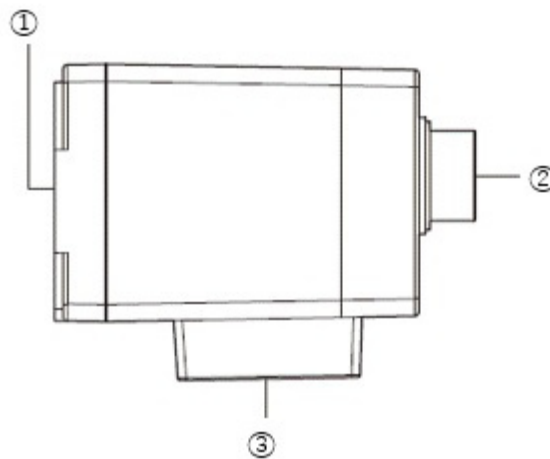


1. Operation and Settings

1.1 Names and functions of each part

1.1.1 Camera head *1



*1 Design and shape are subject to change.

- ① Lens mount part (with C-mount adapter)

Attach the lens that matches the lens mount.

- ② Camera cable connection terminal

Connect a camera cable (GP-UC532G**A or GP-UC532G**AJ equivalent (*2)).

*2 GP-UC532G** (cable without A or AJ at the end) cannot be used.

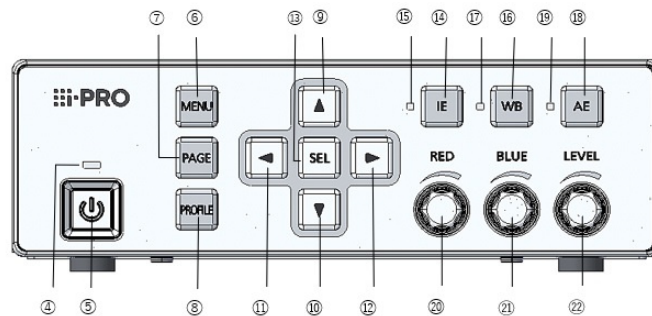
- ③ Tripod mount base

When fixing the camera head to a tripod, etc., use the screw hole on the tripod mount base.

Screw hole: 1/4-20 UNC

1. Operation and Settings
1.1 Names and functions of each part

1.1.2 CCU (Front panel) *1



*1 Design and shape are subject to change.

- ④ Power status lamp (Green)
Indicates the ON/OFF status of the power.
Light On: Power ON
Light Off: Power OFF
- ⑤ Power switch
Turns the power of the CCU and camera head on and off.
- ⑥ Menu button (From now on, this will be referred to as the "[MENU] button".)
Pressing this button for more than one second displays the top page of the ADVANCED MENU.
However, if the page of ADVANCED MENU on which the cursor is displayed is not the top page, it will move to the level above.
Pressing this button for more than one second when any menu screen in any level is displayed will hide the ADVANCED MENU.
Pressing this button except while the SETUP menu is displayed, the screen freeze function will be activated.

Note:

- The cursor is a blinking part. In this document, it is indicated by **Shaded**.
 - The top page of the ADVANCED MENU is made up of multiple pages. See 1.4.3 for details.
 - Pages other than the top page will be referred to as the "SUB MENU" from here on, and to move to the SUB MENU,
move the cursor to an item or setting value on each ADVANCED MENU page that has an "*" next to it and press the [SEL] button.
-

1. Operation and Settings

1.1 Names and functions of each part

- ⑦ Page button (From now on, this will be referred to as the "[PAGE] button".)

Switches the page while the SETUP menu is displayed.

If the SETUP menu is not displayed, press this to switch between the "VIDEO OUTPUT HDMI/SDI 1" and "VIDEO OUTPUT HDMI/SDI 2" settings.

The QUICK MENU will be displayed when the button is pressed while other than SETUP menu is displayed.

- ⑧ Profile selection button (From now on, this will be referred to as the "[PROFILE] button".)

Selects a profile from 1 to 6.

Each profile should be set up beforehand using the SETUP menu.

- ⑨ Up button (From now on, this will be referred to as the "[▲] button".)

The following two operations are possible while the SETUP menu is displayed.

- Move the cursor to switch the item to be set.
- If the item is on the SUB menu screen that requires adjustment in the vertical direction (such as the [COLOR MATRIX] USER AREA screen), the vertical adjustment will be performed.

When it is pressed while other than the SETUP menu is displayed, the setting of the "FLIP AND MIRROR" will be switched.

- ⑩ Down button (From now on, this will be referred to as the "[▼] button".)

See item ⑨ above.

- ⑪ Left button (From now on, this will be referred to as the "[◀] button".)

The following three operations can be performed while the SETUP menu is displayed.

- Change the setting value of the target item (for LEVEL adjustment, adjust in the \pm direction).
- When the SUB menu screen for an item that allows horizontal adjustment (such as the [COLOR MATRIX] USER AREA screen) is displayed, adjust in the horizontal direction.
- When the cursor is on the bottom line ([EXP(RGB,IR) PIC(RGB,IR,MIX)CONTR(RGB,IR) F1 F2 SYS]), moves to each setting screen.

When it is pressed while other than the SETUP menu is displayed, the zoom ratio of the "DIGITAL ZOOM" will be switched.

- ⑫ Right button (From now on, this will be referred to as the "[▶] button".)

See item ⑪ above.

- ⑬ Selection button (From now on, this will be referred to as the "[SEL] button".)

The following four operations can be performed while the SETUP menu is displayed.

- If the cursor is on an item that allows movement to the SUB menu, it will transition to the SUB menu.
 - If the cursor is on an instruction that involves some kind of action, such as "CANCEL",
-

1. Operation and Settings

1.1 Names and functions of each part

"SET(NEW SETTING)", "RET", "END", or "RESET", it will perform the corresponding action.

- When in the SUB menu screen of the "USER PROFILE ID" or "USER PROFILE LABEL" item, the string pointed to by the cursor will be selected as the ID/LABEL.
- When the "WHITE SHADING" item is set to "AUTO(SET)" and the cursor is on it, automatic white shading adjustment will be started.

Pressing this when the SETUP menu is not displayed will display the "SETTING INFORMATION" screen.

When this screen is displayed, pressing this again will return to the camera image.

"SETTING INFORMATION" displays the settings for "IE FUNCTION SELECT", "FOOTSW CONTROL CH1/CH2", "SAVE/LOAD MODE (USB)" and "VIDEO FORMAT (HDMI1/HDMI2/SDI1/SDI2)".

- ⑭ IE (IMAGE ENHANCEMENT) button (From now on, this will be referred to as the "[IE] button".)

Switches On/Off of the IE function.

- ⑮ IE status lamp (Green)

Indicates the On/Off status of the IE function.

On: IE function is enabled.

Off: IE function is disabled.

- ⑯ AWC (Automatic White balanceControl) button (From now on, this will be referred to as the "[WB] button".)

If "WHITE BAL MODE" in the SETUP menu is set to "AWC", AWC will be started up when the button is pressed while the camera images are being displayed.

Important :

- When the camera head is not connected, the [WB] button does not function.

- ⑰ AWC status lamp (Orange)

Indicates the status of the AWC function.

Off : AWC is deactivated.

Blink : AWC is activated or running.

Blink → Off : AWC success

On : AWC error

- ⑱ AE (Automatic Exposure) button (From now on, this will be referred to as the "[AE] button".)

Switches the Auto/Manual mode of the AE function.

- ⑲ AE status lamp (Green)
-

1. Operation and Settings
1.1 Names and functions of each part

Indicates the Auto/Manual mode status of the AE function.

On : Auto exposure

Off : Manual exposure

- ⑳ Red volume (From now on, this will be referred to as the "[RED] volume".)

Adjusts the offset over RED gain of the white balance.

Also, while the adjustment menu is displayed, pressing the [PAGE] button will switch to the DETAIL BAND settings, allowing you to adjust them.

The selected item will be changed if the volume is turned while the SETUP menu is displayed.

- ㉑ Blue volume (From now on, this will be referred to as the "[BLUE] volume".)

Adjusts the offset over BLUE gain of the white balance.

Also, while the adjustment menu is displayed, pressing the [PAGE] button will switch to the DETAIL LEVEL settings, allowing you to adjust them.

- ㉒ Level volume (From now on, this will be referred to as the "[LEVEL] volume".)

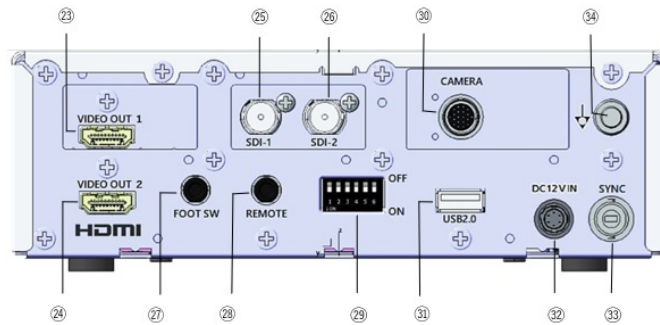
Adjusts the brightness level.

Also, while the adjustment menu is displayed, pressing the [PAGE] button will switch to the IE LEVEL settings, allowing you to adjust them.

moves the cursor or change the content of the selected item while the SETUP menu is displayed.

1. Operation and Settings
 1.1 Names and functions of each part

1.1.3 CCU (Rear panel) *2



*2 Design and shape are subject to change.

- ②③ HDMI output connector [HDMI 1]
Used to connect a monitor equipped with an HDMI function.
- ②④ HDMI output connector [HDMI 2]
Used to connect a monitor equipped with an HDMI function.

Important:

- It is recommended to use the Panasonic HDMI cables (option).
- When using the HDMI1 for YPbPr (422) 10BIT of the 2160p output, make sure to use an HDMI cable (option) that supports 18 Gbps.
- Use a monitor on which HDMI logo mark is displayed.

- ②⑤ SDI output connector [SDI 1]
Connector for 12G-SDI, 3G-SDI signal output.
- ②⑥ SDI output connector [SDI 2]
Connector for 12G-SDI, 3G-SDI signal output.

Note:

- When 4K2MOS or 4K4MOS camera head is connected, the Video Output settings for each terminal are as follows.

Output Terminal	Video Format (Frame Rate)	RGB	RGB+IR	IR	HEATMAP	MULTI(RGB)	MULTI(RGB+IR)	MULTI(IR)	MULTI(HEATMAP)	SIDE BY SIDE
HDMI1 / SDI1	3840x2160p (59.94Hz / 50Hz)	○	○	○	○	○	○	○	○	○
	1920x1080p (59.94Hz / 50Hz)	○	○	○	—	—	—	—	—	—
HDMI2 / SDI2	3840x2160p (59.94Hz / 50Hz)	○	○	○	—	—	—	—	—	—
	1920x1080p (59.94Hz / 50Hz)	○	○	○	—	—	—	—	—	—

○: It is possible to switch to the specified setting. —: It is not possible to switch to the specified setting.

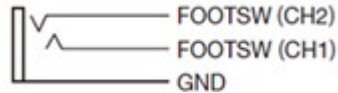
1. Operation and Settings
 1.1 Names and functions of each part

For details on the Video Output settings, please refer to "1.10.3 VIDEO OUTPUT HDMI/SDI 1".

- When 4K1MOS, 4K3MOS or 2K3MOS camera head is connected, it is fixed to "RGB".
-

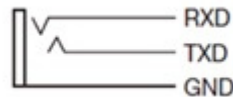
⑳ Foot switch connector [FOOT SW]

Connector for a foot switch.(ø3.5 stereo mini jack)



㉑ Remote connector [REMOTE]

Connector for the external control. (ø3.5 stereo mini jack)



㉒ Function setup switches

Each sets up video output functions.

Switch 1 selects frame frequency of 59.94 Hz/50 Hz.

The switches 2, 3 and 4 are fixed in the ON position.

Switch 5 selects the output format (UHD/FULL-HD) for HDMI OUT 1 and SDI OUT 1.

Switch 6 selects the output format (UHD/FULL-HD) for HDMI OUT 2 and SDI OUT 2.

DIPSW				Frame Rate	HDMI OUT-1	HDMI OUT-2	SDI OUT-1	SDI OUT-2
1	2, 3, 4,	5	6					
ON	ON	ON	ON	59.94Hz (NTSC)	3840x2160p 59.94p	3840x2160p 59.94p	3840x2160p 59.94p	3840x2160p 59.94p
		ON	OFF		3840x2160p 59.94p	1920x1080p 59.94p	3840x2160p 59.94p	1920x1080p 59.94p
		OFF	OFF		1920x1080p 59.94p	1920x1080p 59.94p	1920x1080p 59.94p	1920x1080p 59.94p
OFF		ON	ON	50Hz (PAL)	3840x2160p 50p	3840x2160p 50p	3840x2160p 50p	3840x2160p 50p
		ON	OFF		3840x2160p 50p	1920x1080p 50p	3840x2160p 50p	1920x1080p 50p
		OFF	OFF		1920x1080p 50p	1920x1080p 50p	1920x1080p 50p	1920x1080p 50p

1. Operation and Settings

1.1 Names and functions of each part

③⑩ Camera cable connector [CAMERA]

Connect a camera cable (GP-UC532G**A or GP-UC532G**AJ equivalent (*2)).

*2 GP-UC532G** (cable without A or AJ at the end) cannot be used.

③⑪ USB connector [USB]

By inserting the USB memory, SAVE/LOAD of the profile can be performed.

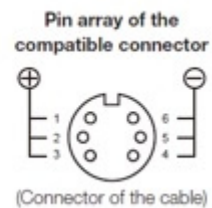
③⑫ 12 V DC power connector [DC IN 12V]

Connector for the external DC power more than 12V DC (3A).

Compatible connector

: HR10A-7P-6S(73)

manufactured by HIROSE ELECTRIC CO., LTD.



③⑬ Synchronizing signal input/output connector [SYNC]

Connector for input or output of external synchronizing signal.

③⑭ GND terminal

Connect to GND.

