows you to display text and the tally indication on the monitor.
• Tilt Stand
A tilt monitor stand is provided as standard.
You can tilt the monitor backwards and forwards to find the angle that best suits your viewing needs.

Dimensions

Unit: mm (inches)

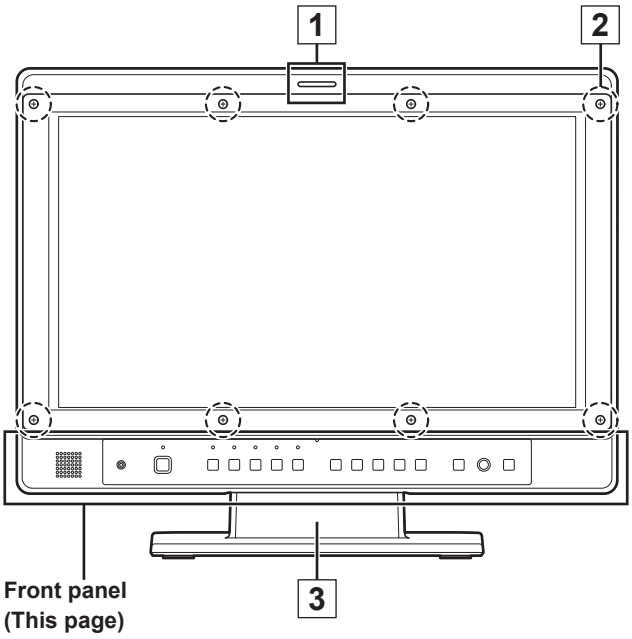


- When installing the monitor in one place permanently, we recommend that you fix the monitor in place using the screw holes on the back of the stand.

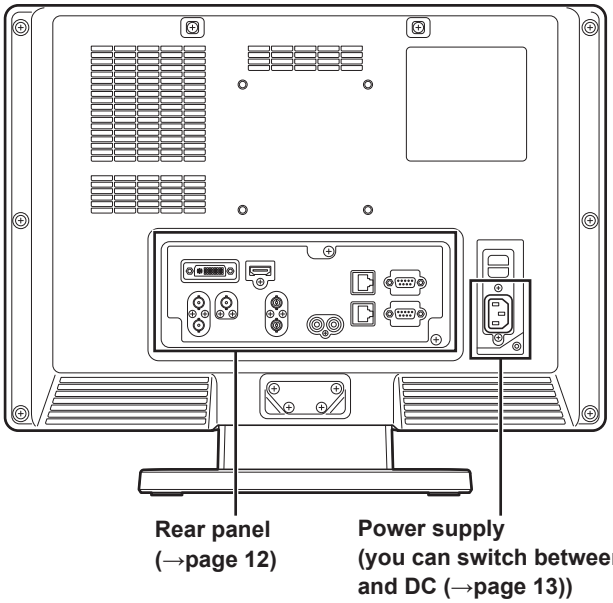
Controls and Their Functions

Video monitor

Front panel



Rear panel



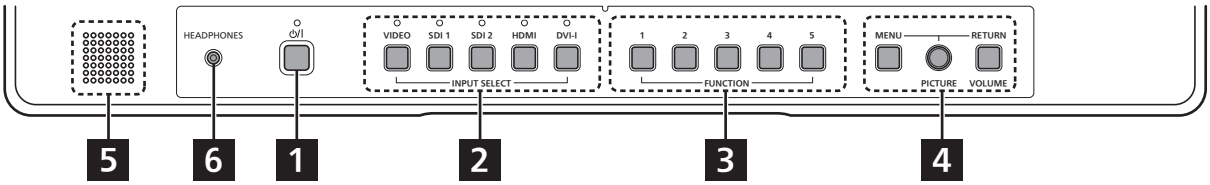
1 Tally Lamps (Red and Green)
Can be lit by a control signal (red tally and green tally) from a GPI/camera.
If the red tally and green tally light at the same time, the tally color will become amber.

2 Protective panel mounting screw holes (8 holes)
Eight screw holes have been provided to enable attachment of a permanent protection panel. The screws for the protective panel are installed in the mounting screw holes at time of shipment. To attach a protective panel, first remove the screws before securing the panel.
<Note>
The LCD panel is shipped covered with a packaging material to protect it from damage during unpacking and transportation. Remove the panel before using the monitor.

3 Tilt Stand
The tilt stand allows you tilt the unit approx. 10 degrees forward or approx. 15 degrees backward.
When tilting the unit, firmly hold the bottom of the stand and move the top of the unit.
If you want to remove the tilt stand, refer to “Detaching and Attaching the Tilt Stand” (→page14).

<Note>
- When tilting the monitor, be careful not to trap your hand between the monitor and stand.

Front panel



1 POWER switch
Switches the power supply ON/OFF. When the power is ON, the LED (green) lights.
To turn the power off, press and hold the switch for at least three seconds.

2 INPUT SELECT button
Selects the signal input line. The green LED light above the pressed button indicates the selected input signal.

VIDEO	: Video input
SDI1	: Serial digital interface input (HD/SD compatible)
SDI2	: Serial digital interface input (HDMI compatible)
HDMI	: HDMI input (HDCP compatible)
DVI-I	: DVI-I input (HDCP compatible)

- Selects one of four input signals: digital video or PC signal, analog video or PC signal. (→page 38)
- The input line when the power supply is switched ON is the one that was selected the last time the power was switched OFF.
- When the control lock is on, the mark appears and input lines cannot be changed. (→page 41)
- When INT-SG (internal chart for adjustment “Color Bar + Grayscale”) is selected, all LEDs above the INPUT SELECT button are off. Use the “INPUT SELECT” menu to select INT-SG. (→page 18)

3 FUNCTION button
FUNCTION1 to FUNCTION5:
Press to use function assigned to the FUNCTION button with the menu.
- When the control lock is on, the mark appears to indicate that FUNCTION operation is disabled. (→page 41)

4 MENU button, rotary knobs (with push-on switch (PICTURE)) and RETURN/VOLUME button (→page 15)

Use these buttons to display menus, select and adjust settings and perform menu selections.

MENU: Press to display the TOP MENU (main menu, FUNCTION menu and INPUT SELECT menu) or to exit from a menu.

Rotary knob:
Turn the knob clockwise or counterclockwise to move the cursor up or down or to change set values.
Press the knob to start changing set values, to confirm them and to open submenus.

RETURN:
Press to return to the previous menu or cancel to recover a previously set value.

When no menu is open, press the rotary knob or RETURN button to open a menu other than the TOP MENU.

PICTURE:
When no menu is displayed, press the rotary knob to open the picture adjusting menu. (→page 15)

VOLUME:
When no menu is displayed, press the RETURN button to open the audio volume bar meter. (→page 15)

5 Speaker (monaural)

Enables monitoring of analog AUDIO, SDI and HDMI signal inputs.

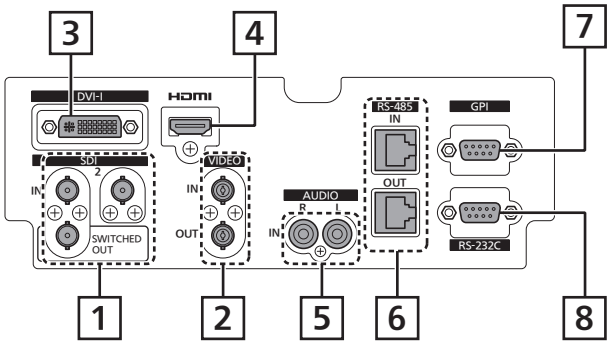
- Connecting headphones to the HEADPHONES output jack turns off the speaker.

6 HEADPHONES output jack (M3 stereo mini jack)

Allows you to connect headphones to monitor analog audio, SDI and HDMI signal input.

- The volume and sound quality differ depending on the headphones.

Rear panel



1 SDI terminal (BNC)

IN1: This is the SDI input terminal (compatible with HD/SD automatic switching).

IN2: This is the SDI input terminal (compatible with HD/SD automatic switching).

SWITCHED OUT: This is the active through-out terminal for the SDI input signal being displayed on the screen.

- Active SDI through-out is only output when [SDI1] or [SDI2] is selected using [INPUT SELECT]. It is not output when something other than SDI is selected. Embedded audio is also supported.
  When this output is used to daisy-chain*1 multiple monitors, the quality of the original signal, cable length, the number of connected devices and other factors all come into play to deteriorate picture quality and introduce noise.

  *1 **Daisy-chain:**
  Refers to connecting the through-out signal from a device to the input of a second, third or more devices in a linear series, thus using a single signal in multiple devices.
- Use a 5C-FB or equivalent cable to make connections to an SDI terminal.

2 VIDEO terminal (BNC) *2*3

IN: This is the VIDEO signal (composite signal) input terminal.

OUT: This is the input signal through-out terminal.

*2 Unless a cable is connected to the OUT terminal, the VIDEO IN terminal is automatically terminated at 75 Ω. Connecting a cable releases this termination.

*3 Since a connection to the through-out terminal releases the 75 Ω termination of the unit, the level of the VIDEO signal input to the unit may become too large depending on the connected device.

3 DVI-I terminal (single link)

This is the DVI-signal input terminal.

- Use double shielded cable for making connections to a DVI-I terminal.

4 HDMI terminal (Type A)

This is the HDMI input terminal.

- Use double-shielded cable for making connections to an HDMI terminal.

5 AUDIO input terminal (pin jack)

This is the common audio input terminal for all video input terminals.

- Use shielded cable for making connections to an AUDIO input terminal.

6 RS-485 input/output terminal (RJ-45)

External control is possible by using an RS-485 signal.

- Use shielded cable for making connections to an RS-485 input/output terminal.
- Make sure that the cable is fully inserted in the terminal and that it cannot easily be pulled out.
- A loop-through connection using the RS-485 IN/OUT terminals allow operation of multiple monitors (up to 32 monitors) connected to the RS-485 IN/OUT terminals.
- Connect a terminator (120 Ω) between the first and second pin of the OUT terminal on the last monitor in the chain.

7 GPI input terminal (D-SUB, 9 pins)

External control is possible by using a GPI signal.

- Use shielded cable for making connections to a GPI input terminal.

8 RS-232C input terminal (D-SUB, 9 pins)

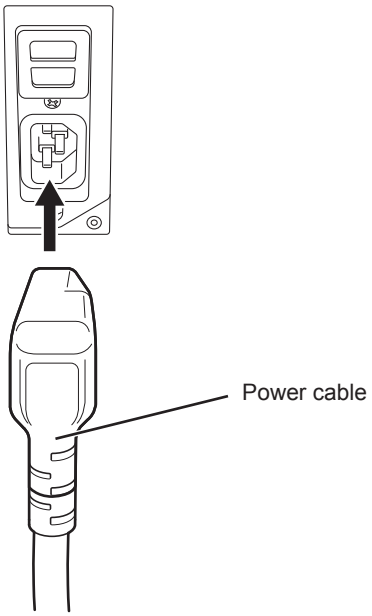
External control is possible by using a RS-232C signal

- Use shielded cable for making connections to an RS-232C input terminal.

Power supply

Connecting the power cable

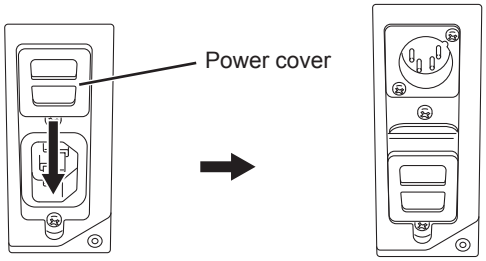
1. Attach the power cable to the unit.



2. Connect the power cable to an AC outlet.

■ **When using external DC power (12 V DC)**

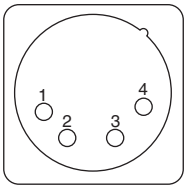
You can slide open the power cover to switch from AC input to external DC input.



<Note>

- If the power cover has come off or been removed, do not use the monitor with the power supply connected to both AC input and DC input terminals.
- Use a shielded DC cable that is not longer than 2 m. A cable that is 2 m or longer may cause noise.

If an external DC power supply is used, be sure to check that the rating of the external DC power supply suits the power requirements of this unit.
When using external DC power (12 V DC), check the external DC input terminal pin signal, and use the correct polarity. If a +12 V power supply is accidentally connected to the GND terminal, this could cause a fire or personal injury.

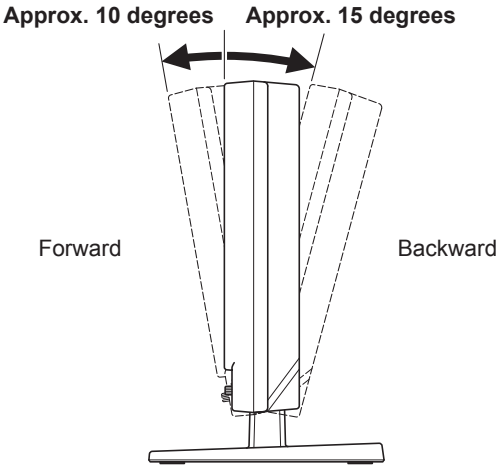


External DC input terminal

Pin number	Signal
1	GND
2, 3	—
4	+12 V

Adjusting monitor angle

Move the unit in the direction of the arrows to adjust it to a comfortable viewing position.



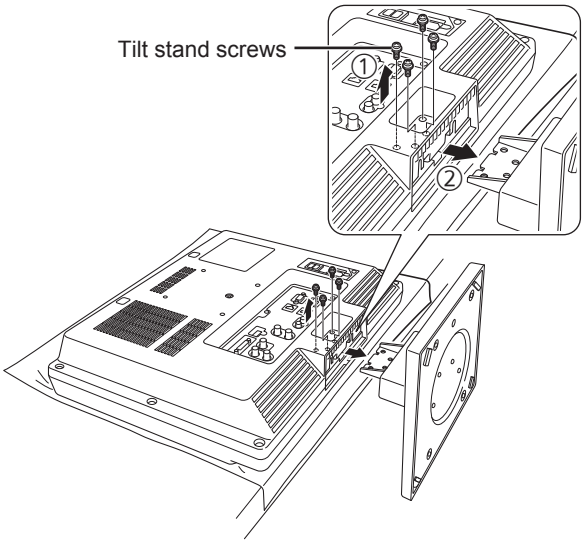
- The tilt stand allows you to tilt the unit approx. 10 degrees forward and approx. 15 degrees backward.

Detaching and Attaching the Tilt Stand

The tilt stand is detachable.

- When detaching and attaching the tilt stand, it is recommended that you place the unit flat on the edge of a desk or table with a soft cloth or similar material spread underneath.

Detaching the tilt stand

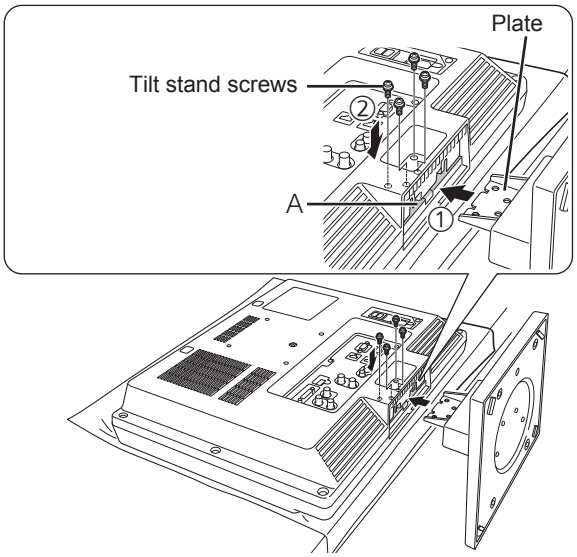


1. Unscrew the tilt stand screws (four) using a Phillips screwdriver.

2. Detach the tilt stand.

- After detaching, please store the tilt stand and the tilt stand screws.

Attaching the tilt stand



1. Attach the tilt stand to the unit.

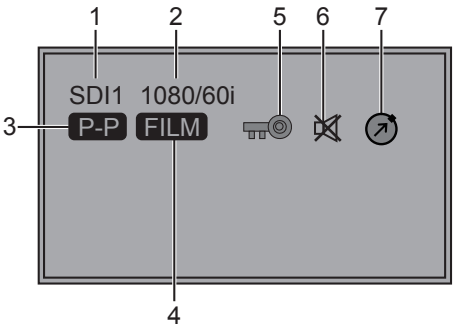
- Insert the plate of the tilt stand into part A (illustrated) of the monitor unit.

2. Screw the tilt stand to the unit by screwing the tilt stand screws (four) using a Phillips screwdriver.
(Screwing torque: Tighten to about 100 N cm or more)

On-screen Display

The screen shows the operation status display, main menu, FUNCTION menu, INPUT SELECT menu, Picture adjusting menu, audio volume display, sharpness display, FUNCTION display, audio level meter display, time code (TC) display, closed caption (CC) display, in monitor display(IMD) display and other information.

Operating status display



<Note>

- The display state of the status can be set in “STATUS DISPLAY” of the “SYSTEM CONFIG” menu (→page 27).
- “UNSUPPORT SIGNAL” and “NO SIGNAL” may not be properly displayed.

1. The selected input line (→pages 11 and 18)

- Displays VIDEO, SDI1, SDI2, HDMI, DVI-I (YPBPR/RGB-COMP./DVI-VIDEO/DVI-COMP.) and INT-SG.

2. Signal format

- “UNSUPPORT SIGNAL” appears if an unsupported signal is input. It may also indicate that the format selected in the “INPUT SELECT” menu does not match the input signal.
- “NO SIGNAL” appears when no signal is input.

3. Various indications (PIXEL TO PIXEL mode)

- This indicates the PIXEL TO PIXEL mode is engaged.

4. Various indications (FILM mode)

- This indicates that “GAMMA SELECT” of the “VIDEO CONFIG” is set to “FILM.”

5. Various displays (lock setting)

- This indicates that the front operations lock is on. (→page 41)

6. Mute indication

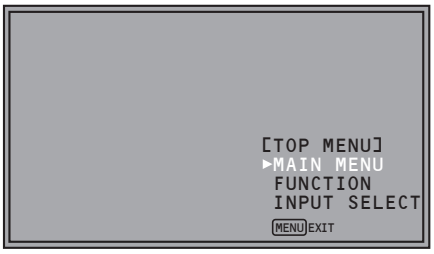
- Indicates that the speaker and headphones are muted. (→page 19)

7. Picture adjustment change indication

- Indicates that picture adjustments (PEAKING/PHASE/CHROMA/BRIGHT/CONTRAST/BACKLIGHT) have been changed from the values assigned using SETUP LOAD or POWER ON SETUP. (→page 19)

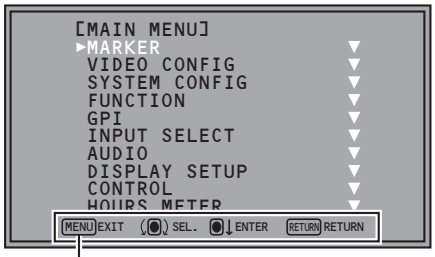
Main menu, FUNCTION menu, INPUT SELECT menu indications

1. Press MENU when no menu is displayed.
- The TOP MENU appears.



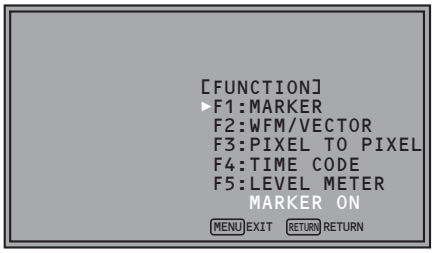
2. Turn the rotary knob to select a menu (MAIN MENU, FUNCTION, INPUT SELECT) and press the rotary knob.
- For details on how to operate menus, refer to “How to Use the On Screen Menu” (→page18).

