SONY®

Color Video Camera

Operating Instructions
Software Version 2.10

Before operating the unit, please read this manual thoroughly
and retain it for future reference.

BRC-X1000/H800

Table of Contents

Appendix

Overview

Safety Regulations (Supplied)

Describes the important points for safe use of the camera.
Be sure to read it.

Operating Instructions (This document/ Web)

These operating instructions describe the names of the various parts of camera and installation, connection, and operation methods.

Using This Manual

The Operating Instructions is designed to be read on a computer display.
The content you need to know in order to use the camera is described here.
Read it before you operate the camera.

Jumping to a related page

When you read the instructions on a computer display and click on the related part of the relevant page that is being displayed, you jump to the related page. Relevant pages can be searched easily.

Software display examples

The software displays described in this manual are explanatory examples. Note that some displays may be different from the ones that actually appear.
The illustrations of the camera and menu display in the instructions show the BRC-X1000 as an example.
Only supported functions are displayed.

Printing the Operating Instructions

Depending on your system, certain displays or illustrations in the Operating Instructions, when printed out, may differ from those that appear on your screen.

Precautions for Preventing Access to the Camera by an Unintended Third Party

The camera settings may be changed by an unintended third party on the network, depending on the usage environment.

The camera can be fraudulently accessed in a network environment where a device is connected or connectable to the network without the administrator's permission, or where a PC or other network device connected to the network can be used without any permission.

After configuring the camera, immediately change the password you use for upgrading the firmware on the camera, from a Web browser on your PC, and for changing settings. For how to change password, see "Changing the password" (page 52).

Features

Pan/Tilt/Zoom CMOS video camera equipped with a small built-in pan-tilt head

- The camera unit is equipped with a 1.0-type Exmor R® CMOS sensor and an optical 12× zoom lens with pan/tilt/zoom features integrated into a small built-in pan-tilt head. This versatile camera can be used for various applications.
- The pan-tilt head can pan to the right or left by ±170 degrees and tilt upward to 90 degrees and downward to 30 degrees, which allows the camera to remotely shoot wide areas.
- The camera pans and tilts smoothly, even at low movement speed.
- The camera pans and tilts quietly, even at its maximum speed of 60 degrees per second.
- Up to 100 preset positions can be saved. The PTZ Motion Sync function enables smooth preset operation with coordinated pan/tilt and zoom. In addition, the speed of movement between positions can be adjusted from an optional RM-IP500/IP10 Remote Controller.

Zoom performance for capturing distant subjects

In addition to 12× optical zoom, it uses Sony's 2×[1] Clear Image Zoom function and 2× Tele Convert mode[2] to achieve the equivalent of up to 48×[2] telephoto performance.

[1] When shooting at 1920×1080 only. 1.5× when shooting at 3840×2160.
[2] When shooting at 1920×1080 only.

High sensitivity and high resolution from built-in 1.0-type CMOS image sensor

With the built-in highly photosensitive 1.0-type Exmor R® CMOS sensor, high resolution shooting with less noise can be achieved. Highly sensitive shooting unique to the large sensor can be achieved. In addition, the camera is equipped with a ZEISS Vario-Sonnar T* built-in lens.

Multi-format support

3840×2160/29.97p (2SI) [1]
1920×1080/59.94p, 1920×1080/59.94i, 1280×720/59.94p
3840×2160/25p (2SI) [1]
1920×1080/50p, 1920×1080/50i, 1280×720/50p
3840×2160/23.98p(2SI)[1], 1920×1080/23.98p
Switching possible with the SYSTEM SELECT switch
[1] Compatible only with the BRC-X1000

Equipped with PoE+ (Power Over Ethernet Plus)

The camera is compatible with PoE+ (Power Over Ethernet Plus), so a single LAN cable can be used for power provision and control.

Compatible with VISCA over IP protocol

An IP connection can be established between the camera and the remote controller.

Equipped with External Video Sync Function

The camera is equipped with an external video sync function to synchronize the camera images on multiple cameras.

Equipped with Tally Lamp Function

The camera is equipped with a Tally lamp that quickly distinguishes when the camera is in use.
The front Tally lamp is a large Tally lamp used for improving visibility. The camera is also equipped with a Tally lamp behind the camera block, in order to improve visibility from the rear side.

Supports network connection with RCP/MSU

Network connection to an optional remote control panel (RCP) or master setup unit (MSU) is supported.

Picture Profile preset function

Picture Profile presets PP1 to PP6 can be loaded. By using these presets, you can match the image texture with other types of camcorders that support the Picture Profile function, or create an image texture that is similar to that of cinematic film.

Built-in ND filter

The camera is equipped with a built-in ND filter to enable adjustment of the light level in bright lighting conditions without changing the shutter speed or iris. You can choose from Off, 1/4, 1/16, and 1/64.

Supports output of tracking data

Tracking information of the pan/tilt/zoom, focus, and iris is output in sync with the sync signal.
The data output complies with the industry standard free-d protocol for integration with various VR/AR systems.

Location and Function of Parts

Camera

Front (BRC-X1000)
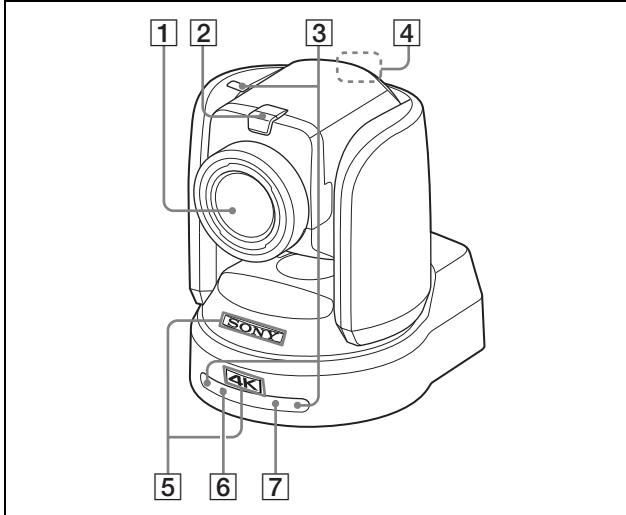
1 Lens

This is a 12× magnification optical zoom lens. When CLEAR IMAGE ZOOM in the PAN TILT ZOOM menu is turned on, the camera can zoom up to 18× for 4K and 24× for HD.

> **Note**
> Do not touch the part around the lens when energized.

2 Tally lamp

Lights up in red when a VISCA Tally command is received or the camera is selected by the remote controller (not supplied) (depending on the setting mode). Brightness can be selected from HIGH, LOW, and OFF (the lights are turned off) in TALLY MODE in the SYSTEM menu.

3 Remote commander sensors

These are sensors for the supplied remote commander.

4 Back Tally lamp

Lights up in red when a VISCA Tally command is received or the camera is selected by the remote controller (not supplied) (depending on the setting mode). The back Tally lamp does not light up when TALLY MODE in the SYSTEM menu (page 41) is set to OFF.

If a fault inside the camera is detected, the lamp flashes at approximately 0.7 second intervals irrespective of the on/off status of the back Tally lamp. When a fault is detected, its content will be displayed in the menu (see page 53). If, however, "CAMERA FAULT" is shown, the back Tally lamp may not flash.

5 SONY nameplate, 4K or HD nameplate

Pull them out to turn them over and attach upside down if required.
4K: BRC-X1000
HD: BRC-H800

6 POWER lamp

Flashes in green when the camera is connected to an outlet using an AC adapter and power cord (not supplied), or when power is being supplied by connecting the camera and PoE+ Hub using a LAN cable. The green lamp stops flashing and lights up when start-up is complete.
The green lamp flashes when the camera receives an operation command from the supplied remote commander.
The orange lamp comes on when the POWER button on the supplied remote commander is pressed.
The yellow lamp flashes while upgrading the firmware.
The orange lamp flashes when there are defects in the camera (for instance, when rotations of fan motor slow down or stop etc.).

7 NETWORK lamp

Lamp flashes during initialization when it is connected to a PoE+ Hub using a LAN cable and power is being supplied from the PoE+ Hub. The lamp lights up when it is connected to the network once start-up is complete.
Lights up after start-up is complete if network is connected, when power is supplied to the camera from outlet using AC adapter and power cord. The lamp is unlit when not connected to the network.
The lamp turns off while upgrading the firmware.
The lamp flashes when there are defects in the camera (for example, when the fan motor stops).

Back

BRC-X1000

BRC-H800
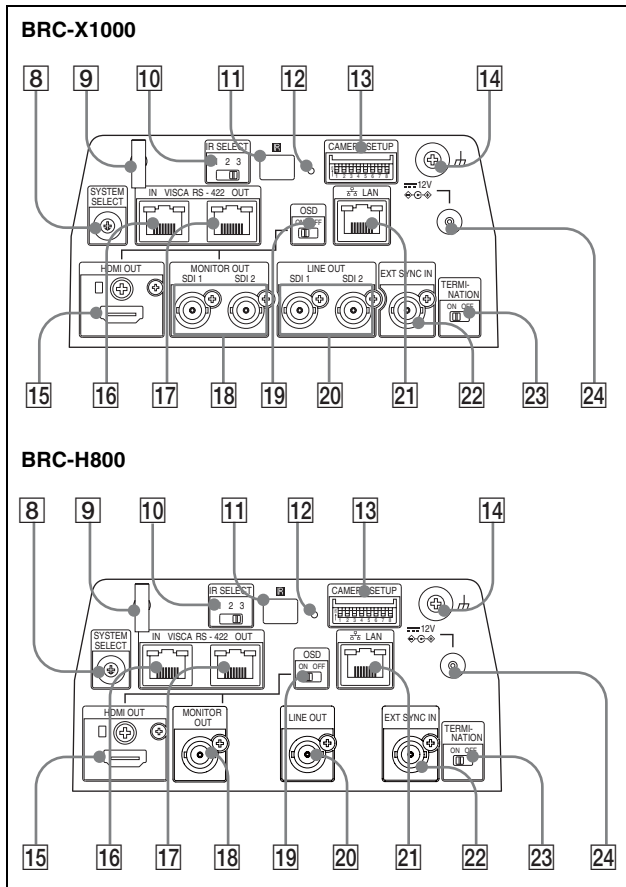
8 SYSTEM SELECT switch

Used for selecting the video format of the signal to be output from the HDMI OUT, MONITOR OUT, and LINE OUT terminals.

For details, see "SYSTEM SELECT switch settings" (page 64).

9 AC adapter cord clamper

Fix the cord of an AC adapter with the cord clamper so that it does not come out.

10 IR SELECT switch

Select the camera number when you operate multiple cameras with the same remote commander.

11 ℝ Remote commander sensors

These are sensors for the supplied remote commander.

12 Network reset switch

This switch is for initializing network settings such as the IP address.

Press the switch for 5 seconds or longer with a pen point, etc., to initialize the network settings.

The camera will reboot, and the network settings will return to the factory default.

Factory settings for network

Network settings
    IP address: 192.168.0.100
    Subnet mask: 255.255.255.0
    Default gateway: 0.0.0.0
CNS tab (page 51)
    Mode: Bridge
    Master IP: 0.0.0.0
    Camera No.: 1
Tracking data output tab (page 51)
    Enable: Off
    Destination IP address: (blank)
    UDP port number: 40000
    Transfer mode: Always
    Camera ID: 255
General
    Camera name: CAM1
    User name: admin*
    Password: Admin_1234
    * The user name cannot be changed.

13 CAMERA SETUP switches
SDI format/level settings

The baud rate settings and camera address settings of RS-422 are set for VISCA communication.

CAMERA SETUP switch settings
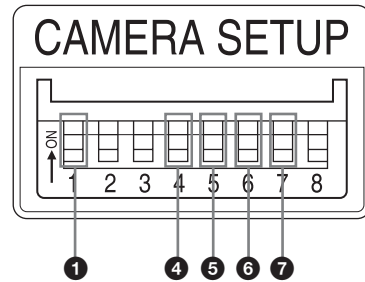
Switch No.	Setting items
1	Setting up 3G-SDI level
2	System reserve
3	
4	Baud Rate settings of RS-422 for VISCA communication
5	VISCA Address settings for VISCA communication
6	
7	
8	System reserve

❶ SDI format/level settings
This setting is enabled when the signal format is 1920×1080/50p or 1920×1080/59.94p.

Switch state	SDI format/level
ON	Level-B
OFF	Level-A

* Turn the power off or to standby, then turn the power on to reflect the changes after setting.

❹ Baud Rate settings of RS-422 for VISCA communication

Switch state	Baud Rate
ON	38400 bps
OFF	9600 bps

* Turn the power off and on to reflect the changes after setting.

❺❻❼ Camera address settings

Sets camera address.

It is normally set to "Auto". When "Auto" is selected, an address is automatically assigned to the camera.

To set the address manually, set a value between "1" to "7" for this switch as indicated below.

Switch No.			Camera address
5	6	7	
OFF	OFF	OFF	Auto
ON	OFF	OFF	1
OFF	ON	OFF	2
ON	ON	OFF	3
OFF	OFF	ON	4
ON	OFF	ON	5
OFF	ON	ON	6
ON	ON	ON	7

* Turn the power off and on to reflect the changes after setting.

⏹14 ⏚ (earth) terminal

⏹15 **HDMI OUT terminal**

Supplies the images as an HDMI video signal.

* The contents of the menu screen, such as text, can be displayed in the output signal when the OSD switch is turned ON.

Notes

- When either 0 or 8 is selected for SYSTEM SELECT, 2K output from the HDMI output terminal results in lower quality images.
- When 7 is selected for SYSTEM SELECT, VGA output from the HDMI output terminal results in lower quality images.

⏹16 **VISCA RS-422 IN terminal**

Connect with an remote controller (not supplied). When you connect multiple cameras, connect it to the VISCA RS-422 OUT terminal of the previous camera in the daisy chain connection.

⏹17 **VISCA RS-422 OUT terminal**

When you connect multiple cameras, connect it to the VISCA RS-422 IN terminal of the next camera in the daisy chain connection.

⏹18 **MONITOR OUT**

Outputs the image from the camera as a 4K or HD signal.

4K output:

Connect the SDI 1 (3G-SDI) output to the SDI 1 input and the SDI 2 (3G-SDI) output to the SDI 2 input respectively.

HD output:

Connect to SDI 1 (3G-SDI) or SDI 2 (3G-SDI).

* The contents of the menu screen, such as text, can be displayed in the output signal when the OSD switch is turned ON.
* For the BRC-H800, only HD output is available.

⏹19 **OSD (On Screen Display) switch**

The contents of the menu screen, such as text, can be superimposed onto the video signal output to MONITOR OUT & HDMI OUT when the switch is turned ON.

⏹20 **LINE OUT**

Outputs the image from the camera as a 4K or HD signal. OSD (screen display) is not superimposed, irrespective of the OSD switch setting.

4K output:

Connect the SDI 1 (3G-SDI) output to the SDI 1 input and the SDI 2 (3G-SDI) output to the SDI 2 input respectively.

HD output:

Connect to SDI 1 (3G-SDI) or SDI 2 (3G-SDI).

* For the BRC-H800, only HD output is available.

⏹21 ⛛ **LAN (network) terminal (RJ-45)**

Network communication and PoE+[*] power supply are provided using the network cable (category 5e or higher, shielded twist pair).

For more information on the connection, refer to the instruction manual of the power supply system.

([*]PoE+: an abbreviation of Power over Ethernet Plus, which complies with IEEE802.3at)

The indicator lights up or flashes when the camera is connected to the network. The indicator is off when the camera is not connected to the network.

Note

When connecting this product to a network, connect via a system that provides a protection function, such as a router or firewall. If connected without such protection, security issues may occur.

w **EXT SYNC IN**

Accepts an external sync signal.

e **TERMINATION switch**

r ⎓ **12 V** ⬦-C-⬦ **(DC power input) terminal**

Connect the AC adapter (not supplied).

Note

Do not use any AC adapter other than the recommended model (sold separately). Otherwise, a fire or malfunction may occur.

Bottom
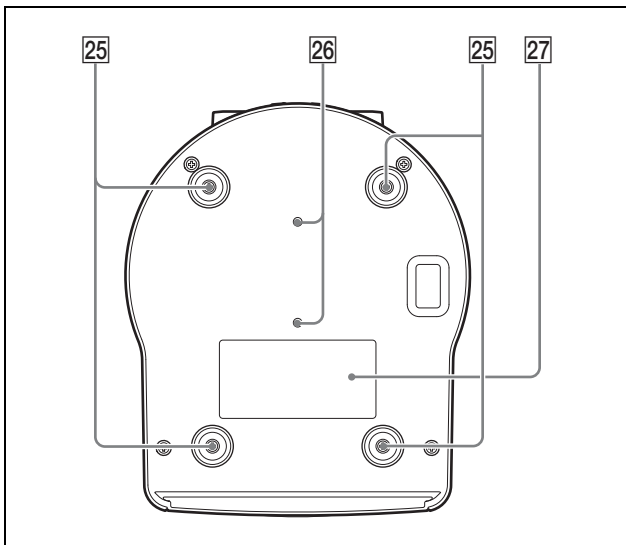
t **Ceiling bracket mounting screw holes**

When you install the camera to the ceiling, on a shelf, or in another high spot, secure the supplied ceiling bracket to these holes using four of the supplied screws.

The four feet are attached to the holes at the factory.

For installation, see "Installing the camera at a high spot" (page 16).

y **Tripod screw holes (1/4-20UNC)**

Used to fix the camera to the camera tripod or something similar.

u **Rating label**

This label shows the name of device and its electric rating.

Important

The product name and electric rating are located at the bottom of the unit.

Remote commander (supplied)
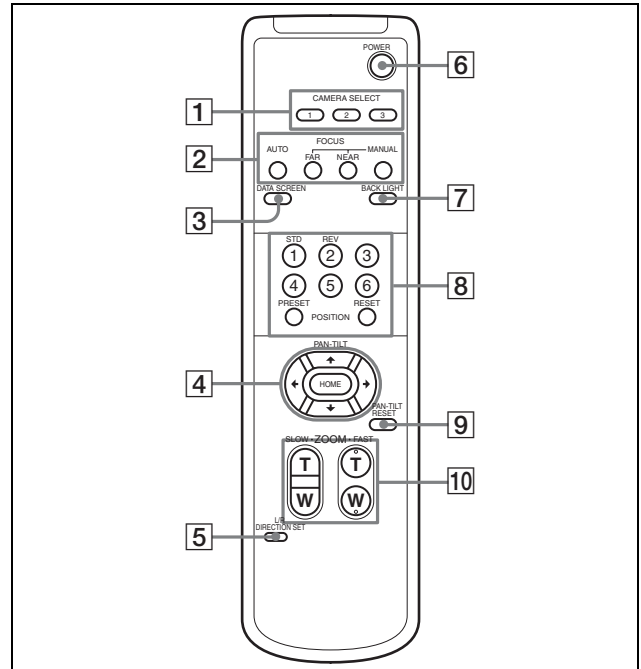
q **CAMERA SELECT buttons**

Press the button corresponding to the camera you want to operate with the remote commander. The camera number can be set using the IR SELECT switch on the rear of the camera.

Note

If two or more cameras are adjacent and have the same camera number, they are operated simultaneously with the supplied remote commander. When you install the cameras close to each other, set different camera numbers.

For setting of camera No., see "Operating multiple cameras with the remote commander" (page 46).

w **FOCUS buttons**

Used for focus adjustment.

Press the AUTO button to adjust the focus automatically. To adjust the focus manually, press the MANUAL button, and adjust it with the FAR and NEAR buttons.

Note

Press the MANUAL button and adjust the focus manually when shooting the following objects.
- White walls and other objects without contrast
- Objects behind glass
- Objects with horizontal stripes
- Objects on which bright lights are cast or reflected
- Nightscapes and other dark objects with blinking lights

• Lit objects shot with darkened exposure adjustment or exposure compensation settings

③ **DATA SCREEN button**
Press this button to display the main menu PAGE. Press it again to close the menu. If you press the button when a lower-level menu is selected, the display goes back to a higher-level menu.

Notes

• You cannot perform pan/tilt/zoom operations while the menu is displayed, except when recording using the PTZ TRACE function.
• The menus are output through MONITOR OUT and HDMI OUT. When you want to display the menus, turn on the OSD switch on the back of the camera.

④ **PAN-TILT button**
Press the arrow buttons to pan or tilt the camera. Press the HOME button to face the camera back to the front.
When the menu is displayed, use ↑ or ↓ to select the menu items and ← or → to change the set values.
Display the menu of selected items with the HOME button.
The selected setting menu is displayed by pressing the HOME button when the main menu is displayed.

⑤ **L/R DIRECTION SET button**
Hold down this button and press the REV button to change the direction of the camera movement to be opposite the direction of the arrows on the ← and → buttons. To reset the direction of the camera movement, press the STD button while holding down this button.

⑥ **POWER button**
Press this button to turn on power or to put the camera in the standby mode.

⑦ **BACK LIGHT button**
Press this button to enable backlight compensation. Press it again to disable backlight compensation.

Note

The BACK LIGHT button is enabled when MODE in the EXPOSURE menu is FULL AUTO, SHUTTER Pri, IRIS Pri, or GAIN Pri.

⑧ **POSITION buttons**
Hold down the PRESET button and press button 1 to 6 to store the current camera direction, zoom, focus adjustment and backlight compensation in the memory of the pressed number button.
To erase the memory contents, hold down the RESET button and press button 1 to 6.

Notes

• These buttons do not function when the menu is displayed.
• Some memory contents may not be erased even if you use the RESET button.
For details on items that can be stored by the PRESET button and erased by the RESET button, see "Preset Items" (page 59).

⑨ **PAN-TILT RESET button**
Press this button to reset the pan/tilt position.

⑩ **ZOOM buttons**
Use the SLOW button to zoom slowly, and the FAST button to zoom quickly.
Press the T (telephoto) side of the button to zoom in, and the W (wide angle) side to zoom out.

