

**Panasonic**

# AG-CX20/AG-CX18

## User's Guide

Firmware Version **1.0** Compatible Version

**AG-CX20/CX18 Product Website**  
For the latest information on compatible  
devices and more, click here.



## Table of Contents

<b>1. Features of AG-CX20/AG-CX18.....</b>	<b>5</b>
1-1. Recording Format and Recording Time .....	8
1-2. Usable Memory Cards.....	9
<b>2. Preparation before shooting .....</b>	<b>10</b>
2-1. Input/Output Terminals .....	11
2-2. Accessories, Tripod Mounting Screw Hole .....	12
2-3. Audio Settings .....	13
2-4. Power Supply and Charging.....	15
2-4-1. Recording Time Guideline .....	15
2-5. Assigning Functions to the USER SW .....	16
2-5-1. USER SW Function Allocation.....	17
2-5-2. List of Functions Assigned to USER Buttons .....	17
<b>3. Menu Item List .....</b>	<b>19</b>
3-1. Menu Items .....	20
[THUMBNAIL] Menu.....	21
3-1-1. PLAYBACK .....	21
3-1-2. CLIP.....	21
3-1-3. DISPLAY.....	21
[CAMERA] Menu .....	22
3-1-4. SW MODE .....	22
3-1-5. USER SW .....	24
[SCENE FILE] Menu.....	25
3-1-6. FILE SELECT.....	25
3-1-7. NAME EDIT .....	25
3-1-8. LOAD/SAVE/INITIALIZE .....	25
3-1-9. MASTER DTL .....	25
3-1-10. DETAIL CORING .....	25
3-1-11. V.DTL LEVEL.....	25
3-1-12. RB GAIN CONTROL SETTING .....	26
3-1-13. CHROMA LEVEL .....	26
3-1-14. CHROMA PHASE .....	26
3-1-15. MATRIX .....	26
3-1-16. COLOR CORRECTION.....	27
3-1-17. SKIN TONE DTL .....	27
3-1-18. MASTER PED.....	27
3-1-19. GAMMA MODE SEL .....	27
3-1-20. BLACK GAMMA.....	28
3-1-21. KNEE MODE.....	28
3-1-22. WHITE CLIP SETTING .....	28
3-1-23. DRS .....	28
3-1-24. DRS EFFECT DEPTH.....	28
3-1-25. NR CONTROL .....	28
3-1-26. AE LEVEL .....	28
3-1-27. AE LEVEL EFFECT .....	28
[AUDIO] Menu.....	29
3-1-28. HANDLE UNIT INPUT SETTING.....	29
3-1-29. MIC SETTING .....	29
3-1-30. INPUT SETTINGS.....	29
3-1-31. OUTPUT SETTINGS.....	30
3-1-32. ALARM.....	30
[VIDEO OUT/LCD/VF] Menu .....	31