[MAIN MENU]

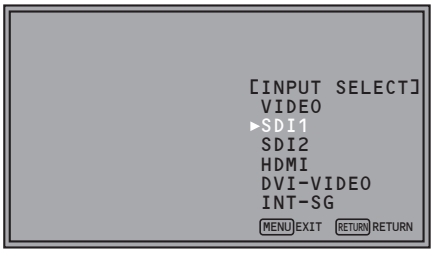


Displays instructions on menu button operations.

[FUNCTION]

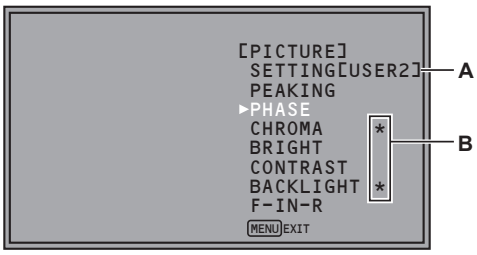


[INPUT SELECT]



3. To close a menu, press MENU.
- It disappears after 2 minutes of inaction. (The value shown before the display clears is confirmed.)

Picture adjusting menu



A : File names called by SETUP LOAD or POWER ON SETUP appear on the screen to the right of SETTING.

B : When picture adjustments (PEAKING/PHASE/CHROMA/BRIGHT/CONTRAST/BACKLIGHT) have been changed from the values assigned using SETUP LOAD or POWER ON SETUP, an asterisk (*) appears beside the menu name.

1. Press rotary knob when no menu is displayed.
- The picture adjusting menu appears.
- For details on how to operate menus, refer to “How to Use the On Screen Menu” (→page18)

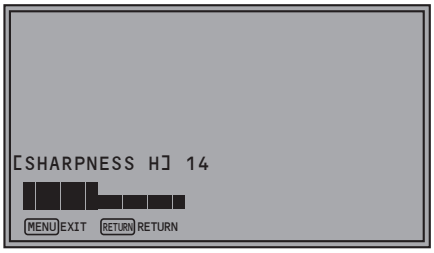
2. To close a menu, press MENU.
- This display disappears after 10 seconds of inaction. (The value shown before the display clears is confirmed.)

Audio volume display

1. Press [RETURN] when no menu is displayed.
- The audio volume bar meter appears.
- For details on how to use the audio volume, refer to “How to Use the On Screen Menu” (→page18)

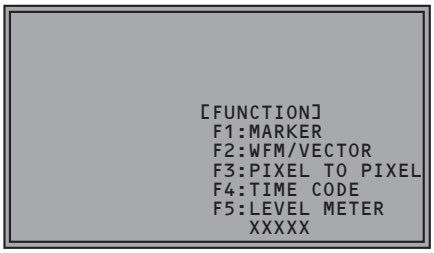
2. To close a menu, press MENU or the rotary knob.
- This display disappears after 10 seconds of inaction. (The value shown before the display disappears is confirmed.)

Sharpness display



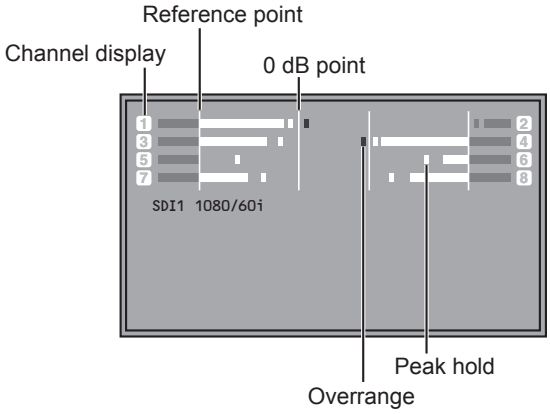
- Indicates the “SHARPNESS H/V” setting value of the “VIDEO CONFIG” menu.
- If no operation is performed for 2 minutes, the setting value is confirmed and the display disappears.

FUNCTION display



- Use the “FUNCTION” menu to set up functions.
- When “FUNCTION DISPLAY” (→page 31) is set to ON1 or ON2, press any of the “FUNCTION1” to “FUNCTION5” buttons to display the status of functions assigned to the FUNCTION buttons.
- If no operation is performed for 2 seconds, the setting value is confirmed and the display disappears.
- “XXXXX” indicates operating status (→page33 “Functions displayed during FUNCTION button operation”).

Audio level meter display

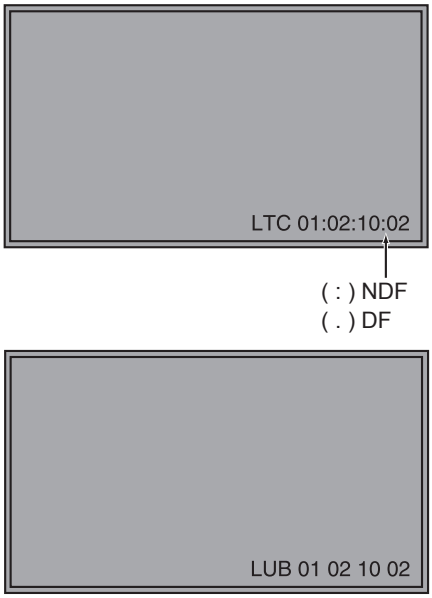


- A color skeleton bar meter indicates the audio level for SDI, HDMI and AUDIO input signals.
- The display method of the audio level meter can be set in the menu (→page 39).

Display color

Green: Up to reference point (included)
Yellow: Reference point (not included) to 0 dB point (not included)
Red: Overrange

Time code (TC) display



- Use the menu to display the time code for HD-SDI signal input. It also allows you to switch display mode (LTC, VITC, LUB, VUB). (→page 40)

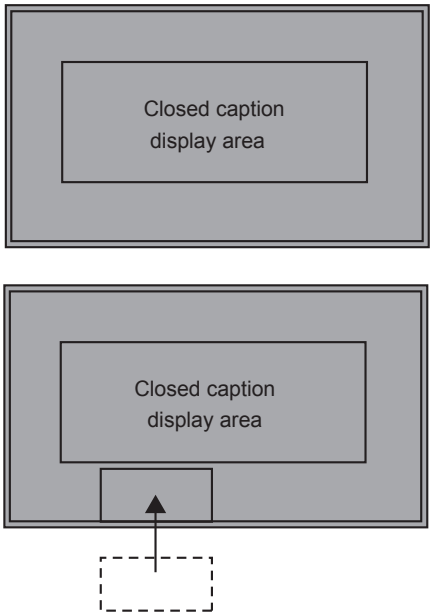
In VITC and LTC display mode:
- Displays the time code as follows.
  hours: minutes: seconds: frames
- In drop-frame mode, a different delimiter between seconds and frames is used.

<Note>
Read errors are displayed as “--:--:--:--”

In VUB and LUB display modes:
- BG8, BG7, BG6, BG5, BG4, BG3, BG2, BG1 appear in the stated order.
  BG: binary group
- The (:) delimiter does not appear.

<Note>
Read errors are displayed as “-- -- -- --”

Closed caption (CC) display

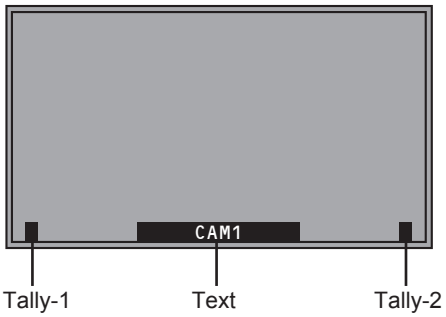


(When the specified window extends out of the entire screen)

- Closed caption can be displayed when SDI signals and VIDEO signals are input.
- Closed caption complies with the following standards.
  - Composite Standard EIA/CEA-608 (VBI), OP-42
  - SD-SDI CC Standard EIA/CEA-608 (ANC/VBI), OP-42
  - HD-SDI CC Standard EIA/CEA-608 (708), EIA/CEA-708, OP-47
- In the case of EIA/CEA-708, multiple windows can be displayed at specified positions (up to 8).
- The display position is within a display area that is located inside the entire screen. (Refer to the following notes.)
- The display settings can be configured in the menus. You can also select the type of closed caption, display channel (EIA/CEA-608), and display service (EIA/CEA-708) in the menus. (→page 40)

<Note>
- The specified window position is displayed as a position within the display area depending on the closed caption information.
- The window may extend out of the display area depending on the specified window position and size. In such a case, the window will be displayed but if the window also extends out of the entire screen, the display position of the window will be changed so that the window is displayed inside the entire screen.

In monitor display (IMD) display



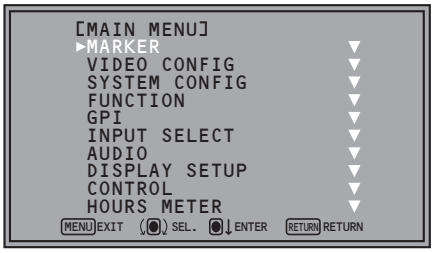
- This monitor supports the TSL UMD PROTOCOL (Ver. 3.1 and Ver. 4.0) and allows you to display text and the tally indication on the monitor using the RS-485 interface.
- For information on how to set IMD and communications, refer to pages 41 and 46.

How to Use the On Screen Menu

Main menu

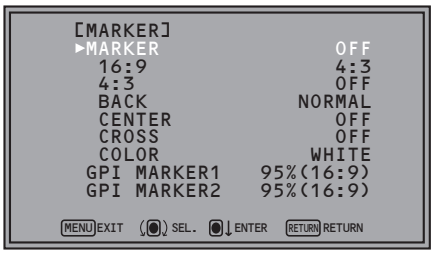
- For details on how to display MAIN MENU, refer to “Main menu, FUNCTION menu, INPUT SELECT menu indications” (→page15).

1. Turn the rotary knob to select a menu item and press the rotary knob.



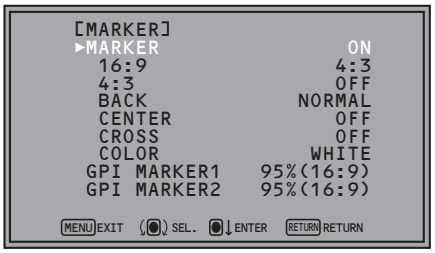
2. Turn the rotary knob to select a submenu and press the rotary knob.

- The settings in the submenu change to green.



3. Turn the rotary knob to select a set value and press the rotary knob.

- To cancel, press [RETURN] before pressing the rotary knob.



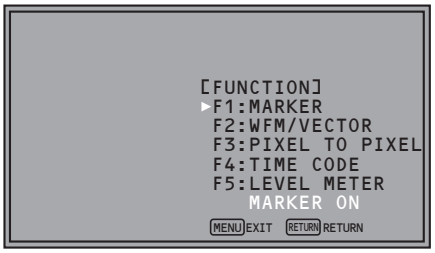
4. To return to the previous screen, press [RETURN].

FUNCTION menu

- For details on how to display the FUNCTION menu, refer to “Main menu, FUNCTION menu, INPUT SELECT menu indications” (→page15).

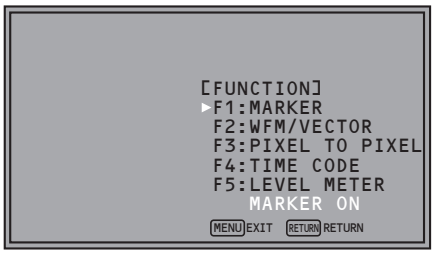
1. Turn the rotary knob to select a function item.

- Selected function item and set value appear in green.



2. Press the rotary knob.

- Each press of the rotary knob changes the set value and enables function operation.



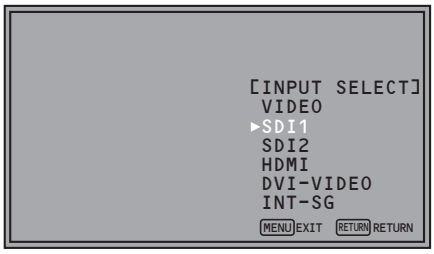
3. To return to the previous screen, press [RETURN].

INPUT SELECT menu

- For details on how to display the INPUT SELECT menu, refer to “Main menu, FUNCTION menu, INPUT SELECT menu indications” (→page15).

1. Turn the rotary knob to select an input signal or INT-SG and press the rotary knob.

- To cancel, press [RETURN] before pressing the rotary knob.



VIDEO:	Video input
SDI1:	Serial digital interface input
SDI2:	Serial digital interface input
HDMI:	HDMI input (HDCP compatible)
DVI-VIDEO*1:	DVI-I input (HDCP compatible)
INT-SG*2:	Internal chart for adjustment [Color Bar + Grayscale] (→page 55)

*1 The name of DVI-I input terminals vary with the menu setting and input signal status as shown in the table below.

Display	Menu setting (→page 38)			Input signal status (DVI-I terminal)
	DVI-I	DIGITAL	ANALOG	
DVI-AUTO	DIGITAL	AUTO	—	No input
				DIGITAL VIDEO input present
				DIGITAL COMP. input present
DVI-VIDEO	DIGITAL	VIDEO	—	—
DVI-COMP.		COMP.		
YPBPR	ANALOG	—	YPBPR	
RGB-COMP.			RGB-COMP.	

When DVI-I [DIGITAL] or DIGITAL [AUTO] is selected in a menu, the DVI-I input terminal name is displayed only as DVI-AUTO. INPUT NAME SETUP in the SYSTEM CONFIG menu cannot be used to change names.

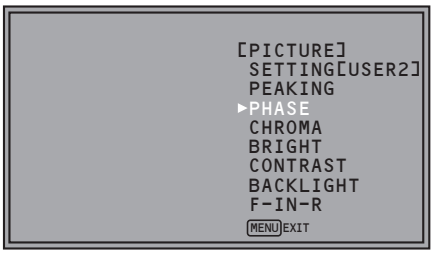
*2 It is not possible to switch to INT-SG in a split-screen display using the SUB WINDOW function (→page 34).

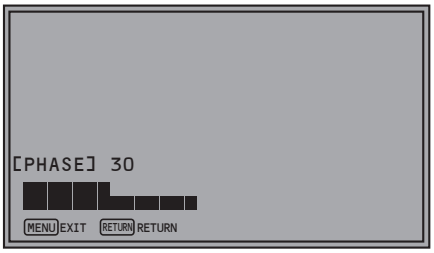
2. To return to the TOP MENU screen, press [RETURN].

Picture adjusting menu

1. Turn the rotary knob to select a menu item and press the rotary knob.

- The menu closes and the set values of the selected menu item appears.





Name	Function	Adjustable range ( ): Factory default
PEAKING	PEAKING	0 to 30 (0)
PHASE	PHASE	0 to 60 (30)
CHROMA	CHROMA	0 to 60 (30)
BRIGHT	BRIGHT	0 to 60 (30)
CONTRAST	CONTRAST	0 to 60 (50)
BACKLIGHT	BACKLIGHT	0 to 100 (80)
F-IN-R	FOCUS-IN-RED	0 to 30 (30)

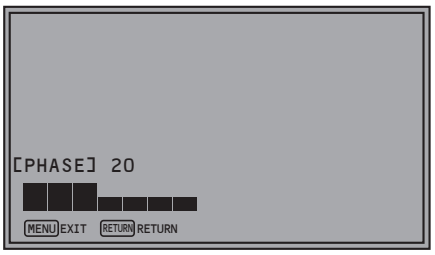
The text color of set values that are factory defaults is green and other values are white.

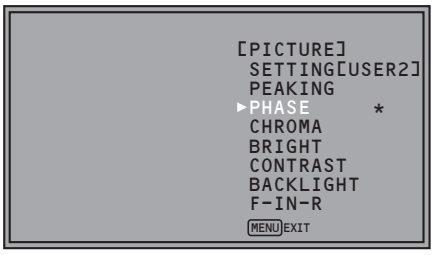
Set values are loaded when the monitor is turned on. However, operations and changes cannot be made in the following conditions.

- When the control lock is on, the key mark (🔑) appears and set values cannot be changed. (→page 41)
- When the MONO function is ON, [PHASE] and [CHROMA] operations are disabled. (→page 26)
- F-IN-R is enabled during operation of the FOCUS-IN-RED function.
- While operating HV DELAY (→page 30) (when set to any other setting than OFF), [BRIGHT] operation is disabled.
- The “CONTRAST” and “BACK LIGHT” operations are disabled in BLACK MODE.

2. Turn the rotary knob to select a set value and press the rotary knob.

- The set value is confirmed and the menu reappears.
- To cancel, press [RETURN] before pressing the rotary knob.





- A mark (*) appears beside menu names whose picture adjustments (PEAKING/CHROMA/PHASE/BRIGHT/CONTRAST/BACKLIGHT) have been changed from the values assigned using “SETUP LOAD” or “POWER ON SETUP”.

Audio volume

- For details on how to display the audio volume, refer to “Audio volume display” (→page15)

1. Turn the rotary knob to select a set value.

- Set value is confirmed when it is changed.
- Changing the audio volume when audio output is muted (“AUDIO MUTE” (→page30)) immediately cancels AUDIO MUTE.
- 🔇 is displayed when audio output of the monitor is muted.
- Audio volume is always available and is not affected by the “CONTROL” menu (→page 41)
- The adjustment range is 0 to 60 (the factory default is 0)

User Data

This unit can save up to five combinations of set values for main menu and screen adjustments made in the picture adjusting menu as user data that can be recalled. You can also return settings and adjustments to their factory defaults.
User data include the following settings.

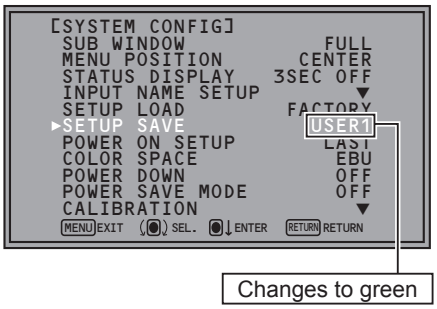
- Menu settings except “SETUP LOAD/SAVE” and “REMOTE in CONTROL” (including button function settings on the monitor front panel)
- Screen adjustments made with the picture adjusting knob

Saving user data

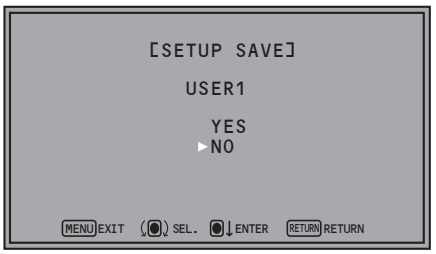
1. Press [MENU] to display the main menu.

2. Turn the rotary knob to select the “SYSTEM CONFIG” menu and press the rotary knob.

3. Turn the rotary knob to select the “SETUP SAVE” sub-menu and press the rotary knob.
The setting in the sub menu changes to green.



4. Turn the rotary knob to select settings to save from the “USER1” to “USER5” and press the rotary knob.
The following screen appears.



5. Select “YES” and press the rotary knob.
This saves the user data.

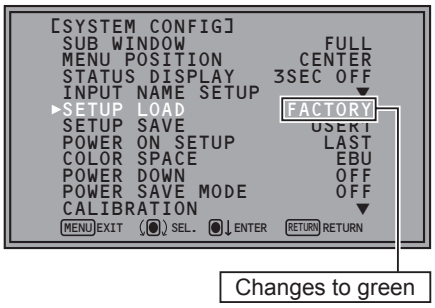
6. To return to the previous screen, press [RETURN].