Installing Batteries in the remote commander

Two R6 (size AA) batteries
(not supplied)
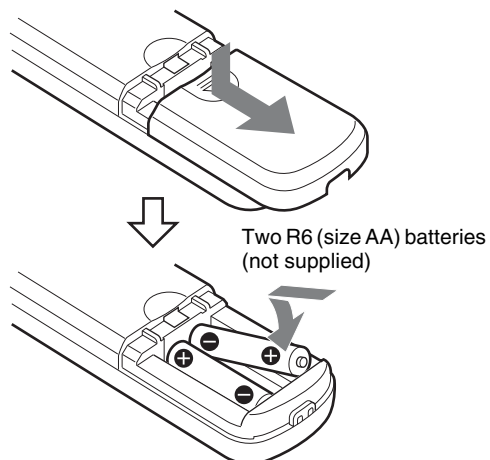
Installing batteries

Two R6 (size AA) batteries are required for the remote commander. To avoid the risk of explosion, use R6 (size AA) manganese or alkaline batteries.

Note

Danger of explosion if the batteries are incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. When you dispose of the batteries, you must obey the laws of your area or country.

R6 (size AA) batteries are not supplied.

System Configuration

This camera can be arranged into various system configurations with other products (not supplied). This section describes typical system examples, with the required components and the main usage of each system.

Operating the camera using the supplied remote commander

What you can do with this system
Operate the camera readily from a short distance.

System Configuration
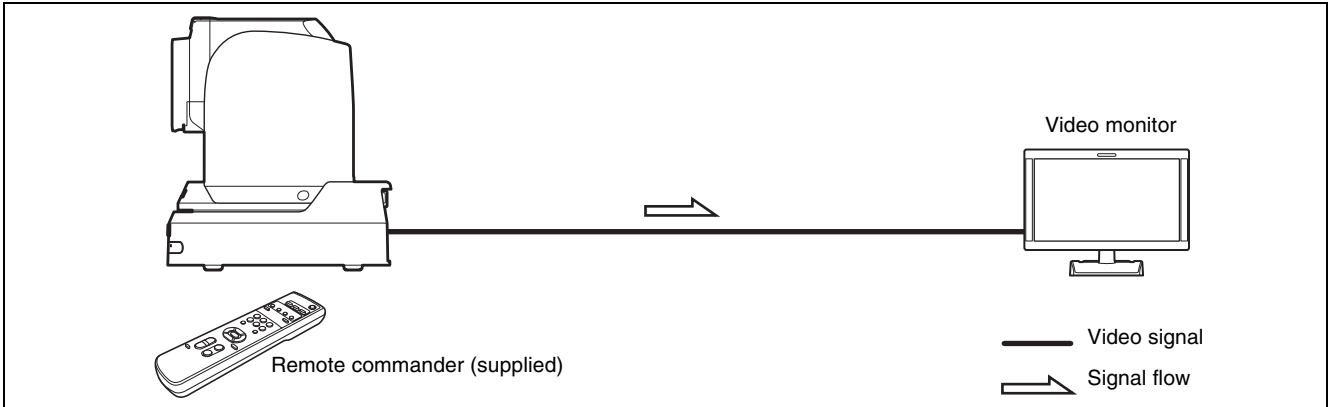
Operating the camera using the remote controller (not supplied)

What you can do with this system

Perform pan/tilt and zoom operations using the joystick of the remote controller.

System Configuration
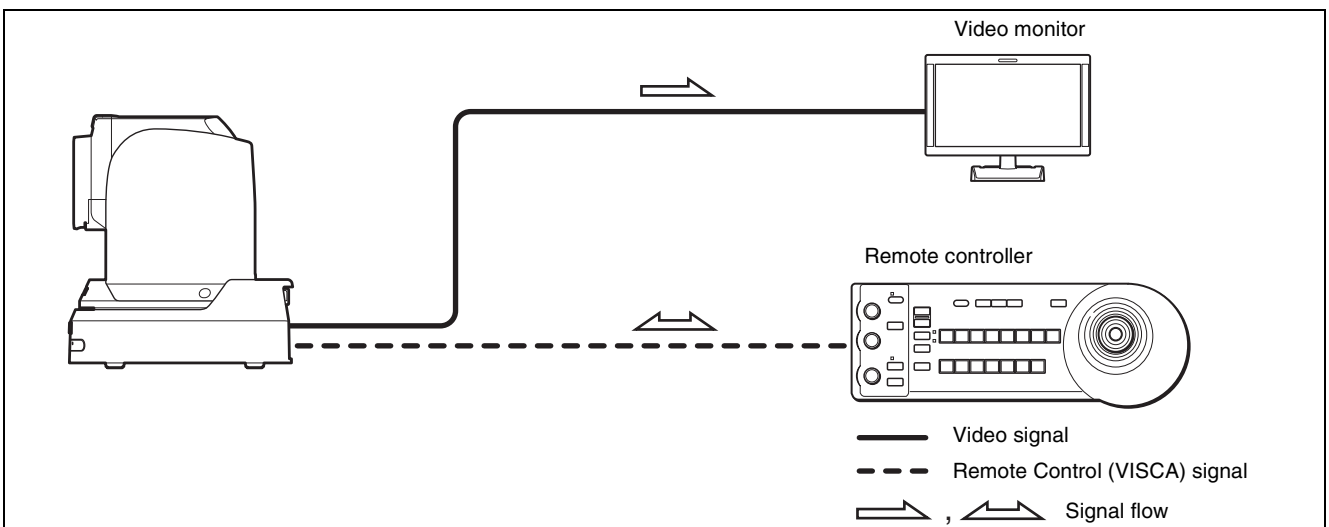
Connecting multiple cameras to the remote controller (not supplied)

What you can do with this system

- Operate up to seven cameras remotely using a single remote controller.
- Perform pan/tilt and zoom operations using the joystick.

System Configuration

Video monitor

Video switcher

Remote controller

——— Video signal

- - - - Remote Control (VISCA) signal

-·-· Tally/contact signal

⟶ , ⟶ Signal flow
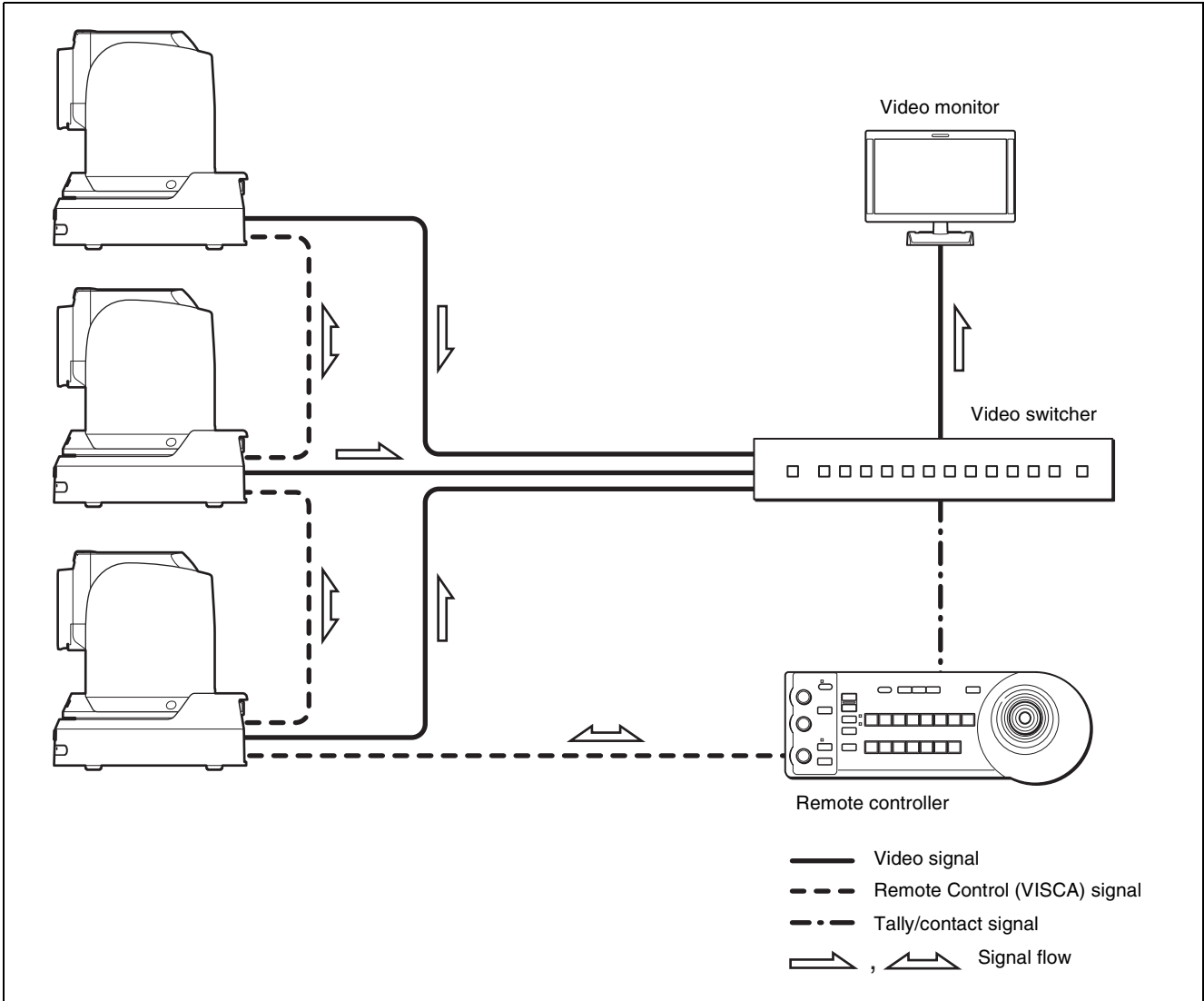
Installing the Camera

Notes

- Be sure to provide safety measures against falling when you mount the camera.
- Do not grasp the camera head when carrying the camera.
- Do not turn the camera head by hand. Doing so may result in a camera malfunction.
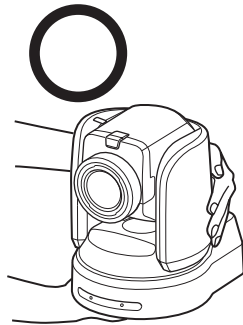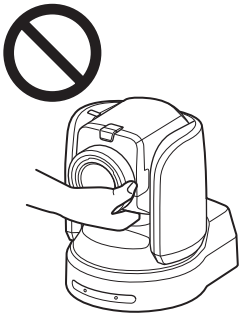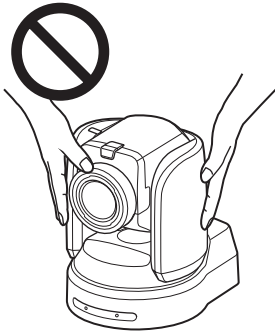
Installing the camera on a desk

Installing the camera on a desk

Place the camera on a flat surface.
If you have to place the camera on an inclined surface, make sure that the inclination is less than ±15 degrees to guarantee pan/tilt performance, and take measures to prevent it from falling.
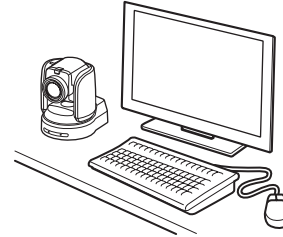
Attaching the camera to a tripod

Screw the tripod screw into a tripod screw hole on the bottom of the camera.
The tripod should be placed on a level surface, and tighten the screw firmly by hand.
The tripod screw should be compliant with the following standards.
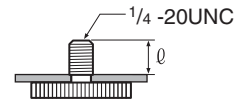
ℓ = 4.5 mm to 7 mm
ℓ = 0.18 to 0.27 inches

Caution

Installation of the camera using the tripod screws and screw holes should not be done for installation on a ceiling, shelf, or other high spot.

Installing the camera at a high spot

The camera can be mounted on a ceiling or on a shelf or stand located at a high spot using the supplied ceiling bracket.
The surface on which the camera will be mounted should be level. If you have to mount the camera on a tilted surface, make sure that the angle is less than 15 degrees to ensure the camera can pan/tilt properly.

Caution
- When you want the camera to be mounted at a high spot, such as on a ceiling, have a professional contractor do the job.
- When you mount the camera at a high spot, make sure the attachment materials to which the camera will be mounted and the fittings (except for accessories) are capable of supporting a weight of 60 kg or greater and that the installation is done properly. If the installation is not strong enough, the camera may fall, resulting in a serious injury.
- As a fall prevention measure, be sure to attach the supplied wire rope to the camera securely.
- When you mount the camera at a high spot, inspect the installation once a year for any loosened parts. Depending on the operation conditions, inspect more frequently.

Before installing the camera

Decide which way the camera will shoot, and drill holes for the ceiling bracket (B) and the connecting cable in the ceiling or the shelf. For the dimensions of the ceiling bracket (B), see page 63.

Notes
- Connection cables cannot be routed through the ceiling bracket (A). A hole to route wires through is needed in the ceiling or the shelf at the back of the camera.
- Do not mount anything other than the camera onto the ceiling bracket.
- The ceiling bracket cannot be mounted on a junction box.

Installing the camera on the ceiling (example)

1 Turn on IMG FLIP in the SYSTEM menu.

2 Loosen the four screws at the bottom of the camera to remove the four feet.
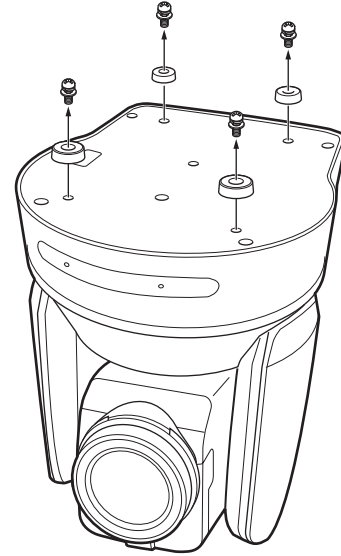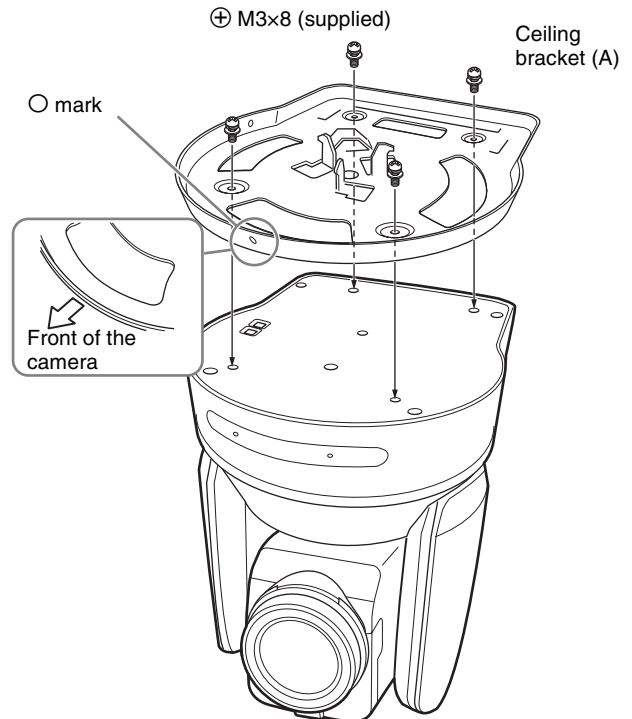
3 Attach the ceiling bracket (A) to the bottom of the camera by using supplied four screws (⊕ M3×8).
Align the ○ mark of the bracket (A) with the front of the camera as illustrated, with the screw holes of the bracket aligned to the screw holes of the camera.

4 Attach the ceiling bracket (B) to the attachment materials (not supplied) to mount the camera on the ceiling.

Be sure to attach it so that the △ hole of the ceiling bracket (B) is placed where the front of the camera will face.

Attachment materials

Ceiling

△ hole

Ceiling bracket (B)

5 Attach the wire rope for fall prevention to the ceiling.

Using an M5 (3/16 inches) socket cap screw (not supplied), attach it to the attachment materials different from the one to which the ceiling bracket (B) is attached.

Wire rope (supplied)

Attachment materials

Ceiling

M5 (3/16 inch) socket cap bolt

Ceiling bracket (B)

6 Attach the wire rope for fall prevention to the ceiling bracket (A).

Put the wire rope through the fitting for wire rope of the ceiling bracket (A) and securely attach it to the bracket using the supplied stainless steel screw (⊕ M4×8).

Wire rope (supplied)

⊕M4×8 (supplied)

Fitting for wire rope

Ceiling bracket (A)

7 Aligning the ○ hole in the front of the ceiling bracket (A) to the ◊ hole of the ceiling bracket (B), push in the camera unit, and turn the camera with the ceiling bracket (A) clockwise to temporarily secure the camera.

Ceiling

Ceiling bracket (B)

◊ mark

Align

○ mark

Ceiling bracket (A)

8 Secure the ceiling brackets (A) and (B) using supplied three screws (⊕ M3×8).

⊕ M3×8 (supplied)

Ceiling

9-1 Connect the cables to the terminals at the back of the camera.

Ceiling

Notes

• Make sure no load is applied to the connectors of the cables.
• For measures that prevent the cord of the AC adapter (not supplied) from being pulled out, see "Connecting the Camera" (page 23).
• For measures that prevent the HDMI cable from being pulled out, proceed to "9-2" after connecting the HDMI cable. Then, connect all the other cables.

9-2 **To help prevent the HDMI cable from being pulled out, remove the HDMI cable locking screw (M2.6×6, black), and use it to attach the supplied HDMI cable fixing plate to the back of the camera. Secure the HDMI cable with a commercially available tie-wrap.**
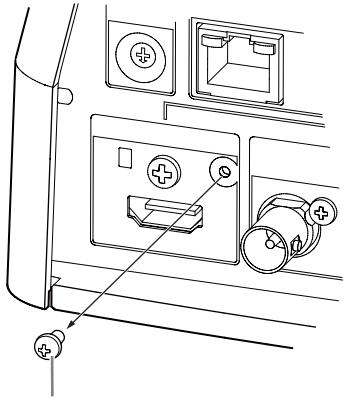
HDMI cable locking screw (M2.6×6, black)
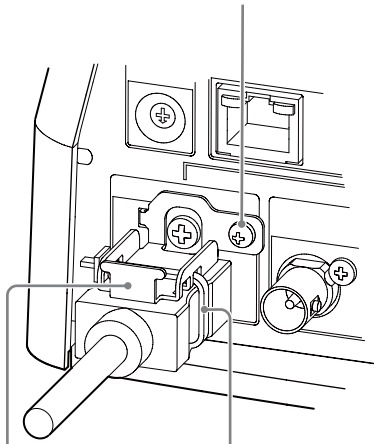
HDMI cable fixing plate (supplied)

Tie-wrap (commercially available)

Note

Do not leave the HDMI cable attached to the camera if you do not use it.

10 **Flip the SONY nameplate and 4K or HD nameplate around as necessary.**

How to remove the camera

1 **Remove the three screws which secured the camera in Step 8 of "Installing the camera on the ceiling (example)".**

2 **Turn the camera unit counter-clockwise to remove it.**

Installing the camera on a shelf located at a high spot (example)

1 **Loosen the four screws at the bottom of the camera to remove the four feet.**
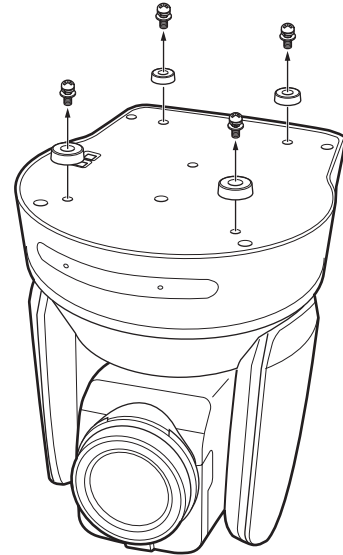
2 **Attach the ceiling bracket (A) to the bottom of the camera by using supplied four screws (⊕ M3×8).**

Align the ○ mark of the bracket (A) with the front of the camera as illustrated, with the screw holes of the bracket aligned to the screw holes of the camera.

⊕ M3×8 (supplied)

○ mark

Front of the camera
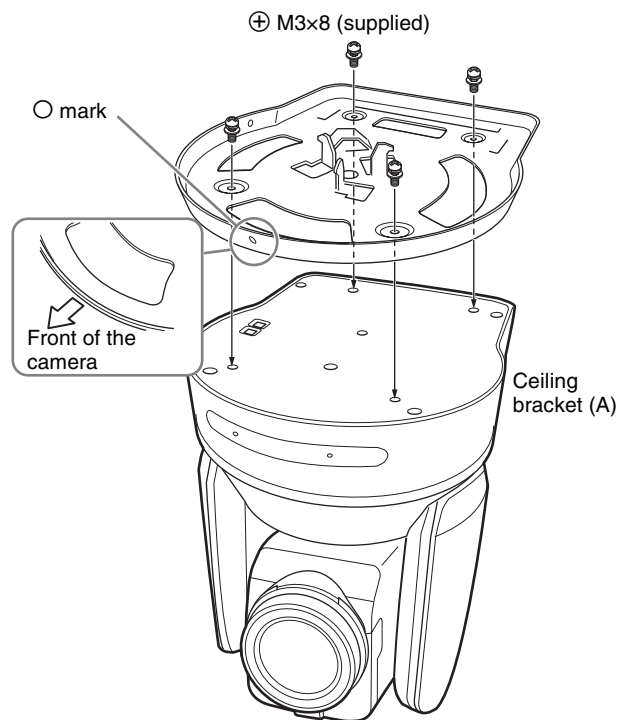
Ceiling bracket (A)

Note

Use the supplied screws. Otherwise, you may break the internal parts of the camera.

3 **Attach the wire rope for fall prevention to the ceiling bracket (A).**

Put the wire rope through the fitting for wire rope of the ceiling bracket (A) and securely attach it to the bracket using the supplied stainless steel screw (⊕ M4×8).