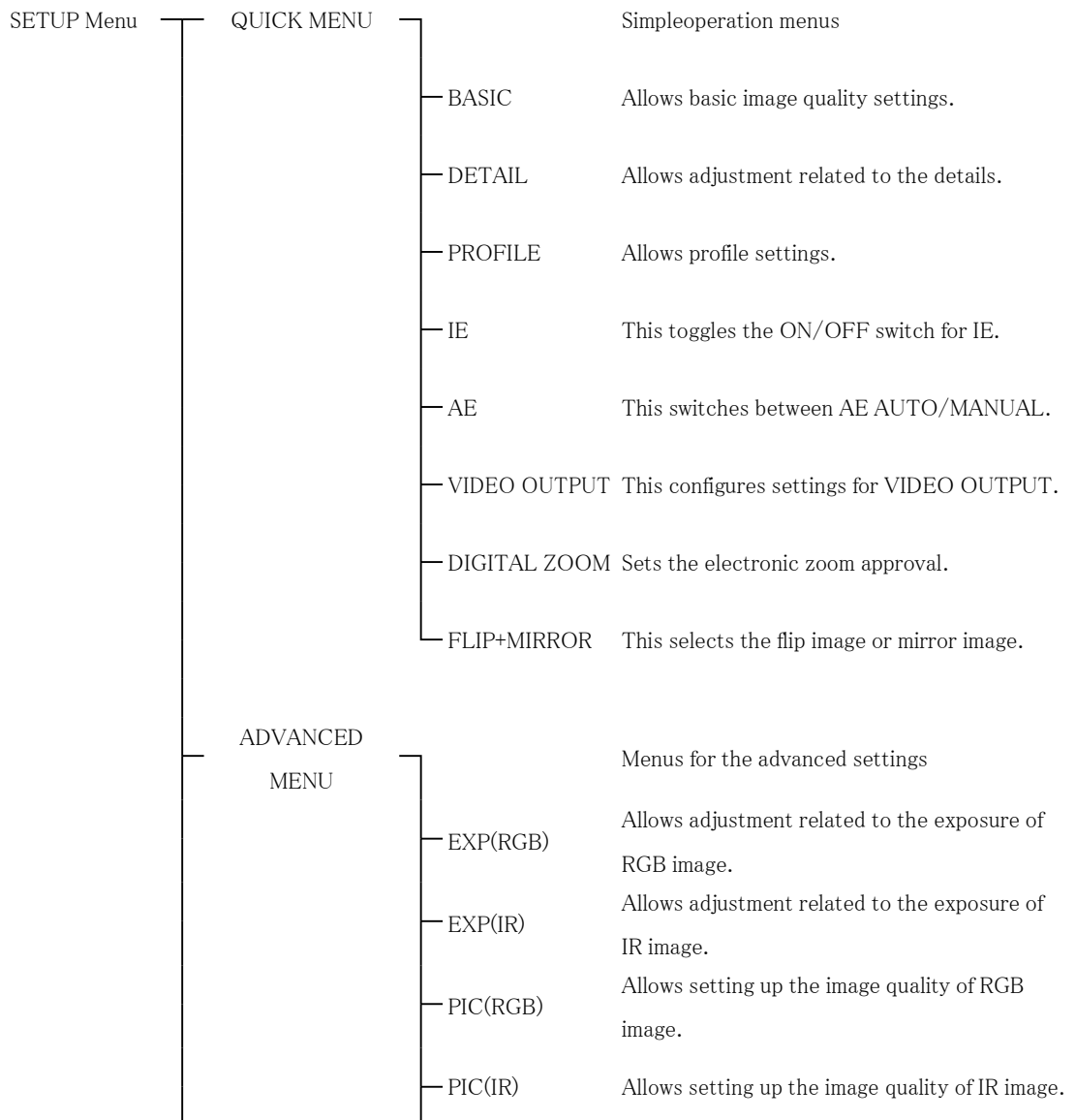
1.2 Setup through the SETUP Menu

Set up each item in the SETUP menu in advance to use this unit.

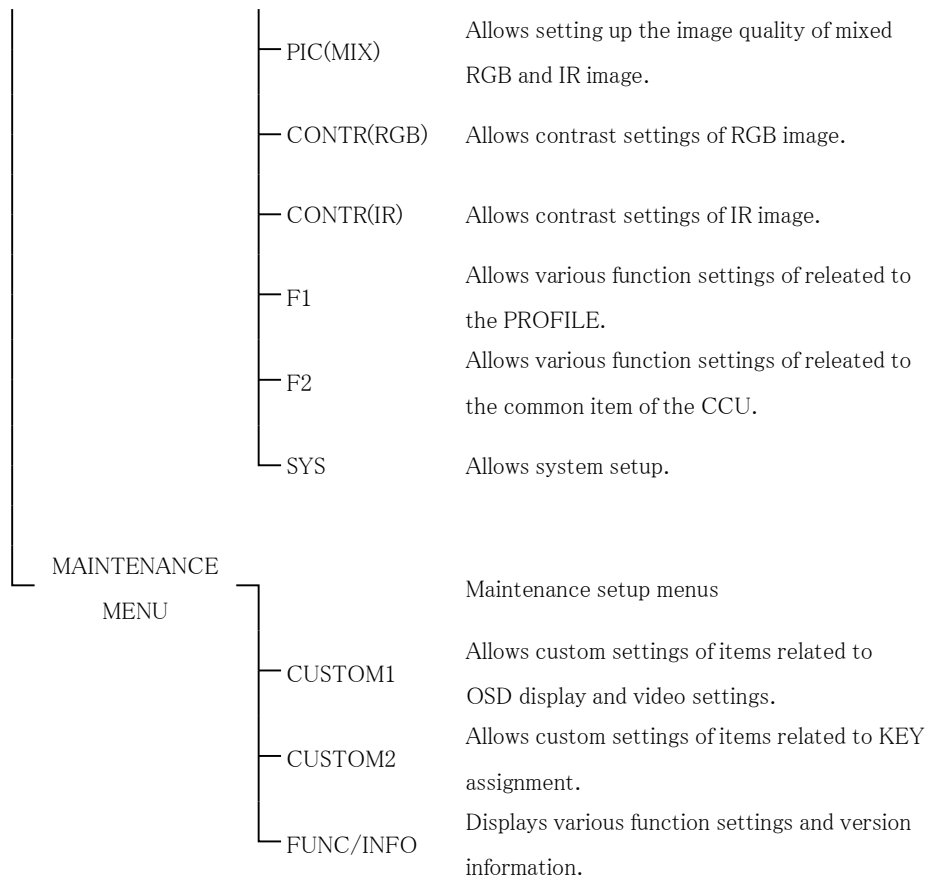
Perform the settings in accordance with the conditions of the camera shooting area.

1.2.1 SETUP menus

The setup menus consist of three menus, "QUICK MENU", "ADVANCED MENU" and "MAINTENANCE MENU".



1. Operation and Settings
1.2 Setup through the SETUP Menu



1. Operation and Settings
 1.2 Setup through the SETUP Menu

The following items can be set in the ADVANCED MENU.

Setup items	Description
EXP(RGB)	
AE(RGB)	Sets up AE (Automatic Exposure).
SHUTTER	Sets the electronic shutter speed.
GAIN	Sets the gain.
AREA SELECTION	Sets the brightness detection area of "AE", "GAIN" and "SHUTTER".
PEAK/AVE LEVEL	Sets the weighting for peak and average for the brightness detection processing.
HEAD GAIN	Sets the head gain.
EXP(IR)	
AE(IR)	Sets up AE (Automatic Exposure).
SHUTTER	Sets the electronic shutter speed.
BINNING	Sets the pixel adding mode.
GAIN	Sets the gain.
LONG EXPOSURE	Sets the long exposure.
AREA SELECTION	Sets the brightness detection area of "AE", "GAIN" and "SHUTTER".
PEAK/AVE LEVEL	Sets the weighting for peak and average for the brightness detection processing.
HEAD GAIN	Sets the head gain.
PIC(RGB)	
WHITE BAL MODE	Sets the white balance.
DETAIL BAND	Sets the details.
2DNR LEVEL	Sets the level of the 2D digital noise reduction.
3DNR LEVEL	Sets the level of the 3D digital noise reduction.
PEDESTAL LEVEL	Adjusts the pedestal level.
COLOR LEVEL	Sets the whole color level.
COLOR MATRIX	Sets various hue.
MOIRE REDUCTION	Sets the moiré reduction function.
PIC(IR)	
2DNR LEVEL	Sets the level of the 2D digital noise reduction.
3DNR LEVEL	Sets the level of the 3D digital noise reduction.
PEDESTAL LEVEL	Adjusts the pedestal level.

1. Operation and Settings

1.2 Setup through the SETUP Menu

Setup items	Description
PIC(MIX)	
IR MIX	Sets the detailed settings of the IR image to be overlaid on the overlay image.
HEATMAP	Sets the detailed settings of the HEATMAP image to be overlaid on the overlay image.
VIDEO OUTPUT HDMI/SDI 1	Sets the screen settings for the output video of the HDMI-1/SDI-1.
VIDEO OUTPUT HDMI/SDI 2	Sets the screen settings for the output video of the HDMI-2/SDI-2.
CONTR(RGB)	
GAMMA SELECT	Sets the gamma correction mode.
GAMMA VALUE	Sets the gamma correction level.
KNEE MODE	Sets the knee mode.
KNEE POINT	Sets the knee point.
KNEE SLOPE	Sets the knee slope.
IE FUNCTION SELECT	Assigns a function to [IE] (IMAGE ENHANCEMENT) button.
IE FUNCTION LEVEL	Sets the correction level selected with IE.
CONTR(IR)	
GAMMA SELECT	Sets the gamma correction mode.
GAMMA VALUE	Sets the gamma correction level.
KNEE MODE	Sets the knee mode.
KNEE POINT	Sets the knee point.
KNEE SLOPE	Setsthe knee slope.
F1	
(USER PROFILE) PROFILE ID	Sets the camera's ID title.
(USER PROFILE) PROFILE LABEL	Sets the label tiles of 1 to 6 profiles to be displayed.
FLUORESCENCE MODE	Set the additional setting for each fluorescent image capture mode.
FLIP AND MIRROR	Sets vertical and horizontal image flip.
F+M STATUS DISPLAY	Sets the display of the vertical and horizontal image flip status.
F2	
COLOR BAR	Sets the color bar display.
FOOTSW CONTROL CH1	Assigns a function to the foot switch 1.
FOOTSW CONTROL CH2	Assigns a function to the foot switch 2.
USER PROFILE SAVE/LOAD	Saves profiles to USB memory / Loads profiles from USB memory
SAVE/LOAD MODE(USB)	Sets the method of saving to/loading from USB memory.
USER PROFILE RESET	Initialize the profile contents.
DIGITAL ZOOM	Sets the electronic zoom approval.
DIGITAL ZOOM STATUS DISPLAY	Sets the display of the electronic zoom ratio.

1. Operation and Settings
1.2 Setup through the SETUP Menu

Setup items	Description
SYS	
OSD POSITION	Sets the OSD position of the video output.
HDMI1 COLOR DEPTH	Sets the color depth of HDMI1.
HDMI2 COLOR DEPTH	Sets the color depth of HDMI2.
G/L SYNC TERMINAL SETTING	Sets the synchronizing signal input/output connector.
G/L SYNC STATUS INFO	Displays the status of the external synchronization connector.
H/V PHASE ADJUST H	Sets the horizontal phases.
H/V PHASE ADJUST V	Sets the vertical phases.
WHITE SHADING	Sets the white shading.

important:

- "WHITE SHADING" is displayed on the menu and can be set only when the 4K4MOS, 4K3MOS and 2K3MOS camera heads are connected.
 - The "EXP(IR)", "PIC(IR)", "PIC(MIX)" and "CONTR(IR)" setting items can be set only when the 4K2MOS and 4K4MOS of the camera head are connected.
If any other camera head is connected, the menu for the target item will not be displayed.
-

1.3 How to display the menu

The description below explains how to display each SETUP menu on the connected monitor.

1.3.1 QUICK MENU

There are the following methods to display the QUICK MENU.

- Turn each [RED],[BLUE],[LEVEL] volume.
The QUICK MENU has two pages. To switch the page, press the [PAGE] button.
- Press the [PROFILE] button.
To switch between six profiles.
- Press the [IE] button.
This displays the selection menu for IE.
Set the function assignment for IE FUNCTION SELECT on CONTR(RGB).
- Press the [AE] button.
This displays the selection menu for AE(RGB) and AE(IR).
- Press the [PAGE] button.
This displays the selection menu for VIDEO OUTPUT HDMI/SDI.
If the function assignment is set to OFF in the MAINTENANCE MENU, it will not be displayed.
- Press the [◀] / [▶] button.
This displays the selection menu for DIGITAL ZOOM.
If the function assignment is set to OFF in the MAINTENANCE MENU, it will not be displayed.
- Press the [▲] / [▼] button.
Display the selection menu for FLIP+MIRROR.
If the function assignment is set to OFF in the MAINTENANCE MENU, it will not be displayed.

1.3.2 ADVANCED MENU

If the [MENU] button is pressed for more than 2 seconds, the top page of the ADVANCED MENU will be displayed.

The ADVANCED MENU has ten pages. To switch the page, press the [PAGE] button, or move the cursor to the tab on the bottom of the page and press the [◀] or [▶] button.

To switch between six profiles, press the [PROFILE] button.

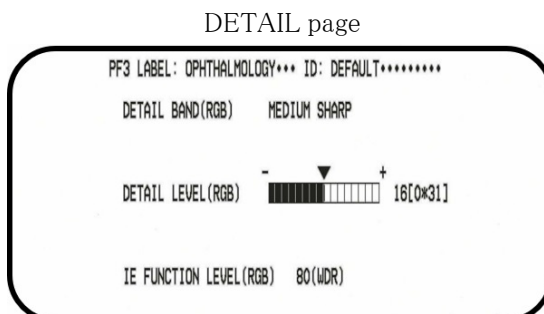
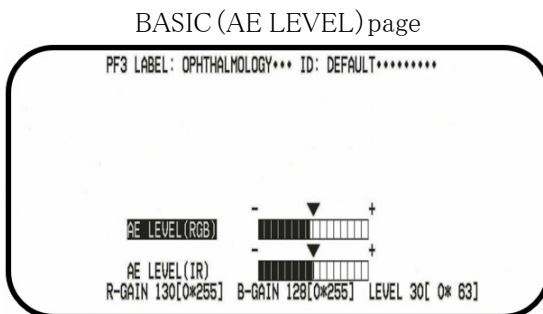
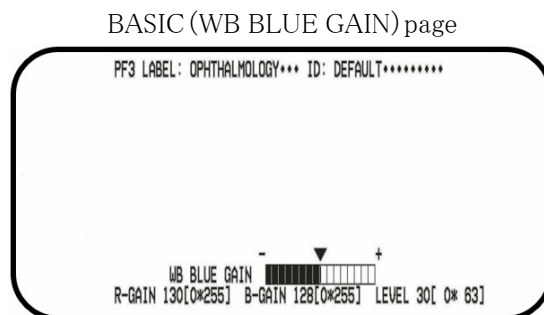
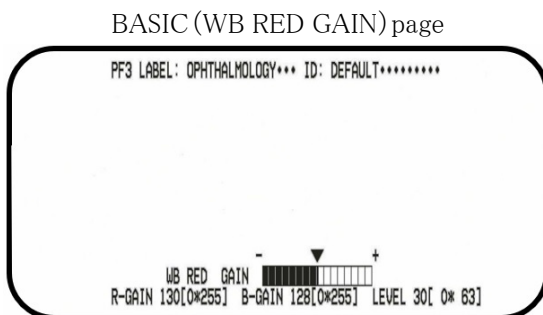
1.4 Basic operation

Important:

- The following functions are not available when the camera head is not connected.
 - AWC startup for WHITE BAL MODE
 - FLIP AND MIRROR
 - WHITE SHADING
 - COLOR MATRIX
 - FREEZE
 - H/V PHASE ADJUST
 - DIGITAL ZOOM

1.4.1 how to operate the QUICK MENU basically

QUICK MENU top page



STEP1

BASIC page

Set up each item.

- WB RED GAIN
Turn the [RED] volume to adjust the red level.
- WB BLUE GAIN
Turn the [BLUE] volume to adjust the blue level.
- AE LEVEL(RGB,IR)
Turn the [LEVEL] volume to adjust the

DETAIL page

The page will be switched to the DETAIL page when the [PAGE] button

is pressed while BASIC page is displayed.

- DETAIL BAND(RGB)
Turn the [RED] volume to adjust the band of the edge correction.
- DETAIL LEVEL(RGB)
Turn the [BLUE] volume to adjust the level

1. Operation and Settings
1.4 Basic operation

brightness.

The switch between AELEVEL(RGB) and AE LEVEL(IR) is done using the [▲] / [▼] button.

STEP2

If operation is stopped for 4 seconds, the setup content will be saved, and the camera image will be restored.

Note:

- If the AE(RGB) setting is MANUAL, it will be displayed as LEVEL(RGB).
 - If the AE(IR) setting is MANUAL, it will be displayed as LEVEL(IR).
-

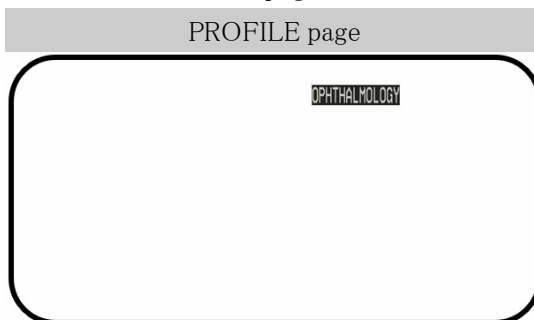
of the edge correction.