Loading user data

1. Press [MENU] to display the main menu.

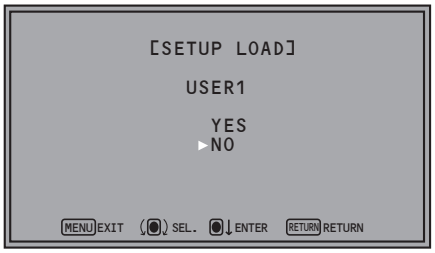
2. Turn the rotary knob to select the “SYSTEM CONFIG” menu and press the rotary knob.

3. Turn the rotary knob to select the “SETUP LOAD” sub-menu and press the rotary knob.
The setting in the sub menu changes to green.



4. Turn the rotary knob to select settings to load from the “USER1” to “USER5” and press the rotary knob.
The following screen appears.

- To return to the factory default, select “FACTORY.”

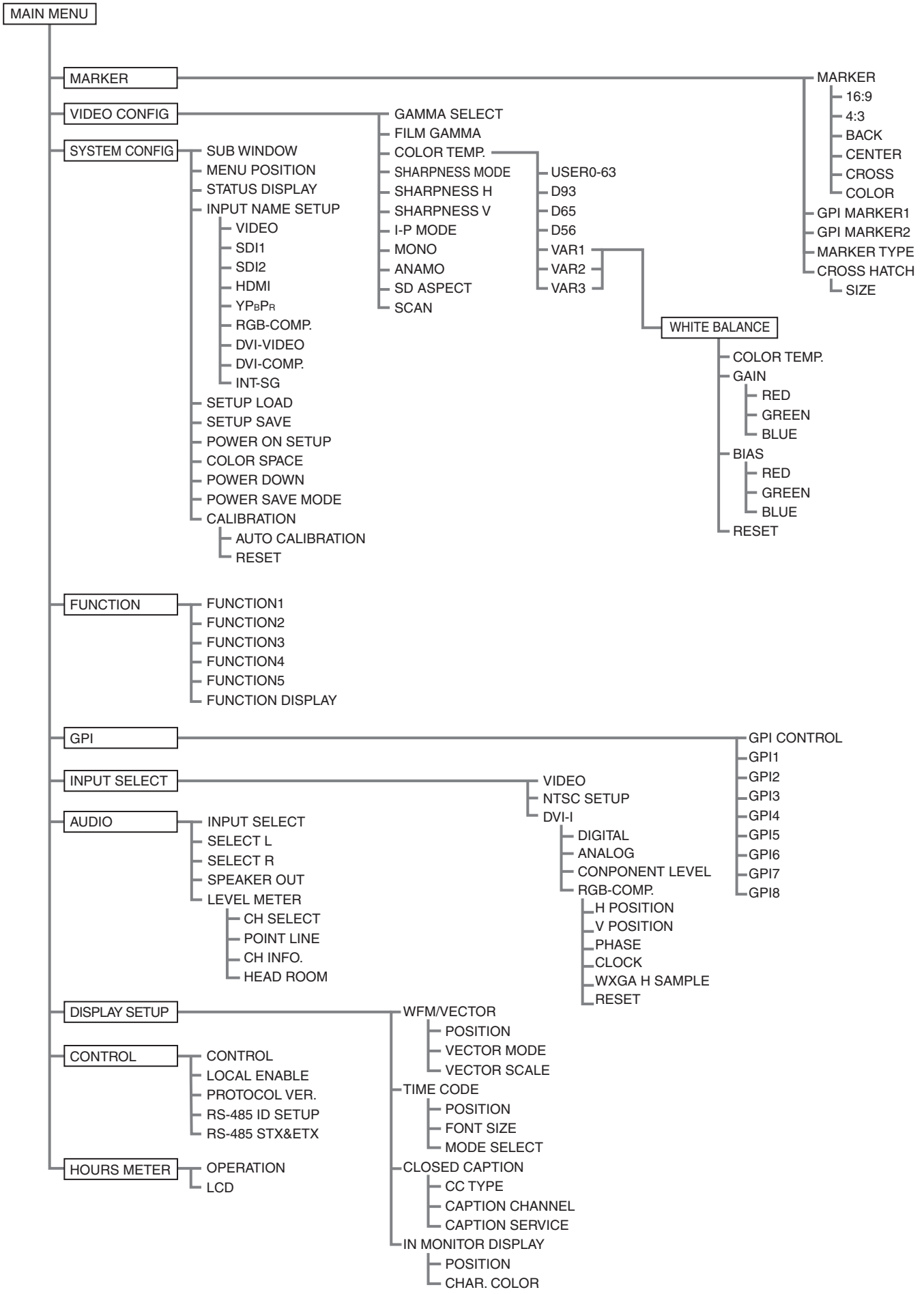


5. Select “YES” and press the rotary knob.
This loads the user data.

6. To return to the previous screen, press [RETURN].

Main menu

Menu configuration



MARKER

The underlined values are factory preset setting values.

Sub menu	Settings	Description
MARKER	OFF *1 ON	Enables the MARKER setting.
16:9 *2*3	OFF 4:3 13:9 14:9 CNSCO 2.39 CNSCO 2.35 2:1 VISTA 95% 93% 90% 88% 80% USER 85% VAR. H. 85% V. 85%	Selects/displays the marker type for when the angle of view of the displayed image is 16:9. <OFF> No marker display <4:3> 4:3 marker <13:9> 13:9 marker <14:9> 14:9 marker <CNSCO 2.39> 2.39:1 marker <CNSCO 2.35> 2.35:1 marker <2:1> 2:1 marker <VISTA> VISTA marker <95%> 95 % area marker <93%> 93.1 % area marker (TYPE1) 93 % area marker (TYPE2) <90%> 90 % area marker <88%> 89.5 % area marker (TYPE1) 88 % area marker (TYPE2) <80%> 80 % area marker <USER> An area marker that is adjustable in 1 % increments within a range of 80 to 100 %. However, when MARKER TYPE is TYPE1, 88 % and 93% indicate area markers whose height are 89.5 % and 93.1 %, respectively. (The factory preset setting value is 85 %.) <VAR.> This area marker can be varied in 1 % increments in the range between 80 % to 100 % separately for vertical and horizontal. (The factory default is 85 % for both vertical and horizontal)
4:3 *2*4	OFF 95% 93% 90% 88% 80% USER 85% VAR. H. 85% V. 85%	Selects/displays the marker type for when the angle of view of the displayed image is 4:3. <OFF> No marker display <95%> 95 % area marker <93%> 93 % area marker <90%> 90 % area marker <88%> 89 % area marker (TYPE1) 88 % area marker (TYPE2) <80%> 80 % area marker <USER> An area marker that is adjustable in 1 % increments within a range of 80 to 100 %. However, when MARKER TYPE is TYPE1, 88 % indicates an area marker whose height is 89 %. (The factory preset setting value is 85 %.) <VAR.> This area marker can be varied in 1% increments in the range between 80 % to 100 % separately for vertical and horizontal. (The factory default is 85 % for both vertical and horizontal)
BACK *2	NORMAL HALF BLACK	Selects the background brightness around the marker. <NORMAL> Normal background <HALF> 50 % background brightness <BLACK> 0 % background brightness (black)
CENTER *2	OFF ON	Displays the center marker. <OFF> Turns the display off <ON> Turns the display on

*1 This setting is turned “ON” when receiving marker control in REMOTE operation. (GPI, if set, has priority.)
*2 These settings are disabled when the GPI function (→page 44) is used to control the marker setting.
*3 These settings are enabled when the SD aspect setting for an HD signal and SD signal is 16:9 (→page 26 “SD ASPECT”)
*4 These settings are enabled when the SD aspect setting for an SD signal is 4:3 (→page 26 “SD ASPECT”)

Sub menu	Settings	Description
CROSS	OFF H. xxxx V. yyy	Displays the cross marker. <OFF> No marker display <H. xxxx V. xxx> Displays the marker Can be displayed for any location within the range of 20 to 1345 (horizontal), 20 to 747 (vertical). When a set value <H. xxxx V. xxx> has been confirmed, press the rotary knob again to set horizontal and vertical positions. (The factory default is set to H: 341 V: 192.)
COLOR	WHITE BLACK RED GREEN BLUE	Selects a marker color. <WHITE> white <BLACK> black <RED> red <GREEN> green <BLUE> blue
GPI MARKER1 *5 **GPI MARKER2** *5	4:3 13:9 14:9 CNSCO 2.39 CNSCO 2.35 2:1 VISTA 95% (16:9) 93% (16:9) 90% (16:9) 88% (16:9) 80% (16:9) USER (16:9) VAR. (16:9) 95% (4:3) 93% (4:3) 90% (4:3) 88% (4:3) 80% (4:3) USER (4:3) VAR. (4:3)	GPI MARKER1 : Selects the marker displayed by the GPI input terminal "MARKER1 ON/OFF" (→page37) operation. GPI MARKER2 : Selects the marker displayed by the GPI input terminal "MARKER2 ON/OFF" (→page37) operation. <4:3> 4:3 marker <13:9> 13:9 marker <14:9> 14:9 marker <CNSCO 2.39> 2.39:1 marker <CNSCO 2.35> 2.35:1 marker <2:1> 2:1 marker <VISTA> VISTA marker <95% (16:9) > 95 % area marker for 16:9 aspect ratio <93% (16:9) > 93 % area marker for 16:9 aspect ratio <90% (16:9) > 90 % area marker for 16:9 aspect ratio <88% (16:9) > 88 % area marker for 16:9 aspect ratio <80% (16:9) > 80 % area marker for 16:9 aspect ratio <USER (16:9) > User settings area marker for 16:9 aspect ratio <VAR. (16:9) > VAR. set area marker for 16:9 aspect ratio <95% (4:3) > 95 % area marker for 4:3 aspect ratio <93% (4:3) > 93 % area marker for 4:3 aspect ratio <90% (4:3) > 90 % area marker for 4:3 aspect ratio <88% (4:3) > 88 % area marker for 4:3 aspect ratio <80% (4:3) > 80 % area marker for 4:3 aspect ratio <USER (4:3) > User settings area marker for 4:3 aspect ratio <VAR. (4:3) > VAR. set area marker for 4:3 aspect ratio
MARKER TYPE *6	TYPE1 TYPE2	Selects conventional monitor or camera recorder marker size. <TYPE1> Conventional monitor marker size <TYPE2> Marker size compliant with the camera recorder (Panasonic made)
CROSS HATCH	OFF LOW HIGH	Turns the cross hatch grid on and off and sets its density. <OFF> No cross hatch grid display <LOW> Displays a dim cross hatch grid <HIGH> Displays a bright cross hatch grid
SIZE	SMALL LARGE	Selects the cross hatch grid size. <SMALL> 43 dots and 43 lines <LARGE> 86 dots and 86 lines

*5 Remote control via RS-232C ends in error (error response: ER001) when "GPI MARKER1" or "GPI MARKER2" is selected with the GPI function.

*6 Display size for SD signals differs.
TYPE1: The effective horizontal area meets the SMPTE125M for NTSC and ITU-R BT. 601-5 for PAL.
TYPE2: The effective horizontal area meets the EIA-RS170A for NTSC and ITU-R BT. 470-4 for PAL.

<Note>

- The marker is not displayed during 2-screen display (SUB WINDOW) and PIXEL TO PIXEL mode.

Types of MARKER

■ 16:9 marker

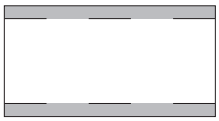
(Displayed for HD input and SD input with 16:9 aspect ratio.)
The marker is only displayed as a vertical bar. In addition, the ▬ section becomes the “MARKER BACK” item.

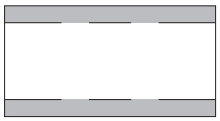
4:3 marker

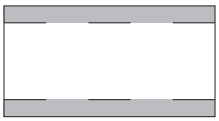
13:9 marker

14:9 marker

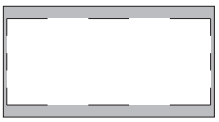
VISTA marker, 2:1 marker, CNSCO marker
A horizontal dotted line is displayed as the marker.

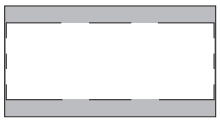

VISTA marker

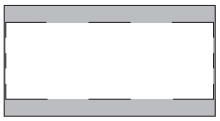

2:1 marker


CNSCO marker (2.35/2.39)

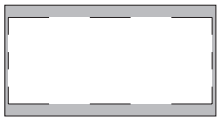
The vertical dotted lines are also displayed as the marker when “UNDER” is selected under “SCAN” in the “VIDEO CONFIG” menu.

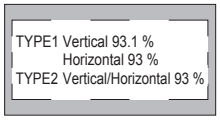

VISTA marker


2:1 marker

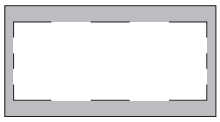

CNSCO marker (2.35/2.39)

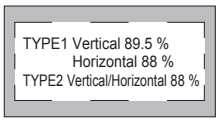
Area marker
A dotted line is displayed as the marker.


95 % Area marker

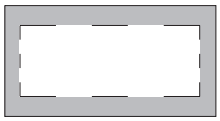


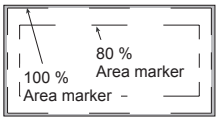
93 % Area marker


90 % Area marker



88 % Area marker

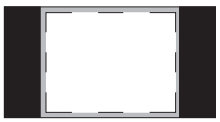

80 % Area marker



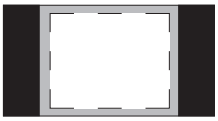
USER Area marker *1
VAR area marker*2

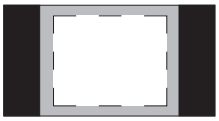
■ 4:3 marker

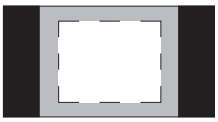
(Displayed for SD input in 4:3 aspect ratio mode)
This marker is displayed as a dotted line.


95 % Area marker

93 % Area marker

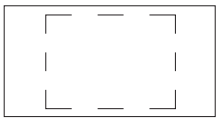

90 % Area marker

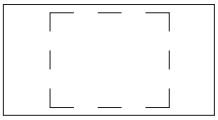

88 % Area marker

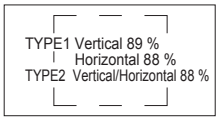

80 % Area marker

(Displayed for HD input and SD input in 16:9 ratio mode.)
This marker is displayed as a dotted line.

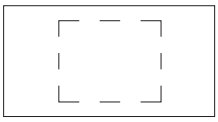
95 % Area marker

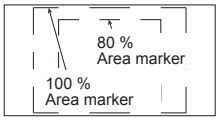

93 % Area marker


90 % Area marker



88 % Area marker

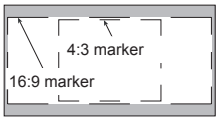

80 % Area marker



USER Area marker *1
VAR area marker*2

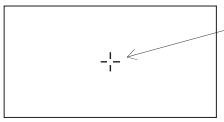
The following markers can be displayed simultaneously with the 16:9 marker.

Simultaneous display example
The ▬ section becomes the “MARKER BACK”.
It controls the background of the marker selected with a 16:9 ratio.



16:9 marker: 95 % area marker
4:3 marker: 80 % area marker

■ Center marker



Center marker
This marker is displayed at the center of the image.

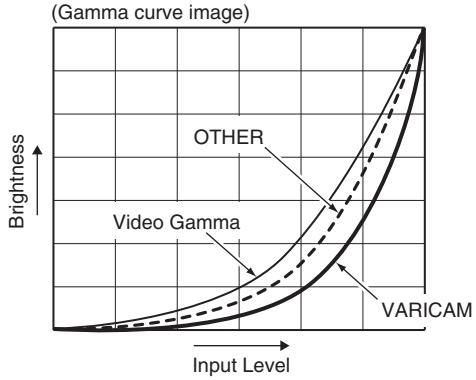
■ Cross marker

Cross marker
Use the rotary knob to move.
(The cross marker is half the length of the center marker and twice the width)

*1 Use the rotary knob to set 80 to 100 % in 1 % increments.
*2 Use the rotary knob to set 80 to 100 % in 1 % increments separately for vertical and horizontal.

VIDEO CONFIG

The underlined values are factory preset setting values.

Sub menu	Settings	Description
GAMMA SELECT *1*2	STANDARD FILM STDIO/PST	Selects gamma curve. <STANDARD> Standard mode (2.2 gamma value) <FILM> Film mode <STDIO/PST> Color emphasis mode (2.35 gamma value) • When FILM is selected, the FILM mark is displayed for the operating status.
FILM GAMMA	VARICAM OTHER	Selects type of FILM gamma mode. <VARICAM> For VARICAM use <OTHER> Other (Gamma curve image) 
COLOR TEMP.	USER 0 - 63 *3 D93 D65 D56 VAR1 VAR2 VAR3	Selects color temperature. <USER 0 - 63> Adjustable settings 0 - 63 (equivalent to a color temperature range of 3,000 K - 9,300 K) <D93> Equivalent to a color temperature of 9,300 K <D65> Equivalent to a color temperature of 6,500 K <D56> Equivalent to a color temperature of 5,600 K <VAR1> WB adjustment mode *4 <VAR2> WB adjustment mode *4 <VAR3> WB adjustment mode *4
SHARPNESS MODE *5	HIGH LOW	Selects the width of outline correction edge. <HIGH> Narrow edge <LOW> Wide edge
SHARPNESS H *5	0 - 30	Sets horizontal outline correction. The item display moves to the lower part of the screen during adjustment.
SHARPNESS V *5	0 - 30	Sets vertical outline correction. The item display moves to the lower part of the screen during adjustment.
I-P MODE *6	MODE1 MODE2	Selects IP conversion mode. (see “IP mode” (→page 26).) <MODE1> Intra-frame interpolation <MODE2> Intra-field interpolation

*1 In split-screen display, changes are not reflected to the still image in the main window.
*2 This menu is grayed out when the same item is assigned to the GPI input terminal pin and GPI CONTROL is set to ENABLE.
*3 When selecting USER 0 - 63
1) Push the rotary knob (USER changes to blue).
2) Use the rotary knob to select 0 to 63 and press the rotary knob.
*4 Selecting “VAR1”, “VAR2” and “VAR3” engages the WB adjustment mode (→page 26).
*5 The following sharpness values are available and the settings for the selected input signal is displayed.
Adjustment status during selection appears at the bottom left of the screen.
1) VIDEO system input (VIDEO) (the factory defaults are SHARPNESS MODE: LOW and SHARPNESS H/V: 0)
2) HD inputs other than (1) above (the factory defaults are SHARPNESS MODE: HIGH and SHARPNESS H/V: 0).
3) SD inputs other than (1) above (the factory defaults are SHARPNESS MODE: LOW and SHARPNESS H/V: 0).
*6 To use the “SUB WINDOW” (→page 34) function,
1) Change settings after exiting the “SUB WINDOW” function.
2) It is recommended to use “MODE2” for handling fast video.

(Continued on next page)

Sub menu	Settings	Description
MONO *2	OFF ON	Switches between color and monochrome (MONO). <OFF> Color <ON> Monochrome • When ON, the CHROMA setting of the picture adjusting knob is fixed at 0.
ANAMO *7	OFF ON	With an Anamo lens and HD-SDI input, the picture is resized to Anamo magnification (the vertically enlarged signal can be vertically compressed and corrected for display).
SD ASPECT *2	4:3 16:9	Sets the aspect ratio for SD signal input. <4:3> 4:3 display <16:9> 16:9 display
SCAN *2*7	NORMAL UNDER	Sets under-scan and normal display. <NORMAL> Normal display <UNDER> Under-scan

*2 This menu is grayed out when the same item is assigned to the GPI input terminal pin and GPI CONTROL is set to ENABLE.
*7 "SCAN" changes are not reflected in Anamo size display.