Wire rope (supplied)

⊕M4×8 (supplied)
Fitting for wire rope
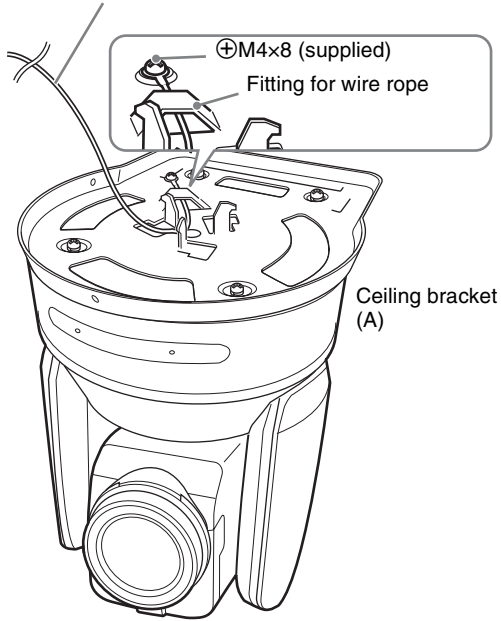
Ceiling bracket (A)

> **Caution**
>
> Use the supplied screw. Otherwise, the wire rope may not function properly.

4 **Mount the ceiling bracket (B) onto the shelf where the camera will be mounted.**

Use four screws (not supplied). Choose the right type of screws for the material of the shelf.
Be sure to attach it so that the △ hole of the ceiling bracket (B) is placed where the front of the camera will face.

Wall

Screws (4)

Ceiling bracket (B)

△ hole

Hole for connecting cable
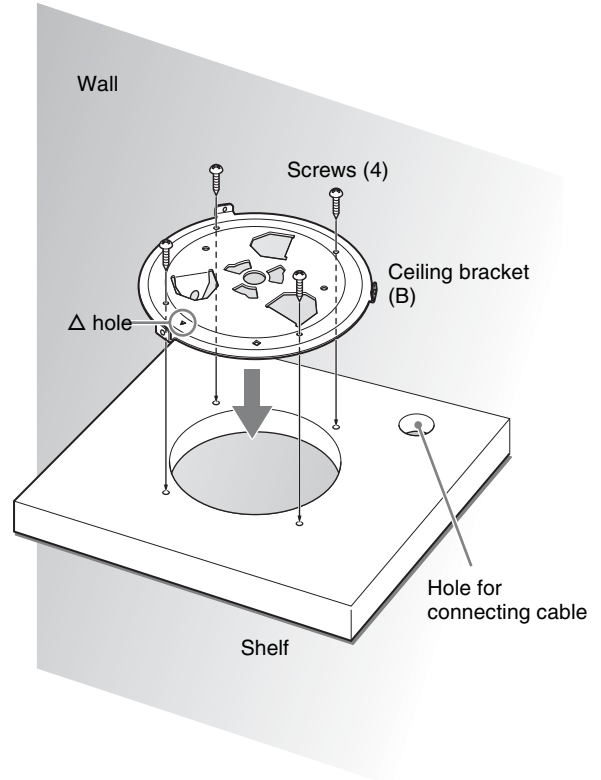
Shelf

5 **Attach the wire rope for fall prevention to the attachment materials on the shelf side.**
Using an M5 (3/16 inches) socket cap screw (not supplied), attach it to the attachment materials different from the one to which the shelf containing the ceiling bracket (B) is attached.
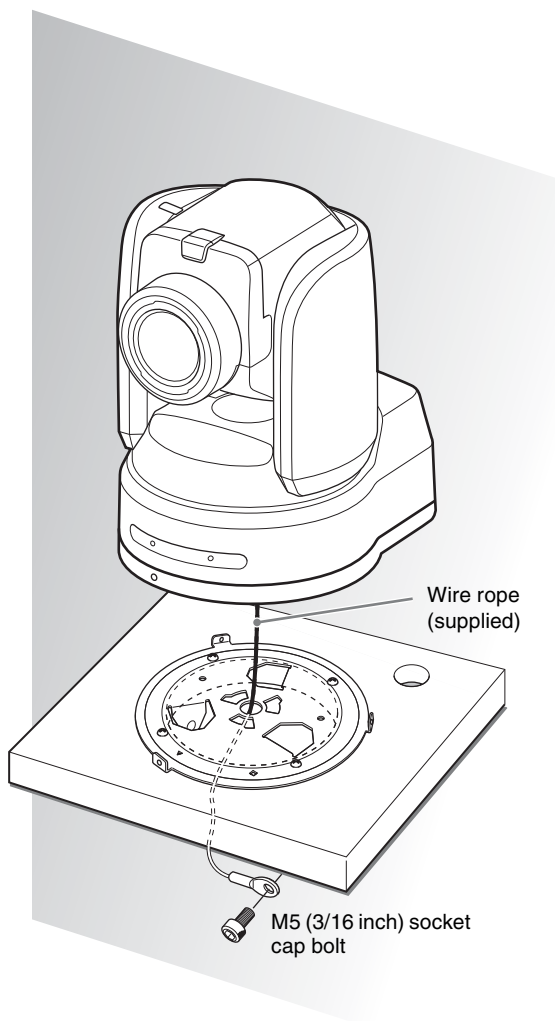
Wire rope (supplied)

M5 (3/16 inch) socket cap bolt

6 **Aligning the ○ hole in the front of the ceiling bracket (A) to the ◊ hole of the ceiling bracket (B), push in the camera unit, and turn the camera with the ceiling bracket (A) clockwise to temporarily secure the camera.**

Ceiling bracket (A)

○ mark

Align

◊ mark

Ceiling bracket (B)

7 **Secure the ceiling brackets (A) and (B) using supplied three screws (⊕ M3×8).**

⊕ M3×8
(supplied)

8 **Connect the cables to the terminals at the back of the camera.**
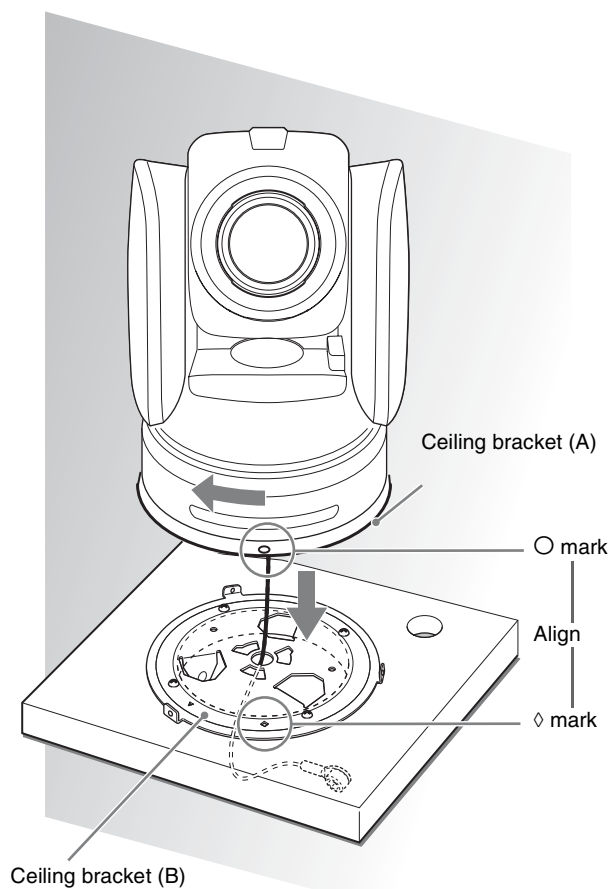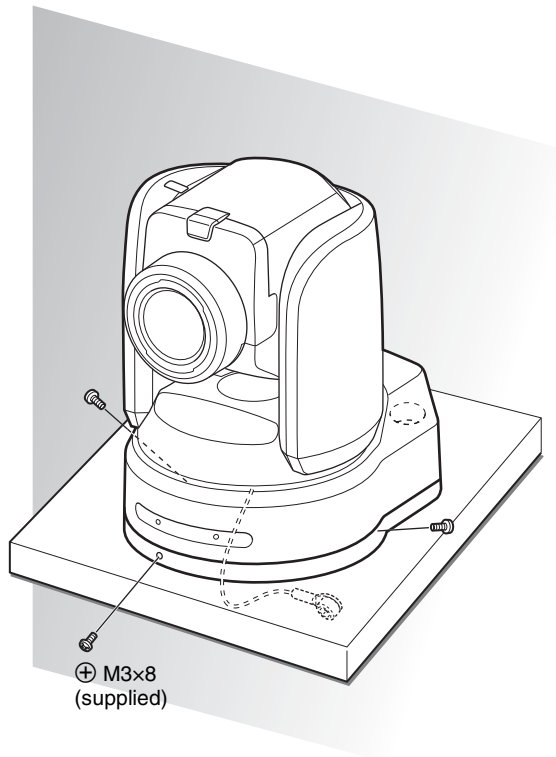
Notes

- Make sure no load is applied to the connectors of the cables.
- For measures that prevent the cord of the AC adapter (not supplied) or HDMI cable from being pulled out, see "Connecting the Camera" (page 23).
- For measures that prevent the HDMI cable from being pulled out, follow the steps in "9-2" of "Installing the camera on the ceiling (example)" after connecting the HDMI cable. Then, connect all the other cables.

How to remove the camera

1 **Remove the three screws which secured the camera in Step 7 of "Installing the camera on a shelf located at a high spot (example)".**

2 **Turn the camera unit counterclockwise to remove it.**
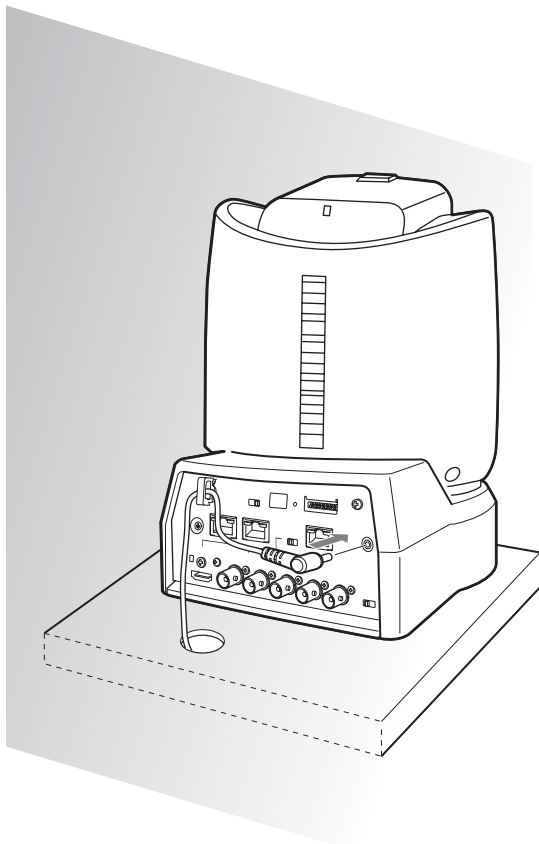
Connecting the Camera

Connecting an AC power supply

Connect the AC adapter (not supplied) to the AC power supply using a power supply cord.

AC adapter
(not supplied)
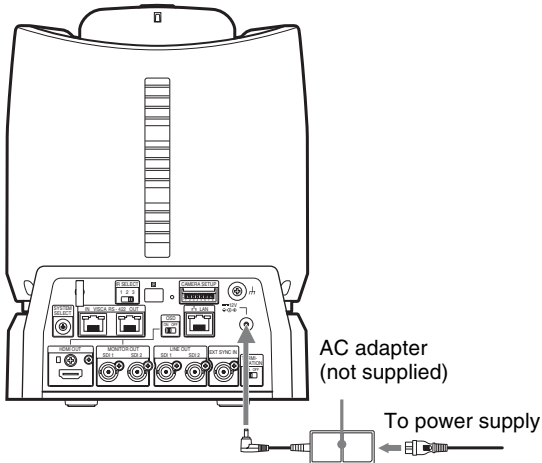
To power supply

1 Connect the AC adapter (not supplied) and a power supply cord.
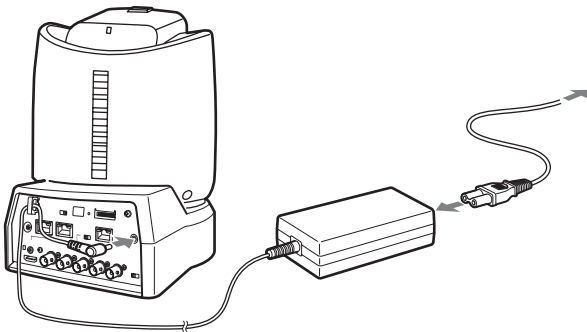
2 To prevent the cord of the AC adapter (not supplied) from being pulled out, use the cord clamper to secure it.
Unlock the cord clamper and put the cord through it. Lock the cord clamper.

AC adapter cord clamper
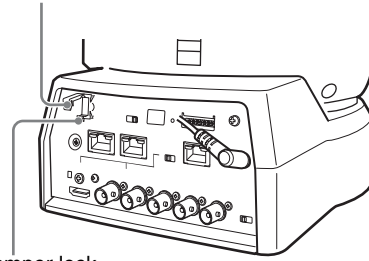
Cord clamper lock

① **Unlock the cord clamper lock.**

AC adapter cord
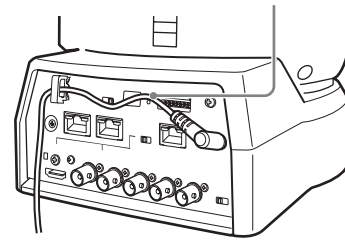
② **Put the AC adapter cord through the cord clamper and lock the cord clamper.**

Note

Do not use any AC adapter other than the specified optional one. Otherwise, a fire or malfunction may occur.

Connecting the camera to a PoE+ (Power over Ethernet Plus) power supply device

A PoE+ (IEEE802.3at compliant) power supply device supplies power through a commercially available network cable. For details, see the operating instructions of the power supply device.

Network cable
(commercially
available)

Hub with PoE+
power supply
feature
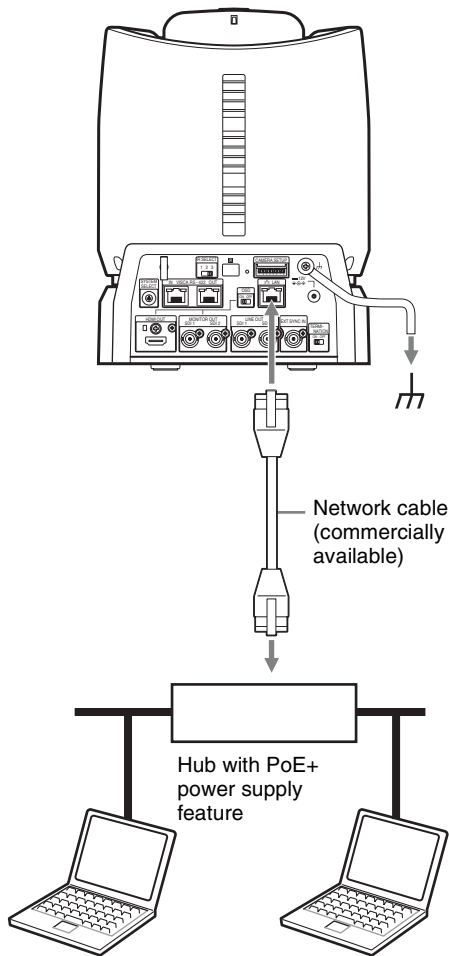
- When you supply power from a PoE+ power source, use a network cable of Category 5e or higher.
- When both the AC adapter and PoE+ power supply are connected, power is supplied through the AC adapter.
- When power is supplied from PoE+, both the POWER lamp (green) and NETWORK lamp (green) flash until the initial verification process is complete (approximately one minute, depending on the power supply device).
- When the network camera is powered by a PoE+ power supply, do not route the wiring outdoors. When you use PoE+ for the power supply, connect the ground wire.
- If a non PoE+ compatible device is connected, both the POWER lamp (green) and NETWORK lamp (green) flash, and the camera won't start.
- When you turn the power off, wait at least 10 seconds before you turn it on again.
- Use an STP (shielded) network cable.

Connecting a single camera to a switcher, recorder and monitor

Devices equipped with an HDMI input terminal

HDMI cable
(not supplied)

To HDMI input terminal

Video monitor
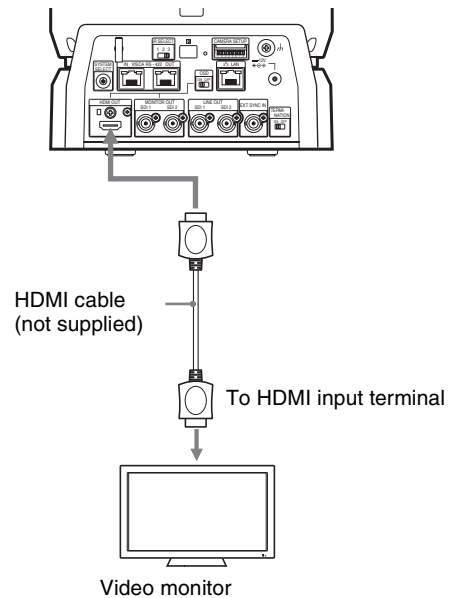
Devices equipped with an SDI input terminal (4K output): BRC-X1000

SDI OUT

Connecting cable with BNC connector

To SDI input terminal

Recorder or monitor equipped with SDI input terminal
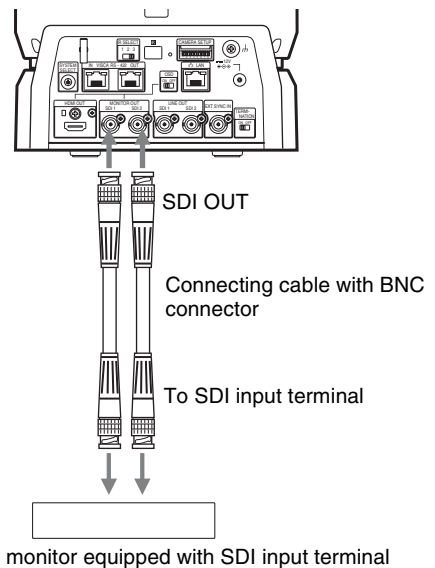
The image size (resolution and frame rate) of the signals delivered through the SDI OUTPUT terminal can be changed with the SYSTEM SELECT switch.
For details, see "SYSTEM SELECT switch settings" (page 64).

Devices equipped with an SDI input terminal (HD output): BRC-X1000

SDI OUT

Connecting cable with BNC connector

To SDI input terminal
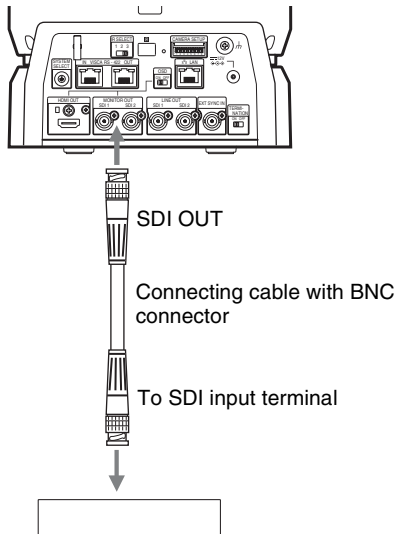
Recorder or monitor equipped with SDI input terminal

* Equivalent signals are delivered to both SDI 1 and SDI 2.

Devices equipped with an SDI input terminal (HD output): BRC-H800

SDI OUT

Connecting cable with BNC connector

To SDI input terminal
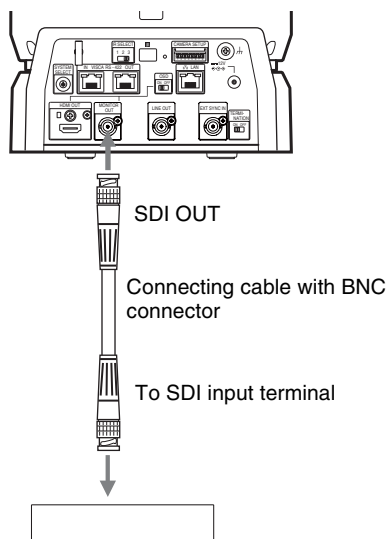
Recorder or monitor equipped with SDI input terminal

Connecting a single camera to a single remote controller (not supplied)

Using VISCA Over IP (LAN terminal)

To LAN terminal

Network cable (commercially available)
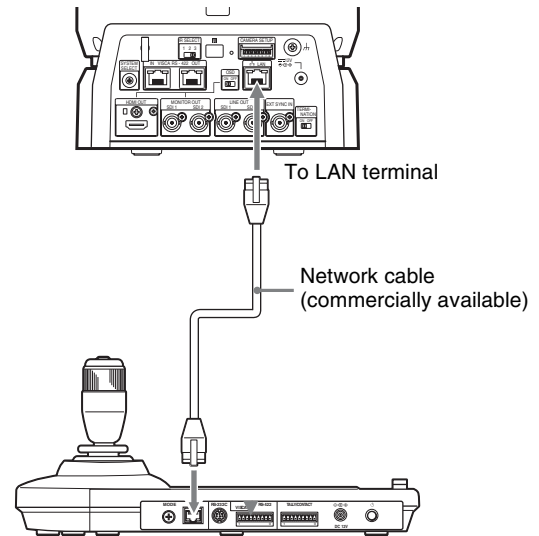
When you connect multiple cameras to a single remote controller or when you connect multiple cameras to multiple remote controllers with a PC, use a switching hub for the connection. When you directly connect them, use a cross network cable.
For details, see the operating instructions of the remote controller.

Connecting a single camera to a single remote controller (not supplied)

Using the VISCA RS-422 terminal
A remote controller can be connected via the VISCA RS-422 terminal. The VISCA RS-422 allows connections of up to 1.2 km in length.
Using supplied RS-422 terminal board connectors and the remote controller, make a connecting cable.
When you make the connecting cable, refer to the pin layout of the VISCA RS-422 terminal (page 64) and the VISCA RS-422 connection diagram (page 64).
Check the setting of each switch of the remote controller. For details, refer to the operating instructions of the remote controller.