3-1-33. VIDEO OUT SEL.....	31
3-1-34. SDI SETTING.....	31
3-1-35. HDMI SETTING .....	31
3-1-36. LCD.....	32
3-1-37. VF .....	32
3-1-38. INDICATOR .....	32
3-1-39. MARKER.....	35
3-1-40. FOCUS ASSIST.....	35
3-1-41. EI ASSIST.....	36
3-1-42. LEVEL GAUGE .....	36
[RECORDING] Menu.....	37
3-1-43. FORMAT MEDIA.....	37
3-1-44. CLIP NAME.....	37
3-1-45. FILE SPLIT *Only CX20 .....	37
3-1-46. 2 SLOTS FUNC.....	37
3-1-47. PRE REC.....	37
3-1-48. PROXY REC *Only CX20.....	37
3-1-49. REC FUNCTION.....	38
3-1-50. TC/UB.....	38
3-1-51. REC COUNTER.....	38
3-1-52. TIME STAMP .....	38
[NETWORK] Menu .....	39
3-1-53. DEVICE SEL.....	39
3-1-54. NETWORK FUNC.....	39
3-1-55. IP REMOTE .....	39
3-1-56. STREAMING.....	39
3-1-57. NDI HX2 *Only CX20 .....	40
3-1-58. WLAN PROPERTY .....	40
3-1-59. WLAN IPv4 SETTING .....	41
3-1-60. USB-LAN IPv4 SETTING .....	41
3-1-61. INFORMATION.....	41
3-1-62. UTILITY.....	41
[SYSTEM] Menu.....	42
3-1-63. FREQUENCY.....	42
3-1-64. FILE FORMAT .....	42
3-1-65. REC FORMAT .....	42
3-1-66. AUDIO SAMPLE RES. *Only CX20.....	42
3-1-67. SUPER SLOW .....	42
[OTHERS] Menu .....	43
3-1-68. FILE .....	43
3-1-69. HANDLE TALLY LED.....	43
3-1-70. CLOCK.....	43
3-1-71. USB DEVICE .....	43
3-1-72. INFORMATION .....	43
3-1-73. ECO MODE.....	44
3-1-74. APPROVED REGULATION .....	44
3-1-75. LANGUAGE .....	44
3-1-76. MENU INITIALIZE .....	44
<b>4. Mastering the features.....</b>	<b>45</b>
4-1. Network Connection Method and Available Functions .....	46
4-1-1. Settings for DIRECT Mode.....	48
4-1-2. Settings for INFRA(SELECT)/INFRA(MANUAL) Mode .....	49
4-1-3. Settings for Wired LAN Mode .....	50
4-1-4. Settings for USB Tethering Mode .....	50

4-1-5. Check the Network Status .....	51
4-2. Mastering the Remote Operation Function .....	53
4-3. Mastering the Live Streaming Function (YouTube, Facebook) .....	56
4-3-1. RTMP(S) MEMORY .....	57
4-3-2. RTMP(S) SD CARD .....	57
4-3-3. RTSP UNICAST .....	58
4-3-4. RTSP MULTICAST .....	58
4-4. Using the NDI® HX2 Connection Function *Only CX20 .....	63
4-5. Monitoring/Recording Video .....	66
4-6. Mastering the Focus Assist Function .....	67
4-7. Mastering the Dual Card Slots .....	68
4-8. Firmware Update Procedure .....	69
<b>5. Effects of image quality adjustment .....</b>	<b>70</b>
5-1. Scene File Preset List .....	71
5-2. Changing the Texture of the Image (Detail Function) .....	72
5-2-1. What Is a Detail Function? .....	73
5-2-2. Master Detail Adjustment .....	74
5-2-3. Detail Coring Adjustment .....	75
5-3. Expressing the Gradation of Images (Knee and Gamma Mode Settings) .....	76
5-3-1. Knee Adjustment .....	76
5-3-2. Gamma Mode Selection .....	78
5-3-3. Black Gamma .....	79
<b>6. Appendix .....</b>	<b>80</b>
6-1. Scene File Settings List .....	81
6-2. List of Output Resolutions for External Output (SDI) .....	82
6-3. List of Output Resolutions for External Output (HDMI) .....	83
6-4. Streaming Format (RTMP/RTSP) .....	84
6-5. Streaming Format (NDI® HX2) .....	85
6-6. Example of Memory Card Folder Structure .....	86
6-7. Error and Warning System .....	87
6-8. Introduction of Accessories and Genuine Accessory Part Numbers .....	91
6-9. Specifications .....	93
6-10. External Dimensions .....	99
6-11. Firmware Ver.1.1 .....	100

# 1. Features of AG-CX20/AG-CX18

AG-CX20

## Compact and lightweight 4K 60p professional camera



This professional camera features a lightweight body of just 1.5kg<sup>\*1</sup>, offering excellent mobility and portability while supporting 4K 60p recording. It combines optical capabilities with convenient streaming functions in a compact design, allowing for long recording times of approximately 4.5 hours<sup>\*2</sup>.