IP mode
"MODE1" performs IP conversion using intra-frame interpolation.
This monitor suppresses the delay to within 1 field.
The factory default is "MODE1".
"MODE2" performs IP conversion using intra-field interpolation.
Since interpolation is performed only inside a field, this mode is suitable for checking interlace status.

■ WB (WHITE BALANCE) adjustment mode

Select "VAR1" to "VAR3" for "COLOR TEMP." in the "VIDEO CONFIG" menu to make "WHITE BALANCE VAR1" to "WHITE BALANCE VAR3" (WB) adjustments.

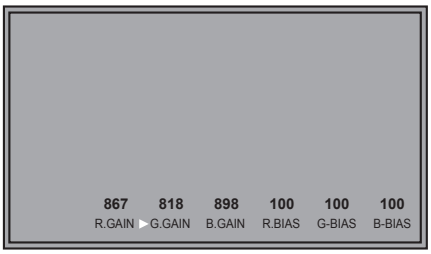
The underlined values are factory preset setting values.

Sub menu	Settings	Description
COLOR TEMP.[*8]	USER 0 - 63 D93 D65 D56	Selects the color temperature that will become the basis for adjustment. <USER 0 - 63> Adjustable settings 0 - 63 (equivalent to a color temperature range of 3,000 K - 9,300 K) <D93> Equivalent to a color temperature of 9,300 K <D65> Equivalent to a color temperature of 6,500 K <D56> Equivalent to a color temperature of 5,600 K
GAIN	▼	Adjusts the GAIN elements Press the rotary knob to switch to RGB direct adjustment mode. (This allows you to begin adjusting GAIN first.)
RED	0 - 1023 (Factory defaults are color temperature <D65> values.) • These are the adjustments made before shipment from the factory.	Displays the GAIN elements for RED. (For numerical value confirmation)
GREEN		Displays the GAIN elements for GREEN. (For numerical value confirmation)
BLUE		Displays the GAIN elements for BLUE. (For numerical value confirmation)
BIAS	▼	Adjusts the BIAS elements Press the rotary knob to switch to RGB direct adjustment mode. (This allows you to begin adjusting BIAS first.)
RED	- 512 - 511 (Factory default: 0)	Adjusts the BIAS elements for RED. (For numerical value confirmation)
GREEN		Adjusts the BIAS elements for GREEN. (For numerical value confirmation)
BLUE		Adjusts the BIAS elements for BLUE. (For numerical value confirmation)
RESET	▼	Resets "GAIN RED" - "BIAS BLUE" to color temperature values selected under "COLOR TEMP."

*8 Selecting "COLOR TEMP." and pressing the rotary knob after making a change, opens a confirmation screen. Selecting "YES" and pressing the rotary knob in this screen resets selected GAIN and BIAS values to the selected color temperature values.

■ **GAIN/BIAS RGB direct adjustment mode**

Press the rotary knob when the “GAIN” or “BIAS” item is selected in the WHITE BALANCE VAR (1 to 3) menu, to switch to the adjusting screen and use the rotary knob to directly adjust RGB while checking the picture.
If “WHITE BALANCE” is assigned to FUNCTION1 to FUNCTION5, this mode can also be accessed from the FUNCTION buttons or the FUNCTION menu.



- To adjust GAIN and BIAS, turn the rotary knob to select items (lower row) and change numbers (upper row). Turn the rotary knob to select items and press it to move the cursor (▶) to the upper row to change numbers.
- Turn the rotary knob to change numbers and press it to enter them and move to the lower row.
- Pressing [MENU] in this adjusting screen returns the user to a normal screen without a menu. *9
  At this time, numbers that are being changed are not confirmed.
- Pressing [RETURN] in this adjusting screen (when the cursor (▶) is in the lower row) opens the following screen. The displayed screen is one of two kinds depending on how the direct adjusting mode was opened.
  (1) WHITE BALANCE VAR 1-3
  When opened from the VIDEO CONFIG screen in the main menu
  (2) “FUNCTION” menu
  When opened from the “FUNCTION” menu
- Pressing [RETURN] in this adjusting screen (when the cursor (▶) is in the upper row) moves the cursor (▶) to the lower row.
  At this time, numbers that are being changed are not confirmed.

*9 The WB (white balance) adjustment menu reappears after 10 seconds of inaction. However, when called using the FUNCTION button, a normal screen without a menu reappears.

SYSTEM CONFIG

The underlined values are factory preset setting values.

Sub menu	Settings	Description
SUB WINDOW	FULL PART	Selects sub-window type. <FULL> Reduces the entire images for both input signals and places them side by side. <PART> Cuts out the center of the images for both input signals and places them side by side (the images are shown at their original size).
MENU POSITION	CENTER LT RT RB LB	Positions the on-screen menu. <CENTER> Center of the screen <LT> Left Top <RT> Right Top <RB> Right Bottom <LB> Left Bottom
STATUS DISPLAY	OFF 3SEC OFF CONTINUE	Sets the display state of the operating status display (→page 14). <OFF> Not displayed. <3SEC OFF> Displayed for 3 seconds after a status change.*1 <CONTINUE> Displayed at all times
INPUT NAME SETUP	▼	Changes the name of displayed input terminals in status display screens.*2
SETUP LOAD	FACTORY USER1 *3 USER2 *3 USER3 *3 USER4 *3 USER5 *3	Loads saved factory defaults (FACTORY) or user data (USER1 - USER5) (→page 20). After loading user data, the screen displays the signal selected before user data was loaded.
SETUP SAVE	USER1 USER2 USER3 USER4 USER5	Up to 5 sets of user data can be saved (→page 20). Menu settings, except “SETUP SAVE/SETUP LOAD”, and adjustment values made with the picture adjusting knob can be saved.

*1 When PIXEL TO PIXEL, the 3SEC OFF setting becomes equivalent to CONTINUE.
*2 Up to 9 characters can be entered for this unit. Only alphabetic characters (English), numeric characters and symbols can be used.
*3 The settings of USER1 to USER 5 and FACTORY are the same at the time of shipment from the factory.

(Continued on next page)

Sub menu	Settings	Description
POWER ON SETUP	LAST FACTORY USER1 USER2 USER3 USER4 USER5	Selects the settings used when the power is turned on. <LAST> Starts in the mode used when the power was last turned off. <FACTORY> Starts up using the factory defaults. <USER1 - 5> Starts up using USER registered settings.
COLOR SPACE	SMPTE-C *4 EBU *5 ITU-709 *6	Sets the studio standard color space.
POWER DOWN	OFF ON	Determines whether or not the power will be turned off (power down) when there is no signal input and the unit has been idle for a certain period of time. <OFF> The unit is not powered down. <ON> The unit is powered down.
POWER SAVE MODE	OFF ON	Sets the power save mode. <OFF> POWER SAVE MODE is not engaged. <ON> The backlight dims when no signal (NO SIGNAL) is input for 60 seconds or longer. Signal input or menu operation will return the backlight to its normal brightness.
CALIBRATION	▼	Connect Display Color Analyzer CA-310 and then perform calibration. This also allows you to restore the calibration data to the factory preset setting values. (→pages 28 to 30)

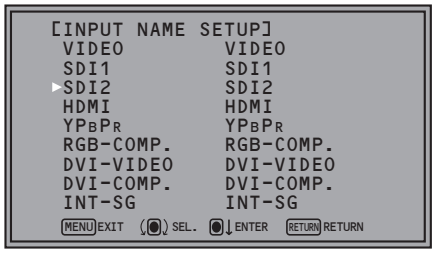
*4 Factory default setting for the BT-LH1850P.
*5 Factory default setting for the BT-LH1850E.
*6 ITU-709 indicates the ITU-R BT.709 standard.

■ INPUT NAME SETUP

The "INPUT NAME SETUP" function allows you to change the names of the input lines (VIDEO, SDI1, SDI2, HDMI, DVI-I (YPBPR/RGB-COMP./DVI-VIDEO/DVI-COMP.), INT-SG) that are displayed in status or other indications.

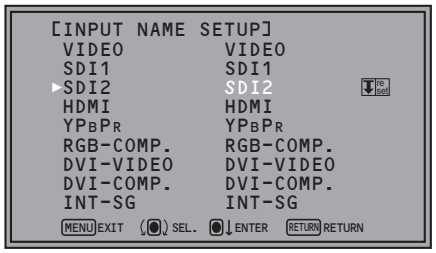
1. Turn the rotary knob in the "SYSTEM CONFIG" menu to select the "INPUT NAME SETUP" submenu and press the rotary knob.

2. Turn the rotary knob to select the name of the input line you want to change and press the rotary knob.



3. Turn the rotary knob to select the characters you want to change*7 and press the rotary knob to enter them.

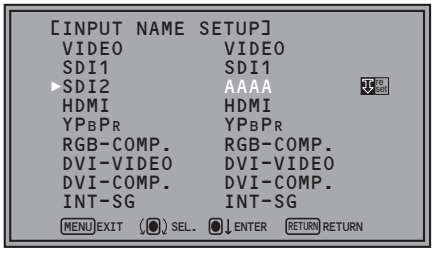
- The selected characters are highlighted and change to italics when entered.



*7 The "B" and "R" in YPBPR cannot be selected.

4. Turn the rotary knob to enter the characters and press the rotary knob to confirm them.

- After entering all display characters, select ⇩ and press the rotary knob to confirm them.



- Selecting reset and pressing the rotary knob cancels the entered characters and returns them to their default values.

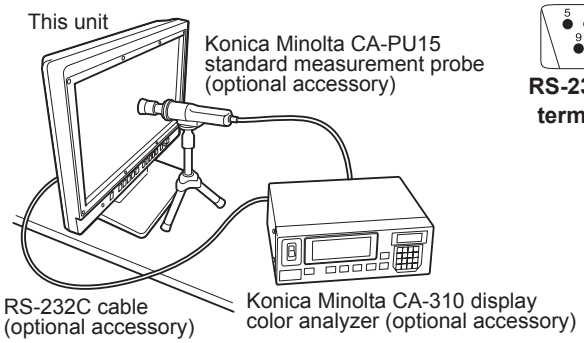
- To cancel a setting, press RETURN before pressing the rotary knob to set the display characters.

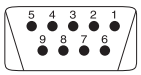
■ CALIBRATION

The CALIBRATION function in this unit measures LCD panel characteristics from low to high brightness values and internal monitor processing handles CALIBRATION.
CALIBRATION does not rely on image quality settings since internal signals are used for a calibration. CALIBRATION in this unit is made at D65 color temperature and other color temperatures are results calculated automatically from this value.

■ **Equipment required for calibration**

- Konica Minolta CA-310 display color analyzer (optional accessory)
- Konica Minolta CA-PU12 or CA-PU15 standard measurement probe (optional accessory)
- A RS-232C cable (male to male, straight) (optional accessory)
  Connect the RS-232C input terminal on this unit to the RS-232C terminal on the display color analyzer using a straight cable.
- Set the Baud rate of the display color analyzer to 38,400.





RS-232C input terminal (9P)

Analyzer Side		(Straight)	On the monitor	
Pin number	**Signal**		**Pin number**	**Signal**
1	CD		1	N.C.
2	RXD	←	2	TXD
3	TXD	→	3	RXD
4	DTR	→	4	DSR
5	GND	—	5	GND
6	DSR	←	6	DTR
7	RTS	→	7	CTS
8	CTS	←	8	RTS
9	GND		9	N.C.

- Turn on this unit and perform adequate aging (approx. 1 hour) before starting calibration.
- Make the room dark so that no external light can enter the standard measurement probe before starting the calibration. If external light enters the probe, the low brightness characteristics may not be calibrated correctly.
- LCD panel characteristics and instrument error in the display color analyzer may sometimes result in small differences in values after calibration.
  To further fine tune the monitor, set GAIN and BIAS for R, G and B in the VAR mode of COLOR TEMP.
- Do not apply the probe to a WFM/VECTOR display on the screen.
- If you are using CA-210, consult the supplier of the unit.

■ **CALIBRATION**

Select “CALIBRATION” in the “SYSTEM CONFIG” menu to open the following menus.

Sub menu	Settings	Description
AUTO CALIBRATION *8	▼	Connect a CA-310 display color analyzer and use this submenu to make a calibration. Select “AUTO CALIBRATION” and select “YES” in the confirmation screen that appears to start calibration.
RESET *9	▼	Returns calibration data to their factory defaults. Select “RESET” and select “YES” in the confirmation screen that appears to return calibrated values to their factory defaults.

*8 “EXECUTING” is displayed during “AUTO CALIBRATION” and “COMPLETE” appears when calibration ends. “INCOMPLETE” appears if calibration could not be completed.

*9 When “RESET” ends, “COMPLETE” appears.

Performing AUTO CALIBRATION

1. Turn the rotary knob in the “SYSTEM CONFIG” menu to select the “CALIBRATION” submenu and press the rotary knob.

2. Turn the rotary knob to select the AUTO CALIBRATION submenu and press the rotary knob.

3. Select “YES” and press the rotary knob.

This starts calibration.

xxxxxxxxx indicates that one of the following messages with the meaning listed below appears.

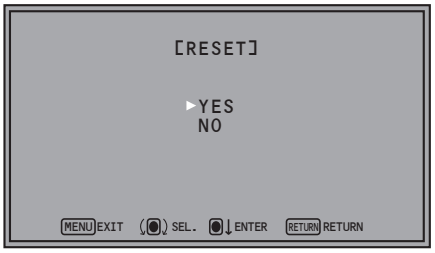
EXECUTING:	Operation in progress
COMPLETE:	Operation completed
INCOMPLETE:	Operation incompleted. (Check the RS-232C connection or display color analyzer connection.)

4. Turn the power off and then on after performing auto calibration.

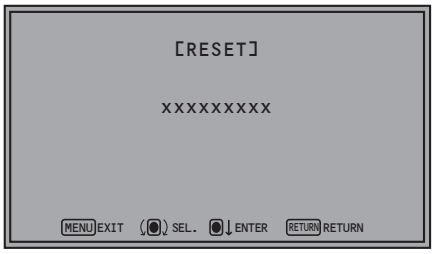
RESET operation

1. Turn the rotary knob in the "SYSTEM CONFIG" menu to select the "CALIBRATION" submenu and press the rotary knob.

2. Turn the rotary knob to select the "RESET" submenu and press the rotary knob.



3. Select "YES" and press the rotary knob.
This starts calibration.



xxxxxxxxx indicates that the following message with the meaning listed below appears.
COMPLETE: Operation completed

4. Turn the power off and then on after performing reset operation.

FUNCTION

The underlined values are factory preset setting values.

Sub menu	Settings	Description
FUNCTION 1 - FUNCTION 5	HV DELAY BLUE ONLY GAMMA SELECT SD ASPECT SCAN SUB WINDOW WFM/VECTOR MARKER WHITE BALANCE PIXEL TO PIXEL PIXEL POSITION FOCUS-IN-RED LEVEL METER CROSS HATCH MONO BLACK MODE TIME CODE CLOSED CAPTION AUDIO MUTE UNDEF (Factory defaults FUNCTION1: MARKER FUNCTION2: WFM/VECTOR FUNCTION3: PIXEL TO PIXEL FUNCTION4: TIME CODE FUNCTION5: LEVEL METER)	Selects functions to be assigned to [FUNCTION1] - [FUNCTION5] (front panel buttons) or the FUNCTION menu. <HV DELAY> *1 Displays the image blanking period. The display changes in the following order. DELAY OFF → H DELAY → V DELAY → HV DELAY → DELAY OFF <BLUE ONLY> *1 Cuts the red and green signals. Use this function to check phase and chroma. This button toggles between ON and OFF. <GAMMA SELECT>*2*3 Selects the gamma curve. The display changes in the following order. GAMMA STANDARD → GAMMA FILM → GAMMA STDIO/PST → GAMMA STANDARD <SD ASPECT> *2*3 Switches between "16:9" and "4:3." <SCAN> *2*3 Switches between "UNDER SCAN" and "NORMAL SCAN". <SUB WINDOW> *1 Sets the split-screen function. The display changes in the following order. SINGLE → FULL/PART → STILL → SINGLE <WFM/VECTOR> *2 Displays waveform or vector display. For details on the available operation items, refer to page 33. <MARKER> *2*3*4 Turns the marker on and off. For details on the available operation items, refer to page 33. <WHITE BALANCE> WHITE BALANCE GAIN/BIAS RGB direct adjustment can only be accessed when VAR1 to VAR3 are selected in COLOR TEMP. <PIXEL TO PIXEL> Turns the PIXEL TO PIXEL function On and Off. <PIXEL POSITION> Positions the display of signals in PIXEL TO PIXEL mode.

*1 The settings are cancelled when the power is turned OFF.
*2 If these settings are changed, the menu settings will also change.
*3 The control settings do not operate during GPI operation.
*4 Not displayed when "16:9", "4:3" and "CENTER" are all "OFF" in the MARKER menu settings.

Sub menu	Settings	Description
(From the previous page)		<FOCUS-IN-RED> *3*5 Turns On/Off the function that highlights in red the section of the image that is being focused. <LEVEL METER> *2 Turns the AUDIO LEVEL METER display On and Off. <CROSS HATCH> *2 Displays the cross hatch grid. The display changes in the following order. CROSS HATCH OFF → CROSS HATCH LOW → CROSS HATCH HIGH <MONO> *2*3 Switches between color and monochrome. <BLACK MODE> *1*6 This mode is for reducing floating black and checking the gradation of dark sections. The brightness of the backlight is reduced and the contrast is increased so that up to 75 % of the input signal level has the same gamma curve as the set GAMMA SELECT. The signal level on or above that is clipped at 75 %. <TIME CODE> *2 Turns the time code display on and off. <CLOSED CAPTION> *2 Turns the closed caption display on and off. For details on the available operation items, refer to page 33. <AUDIO MUTE> Turns on or off the audio MUTE function. <UNDEF> Undefined
FUNCTION DISPLAY *7	OFF ON1 ON2 *8	Selects display of functions assigned to [FUNCTION1] - [FUNCTION5] (front panel buttons). It also selects button action (1-touch, 2-touch, off). <OFF> 1-touch action to perform functions. Functions are not displayed. <ON1> 1-touch action to display and perform functions. <ON2> 2-touch action to display and perform functions.

• Pressing the [FUNCTION1] to [FUNCTION5] buttons will not activate FUNCTION operation when the rotary knob is used for picture adjustments.

*1 The settings are cancelled when the power is turned OFF.
*2 If these settings are changed, the menu settings will also change.
*3 The control settings do not operate during GPI operation.
*5 During FOCUS-IN-RED operation, use the rotary knob to change the detection sensitivity. The setting range is from 0 to 30, with a higher numerical value resulting in higher detection sensitivity (the focus becomes worse).
*6 The bright picture is clipped. The back light and contrast cannot be adjusted.
*7 The operating status is displayed regardless of the ON/OFF setting.
*8 The function displayed with the ON2 setting can be operated with a button only during the time that it is displayed.

■ **FUNCTION setting restrictions**

Under the following conditions, “INVALID FUNCTION” is displayed and the settings cannot be configured.