RS-422 conversion cable

Connecting multiple cameras to a single remote controller (not supplied)

Using the VISCA RS-422 terminal

Multiple cameras can be connected via the VISCA RS-422 terminal. The VISCA RS-422 allows connections of up to 1.2 km in length.

Using supplied RS-422 terminal board connectors and the remote controller, make a connecting cable.

When you make the connecting cable, refer to the pin layout of the VISCA RS-422 terminal (page 64) and the VISCA RS-422 connection diagram (page 64).

Check the setting of each switch of the remote controller. For details, refer to the operating instructions of the remote controller.

RS-422 conversion cable

Network cable (commercially available)

Network cable (commercially available)

Use straight network cables.

Connecting a commercially available video switcher

For 4K output

When you want to switch cameras, connect a commercially available video switcher.

For the connection to the video switcher, refer to the operating instructions of the switcher.
* LINE OUT menu display is not output.
* You can switch the MONITOR OUT menu display by turning the OSD switch on/off.
  Depending on the application, you can choose the one you want.
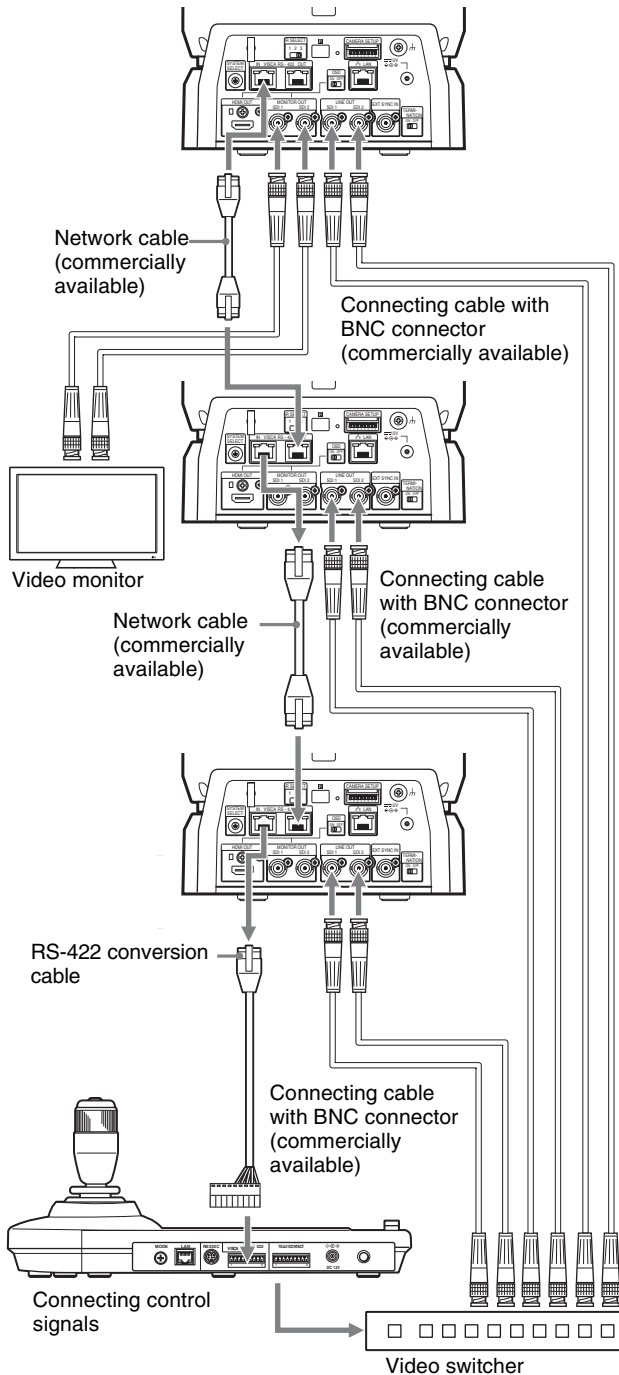
Network cable (commercially available)

Connecting cable with BNC connector (commercially available)

Video monitor

Network cable (commercially available)

Connecting cable with BNC connector (commercially available)

RS-422 conversion cable

Connecting cable with BNC connector (commercially available)

Connecting control signals

Video switcher

* The BRC-H800 does not have MONITOR OUT SDI 2 LINE OUT SDI 2 terminal.
* Use straight network cables.

For HD output

When you want to switch cameras, connect a commercially available video switcher.
For the connection to the video switcher, refer to the operating instructions of the switcher.

Network cable (commercially available)

Connecting cable with BNC connector (commercially available)

Video monitor

Network cable (commercially available)

Connecting cable with BNC connector (commercially available)

RS-422 conversion cable

Connecting cable with BNC connector (commercially available)

Connecting control signals

Video switcher
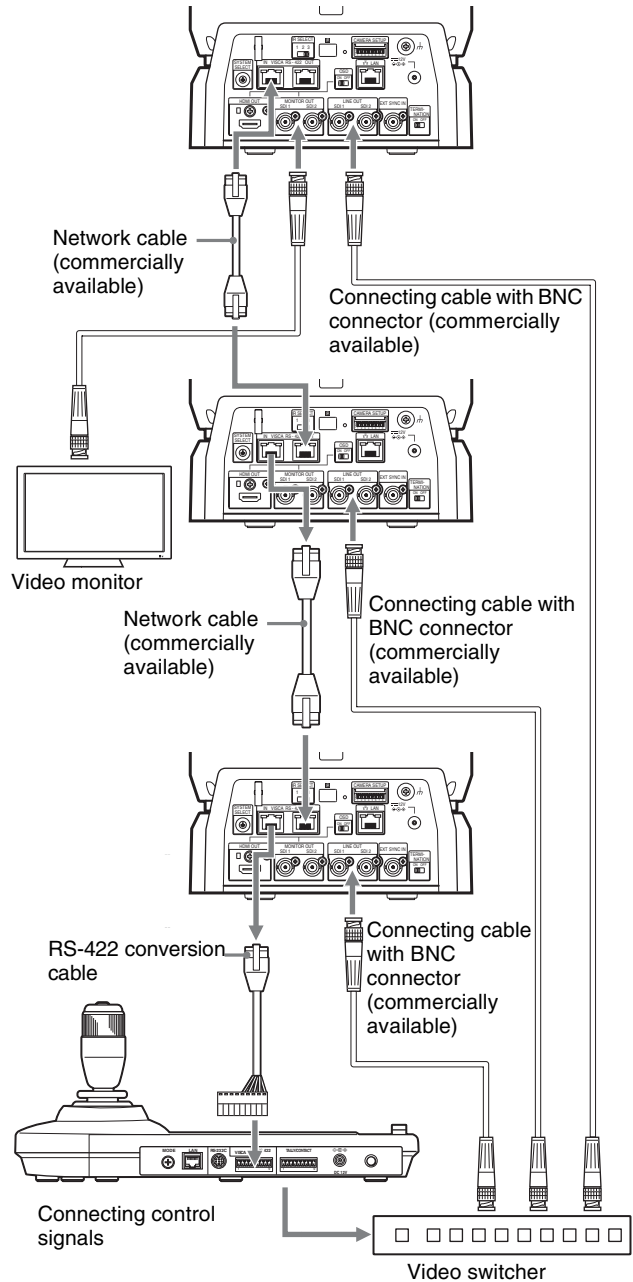
* The BRC-H800 does not have MONITOR OUT SDI 2 LINE OUT SDI 2 terminal.
* Use straight network cables.
* Equivalent signals are delivered to both SDI 1 and SDI 2.

Externally synchronizing a single camera

TERMINATION switch: On

Connecting cable with BNC connector (commercially available)

To SYNC OUT terminal

Synchronizing signal generator
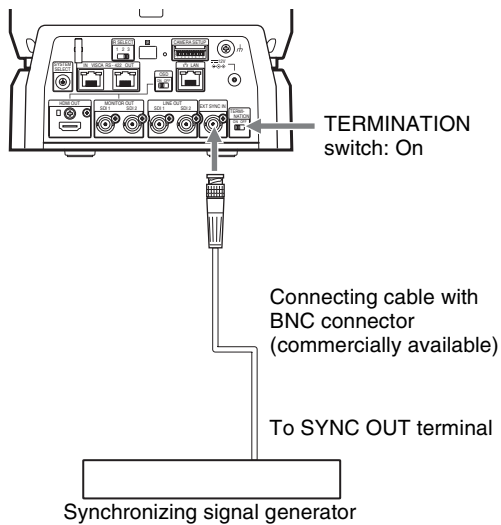
External synchronization

Multiple cameras can be synchronized to a specific reference signal.
Providing a reference signal to the EXT SYNC IN terminal (page 10) allows the camera to be synchronized in phase with the video signal. Depending on the system frequency, the compatible reference signal varies.

System select	Compatible reference signals
0: 3840×2160/29.97p 1: 1920×1080/59.94p 2: 1920×1080/59.94i	1920×1080/59.94i 720×486/59.94i (NTSC)
4,7: 1280×720/59.94p	1920×1080/59.94i 1280×720/59.94p 720×486/59.94i (NTSC)
8: 3840×2160/25p 9: 1920×1080/50p A:1920×1080/50i	1920×1080/50i 720×576/50i (PAL)
C:1280×720/50p	1920×1080/50i 1280×720/50p 720×576/50i (PAL)
E: 3840×2160/23.98p F: 1920×1080/23.98p	1920×1080/47.95i (23.98PsF)

Notes

- When the reference signal is unstable, the camera cannot be externally synchronized.
- Sub-carriers cannot be synchronized.

About On-Screen Menus

You can configure the shooting conditions and system setup of the camera from the menus displayed on an external monitor. The setting menu only displays items available for set up.

Menu operations can be performed using the supplied remote commander or a remote controller (sold separately).

For details, refer to the operating instructions of the remote controller.

Show/hide menu switch

Item select

Confirm selection/ execute operation
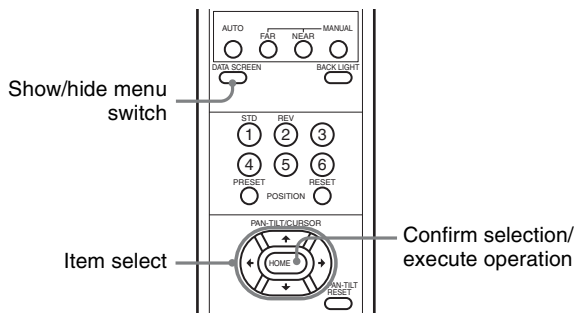
This section explains how to read the on-screen menus before starting menu operations.

For the overall menu configurations, see page 56.

Notes

• You cannot perform pan/tilt/zoom operations while the menu is displayed.
• The menus are output through MONITOR OUT and HDMI OUT.
 When you want to display the menus, turn on the OSD switch on the back of the camera.

Confirming selection of menu items and settings / Executing operations

Icons for buttons used for setup operations are displayed along the bottom of the currently displayed menu screen.

⬆⬇SELECT or ⬆⬇◀▶SELECT: Indicates use of the ↑/↓/←/→ buttons to select menu items and settings. These correspond to the joystick directions on a remote controller.

ENTERNEXT: Indicates use of the HOME button (equivalent to ENTER) to confirm the menu item or setting selection, or to advance to the next screen or next

operation. This corresponds to the joystick button on a remote controller.

MENUEXIT: Indicates use of the DATA SCREEN button (equivalent to MENU) to show/hide the menu screen.

The method used to display the menu will vary depending on the remote controller model. Refer to the operating instructions of the remote controller (sold separately).

Main menu

Press the DATA SCREEN button on the remote commander to display the main menu.

```
<MENU>
 >EXPOSURE
  COLOR
  DETAIL
  KNEE
  GAMMA/VISIBILITY ENHANCER
  FOCUS
  PICTURE/OPTICAL FILTER
  PAN TILT/ZOOM
  VIDEO OUT
  SYSTEM
  NETWORK
  PICTURE PROFILE
  PTZ TRACE
  ⬆⬇SELECT      ENTERNEXT      MENUEXIT
```
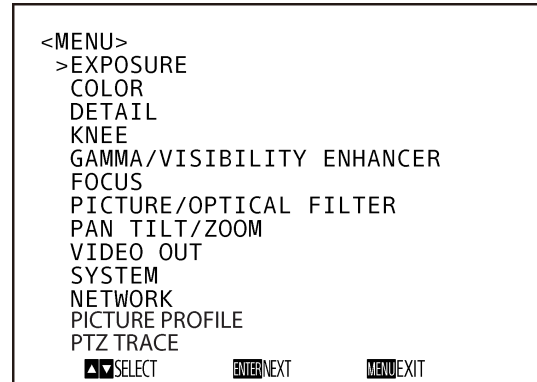
❶ **Cursor**

The cursor selects a setting menu.
Press the ↑ or ↓ button of the remote commander to move the cursor up or down.

❷ **Menu items**

Press the ↑ or ↓ button of the remote commander to select a setting menu. Press the HOME button of the remote commander to display the selected setting menu.

Setting menu

The setting menu selected on the main menu is displayed.

```
<EXPOSURE>
 >MODE                IRIS Pri
   IRIS                   F2.8
   AE SPEED                  3
   EX-COMP                  ON
    LEVEL                    0
   GAIN LIMIT             OFF
   GAIN POINT              ON
    POINT POSITION         0dB
   MAX SPEED            1/2000
   MIN SPEED             1/60
   BACK LIGHT            OFF
   SPOT LIGHT            OFF

   ▲▼◀▶SELECT          MENUBACK
```
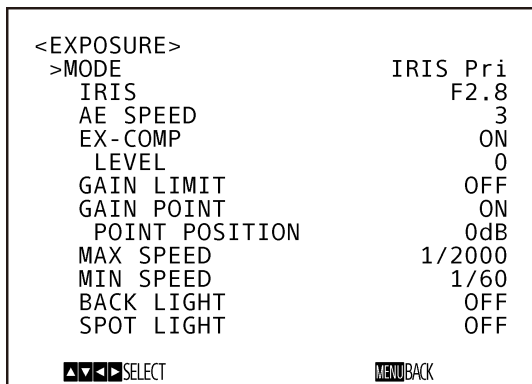
❶ **Setting menu**

The name of the setting menu currently selected is displayed.

❷ **Cursor**

The cursor selects a setting item.
Press the ♦ or ♦ button of the remote commander to move the cursor up or down.

❸ **Setting items**

The setting items for this setting menu are displayed.
Press the ♦ or ♦ button of the remote commander to select a setting item. Press the ← or → button to change the set value.

❹ **Set value**

The current set values are displayed.
Press the ← or → button of the remote commander to change the set value.

For the default value of each setting item, see "Menu Configuration" (page 56).

How to Use Menus

This section explains how to configure the camera using the supplied remote commander.

For details on the menu items, refer to pages 31 through 42.

Using the supplied remote commander
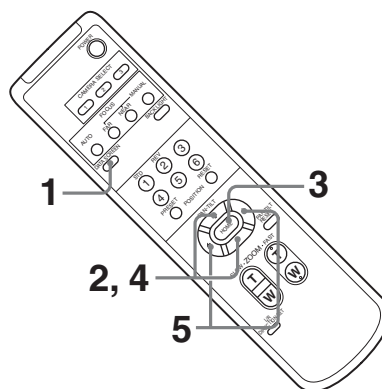
1 **Press the DATA SCREEN button.**

The main menu is displayed.

```
<MENU>
 >EXPOSURE
  COLOR
  DETAIL
  KNEE
  GAMMA/VISIBILITY ENHANCER
  FOCUS
  PICTURE/OPTICAL FILTER
  PAN TILT/ZOOM
  VIDEO OUT
  SYSTEM
  NETWORK
  PICTURE PROFILE
  PTZ TRACE
   ▲▼SELECT    ENTERNEXT    MENUEXIT
```
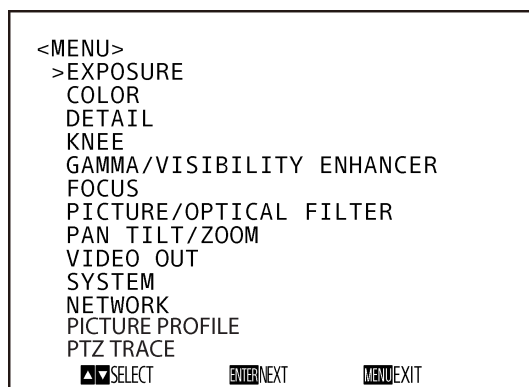
2 **Use the ♦ or ♦ button to move the cursor to the menu item you want to change.**

3 Press the HOME button.

The selected menu is displayed.

```
<EXPOSURE>
 >MODE                    FULL AUTO

   AE SPEED                        1
   EX-COMP                       OFF

   GAIN LIMIT                    OFF
   GAIN POINT                    OFF

   MAX SPEED                  1/2000
   MIN SPEED                    1/60
   BACK LIGHT                    OFF
   SPOT LIGHT                    OFF

   ▲▼◀▶SELECT          MENUBACK
```

4 Use the ↑ or ↓ button to move the cursor to the setting item you want to change.

5 Use the ← or → button to change the set value.

```
<EXPOSURE>
   MODE                    FULL AUTO

 > AE SPEED                        3
   EX-COMP                       OFF

   GAIN LIMIT                    OFF
   GAIN POINT                    OFF

   MAX SPEED                  1/2000
   MIN SPEED                    1/60
   BACK LIGHT                    OFF
   SPOT LIGHT                    OFF

   ▲▼◀▶SELECT          MENUBACK
```

Note

You cannot turn off IR RECEIVE in the SYSTEM menu with the supplied remote commander. To turn off IR RECEIVE, use the remote controller (not supplied) or VISCA command.

To go back to the Main menu

Press the DATA SCREEN button.

To close the menu

When the main menu is displayed, press the DATA SCREEN button once. When a setting menu is displayed, press the DATA SCREEN button twice.

EXPOSURE Menu

The EXPOSURE menu is used to set the items regarding the exposure.

```
<EXPOSURE>
 >MODE                     IRIS Pri
   IRIS                         F2.8
   AE SPEED                        3
   EX-COMP                        ON
    LEVEL                          0
   GAIN LIMIT                    OFF
   GAIN POINT                     ON
    POINT POSITION               0dB
   MAX SPEED                  1/2000
   MIN SPEED                    1/60
   BACK LIGHT                    OFF
   SPOT LIGHT                    OFF

   ▲▼◀▶SELECT          MENUBACK
```

MODE (Exposure mode)

FULL AUTO: The exposure is adjusted automatically using the sensitivity, electronic shutter speed, and aperture setting.

MANUAL: You can manually adjust the sensitivity, electronic shutter speed, and aperture setting individually.

SHUTTER Pri: You can adjust the electronic shutter speed manually. Automatically adjusts the exposure using the gain and iris.

IRIS Pri: You can adjust the aperture setting manually. Automatically adjusts the exposure using the gain and electronic shutter speed.

GAIN Pri: You can adjust the sensitivity manually. Automatically adjusts the exposure using the electronic shutter speed and iris.

When you select any of the above modes, you will see available options for the selected mode among the following setting items.

GAIN: Select the gain.

When EXPOSURE MODE is either MANUAL or GAIN Pri, you can choose a value from –3 to 33 dB in 3 dB increments.

SPEED: When EXPOSURE MODE is either MANUAL or SHUTTER Pri, select the electronic shutter speed.
When the signal format is 2160/29.97p (the BRC-X1000 only), 1080/59.94p, 1080/59.94i, or 720/59.94p
You can choose from 1/8, 1/15, 1/30, 1/50, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500,

1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, and 1/10000.

When the signal format is 2160/25p (the BRC-X1000 only), 1080/50p, 1080/50i, or 720/50p

You can choose from 1/6, 1/12, 1/25, 1/30, 1/50, 1/60, 1/100, 1/120, 1/150, 1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, and 1/10000.

When the signal format is 2160/23.98p (the BRC-X1000 only), 1080/23.98p

You can choose from 1/6, 1/12, 1/24, 1/25, 1/40, 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/144, 1/192, 1/200, 1/288, 1/400, 1/576, 1/1200, 1/2400, 1/4800, and 1/10000.

IRIS: When EXPOSURE MODE is either MANUAL or IRIS Pri, you can choose aperture setting. You can choose from F2.8/F3.1/F3.4/F3.7/F4.0/F4.4/F4.8/F5.2/F5.6/F6.2/F6.8/F7.3/F8.0/F8.7/F9.6/F10/F11.

AE SPEED: Select the adjustment speed for exposure adjustment.
You can adjust the speed at which the camera reaches the optimum exposure setting from 1 (Standard) to 48 (Slow). Adjust this when the brightness of the object changes instantaneously. This setting is enabled when MODE is FULL AUTO, SHUTTER Pri, IRIS Pri, or GAIN Pri.

EX-COMP: Turn this ON when you want to correct brightness of a picture whose exposure is already automatically adjusted. This setting is enabled when MODE is FULL AUTO, SHUTTER Pri, IRIS Pri, or GAIN Pri. The LEVEL setting is displayed when this is turned ON.

LEVEL: Choose a level to adjust the brightness of a picture whose exposure is already automatically adjusted. Choose a value from –7 to +7 for the level.
This is not displayed when EX-COMP is turned OFF.

GAIN LIMIT: Set the maximum sensitivity when exposure is automatically adjusted using sensitivity. Choose a value from 9 dB to 24 dB (in 3 dB increments) or you can turn this OFF. When turned off, the maximum is not limited. This setting is enabled when MODE is FULL AUTO, SHUTTER Pri, or IRIS Pri. You cannot choose a value smaller than the POINT POSITION setting.

GAIN POINT: When you set MIN SPEED to be slower than the output image frame rate, the shutter speed controls exposure based on the GAIN POINT setting. Normally, when exposure is controlled with sensitivity, noise becomes prominent if sensitivity is increased to make the image brighter. You can decrease noise by adjusting the exposure through lower shutter speeds to cancel sensitivity adjustments. When you do this, turn on GAIN POINT and set the POINT POSITION to the sensitivity at which you want the shutter speed to change. When the shutter speed reaches MIN SPEED for exposure adjustment, increase sensitivity to adjust exposure. This setting is enabled when MODE is either FULL AUTO or IRIS Pri.