\*1: Weight including handle unit, lens hood, battery, and eyecup when shooting

\*2: When shooting at 4K 60p/200Mbps

## Wide angle 25mm, 24x optical zoom + i.Zoom



Indoor shot using the wide-angle end

The camera features an industry-leading wide-angle capability with a 25mm<sup>\*1</sup> wide end, allowing for minimal distortion in wide-angle shots without the need for a conversion lens. The optical 24x zoom covers up to 600mm in all modes. Additionally, with i.Zoom, you can achieve seamless zooming from the telephoto end up to 48x in FHD and 32x in UHD, all while maintaining resolution.

\*1: 35mm equivalent value.

## Various network functions



You can record while outputting FHD streaming. The supported protocols include RTSP, RTMP(S), and SRT<sup>\*1</sup>. This allows you to stream to many services, such as Facebook and YouTube, making it perfect for live coverage of concerts, sports events, and breaking news. For more details on the settings and features, please refer to section 4-3. Mastering the Live Streaming Function (YouTube, Facebook) (P.56).

\*1: Will be supported by a firmware update.

## Wireless control from your tablet/smartphone

You can wirelessly control the camera using the HC ROP app<sup>\*1</sup> on your tablet or smartphone. It is available as a free download from the App Store and Google Play. This allows for remote control of zoom, i.Zoom, and focus, as well as other camera settings and adjustments, REC start/stop, and menu settings, providing a wide range of remote operation features. Additionally, you can switch and control up to 8 cameras<sup>\*2</sup>. For more details on the settings and features, please refer to section 4-2. Mastering the Remote Operation Function (P.53)



**HC ROP**

\*1: For iPad/iPhone: iOS 9 or later. For Android devices: Android 5.0 or later.

\*2: Simultaneous and synchronous control of multiple cameras is not supported. Switching between cameras takes several seconds.

## Simultaneous SDI/HDMI output

Simultaneous outputs of SDI and HDMI are possible. You can output UHD from HDMI and FHD from SDI in high quality at 10-bit 4:2:2. This feature supports a variety of workflow applications.

## 1-1. Recording Format and Recording Time

	Recording Format	Sampling	File Format	Frame Count	Audio	Recording Time (256GB)	
UHD 3840x2160	HEVC Long GOP 200M	4:2:0 10bit	MOV	59.94p, 50p	24 bit LPCM 2ch	2h 40m	
	HEVC Long GOP 150M			29.97p, 25p, 23.98p		3h40 m	
	HEVC Long GOP 100M			59.94p, 50p		5h20m	
	422LongGOP 150M	4:2:2 10bit		29.97p, 25p, 23.98p		3h40 m	
	420LongGOP 150M			59.94p, 50p			
	420LongGOP 100M	4:2:0 8bit		29.97p, 25p, 23.98p		5h20m	
	HEVC Long GOP 100M		MP4	59.94p, 50p	16 bit AAC 2ch		
	HEVC Long GOP 72M	29.97p, 25p, 23.98p		7h20m			
	420LongGOP 72M	4:2:0 8bit					
FHD 1920x1080	AVC-I100	4:2:2 10bit	P2	59.94i, 50i	24/16 bit LPCM 2ch	4h 16m	
	AVC-I50	4:2:0 10bit				8h 30m	
	AVC-G50	4:2:2 10bit			59.94p, 50p	24 bit LPCM 2ch	8h 30m
	AVC-G25			59.94i, 50i			17 hours
	AVC-G12			4:2:0 8bit	59.94p, 50p	16 bit LPCM 2ch	16 hours
	AVC-G12	59.94i, 50i			32 hours		
	422LongGOP 100M	4:2:2 10bit	MOV	59.94p, 50p	24 bit LPCM 2ch	5h20m	
	422LongGOP 50M			59.94i, 50i, 29.97p, 25p 23.98p		10h40m	
	422ALL-I 200M			59.94p, 50p		2h 40m	
	422ALL-I 100M			59.94i, 50i, 29.97p, 25p 23.98p		5h20m	
	420LongGOP 50M	4:2:0 8bit	MP4	59.94p, 50p 23.98p	16 bit AAC 2ch	10h40m	
	PS 25Mbps		AVCHD	59.94p, 50p		16 bit Dolby Audio 2ch	22h
	PH 21Mbps			59.94i, 50i 23.98p			25h
	HA 17Mbps			59.94i, 50i			35h