● IE FUNCTIONLEVEL(RGB)

Turn the [LEVEL] volume to adjust the selected IE function level.

1.4.2 how to operate other QUICK MENU

Other QUICK MENU page

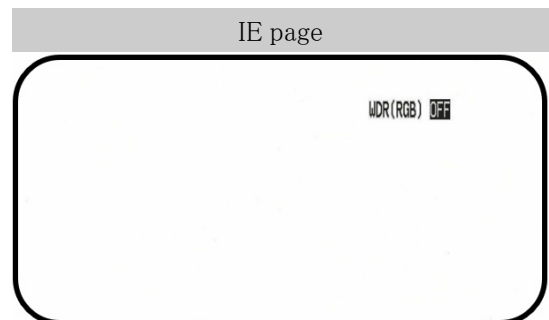


STEP1

To switch between six profiles, press the [PROFILE] button.

STEP2

If operation is stopped for 4 seconds, the setup content will be saved, and the camera image will be restored.



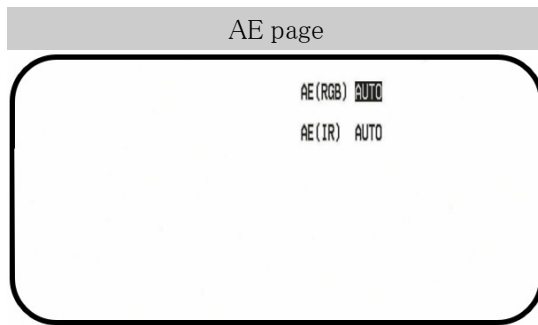
STEP1

Pressing the [IE] button toggles between ON and OFF.

STEP2

If operation is stopped for 4 seconds, the setup content will be saved, and the camera image will be restored.

1. Operation and Settings
1.4 Basic operation



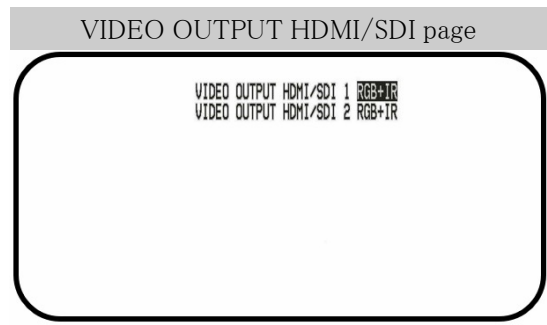
STEP1

Press the [AE] button or turn the [LEVEL] volume to switch between AUTO and MANUAL.

Press the [▲] / [▼] button or turn the [RED] volume to switch between RGB and IR.

STEP2

If operation is stopped for 4 seconds, the setup content will be saved, and the camera image will be restored.



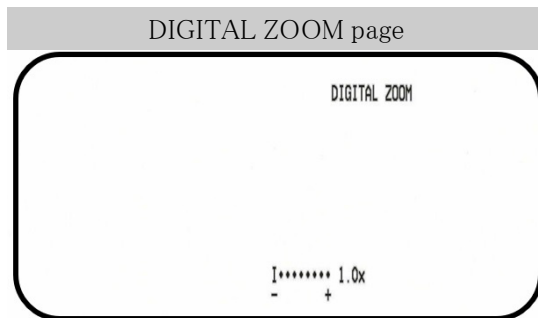
STEP1

Press the [PAGE] button or turn the [LEVEL] volume to switch between selected items.

Press the [▲] / [▼] button or turn the [RED] volume to switch between HDMI/SDI1 and HDMI/SDI2.

STEP2

If operation is stopped for 4 seconds, the setup content will be saved, and the camera image will be restored.

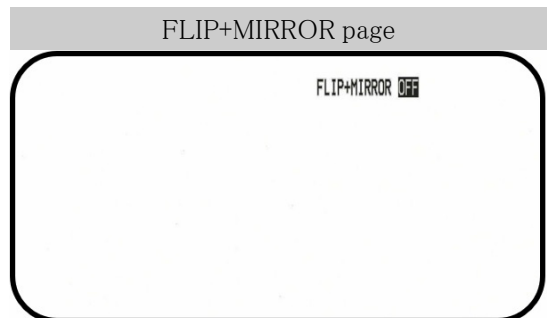


STEP1

Press the [◀] / [▶] button to change the DIGITAL ZOOM magnification.

STEP2

If operation is stopped for 4 seconds, the setup content will be saved, and the camera image will be restored.



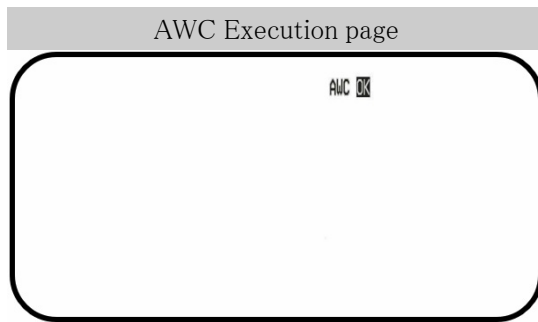
STEP1

Press the [▲] / [▼] button to switch between selected items.

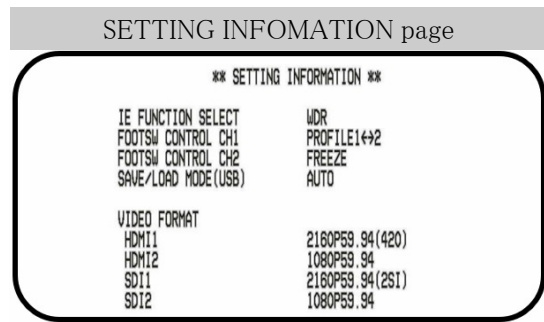
STEP2

If operation is stopped for 4 seconds, the setup content will be saved, and the camera image will be restored.

1. Operation and Settings
1.4 Basic operation



Press the [WB] button to execute AWC.
During AWC execution, the characters 'AWC' will blink in reverse in the upper right corner of the OSD display area.
When AWC completes successfully, 'AWC OK' will be displayed for approximately 3 seconds.



Press the [SEL] button to display the settings for the 4 items of 'IE FUNCTION SELLECT', 'FOOTSW CONTROL CH1', 'FOOTSW CONTROL CH2', 'SAVE/LOAD MODE(USB)' and the VIDEO FORMAT of each 'HDMI1/HDMI2', 'SDI1/SDI2' output terminal are displayed, and it becomes a color bar image.
Press the [SET] button again to return to the camera image.

1. Operation and Settings
 1.4 Basic operation

1.4.3 how to operate the ADVANCED MENU basically

ADVANCED MENU top page

EXP(RGB) page

```
PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
AE (RGB)      *AUTO   LEVEL 30[ 0* 63]
SHUTTER      AUTO     ---
GAIN         *AUTO   MAXGAIN 18dB[ 3* 18]
AREA SELECTION  AUTO
PEAK/AVE LEVEL 8[0*8]
HEAD GAIN    AUTO

[EXP(000,IR) PIC(RGB,IR,MIX) CONTR(RGB,IR) F1 F2 SYS]
```

EXP(IR) page

```
PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
AE (IR)      *AUTO   LEVEL 32[ 0* 63]
SHUTTER      AUTO     ---
BINNING      P/L MIX
GAIN         *AUTO   MAXGAIN 12dB[ 3* 18]
LONG EXPOSURE OFF
AREA SELECTION  AUTO
PEAK/AVE LEVEL 0[0*8]
HEAD GAIN    +9dB

[EXP(RGB,000) PIC(RGB,IR,MIX) CONTR(RGB,IR) F1 F2 SYS]
```

PIC(RGB) page

```
PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
WHITE BAL MODE *AWC   R-GAIN 130[ 0*255]
              B-GAIN 128[ 0*255]
DETAIL BAND   *MEDIUM SHARP LEVEL 16[ 0* 31]
2DNR LEVEL   3[ 0* 10]
3DNR LEVEL   3[ 0* 10]
PEDESTAL LEVEL 76[68* 95]
COLOR LEVEL   170[ 0*255]
COLOR MATRIX *USER
NOISE REDUCTION OFF

[EXP(RGB,IR) PIC(000,IR,MIX) CONTR(RGB,IR) F1 F2 SYS]
```

PIC(IR) page

```
PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
2DNR LEVEL   5[ 0* 10]
3DNR LEVEL   5[ 0* 10]
PEDESTAL LEVEL 76[68* 95]

[EXP(RGB,IR) PIC(RGB,000,MIX) CONTR(RGB,IR) F1 F2 SYS]
```

PIC(MIX) page

```
PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
*IR MIX
*HEATMAP
VIDEO OUTPUT HDMI/SDI 1 RGB+IR
VIDEO OUTPUT HDMI/SDI 2 RGB+IR

[EXP(RGB,IR) PIC(RGB,IR,000) CONTR(RGB,IR) F1 F2 SYS]
```

CONTR(RGB) page

```
PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
GAMMA SELECT  S-CURVE
GAMMA VALUE   0.45[ 0.35*0.55]
KNEE MODE     MANUAL
KNEE POINT    8[0*15]
KNEE SLOPE    3[0*7]
IE FUNCTION SELECT WDR
LEVEL         80[0*255]

[EXP(RGB,IR) PIC(RGB,IR,MIX) CONTR(000,IR) F1 F2 SYS]
```

CONTR(IR) page

```
PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
GAMMA SELECT  S-CURVE
GAMMA VALUE   0.35[ 0.35*0.55]
KNEE MODE     MANUAL
KNEE POINT    8[0*15]
KNEE SLOPE    3[0*7]

[EXP(RGB,IR) PIC(RGB,IR,MIX) CONTR(RGB,000) F1 F2 SYS]
```

F1 page

```
PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
USER PROFILE
USER PROFILE ID *OFF
USER PROFILE LABEL *OFF
FLUORESCENCE MODE OFF
FLIP AND MIRROR OFF
F+M STATUS DISPLAY OFF

[EXP(RGB,IR) PIC(RGB,IR,MIX) CONTR(RGB,IR) 000 F2 SYS]
```

F2 page

```
COLOR BAR *ON
FOOTSW CONTROL CH1 PROFILE1↔2
FOOTSW CONTROL CH2 FREEZE
USER PROFILE SAVE/LOAD *USB → CAMERA (ALL)
SAVE/LOAD MODE (USB) AUTO
*USER PROFILE RESET
DIGITAL ZOOM ON
DIGITAL ZOOM STATUS DISPLAY OFF

[EXP(RGB,IR) PIC(RGB,IR,MIX) CONTR(RGB,IR) F1 000 SYS]
```

SYSTEM page

```
OSD POSITION UPPER LEFT
HDMI1 COLOR DEPTH YpbPr(420)8BIT
HDMI2 COLOR DEPTH YpbPr(422)
G/L SYNC TERMINAL SETTING OUT
G/L SYNC STATUS INFO INTERNAL
H/V PHASE ADJUST H 0[-20* 20]
V 0[-12* 12]

[EXP(RGB,IR) PIC(RGB,IR,MIX) CONTR(RGB,IR) F1 F2 000 SYS]
```

1. Operation and Settings

1.4 Basic operation

STEP1

Select the page.

Press the [PAGE] button to switch pages. If the cursor is on the tab at the bottom of the menu, pressing the [◀] / [▶] button or turning the [LEVEL] volume will switch the page.

STEP3

Press the [MENU] button for 1 second or more after saving the setup content to close the setup page and return to the camera image.

The setup content will be maintained even after the power of the CCU is turned off.

STEP2

Set up each item.

● Select the item to be set

Move the cursor by turning the [RED] volume or pressing the [▲] or [▼] button.

● Change the set item

Turn the [LEVEL] volume or press the [◀] or [▶] button.

● Display advanced setup page

Press the [SEL] button for the item "*" is indicated.

● Return to the upper level setup page

Press the [MENU] button.

Note:

- If you press the [MENU] button when not in MENU display, the screen freeze function will activate.
-

1.5 Set up profile

If details, gamma, hue, etc. are registered as a profile in accordance with an installation site, the user can call the registered contents only by pressing the [PROFILE] button on the front panel of the CCU.

We have prepared the following profiles as recommended values.

Please select according to your needs. (You can overwrite these profiles and customize settings individually.)

PROFILE	USER PROFILE LABEL (Factory settings.)	Recommended use
PROFILE 1	"ENDOSCOPE(WARM)"	Setting for endoscopes.
PROFILE 2	"ENDOSCOPE(COOL)"	The settings are for endoscopes, and the color temperature is set lower than the "PROFILE 1" setting.
PROFILE 3	"OPHTHALMOLOGY"	Settings for ophthalmology with microscope specifications.
PROFILE 4	"NEUROSURGERY"	Settings for microscopes and for neurology.
PROFILE 5	"FLUORESCENCE"	Settings for fluorescence imaging.
PROFILE 6	"STANDARD"	Standard settings.

1. Operation and Settings
 1.5 Set up profile

1.5.1 Initial setting value of PROFILE

PROFILE initial setting value table (1/4)

Setup items		PROFILE 1	PROFILE 2	PROFILE 3	PROFILE 4	PROFILE 5	PROFILE 6
EXP(RGB)							
AE(RGB)		AUTO	←	←	←	←	←
<AUTO>LEVEL		25	←	30	25	55	22
<MANUAL>LEVEL		176	←	←	←	←	←
SHUTTER		AUTO	←	←	←	←	←
<MANUAL(FIX)> Fixed Shutter Speed	59.94Hz	1/60	←	←	←	←	←
	50Hz	1/50	←	←	←	←	←
<MANUAL(FIX)>Manual Shutter Speed		1124/1125	←	←	←	←	←
GAIN		AUTO	←	←	←	←	←
<AUTO>LEVEL		12dB	←	18dB	←	12dB	←
<MANUAL(FIX)>LEVEL		12dB	←	18dB	←	12dB	←
AREA SELECTION		AUTO	←	←	←	ALL	←
PEAK/AVE LEVEL		8	←	←	←	←	←
HEAD GAIN		AUTO	←	←	←	←	←
EXP(IR)							
AE(IR)		AUTO	←	←	←	MANUAL	AUTO
<AUTO>LEVEL		32	←	←	←	←	←
<MANUAL>LEVEL		176	←	←	←	←	←
SHUTTER		AUTO	←	←	←	MANUAL (VAL)	AUTO
<MANUAL(FIX)> Fixed Shutter Speed	59.94Hz	1/60	←	←	←	←	←
	50Hz	1/50	←	←	←	←	←
<MANUAL(FIX)>Manual Shutter Speed		1124/1125	←	←	←	←	←
BINNING		P/L MIX	←	←	←	OFF	LINE MIX

1. Operation and Settings

1.5 Set up profile

PROFILE initial setting value table (2/4)