POINT POSITION: This is enabled when GAIN POINT is turned ON. When sensitivity during exposure adjustment reaches the value for POINT POSITION, exposure is adjusted through a slower shutter speed. This setting is enabled when MODE is either FULL AUTO or IRIS Pri. You cannot choose a value smaller than the GAIN setting.

MAX SPEED: This sets the maximum (fastest) shutter speed when exposure is adjusted with the electronic shutter.
This setting is enabled when MODE is FULL AUTO, IRIS Pri, or GAIN Pri. You cannot choose a value slower than MIN SPEED.

When the signal format is 2160/29.97p (the BRC-X1000 only), 1080/59.94p, 1080/59.94i, 720/59.94p

You can choose from 1/30, 1/50, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, and 1/10000.

When the signal format is 2160/25p (the BRC-X1000 only), 1080/50p, 1080/50i, 720/50p

You can choose from 1/25, 1/30, 1/50, 1/60, 1/100, 1/120, 1/150, 1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, and 1/10000.

When the signal format is 2160/23.98p (the BRC-X1000 only), 1080/23.98p

You can choose from 1/24, 1/25, 1/40, 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/144, 1/192, 1/200, 1/288, 1/400, 1/576, 1/1200, 1/2400, 1/4800, and 1/10000.

MIN SPEED: This sets the minimum (slowest) shutter speed when exposure is adjusted with the electronic shutter.
This setting is enabled when MODE is FULL AUTO, IRIS Pri, or GAIN Pri. You cannot choose a value faster than MAX SPEED.

When the signal format is 2160/29.97p (the BRC-X1000 only), 1080/59.94p, 1080/59.94i, 720/59.94p

You can choose from 1/8, 1/15, 1/30, 1/50, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, and 1/10000.

When the signal format is 2160/25p (the BRC-X1000 only), 1080/50p, 1080/50i, 720/50p

You can choose from 1/6, 1/12, 1/25, 1/30, 1/50, 1/60, 1/100, 1/120, 1/150, 1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, and 1/10000.

When the signal format is 2160/23.98p (the BRC-X1000 only), 1080/23.98p

You can choose from 1/6, 1/12, 1/24, 1/25, 1/40, 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/144, 1/192, 1/200, 1/288, 1/400, 1/576, 1/1200, 1/2400, 1/4800, and 1/10000.

BACK LIGHT: This menu allows you to enable/disable backlight compensation so that exposure is optimized for backlight. You can choose either ON or OFF. This setting is enabled when MODE is FULL AUTO, SHUTTER Pri, IRIS Pri, or GAIN Pri.

SPOT LIGHT: This menu allows you to enable/disable spotlight compensation by adjusting the exposure darker when a part of the object is bright, such as a person's face in spotlight. You can choose either ON or OFF. This setting is enabled when MODE is FULL AUTO, SHUTTER Pri, IRIS Pri, or GAIN Pri. SPOT LIGHT becomes disabled when BACK LIGHT is ON.

COLOR Menu

The COLOR menu is used to adjust the white balance and the color.

```
<COLOR>
 >WHITE BALANCE MODE        AUTO1
    SPEED                      3
    OFFSET                     0
   MATRIX                     ON
    SELECT                   STD
    LEVEL                      4
    PHASE                      0
    R-G                        0
    R-B                        0
    G-R                        0
    G-B                        0
    B-R                        0
    B-G                        0
 ▲▼◄►SELECT            MENU BACK
```

WHITE BALANCE MODE

This setting allows you to select a white balance mode. You can choose from AUTO1, AUTO2, INDOOR, OUTDOOR, ONE PUSH, and MANUAL.

AUTO1: Automatically adjusts the color to be closest to the image you are viewing.

AUTO2: Automatically adjusts the white balance to reproduce the original colors of the objects, eliminating the influences of ambient illumination.

INDOOR: Fixes R/B GAIN when the color temperature is 3200 K.

OUTDOOR: Fixes R/B GAIN when the color temperature is 5800 K.

ONE PUSH: White balance is adjusted when you press the HOME button of the supplied remote commander or the top button or ONE PUSH AWB button on the joystick of an remote controller, while shooting a large white object.

MANUAL: Allows you to manually adjust the white balance.

When you select any of the above modes, you will see available options for the selected mode among the following setting items.

SPEED (white balance speed): You can adjust the speed at which the camera reaches the white convergence point when AUTO1 or AUTO2 is chosen. Choose a value from 1, 2, 3, 4, and 5. 5 is the fastest and 1 is the slowest.

OFFSET: The white convergence point can be shifted when WHITE BALANCE mode is AUTO1, AUTO2, or ONE PUSH. The range is from –7 to 0 to +7. White balance is shifted toward blue when a negative value is chosen, and it is shifted toward red when a positive value is chosen.

R. GAIN and B. GAIN: Displayed when MANUAL is chosen. White balance can be manually adjusted within the range from –128 to +127.

MATRIX

You can emphasize or weaken a specific color region while keeping the white convergence point unchanged. When you turn this ON, the following items are displayed for adjustment.

SELECT: You can choose an internal preset matrix for matrix calculation. You can choose from STD, HIGH SAT, FL LIGHT, MOVIE, STILL, CINEMA, PRO, ITU709, and B/W. This becomes disabled when MATRIX is turned OFF.

LEVEL (color level): You can adjust the color density of the picture. Choose a value in the range from 0 to 14. The greater the number, the denser the colors, and vice versa. This becomes disabled when MATRIX is turned OFF.

PHASE: You can adjust the color tone of the entire picture. Choose a value from –7 to 0 to +7. This becomes disabled when MATRIX is turned OFF.

R-G, R-B, G-R, G-B, B-R, B-G: You can set a coefficient for each combination of RGB individually, to adjust the hue of the entire picture.
Choose a value from –99 to 0 to +99. This becomes disabled when MATRIX is turned OFF.

DETAIL Menu

The DETAIL menu is used to adjust the image enhancer function.

```
<DETAIL>
 >MODE                      MANUAL
   LEVEL                          0
   BAND WIDTH              DEFAULT
   CRISPENING                     3
   H/V BALANCE                    0
   B/W BALANCE                TYPE2
   LIMIT                          3
   HIGHLIGHT DETAIL               0
   SUPER LOW                      3



  ▲▼◀▶SELECT               MENUBACK
```

MODE

When you choose AUTO, contour correction signal is automatically added.
When you want to make adjustment by yourself, choose MANUAL.
Only LEVEL will be displayed when you choose AUTO.

LEVEL: You can set the volume of the contour correction signal. Choose a value from –7 to +8. The greater the value, the stronger the contour correction signal.

BAND WIDTH: You can set the bandwidth for signals undergoing contour emphasis. You can choose from DEFAULT, LOW, MIDDLE, HIGH, and WIDE. For example, when you choose MIDDLE, the middle range of the signals is elevated, and contours in that middle range are emphasized.

CRISPENING: You can choose the fineness of the objects subject to contour correction with contour correction signals.
Choose a value from 0 to 7. When you choose a higher value, minute contour correction signal elements are removed, and only the high level contour correction signals are left, which reduces noise. When you choose a lower value, minute contour correction signal elements are added to the picture, increasing noise.

H/V BALANCE: You can choose the ratio for horizontal and vertical contour correction signal elements. Choose a value from –2 to 0 to +2. When you choose a higher value, the horizontal contour correction elements become greater compared to the vertical elements.

B/W BALANCE: You can adjust the balance between contours in black on the low brightness side of the spectrum and contours in white on the high brightness side. Choose from TYPE1 to TYPE5. The ratio of contours in black is higher for TYPE1 while the ratio of contours in white is higher for TYPE5.

LIMIT: You can set the maximum value for the amount of contour emphasis in black on the low brightness side of the spectrum and in white on the high brightness side. Choose a value from 0 to 7.

HIGHLIGHT DETAIL: You can adjust the level of contour added to brightly-lit objects. Choose a value from 0 to 4. Adjust this when you want to emphasize the contour of a brightly-lit object in a bright background.

SUPER LOW: Emphasizes contours in the super low range. Choose a value from 0 to 7. The greater the value, the greater the contour emphasis. Contrast and resolution increase.

KNEE Menu

The KNEE menu is used to adjust the KNEE.

```
<KNEE>
 >SETTING                      ON
    KNEE MODE               MANUAL
     KNEE SLOPE                 +7
     KNEE POINT                  5




  ▲▼◀▶SELECT            MENU BACK
```
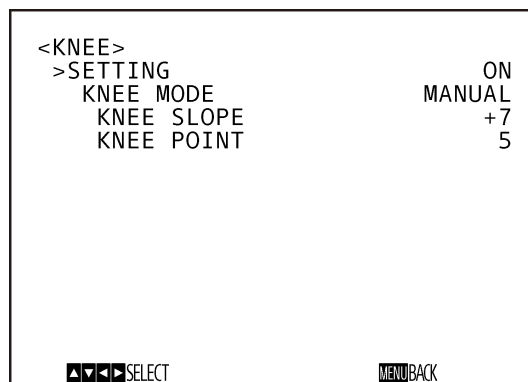
SETTING

When you turn this ON, the following KNEE MODE setting items are displayed for adjustment.

KNEE MODE: When you choose AUTO, the KNEE level is automatically calculated based on the brightness level of the picture being shot. When you choose MANUAL, you can manually adjust the KNEE level irrespective of the brightness level of the picture.

KNEE SLOPE: When KNEE MODE is MANUAL, you can adjust the gradient of KNEE (compression rate).
Choose a value from –7 to 0 to +7. This is disabled when KNEE MODE is AUTO.

KNEE POINT: When KNEE MODE is MANUAL, you can adjust the knee point. Choose a value from 0 to 12. This is disabled when KNEE MODE is AUTO.

GAMMA/VISIBILITY ENHANCER Menu

The GAMMA/VISIBILITY ENHANCER menu is used to adjust GAMMA correction and VISIBILITY ENHANCER features.

```
<GAMMA/VISIBILITY ENHANCER>
 GAMMA
 >SELECT              PATTERN
   PATTERN               25
   PATTERN FINE           6
 OFFSET                   0
 LEVEL                    0
 BLACK GAMMA              0
 BLACK GAMMA RANGE      LOW
 BLACK LEVEL             0

 VISIBILITY ENHANCER
 SETTING                 ON
 EFFECT                   0
 ▲▼◀▶SELECT          MENUBACK
```

GAMMA

SELECT

You can choose the type of basic curve for GAMMA correction.

STD: Standard setting (same as the MOVIE setting on the camera).

STRAIGHT: This selects a straight GAMMA curve.

MOVIE: Use standard gamma curve for movies.

STILL: Use gamma curve for the tone of a still image.

CINE1: Softens the contrast in darker regions and emphasizes gradation changes in lighter regions, producing a subdued tone overall.

CINE2: Similar to [CINE1] but optimized for editing with up to 100% video signal.

CINE3: Stronger contrast between dark and light regions and greater emphasis on black gradation changes (compared to [CINE1] and [CINE2]).

CINE4: Stronger contrast than [CINE3] in darker regions. Compared to the standard curve, has less contrast in darker regions and more contrast in lighter regions.

ITU709: Gamma curve equivalent to ITU-709.

PATTERN: You can choose a gamma curve from 512 patterns stored in the camera. You can specify the pattern out of 512 patterns using PATTERN and PATTERN FINE. PATTERN defines the upper two digits of the pattern, and PATTERN FINE defines the last digit.

PATTERN: Choose a value from 0 to 51. This can be chosen when SELECT is PATTERN.

PATTERN FINE: Choose a value from 0 to 9. When PATTERN is 0, 0 cannot be chosen for PATTERN FINE. When PATTERN is 51, a value larger than 2 cannot be chosen for PATTERN FINE. This can be chosen when SELECT is PATTERN.

OFFSET: You can choose the offset of the output level of gamma curves.
Choose a value from –64 to 0 to +64.

LEVEL: You can adjust the correction level of the GAMMA curve. Choose a value from –7 to 0 to +7.

BLACK GAMMA: You can adjust the black gamma level to recreate gradation in the dark areas of the picture or to suppress noise with black-out. Choose a value from –7 to 0 to +7.

BLACK GAMMA RANGE: You can adjust the brightness range for which BLACK GAMMA becomes effective. Choose from LOW, MIDDLE, and HIGH. The range becomes small when LOW is chosen, and it becomes large when HIGH is chosen.

BLACK LEVEL: You can adjust the master BLACK LEVEL. Choose a value from –48 to 0 to +48.

VISIBILITY ENHANCER

SETTING

When this is turned ON, gradation correction is adaptively performed according to the scene being shot.

EFFECT

You can adjust the brightness of the shadows on the screen. Choose a value from –3 to 0 to +3.

FOCUS Menu

The FOCUS menu is used to select the focus mode.

```
<FOCUS>
  >MODE                    AUTO




        ▲▼◀▶SELECT       MENUBACK
```
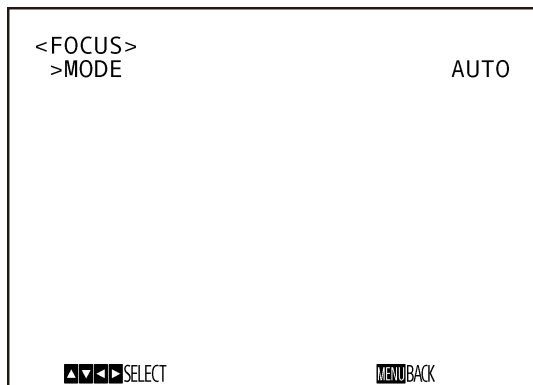
MODE (Focus mode)

Select the focus mode.

AUTO: The camera focuses automatically.

MANUAL: You can focus manually. Adjust using the supplied remote commander or optional remote controller.

Notes

Press the MANUAL button and adjust the focus manually when shooting the following objects.
- White walls and other objects without contrast
- Objects behind glass
- Objects with horizontal stripes
- Objects on which bright lights are cast or reflected
- Nightscapes and other dark objects with blinking lights
- Lit objects shot with darkened exposure adjustment or exposure compensation settings

PICTURE/OPTICAL FILTER Menu

The PICTURE/OPTICAL FILTER menu is used to adjust picture quality improvement features and optical filters.

```
<PICTURE/OPTICAL FILTER>
 PICTURE
 >NOISE REDUCTION      ADVANCED
   2D NR LEVEL              OFF
   3D NR LEVEL              OFF
  FLICKER CANCEL            OFF

 OPTICAL FILTER
  ND FILTER                 OFF
  IR CUT FILTER             DAY



        ▲▼◀▶SELECT       MENUBACK
```
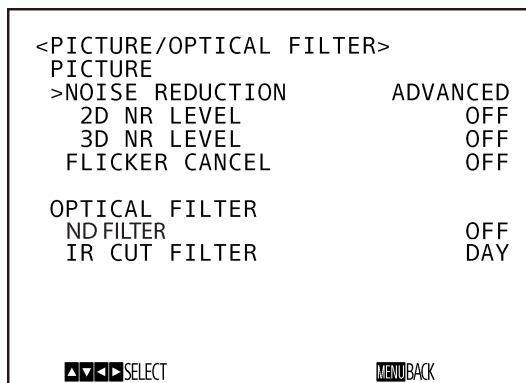
NOISE REDUCTION

You can obtain clearer images by removing unnecessary noise (fixed pattern and randomized noise) with NOISE REDUCTION. Choose from OFF or LEVEL 1 through LEVEL 5. When you select ADVANCED, you can set up 2D NR LEVEL and 3D NR LEVEL independently.

2D NR LEVEL

This is enabled when NOISE REDUCTION is ADVANCED. Choose from OFF or LEVEL 1 through LEVEL 5 for noise reduction.

3D NR LEVEL

This is enabled when NOISE REDUCTION is ADVANCED. Choose from OFF or LEVEL 1 through LEVEL 5 for noise reduction.

FLICKER CANCEL

When this is turned ON, the flicker correction feature becomes enabled.
When this is turned OFF, the flicker correction feature becomes disabled.

Note

Depending on conditions such as the type of illumination and shutter speed, the flicker correction feature may not be effective.
If the frame rate is close to the power supply frequency, the flicker correction feature may not be able to fully remove flickers, even if it is enabled. If this happens, use the electronic shutter.
We recommend turning OFF, FLICKER CANCEL

under lights where no flicker is generated, such as outdoors.

ND FILTER

You can adjust the internal ND filter to control the light level according to the brightness of the subject.

OFF: Do not use ND filter.

1/4: Use ND filter to reduce the light level to approximately 1/4.

1/16: Use ND filter to reduce the light level to approximately 1/16.

1/64: Use ND filter to reduce the light level to approximately 1/64.

IR CUT FILTER

You can choose either to enable or disable the IR CUT FILTER feature.
By disabling the IR CUT FILTER, the gain in the IR region is increased allowing the camera to capture images in shadow.
Day: IR CUT FILTER is enabled to remove unnecessary IR.
Night: IR CUT FILTER is disabled. The picture becomes monochrome.

PAN TILT/ZOOM Menu

The PAN TILT/ZOOM menu is used to select the pan/tilt/zoom mode.

```
<PAN TILT/ZOOM>
 PAN TILT
  LIMIT
 > PAN                    ON
    LEFT                  END
    RIGHT                 END
   TILT                   ON
    DOWN                  END
    UP                    END
  RAMP CURVE            MODE1

 ZOOM
  CLEAR IMAGE ZOOM       OFF
  ▲▼◀▶ SELECT      MENU BACK
```
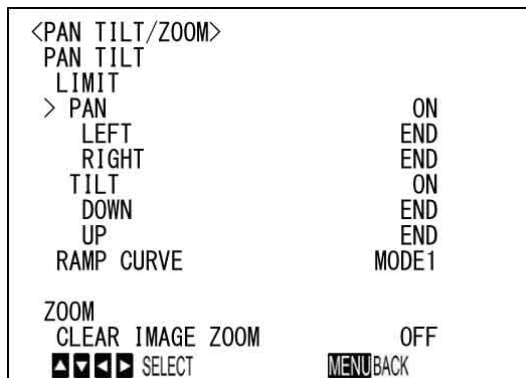
LIMIT (pan/tilt limit)

PAN

Set whether to limit the pan rotation range.

OFF: Do not apply range limit.

ON: Apply range limit.

LEFT: END, 169° to –169°, adjustable in 1° increments.

RIGHT: END, –169° to 169°, adjustable in 1° increments.

TILT

Set whether to limit the tilt rotation range.

OFF: Do not apply range limit.

ON: Apply range limit.

DOWN: END, –29° to 89°, adjustable in 1° increments.

UP: END, 89° to –29°, adjustable in 1° increments.

Setting range of LEFT/RIGHT

CENTER (±0°)

169°
END
(170°)

−169°
END
(−170°)

Setting range of DOWN/UP

END (90°)

89°

±0°

−29°

END (30°)

Notes

- Before storing the camera position in a preset memory, configure the PAN setting and TILT setting under LIMIT. If the camera position is not within the range of the PAN setting or TILT setting under LIMIT, you cannot store the camera position in the preset memory.
- The PAN setting and TILT setting under LIMIT are reset to the factory settings when you change the IMG FLIP setting in the SYSTEM menu.

RAMP CURVE (acceleration/deceleration curve)

You can set the acceleration/deceleration curve for pan and tilt.

MODE1: The camera accelerates/decelerates quicker than MODE2.

MODE2: This is the standard acceleration/deceleration curve.

MODE3: The camera accelerates/decelerates slower than MODE2.

CLEAR IMAGE ZOOM

You can set the range of zooming.

OFF: This restricts zooming only to optical zooming.

ON: This allows zooming within the range of optical zoom and Clear Image Zoom.

VIDEO OUT Menu

```
<VIDEO OUT>
 HDMI
 >VIDEO MODE          1920x1080
  COLOR SPACE              YCbCr

 H PHASE
  H PHASE                       3
  H PHASE FINE                  0




 ▲▼◀▶SELECT            MENU BACK
```

VIDEO MODE

This is the screen size for HDMI output. When the
signal format is 3840×2160, you can choose either
3840×2160 or 1920×1080.

COLOR SPACE

You can set the color space of HDMI output.

H PHASE (horizontal phase adjustment)

This feature allows you to regulate phase differences in
image signals from the external synchronizing signal, as
opposed to the image signal of the camera, when a
device which generates the synchronizing signal is
connected. The adjustment range is from 0 to 959.
When the video signal and the external video sync signal
are not synchronized, the video signal can be advanced
with + and delayed with –.
1 STEP time for H PHASE is 0.0135 μs.

H PHASE
This allows you to adjust by 10 STEP increments.
Choose a value from 0 to 3 to 95.

H PHASE FINE
This allows you to adjust by 1 STEP increments.
Choose a value from 0 to 9.
If you increase the value beyond 9, the tens digit
automatically increases (+1 to H PHASE).
If you decrease the value beyond 0, the tens digit
automatically decreases (–1 to H PHASE).

SYSTEM Menu

```
<SYSTEM>
 >IMG FLIP                OFF
  PAN REVERSE             OFF
  TILT REVERSE            OFF
  IR RECEIVE               ON
  TALLY MODE              OFF
  TELE CONVERT MODE       OFF
  PRESET MODE           MODE1
  P/T SPEED TYPE       NORMAL
   P/T SLOW MODE           ON
  ZOOM SPEED TYPE  Extd. RANGE

  VERSION                *.**
 ▲▼◀▶ SELECT         MENU BACK
```
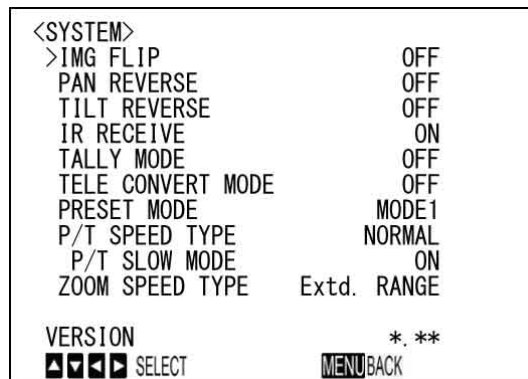
IMG FLIP (vertical flipping of the image)

When IMG FLIP is turned ON, the picture from the SDI
and HDMI outputs is flipped.