## 1-1. Recording Format and Recording Time (Continued)

Recording Format	Sampling	File Format	Frame Count	Audio	Recording Time (64GB)
HD 1280x720	AVC-I100	4:2:2 10bit	59.94p, 50p	24/ 16 bit LPCM 2ch	4h 16m
	AVC-I50	4:2:0 10bit			8h 30m
	AVC-G50	4:2:2 10bit		24 bit LPCM 2ch	17h
	AVC-G25				
	AVC-G12	4:2:0 8bit		16 bit LPCM 2ch	32 hours
	PM 8Mbps			AVCHD	16bit Dolby Audio 2ch

## 1-2. Usable Memory Cards

The type of memory card required (compatible speed) varies depending on the file format and recording format. Use a memory card that supports the Speed Class or UHS Speed Class.

Format	Available Memory Card Standard	Recording Bit Rate and Recording Mode	Minimum Required Speed Class	
			Speed Class	UHS Speed Class
P2		AVC-Intra422, AVC-LongG AVC-Intra200/100/50	--	
MOV/MP4		200Mbps, 150Mbps, 100Mbps, Super slow recording	--	
	 (64GB)	72Mbps or less		
AVCHD	  	All		--

Memory cards up to 512GB can be used.

For the folder structure of the memory card, please refer to 6-6. Example of the folder structure of the memory card (P.86).

## 2. Preparation before shooting

AG-CX22

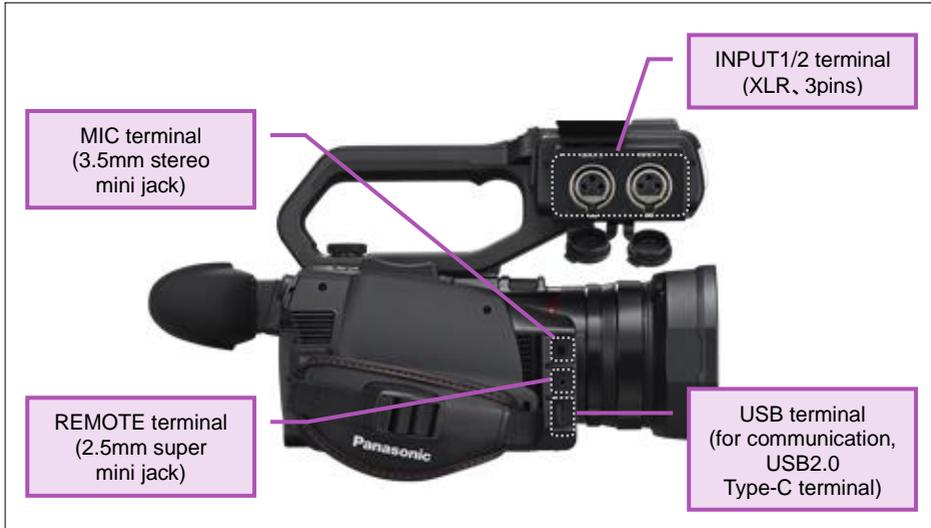
## 2-1. Input/Output Terminals

The resolution of the video output (HDMI, SDI) will change depending on the settings. For more details, please refer to the following sections: 6-2. List of Output Resolutions for External Output (SDI) (P.82), and 6-3. List of Output Resolutions for External Output (HDMI) (P.83).

### [Rear of main unit]



### [Side of main unit]



This unit has separate USB terminals for power supply and communication so that it can supply power and communicate at the same time. Before connecting a USB cable to either of these ports, please take care and ensure that the correct port is used for your intended signal.