Setup items	PROFILE 1	PROFILE 2	PROFILE 3	PROFILE 4	PROFILE 5	PROFILE 6
GAIN	AUTO	←	←	←	MANUAL (VAL)	AUTO
<AUTO>LEVEL	12dB	←	←	←	←	←
<MANUAL(FIX)>LEVEL	12dB	←	←	←	←	←
LONG EXPOSURE	OFF	←	←	←	←	←
<AUTO>	OFF	←	←	←	←	←
<MANUAL(FIX)>	OFF	←	←	←	←	←
AREA SELECTION	AUTO	←	←	←	ALL	AUTO
PEAK/AVE LEVEL	0	←	←	←	8	0
HEAD GAIN (depends on HEAD Settings)	9dB	←	←	←	OFF	←
PIC(RGB)						
WHITE BAL MODE	AWC	←	←	←	MANUAL	AWC
<R-GAIN>	128	120	130	128	230	128
<B-GAIN>	128	131	128	←	255	128
DETAIL BAND	SHARP	←	MEDIUM SHARP	SHARP	SOFT	←
DETAIL LEVEL	12	←	16	12	16	←
2DNR LEVEL	5	←	3	5	←	1
3DNR LEVEL	3	←	←	←	5	←
PEDESTAL LEVEL	76	←	←	←	←	←
COLOR LEVEL	160	←	170	160	←	180
COLOR MATRIX	USER	←	←	←	←	←
PHASE, GAIN	ALL 0	←	←	←	←	←
MOIRE REDUCTION	OFF	←	←	←	←	←
PIC(IR)						
2DNR LEVEL	5	←	←	←	←	←
3DNR LEVEL	5	←	←	←	←	←
PEDESTAL LEVEL	76	←	←	←	←	←

1. Operation and Settings
 1.5 Set up profile

PROFILE initial setting value table (3/4)

Setup items	PROFILE 1	PROFILE 2	PROFILE 3	PROFILE 4	PROFILE 5	PROFILE 6
PIX(MIX)						
VIDEO OUTPUT HDMI/SDI 1	RGB+IR	←	←	RGB	←	←
(SIDE BY SIDE) DISPLAY LEFT	RGB+IR	←	←	←	←	←
(SIDE BY SIDE) DISPLAY RIGHT	HEATMAP	←	←	←	←	←
VIDEO OUTPUT HDMI/SDI 2	RGB+IR	←	←	RGB	←	←
CONTR(RGB)						
GAMMA SELECT	S-CURVE	←	←	←	←	←
GAMMA VALUE	0.45	←	←	←	←	←
KNEE MODE	MANUAL	←	←	←	←	←
KNEE POINT	8	←	←	←	←	←
KNEE SLOPE	3	←	←	←	←	←
IE FUNCTION SELECT	COLOR ENHANCE MENT	←	WDR	COLOR ENHANCE MENT	WDR	←
(IE) ON/OFF	ON	←	OFF	ON	OFF	←
IE FUNCTION LEVEL						
(WDR) LEVEL	80	←	←	←	←	←
(DARK AREA CORRECTION) LEVEL	120	←	←	←	←	←
(OVER EXPOSURE REDUCTION) LEVEL	180	←	←	←	←	←
(SMOKE CORRECTION) LEVEL	120	←	←	←	←	←
(COLOR ENHANCEMENT) LEVEL	100	←	←	←	←	←
CONTR(IR)						
GAMMA SELECT	S-CURVE	←	←	←	←	←
GAMMA VALUE	0.35	←	←	←	0.45	←
KNEE MODE	MANUAL	←	←	←	←	←
KNEE POINT	8	←	←	←	←	←
KNEE SLOPE	3	←	←	←	←	←

1. Operation and Settings
 1.5 Set up profile

PROFILE initial setting value table (4/4)

Setup items	PROFILE 1	PROFILE 2	PROFILE 3	PROFILE 4	PROFILE 5	PROFILE 6
F1						
(USER PROFILE) PROFILE LABEL	OFF	←	←	←	←	←
LABEL Data	"ENDOSCOPE (WARM)"	"ENDOSCOPE (COOL)"	"OPHTHALMOLOGY"	"NEUROSURGERY"	"FLUORESCENCE"	"STANDARD"
LABEL POSI	UPPER LEFT	←	←	←	←	←
FLUORESCENCE MODE	OFF	←	←	←	MODE2	OFF
MONOCHROME MODE	OFF	←	←	←	←	←
FLIP AND MIRROR	OFF	←	←	←	←	←

1.5.2 how to set PROFILE

The user can call the registered contents only by pressing the [PROFILE] button on the front panel of the CCU.

Up to 6 profiles can be registered. Profiles 1 and 2 are initially configured with settings suitable for Endoscope imaging.

Profile 3 is initially configured with settings suitable for ophthalmology under a microscope.

Profile 4 is initially configured with settings suitable for neurology under a microscope.

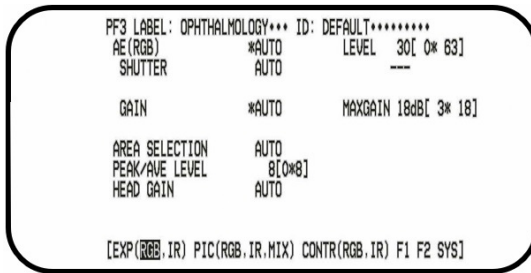
Profile 5 is initially configured with settings suitable for fluorescence imaging.

The registration can be performed on the top page of the ADVANCED MENU. The profile page has eight pages.

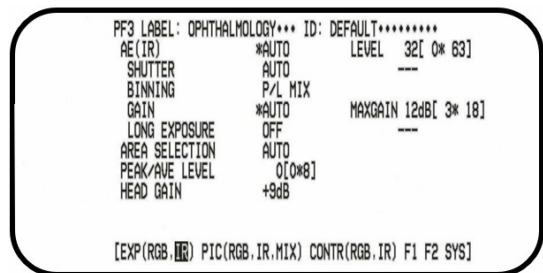
The profile number will be displayed on the top left of the corresponding profile page.

The characters specified at "USER PROFILE LABEL" will be displayed in "LABEL".

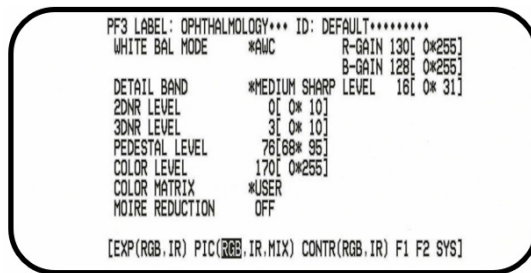
EXP(RGB) page



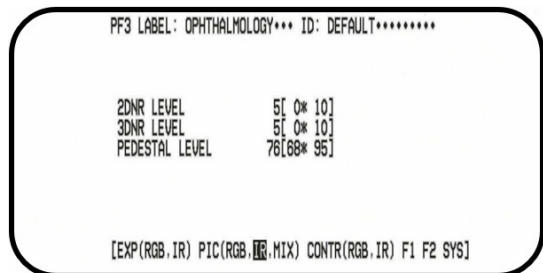
EXP(IR) page



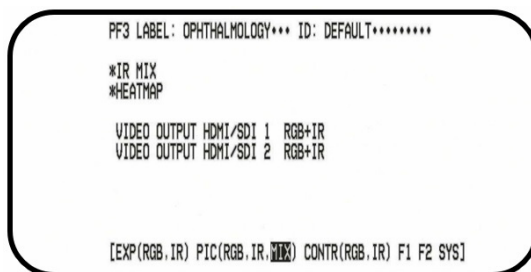
PIC(RGB) page



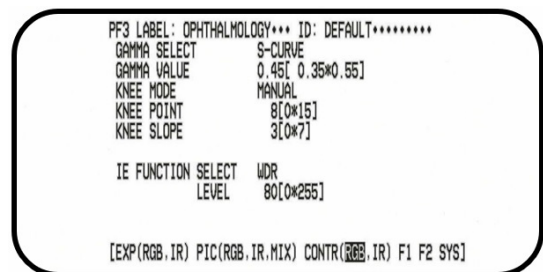
PIC(IR) page



PIC(MIX) page



CONTR(RGB) page



CONTR(IR) page

F1 page

1. Operation and Settings
1.5 Set up profile

PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
GAMMA SELECT S-CURVE
GAMMA VALUE 0.36[0.35*0.55]
KNEE MODE MANUAL
KNEE POINT 8[0*15]
KNEE SLOPE 3[0*7]

[EXP(RGB,IR) PIC(RGB,IR,MIX) CONTR(RGB,IR) F1 F2 SYS]

PF3 LABEL: OPHTHALMOLOGY*** ID: DEFAULT*****
USER PROFILE
USER PROFILE ID *OFF
USER PROFILE LABEL *OFF

FLUORESCENCE MODE OFF
FLIP AND MIRROR OFF
F+M STATUS DISPLAY OFF

[EXP(RGB,IR) PIC(RGB,IR,MIX) CONTR(RGB,IR) F2 SYS]

1.6 Restore default

There are four ways to restore.

1. To restore each setting in the SETUP MENU to the default, move the cursor to the item to change and hold down the [◀] and the [▶] buttons simultaneously for 1 second or more.
2. To restore the initial setting of all the items in each page of "ADVANCED MENU", move the cursor to the tab on the bottom of the page, and hold down the [◀] and [▶] buttons simultaneously for 1 second or more.
3. To restore the initial setting of only the selected profile, press the [PROFILE] button for more than 2 seconds.
4. To restore the initial setting of all the profiles, use "USER PROFILE RESET".

Note:

- To initialize the following items, perform the reset operation mentioned in step 1 to return to the default settings.
"H/V PHASE ADJUST" in the "ADVANCED MENU"
 - When resetting individual settings to their default settings, some items are not supported.
The table of supported/non-supported items for resetting the factory settings is shown on the next page.
-

1. Operation and Settings
 1.6 Restore default

The table of supported/non-supported items for resetting the factory settings (1/7)

Setup items	Current status of support
EXP(RGB)	
AE(RGB)	non-supported
<AUTO> LEVEL	supported
<MANUAL> LEVEL	supported
SHUTTER	non-supported
<MANUAL(FIX)>	59.94Hz non-supported
Fixed Shutter Speed	50Hz non-supported
<MANUAL(FIX)> Manual Shutter Speed	supported
GAIN	non-supported
<AUTO> LEVEL	supported
<MANUAL(FIX)> LEVEL	supported
AREA SELECTION	non-supported
PEAK/AVE LEVEL	supported
HEAD GAIN	supported

The table of supported/non-supported items for resetting the factory settings (2/7)

Setup items	Current status of support
EXP(IR)	
AE(IR)	non-supported
<AUTO> LEVEL	supported
<MANUAL> LEVEL	supported
SHUTTER	non-supported
<MANUAL(FIX)>	59.94Hz non-supported
Fixed Shutter Speed	50Hz non-supported
<MANUAL(FIX)> Manual Shutter Speed	supported
BINNING	non-supported
GAIN	non-supported
<AUTO> LEVEL	supported
<MANUAL(FIX)> LEVEL	supported
LONG EXPOSURE	non-supported
<AUTO>	non-supported
<MANUAL(FIX)>	non-supported
AREA SELECTION	non-supported
PEAK/AVE LEVEL	supported
HEAD GAIN (depends on HEAD Settings)	supported

1. Operation and Settings
 1.6 Restore default

The table of supported/non-supported items for resetting the factory settings (3/7)

Setup items	Current status of support
PIC(RGB)	
WHITE BAL MODE	non-supported
<R-GAIN>	supported
<B-GAIN>	supported
DETAIL BAND	supported
DETAIL LEVEL	supported
2DNR LEVEL	supported
3DNR LEVEL	supported
PEDESTAL LEVEL	supported
COLOR LEVEL	supported
COLOR MATRIX	non-supported
PHASE, GAIN	supported
MOIRE REDUCTION	non-supported
PIC(IR)	
2DNR LEVEL	supported
3DNR LEVEL	supported
PEDESTAL LEVEL	supported

The table of supported/non-supported items for resetting the factory settings (4/7)

Setup items	Current status of support
PIC(MIX)	
(IR MIX)THRESHOLD GAIN	supported
(IR MIX)GAIN	supported
(IR MIX)COLOR	supported
(IR MIX)GRADATION	supported
(IR MIX)KNEE POINT	supported
(IR MIX)KNEE SLOPE	supported
(HEATMAP)THRESHOLD GAIN	supported
(HEATMAP)GAIN	supported
(HEATMAP)GAIN (Cb/Cr)	supported
(HEATMAP)OFFSET LEVEL	supported
(HEATMAP)RGB MONO	non-supported
VIDEO OUTPUT HDMI/SDI 1	non-supported
(SIDE BY SIDE)DISPLAY LEFT	non-supported
(SIDE BY SIDE)DISPLAY RIGHT	non-supported
VIDEO OUTPUT HDMI/SDI 2	non-supported

1. Operation and Settings
 1.6 Restore default

The table of supported/non-supported items for resetting the factory settings (5/7)

Setup items	Current status of support
CONTR(RGB)	
GAMMA SELECT	non-supported
GAMMA VALUE	supported
KNEE MODE	non-supported
KNEE POINT	supported
KNEE SLOPE	supported
IE FUNCTION SELECT	supported
(IE) ON/OFF	non-supported
IE FUNCTION LEVEL	supported
(WDR) LEVEL	supported
(DARK AREA CORRECTION) LEVEL	supported
(OVER EXPOSURE REDUCTION) LEVEL	supported
(SMOKE CORRECTION) LEVEL	supported
(COLOR ENHANCEMENT) LEVEL	supported

The table of supported/non-supported items for resetting the factory settings (6/7)

Setup items	Current status of support
CONTR(IR)	
GAMMA SELECT	non-supported
GAMMA VALUE	supported
KNEE MODE	non-supported
KNEE POINT	supported
KNEE SLOPE	supported
F1	
(USER PROFILE) PROFILE ID	non-supported
ID Data	non-supported
ID POSI	non-supported
(USER PROFILE) PROFILE LABEL	non-supported
LABEL Data	non-supported
LABEL POSI	non-supported
FLUORESCENCE MODE	non-supported
MONOCHROME MODE	non-supported
FLIP AND MIRROR	non-supported

1. Operation and Settings
1.6 Restore default

The table of supported/non-supported items for resetting the factory settings (7/7)

Setup items	Current status of support
F2	
FOOTSW CONTROL CH1	non-supported
FOOTSW CONTROL CH2	non-supported
USER PROFILE SAVE/LOAD	non-supported
SAVE/LOAD MODE(USB)	non-supported
DIGITAL ZOOM	non-supported
DIGITAL ZOOM STATUS	non-supported
DISPLAY	
SYS	
OSD POSITION	non-supported
HDMI1 COLOR DEPTH	non-supported
HDMI2 COLOR DEPTH	non-supported
G/L SYNC TERMINAL SETTING	non-supported
G/L SYNC STATUS INFO	non-supported
H/V PHASE ADJUST H	supported
H/V PHASE ADJUST V	supported
WHITE SHADING	non-supported
R W/S H	supported
B W/S H	supported
R W/S V	supported
B W/S V	supported

CAUTION

When you initiate a request to reset to the default settings, all previous configurations will be erased and cannot be recovered.

During the execution of the initialization for the item "USER PROFILE RESET" in the tab "F2" at the bottom of the menu, 'USER PROFILE RESET' will blink.

The initial setup process takes about 1 minute, so please wait without turning off the power during this time.

After the initial setup is complete, the power will be restored, and the system will be in its factory default state.

1.7 MAINTENANCE MENU

For details and how to operate MAINTENANCE MENU, contact your dealer.

When displaying the MAINTENANCE MENU, the video output format is forcibly set to factory default.

The following items can be set in the MAINTENANCE MENU.