The directions of pan and tilt are also reversed. If you
change the IMG FLIP setting, turn off the camera and
turn it on again to activate the change.

Notes
- When you turn off the camera and turn it on again with
  IMG FLIP turned ON, PAN REVERSE and TILT
  REVERSE are turned ON. When you turn off the
  camera and turn it on again with IMG FLIP turned
  OFF, PAN REVERSE and TILT REVERSE are
  turned off.
- If the IMG FLIP setting is changed, the coordinates
  for pan and tilt are flipped and all preset values are
  reset.
- If the IMG FLIP setting is changed, all content
  recorded using the PTZ TRACE function is erased.

PAN REVERSE
When this is turned ON, the PAN direction is reversed.

TILT REVERSE
When this is turned ON, the TILT direction is reversed.

IR RECEIVE

If this is turned OFF, the camera does not receive signals
from the supplied remote commander.
Be sure to turn this ON when you use the supplied
remote commander.

Note
You cannot turn OFF, IR RECEIVE when using the
supplied remote commander. To turn off IR RECEIVE,
use the remote controller (not supplied) or VISCA
command.

TALLY MODE

This allows you to set up the Tally lamps on the front and back of the camera. Choose from HIGH, LOW, and OFF.

HIGH: When the Tally lamp is turned on, the one on the front of the camera comes on bright.

LOW: When the Tally lamp is turned on, the one on the front of the camera comes on dim.

OFF: When the Tally-lamp-on command is issued, the Tally lamps on the front and back of the camera do not come on.

> **Note**
>
> When TALLY MODE is turned off, both the front and back Tally lamps do not come on.
> The brightness of the Tally lamp on the back of the camera cannot be adjusted. It comes on at the same brightness for LOW and HIGH.

TELE CONVERT MODE

You can shoot using 2× magnification.

OFF: Does not use the magnification function.

2x: Uses the magnification function.

> **Notes**
>
> • Enabled only when SYSTEM SELECT is set to 1920×1080.
> • The angle of view when TELE CONVERT MODE is set to 2x is narrower than when set to OFF.

PRESET MODE

Sets preset mode.

MODE1: Recall all saved settings when recalling a preset.

MODE2: Recall only the pan, tilt, zoom, and focus positions when recalling a preset.

TRACE: Select to control operation using the PTZ TRACE function, without displaying the menu.

P/T SPEED TYPE

Selects the range and number of resolution steps for the pan/tilt operation speed.

NORMAL: Assigns speeds in the NORMAL speed range over 24 steps.

Extd. RANGE: Extends the speed range by having lower minimum speed than NORMAL range. The speed can be set over 24 steps.

Extd. STEP: Extends the speed range by having slower minimum speed than NORMAL range with higher number of resolution steps. The speed can be set over 50 steps.

> **Note**
>
> For pan/tilt operation using when P/T SPEED TYPE is set to Extd. STEP, use a remote controller that supports this speed type. Correct operation may not occur if using a remote controller that does not support this speed type.

P/T SLOW MODE

Set to ON to reduce the speed of each step setting for slower pan/tilt operation. This is enabled when P/T SPEED TYPE is set to NORMAL or Extd. RANGE.

ZOOM SPEED TYPE

Selects the range for the operating speed of zoom operation.

NORMAL: Operates in the NORMAL speed range.

Extd. RANGE: Operates in the speed range with lower minimum speed setting than NORMAL range.

VERSION

This indicates the version of the firmware installed on the camera.

NETWORK Menu

The NETWORK menu is used to configure Network settings.

```
<NETWORK>
   IPv4 ADDRESS      192.168.0.100
   SUBNET MASK       255.255.255.0
   GATEWAY                 0.0.0.0
   MAC ADDRESS       **-**-**-**-**
   NAME                        CAM1




   ▲▼◀▶SELECT              MENUBACK
```
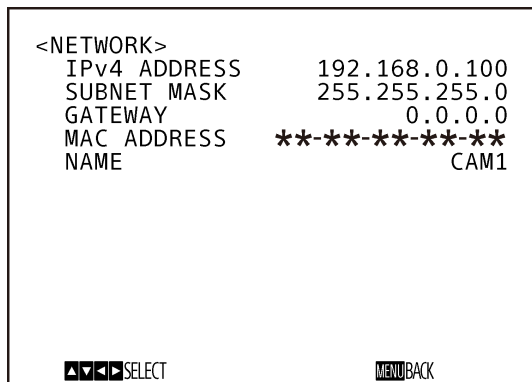
IPv4 ADDRESS: Displays the IP address set up on the camera.

SUBNET MASK: Displays the subnet mask currently set up for the camera.

GATEWAY: Displays the default gateway address currently set up for the camera.

MAC ADDRESS: Displays the MAC address of the camera.

NAME: Displays the name currently set up for the camera.

Note

You should set up the IP address, subnet mask, and default gateway before you first use the Network features. Configure these settings using the setup application "RM-IP Setup Tool" or "RM-IP10 Setup Tool" on your PC.
For details on the settings, refer to "RM-IP Setup Tool Guide" or "RM-IP10 Setup Tool Guide."

PICTURE PROFILE Menu

```
<PICTURE PROFILE>
  >PROFILE NUMBER                    PP1
     RECALL:EXECUTE





  *ENTER TO RECALL
     ▲▼◀▶SELECT              MENUBACK
```
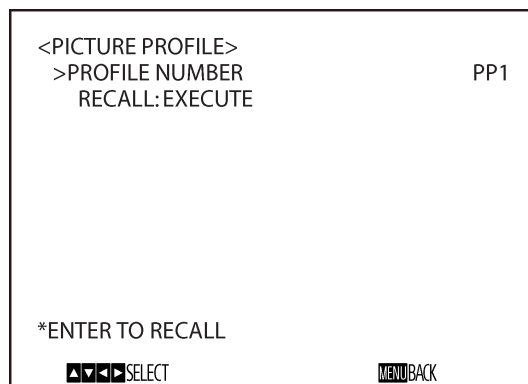
PROFILE NUMBER

Selects the Picture Profile number.
The camera is equipped with six types of Picture Profiles.
You can match the image texture with other types of camcorders that support the Picture Profile function, or create an image texture that is similar to that of cinematic film.

PP1: Set to image quality that uses [MOVIE] gamma.

PP2: Set to image quality that uses [STILL] gamma.

PP3: Set to image quality that uses [ITU709] gamma for natural color tones.

PP4: Set to image quality for ITU-709 standard color tones.

PP5: Set to image quality that uses [CINE1] gamma.

PP6: Set to image quality that uses [CINE2] gamma.

RECALL: Recall the selected Picture Profile.
The following settings are changed when PP1 to PP6 are recalled.
   • GAMMA/VISIBILITY ENHANCER SELECT,
      GAMMA OFFSET,
      GAMMA LEVEL,
      BLACK GAMMA,
      BLACK GAMMA RANGE,
      BLACK LEVEL,
      VE SETTING
   • KNEE
      SETTING,
      KNEE MODE
   • COLOR
      MATRIX,
      SELECT,

LEVEL,
        PHASE,
        R-G,
        R-B,
        G-R,
        G-B,
        B-R,
        B-G
    • DETAIL
        LEVEL,
        MODE

Settings can be adjusted individually after
recalling a Picture Profile.
To save settings, save to a preset.

Notes

• The settings for a Picture Profile cannot be changed.
• To load specific settings at startup, save the settings in
  preset position 1.

PTZ TRACE Menu

```
<PTZ TRACE>
   TRACE NO                                15
 > RECORD:     SET START POSITION
   PLAY :      RECALL START POSITION
   DELETE:     EXECUTE

RECORDED TRACE NO
          1   2   3   4   5   6   7   8
          9  10  11  12  13

*ENTER TO REC/PLAY/DELETE*
ELAPSED TIME(SEC)                      0/180
  ▲▼◄►SELECT                      MENU BACK
```
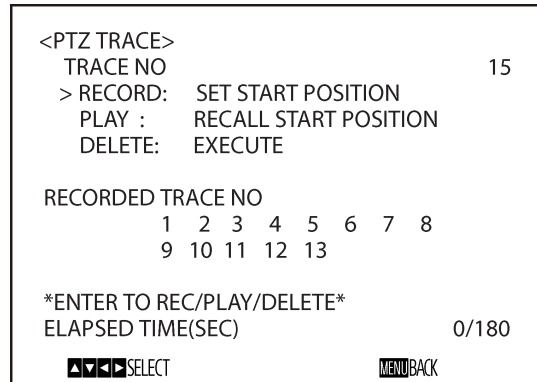
PTZ TRACE is a function used to record pan/tilt/zoom
operations, controlled by the remote commander or a
remote controller, and then to play back the operations
as required. Up to 16 pan/tilt/zoom positions can be
recorded for up to 180 seconds.

Notes

• If pan and tilt limits are configured in the PAN TILT/
  ZOOM menu after recording operations, the pan and
  tilt limits are not applied upon playback.
• To use the PTZ TRACE function and pan/tilt limit
  function together, first configure the PAN and TILT
  settings in the PAN TILT/ZOOM menu and then use
  the PTZ TRACE function.
• Recorded operations will be erased if the IMG FLIP
  setting or camera operating frequency setting is
  changed.
• When P/T SPEED TYPE is set to Extd. STEP, the
  recorded trace may not be reproducible upon
  playback.
• Playback operations will restore CLEAR IMAGE
  ZOOM, RAMP CURVE, P/T SPEED TYPE, P/T
  SLOW MODE, and ZOOM SPEED TYPE to their
  states held during recording.

TRACE NO: Select the TRACE number to record, play
    back, or delete.

RECORD: Record operations.

PLAY: Play back the recorded operations.

DELETE: Delete the recorded operations.

RECORDED TRACE NO: Displays the recorded
    TRACE numbers.

ELAPSED TIME (SEC): Displays the elapsed time
    during recording or playback in seconds.

The HOME button (equivalent to ENTER) on the
supplied remote commander corresponds to the joystick
button on an optional remote controller.

For details, refer to the operating instructions of the remote controller.

Recording pan/tilt and zoom operations

1. **Select the trace number you want to record in TRACE NO.**

2. **Move the cursor to RECORD, and press the HOME button.**
   SETTING(ENTER TO START REC) is displayed at the bottom of the screen.

3. **Move to the record start position, and press the HOME button.**
   RECORDING(ENTER TO START STOP) is displayed at the bottom of the screen.

4. **Perform the pan/tilt and zoom operations you want to record.**
   During recording, the ELAPSED TIME(SEC) number at the bottom of the screen increases in increments of 1.
   During recording, the menu screen display continues.

   ### Note
   If using the remote commander, pan/tilt and zoom operations cannot be performed simultaneously.

5. **Press the HOME button to stop recording.**
   The recorded trace number is displayed under RECORDED TRACE NO.

   ### Note
   The recording automatically stops after the maximum recording time has elapsed.

Playing pan/tilt and zoom operations

1. **Select the recorded trace number you want to play in TRACE NO.**
   The recorded traces numbers are displayed under RECORDED TRACE NO.

2. **Move the cursor to PLAY, and press the HOME button.**
   READY FOR PLAY(ENTER) is displayed at the bottom of the screen, and the camera moves position to the recorded pan/tilt/zoom start position.

3. **Press the HOME button to begin playback.**
   The recorded pan/tilt/zoom operations are played back, and the ELAPSED TIME(SEC) number increases in increments of 1.
   During playback, the menu screen display continues, with *PLAYING* displayed at the bottom of the screen.

Note
Playback stops if a pan, tilt, or zoom operation is performed during playback using the remote commander or a remote controller.

Deleting recorded pan/tilt and zoom operations

1. **Select the trace number you want to delete in TRACE NO.**

2. **Move the cursor to DELETE, and press the HOME button.**
   The recording is deleted, and the corresponding trace number is removed from RECORDED TRACE NO.

Before Starting Operations

Before operating, check that the camera and peripheral devices are properly installed and connected.

For details, see "Installing the Camera" (page 15) and "Connecting the Camera" (page 23).

Turning on the Power

to the AC adapter (not supplied)   POWER lights
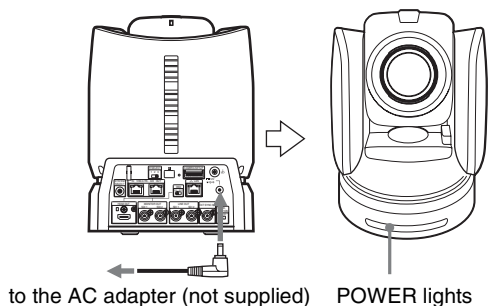
1 Connect the camera to an AC outlet using the AC adapter (not supplied) and power cord.
Or, connect the powered PoE+ Hub and the camera using a LAN cable.

The power is turned on and the POWER lamp turns green.
The camera will automatically pan and tilt and then stop to the position stored as POSITION 1 (pan/tilt reset).

2 Turn on the peripheral devices.
If the POWER button on the remote commander is pressed while the camera is turned on, the camera goes into the standby mode. The POWER lamp turns from green to orange.

Note

Wait at least 10 seconds if you want to turn on the camera again after putting it in the standby mode.

Pan/Tilt and Zoom Operations

Panning and tilting
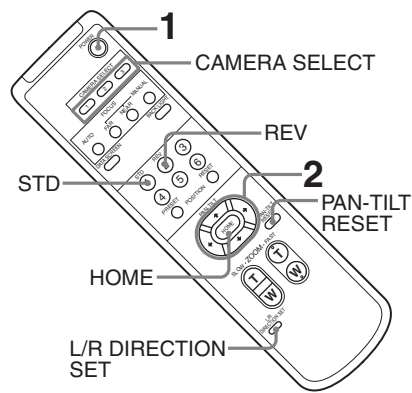
1 Press the POWER button.
The camera will turn on and perform the pan/tilt reset action automatically.

2 Press the arrow button to pan or tilt the camera.
While checking the picture on the screen, press the appropriate arrow button.
To move the camera little by little, press the button just for a moment.
To move the camera in a wide range, press and hold the button.
To move the camera diagonally, press the ↑ or ↓ button while holding down the ← or → button.

To face the camera back to the front
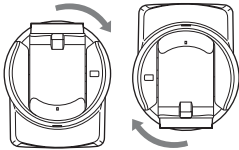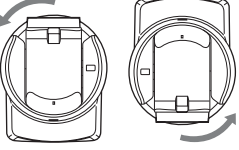
Press the HOME button.

If you accidentally move the camera with your hand

Press the PAN-TILT RESET button to perform the pan/tilt reset action.

If the camera moves in a different direction from what you intended

The camera is preset to face toward the right whenever the ➡ button is pressed. You might wish to reverse the direction in which the camera moves, for example, when you change the direction of the camera while checking the picture on the screen. In such cases, press the 2 (REV) button while holding down the L/R DIRECTION SET button. To reset the setting, press the 1 (STD) button while holding down the L/R DIRECTION SET button.

Arrow button	Movement of the camera	Setting
➡		L/R DIRECTION SET — While holding down — STD (1) Press
➡		L/R DIRECTION SET — While holding down — REV (2) Press

Note

The above setting changes only the signal emitted from the remote commander, and does not change the setting of the camera itself. Therefore, repeat the setting process for each remote commander if you are using more than one remote commander.

If the POWER lamp and NETWORK lamp of the camera flash simultaneously, and PAN-TILT ERROR! is displayed on the menu screen

When the camera is moved or turned by hand or by external shock, the microcomputer inside the camera may not be able to recall the pan/tilt position properly, in which case the camera automatically stops.
To reset the pan/tilt position, press the PAN-TILT RESET button or turn off the camera and turn it on again.

Zooming

Press either of the ZOOM buttons.

Subject appears farther away. (Wide angle)
Subject appears closer. (Telephoto)
Zooms in or out slowly (SLOW side)
Zooms in or out quickly (FAST side)
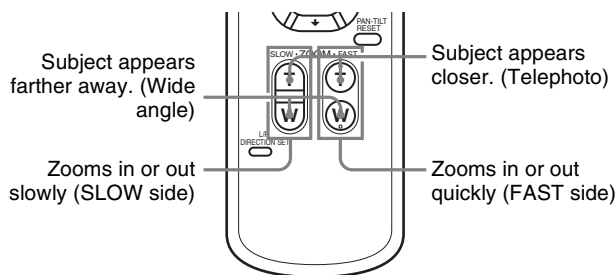
Note

When you perform pan/tilt operations while the camera is in telephoto mode, the moving speed of the image on the screen may be a little jerky.

Operating multiple cameras with the remote commander

1 Set the IR SELECT switch on the rear of the camera you want to operate to 1, 2 or 3.

1 2 3
IR SELECT

2 Press the CAMERA SELECT button on the remote commander that corresponds to the number set in step 1.
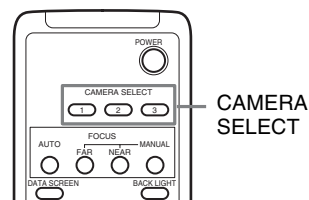
CAMERA SELECT

You can then operate the specified camera(s).
Every time you operate the camera(s) using the remote commander, the CAMERA SELECT button pressed in step 2 lights up.

Adjusting the Camera

NEAR

MANUAL

BACK LIGHT

AUTO

FAR
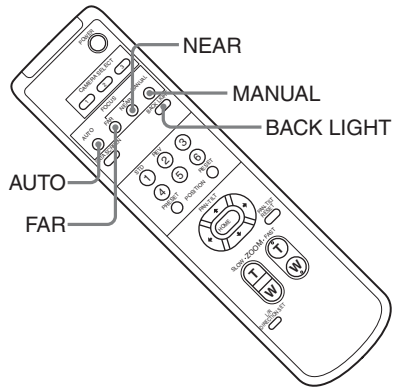
Focusing on a subject

To focus the camera on a subject automatically

Press the AUTO button.
The camera focuses on the subject in the center of the screen automatically.

To focus the camera on a subject manually

After pressing the MANUAL button, press either the FAR or the NEAR button to adjust the focus.

Focusing on a far off subject

Focusing on a nearby subject
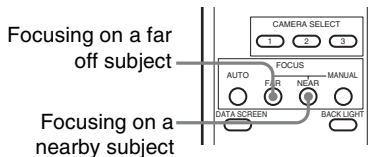
Shooting with back lighting

When you shoot a subject with a light source behind it, the subject becomes dark. In such cases, press the BACK LIGHT button.
To cancel the function, press the BACK LIGHT button again.

Subject appears brighter.
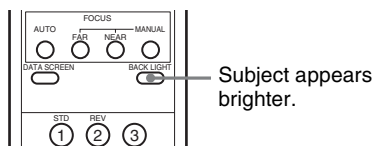
Storing the Camera Settings in Memory
– Preset Feature

Settings, including the camera position, zoom, focus, and backlighting, can be stored in a preset.

Note

The camera supports 100 position presets. The number of positions that are supported will vary depending on the device used.
- For the RM-IP500 (sold separately), up to 100 positions.
- For the RM-IP10 (sold separately), up to 16 positions.
- For the remote commander (supplied), up to 6 positions.

For details on the camera settings that can be preset, see "Preset Items" (page 59).
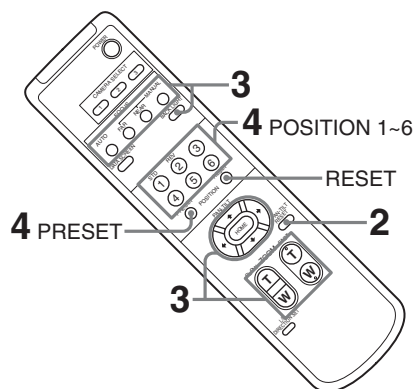
Storing the camera status

1 **Set PRESET MODE in the SYSTEM menu to MODE1 or MODE2.**

2 **Press the PAN-TILT RESET button to reset the pan/ tilt position.**

3 **Adjust the position, zoom, and focus of the camera. (See pages 46 and 47.)**

4 **Hold down the PRESET button and press any of the POSITION buttons, 1 to 6, in which you want to store the settings.**
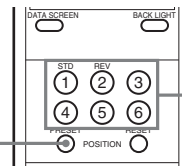
While holding down — Press the POSITION button you want to set.

Note

Before you store the position, zoom, focus, etc. of the camera, make sure to install and secure the camera in place to use it properly. If you change the installation of the camera after storing the settings, differences may occur in the settings.

Recalling stored status

Press any of the POSITION 1 to 6 buttons in which you have stored the settings.

Clearing the preset memory

Hold down the RESET button and press the desired POSITION button from buttons 1 to 6 for which you want to clear the settings.

Press the POSITION button you want to clear.

While holding down

Notes

- If you want to retain the previous pan and tilt positions when the power is turned off and turned on again, store those positions in POSITION 1.
  When PRESET MODE is set to TRACE, the camera does not move to the trace start position when the power is turned on.
- Storing or clearing the settings in POSITION 1 takes about two seconds longer than for other positions.
- When you are storing or clearing the settings in one POSITION, you cannot restore, store or clear the settings in another POSITION.
- For details on the items that can be cleared from the memory, see page 59.
- When PRESET MODE is set to MODE2 in the SYSTEM menu, only the pan/tilt, zoom, and focus positions of the camera are recalled.