Settings	Inoperable Condition or Mode
HV DELAY	• SUB WINDOW • WFM • PIXEL TO PIXEL • During DVI-I (digital or analog signal PC) input • When HDMI (640 x 480) input • When INT-SG is selected
GAMMA SELECT	• When GPI is set • During DVI-I (digital or analog signal PC) input • When HDMI (640 x 480) input
SD ASPECT	• When GPI is set • SUB WINDOW (Still image) • When HD signal input • During DVI-I (digital or analog signal PC) input • When HDMI (640 x 480) input
SCAN	• When GPI is set • SUB WINDOW • PIXEL TO PIXEL • During DVI-I (digital or analog signal PC) input • When HDMI (640 x 480) input
SUB WINDOW	• During DVI-I (digital or analog signal PC) input • When HDMI (640 x 480) input
WFM/VECTOR	(VECTOR is not displayed when other than SDI1 or SDI2 input) • SUB WINDOW • PIXEL TO PIXEL • During DVI-I (digital or analog signal PC) input • When HDMI (640 x 480) input • When INT-SG is selected
MARKER	• When GPI is set • SUB WINDOW • PIXEL TO PIXEL • During DVI-I (digital or analog signal PC) input • When HDMI (640 x 480) input
WHITE BALANCE	When other than VAR1 to VAR3 selected in COLOR TEMP.
PIXEL TO PIXEL	(Enabled when HD signal input) • When other than HD signal input • During GPI setting • SUB WINDOW • During DVI-I (digital or analog signal PC) input • During HDMI (640 x 480) input • During INT-SG selection
PIXEL POSITION	During input other than HD signal input
FOCUS-IN-RED	• When GPI is set • When INT-SG is selected • When BLUE ONLY ON is selected • SUB WINDOW • During DVI-I (digital or analog signal PC) input • During HDMI (640 x 480) input • During NO SIGNAL input
MONO	• When GPI is set • When HDMI (640 x 480) input
TIME CODE	When other than HD-SDI input
CLOSED CAPTION	• During DVI-I (digital or analog signal PC) input • When HDMI (640 x 480) input
BLACK MODE	During NO SIGNAL input

■ Functions displayed during FUNCTION button operation

Pressing any of the [FUNCTION1] to [FUNCTION5] buttons displays the operations assigned to each button as shown below.

- **HV DELAY**
  DELAY OFF/H DELAY/V DELAY/HV DELAY
- **BLUE ONLY**
  BLUE ONLY ON/BLUE ONLY OFF
- **GAMMA SELECT**
  GAMMA STANDARD/GAMMA FILM/
  GAMMA STDIO/PST
- **SD ASPECT**
  4:3/16:9
- **SCAN**
  NORMAL SCAN/UNDER SCAN
- **SUB WINDOW**
  SINGLE/FULL/PART/STILL
- **WFM/VECTOR**
  WFM/VECTOR OFF/WFM Y ON/WFM R ON/
  WFM G ON/WFM B ON/VECTOR×1/VECTOR×2S/
  VECTOR×2/VECTOR×4/VECTOR×8
- **MARKER**
  MARKER OFF/4:3 MARKER/
  13:9 MARKER/14:9 MARKER/
  CNSCO2.39 MARKER/CNSCO2.35 MARKER/
  2:1 MARKER/VISTA MARKER/95 % MARKER/
  93 % MARKER/90 % MARKER/88 % MARKER/
  80 % MARKER/
  xx% MARKER (xx % is a USER setting value of 80 % to 100 %)/
  xx%/xx% MARKER (xx % is the VAR setting for 80 to 100 % when set vertical value and horizontal value separately.)/
  MARKER ON
  - When the setting values of both “16:9” and “4:3” are set to other than “OFF” in the “MARKER” menu settings, the setting value of “16:9” is displayed in the first half section, and the setting value of “4:3” is displayed in the second half section.
- **PIXEL TO PIXEL**
  PIXEL TO PIXEL OFF/PIXEL TO PIXEL CENTER/
  PIXEL TO PIXEL LT/PIXEL TO PIXEL RT/
  PIXEL TO PIXEL RB/PIXEL TO PIXEL LB
- **PIXEL POSITION**
  PIXEL TO PIXEL CENTER/PIXEL TO PIXEL LT/
  PIXEL TO PIXEL RT/PIXEL TO PIXEL RB/
  PIXEL TO PIXEL LB
- **FOCUS-IN-RED**
  FOCUS-IN-RED OFF/FOCUS-IN-RED ON
- **LEVEL METER**
  METER OFF/METER 2CH/METER 4CH/
  METER 8CH
- **CROSS HATCH**
  CROSS HATCH HIGH/CROSS HATCH LOW/
  CROSS HATCH OFF
- **MONO**
  MONO ON/MONO OFF
- **TIME CODE**
  LTC/VITC/LUB/VUB/TC OFF
- **BLACK MODE**
  BLACK MODE OFF/BLACK MODE ON
- **CLOSED CAPTION**
  CC1/CC2/CC3/CC4/CC OFF
  (SRV1/SRV2/SRV3/SRV4/SRV5/SRV6/CC OFF)
  (OP-42/CC OFF)
  (OP-47/CC OFF)
  - The displayed items differ depending on the selection for CC TYPE.
- **AUDIO MUTE**
  AUDIO MUTE OFF/AUDIO MUTE ON

<Note>
WHITE BALANCE is switched to adjustment mode with a FUNCTION button, and the indication that indicates the operation is not displayed.

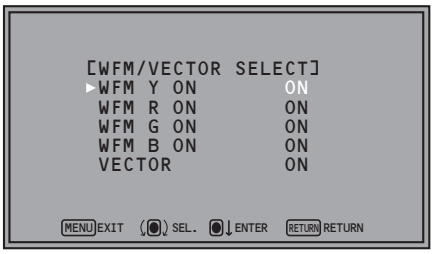
■ FUNCTION skip function

This function allows you to skip some of the functions assigned to FUNCTION during FUNCTION operation.
When functions are assigned to [FUNCTION1] to [FUNCTION5] in the FUNCTION menu, a submenu that allows you to skip function settings appears. Turn OFF the setting you want to skip during FUNCTION operation.

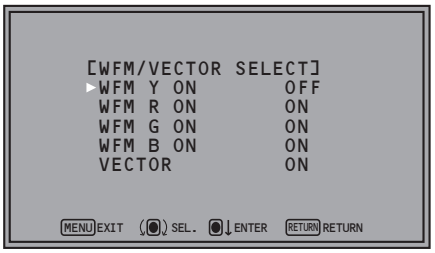
Submenus appear for the following functions.
HV DELAY, GAMMA SELECT, WFM, VECTOR, PIXEL POSITION and CROSS HATCH

<<Setup example>>
Select WFM/VECTOR in the FUNCTION menu and press the rotary knob to open the submenu shown below.

1. Turn the rotary knob to select the setting you want to skip and press the rotary knob.
- The set value changes to green.



2. Turn the rotary knob to select OFF and press the rotary knob.



3. Press RETURN
- The submenu closes and the FUNCTION menu reappears.

■ **HV DELAY**

This displays the blanking period. Each press of the button changes the display as follows: H blanking display → V blanking display → H and V blanking display → no blanking display.

■ **SUB WINDOW**

Use the "SUB WINDOW" function to split the screen (main window) in two as shown below to enable comparison of a recorded still image with live video.

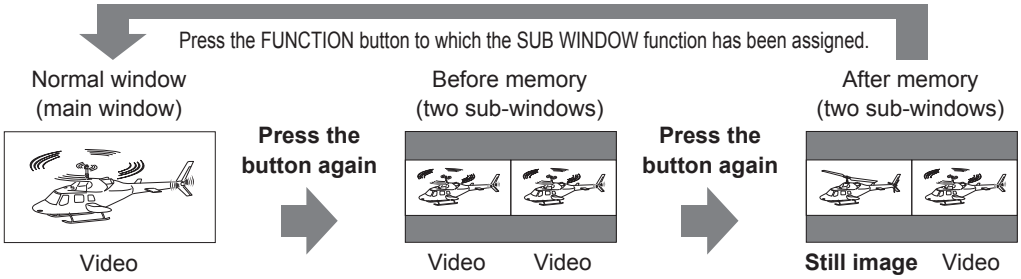
Depending on the SUB WINDOW setting (FULL, PART) in the SYSTEM CONFIG menu (→page 27) the screen switches as shown below. The screen switches at each press of a ([FUNCTION1] to [FUNCTION5] (→page 11)) button to which a SUB WINDOW function has been assigned.

• This assumes that the SUB WINDOW function has been assigned to any of the [FUNCTION1] to [FUNCTION5] buttons.

To setup "I-P MODE" (→page 25), exit the SUB WINDOW function first.

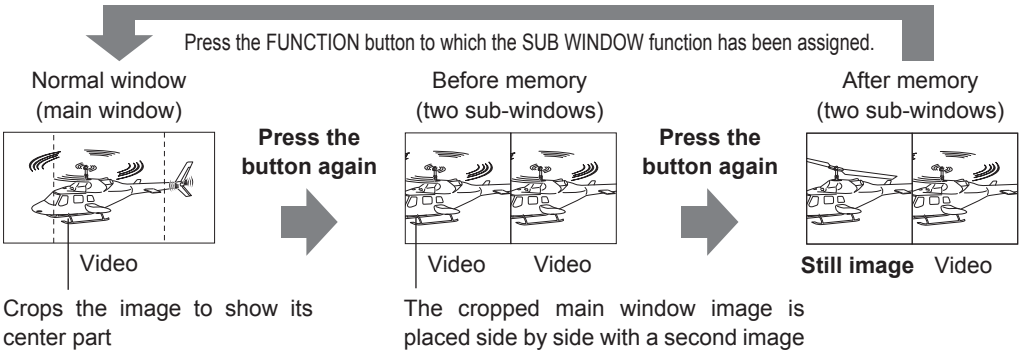
• **FULL**

Resizes the main window to also display a second window (two sub-windows).



• **PART**

Resizes the main window to show only its center to also display a second image (two sub-windows).



These examples show 16:9 aspect ratio images.

Note on FULL/PART selection

This function is designed to enable comparison of identical formats input to the same input terminal. Input of different formats via different input channels may distort the sub-window (left side, still image) or blanking could occur. However, input of an identical format signal to the input terminal during still image acquisition will display correctly.

■ **WFM/VECTOR**

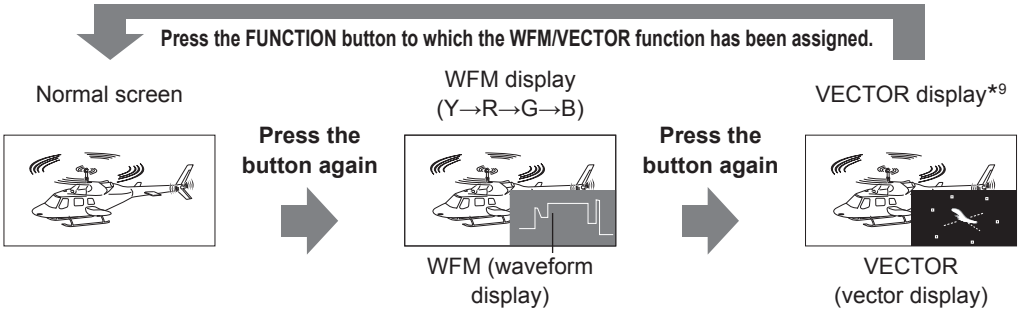
The WFM/VECTOR function enables display of the waveform and vector display. Use DISPLAY SETUP in the main menu to select WFM and VECTOR display. (→page 40)

Press the button ([FUNCTION1] to [FUNCTION5] (→page 11)) to which the WFM/VECTOR function has been assigned to switch the display in the following order.

WFM/VECTOR OFF → WFM Y ON → WFM R ON → WFM G ON → WFM B ON → VECTOR (x1 to x8)

• This assumes that the WFM/VECTOR function has been assigned to any of the [FUNCTION1] to [FUNCTION5] buttons.

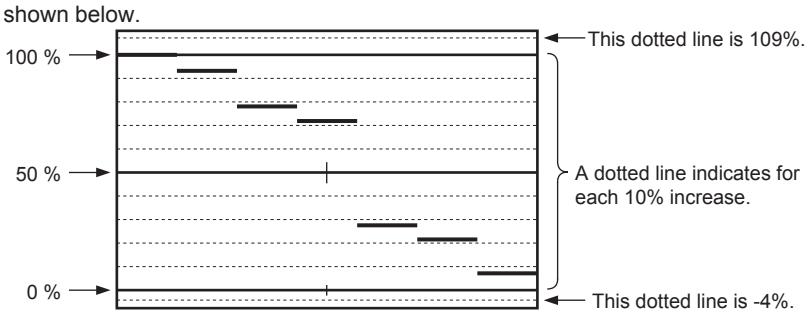
WFM is displayed in the order of the Y signal, R signal, G signal, and B signal.

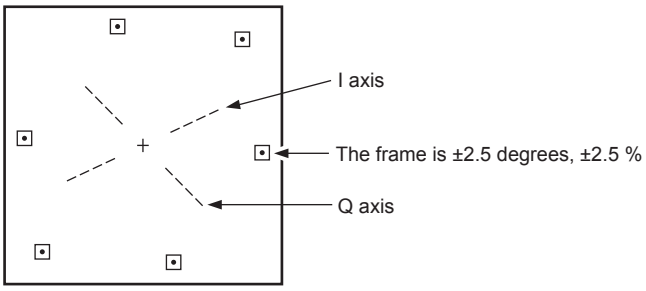


These examples show 16:9 aspect ratio images.

*9 Displayed only for SDI signal input.

• The scale display is as shown below.





■ PIXEL TO PIXEL and PIXEL POSITION

The PIXEL TO PIXEL function allows you to check images at their actual pixel resolution (HD signals only).
Press the button ([FUNCTION1] to [FUNCTION5] (→page 11)) to which the PIXEL TO PIXEL function has been assigned to turn the function on. Then press the button ([FUNCTION1] to [FUNCTION5] (→page 11)) to which the "PIXEL POSITION" function has been assigned to position the display of signals.

- This assumes that the "PIXEL TO PIXEL" and "PIXEL POSITION" functions have been assigned to any of the [FUNCTION1] to [FUNCTION3] buttons.

The underlined values are factory preset setting values.

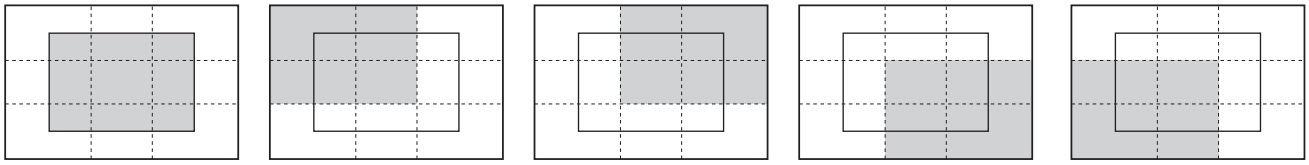
Item	Settings	Description
PIXEL TO PIXEL*10*11	OFF ON	Sets whether to display the screen display size at the input signal size. <OFF> Not displayed. <ON> Displayed. Compatible formats 1080/60i, 1080/59.94i, 1080/50i, 1080/60p, 1080/59.94p, 1080/50p, 1080/30p, 1080/29.97p, 1080/25p, 1080/24p, 1080/23.98p, 1080/25PsF, 1080/24PsF, 1080/23.98PsF, 720/60p, 720/59.94p, 720/50p
PIXEL POSITION	C LT RT RB LB	Positions the display of signals in PIXEL TO PIXEL mode. <C> Center of the screen <LT> Left Top <RT> Right Top <RB> Right Bottom <LB> Left Bottom • When the input signal is 720/60p, 720/59.94p or 720/50p, the number of pixels of the monitor panel is greater than the number of samples of the input signal. Although the image can be set, it will be displayed at C (screen center) and cannot be displayed at any other position.

*10 The following settings are disabled in "PIXEL TO PIXEL" mode.
- Setting "ANAMO" to "ON", and setting "SCAN" to "UNDER" in "VIDEO CONFIG"
- Any "HV DELAY" setting in "FUNCTION"
- "MARKER" display

*11 Enabled during "SDI1", "SDI2", "HDMI", "YP_BP_R" and "DVI-VIDEO" input.

■ "PIXEL POSITION" display position sequence

PIXEL POSITION: ① → ② → ③ → ④ → ⑤ → ① .....



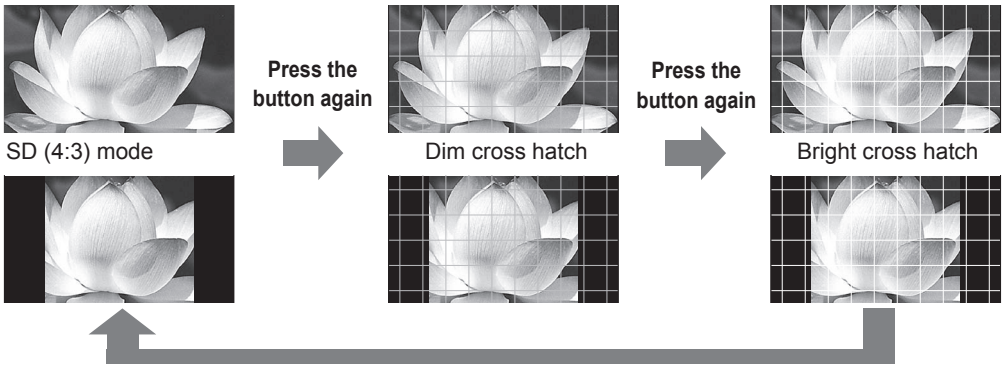
① C (CENTER) ② LT (LEFT TOP) ③ RT (RIGHT TOP) ④ RB (RIGHT BOTTOM) ⑤ LB (LEFT BOTTOM)

■ CROSS HATCH

If the CROSS HATCH function is used, markers are displayed at regular vertical and horizontal intervals to facilitate, for example, easy composition. The marker line width is 1 dot /1 line and the interval is 86 dots/86 lines or 43 dots/43 lines depending on the "SIZE" setting in the MARKER menu (→page 22).
Each press of the button ([FUNCTION1] to [FUNCTION5] (→page 11)) to which the CROSS HATCH has been assigned turns the function on and off.

Each press of the FUNCTION button to which the "CROSS HATCH" function is assigned changes the display as shown.

HD/SD (16:9) mode

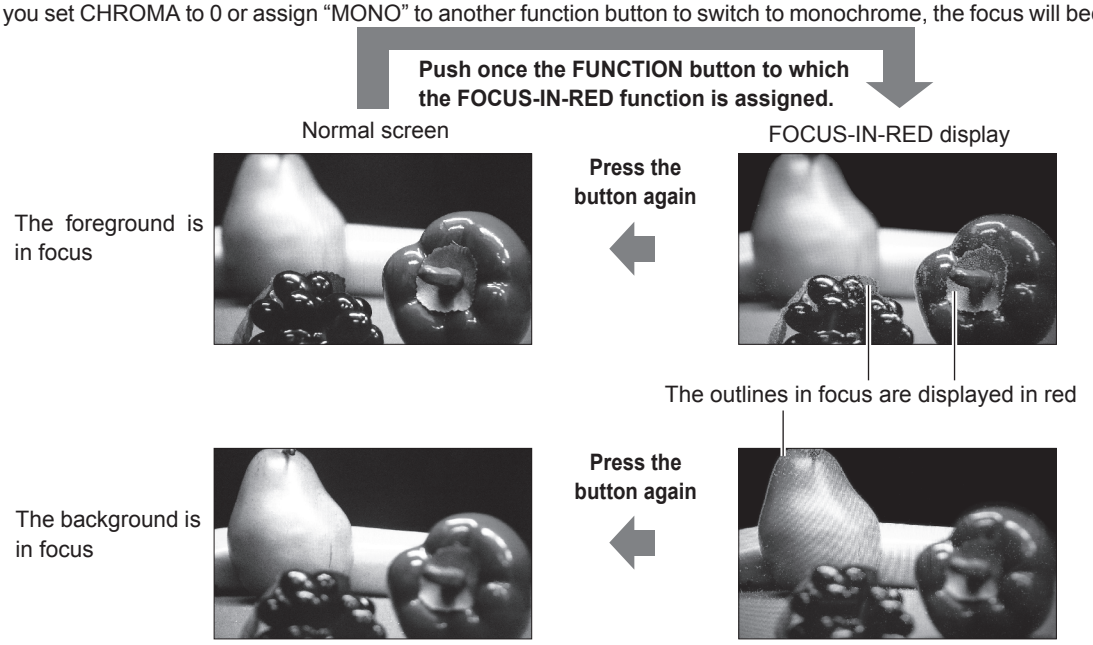


■ **FOCUS-IN-RED**

FOCUS-IN-RED shows the outline of a subject that is in focus in red to simplify focusing the camera.
Each press of the button ("FUNCTION1" to "FUNCTION5") to which the FOCUS-IN-RED has been assigned turns the function on and off.