Setup items	Description
CUSTOM1	
OSD OUTPUT SEL(HDMI)	Sets up the OSD display of the HDMI output.
OSD OUTPUT SEL(SDI)	Sets up the OSD display of the SDI output.
OSD CHARACTER MODE	Specifies the OSD character format.
COLOR GAMUT SDI1	Specifies the color gamut of SDI1.
COLOR GAMUT SDI2	Specifies the color gamut of SDI2.
COLOR GAMUT HDMI1(UHD422)	Specifies the color gamut of HDMI1.
COLOR GAMUT HDMI2(UHD422)	Specifies the color gamut of HDMI2.
CUSTOM2	
KEY BIND(MENU)	Assigns a function to [MENU] button.
KEY BIND(↑ ↓)	Assigns functions to [▲] and [▼] button.
KEY BIND(←→)	Assigns functions to [◀] and [▶] button.
KEY BIND(PAGE)	Assigns a function to [PAGE] button.
FUNC/INFO	
BLACK BAL	Sets up the black balance.
[BLACK BAL]-(MANUAL)R-Ped	Adjusts the red pedestal level for black balance.
[BLACK BAL]-(MANUAL)B-Ped	Adjusts the blue pedestal level for black balance.
CABLE DIAG MODE	Diagnoses the quality of the camera cable.
DIPSW STATUS	Indicates the set status of DIPSW.
FPGA STATUS	Displays the temperature of FPGA.
ALL RESET	Restores all the default settings.
DFX FILE LOAD	The update file for the EEPROM area stored in the USB memory is used to update the target area.
FW UPDATE	Updates the target parts of the CCU unit and camera head using the firmware stored in the USB memory.
CPU VER.	Displays the CPU version.
FPGA VER. (FPGA1/2)	Displays the FPGA (FPGA1/2) version.
HEAD VER.	Displays the FPGA (HEAD) version and camera type.

Note:

- [ALL RESET] will not initialize the following:
[H/V PHASE ADJUST] in the ADVANCED MENU.
 - The "BLACK BAL" related items will be displayed and adjustable only when 4K3MOS, 4K4MOS and 2K3MOS are connected to the camera head.
-

CAUTION

During the execution of ALL RESET, "ALL RESET" will blink. The initial setup process takes about 1 minute, so please wait without turning off the power during this time.

After the initial setup is complete, the power will be restored, and the system will be in its factory default state.

1.7.1 how to display the MAINTENANCE MENU

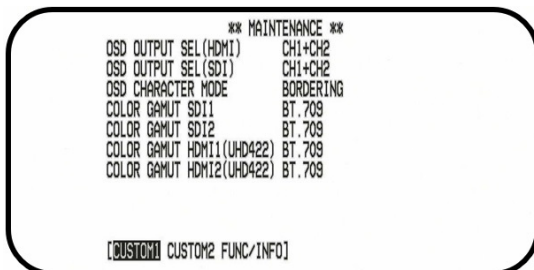
Immediately after turning on the power switch, press the [MENU] and [SEL] buttons simultaneously for more than 3 seconds to display the MAINTENANCE MENU top page.

The MAINTENANCE MENU has three pages. To switch pages, press the [PAGE] button, or move the cursor to the tab at the bottom of the menu and click the [◀] or [▶] button.

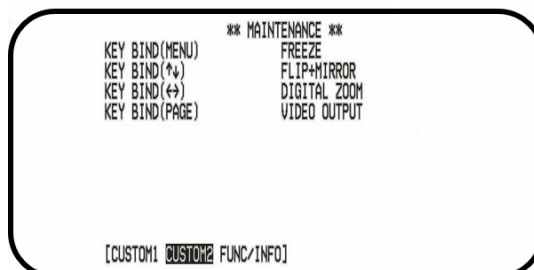
1.7.2 how to operate the MAINTENANCE MENU basically

MAINTENANCE MENU top page

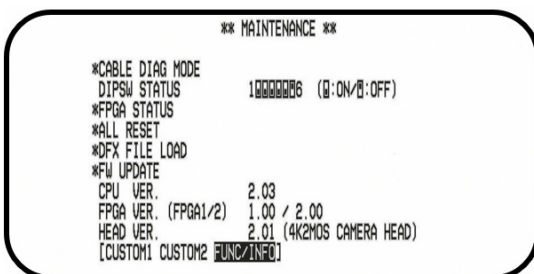
CUSTOM1 page



CUSTOM2 page



FUNC/INFO page



STEP1

Set up each item.

- Select the item to be set
Move the cursor by turning the [RED] volume or pressing the [▲] or [▼] button.
- Change the set item
Turn the [LEVEL] volume or press the [◀] or [▶] button.
- Display advanced setup page
Press the [SEL] button for the item "*" is indicated.
- Return to the upper level setup page
Press the [MENU] button.

STEP2

To save the settings and complete the configuration, power off the device.

1.8 EXP(RGB,IR)

Adjust exposure settings.

Selecting RGB on the tab at the bottom of the menu adjusts the settings for the RGB image.

Selecting IR on the tab at the bottom of the menu adjusts the settings for the IR image.

The settings values for RGB image and IR image are not linked; they are independent values.

1.8.1 AE(RGB)

Adjust exposure settings.

Selecting RGB on the tab at the bottom of the menu adjusts the settings for the RGB image.

Selecting IR on the tab at the bottom of the menu adjusts the settings for the IR image.

The settings values for RGB image and IR image are not linked; they are independent values.

Selected items	Description
AUTO	The brightness of the image will be automatically adjusted.
MANUAL	The brightness of the image will be manually adjusted.

(The default settings are referenced in index 1.5.1.)

1.8.2 AE(IR)

See 1.8.1 AE(RGB) above.

1.8.3 AE LEVEL

The brightness of the image will be adjusted.

The values for adjustment level settings differ between the 'AUTO' and 'MANUAL' modes in the AE (Auto Exposure) setting.

It can also be configured using the [LEVEL] volume.

AE LEVEL when [AUTO] is selected.

Adjusting range	Description
0 ~ 63	When AE is set to 'AUTO', it adjusts the brightness level of the image. When decreased, the image becomes darker. When increased, the image becomes brighter.

(The default settings are referenced in index 1.5.1.)

LEVEL when "MANUAL" is selected.

Adjusting range	Description
28 ~ 236 (Default: 176)	When AE is set to 'MANUAL', it adjusts the brightness level of the image. When decreased, the image becomes darker. When increased, the image becomes brighter.

1.8.4 SHUTTER

The electronic shutter speed will be adjusted.

Select the electronic shutter speed from the following: "AUTO", "MANUAL(FIX)", "MANUAL (VAL)"

If 'MANUAL(FIX)' is selected, please set the electronic shutter speed according to the environmental conditions.

When "MANUAL(VAL)" is selected, the shutter speed setting will be adjusted to match the control resolution of the electronic shutter used for AE level adjustment.

Selected items	Description
AUTO (Default)	The electronic shutter speed will be automatically adjusted. It can only be selected when AE is set to 'AUTO'.
MANUAL(FIX)	The electronic shutter speed can be specified.
MANUAL(VAL)	The shutter speed setting will be adjusted to match the control resolution of the electronic shutter used for AE level adjustment.

If "MANUAL(FIX)" is selected, the electronic shutter speed can be specified.

System Video Format	Selected items
59.94Hz	1/60 (Default), 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, MANU
50Hz	1/50 (Default), 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, MANU

When pressing the [SEL] button after selecting "MANU", the "SHUTTER" page will be displayed, and fine adjustment of the shutter speed can be performed.

It is the electronic shutter speed when 'MANU' is selected under 'MANUAL(FIX)'.

Adjusting range	Description
10/1125~1124/1125 (Default: 1124/1125)	Fine adjustment of the shutter speed can be performed. When decreased, the electronic shutter speed becomes faster. When increased, the electronic shutter speed becomes slower.

Note:

- If flicker is observed under fluorescent lighting of 50 Hz, selecting "1/100" for the speed can reduce flicker.
-

1.8.5 BINNING

This item can be adjusted when selecting IR on the tab at the bottom of the menu.

The sensitivity can be improved by adding pixels.

The pixel adding mode can be selectable from the following:

Selected items	Description
OFF	Sets the pixel adding off.
LINE MIX	Adds pixels in the vertical direction. (The vertical resolution will be deteriorated.)
PIX MIX	Adds pixels in the horizontal direction. (The horizontal resolution will be deteriorated.)
P/L MIX	Adds pixels in the vertical and horizontal directions. (The horizontal and vertical resolutions will be deteriorated.)

(The default settings are referenced in index 1.5.1.)

1.8.6 GAIN

The gain settings will be adjusted.

The gain adjustment method can be selected from "OFF", "AUTO", "MANUAL(FIX)" or "MANUAL(VAL)".

When "MANUAL(FIX)" is selected, please adjust the gain according to the operating environment.

Selected items	Description
OFF	No gain adjustment
AUTO (Default)	Automatic gain adjustment The allowable maximum value for the automatic adjustment will be applied.
MANUAL(FIX)	Manual gain adjustment The gain will be fixed at the set value.
MANUAL(VAL)	The gain setting will be adjusted to match the control resolution of the gain control used for AE level adjustment. It can only be selected when AE is set to "MANUAL".

Gain selection in MANUAL(FIX) mode.

Adjusting range	Description
3~18dB	Adjust gain selection in MANUAL mode in 1dB increments. The smaller the value, the lower the gain, and the darker the image becomes. The larger the value, the higher the gain, and the brighter the image becomes.

(The default settings are referenced in index 1.5.1.)

Gain selection in MANUAL(VAL) mode.

When "MANUAL(VAL)" is selected, the gain setting will be adjusted to match the control resolution of the gain control used for AE level adjustment.

1.8.7 LONG EXPOSURE

This item can be adjusted when selecting IR on the tab at the bottom of the menu.

Settings related to long exposure will be adjusted.

The larger the value of the long exposure time, the brighter the image becomes, but please be aware that there may be more blur in moving subjects.

Selected items	Description
OFF (Default)	Sets the long exposure off.
AUTO	Automatically controls the long exposure. The maximum exposure time for automatic control can be selected from OFF, x2, x4, x8. It can only be selected when AE is set to 'AUTO'.
MANUAL(FIX)	Enables manual adjustment of the long exposure. It will be fixed to the set the long exposure time. The long exposure time can be selected from OFF (Default), x2, x4, x8.
FIX(x1)	Disables the long exposure. It is available when "MANUAL" is selected for AE.

1.8.8 AREA SELECTION

Set the brightness detection areas for 'AE', 'GAIN', and 'SHUTTER'.

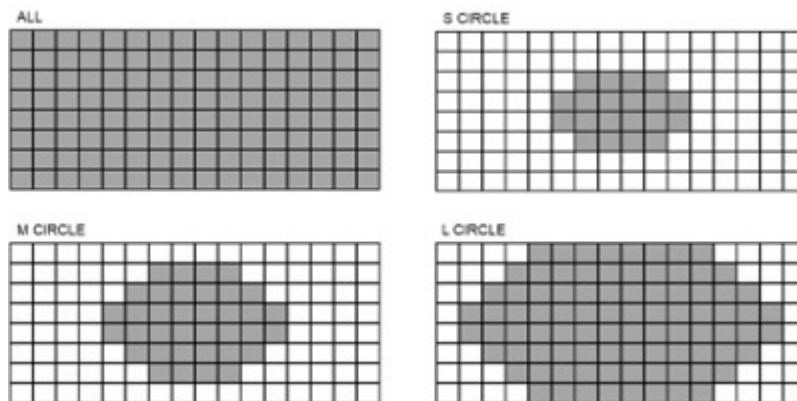
If bright light such as a spotlight is present in the background behind a subject, the subject may appear dark.

To eliminate this phenomenon, masking bright areas allows users to perform backlight compensation to hide bright areas.

Selected items	Description
AUTO	Dark areas are automatically masked, and only bright areas are detected.
ALL	The detection target is the whole area on the screen.
S CIRCLE	The detection target is the small circle area in the center of the screen.
M CIRCLE	The detection target is the medium circle area in the center of the screen.
L CIRCLE	The detection target is the large circle area in the center of the screen.

(The default settings are referenced in index 1.5.1.)

※The detection areas shown in the drawings below are not displayed.



1.8.9 PEAK/AVE LEVEL

Adjusts the weighting for peak and average brightness detection processing.

Adjusting range	Description
0~8	Adjust the brightness detection weighting level. When the value is moved in the "0" direction, the peak value (maximum value) will be detected. When the value is moved in the "8" direction, the average value will be detected.

(The default settings are referenced in index 1.5.1.)

1.8.10 HEAD GAIN

The HEAD GAIN will be adjusted.

Selected items	Description
-9dB、-6dB、-3dB、 OFF(0dB)、+3dB、 +6dB、+9dB	Set the gain of the camera head in 3dB increments. A smaller value results in darker images, while a larger value results in brighter images. (The initial value depends on the camera head gain settings.)
AUTO	This item can only be selected when RGB is selected in the tab at the bottom of the menu and when both "AE" and "GAIN" are set to "AUTO". The gain is automatically adjusted according to the illuminance of the subject.

(The default settings are referenced in index 1.5.1.)

CAUTION

When "HEAD GAIN" is set to "AUTO", if you change either the "AE" or "GAIN" setting from "AUTO" to another setting, the "HEAD GAIN" setting will be forcibly changed to a setting other than "AUTO". Even if you then change the changed "AE" or "GAIN" settings back to "AUTO", the "HEAD GAIN" setting will not return to "AUTO". If you want to set "HEAD GAIN" to "AUTO", please change it back manually.

1.9 PIC (RGB,IR)

Settings related to image quality.

Selecting RGB on the tab at the bottom of the menu adjusts the settings for the RGB image.

Selecting IR on the tab at the bottom of the menu adjusts the settings for the IR image.

The settings values for RGB image and IR image are not linked; they are independent values.

1.9.1 WHITE BAL MODE

Only the RGB image can be adjusted.

The white balance settings will be adjusted.

The white balance adjustment can be selected from "AWC" and "MANUAL".

Selected items	Description
AWC	White balance control mode is set. It is suitable for a location where a light source is stable. When "AWC" is selected, the operation to adjust the white balance is required.
MANUAL	White balance can be manually adjusted. Adjust "R-GAIN" or "B-GAIN" to set the white balance.

(The default settings are referenced in index 1.5.1.)

● White balance adjustment procedure for AWC.

Adjust the white balance using the following steps.

- a. Aim the camera at a white subject.

Take an image of a sufficiently bright white subject under the light source to be used.

- b. Press the [WB] button in the previous screen.

- c. AWC will start and the AWC status lamp will flash.

When adjustment is complete, "AWC OK" will be displayed and the lamp will turn off.

If adjustment fails, "AWC NG" will be displayed.

Note:

- If AWC is performed while the setting of "R-GAIN" or "B-GAIN" of "MANUAL" is set to other than the default (128), the white balance may not be set properly.
- After adjusting the white balance in AWC, adjust "R" and "B" when the white balance is not perfectly matched or when you intentionally want to introduce a reddish or bluish tone.
- Adjustment is available for each profile.
- If the lamp is kept on after "AWC NG" is displayed or the lamp lights up after the profile is changed, retry step a and b.

- White balance adjustment procedure for MANUAL.

When "MANUAL" is selected, move the cursor to "R-GAIN" or "B-GAIN" and adjust the white balance.

R-GAIN (WB RED GAIN)

Adjusting range	Description
0~255	Adjust the gain level of the R signal. The smaller the value, the lower the gain, and the less red color tint. The larger the value, the higher the gain, and the more intense the red color tint.

(The default settings are referenced in index 1.5.1.)

B-GAIN (WB BLUE GAIN)

Adjusting range	Description
0~255	Adjust the gain level of the B signal. The smaller the value, the lower the gain, and the less blue color tint. The larger the value, the higher the gain, and the more intense the blue color tint.

(The default settings are referenced in index 1.5.1.)

Note:

- Increasing the gain values for both the R signal and B signal will reduce the green color tint.
 - Decreasing the gain values for both the R signal and B signal will increase the green color tint.
 - When resetting the WHITE BAL MODE to "AWC", it is recommended to set "R-GAIN" and "B-GAIN" to 128.
-

1.9.2 DETAIL BAND

Only the RGB image can be adjusted.

The band and level of the edge correction are specified.

Set the contour correction bandwidth and correction amount using the following procedure.