Storing Camera Pan/Tilt and Zoom Operations
– PTZ TRACE function

Up to 16 pan/tilt/zoom operation patterns can be stored for up to 180 seconds.
This allows you to perform quick operations using the remote commander, without displaying the menu.
To perform an operation without displaying the menu, set PRESET MODE in the SYSTEM menu (page 40) to TRACE.
To display the menu and perform an operation, see "PTZ TRACE Menu" (page 43).
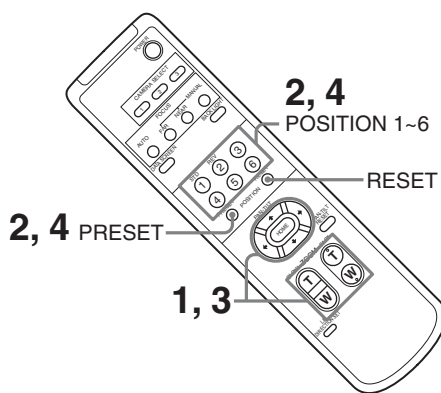
Notes

• If using the remote commander, pan/tilt and zoom operations cannot be performed simultaneously.
• The menu and camera status are not displayed on the screen.
• Recorded operations will be erased if the IMG FLIP setting or camera operating frequency setting is changed.
• When P/T SPEED TYPE is set to Extd. STEP, the recorded trace may not be reproducible upon playback.
• Playback operations will restore CLEAR IMAGE ZOOM, RAMP CURVE, P/T SPEED TYPE, P/T SLOW MODE, and ZOOM SPEED TYPE to their states held during recording.
• The camera supports up to 16 patterns of recorded operations. The number of patterns that are supported will vary depending on the device used.
  - RM-IP500 (sold separately): Up to 16
  - RM-IP10 (sold separately): Up to 16
  - Remote commander (supplied): Up to 6

Recording pan/tilt and zoom operations

1 Adjust the operation start position of the camera.

2 Hold down the PRESET button and press any of the POSITION1 to 6 buttons in which you want to store the settings.
Recording starts.

3 Perform the pan/tilt and zoom operations you want to record.

4 To stop recording, hold down the PRESET button, and press the POSITION button selected in step 2.

Playing pan/tilt and zoom operations

1 Press one of the POSITION1 to 6 buttons.
The camera moves position to the playback start position.

2 Press the same POSITION button again.
Playback starts.

Note
Playback stops if a pan, tilt, or zoom operation is performed during playback.

Deleting recorded pan/tilt and zoom operations

Hold down the RESET button and press the desired POSITION1 to 6 button for which you want to clear the registered recording.

Accessing from a Web Browser

You can access the camera from a web browser on a PC to upgrade the firmware and to change settings.
An IP address must be set on the camera to access it from a web browser. For details on IP settings, refer to "RM-IP Setup Tool Guide" or "RM-IP10 Setup Tool Guide."

Before starting the operation

Setting-up the PC

One of the following system configurations is required for the PC:

OS

Windows 8.1 Pro (32-bit version, 64-bit version)
Windows 10 Pro (32-bit version, 64-bit version)

Web browser

Windows Internet Explorer Ver. 11.0

Notes
• In the case of Windows 8.1, use the Internet Explorer desktop user interface (desktop UI) version.
• Turn off tablet mode when using Windows 10.
• Every page is optimized for Internet Explorer in Medium font size.
• The web page displayed when you log in to the camera is made using JavaScript. The web page may not display correctly if your computer uses certain software, such as anti-virus software.

Accessing the camera from a web browser

Start a web browser on the computer and type the IP address of the camera in the address bar.

Address http://192.168.0.100
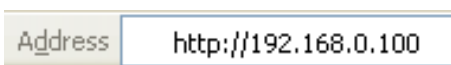
A user ID and password authentication is required to access the camera. The user ID and factory-set password of the camera are as follows:
User name: admin

Password: Admin_1234

Note
The password change screen is displayed when the camera is accessed using the factory-set password. You can view other tabs after changing the password.

Operation

Connecting with RCP/MSU devices

The camera can be connected to an optional remote control panel (RCP) or master setup unit (MSU) for operation. For details about supported devices, contact your Sony sales representative.

Configure the following settings on the CNS tab to connect with an RCP/MSU.

Mode

Bridge: Set to BRIDGE mode to connect directly with an RCP on a LAN.

MCS: Set to MCS mode when building a multi-camera system on a LAN.

Master IP Address

Set the IP address of the master device when building a multi-camera system on a LAN.

Camera No.

Set the camera number when building a multi-camera system on a LAN. Set so that the number is not duplicated within the system.

Notes

- Configure settings on the RCP/MSU side as required.
- An MSU is required in a multi-camera system.
- If there are multiple MSUs, set one MSU as the master, and set all other MSUs as clients.

Outputting Tracking Data

The unit can output tracking data compliant with the free-d protocol from the LAN connector to work with various systems, such as virtual studio systems.
The tracking data is output using UDP packets in sync with the external sync signal.

To output tracking data, configure the following settings on the Tracking data output tab.

Enable

Insert a check mark to enable the output of tracking data.

Destination IP address

When Transfer mode is set to Always, specify the IP address of the client which will receive the tracking data from the camera.

UDP port number

When Transfer mode is set to Always, specify the UDP port of the client which will receive the tracking data from the camera.
When Transfer mode is set to On demand, specify the UDP port number on which the camera will listen for messages from the client.

Transfer mode

Set the output control method for the tracking data.

Always: Always output tracking data.

On demand: Start/stop output of tracking data in accordance with a "Type D0 (poll/command)" message from the client.

Camera ID

Set the ID for identifying the camera.

When Transfer mode is set to On demand, the unit controls the output of tracking data using messages specified by Type D0 commands of the free-d protocol. The unit supports the following commands.

00 (Stop stream mode): Stop output.

01 (Start stream mode): Start output.

In addition, the tracking data output from the unit is stored and output as shown below according to the format specified by the Type D1 command of the free-d protocol.

Camera ID: Stores the configured camera ID.

Camera Pan Angle: Stores the pan angle of the unit in a format specified by the free-d protocol.

Camera Tilt Angle: Stores the tilt angle of the unit in a format specified by the free-d protocol.

Camera Roll Angle: Not supported (always 0)

Camera X-Position: Not supported (always 0)

Camera Y-Position: Not supported (always 0)

Camera Height (Z-Position): Not supported (always 0)

Camera Zoom: Store the zoom position of the unit in the same format as VISCA commands.

Camera Focus: Store the focus position in the same format as VISCA commands.

Spare/Undefined Data: Stores the frame count from the upper 4 bits (0h to Fh) and the iris value (F

value) of the unit from the lower 12 bits multiplied by 100.

Notes

- When mounted on a ceiling, set IMG FLIP in the SYSTEM menu to ON so that the Camera Pan Angle and Camera Tilt Angle data is in the correct orientation.
- The TELE CONVERT MODE magnification setting has no effect on the Camera Zoom value.
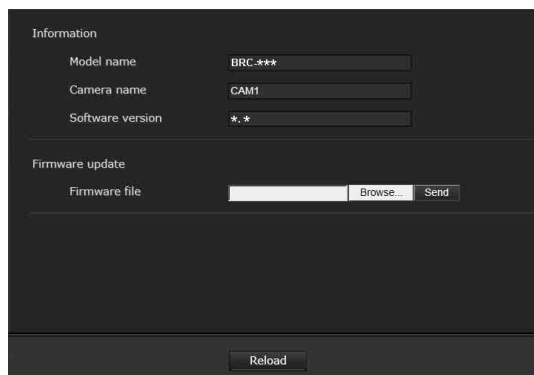
Upgrading the firmware

You can upgrade the firmware on the Firmware update tab. The Model name of the camera, Camera name, and Software version are displayed.

Notes

- Do not turn off the camera while you are upgrading the firmware.
- It takes approximately 10 minutes to upgrade the firmware. You cannot access the camera while the upgrading is in progress. You also will not see any image while the upgrading is in progress.

Display sample: If the OS language is English

Upgrading the firmware

You can upgrade the firmware as follows:

1 Click the [Browse...] button to select the firmware file.

2 Click the [Send] button.

3 Click the [OK] button when the "Start update?" message is displayed.

The message is closed and "Upgrading firmware" is shown instead. You cannot access the camera while the upgrading is in progress.

Checking the version after the update
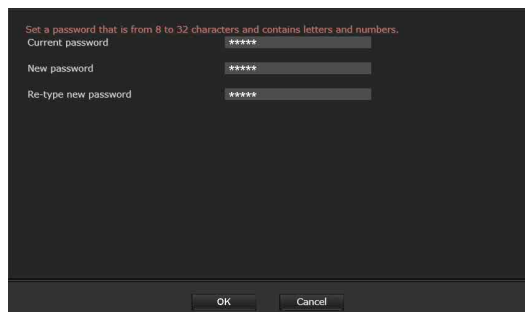
It takes approximately 10 minutes to upgrade the firmware.
When the upgrading is completed, the camera automatically starts in the new upgraded version. Click the [Reload] button after the reboot. The firmware version after the update will be displayed in Software version on the screen.

Changing the password

You can change the password on the Password tab. The length of the password should be between 8 to 32 characters. Alphanumeric characters, hyphens "-", and underscores "_" can be used in the password. The password must contain both letters and numbers.
The password can be changed as follows:

1 Enter your current password in the "Current password" field.

2 Enter your new password in the "New password" and "Re-type new password" fields.

3 Press the OK button.

Note

The user name cannot be changed.

Message List

The following messages and indications may appear on this camera. Perform the following as necessary.

Camera lamp display

Lamp	Meaning and solution
Flashing of POWER lamp (orange) and NETWORK lamp (green)	An error has occurred in the camera. Details of the error are displayed in the camera menu. Deal with the error after confirming the details.
Flashing of back Tally lamp	Turn off the device as it may malfunction if used in this state. Contact the inquiry counter of your Sony Service Center or your licensed Sony dealer.

Camera screen display (flashing in Main menu)

Message	Meaning and solution
⚠ FAN STOP! (BASE)	Turn off the device as it may malfunction if used in this state. Contact the Sony Service Center or your licensed Sony dealer.
⚠ PAN-TILT ERROR!	The movement of the camera has stopped due to an error in the pan-tilt driving unit. Reset the pan/tilt position. Or, restart the camera.
⚠ PAN-TILT FAULT!	Turn off the device as it may malfunction if used in this state. Contact the Sony Service Center or your licensed Sony dealer.
⚠ FPGA FAULT!	Turn off the device as it may malfunction if used in this state. Contact the Sony Service Center or your licensed Sony dealer.
⚠ CAMERA FAULT!	Turn off the device as it may malfunction if used in this state. Contact the Sony Service Center or your licensed Sony dealer.

Troubleshooting

Before bringing in your camera for service, check the following as a guide to troubleshooting the problem. If the problem cannot be corrected, consult your Sony dealer.

Symptom	Cause	Remedy
The power of the camera is not turned on.	The AC adapter (not supplied) is not firmly connected to the DC IN 12 V terminal.	Insert the power cord firmly as far as it will go.
	The power cord is not firmly connected to the AC adapter or the power outlet.	Insert the power cord firmly as far as it will go.
	The connection cable with the PoE+ Hub is not firmly connected.	Insert the connection cable firmly as far as it will go.
	A power supply device that is not compliant with PoE+ is connected.	Connect a PoE+ compliant power supply device.
The camera does not work, even when buttons on the remote commander are pressed.	IR RECEIVE on the SYSTEM menu is turned OFF.	Operate the menu using remote controller RM-IP500/IP10, and turn on IR RECEIVE (page 40).
	The remote commander's CAMERA SELECT button number and the camera's IR SELECT switch settings are different.	Press the CAMERA SELECT button that matches the IR SELECT switch setting (page 10).
	PRESET MODE in the SYSTEM menu is not set appropriately.	Set PRESET MODE to match the content (PRESET or PTZ TRACE) you want to recall.
The picture is not displayed on the connected video monitor.	The video cable is not connected properly.	Check the connection between the camera and video monitor.
	The exposure is not set correctly on the camera.	Check the exposure settings in the EXPOSURE menu.
Pan, tilt, or zoom cannot be operated.	The camera menu is displayed.	Close the menu by pressing the DATA SCREEN button on the supplied remote commander or using a remote controller.
The camera does not operate from the remote controller RM-IP500/IP10.	The connection method is not configured properly.	The connection method (LAN or serial) must be configured on the RM-IP500/IP10. Check that the connection method on the RM-IP500/IP10 corresponds to the physical connection method.
	The VISCA RS-422 connection is incorrect.	Check the connections to the VISCA RS-422 terminal, and the wiring of the RS-422 cable.
	The camera address on the CAMERA SETUP switch at the back side of the camera is not set to 0 (AUTO).	Check the camera address, and select the same camera number with the CAMERA button on the remote controller.
	The communication baud rate settings are different.	Set the baud rate (9600 bps or 38400 bps) of the remote controller to the same setting as the CAMERA SETUP switch (page 8) at the back of the camera.
	The VISCA over IP connection is incorrect.	Check the connection to the LAN terminal.Use a cross network cable when connected to the remote controller on a one-to-one basis.

Symptom	Cause	Remedy
VISCA is not available, even when a computer is connected to the camera.	The computer is not correctly connected to the camera.	Make sure the connection between the computer and camera is made correctly.
		Confirm that the baud rate (9600 bps or 38400 bps) is correctly set on the CAMERA SETUP switch at the back of the camera (page 8) and in the PC settings.
		Check that the camera is not damaged by connecting the camera to the remote controller RM-IP500/IP10.
The camera cannot be operated at all.	–	Remove the plug of the power cord from the AC outlet, then reinsert it into the AC outlet after waiting a while.

Menu Configuration

The camera menu is configured as described below. For more details, refer to the pages in parentheses.
The initial settings of each item are in bold. Only supported functions are displayed.

EXPOSURE ————— MODE ————————— **FULL AUTO**, MANUAL, SHUTTER Pri, IRIS Pri, GAIN Pri
(page 31)
└ GAIN ————————— –3dB, **0dB**, 3dB, 6dB, 9dB, 12dB, 15dB, 18dB, 21dB, 24dB, 27dB, 30dB, 33dB
(Adjustable only when MODE in the EXPOSURE menu is set to MANUAL or GAIN Pri.)

└ SPEED ———————— For the 59.94 frame rate of video output: 1/8, 1/15, 1/30, 1/50, **1/60**, 1/90, 1/100, 1/125,
1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000
For the 29.97 frame rate of video output: 1/8, 1/15, **1/30**, 1/50, 1/60, 1/90, 1/100, 1/125,
1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000
For the 50 frame rate of video output: 1/6, 1/12, 1/25, 1/30, **1/50**, 1/60, 1/100, 1/120, 1/150,
1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10000
For the 25 frame rate of video output: 1/6, 1/12, **1/25**, 1/30, 1/50, 1/60, 1/100, 1/120, 1/150,
1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10000
For the 23.98 frame rate of video output: 1/6, 1/12, 1/24, 1/25, 1/40, **1/48**, 1/50, 1/60, 1/96, 1/100,
1/120, 1/144, 1/192, 1/200, 1/288, 1/400, 1/576, 1/1200, 1/2400, 1/4800, 1/10000
(Adjustable only when MODE in the EXPOSURE menu is set to MANUAL or SHUTTER Pri.)

└ IRIS —————————— **F2.8**/F3.1/F3.4/F3.7/F4.0/F4.4/F4.8/F5.2/F5.6/F6.2/F6.8/F7.3/F8.0/F8.7/F9.6/F10/F11
(Adjustable only when MODE in the EXPOSURE menu is set to MANUAL or IRIS Pri.)

└ AE SPEED ————— **1** ~ 48 (Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO,
GAIN Pri, SHUTTER Pri, or IRIS Pri.)

└ EX-COMP ———— **OFF**, ON (Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO,
GAIN Pri, SHUTTER Pri or IRIS Pri.)

└ LEVEL ———————— -7, -6, -5, -4, -3, -2, -1, **0**, +1, +2, +3, +4, +5, +6, +7
(Adjustable only when MODE in the EX-COMP menu is set to ON.)

└ GAIN LIMIT ———— 9dB, 12dB, 15dB, 18dB, 21dB, 24dB, **OFF**
(Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO,
SHUTTER Pri or IRIS Pri.)

└ GAIN POINT ———— **OFF**, ON (Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO or IRIS Pri.)
└ POINT POSITION —— **0dB**, 3dB, 6dB, 9dB, 12dB, 15dB, 18dB, 21dB, 24dB
(Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO or IRIS Pri.)

└ MAX SPEED ——— For the 59.94 frame rate of video output: 1/30, 1/50, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250,
1/350, 1/500, 1/725, 1/1000, 1/1500, **1/2000**, 1/3000, 1/4000, 1/6000, 1/10000
For the 29.97 frame rate of video output: 1/30, 1/50, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250,
1/350, 1/500, 1/725, 1/1000, 1/1500, **1/2000**, 1/3000, 1/4000, 1/6000, 1/10000
For the 50 frame rate of video output: 1/25, 1/30, 1/50, 1/60, 1/100, 1/120, 1/150, 1/215, 1/300,
1/425, 1/600, 1/1000, 1/1250, **1/1750**, 1/2500, 1/3500, 1/6000, 1/10000
For the 25 frame rate of video output: 1/25, 1/30, 1/50, 1/60, 1/100, 1/120, 1/150, 1/215, 1/300,
1/425, 1/600, 1/1000, 1/1250, **1/1750**, 1/2500, 1/3500, 1/6000, 1/10000
For the 23.98 frame rate of video output: 1/24, 1/25, 1/40, 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/144,
1/192, 1/200, 1/288, 1/400, 1/576, **1/1200**, 1/2400, 1/4800, 1/10000
(Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO, GAIN Pri or IRIS Pri.)

└ MIN SPEED ———— For the 59.94 frame rate of video output: 1/8, 1/15, 1/30, 1/50, **1/60**, 1/90, 1/100, 1/125, 1/180,
1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000
For the 29.97 frame rate of video output: 1/8, 1/15, **1/30**, 1/50, 1/60, 1/90, 1/100, 1/125, 1/180,
1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000
For the 50 frame rate of video output: 1/6, 1/12, 1/25, 1/30, **1/50**, 1/60, 1/100, 1/120, 1/150,
1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10000
For the 25 frame rate of video output: 1/6, 1/12, **1/25**, 1/30, 1/50, 1/60, 1/100, 1/120, 1/150,
1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10000
For the 23.98 frame rate of video output: 1/6, 1/12, 1/24, 1/25, 1/40, **1/48**, 1/50, 1/60, 1/96, 1/100,
1/120, 1/144, 1/192, 1/200, 1/288, 1/400, 1/576, 1/1200, 1/2400, 1/4800, 1/10000
(Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO, GAIN Pri or IRIS Pri.)

└ BACK LIGHT ——— **OFF**, ON (Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO,
GAIN Pri, SHUTTER Pri or IRIS Pri.)

└ SPOT LIGHT ———— **OFF**, ON (Adjustable only when MODE in the EXPOSURE menu is set to FULL AUTO,
GAIN Pri, SHUTTER Pri or IRIS Pri.)

COLOR (page 33)	WHITE BALANCE MODE	**AUTO1**, AUTO2, INDOOR, OUTDOOR, ONE PUSH, MANUAL
	SPEED	1, 2, **3**, 4, 5 (Adjustable only when COLOR MODE in the WHITE BALANCE menu is set to AUTO1 or AUTO2.)
	OFFSET	–7, –6, –5, –4, –3, –2, –1, **0**, +1, +2, +3, +4, +5, +6, +7 (Adjustable only when COLOR MODE in the WHITE BALANCE menu is set to AUTO1, AUTO2 or ONE PUSH.)
	R.GAIN	–128〜**0**〜+127 (Adjustable only when COLOR MODE in the WHITE BALANCE menu is set to MANUAL.)
	B.GAIN	–128〜**0**〜+127 (Adjustable only when COLOR MODE in the WHITE BALANCE menu is set to MANUAL.)
	MATRIX	OFF, **ON**
	SELECT	**STD**, HIGH SAT, FL LIGHT, MOVIE, STILL, CINEMA, PRO, ITU709, B/W (Adjustable only when COLOR MODE in the MATRIX menu is set to ON.)
	LEVEL	0, 1, 2, 3, **4**, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 (Adjustable only when COLOR MODE in the MATRIX menu is set to ON.)
	PHASE	–7, –6, –5, –4, –3, –2, –1, **0**, +1, +2, +3, +4, +5, +6, +7 (Adjustable only when COLOR MODE in the MATRIX menu is set to ON.)
	R-G	–99〜**0**〜+99 (Adjustable only when MODE in the MATRIX menu is set to ON.)
	R-B	–99〜**0**〜+99 (Adjustable only when MODE in the MATRIX menu is set to ON.)
	G-R	–99〜**0**〜+99 (Adjustable only when MODE in the MATRIX menu is set to ON.)
	G-B	–99〜**0**〜+99 (Adjustable only when MODE in the MATRIX menu is set to ON.)
	B-R	–99〜**0**〜+99 (Adjustable only when MODE in the MATRIX menu is set to ON.)
	B-G	–99〜**0**〜+99 (Adjustable only when MODE in the MATRIX menu is set to ON.)
DETAIL (page 34)	MODE	**AUTO**, MANUAL
	LEVEL	–7, –6, –5, –4, –3, –2, –1, **0**, +1, +2, +3, +4, +5, +6, +7, +8
	BAND WIDTH	**DEFAULT**, LOW, MIDDLE, HIGH, WIDE (Adjustable only when MODE in the DETAIL menu is set to MANUAL.)
	CRISPENING	0, 1, 2, **3**, 4, 5, 6, 7 (Adjustable only when MODE in the DETAIL menu is set to MANUAL.)
	H/V BALANCE	–2, –1, **0**, +1, +2 (Adjustable only when MODE in the DETAIL menu is set to MANUAL.)
	B/W BALANCE	TYPE1, TYPE2, **TYPE3**, TYPE4, TYPE5 (Adjustable only when MODE in the DETAIL menu is set to MANUAL.)
	LIMIT	0, 1, 2, **3**, 4, 5, 6, 7 (Adjustable only when MODE in the DETAIL menu is set to MANUAL.)
	HIGHLIGHT DETAIL	**0**, 1, 2, 3, 4 (Adjustable only when MODE in the DETAIL menu is set to MANUAL.)
	SUPER LOW	0, 1, 2, **3**, 4, 5, 6, 7 (Adjustable only when MODE in the DETAIL menu is set to MANUAL.)
KNEE (page 35)	SETTING	**ON**, OFF
	KNEE MODE	**AUTO**, MANUAL (Adjustable only when setting in the KNEE is set to ON.)
	KNEE SLOPE	–7, –6, –5, –4, –3, –2, –1, 0, +1, +2, +3, +4, +5, +6, **+7** (Adjustable only when setting in the KNEE is set to MANUAL.)
	KNEE POINT	0, 1, 2, 3, 4, **5**, 6, 7, 8, 9, 10, 11, 12 (Adjustable only when MODE in the KNEE is set to MANUAL.)
GAMMA / VISIBILITY ENHANCER (page 36)	GAMMA	
	SELECT	**STD**, STRAIGHT, PATTERN, MOVIE, STILL, CINE1, CINE2, CINE3, CINE4, ITU709
	PATTERN	0〜**25**〜51 (Adjustable only when the SELECT is set to PATTERN.)
	PATTERN FINE	0〜**6**〜9 (Adjustable only when the SELECT is set to PATTERN.)
	OFFSET	–64〜**0**〜+64
	LEVEL	–7〜**0**〜+7
	BLACK GAMMA	–7〜**0**〜+7
	BLACK GAMMA RANGE	**LOW**, MIDDLE, HIGH
	BLACK LEVEL	–48〜**0**〜+48
	VISIBILITY ENHANCER	
	SETTING	**OFF**, ON
	EFFECT	–3, –2, –1, **0**, +1, +2, +3
FOCUS (page 37)	MODE	**AUTO**, MANUAL
PICTURE / OPTICAL FILTER (page 37)	PICTURE	
	NOISE REDUCTION	OFF, 1, 2, **3**, 4, 5, ADVANCED
	2D NR LEVEL	OFF, 1, 2, **3**, 4, 5 (Adjustable only when the NOISE REDUCTION is set to ADVANCED.)
	3D NR LEVEL	OFF, 1, 2, **3**, 4, 5 (Adjustable only when the NOISE REDUCTION is set to ADVANCED.)
	FLICKER CANCEL	**OFF**, ON
	OPTICAL FILTER	
	ND FILTER	**OFF**, 1/4, 1/16, 1/64
	IR CUT FILTER	NIGHT, **DAY**