• To use the FOCUS-IN-RED function, it must be assigned to one of the "FUNCTION1" to "FUNCTION5" functions.

When the FOCUS-IN-RED function is displayed, use the rotary knob to change detection sensitivity level (0 - 30). A higher numerical value results in higher detection sensitivity (outlines are displayed in red even when they are not properly focused).
If you set CHROMA to 0 or assign "MONO" to another function button to switch to monochrome, the focus will become easier to check.



These examples show 16:9 aspect ratio images.

GPI

"GPI CONTROL" is used to enable and disable GPI functions and assign functions to each of the GPI input terminal pins (→page 44)

The underlined values are factory preset setting values.

Sub menu	Settings	Description
GPI CONTROL	DISABLE ENABLE	Enables and disables GPI functions <DISABLE> Disabled <ENABLE> Enabled
GPI1 - GPI8	UNDEF MARKER1 ON/OFF MARKER2 ON/OFF MARKER BACK HALF MARKER BACK BLACK CENTER MARKER CROSS MARKER INPUT SEL. VIDEO INPUT SEL. SDI1 INPUT SEL. SDI2 INPUT SEL. HDMI INPUT SEL. DVI-I INPUT SEL. INT SG SD ASPECT SCAN R-TALLY G-TALLY MONO GAMMA SEL. FILM GAMMA SEL. STDIO/PST PIXEL TO PIXEL FOCUS-IN-RED REMOTE STANDBY	Assigns functions to the GPI input terminal pins. The same items can be set to each terminal (→page 44).

<Note>

• Operation may not be possible depending on the setting conditions.
Example: "SD ASPECT" operation when input signal is HD

INPUT SELECT

The underlined values are factory preset setting values.

Sub menu	Settings	Description
VIDEO	AUTO NTSC PAL	Selects the VIDEO input format. *1 <AUTO> Automatically selects NTSC or PAL. <NTSC> NTSC <PAL> PAL
NTSC SETUP	00 75	Selects NTSC setup level. <00> Select this when the signal is at a 0 IRE setup level. <75> Select this function when using 7.5 % setup signals. (The unit internally adjusts the 7.5 % setup level to suit the black level)
DVI-I	DIGITAL ANALOG	Selects DVI-I input mode. <DIGITAL> Selects digital input. <ANALOG> Selects analog input.
DIGITAL	AUTO VIDEO COMP.	Selects a DVI-I digital input mode. <AUTO> Selects the input mode automatically depending on the input format. <VIDEO> Selects component input. <COMP> Selects PC input.
ANALOG	YPBPR RGB-COMP.	Selects YPBPR (component) or RGB input mode when DVI-I is set to ANALOG. <YPBPR> Selects YPBPR signals <RGB-COMP> Selects the PC RGB signal.
COMPONENT LEVEL	SMPTE B75 B00	Selects the YPBPR (component) signal input level of DVI-I analog inputs. <SMPTE> Signal level complies with SMPTE and PB and PR are 0.7 V [p-p] at 100 % chroma. <B75> Select this when connecting a Betacam or similar device with a setup function. (The unit internally adjusts the 7.5 % setup level to suit the black level) <B00> Select this when connecting a Betacam or similar device without a setup function.
RGB-COMP.	▼	Performs analog PC settings. (This page)

*1 "AUTO" is the factory default, but select an appropriate format when there is risk that the input signal may be contaminated by outside noise.

■ RGB-COMP.

Selecting "ANALOG." under "DVI-I" in the "INPUT SELECT" menu and selecting "RGB-COMP." under "ANALOG" opens the following menu.

The underlined values are factory preset setting values.

Sub menu	Settings	Description
H POSITION	0 to 60 (Factory default setting: 30)	Adjusts horizontal image display position in 2-clock units.*2
V POSITION	0 to 15 (Factory default setting: 8)	Adjusts vertical image display position.*2
PHASE	0 to 31 (Factory default setting: 16)	Adjusts the clock phase in 1/32 clock period increments.*2
CLOCK	700 to 1900 (Factory default setting*3)	Adjusts the sampling clock in 2 clock units.*2
WXGA H SAMPLE	1280 1366	Select a WXGA format. <1280> Select a 1280 x 768 format. <1366> Select a 1366 x 768 format.
RESET		Returns H POSITION, V-POSITION, PHASE and CLOCK settings in the RGB-COMP. input compliant format to their factory defaults.

*2 Each (compatible) input format can be adjusted but not when user data is loaded (→page27 "SETUP LOAD") or saved (→page27 "SETUP SAVE")

*3 "CLOCK" factory default

Format	CLOCK	Format	CLOCK
640×480 (60 Hz)	800	1280×768 (60 Hz)	1664
800×600 (60 Hz)	1056	1366×768 (60 Hz)	1792
1024×768 (60 Hz)	1344		

AUDIO

Sets the audio level meters to audio output (speakers, headphones).

The underlined values are factory preset setting values.

Sub menu	Settings	Description
INPUT SELECT	AUTO ANALOG	Selects speaker, headphones output and audio level meter indication. <AUTO> When an SDI input line is selected with the INPUT SELECT button (→page 11) on the front panel: Embedded audio (SDI terminal) When an HDMI input line is selected with the INPUT SELECT button (→page 11) on the front panel: Embedded audio (HDMI terminal) When an input line other than SDI1, SDI2 or HDMI are selected with the INPUT SELECT button (→page 11) on the front panel: Analog (AUDIO input terminal) <ANALOG> Analog (AUDIO input terminal)
SELECT L*1*2*4	CH1 - CH8 (Factory default: CH1)	Selects embedded audio channel output to the speaker or headphones (L).
SELECT R*1*3*5	CH1 - CH8 (Factory default: CH2)	Selects embedded audio channel output to the speaker or headphones (R).
SPEAKER OUT	MIX L R	Selects SPEAKER OUT status. <MIX> Outputs a combination of the sound selected with [SELECT L] and [SELECT R]. <L> Outputs the sound selected with [SELECT L]. <R> Outputs the sound selected with [SELECT R].
LEVEL METER	OFF ON	Turns the audio level meter indication on and off. (→page 16)
CH SELECT*6	2CH 4CH 8CH	Selects number of audio level meter channels.
POINT LINE	OFF ON	Turns the 0 dB line (reference point) indication on the meter on and off.
CH INFO.	OFF ON	Switches the channel displayed on the meter on and off.
HEAD ROOM*7	12dB 18dB *8 20dB *9	Sets the display position of the reference point in the meter display.

*1 When CH 5 to 8 are selected during SD signal input to the SDI terminal:
The channel can be switched from CH5→CH1, CH6→CH2, CH7→CH3, and CH8→CH4. (The menu settings remain as is.)
*2 When an HDMI signal is input, CH1 audio is output regardless of the menu setting.
*3 When an HDMI signal is input, CH2 audio is output regardless of the menu setting.
*4 When analog audio is selected, L audio is output regardless of the menu setting.
*5 When analog audio is selected, R audio is output regardless of the menu setting.
*6 When an HDMI signal or analog signal is input, 2CH is displayed regardless of the menu setting. When an SD-SDI signal is input, 4CH is displayed even when 8CH is selected in the menu.
*7 When an analog signal is input, the reference point is 20 dB regardless of menu setting.
*8 Factory default setting for the BT-LH1850E.
*9 Factory default setting for the BT-LH1850P.

DISPLAY SETUP

The underlined values are factory preset setting values.

Sub menu	Settings	Description
WFM/VECTOR	OFF WFM Y WFM R WFM G WFM B VECTOR	Switches between “WFM/VECTOR” waveform and vector display. <WFM Y> - <WFM B> Displays waveforms. <VECTOR> Displays vector waveforms.*1
POSITION	RT RB LB LT	Selects the position for the “WFM/VECTOR” waveform display.*1 <RT> Right Top <RB> Right Bottom <LB> Left Bottom <LT> Left Top
VECTOR MODE	×1 ×2S ×2 ×4 ×8	Enlarges vector waveforms.*1 <×1> 1 × <×2S> State in which displayed at scale of 1 x, and only waveforms enlarged to 2 x. <×2> 2 × <×4> 4 × <×8> 8 ×
VECTOR SCALE	75% 100%	Determines the scale of vector waveform. <75%> Displays it at 75 % scale. <100%> Displays it at 100 % scale.
TIME CODE	OFF ON	Turns the time code display on and off.
POSITION	TOP RIGHT CENTER LEFT	Selects position of time code display. <TOP> Top Center <RIGHT> Bottom Right <CENTER>Bottom Center <LEFT> Bottom Left
FONT SIZE	SMALL LARGE	Selects font size of time code display. <SMALL> Menu font size <LARGE> Twice the height and width of menu font size
MODE SELECT	LTC VITC LUB VUB	Selects time code display mode. <LTC> Displays linear time code (LTC). <VITC> Displays vertical interval time code (VITC). <LUB> Displays user bits included in LTC. <VUB> Displays user bits included in VITC.
CLOSED CAPTION	OFF ON	Turns closed caption display on and off.*2
CC TYPE	CEA-608 (ANC) CEA-608 (VBI) CEA-608 (708) CEA-708 OP-42 OP-47	Selects the closed caption display mode. <CEA-608(ANC)> Displays data compliant with CEA-608 (ANC). <CEA-608(VBI)> Displays data compliant with CEA-608 (VBI). <CEA-608(708)> Displays CEA-608 standard data transmitted according to the CEA-708 standard. <CEA-708> Displays data compliant with CEA-708. <OP-42> Displays OP-42 data <OP-47> Displays OP-47 data
CAPTION CHANNEL	CC1 CC2 CC3 CC4	Selects the closed caption display channel for when CEA-608.
CAPTION SERVICE	SRV1 SRV2 SRV3 SRV4 SRV5 SRV6	Selects the closed caption display service for when CEA-708.

*1 Opens the vector display during SDI signal input.
*2 A bright line appears on line 21 when signal input is set to ON during video and underscan is enabled.

Sub menu	Settings	Description
IN MONITOR DISPLAY	OFF ON	Enables IMD display.
POSITION	TOP BOTTOM	Selects the position for the IMD display. <TOP> Top <BOTTOM> Bottom
CHAR. COLOR	CMD WHITE BLUE GREEN YELLOW CYAN RED GRAY MAGENTA	Selects IMD font color. <CMD> Color specified by command*3 <WHITE> White <BLUE> Blue <GREEN> Green <YELLOW> Yellow <CYAN> Cyan <RED> Red <GRAY> Gray <MAGENTA> Magenta

*3 When colors selected by commands are set to “OFF,” the IMD character string is not displayed.

CONTROL

The underlined values are factory preset setting values.

Sub menu	Settings	Description
CONTROL	LOCAL REMOTE	Selects operation. (with control lock) <LOCAL> Front panel operation is enabled (including controls that use the GPI function) <REMOTE> Remote operation enabled (controls using RS-232C or RS-485). (Front panel operation is locked) • Power On/Off, VOLUME operations, GPI control and menu display are available when the lock is engaged. • Only “CONTROL/LOCAL ENABLE” menu items are available when the lock is engaged. • The rotary knob is disabled and set values cannot be changed when the lock is engaged. • The “LOCAL ENABLE” setting determines operations in lock mode. • The key icon appears in the operation status display, menu display (main menu, FUNCTION menu, INPUT SELECT menu), picture adjustment menu display, and function display screens when the lock is engaged.
LOCAL ENABLE *1	DISABLE INPUT FUNCTION INPUT+FUNC.	Selects whether to enable or disable INPUT SELECT and FUNCTION button operations when “REMOTE” is selected under “CONTROL.” <DISABLE> Disables INPUT SELECT and FUNCTION button operations. <INPUT> Enables INPUT SELECT button operations. <FUNCTION> Enables FUNCTION button operations. <INPUT+FUNC.> Enables INPUT SELECT and FUNCTION button operations.
PROTOCOL VER. *2	V3.1 V4.0	Selects version of the TSL protocol.
RS-485 ID SETUP	0-126	Sets the unit ID number to use in RS-485 communication.
RS-485 STX&ETX	OFF ON	Select RS-485 interface command format (→page 46). <OFF> STX and ETX need not be placed. <ON> STX and ETX must be placed.

*1 Only available when “REMOTE” is selected under “CONTROL.”
*2 The monitor supports version 3.1 and 4.0 of the TSL UMD PROTOCOL provided by Television System LTD.

HOURS METER

Sub menu	Settings	Description
OPERATION	XXXXXXh *1	Displays the number of hours it has been on.
LCD	XXXXXXh *1	Displays the number of hours that the backlight has been on.

*1 “XXXXXX” indicates up to 262800 hours (approx. 30 years). “OVER” is indicated when the number of hours is 262800 or higher.

Setting Item Restrictions

■ **List of Setting Item Restrictions**

(✓: Can be set)

Settings \ Input CH		VIDEO	SDI1/SDI2		HDMI			DVI-I					
								ANALOG			DIGITAL		
								RGB-COMP.	YPBPR		COMP.	VIDEO	
		—	SD	HD	VGA	SD	HD	—	SD	HD	—	SD	HD
MARKER	MARKER *1*2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	16:9 *1*2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	4:3 *1*2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	BACK *1*2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	CENTER *1*2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	CROSS (USER) *1*2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	COLOR *1*2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	GPI MARKER1	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	GPI MARKER2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	MARKER TYPE *1*2	✓	✓	✓	✓*3	✓	✓	✓*3	✓	✓	✓*3	✓	✓
	CROSS HATCH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SIZE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VIDEO CONFIG	GAMMA SELECT	✓	✓	✓		✓	✓		✓	✓		✓	✓
	FILM GAMMA	✓	✓	✓		✓	✓		✓	✓		✓	✓
	COLOR TEMP.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SHARPNESS MODE	✓	✓	✓		✓	✓		✓	✓		✓	✓
	SHARPNESS H	✓	✓	✓		✓	✓		✓	✓		✓	✓
	SHARPNESS V	✓	✓	✓		✓	✓		✓	✓		✓	✓
	I-P MODE	✓	✓	✓		✓	✓		✓	✓		✓	✓
	MONO	✓	✓	✓		✓	✓		✓	✓		✓	✓
	ANAMO *1*2	✓*3	✓*3	✓		✓*3	✓*3		✓*3	✓*3		✓*3	✓*3
	SD ASPECT *1*2	✓	✓	✓*3		✓	✓*3		✓	✓*3		✓	✓*3
	SCAN *1*2	✓	✓	✓		✓	✓		✓	✓		✓	✓
SYSTEM CONFIG	SUB WINDOW	✓	✓	✓		✓	✓		✓	✓		✓	✓
	MENU POSITION	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	STATUS DISPLAY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INPUT NAME SETUP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SETUP LOAD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SETUP SAVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	POWER ON SETUP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	COLOR SPACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	POWER DOWN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	POWER SAVE MODE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CALIBRATION	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FUNCTION	FUNCTION1 - 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	FUNCTION DISPLAY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GPI	GPI CONTROL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	GPI1 - GPI8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

*1 This is not available when two screens are displayed with the SUB WINDOW function.
*2 This is not available in PIXEL TO PIXEL mode.
*3 Can be set but the function is disabled.

Setting Item Restrictions (continued)

(✓: Can be set)

Settings	Input CH	VIDEO	SDI1/SDI2		HDMI			DVI-I					
								ANALOG			DIGITAL		
								RGB-COMP.	YPBPR		COMP.	VIDEO	
		—	SD	HD	VGA	SD	HD	—	SD	HD	—	SD	HD
INPUT SELECT	VIDEO	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	NTSC SETUP	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	DVI-I	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓	✓	✓	✓	✓	✓
	DIGITAL	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓	✓	✓
	ANALOG	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓	✓	✓	✓*3	✓*3	✓*3
	COMPONENT LEVEL	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓	✓*3	✓*3	✓*3	✓*3
	RGB-COMP.							✓					
AUDIO	INPUT SELECT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SELECT L	✓*3	✓	✓	✓	✓	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	SELECT R	✓*3	✓	✓	✓	✓	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	SPEAKER OUT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	LEVEL METER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CH SELECT	✓*3	✓	✓	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	POINT LINE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CH INFO.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	HEAD ROOM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DISPLAY SETUP	WFM/VECTOR *1*2	✓*4	✓	✓		✓*4	✓*4		✓*4	✓*4		✓*4	✓*4
	POSITION *1*2	✓	✓	✓		✓	✓		✓	✓		✓	✓
	VECTOR MODE *1*2	✓*3	✓	✓		✓*3	✓*3		✓*3	✓*3		✓*3	✓*3
	VECTOR SCALE *1*2	✓*3	✓	✓		✓*3	✓*3		✓*3	✓*3		✓*3	✓*3
	TIME CODE	✓*3	✓*3	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	POSITION	✓*3	✓*3	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	FONT SIZE	✓*3	✓*3	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	MODE SELECT	✓*3	✓*3	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	CLOSED CAPTION	✓	✓	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	CC TYPE	✓*3	✓	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	CAPTION CHANNEL	✓	✓	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	CAPTION SERVICE	✓*3	✓*3	✓	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3	✓*3
	IN MONITOR DISPLAY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	POSITION	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHAR. COLOR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CONTROL	CONTROL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	LOCAL ENABLE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	PROTOCOL VER.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	RS-485 ID SETUP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	RS-485 STX&ETX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HOURS METER	OPERATION	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	LCD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

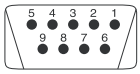
*1 This is not available when two screens are displayed with the SUB WINDOW function.
*2 This is not available in PIXEL TO PIXEL mode.
*3 Can be set but the function is disabled.
*4 The VECTOR display appears only during SDI input.

REMOTE Specifications

This monitor permits remote operation via GPI input terminal, RS-232C input terminal or RS-485 input/output terminal.

GPI input terminal

GPI screen items correspond to the following terminals. Use the GPI menu to assign functions to each terminal (→page 37).
The functions assigned to each terminal are executed as specified depending on whether GND (pin 5) is short-circuited (ON) or open (OFF).



GPI input terminal (9P)

Pin number	Signal
1	GPI1
2	GPI2
3	GPI3
4	GPI4
5	GND
6	GPI5
7	GPI6
8	GPI7
9	GPI8

■ **Operating conditions**

Level operation: Operates when GND is short-circuited.
Edge operation: Operates when GND changes from open to short-circuited.

<Note>

- When level operation is assigned to more than one terminal, the function operates as long as one of the terminals is short-circuited.
- Hold the edge operation for at least 0.2 seconds after the change.