- (1) Move the cursor to "DETAIL BAND", and select a band pattern from the following:
"OFF", "SOFT", "MEDIUM SHARP", "SHARP" or "SHARPEST".
- (2) Move the cursor to "DETAIL LEVEL" to adjust the intensity level.

DETAIL BAND

Selected items	Description
OFF	Turn off the contour correction.
SOFT	The contour becomes thinner, and the contour correction bandwidth is high.
MEDIUM SHARP	Compared to SOFT, the contours become slightly thicker.
SHARP	Compared to SHARPEST, the contours become slightly thinner.
SHARPEST	Contours become thicker, and the contour correction bandwidth is low.

(The default settings are referenced in index 1.5.1.)

DETAIL LEVEL

Adjusting	Description
0~31	Adjust the intensity level of contour correction. The smaller the value, the less detail, resulting in a softer image. The larger the value, the more detail, resulting in a sharper image.

(The default settings are referenced in index 1.5.1.)

Note:

- Jaggies may present in the contour of a photographic subject, but it is not an abnormal phenomenon.

If this phenomenon is not favorable, decrease "DETAIL BAND" or "DETAIL LEVEL" and adjust the image quality.

1.9.3 2DNR LEVEL

The 2D digital noise reduction settings will be adjusted.

Adjusting range	Description
0~10	Digital noise reduction is performed using the data of the surrounding pixels in both vertical and horizontal directions of the pixel of interest. Adjust the strength of this effect. The smaller the value, the less noise reduction effect. The larger the value, the more noise reduction occurs, but it may lead to a decrease in resolution.

(The default settings are referenced in index 1.5.1.)

1.9.4 3DNR LEVEL

The 3D digital noise reduction settings will be adjusted.

Adjusting range	Description
0~10	Utilizing data from pixels in both vertical and horizontal directions around the focal pixel, as well as data from the pixel at the corresponding position in the previous frame, performs 3D digital noise reduction. Adjust the strength of this effect. The smaller the value, the less noise reduction effect. The larger the value, the more noise reduction, but it may increase the occurrence of ghosting.

(The default settings are referenced in index 1.5.1.)

1.9.5 PEDESTAL LEVEL

The Pedestal level, which serves as the reference for brightness, will be adjusted.
Adjust the pedestal level (black signal level) viewing a vector scope or color video monitor.

Adjusting range	Description
68~95 (Default: 76)	Adjust the pedestal level (black signal level) When the value is decremented, the image becomes darker. When the value is incremented, the image becomes brighter.

1.9.6 COLOR LEVEL

Only the RGB image can be adjusted.
The color level settings will be adjusted.
Adjust the color level viewing a vector scope or color video monitor.

Adjusting range	Description
0~255	Adjust the color level. When the value is decremented, the color becomes lighter. When the value is incremented, the color becomes deeper.

(The default settings are referenced in index 1.5.1.)

1.9.7 COLOR MATRIX

Only the RGB image can be adjusted.

Adjust the hue viewing a vector scope or color video monitor.

It stores the settings for "B-Mg", "Mg", "Mg-R", "R", "R-Ye", "Ye", "Ye-G", "G", "G-Cy", "Cy", "Cy-B" and "B".

You can adjust PHASE (hue) and GAIN (color intensity, saturation) for each axis.

PHASE

Adjusting range	Description
-127~0~+127 (Default: 0)	Adjust the hue of the color on the target axis. The smaller the value, the hue changes counterclockwise. The larger the value, the hue changes clockwise.

※ PHASE can be set for each axis.

GAIN

Adjusting range	Description
-127~0~+127 (Default: 0)	Adjust the intensity (saturation) of the color on the target axis. The smaller the value, the weaker the color intensity (lower saturation). The larger the value, the stronger the color intensity (higher saturation).

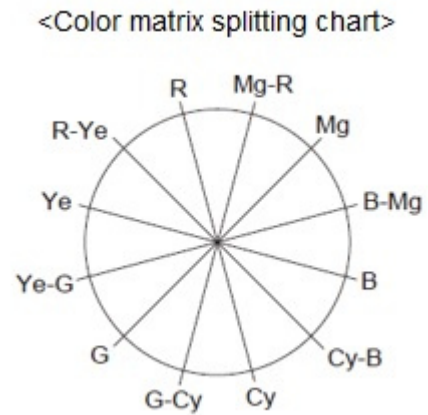
※ GAIN can be set for each axis.

Adjust the hue using the following steps.

- (1) Display the color to be adjusted in the screen center as large as possible.
- (2) Select the axis close to the target color. The axis is selectable from the following:
USER (default), B-Mg, Mg, Mg-R, R, R-Ye, Ye, Ye-G, G, G-Cy, Cy, Cy-B, B
- (3) Press the [SEL] button after selecting the axis.
→ The "MATRIX" screen will be displayed.
- (4) To perform fine adjustment, adjust "PHASE" (hue) and "GAIN" (chroma) with use of the [◀] or [▶] button.
- (5) Select "BEFORE" or "AFTER" with "EFFECT SELECT" and check if the effect is applied.

To determine the setting, select "SET(NEW SETTING)", and then press the [SEL] button.

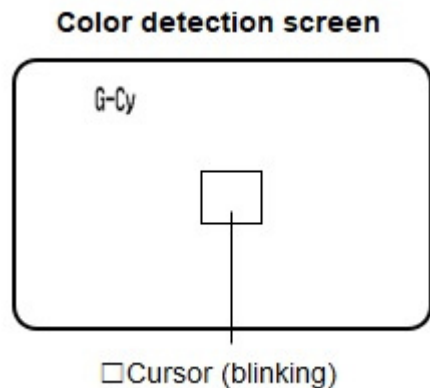
To restore the previous setting, select "CANCEL" and then select the [SEL] button.



When the color axis is unclear

When "USER AREA" is selected on the "MATRIX" screen, the axis is automatically displayed by selecting a color on the screen. Color selection is performed on the color detection screen.

The black rectangle cursor is blinking to select a target color on the color detection screen.

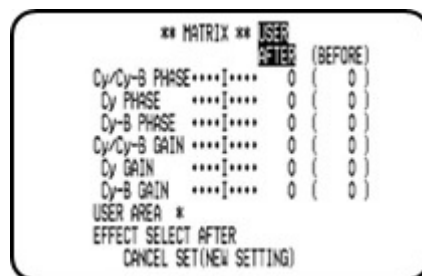


- (1) Point the camera at the center of the subject with which the color is detected.
 If the camera is immovable, move the rectangle cursor to the area with the target color by pressing the [▲], [▼], [◀] and [▶] buttons.

Note:

- When the blue volume is rotated counterclockwise, the size of the rectangle cursor changes in the order of large → medium → small.
 Select a size to meet the subject size.

- (2) Press the [SEL] button or [MENU] button.
 →The "MATRIX" screen appears again.
- (3) To perform fine adjustment, adjust "PHASE" (hue) and "GAIN" (chroma).
 For example, the adjustment of "PHASE" or "GAIN" of "Cy/Cy-B" on the following screen provides the simultaneous adjustment of "PHASE" or "GAIN" of the adjacent axes "Cy" and "Cy-B" in the color matrix splitting chart.



Note:

- When the color on the axis in the color matrix splitting chart is detected, the adjacent axes are not displayed.
-

1.9.8 MOIRE REDUCTION

Only the RGB image can be adjusted.

Set the moiré reduction function.

Selected items	Description
OFF (Default)	Disables the moiré reduction function.
LOW	Set the moiré reduction function to 'LOW'.
MID	Set the moiré reduction function to 'MID'.
HIGH	Set the moiré reduction function to 'HIGH'.

Note:

- When the setting is selected as "LOW" or "MID", the "DETAIL BAND" and "DETAIL LEVEL" items cannot be adjusted.
 - When the setting is selected as "HIGH", the "DETAIL BAND", "DETAIL LEVEL", and "2DNR LEVEL" items cannot be adjusted.
-

1.10 PIC (MIX)

Set the quality of the superimposed image and the display settings for the video output.

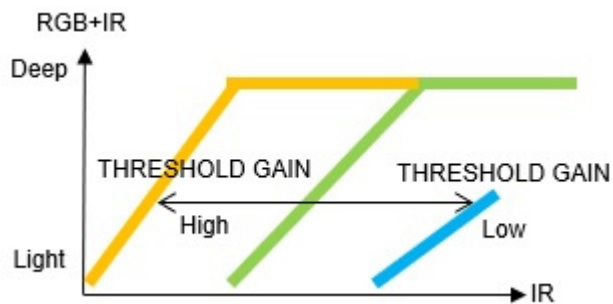
1.10.1 IR MIX

Sets the levels for the mode in which RGB and IR images are superimposed.

The IR image used for this will be replaced with a single color to create the superimposed image.

1.10.1.1 (IR MIX) THRESHOLD GAIN

Adjust the level of the IR image to be superimposed on the overlay image.



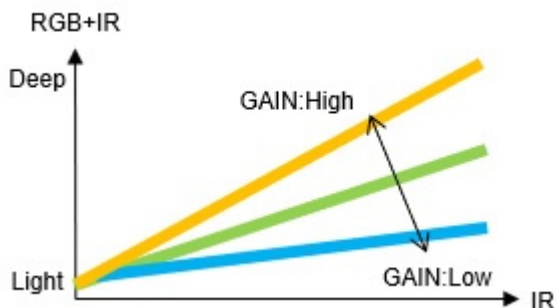
Adjusting range	Description
0~255 (Default: 64)	Set the threshold to select the portion for overlaying the IR image. Increasing the value will cause even the low-brightness areas of the IR image to be overlaid, resulting in more extensive superimposition of the IR image.

1. Operation and Settings

1.10 PIC (MIX)

1.10.1.2 (IR MIX) GAIN

Adjust the gain of the IR image to be superimposed on the overlay image.



Adjusting range	Description
0~255 (Default: 128)	Adjusting the level of emphasis for the overlaid IR image. Reducing the value weakens the emphasis. Increasing the value strengthens the emphasis.

1.10.1.3 (IR MIX) COLOR

Adjust the color of the IR image to be superimposed on the overlay image.

Adjusting range	Description
1~6 (Default: 1)	Select the color for overlaying the IR image from 1. Green, 2. Blue, 3. Red, 4. Cyan, 5. Magenta, 6. Yellow.

1.10.1.4 (IR MIX) GRADATION

Adjust the gradient of the IR image superimposed on the overlay image.

Selected items	Description
LOW	Overlay the gradation of the IR image in 2 levels (with/without overlay).
HIGH	Overlay the gradation of the IR image in multiple levels (according to the level of the IR image).
HIGH(KNEE) (Default)	When overlaying the gradation of the IR image in multiple levels, use the KNEE function to overlay. Adjusted using "IR MIX KNEE POINT" and "IR MIX KNEE SLOPE".

1.10.1.5 (IR MIX) KNEE POINT

Adjust the knee point of the IR image superimposed on the overlay image.

Adjusting range	Description
0~255 (Default: 255)	When the IR image is greater than the kneepoint, adjust the emphasis of the overlay with "IR MIX KNEE SLOPE". Reducing the value lowers the knee point. Increasing the value raises the knee point.

Note:

- If "IR MIX KNEE POINT" is set to 255, the effect of "IR MIX KNEESLOPE" will not be apparent.
-

1.10.1.6 (IR MIX) KNEE SLOPE

Adjust the knee slope of the IR image superimposed on the overlay image.

Adjusting range	Description
0~255 (Default: 0)	Adjust the overlay intensity by compressing or stretching IR images with levels higher than the KNEE POINT. The smaller the value, the more compressed (lower slope) and weaker the emphasis of the overlay. The larger the value, the more stretched (higher slope) and stronger the emphasis of the overlay.

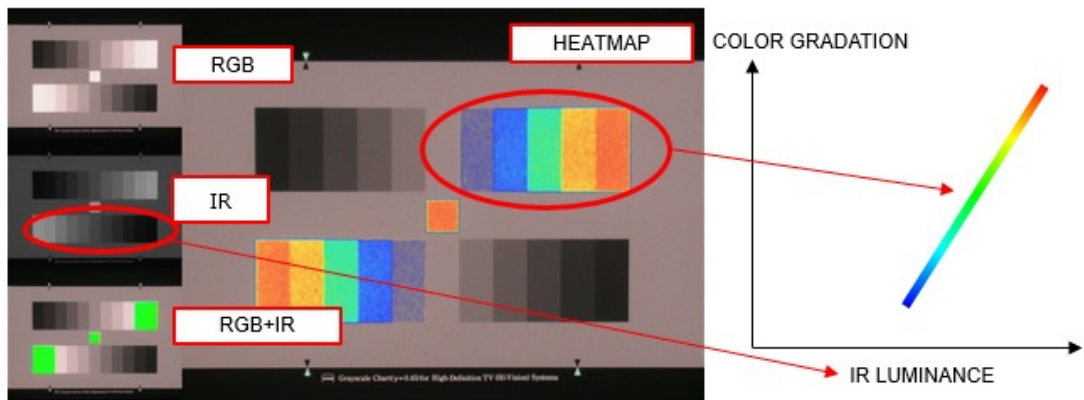
1.10.2 HEATMAP

Set each level of the HEATMAP function.

The IR image is replaced with a color distribution (HEATMAP function) according to the IR image level, creating an overlay image.

As the IR signal level increases, the HEATMAP color changes from blue to red.

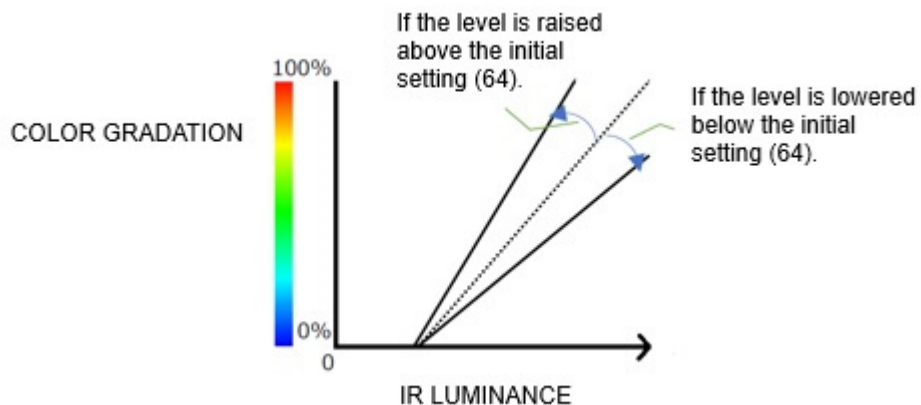
The parameters of the IR image level and color distribution functions are fixed.



1.10.2.1 (HEATMAP MIX) THRESHOLD GAIN

Sets the IR image level used by the HEATMAP function.

Adjusting range	Description
0~255 (Default: 64)	This adjusts the slope of the ratio between the color distribution and IR image level.



1.10.2.2 (HEATMAP MIX) GAIN

Adjust the emphasis level of HEATMAP.

Adjusting range	Description
0~64 (Default: 32)	Adjust the intensity of the heatmap with the gain of the IR image. Reducing the value weakens the emphasis. Increasing the value enhances the emphasis, and the color of the "heatmap" image becomes darker.

When the value is increased, the color of the "heatmap" image becomes darker. If it becomes difficult to distinguish the RGB image portion,

you can improve the RGB image portion by increasing the level of "HEAT MAP MIX GAIN (Cb / Cr)".

An example of improvement when setting the value of "HEATMAP MIX GAIN" from 64 to 32 for "HEATMAP MIX GAIN" and 32 for "HEAT MAP MIX GAIN (Cb / Cr)".