## 2-2. Accessories, Tripod Mounting Screw Hole

AG-CX20/CX18 has a tripod screw hole located on the bottom of the camera.  
N.B. Please use a tripod screw length of 5.5mm or less in length.



### 2-3. Audio Settings

When the included handle unit is attached to AG-CX20/CX18, you can connect audio equipment and external microphones. It allows for dual audio recording using the built-in stereo microphone, an external microphone, or connected external audio sources.

#### Audio setup procedure

**1. Connecting an audio source**

When you use an external microphone or audio device, please connect the external device to the MIC terminal or INPUT 1, 2 terminals.

**2. [A] Selecting audio source (CH1 SELECT, CH2 SELECT switch)**

Set the audio source for CH1 and CH2.

Example: When you use a sound source connected to the INPUT1 terminal, select INPUT1. When you use the built-in microphone or an external microphone connected to the MIC terminal, select INT/MIC(L) or INT/MIC(R).

**3. [B] Setting the input level (INPUT1, INPUT2 switch: not required when using the built-in microphone or a microphone connected to the MIC terminal)**

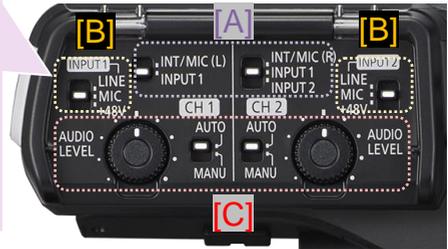
Switch the audio input using the INPUT1 and INPUT2 switches, depending on the connected audio source (such as a microphone that requires +48V power, a microphone that does not require power, or a line input). The input levels for both LINE and MIC settings can be adjusted in the MENU > Audio > Handle Unit INPUT Settings.

**4. [C] Adjusting the recording audio level**

Adjust the recording volume with the AUDIO LEVEL knob. This can only be set when the AUTO/MANU switch is set to "MANU".

Setting the input level  
(MENU > Audio > Handle unit INPUT setting)

Menu Items	Setting
INPUT1, 2 Line Level	4dB, <u>0dB</u>
INPUT1, 2 Microphone Level	-40dB, <u>-50dB</u> , -60dB



#### Audio setting example:

If you connect a +48V powered condenser microphone to INPUT1 and record the audio to CH1, recording the audio from the built-in microphone to CH2 is also possible.

	CH1	CH2
(A) CH SELECT switch	INPUT1	INT/MIC(R)
(B) INPUT switch	+48V	Any location *1

\* 1: it doesn't function when the built-in microphone is selected.

**NOTE: MENU > AUDIO > HANDLE UNIT INPUT SETTING > MIC INPUT**

INPUT1 MIC LEVEL and INPUT2 MIC LEVEL menu items can be changed to -40dB, -50dB, or -60dB depending on the sensitivity of the microphone being used.

Check the sensitivity of the microphone you are using and select the closest value in this menu.

The following is an example of a Panasonic microphone (AG-MC200G). The sensitivity of this microphone is -40 dB, but please set it to -50 dB in the microphone input menu.

## Specifications

**Power supply:** Phantom power supply, 48 V DC

**Current consumption:** 2.0 mA (typical)

 indicates safety information.

**Type:**

Back electret capacitor type microphone

**Frequency response:**

160 Hz to 20 kHz

**Sensitivity:**

-40 dB  $\pm$ 3.5 dB (0 dB = 1 V/Pa. at 1 kHz)

**Maximum input sound pressure level:**

127 dB S.P.L. (at 1 kHz, 1% distortion)

**S/N ratio (1 kHz/Pa):**

69 dB or more

**Output impedance:**

100  $\Omega$   $\pm$ 30% (at 1 kHz)

Example: Panasonic microphone AG-MC200 rating display

## 2-4. Power Supply and Charging

AG-CX20/CX18 can be powered by a battery or a commercially available AC adapter.