Assigned item	Function	Operating conditions
UNDEF	Undefined (no function assigned)	—
MARKER1 ON/OFF *1	Switches marker display defined in “GPI MARKER1” (→page 23) in the “MARKER” menu.	Level operation (Short-circuited: ON, Open: OFF)
MARKER2 ON/OFF *1	Switches marker display defined in “GPI MARKER2” (→page 23) in the “MARKER” menu.	Level operation (Short-circuited: ON, Open: OFF)
MARKER BACK HALF *2	Reduces the brightness of the background outside the marker displayed in “GPI MARKER1” (→page 23) to 50 %.	Level operation (Short-circuited: ON, Open: OFF)
MARKER BACK BLACK *2	Reduces the brightness of the background outside the marker displayed in “GPI MARKER1” (→page 23) to 0 %.	Level operation (Short-circuited: ON, Open: OFF)
CENTER MARKER	Turns the center marker display on and off. (When other markers are displayed, this marker is superimposed on other markers.)	Level operation (Short-circuited: ON, Open: OFF)
CROSS MARKER	Turns the cross marker display ON and OFF. (When other markers are displayed, this marker is superimposed on other markers.)	Level operation (Short-circuited: ON, Open: OFF)
INPUT SEL. VIDEO	Switches the input line to VIDEO.	Edge operation
INPUT SEL. SDI1	Switches the input line to SDI1.	Edge operation
INPUT SEL. SDI2	Switches the input line to SDI2.	Edge operation
INPUT SEL. HDMI	Switches the input line to HDMI.	Edge operation
INPUT SEL. DVI-I	Switches the input line to DVI-I.	Edge operation
INPUT SEL. INT SG	Switches the input line to INT SG.	Edge operation
SD ASPECT	Sets the aspect ratio for SD signal input. (Disabled during HD signal input)	Level operation (Short-circuited: 16:9, open: 4:3)
SCAN	Switches the scan mode between “UNDER” and “NORMAL”.	Level operation (Short-circuited: UNDER, Open: NORMAL)
R-TALLY *3	Lights the red tally.	Level operation (Short-circuited: ON, Open: OFF)
G-TALLY *3	Lights the green tally.	Level operation (Short-circuited: ON, Open: OFF)
MONO	Switches between color and monochrome (MONO).	Level operation (Short-circuited: monochrome, Open: color)
GAMMA SEL. FILM	Switches the gamma curve to FILM mode.	Level operation (Short-circuited: FILM mode, Open: STANDARD mode)
GAMMA SEL. STDIO/PST	Switches the gamma curve to STDIO/PST mode.	Level operation (Short-circuited: STDIO/PST mode, Open: STANDARD mode)

*1 When a 16:9 marker and a 4:3 marker are simultaneously selected and activated on a 16:9 aspect ratio display, both markers are displayed.
*2 When a 16:9 marker and a 4:3 marker are simultaneously displayed, the background of the marker selected by the 16:9 marker is controlled.
*3 When “R-TALLY” and “G-TALLY” simultaneously go on, the tally color changes to amber.

Assigned item	Function	Operating conditions
PIXEL TO PIXEL	Switches screen display between input size and display size.	Level operation (Short-circuited: ON, Open: OFF)
FOCUS-IN-RED	Displays the outlines of the subject that are in focus in red	Level operation (Short-circuited: ON, Open: OFF)
REMOTE STANDBY *4*5	Sets REMOTE STANDBY (the backlight is turned off).	Level operation (Short-circuited: ON, Open: OFF)

*4 When remote standby is set to ON, the front power LED flashes.
*5 If the GPI input terminal to be assigned is set to a short-circuited state first and then MENU is operated to set this item, the backlight turns off and the screen display disappears, so MENU operation becomes unable to be checked. To change the setting of this item, be sure to set it when the GPI input terminal is in the open state.

Restrictions

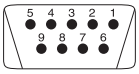
- "SD ASPECT" does not operate when the input signal is HD.
- "SD ASPECT", "SCAN", "WFM/VECTOR", "MARKER", and "PIXEL TO PIXEL" do not operate in SUB WINDOW mode.
- "SCAN" and "MARKER" do not operate in PIXEL TO PIXEL mode.
- "GAMMA SELECT", "SD ASPECT", "SCAN", "MARKER", and "MONO" do not operate when the input line of the signal is HDMI and the signal format is 640 x 480.

■ Priority of assigned functions

- When both "MARKER1" and "MARKER2" are activated at the same time, "MARKER1" has priority. However, when the display aspect ratio is 4:3, the "MARKER1" aspect ratio is 16:9 and the "MARKER2" aspect ratio is 4:3, "MARKER2" is displayed. In this case, the "MARKER2" background is controlled.
- When "MARKER BACK HALF" and "MARKER BACK BLACK" are activated at the same time, "MARKER BACK BLACK" has priority.
- When "GAMMA SEL. FILM" and "GAMMA SEL. STDIO/PST" are activated at the same time, "GAMMA SEL. FILM" has priority.

RS-232C input terminal

External operations can be performed via the RS-232C interface.
Regarding the pin arrangement and connections of the RS-232C input terminal, refer to the diagram below and the table below right.
For details on systems using RS-232C input terminal, be sure to consult your dealer.



RS-232C terminals (9P)

■ Connectors and signals

Connector: D-SUB 9-pin (female)
Signal

Pin number	Signal	Description
1	N.C.	Not connected
2	TXD	Transmission data
3	RXD	Reception data
4	DSR	Connected inside
5	GND	Ground
6	DTR	Connected inside
7	CTS	Connected inside
8	RTS	Connected inside
9	N.C.	Not connected

■ Communication parameters

Signal level	RS-232C compliant
Synchro system	Asynchronous
Transfer rate	9600 bps
Parity	None
Data length	8 bit
Stop bit	1 bit
Flow control	None

External Device Side		(Straight)		This unit Side	
Pin number	**Signal**			**Pin number**	**Signal**
1	N.C.			1	N.C.
2	RXD	←		2	TXD
3	TXD	→		3	RXD
4	DTR	→		4	DSR
5	GND	—		5	GND
6	DSR	←		6	DTR
7	RTS	→		7	CTS
8	CTS	←		8	RTS
9	N.C.			9	N.C.

■ Command format

STX (02h)	Command	:	Data	ETX (03h)

- The command is the 3-character string starting with STX and ending with ETX.
- Append any data after the colon (:) following the command, as required.

■ Response formats

1. Setting command response

STX (02h)	Command	ETX (03h)

2. Query command response

STX (02h)	Data	ETX (03h)

3. Error response

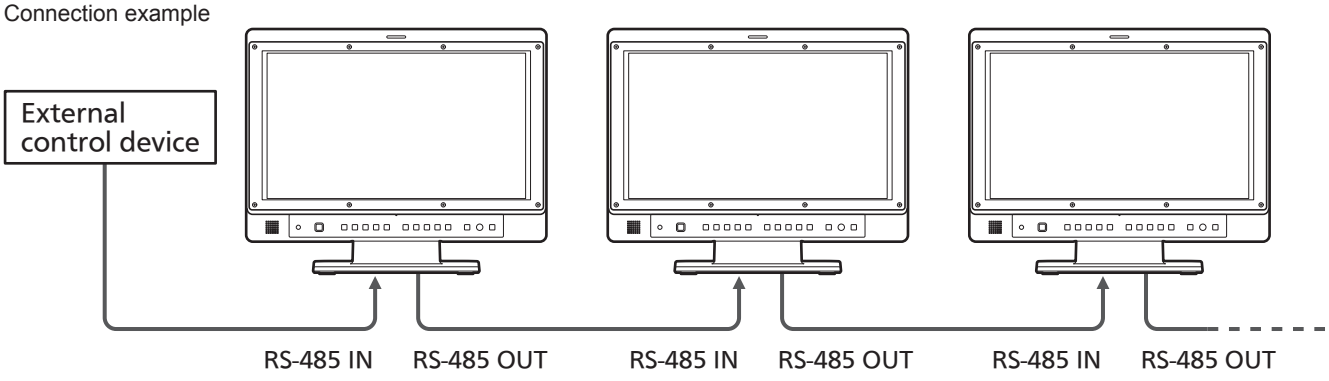
STX (02h)	Error codes	ETX (03h)

Error codes
ER001: Invalid command
ER002: Parameter error

RS-485 input/output terminal

The RS-485 interface enables external operations.
The figures below show RS-485 input/output terminal pin arrangement and connections.
TSL protocol version3.1 or version4.0 is supported. Make sure that the same TSL protocol versions are used on external control devices and the monitor.
For information on specific systems using RS-485 input/output terminal, contact your supplier.

Connection example



• A loop-through connection using the RS-485 input and output terminals allows operation of multiple monitors (up to 32 monitors).
• Connect a terminator (120 Ω) between the first and second pin of the OUT (output) terminal on the last monitor in the chain.

■ Connectors and signals

Connector: 8-pin RJ-45 connector

Pin number		Signal	Description
IN	OUT		
1	3	RXD+	Received data (+)
2	6	RXD-	Received data (-)
3	1	TXD+	Send data (+)
4	4	N.C.	Not connected
5	5	N.C.	Not connected
6	2	TXD-	Send data (-)
7	7	N.C.	Not connected
8	8	GND	Ground

■ Communication parameters

Synchro system	Asynchronous
Transfer rate	38,400 bps
Parity	EVEN
Data length	8 bit
Stop bit	1 bit
Flow control	None

■ Command format

STX (02h)	Header (ID)	Command	Data	EXT (03h)

The header (ID) is 8-bit data.
Use the RS-485 ID SETUP function in the SYSTEM CONFIG menu to set up.
Setting the most significant bit using external control device allows you to switch between TSL protocol support and “Setting command” (→page47) / “Query command” (→page49) support.
Example: RS-485 ID SETUP 31 setting = (hexadecimal conversion)
⇨ Header 1Fh (for support of commands listed below)
Header 9Fh (for TSL protocol support)
When 0 is set in RS-485 ID SETUP, connected multiple monitors can be controlled.

■ Response formats

1. Setting command response

STX (02h)	Command	EXT (03h)

2. Query command response

STX (02h)	Data	EXT (03h)

3. Error response

STX (02h)	Error code	EXT (03h)

Error code
ER001: Invalid command
ER002: Parameter error

When 0 is set in RS-485 ID SETUP, operation is enabled but responses are not.

After receiving a monitor response command, there should be a time lag of approx. 200 ms before a command is transmitted from an external control device.

■ Setting command

No	Send Command	Command Name	Data	Response
1	IIS:<data>	INPUT SELECT	0 : SDI1 1 : SDI2 2 : VIDEO 6 : DVI 8 : HDMI 9 : INT-SG	IIS
2	VPC:CON<data>	CONTRAST	00 - 60	VPC
3	VPC:BRI<data>	BRIGHT	00 - 60	VPC
4	VPC:CRO<data>	CHROMA	00 - 60	VPC
5	VPC:PHA<data>	PHASE	00 - 60	VPC
6	VPC:VOL<data>	VOLUME	00 - 60	VOL
7	VBL:<data>	BACKLIGHT	000 - 100	VBL
8	DMK:MK1<data>	MARKER 16:9	00 : OFF 01 : 80% 02 : 88% 03 : 93% 04 : 95% 05 : 14:9 06 : 13:9 07 : 4:3 08 : 90% 09 : CNSCO2.35 10 : VISTA 11 : 2:1 12 : CNESCO2.39 080-100 : USER 80 % - 100 % xxxyyy : VAR. H. 80 % - 100 % V. 80 % - 100 % (xxx : 080-100 yyy : 080-100)	DMK
9	DMK:MK2<data>	MARKER 4:3	00 : OFF 01 : 80% 02 : 88% 03 : 93% 04 : 95% 08 : 90% 080-100 : USER 80 % - 100 % xxxyyy : VAR. H. 80 % - 100 % V. 80 % - 100 % (xxx : 080-100 yyy : 080-100)	DMK
10	DMK:BAK<data>	MARKER BACK	0 : NORMAL 1 : HALF 2 : BLACK	DMK
11	DMK:CMK<data>	CENTER MARKER	0 : OFF 1 : ON	DMK
12	DCH:<data>	CROSS HATCH	0 : OFF 1 : LOW 2 : HIGH	DCH
13	DCW:<data>	CROSS HATCH WIDTH	0 : SMALL 1 : LARGE	DCW
14	DMK:MCO<data>	MARKER COLOR	0 : WHITE 1 : BLACK 2 : RED 3 : GREEN 4 : BLUE	DMK
15	DMK:VMK<data>	CROSS MARKER	xxxxyyyy : position range 00000000 (off) (xxxx : 0020-1345 yyyy : 0020-0747)	DMK
16	MGM:<data>	GAMMA SELECT	1 : STANDARD 2 : FILM 3 : STDIO/PST	MGM
17	MCT:<data>	COLOR TEMP	00 : D56 01 : D65 02 : D93 03 : VAR1 04 : VAR2 05 : VAR3 10-73 : USER0-63	MCT
18	VPC:SHP<data>	SHARPNESS MODE	0 : LOW 1 : HIGH	VPC
19	VPC:SHH<data>	SHARPNESS H	00-30 : Horizontal sharpness settings	VPC
20	VPC:SHV<data>	SHARPNESS V	00-30 : Vertical sharpness settings	VPC
21	MIP:<data>	IP MODE	0 : MODE1 1 : MODE2	MIP
22	OMO:<data>	MONO	1 : OFF 2 : ON	OMO
23	MAS:<data>	SD ASPECT	0 : 16:9 1 : 4:3	MAS
24	MSC:<data>	SCAN	0 : NORMAL 1 : UNDER	MSC
25	DSD:<data>	STATUS DISP	0 : CONTINUE 1 : 3SEC OFF 2 : OFF	DSD
26	SCS:<data>	COLOR SPACE	0 : SMPTE-C 1 : EBU 2 : ITU709	SCS
27	ISM:VNS<data>	NTSC SETUP	0 : 0.0 % 1 : 7.5 %	ISM
28	ISM:TDA<data>	DVI-I TYPE	0 : DIGITAL 1 : ANALOG	ISM
29	ISM:DVD<data>	DVI-I DIGITAL MODE	0 : AUTO 1 : VIDEO 2 : COMP.	ISM
30	ISM:DVA<data>	DVI-I ANALOG MODE	0 : YPBPR 1 : RGB-COMP.	ISM
31	MCO:<data>	CONTROL	0 : LOCAL 1 : REMOTE	MCO
32	MLE:<data>	LOCAL ENABLE	0 : DISABLE 1 : INPUT 2 : FUNCTION 3 : INPUT+FUNC.	MLE
33	OBO:<data>	BLUE ONLY	0 : OFF 1 : ON	OBO
34	OHV:<data>	HV DELAY	0 : OFF 1 : H DELAY 2 : V DELAY 3 : HV DELAY	OHV
35	MBM:<data>	BLACK MODE	0 : OFF 1 : ON	MBM
36	MSB:<data>	SUB WINDOW	0 : SINGLE 1 : FULL/PART 2 : STILL	MSB

(Continued on next page)

No	Send Command	Command Name	Data	Response
37	DWM:<data>	WFM/VECTOR	0 : OFF 1 : WFM Y ON 2 : WFM R ON 3 : WFM G ON 4 : WFM B ON 5 : VECTOR ON	DWM
38	VWB:RGN<data>	WHITE BALANCE (R GAIN)	0000 - 1023 : RED GAIN settings	VWB
39	VWB:GGN<data>	WHITE BALANCE (G GAIN)	0000 - 1023 : GREEN GAIN settings	VWB
40	VWB:BGN<data>	WHITE BALANCE (B GAIN)	0000 - 1023 : BLUE GAIN settings	VWB
41	VWB:RBS<data>	WHITE BALANCE (R BIAS)	0000 - 1023 : RED BIAS settings -511 - 512	VWB
42	VWB:GBS<data>	WHITE BALANCE (G BIAS)	0000 - 1023 : GREEN BIAS settings -511 - 512	VWB
43	VWB:BBS<data>	WHITE BALANCE (B BIAS)	0000 - 1023 : BLUE BIAS settings -511 - 512	VWB
44	MPP:<data>	PIXEL TO PIXEL	0 : OFF 1 : ON	MPP
45	DPO:<data>	PIXEL POSITION	0 : CENTER 1 : LEFT TOP 2 : RIGHT TOP 3 : RIGHT BOTTOM 4 : LEFT BOTTOM	DPO
46	MFR:<data>	FOCUS IN RED	0 : OFF 1 : ON	MFR
47	DLM:<data>	LEVEL METER	0 : OFF 1 : 2ch 2 : 4ch 3 : 8ch	DLM
48	DTM:<data>	TIME CODE	0 : OFF 1 : LTC 2 : VITC 3 : LUB 4 : VUB	DTM
49	MCC:<data>*1	CLOSED CAPTION	00 : OFF 01 : CC1(VBI) 02 : CC2(VBI) 03 : CC3(VBI) 04 : CC4(VBI) 05 : SRV1 06 : SRV2 07 : SRV3 08 : SRV4 09 : SRV5 10 : SRV6 11 : OP-42 12 : OP-47 13 : CC1(ANC) 14 : CC2(ANC) 15 : CC3(ANC) 16 : CC4(ANC) 17 : CC1(708) 18 : CC2(708) 19 : CC3(708) 20 : CC4(708)	MCC
50	DIS:WVP<data>	WFM/VEC POSITION	0 : RT 1 : RB 2 : LB 3 : LT	DIS
51	DIS:VMO<data>	VECTOR MODE	0 : ×1 1 : ×2S 2 : ×2 3 : ×4 4 : ×8	DIS
52	DIS:VSC<data>	VECTOR SCALE	0 : 100 % 1 : 75 %	DIS
53	DIS:TMP<data>	TIME CODE POSITION	0 : TOP 1 : RIGHT 2 : CENTER 3 : LEFT	DIS
54	DIS:TFS<data>	TIME CODE FONT SIZE	0 : LARGE 1 : SMALL	DIS
55	DIS:IMD<data>	IN MONITOR DISPLAY	0 : OFF 1 : ON	DIS
56	DIS:IMP<data>	IN MONITOR DISPLAY POSITION	0 : TOP 1 : BOTTOM	DIS
57	DIS:IMC<data>	IN MONITOR DISPLAY CHAR. COLOR	0 : CMD (RS-485 settings) 1 : WHITE 2 : BLUE 3 : GREEN 4 : YELLOW 5 : CYAN 6 : RED 7 : GRAY 8 : MAGENTA	DIS
58	DIS:IMV<data>	IN MONITOR DISPLAY VERSION	0 : Ver3.1 1 : Ver4.0	DIS
59	AUD:IIS<data>	AUDIO INPUT SELECT	0 : AUTO 1 : ANALOG	AUD
60	AUD:ISL<data>	AUDIO SELECT L	0 : 1ch 1 : 2ch 2 : 3ch 3 : 4ch 4 : 5ch 5 : 6ch 6 : 7ch 7 : 8ch	AUD
61	AUD:ISR<data>	AUDIO SELECT R	0 : 1ch 1 : 2ch 2 : 3ch 3 : 4ch 4 : 5ch 5 : 6ch 6 : 7ch 7 : 8ch	AUD
62	AMT:<data>	AUDIO MUTE	0 : OFF 1 : ON	AMT

*1 Configures settings for the CLOSED CAPTION, CC TYPE, CAPTION CHANNEL, CAPTION SERVICE sub menu items under the DISPLAY SETUP menu simultaneously.