<<HEATMAP MIX> THRESHOLD GAIN>	64
<<HEATMAP MIX> GAIN>	64
<<HEATMAP MIX> GAIN(Cb/Cr)>	0
<<HEATMAP MIX> OFFSET LEVEL>	0



<<HEATMAP MIX> THRESHOLD GAIN>	64
<<HEATMAP MIX> GAIN>	32
<<HEATMAP MIX> GAIN(Cb/Cr)>	32
<<HEATMAP MIX> OFFSET LEVEL>	0

1.10.2.3 (HEATMAP MIX) GAIN (Cb/Cr)

Adjust the emphasis level of HEATMAP.

Adjusting range	Description
0~64 (Default: 32)	Adjust the emphasis level of the heatmap with the gain of "Cb/Cr". Reducing the value weakens the emphasis. Increasing the value strengthens the emphasis.

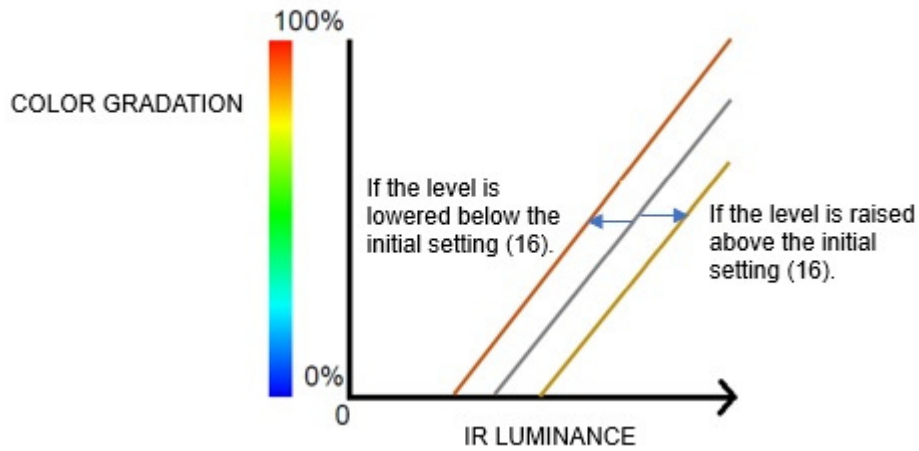
Note:

- Add the values of "HEATMAP MIX GAIN" and "HEATMAP MIX GAIN(Cb/Cr)", then clip the result to a maximum of 64, and set it as the video signal.
-

1.10.2.4 (HEATMAP) OFFSET LEVEL

Adjust the color distribution of HEAT MAP.

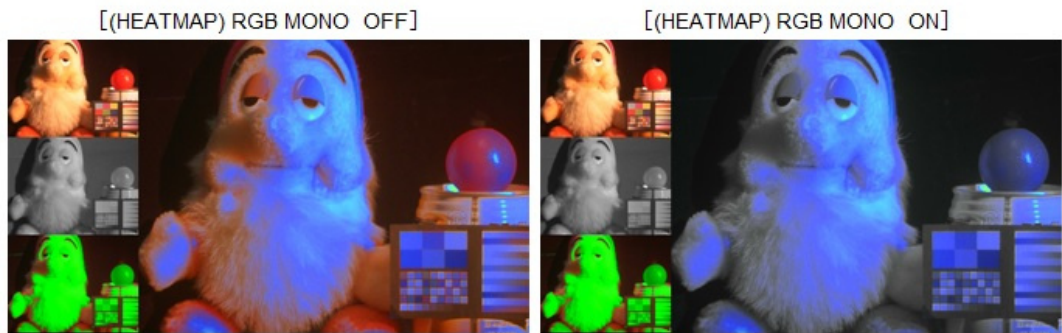
Adjusting range	Description
0~255 (Default: 16)	<p>Adjust the color distribution of the heatmap with the offset of the IR image.</p> <p>Reducing the value decreases the offset amount of the IR image.</p> <p>When the offset amount of the IR image is reduced, the heatmap creates a color distribution starting from the low parts of the IR image.</p> <p>Increasing the value will result in a higher offset amount for the IR image.</p> <p>A larger offset value for the IR image results in the heatmap creating color distribution starting from the higher parts of the IR image.</p>



1.10.2.5 (HEATMAP) RGB MONO

Adjust the RGB image of HEAT MAP.

Selected items	Description
OFF (Default)	When the heatmap function is enabled, the RGB image is converted into a color image.
ON	When the heatmap function is enabled, the RGB image is converted into a monochrome image.



1.10.3 VIDEO OUTPUT HDMI/SDI 1

Sets the screen settings for the output video of the HDMI-1/SDI-1.

Selected items	Description
RGB	Output RGB images on a single screen.
RGB+IR	Output RGB+IR images (overlay) on a single screen.
IR	Output IR images on a single screen.
HEATMAP	Output HEATMAP images (overlay) on a single screen.
MULTI(RGB)	Output MULTI (RGB) images on a multi-screen (The main screen is on the right side, starting from the center, and there are three sub-screens on the left side).
MULTI(RGB+IR)	Output MULTI (RGB+IR) images on a multi-screen (The main screen is on the right side, starting from the center, and there are three sub-screens on the left side).
MULTI(IR)	Output MULTI (IR) images on a multi-screen (The main screen is on the right side, starting from the center, and there are three sub-screens on the left side).
MULTI(HEATMAP)	Output MULTI (HEATMAP) images on a multi-screen (The main screen is on the right side, starting from the center, and there are three sub-screens on the left side).
SIDE BY SIDE	Images are set and output on two screens (divided equally into left and right screens). There are four types of images that can be set on each screen: RGB image, RGB+IR image (overlay), IR image, and heat map image (overly).

(The default settings are referenced in index 1.5.1.)

- When "SIDE BY SIDE" is selected, the left and right allocation of the two screen display can be set in the SUB-MENU.

DISPLAY LEFT (Setting the allocation of the left side of the two-screen display.)

Selected items	Description
RGB	Output RGB images to the left side of the screen.
IR	Output IR images to the left side of the screen.
RGB+IR	Output RGB+IR images (overlay) to the left side of the screen.
HEATMAP	Output HEATMAP images (overlay) to the left side of the screen.

(The default settings are referenced in index 1.5.1.)

DISPLAY RIGHT (Setting the allocation of the right side of the two-screen display.)

Selected items	Description
RGB	Output RGB images to the right side of the screen.
IR	Output IR images to the right side of the screen.
RGB+IR	Output RGB+IR images (overlay) to the right side of the screen.
HEATMAP	Output HEATMAP images (overlay) to the right side of the screen.

(The default settings are referenced in index 1.5.1.)

1.10.4 VIDEO OUTPUT HDMI/SDI 2

Sets the screen settings for the output video of the HDMI-2/SDI-2.

Selected items	Description
RGB	Output RGB images on a single screen.
RGB+IR	Output RGB+IR images (overlay) on a single screen.
IR	Output IR images on a single screen.
HEATMAP	Output HEATMAP images (overlay) on a single screen.

(The default settings are referenced in index 1.5.1.)

1.11 CONTR(RGB,IR)

Adjust the contrast of the image.

Selecting RGB on the tab at the bottom of the menu adjusts the settings for the RGB image.

Selecting IR on the tab at the bottom of the menu adjusts the settings for the IR image.

The settings values for RGB image and IR image are not linked; they are independent values.

1.11.1 GAMMA SELECT

Set the gamma correction mode.

Selected items	Description
S-CURVE	By enhancing gamma, noise can be reduced while keeping the contrast.
NORMAL	A standard gamma characteristic.

(The default settings are referenced in index 1.5.1.)

1.11.2 GAMMA VALUE

Adjust the gamma correction level.

View a waveform monitor or color video monitor to set the gamma correction level.

Adjusting range	Description
0.35~0.55、OFF(1.00)	Adjust the gamma correction level. The smaller the value, the higher the output of the gamma curve that amplifies the input. The larger the value, the lower the output of the gamma curve that attenuates the input. In the OFF mode, it becomes gamma correction OFF (1.00).

(The default settings are referenced in index 1.5.1.)

1.11.3 KNEE MODE

Set the knee mode.

Due to illumination or reflection of the subject, "blown out highlights" may occur in which the bright part of the image may appear flattened.

This phenomenon occurs when the luminance signal exceeds the dynamic range of the camera.

To set the high luminance input signals within the dynamic range of the camera, compress the gradation using the knee function.

Selected items	Description
MANUAL (Default)	Enables manual adjustment of knee point and knee slope.
AUTO	Adjusts the knee point and knee slope automatically.

1.11.4 KNEE POINT

Set the knee point.

Be sure to view the waveform monitor or color video monitor while adjusting the knee point adjustment.

It sets the compression point for the high luminance input signals.

Adjusting range	Description
0~15 (Default: 8)	Set the knee point. The smaller the value, the lower the video level at which the knee function compression starts. The larger the value, the higher the video level at which the knee function compression starts.

1.11.5 KNEE SLOPE

Set the slope of the knee.

Be sure to view the waveform monitor or color video monitor while adjusting the knee slope.

Set the compression level for the high luminance input signals by adjusting the knee slope.

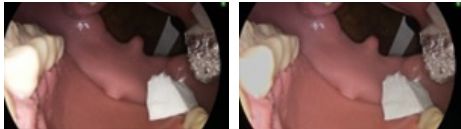
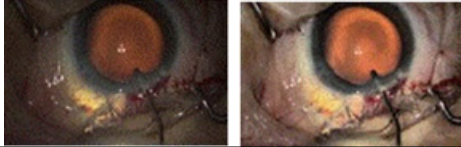
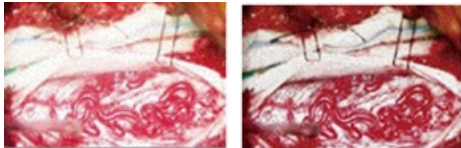
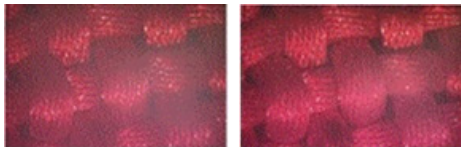
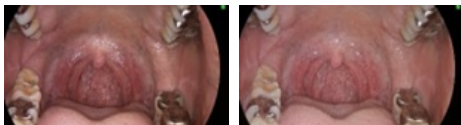
Adjusting range	Description
0~7 (Default: 3)	Adjust the amount (slope) of compressing high-luminance input signals. The smaller the value, the stronger the amount of compression by knee (lower slope). The larger the value, the gentler the amount of compression by knee (higher slope).

1.11.6 IE FUNCTION SELECT

Only the RGB image can be adjusted.

Set the function assignment for IE(IMAGE ENHANCEMENT).

IE FUNCTION assignable functions (Image Enhancement On/Off)

Selected items	Description
WDR	<p>The dynamic range expansion function corrects the dark area brighter while controlling the over exposure.</p> <p>(Left side: function OFF, Right side: function ON)</p> 
DARK AREA CORRECTION	<p>The adaptive black stretch function corrects the dark area brighter.</p> <p>(Left side: function OFF, Right side: function ON)</p> 
OVER EXPOSURE REDUCTION	<p>The exposure correction function controls the over exposure.</p> <p>(Left side: function OFF, Right side: function ON)</p> 
SMOKE CORRECTION	<p>The smoke correction function clears white blur.</p> <p>(Left side: function OFF, Right side: function ON)</p> 
COLOR ENHANCEMENT	<p>The color enhancement function enhances the selected color.</p> <p>(Left side: function OFF, Right side: function ON)</p> 
OFF	<p>Turn off the function assigned to "IE".</p>

(The default settings are referenced in index

1.5.1.)

1. Operation and Settings
1.11 CONTR(RGB,IR)

Note:

In order to improve image quality, some of the specifications of the "Color Enhancement" function have been changed from Ver.2.00 onwards.

As a result, the "COLOR" setting of this function has been discontinued, so if you want to reproduce the previous image quality adjustments,

you can do so by adjusting the "Color Matrix" function (see 1.9.7 COLOR MATRIX).

Specifically, for the "COLOR" settings "RED", "RED&YELLOW", and "YELLOW", adjust the PHASE/GAIN settings of "Mg-R", "R", "R-Ye", and "Ye" in "COLOR MATRIX".

1.11.7 IE FUNCTION LEVEL

Only the RGB image can be adjusted.

Adjust the correction level of the function selected with IE FUNCTION SELECT.

Adjust the correction level of the function selected with [IE FUNCTION SELECT] by operating the [◀] or [▶] button viewing a vector scope or color video monitor.

LEVEL (Wide D-range (WDR)Effect Level)

Adjusting range	Description
0~255 (Default: 80)	Adjust the correction level of the WDR function. The smaller the value, the lower the correction amount. The larger the value, the higher the correction amount.

LEVEL (DARK AREA CORRECTION Level)

Adjusting range	Description
0~255 (Default: 120)	Adjust the correction level of the DARK AREA CORRECTION function. The smaller the value, the lower the correction amount. The larger the value, the higher the correction amount.

LEVEL (OVER EXPOSURE REDUCTION Level)

Adjusting range	Description
0~255 (Default: 180)	Adjust the correction level of the OVER EXPOSURE REDUCTION function. The smaller the value, the lower the correction amount. The larger the value, the higher the correction amount.

LEVEL (SMOKE CORRECTION Level)

Adjusting range	Description
0~255 (Default: 120)	Adjust the correction level of the SMOKE CORRECTION function. The smaller the value, the lower the correction amount. The larger the value, the higher the correction amount.

1. Operation and Settings
1.11 CONTR(RGB,IR)

LEVEL (COLOR ENHANCEMENT Level)

Adjusting range	Description
0~255 (Default: 100)	Adjust the correction level of the COLOR ENHANCEMENT function. The smaller the value, the lower the correction amount. The larger the value, the higher the correction amount.

1.12 F1 (PROFILE)

Configure settings related to profiles and various functions.

1.12.1 USER PROFILE ID

The ID title (USER PROFILE ID) that indicate the camera location or image content can be created and displayed on the screen with use of alphanumeric characters and symbols.

Up to 16 characters can be used for the ID title.

Follow the procedure below to set the ID title.

- (1) Set "USER PROFILE ID" to "ON" and press the [SEL] button.
→ The ID title creation screen will be displayed.
- (2) Move the cursor to the target character using the [▲], [▼], [◀] or [▶] button, and press the [SEL] button.
→ The entered characters will be displayed in the editing area.
- (3) After entering the ID title, move the cursor to "POS1" and press the [SEL] button.
→ The display positioning screen will be displayed and the entered the ID title blinks.
- (4) Use the [▲], [▼], [◀] and [▶] buttons to set the ID title position and press the [MENU] button.
→ The display position is determined and the ID title creation screen will be restored.

<Character entry >

- To revise a character, move the cursor to "←" or "→" and press the [SEL] button. Move the cursor to the character to be revised in the entry range and re-enter a correct character.
- To enter a blank, move the cursor to "SPACE" and press the [SEL] button.
- To delete all the entered characters, move the cursor to "RESET" and press the [SEL] button.

Important:

- When "OFF" is selected for "USER PROFILE ID" or "USER PROFILE LABEL", "USER PROFILE" ID title and LABEL title can be set but not displayed.
-

1. Operation and Settings
1.12 F1 (PROFILE)

Note:

- The "POSI" setting of "USER PROFILE ID" is available only when "OFF" is selected for "USER PROFILE LABEL".

When "ON" is selected for "USER PROFILE LABEL", a higher priority will be given to the "POSI" setting of "USER PROFILE LABEL".

1.12.2 USER PROFILE LABEL

The LABEL title (USER PROFILE LABEL) that indicate the camera location or image content can be created and displayed on the screen with use of alphanumeric characters and symbols.

Up to 16 characters can be used for the LABEL title.

Follow the procedure below to set the LABEL title.