### Compatible devices

**Battery : AG-VBR59 (included/sold separately, supports quick charging)**

Battery	Battery Charger
 AG-VBR59 (included/sold separately, supports quick charging)	 AG-BRD50 (sold separately)

N.B. The only battery that can be used with this unit is the AG-VBR59 .

### AC adapter (recommended): DMW-AC11 (sold separately)

- If the AC adapter is connected to the camera's DC IN terminal in the power OFF mode, the attached battery will be charged.
- If you turn the camera power ON while charging, the charging function will stop.

Power Supply	Charging
 DMW-AC11 (sold separately) or An AC adapter that meets all of the recommended specifications below. <ul style="list-style-type: none"> <li>- PD (Power Delivery) compatible</li> <li>- Supports DC9V/3A (27W) output</li> <li>- USB Type-C connector</li> </ul>	 DMW-AC11 (sold separately) or Recommended specifications AC adapter * You can also use a DC5V/500mA or higher AC adapter for charging. However, charging times may be longer than with an AC adapter of the recommended specifications .

### 2-4-1. Recording Time Guideline

Battery Part Number	Battery Rating	Charging Time	Continuous Shooting Available Time
 AG-VBR59	7.28V 5900mAh, 43Wh	Approx. 5hours	59.94Hz: Approx. 4h 35min 50.00Hz Approx. 4h 50min

Continuous shooting available time and charging time vary depending on the operating environment and conditions.

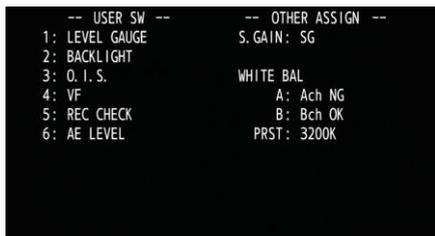
## 2-5. Assigning Functions to the USER SW

You can assign pre-defined functions to each of the six USER buttons on the camera body and the seven buttons displayed on the LCD monitor .



### How can I check the currently assigned functions?

By pressing the DISP/MODE CHK button for more than one second, you will enter the detailed display mode. After that, with each press of this button, you can cycle through Status screen, Function screen, Audio screen, Switch screen, Network screen and the Camera Image screen.



## 2-5-1. USER SW Function Allocation

MENU > CAMERA > USER SW > Any function can be assigned to any USER button.

## 2-5-2. List of Functions Assigned to USER Buttons

(☉): Functions that are disabled when the unit is put into standby and the next time it is turned on

Item	Function
(☉) INHIBIT	Disables that USER button (no function assigned).
AWB	Assigns the Auto White Balance function.
DRS	Assigns the DRS function, which expands the dynamic range by compressing the image level of high-brightness areas while maintaining contrast.
(☉) FBC	Turns ON/OFF the function that corrects the Flash Band phenomenon in which brightly exposed bands of the image are created when shooting in environments where photographic cameras with flashlights are used.
ONE PUSH AF	As with pressing the PUSH AUTO button, the AF (Auto Focus) function is active only while the button is pressed.
(☉) S.GAIN	Set the gain to 24dB or higher.
(☉) AREA	Touch any position on the built-in LCD screen to apply the pre-selected function set in the Area Mode function menu. e.g. iris, focus, etc.
(☉) ATW	ATW (Auto Tracking White Balance) function ON/OFF
(☉) ATW LOCK	Fixes the current ATW value. Press the USER button again or touch the USER button icon to resume operation of ATW. Enabled when the ATW is operating.
(☉) SPOTLIGHT	Turns ON/OFF the auto iris control function for spotlights.
(☉) BACHLIGHT	Turns ON/OFF the Auto Iris control function for backlight compensation.
ONE PUSH A.IRIS	The Auto Iris function operates only while the button is pressed.
AE LEVEL	Turns ON/OFF the AE level exposure compensation function.
(☉) Y GET	Assigns the Y GET function which displays the luminance level near the image centre
O.I.S.	Turns the Optical Image Stabilizer function ON/OFF.
O.I.S. MODE	Switches the operation mode of the Optical Image Stabilizer function (NORMAL, PAN/TILT, STABLE).
i.ZOOM	Assigns the i.Zoom function with minimal degradation of image quality.
(☉) D. ZOOM	Switches between digital zoom values of 2x, 5x or 10x.
IR REC	Turns IR recording ON/OFF.
(☉) FAST ZOOM	Turns ON/OFF the high-speed zoom function, which increases the zoom speed when the zoom lever is pressed all the way down.
REC SW	Assigns the same function as the REC button.
PRE REC	Turns ON/OFF the pre-recording function, which records video and audio from a certain period of time before the start of recording.
SUPER SLOW	Turns ON/OFF the super slow recording function.