PAN TILT ZOOM ─┬─ PAN TILT
(page 38)   │   LIMIT
               ├─ PAN ────────────────── OFF, ON
               ├─ LEFT ───────────────── END, 169~−169 (Adjustable when PAN is set to ON.)
               ├─ RIGHT ──────────────── END, −169~169 (Adjustable when PAN is set to ON.)
               ├─ TILT ───────────────── OFF, ON
               ├─ DOWN ───────────────── END, −29~89 (Adjustable when TILT is set to ON.)
               ├─ UP ─────────────────── END, 89~−29 (Adjustable when TILT is set to ON.)
               ├─ RAMP CURVE ─────────── MODE1, **MODE2**, MODE3
               │
               │   ZOOM
               └─ CLEAR IMAGE ZOOM ── **OFF**, ON

VIDEO OUT ─────┬─ HDMI
(page 40)   ├─ VIDEO MODE ─────────── **3840×2160**, 1920×1080 (Adjustable only when the VIDEO MODE is set to SYSTEM SELECT 0, 8, or E)
               │   **1920×1080** (Adjustable only when the VIDEO MODE is set to SYSTEM SELECT 1, 2, 9, A, or F.)
               │   **1280×720** (Adjustable only when the VIDEO MODE is set to SYSTEM SELECT 4 or C.)
               │   **640×480** (Adjustable only when the VIDEO MODE is set to SYSTEM SELECT 7.)
               ├─ COLOR SPACE ────────── **YCbCr**, RGB
               │
               │   H PHASE
               ├─ H PHASE ───────────── 0~**3**~95
               └─ H PHASE FINE ──────── **0**~9

SYSTEM─────────┬─ IMG FLIP ───────────── ON, **OFF**
(page 40)   ├─ PAN REVERSE ────────── ON, **OFF**
               ├─ TILT REVERSE ───────── ON, **OFF**
               ├─ IR RECEIVE ─────────── **ON**, OFF
               ├─ TALLY MODE ─────────── OFF, **LOW**, HIGH
               ├─ TELE CONVERT MODE ── **OFF**, 2x
               ├─ PRESET MODE ────────── **MODE1**, MODE2, TRACE
               ├─ P/T SPEED TYPE ─────── **NORMAL**, Extd. RANGE, Extd. STEP
               ├─ P/T SLOW MODE ──────── ON, **OFF**
               ├─ ZOOM SPEED TYPE ────── **NORMAL**, Extd. RANGE
               └─ VERSION

NETWORK ───────┬─ IPv4 ADDRESS
(page 42)   ├─ SUBNET MASK
               ├─ GATEWAY
               ├─ MAC ADDRESS
               └─ NAME

PICTURE ───────┬─ PROFILE ────────────── PP1, PP2, PP3, PP4, PP5, PP6
PROFILE   └─ OPERATION ──────────── RECALL
(page 42)

PTZ TRACE ─────┬─ TRACE NO ───────────── 1~16
(page 43)   ├─ RECORD:SET START POSITION
               ├─ PLAY:RECALL START POSITION
               ├─ DELETE:EXECUTE
               ├─ RECORDED TRACE NO ──── 1~16
               └─ ELAPSED TIME(SEC) ──── 0~180

Preset Items

The following items are stored in the memory of the camera.

General Items

Items that can be stored	Preset position number	
	1	2 to 100
PAN TILT Position	●	○
ZOOM Position	●	○
FOCUS Position (Only when manual)	●	○

Menu Items Which Can Be Preset

Items that can be stored	Preset position number	
	1	2 to 100
EXPOSURE MODE	●	○
GAIN	●	○
GAIN LIMIT	●	○
GAIN POINT	●	○
POINT POSITION	●	○
SPEED	●	○
MAX SPEED	●	○
MIN SPEED	●	○
IRIS	●	○
AE SPEED	●	○
EX-COMP	●	○
LEVEL	●	○
BACK LIGHT	●	○
SPOT LIGHT	●	○
WHITE BALANCE MODE	●	○
SPEED	●	○
OFFSET	●	○
R.GAIN	●	○
B.GAIN	●	○
MATRIX SELECT	●	○
LEVEL	●	○
PHASE	●	○
R-G	●	○
R-B	●	○
G-R	●	○
G-B	●	○
B-R	●	○
B-G	●	○
DETAIL MODE	●	○

Items that can be stored	Preset position number	
	1	2 to 100
LEVEL	●	○
BAND WIDTH	●	○
CRISPENING	●	○
H/V BALANCE	●	○
B/W BALANCE	●	○
LIMIT	●	○
HIGHLIGHT DETAIL	●	○
SUPER LOW	●	○
KNEE SETTING	●	○
KNEE MODE	●	○
KNEE SLOPE	●	○
KNEE POINT	●	○
GAMMA SELECT	●	○
PATTERN	●	○
PATTERN FINE	●	○
OFFSET	●	○
LEVEL	●	○
BLACK GAMMA	●	○
BLACK GAMMA RANGE	●	○
BLACK LEVEL	●	○
VE SETTING	●	○
VE EFFECT	●	○
FOCUS MODE	●	○
NOISE REDUCTION	●	○
2D NR LEVEL	●	○
3D NR LEVEL	●	○
FLICKER CANCEL	●	○
ND FILTER	●	○
IR CUT FILTER	●	○
PAN	△	×
LEFT	△	×
RIGHT	△	×
TILT	△	×
UP	△	×
DOWN	△	×
RAMP CURVE	△	×
CLEAR IMAGE ZOOM	●	○
HDMI VIDEO MODE	△	×
COLOR SPACE	△	×
H PHASE	△	×
H PHASE FINE	△	×
IMG FLIP[1]	×	×
PAN REVERSE	△	×
TILT REVERSE	△	×
IR RECEIVE	△	×

Items that can be stored	Preset position number	
	1	2 to 100
TALLY MODE	△	×
TELE CONVERT MODE	△	×
PRESET MODE	×	×
P/T SPEED TYPE[1]	×	×
P/T SLOW MODE[1]	×	×
ZOOM SPEED TYPE[1]	×	×
VERSION	×	
IPv4 ADDRESS	×	
SUBNET MASK	×	
GATEWAY	×	
NAME	×	
PROFILE	×	
OPERATION	×	

[1] IMG FLIP, P/T SPEED TYPE, P/T SLOW MODE, and ZOOM SPEED TYPE are enabled with the current settings irrespective of the preset settings.

● Can be stored. During power-up, the camera boots-up with the settings stored in this preset number.

○ Can be stored. After power-up, the stored setting value is applied by recalling the relevant preset number.

△ Can be stored. During power-up, the camera boots-up with the settings stored in this preset number. The setting value is not initialized by a reset. The settings do not change even if the preset is recalled after the corresponding setting values have been changed.

× Cannot be stored.

Specifications

System

Video signal   3840×2160/29.97p (2SI)[*1]
1920×1080/59.94p,
1920×1080/59.94i,
1280×720/59.94p
3840×2160/25p (2SI)[*1]
1920×1080/50p, 1920×1080/50i,
1280×720/50p
3840×2160/23.98p (2SI)[*1],
1920×1080/23.98p
(switched with the SYSTEM
SELECT switch)
[*1] Compatible only with the
BRC-X1000

Synchronization
Internal synchronization/External
synchronization, Automatic
switching
Image device   1.0-type, CMOS image sensor
Effective pixel number:
Approx. 14.2 Megapixels

Camera

Lens   Optical, 12×
Filter Diameter M62 mm (wide
angle/tele-conversion lenses cannot
be used)
f = 9.3 mm to 111.6 mm, F2.8 to F4.5
f = 29.0 mm to 348.0 mm (35 mm
camera conversion)
Minimum object distance
80 mm (wide)
1,000 mm (tele)
Minimum illumination
1.7 lux 4K/HD output, 50IRE, F2.8,
1/30s, Max.Gain (WIDE end)
Shutter speed   1/10000s to 1/8 (59.94/29.97)
1/10000s to 1/6 (50/25)
1/10000s to 1/6 (23.98)
Pan/tilt action   Horizontal ±170°
Maximum speed: 60°/second
Minimum speed:
0.3°/second[*2]
0.05°/second[*3]
0.02°/second[*4]
Vertical +90°, –30°
Maximum speed: 60°/second
Minimum speed:
0.3°/second[*2]
0.05°/second[*3]
0.02°/second[*4]

[*2] When P/T SPEED TYPE is set to
NORMAL
[*3] When P/T SPEED TYPE is set to
Extd. RANGE
[*4] When P/T SPEED TYPE is set to
Extd. STEP

Input and Output terminals

HDMI OUT terminal
HDMI connector (Type A) × 1
MONITOR OUT terminal
BNC connector (3G-SDI) × 2
(BRC-X1000)
BNC connector (3G-SDI) × 1
(BRC-H800)
LINE OUT terminal
BNC connector (3G-SDI) × 2
(BRC-X1000)
BNC connector (3G-SDI) × 1
(BRC-H800)
EXT SYNC IN terminal
BNC connector
VISCA RS-422 terminal
RJ-45×2
LAN terminal   RJ-45 (IEEE802.3at compatible)
Power terminal   IEC60130-10 (JEITA standard
RC-5320A) TYPE 4

General

Input voltage   DC 12 V ±10% (Use the recommended
AC adapter (not supplied))
PoE+ (IEEE802.3at compatible)
Power consumption
BRC-X1000
For DC 12 V: 21.5 W
For PoE+: 25.5 W
BRC-H800
For DC 12 V: 19.0 W
For PoE+: 23.0 W
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Storage temperature
–20 °C to +60 °C (–4 °F to +140 °F)
External dimensions (dimensions P.63)
Main unit: 198 × 260 × 238 mm
(7 $^7/_8$ × 10 $^1/_4$ × 9 $^3/_8$ in.)
(width/height/depth) (without
protrusions)
Remote commander: 56 mm × 26 mm
× 210 mm (2 $^1/_4$ × 1 $^1/_{16}$ × 8 $^3/_8$ in.)
(width/height/depth)
Mass   Unit: Approx. 4.3 kg (9 lb 8 oz)
Remote commander: 110 g (3.9 oz)

Installation angle
Less than ±15 degrees to the horizontal
surface

Supplied Accessories

Remote commander (1)
Ceiling bracket (A) (1)
Ceiling bracket (B) (1)
Wire rope (1)
Mounting screws (⊕ M3×8) (7)
Stainless steel screw (⊕ M4×8) (1)
HDMI cable fixing plate (1)

Optional accessories
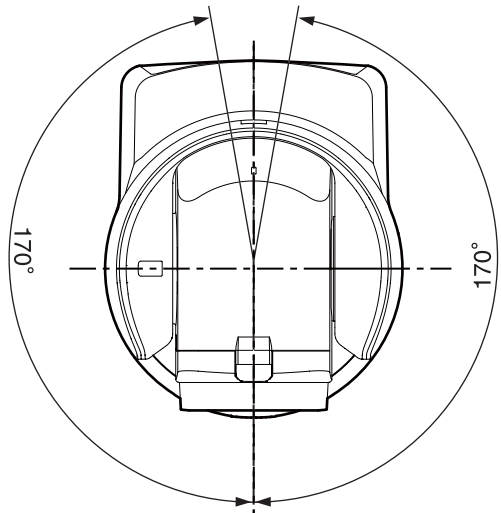
IP remote controller (RM-IP500/IP10)
AC adapter (AC-UES1230 series)

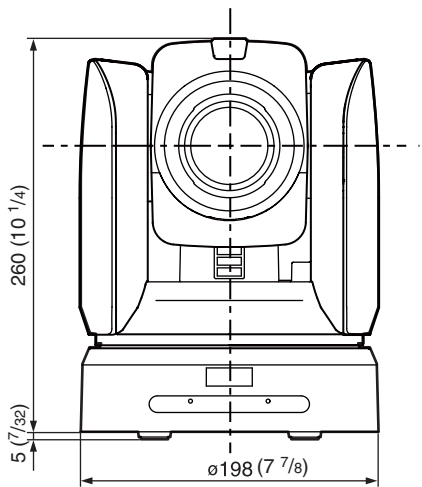For recommended AC adapters, contact SONY
Customer Service.

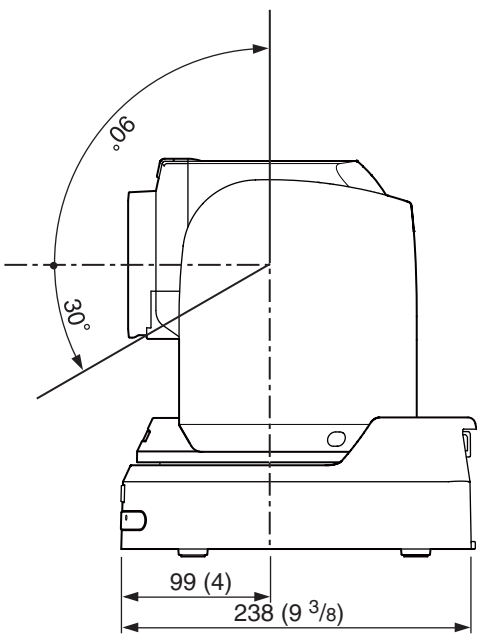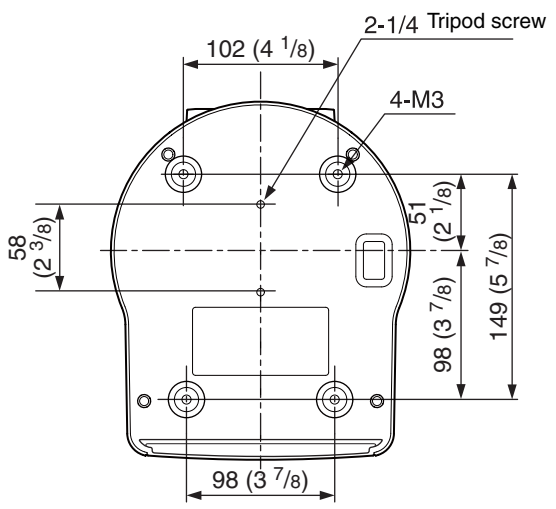Design and specifications are subject to change without
notice.

Dimensions

Top

170°   170°

Front

260 (10 1/4)

5 (7/32)

ø198 (7 7/8)

Side

90°

30°

99 (4)

238 (9 3/8)

Bottom

102 (4 1/8)

2-1/4 Tripod screw

4-M3

58 (2 3/8)

51 (2 1/8)

98 (3 7/8)

149 (5 7/8)

98 (3 7/8)

Ceiling bracket (B)

Top

90°   30°

20°

20°

ø186

ø161

ø

50

50

20°

30°   50

4-ø4.2 Hole

Side

ø8.2 Hole
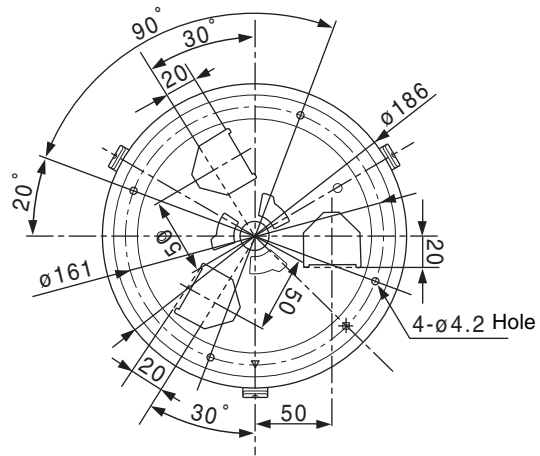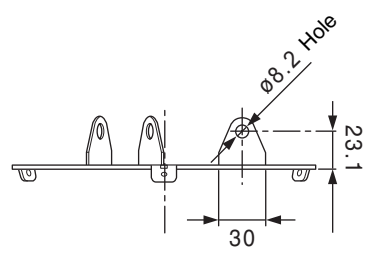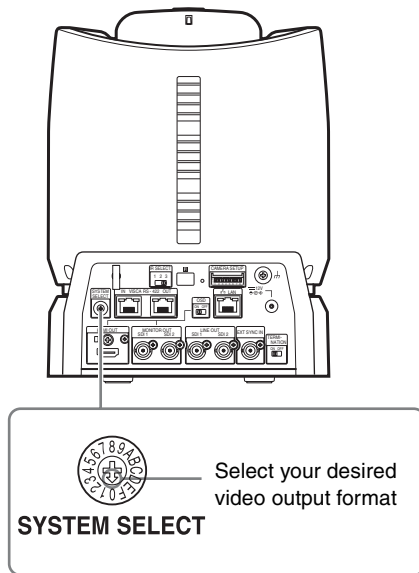
23.1

30

Unit: mm (inches)

SYSTEM SELECT switch settings

The image output method (video format) for the HDMI OUT/SDI OUT terminals can be set with this switch.

Select your desired video output format

SYSTEM SELECT

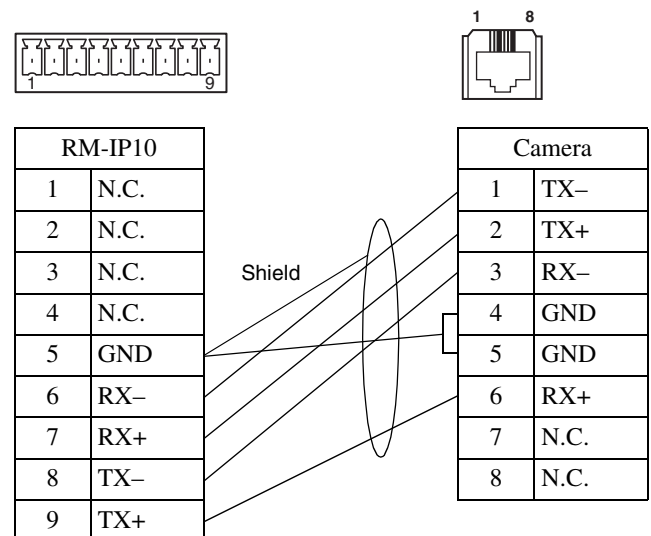| No.	Image size/Frame rate	
	BRC-X1000	**BRC-H800**
0	3840×2160/29.97p	No output
1	1920×1080/59.94p	1920×1080/59.94p
2	1920×1080/59.94i	1920×1080/59.94i
3	No output	No output
4	1280×720/59.94p	1280×720/59.94p
5	No output	No output
6	No output	No output
7	HDMI: 640×480/59.94p SDI: 1280×720/59.94p	HDMI: 640×480/59.94p SDI: 1280×720/59.94p
8	3840×2160/25p	No output
9	1920×1080/50p	1920×1080/50p
A	1920×1080/50i	1920×1080/50i
B	No output	No output
C	1280×720/50p	1280×720/50p
D	No output	No output
E	3840×2160/23.98p	No output
F	1920×1080/23.98p	1920×1080/23.98p

Notes

- Be sure to set this switch before you turn on the camera.
  Turn on the power after you set the switch.
- Be sure to use a Phillips-head screwdriver when changing the switch position. If you use a tool other than the designated screwdriver, the crossed groove may be damaged.

Pin array of the VISCA RS-422 terminal and how to use it

Pin array of VISCA RS-422 terminal

IN

Pin No.	Function
1	TX–
2	TX+
3	RX–
4	GND
5	GND
6	RX+
7	N.C.
8	N.C.

OUT

Pin No.	Function
1	RX–
2	RX+
3	TX–
4	GND
5	GND
6	TX+
7	N.C.
8	N.C.

Connection diagram with remote control unit RM-IP10

RM-IP10		Camera	
1	N.C.	1	TX–
2	N.C.	2	TX+
3	N.C.	3	RX–
4	N.C.	4	GND
5	GND	5	GND
6	RX–	6	RX+
7	RX+	7	N.C.
8	TX–	8	N.C.
9	TX+		

Shield

Notes

- Connect the GNDs of both devices together to stabilize the voltage level of the signal.
- When preparing cables, use network cables of category 5e or more. Use cables equivalent to or higher than shielded twisted pair cables.