- (1) Set "USER PROFILE LABEL" to "ON" and press the [SEL] button.
→ The LABEL title creation screen will be displayed.
- (2) Move the cursor to the target character using the [▲], [▼], [◀] or [▶] button, and press the [SEL] button.
→ The entered characters will be displayed in the editing area.
- (3) After entering the LABEL title, move the cursor to "POSI" and press the [SEL] button.
→ The display positioning screen will be displayed and the entered the LABEL title blinks.
- (4) Use the [▲], [▼], [◀] and [▶] buttons to set the LABEL title position and press the [MENU] button.
→ The display position is determined and the LABEL title creation screen will be restored.

For information on entering characters, see "1.12.1 USER PROFILE ID" above.

Profile selection (switching) settings.

Press the [PROFILE] button to switch profiles.

Profile Select

Selected items	Description
"ENDOSCOPE(WARM)"	Select PROFILE1
"ENDOSCOPE(COOL)"	Select PROFILE2
"OPHTHALMOLOGY" (Default)	Select PROFILE3
"NEUROSURGERY"	Select PROFILE4
"FLUORESCENCE"	Select PROFILE5
"STANDARD"	Select PROFILE6

1.12.3 FLUORESCENCE MODE

Set the additional setting for each fluorescent image capture mode.

The additional setting can be selectable from the following.

Selected items	Description
OFF	Does not perform the additional setting for fluorescent image capturing.
MODE1	Performs the additional setting for FLUORESCENCE1.
MODE2	Performs the additional setting for FLUORESCENCE2.
MODE3	Performs the additional setting for FLUORESCENCE3.

(The default settings are referenced in index 1.5.1.)

If **MODE1** is selected, the selection menu for "MONOCHROME MODE" will be displayed.

Selected items	Description
OFF (Default)	When set to "FLUORESCENCE1", it will display in color.
ON	When set to "FLUORESCENCE1", it will display in monochrome.

Important:

- The setting for fluorescent imaging is preset in PROFILE 5.
- When using the fluorescent image capture mode, peripheral devices such as a light source or filter, etc. are required.
- If considering using them, contact your dealer.

Note:

- When "MODE1" is selected, set "MONOCHROME MODE" either "ON" (monochrome mode: default) or "OFF" (color mode).
-

1.12.4 FLIP AND MIRROR

The vertical and horizontal flip function will be adjusted.

The following is available as the vertical and horizontal flip function.

Selected items	Description
OFF (Default)	Normal display
FLIP	Vertically flipped
MIRROR	Horizontally flipped
FLIP+MIRROR	Vertically and horizontally flipped.

Note:

- The freeze function can be performed at the same time.
-

1.12.5 F+M STATUS DISPLAY

Set the display state of the video's vertical and horizontal flip function.

Selected items	Description
OFF (Default)	The current status of the FLIP & MIRROR function is not displayed on the screen.
ON	The current status of the FLIP & MIRROR function is displayed on the screen in conjunction with the letter "R".

1.13 F2

Save and read profiles, make settings for foot switches, and make settings for various functions.

1.13.1 COLOR BAR

Set the color bar display. Display SMPTE color bar.

The top page will be restored when the [MENU] button is pressed.

When the camera head is not connected with the CCU, the color bar will be displayed.

1.13.2 FOOTSW CONTROL CH1

Sets the function assignment for footswitch 1 (CH1).

The following functions can be assigned to CH1:

Selected items	Description
NONE	Disable the switch.
FREEZE	Sets ON/OFF of screen freeze.
FLIP+MIRROR	Sets ON/OFF of vertical and horizontal image flip.
FLIP	Sets ON/OFF of vertical image flip.
MIRROR	Sets ON/OFF of horizontal image flip.
PROFILE 1 \leftrightarrow 2 (Default)	Switches between profile 1 and 2.
PROFILE 1 \leftrightarrow 5	Switches between profile 1 and 5.
PROFILE 1 \leftrightarrow 6	Switches between profile 1 and 6.
PROFILE 3 \leftrightarrow 4	Switches between profile 3 and 4.
PROFILE ALL	Switches between all the profiles, from 1 to 6 in order.
ZOOM IN	Zooms in the image when "ON(ENABLE)" is selected for "DIGITAL ZOOM".
ZOOM OUT	Zooms out the image when "ON(ENABLE)" is selected for "DIGITAL ZOOM".
ZOOM 1.0x \leftrightarrow 2.0x	Switches between 1.0x and 2.0x when "ON(ENABLE)" is selected for "DIGITAL ZOOM".
VIDEO OUTPUT 1	Switches the output of VIDEO OUTPUT1 (HDMI/SDI1). The switchable settings will differ depending on the output screen settings. <ul style="list-style-type: none">● When VIDEO OUTPUT1 (HDMI/SDI1) is set to a single screen, it can be switched to "RGB", "IR", "RGB+IR" or "HEATMAP".● When VIDEO OUTPUT1 (HDMI/SDI1) is set to multi-screen (four-screen), it can be switched to "MULTI (RGB)", "MULTI (IR)", "MULTI (RGB+IR)" and "MULTI (HEATMAP)".● If VIDEO OUTPUT1 (HDMI/SDI1) is set to two-screen (SIDE BY SIDE), it is fixed to "SIDE BY SIDE".

1.13.3 FOOTSW CONTROL CH2

Sets the function assignment for footswitch 2 (CH2).

The following functions can be assigned to CH2:

Selected items	Description
NONE	Disable the switch.
FREEZE (Default)	Sets ON/OFF of screen freeze.
FLIP+MIRROR	Sets ON/OFF of vertical and horizontal image flip.
FLIP	Sets ON/OFF of vertical image flip.
MIRROR	Sets ON/OFF of horizontal image flip.
PROFILE 1 \leftrightarrow 2	Switches between profile 1 and 2.
PROFILE 1 \leftrightarrow 5	Switches between profile 1 and 5.
PROFILE 1 \leftrightarrow 6	Switches between profile 1 and 6.
PROFILE 3 \leftrightarrow 4	Switches between profile 3 and 4.
PROFILE ALL	Switches between all the profiles, from 1 to 6 in order.
ZOOM IN	Zooms in the image when "ON(ENABLE)" is selected for "DIGITAL ZOOM".
ZOOM OUT	Zooms out the image when "ON(ENABLE)" is selected for "DIGITAL ZOOM".
ZOOM 1.0x \leftrightarrow 2.0x	Switches between 1.0x and 2.0x when "ON(ENABLE)" is selected for "DIGITAL ZOOM".
VIDEO OUTPUT 2	Switch the output of VIDEO OUTPUT2 (HDMI/SDI2) to between "RGB", "IR", "RGB+IR" and "HEATMAP".

Note:

- The foot switch operation will be disabled while the SETUP menu is displayed.
-

1.13.4 USER PROFILE SAVE/LOAD

By inserting the USB memory, SAVE (CAMERA→USB) or LOAD (USB→CAMERA) of the profile can be performed.

Select "ALL" to save or read all of six profiles and select "SINGLE" to save or read one file.

Do not change the folder and file name to be created in the USB memory.

If the names are changed, loading the profile will fail.

After saving or loading, the USB memory will be automatically unmounted.

To operate the USB memory continuously, disconnect and insert it again.

Selected items	Description
USB→CAMERA(ALL)	Read all 6 profiles data from USB memory stick to camera.
CAMERA→USB(ALL)	Save all 6 profiles data from camera to USB memory stick.
USB→CAMERA(SINGLE)	Read 1 profile data from USB memory stick to camera.
CAMERA→USB(SINGLE)	Save 1 profile data from camera to USB memory stick.

Important:

- Do not edit the file and folder configuration created by pressing the [SAVE] button. It may result in load failure.
- If you are unplugging the USB, please select "NO" or wait until the "USB Operation" indication disappears before proceeding.

1.13.5 SAVE/LOAD MODE(USB)

Select the operation mode when a USB memory stick is inserted.

Selected items	Description
AUTO (Default)	A prompt message to ask the operation (read/load/no action) will be automatically displayed.
MANUAL	No action is made when a USB memory is inserted. Operate in the [USER PROFILE SAVE/LOAD] page.

Note:

- The content of all the items in the QUICK MENU, "EXPOSURE", "PICTURE", "CONTRAST" and "PROFILE" in the ADVANCED MENU will be saved or loaded.
-

1.13.6 USER PROFILE RESET

Reset profile settings to factory default settings.

Returns the settings of "EXP (RGB, IR)", "PIC (RGB, IR, MIX)", "CONTR (RGB, IR)" and "F1" to the default settings.

To execute this operation, follow the steps below.

- (1) Move the cursor to "USER PROFILE RESET" and press the [SEL] button.
- (2) A confirmation message "USER PROFILE RESET? YES/NO" will be displayed.

Select "YES" to reset the profile settings to the default settings.

Note:

- "HEAD GAIN" of "EXP(IR)" is not initialized.
-

1.13.7 DIGITAL ZOOM

Set permission for electronic zoom.

Set the zoom function ON(ENABLE)/OFF(DISABLE).

The zoom factor can be set between 1x to 2.5x in steps of 0.1x. To switch the setting, press [◀] or [▶] button.

Selected items	Description
OFF	Do not allow electronic zoom function (DISABLE)
ON (Default)	Allow electronic zoom function (ENABLE)

Zoom Level Select

Adjusting range	Description
x1.0 ~ x2.5 (Default: x1.0)	Set the zoom magnification for electronic zoom.

1.13.8 DIGITAL ZOOM STATUS DISPLAY

Set whether to display the current zoom ratio on the screen.

Selected items	Description
OFF (Default)	The electronic zoom magnification display is not displayed on the screen.
ON	Display the electronic zoom magnification on the screen.

Note:

- When 1.0x is selected, the ratio will not be displayed on the screen.
-

1.14 SYS(SYSTEM)

Perform system settings.

1.14.1 OSD POSITION

Set the OSD display position of video output.

Selected items	Description
UPPER LEFT (Default)	Displays OSD in the upper left area of the video output angle of view.
UPPER RIGHT	Displays OSD in the upper right area of the video output angle of view.
LOWER LEFT	Displays OSD in the lower left area of the video output angle of view.
LOWER RIGHT	Displays OSD in the lower right area of the video output angle of view.

1.14.2 HDMI1 COLOR DEPTH

Set the output signals for HDMI-CH1 output connector.

The output signal selection differs between 2160p and 1080p.

When the setting for HDMI output signal or the video format is changed, the HDMI output video may be interrupted for a few seconds.

Output Signal	Selected items	Description
2160p	YPbPr (420)8BIT (Default)	Set the color depth of the output signal to YPbPr (420)8BIT.
	YPbPr (422)10BIT	Set the color depth of the output signal to YPbPr (422)10BIT.
1080p	YPbPr (422) (Default)	Set the color depth of the output signal to YPbPr (422).
	YPbPr (444)	Set the color depth of the output signal to YPbPr (444).
	RGB (LIMITED)	Set the color depth of the output signal to RGB (LIMITED).
	RGB (FULL)	Set the color depth of the output signal to RGB (FULL).

1.14.3 HDMI2 COLOR DEPTH

Set the output signals for HDMI-CH2 output connector.

For other details, see "1.14.2 HDMI1 COLOR DEPTH" above.

1.14.4 G/L SYNC TERMINAL SETTING

Set the synchronizing signal input/output connector.

Selected items	Description
IN	Make the synchronous signal input/output terminal as an input terminal.
OUT (Default)	Make the synchronous signal input/output terminal as an output terminal.

Important:

- The external synchronization function can be used between this series of control units. Connect the "GP-CS Series" to the synchronizing signal input/output connector. Then, set "OUT" for the MAIN-CCU and "IN" for the SUB-CCU, and apply the same video output format.

1.14.5 G/L SYNC STATUS INFO

Display synchronization state.

The internal synchronization state will be displayed in "INTERNAL".

When "*EXTERNAL" is selected, the horizontal phase can be adjusted.

Selected items	Description
INTERNAL (Default)	Internal synchronization status.
EXTERNAL	External synchronization status.

H PHASE (Sync Lock H Phase Adjustment)

Adjusting range	Description
-128~0~+127 (Default: 0)	Adjust horizontal phase. The smaller the value, the slower the change will be relative to the synchronous signal. The larger the value, the faster the change will be relative to the synchronous signal.

Note:

- The "EXTERNAL" will be displayed when "IN" is selected for "G/L SYNC TERMINAL SETTING" and the external synchronizing signals are input.
In other time, "INTERNAL" is displayed.
 - When closing the adjustment screen of "H PHASE" (horizontal phase in the external synchronization mode), HDMI video output may be disturbed for approximately 5 seconds.
-

1.14.6 H/V PHASE ADJUST H

Set the horizontal (left and right) phase of the screen phase.

Adjusting range	Description
-20~0~+20 (Default: 0)	Adjust the horizontal (left and right) phase of the screen phase. The smaller the value, the more the screen moves to the right. The higher the value, the more the screen moves to the left.

1.14.7 H/V PHASE ADJUST V

Set the vertical (up and down) phase of the screen phase.

Adjusting range	Description
-12~0~+12 (Default: 0)	Adjust the vertical (up and down) phase of the screen phase. The smaller the value, the more the screen moves down. The larger the value, the more the screen moves up.

Note:

- "H/V PHASE ADJUST" can be set for each camera head.
 - If the camera head is "4K4MOS", "4K3MOS" or "2K3MOS", the selectable range is -11 to +11.
-

1.14.8 WHITE SHADING

Set white shading.

Selected items	Description
MANUAL	Adjust white shading manually. Adjust "R W/S H", "B W/S H", "R W/S V" and "B W/S V" to reduce shading.
AUTO(SET) (Default)	Automatically adjust white shading.

- White shading with "AUTO(SET)"
 - (1) Point the camera at a white subject.
 - (2) Select "AUTO(SET)" and press the [SEL] button.
 - (3) When white shading starts, the "AUTO(SET)" display will repeatedly invert and blink.
 - (4) Automatic adjustment is complete when "WHITE SHADING OK" is displayed at the bottom of the MENU.

Note:

- WHITE SHADING is set for each camera head.
 - If "WHITE SHADING NG" is displayed, perform steps (1) and (2) again.
 - Switching is possible when a "4K4MOS", "4K3MOS" or "2K3MOS" camera head is connected.
-
- To set white shading to "MANUAL".
 - (1) Select "MANUAL" and press the [SEL] button to display the manual setting screen for white shading.
 - (2) Adjust the top/bottom/left/right direction of the red/blue component with "R W/S H", "B W/S H", "R W/S V" and "B W/S V" in White Shading.

R W/S H

Adjusting range	Description
80~128~176 (Default: 128)	Adjusts the horizontal shading of the red component. The smaller the value, the less the red component on the right side of the screen and the more the red component on the left side of the screen. The larger the value, the more the red component on the right side of the screen and the less the red component on the left side of the screen.

1. Operation and Settings
1.14 SYS(SYSTEM)

B W/S H

Adjusting range	Description
80~128~176 (Default: 128)	<p>Adjusts the horizontal shading of the blue component.</p> <p>The smaller the value, the less the blue component on the right side of the screen and the more the blue component on the left side of the screen.</p> <p>The larger the value, the more the blue component is on the right side of the screen and the less the blue component is on the left side of the screen.</p>

R W/S V

Adjusting range	Description
80~128~176 (Default: 128)	<p>Adjusts the vertical shading of the red component.</p> <p>The smaller the value, the less the red component at the bottom of the screen and the more the red component at the top of the screen.</p> <p>The larger the value, the more the red component is at the bottom of the screen and the less the red component is at the top of the screen.</p>

B W/S V

Adjusting range	Description
80~128~176 (Default: 128)	<p>Adjusts the vertical shading of the blue component.</p> <p>The smaller the value, the less the blue component at the bottom of the screen and the more the blue component at the top of the screen.</p> <p>The larger the value, the more the blue component is at the bottom of the screen and the less the blue component is at the top of the screen.</p>