■ Query command

No	Command: Parameter	Description	Response data
1	QIS	INPUT SELECT	0 : SDI1 1 : SDI2 2 : YPBPR (DVI-ANALOG-VIDEO) 4 : VIDEO 6 : RGB-COMP. (DVI-ANALOG-COMP.) 9 : DVI-DIGITAL-VIDEO 10 : DVI-DIGITAL-COMP. 11 : HDMI 12 : INT-SG
2	QPC:CON	CONTRAST	00 - 60
3	QPC:BRI	BRIGHT	00 - 60
4	QPC:CRO	CHROMA	00 - 60
5	QPC:PHA	PHASE	00 - 60
6	QPC:VOL	VOLUME	00 - 60
7	QBL	BACKLIGHT	000 - 100
8	QMK:MAK	MARKER *2	00 : OFF 01 : 80 % 02 : 88 % 03 : 93 % 04 : 95 % 05 : 14:9 06 : 13:9 07 : 4:3 08 : 90 % 09 : CNSCO2.35 10 : VISTA 11 : 2:1 12 : CNESCO2.39 080-100 : USER 80 % - 100 % xxxyyy : VAR. H. 80 % - 100 % V. 80 % - 100 % (xxx : 080-100 yyy : 080-100)
9	QMK:BAK	MARKER BACK	0 : NORMAL 1 : HALF 2 : BLACK
10	QMK:CMK	CENTER MARKER	0 : OFF 1 : ON
11	QCH	CROSS HATCH	0 : OFF 1 : LOW 2 : HIGH
12	QCW	CROSS HATCH WIDTH	0 : SMALL 1 : LARGE
13	QMK:COL	MARKER COLOR	0 : WHITE 1 : BLACK 2 : RED 3 : GREEN 4 : BLUE
14	QMK:VMK	CROSS MARKER	xxxxyyyy : position range 00000000 (off) (xxxx : 0020-1345 yyyy : 0020-0747)
15	QGM	GAMMA SELECT	1 : STANDARD 2 : FILM 3 : STDIO/PST
16	QCT	COLOR TEMP	00 : D56 01 : D65 02 : D93 03 : VAR1 04 : VAR2 05 : VAR3 10-73 : USER0-63
17	QPC:SHP	SHARPNESS MODE	0 : LOW 1 : HIGH
18	QPC:SHH	SHARPNESS H	00-30 : Horizontal sharpness value
19	QPC:SHV	SHARPNESS V	00-30 : Vertical sharpness value
20	QIP	IP MODE	0 : MODE1 1 : MODE2
21	QMO	MONO	1 : OFF 2 : ON
22	QAS	SD ASPECT	0 : 16:9 1 : 4:3
23	QSC	SCAN	0 : NORMAL 1 : UNDER
24	QCS	COLOR SPACE	0 : SMPTE-C 1 : EBU 2 : ITU709
25	QNS	NTSC SETUP	0 : 0.0 % 1 : 7.5 %
26	QDT	DVI-I TYPE	0 : DIGITAL 1 : ANALOG
27	QDD	DVI-I DIGITAL MODE	0 : AUTO 1 : VIDEO 2 : COMP.
28	QDA	DVI-I ANALOG MODE	0 : YPBPR 1 : RGB-COMP.
29	QFR	FORMAT CHECK	00 : NO SIGNAL 01 : 1080/60i 02 : 1080/59.94i 03 : 1080/50i,1080/25PsF 04 : 1080/30p 05 : 1080/29.97p 06 : 1080/25p 07 : 1080/24p 08 : 1080/23.98p 09 : 1080/24PsF 10 : 1080/23.98PsF 13 : 720/60p 14 : 720/59.94p 15 : 576/50i 16 : 480/59.94p 17 : 480/59.94i 18 : 576/50p 20 : 1080/60p 21 : 1080/59.94p 22 : 1080/50p 23 : 720/50p 51 : 680×480 (60 Hz) 54 : 800×600 (60 Hz) 57 : 1024×768 (60 Hz) 61 : 1280×768 (60 Hz) 68 : 680×480 (59.94 Hz) 69 : 1366×768 (60 Hz) FF : UNSUPPORT SIGNAL

*2 When both 16:9 and 4:3 markers are displayed, the 16:9 marker state is returned.

(Continued on next page)

No	Command: Parameter	Description	Response data
30	QBO	BLUE ONLY	0 : OFF 1 : ON
31	QHV	HV DELAY	0 : OFF 1 : H DELAY 2 : V DELAY 3 : HV DELAY
32	QBM	BLACK MODE	0 : OFF 1 : ON
33	QSB	SUB WINDOW	0 : SINGLE 1 : FULL/PART 2 : STILL
34	QWM	WFM/VECTOR	0 : OFF 1 : WFM Y ON 2 : WFM R ON 3 : WFM G ON 4 : WFM B ON 5 : VECTOR ON
35	QWB:RGN	WHITE BALANCE R-GAIN	0000 - 1023 : RED GAIN setting value
36	QWB:GGN	WHITE BALANCE G-GAIN	0000 - 1023 : GREEN GAIN setting value
37	QWB:BGN	WHITE BALANCE B-GAIN	0000 - 1023 : BLUE GAIN setting value
38	QWB:RBS	WHITE BALANCE R-BIAS	0000 - 1023 : RED BIAS setting value -511 - 512
39	QWB:GBS	WHITE BALANCE G-BIAS	0000 - 1023 : GREEN BIAS setting value -511 - 512
40	QWB:BBS	WHITE BALANCE B-BIAS	0000 - 1023 : BLUE BIAS setting value -511 - 512
41	QPP	PIXEL TO PIXEL	0 : OFF 1 : ON
42	QPO	PIXEL POSITION	0 : CENTER 1 : LEFT TOP 2 : RIGHT TOP 3 : RIGHT BOTTOM 4 : LEFT BOTTOM
43	QFI	FOCUS IN RED	0 : OFF 1 : ON
44	QLM	LEVEL METER	0 : OFF 1 : 2ch 2 : 4ch 3 : 8ch
45	QTM	TIME CODE	0 : OFF 1 : LTC 2 : VITC 3 : LUB 4 : VUB
46	QCC*3	CLOSED CAPTION	00 : OFF 01 : CC1(VBI) 02 : CC2(VBI) 03 : CC3(VBI) 04 : CC4(VBI) 05 : SRV1 06 : SRV2 07 : SRV3 08 : SRV4 09 : SRV5 10 : SRV6 11 : OP-42 12 : OP-47 13 : CC1(ANC) 14 : CC2(ANC) 15 : CC3(ANC) 16 : CC4(ANC) 17 : CC1(708) 18 : CC2(708) 19 : CC3(708) 20 : CC4(708)
47	QWV	WFM/VEC POSITION	0 : RT 1 : RB 2 : LB 3 : LT
48	QVM	VECTOR MODE	0 : ×1 1 : ×2S 2 : ×2 3 : ×4 4 : ×8
49	QVS	VECTOR SCALE	0 : 100 % 1 : 75 %
50	QTP	TIME CODE POSITION	0 : TOP 1 : RIGHT 2 : CENTER 3 : LEFT
51	QTF	TIME CODE FONT SIZE	0 : LARGE 1 : SMALL
52	QMD	IN MONITOR DISPLAY	0 : OFF 1 : ON
53	QMP	IN MONITOR DISPLAY POSITION	0 : TOP 1 : BOTTOM
54	QMC	IN MONITOR DISPLAY CHAR. COLOR	0 : CMD (RS-485 settings) 1 : WHITE 2 : BLUE 3 : GREEN 4 : YELLOW 5 : CYAN 6 : RED 7 : GRAY 8 : MAGENTA
55	QMV	IN MONITOR DISPLAY VERSION	0 : Ver3.1 1 : Ver4.0
56	QAI	AUDIO INPUT SELECT	0 : AUTO 1 : ANALOG
57	QSL	AUDIO SELECT L	0 : 1ch 1 : 2ch 2 : 3ch 3 : 4ch 4 : 5ch 5 : 6ch 6 : 7ch 7 : 8ch
58	QSR	AUDIO SELECT R	0 : 1ch 1 : 2ch 2 : 3ch 3 : 4ch 4 : 5ch 5 : 6ch 6 : 7ch 7 : 8ch
59	QMT	AUDIO MUTE	0 : OFF 1 : ON
60	QID	MODEL CHECK	BT-LH1850

*3 Responds with the current setting status of the CLOSED CAPTION, CC TYPE, CAPTION CHANNEL, CAPTION SERVICE sub menu items under the DISPLAY SETUP menu.

Error and Warning Displays

If for any reason an error occurs in the monitor, the following indications are made to notify the error or warning.

Error and Warning Displays	Displayed information	Remedy
Warning of drop in external DC input voltage/LOW VOLTAGE	A “LOW VOLTAGE” indication in blue flashes on the screen. This means that the external DC power supply input voltage has dropped to approximately 11.3 V or less.	If the power goes off, connect an external DC power supply providing 11.0 V or more and set the POWER switch to ON.
	The “LOW VOLTAGE” indication lights red on the screen and the power is turned off approximately 4 seconds later. This means that the external DC power supply input voltage has dropped below approximately 11.0 V.	

Maintenance

- To clean the cabinet or surface of the liquid crystal panel, gently wipe with a soft, dry cloth.
  If the surfaces are extremely dirty, use a soft cloth dipped in a weak detergent solution and then wrung-out to clean the surfaces, then use a dry cloth to finish. Water or similar substances getting inside the monitor can cause a malfunction.
- Never use alcohol, thinner or benzene to clean this unit.
  Doing so would cause the surface of the monitor to become discolored, and cause paint to peel.
- Do not spray cleansers directly onto the monitor.
  Water or similar substances getting inside the monitor can cause a malfunction.

Specifications

■ General

Power input

	Power supply	Power consumption
AC :	100 V – 240 V, 50/60 Hz	0.30 A – 0.15 A
DC :	12 V (11 V – 17 V)	1.8 A

▭ indicates safety information.

Dimensions (W x H x D):	479 mm x 390.7 mm x 240 mm (18-7/8 inches x 15-3/8 inches x 9-7/16 inches) (including tilt stand) 479 mm x 339 mm x 76.5 mm (18-7/8 inches x 13-3/8 inches x 3 inches) (monitor only not including tilt stand)
Mass:	7.0 kg (15.43 lb) (including tilt stand) 5.6 kg (12.35 lb) (monitor only not including tilt stand)
Operating temperature range:	5 to 35 °C (41 °F to 95 °F)
Operating humidity range:	20 to 80 % (no condensation)
Storage temperature:	- 20 °C to 60 °C (-4 °F to 140 °F)

■ Panel

Dimensions:	47 cm (18.5 inches) (Effective display area)
Aspect ratio:	16:9
Number of pixels:	1,366 x 768 (WXGA)
Display colors:	Approx. 16,770,000 colors
View angle: (contrast > 10:1):	left/right 170 degrees, up/down 160 degrees

■ Input/output Terminals

VIDEO input:	1 input, BNC x 1
SDI input:	2 inputs, BNC x 2 SMPTE274/296M/259M-C/ITU-R BT.656-4 compliant EMBEDDED AUDIO supported HD-SDI: SMPTE299M compliant 48 kHz, synchronous compatible 8 channels supported SD-SDI: SMPTE272M compliant 48 kHz, synchronous compatible 4 channels supported
HDMI input:	1 line, HDMI terminal x 1 (Type A terminal) HDCP supported EMBEDDED AUDIO supported VIERA Link not supported
DVI-I input:	1 input (single link)
Audio Input:	Pin jack x 2 (stereo) Input signal level: 0.31 Vrms
VIDEO output (through-out):	1 line, BNC x 1
SDI output (switched out):	1 line, BNC x 1
GPI:	1 line, D-SUB, 9 pins x 1
RS-232C:	1 line, D-SUB, 9 pins x 1
RS-485:	1 line, RJ-45 x 2 (input, output)
Headphones:	Stereo mini jack M3 x 1, 32 Ω, level adjustable

■ Other Input/output Terminals

Speaker output:	Monaural 0.5 W
Tally output (display):	Red , Green, Amber

Inrush current, measured according to European standard EN55103-1: 5 A

■ List of supported video input signal formats (✓: Supported)

Input Signal Format/ Status display	VIDEO	SDI1/SDI2	HDMI	DVI-I	
				ANALOG	DIGITAL
				YPBPR	VIDEO
NTSC	✓				
PAL	✓				
640×480 (59.94p)			✓		
640×480 (60p)			✓		
480/59.94i		✓		✓	✓
480/59.94p			✓	✓	✓
576/50i		✓		✓	✓
576/50p			✓	✓	✓
720/50p		✓	✓	✓	✓
720/59.94p		✓	✓	✓	✓
720/60p		✓	✓	✓	✓
1035/59.94i *1		✓	✓	✓	✓
1035/60i *2		✓	✓	✓	✓
1080/23.98PsF		✓		✓	
1080/24PsF		✓		✓	
1080/25PsF *3		✓		✓	
1080/50i		✓	✓	✓	✓
1080/59.94i		✓	✓	✓	✓
1080/60i		✓	✓	✓	✓
1080/23.98p		✓	✓	✓	✓
1080/24p		✓	✓	✓	✓
1080/25p		✓	✓	✓	✓
1080/29.97p		✓	✓	✓	✓
1080/30p		✓	✓	✓	✓
1080/50p			✓		✓
1080/59.94p			✓		✓
1080/60p			✓		✓

*1 When 1035/59.94i signal is input, displayed as 1080/59.94i. Other various marker displays will also use the 1080/59.94i marker.
*2 When 1035/60i signal is input, displayed as 1080/60i. Other various marker displays will also use the 1080/60i marker.
*3 When 1080/25PsF signal is input, displayed as 1080/50i. Other various marker displays will also use the 1080/50i marker.

■ List of supported PC input signal formats (✓: Supported)

Input Signal Format/ Status displays	DVI-I	
	ANALOG	DIGITAL
	RGB-COMP.	COMP.
640×480 (60 Hz)	✓	✓
800×600 (60 Hz)	✓	✓
1024×768 (60 Hz)	✓	✓
1280×768 (60 Hz)	✓	✓
1366×768 (60 Hz)	✓	✓

■ Closed Caption Decoding

Supported Signals

Composite	NTSC, PAL
SD-SDI	480/59.94i, 576/50i
HD-SDI	1080/60i *1, 720/60p *1, 1080/50i, 720/50p, 1080/24PsF *1, 1080/25PsF, 1080/30p *1, 1080/24p *1, 1080/25p

Supported Standards

Composite	EIA/CEA-608 (VBI) , OP-42
SD-SDI	EIA/CEA-608 (VBI) , EIA/CEA-608 (ANC) , OP-42
HD-SDI	EIA/CEA-608 (708) , EIA/CEA-708, OP-47

Supported Specifications (EIA/CEA-608)

Decode channels	CC1 - CC4 *2
Character	Standard Character, Special Charactor

Supported Specifications (EIA/CEA-708)

Caption service	Service #1 to #6
Character	G0 Code, G1 Code, Window Style*3, Pen Style*4

*1 The frame frequency of 1/1.001 is also supported.
*2 The XDS service is not supported.
*3 Window Style
Only justify LEFT is supported.
Only print direction LEFT-TO-RIGHT is supported.
Only scroll direction BOTTOM-TO-TOP is supported.
Word wrap is not supported.
Only the display effect SNAP is supported.
Fill color is not supported.
Fill opacity is not supported.
Border type is not supported.
*4 Pen Style
Pen size SMALL is supported.
Font style is 0
Only offset NORMAL is supported.
Italics is supported.
Underline is supported.
Only edge type UNIFORM is supported.
Foreground colors white, blue, green, yellow, cyan, red, gray, and magenta are supported.
Foreground opacity is not supported.
Background colors black and orange (orange is displayed when any color other than black is specified) are supported.
Background opacity: only black (semi-transparent) is supported.

Supported specifications (OP-42)

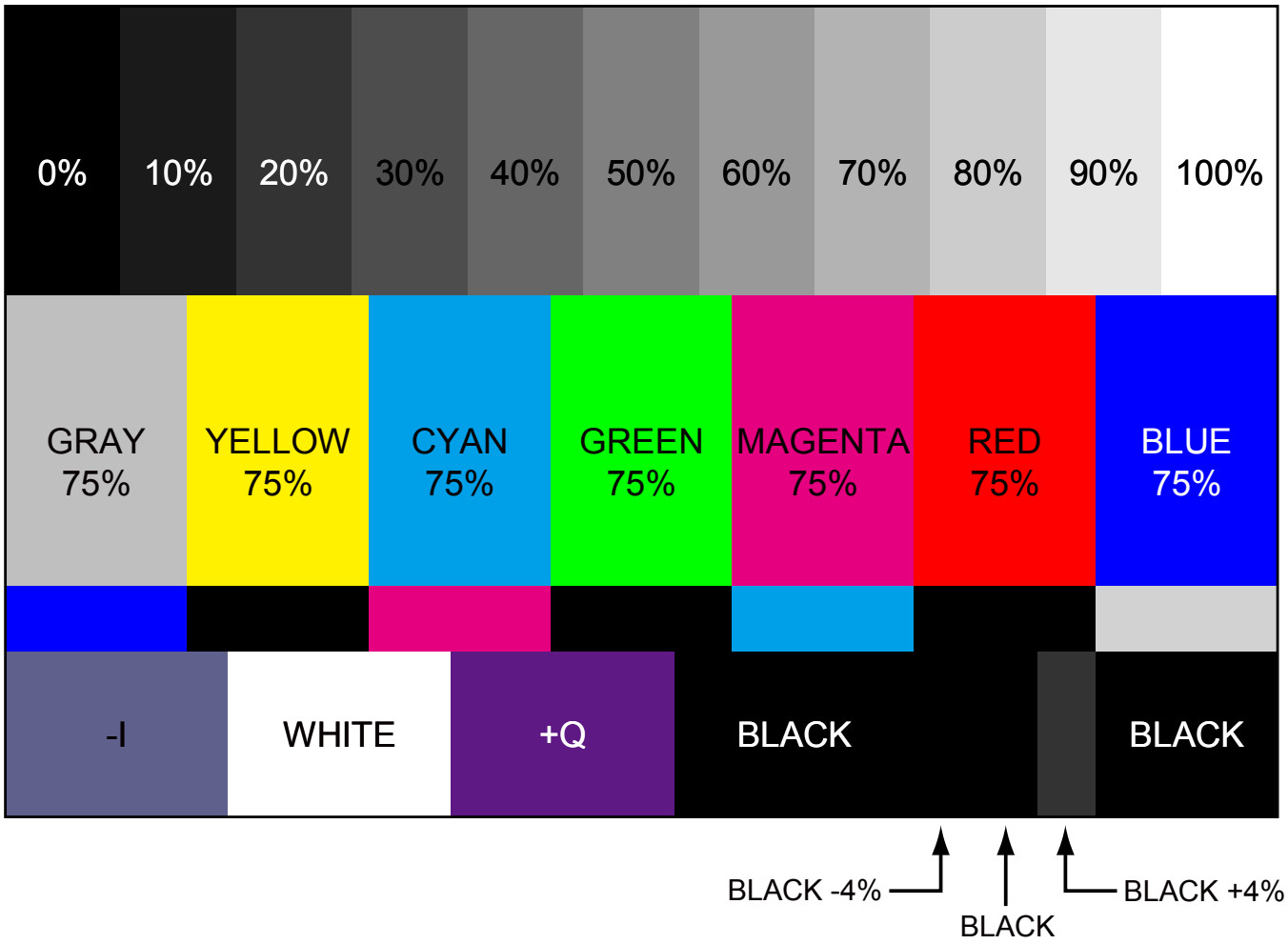
Only character code is supported

Supported specifications (OP-47)

Only character code is supported

Weight and dimensions are approximate.
Specifications are subject to change without notice.

■ INT-SG (Internal chart for adjustment)



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MEMO

Disposal of Old Equipment

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