## 2-5-2. List of Functions Assigned to USER Buttons (Continued)

Item	Function
<b>BACKGR PAUSE</b>	Assigns the function to stop background recording on card slot 2.
<b>(Ⓞ) REC CHECK</b>	Automatically plays back the last approx. 3 seconds of the previously recorded clip.
<b>(Ⓞ) DEL LAST CLIP</b>	Delete the previously recorded clip.
<b>AUDIO CH1 LEVEL</b>	Switches the recording level adjustment method (auto or manual) for audio channel 1.
<b>AUDIO CH2 LEVEL</b>	Switches the recording level adjustment method (auto or manual) for audio channel 2.
<b>(Ⓞ) FOCUS ASSIST</b>	Turns the Focus Assist function ON/OFF to make it easier to focus.
<b>(Ⓞ) WFM</b>	Switches the display of the waveform monitor. Waveform display is selected in MENU > VIDEO OUT/LCD/VF > EXPOSURE ASSIST > WFM MODE.
<b>ZEBRA</b>	Display or hide the zebra patterns.
<b>GUIDE LINES</b>	Display the shooting guide lines (Horizontal, Grid 1, Grid 2, Hidden).
<b>LEVEL GAUGE</b>	Display or hide the level gauge.
<b>LEVEL GAUGE SET</b>	Sets the current horizontal and vertical directions as the reference value of the Level Gauge.
<b>VF</b>	When MENU > VIDEO OUT/LCD/VF > VIDEO OUTPUT SELECT > SDI+HDMI SIMULTANEOUS OUTPUT is ON, switches the LCD monitor/viewfinder display method.
<b>LCD/VF DETAIL</b>	To make it easier to focus, the image contours displayed on the viewfinder and the LCD monitor images are emphasized.
<b>AUDIO OUT</b>	Switches the audio channel and the format output from the headphone jack and built-in speaker.
<b>FACE DETECT</b>	Turns ON/OFF the Face Detection AE & AF function.
<b>MENU</b>	Display or hide the menu.
<b>LOAD SETUP FILE</b>	Load the setup file saved on the memory card into the unit.
<b>LCD BACKLIGHT</b>	Switches the LCD monitor brightness (-1, 0, 1, 2).
<b>(Ⓞ) CARD READER MODE</b>	Turns ON/OFF the card reader mode (USB mass storage function).
<b>(Ⓞ) STREAMING START</b>	Starts/stops streaming from this unit.
<b>COUNTER</b>	Switches between time code display (time code display, user bit number, counter display, no display).
<b>RESET</b>	Resets the counter value.
<b>REAR RING</b>	Switches the rear ring operation (Zoom, Iris, Iris and AE level).

# 3. Menu Item List

AG-CX20

### 3-1. Menu Items

The menu structure of this unit is as follows:

#### MENU

— THUMBNAIL (Viewing and deleting recorded clips)	[ P. 21 ]
— CAMERA (Camera function settings)	[ P. 22 ]22
— SCENE FILE (Image quality and image creation settings )	[ P. 25 29]
— AUDIO (Input sensitivity and other audio-related settings)	[ P. 29 29]
— VIDEO OUT/LCD/VF (Settings related to video output)	[ P. 31 ]
— RECORDING (TC, Pre-recording settings, etc.)	[ P. 37 ]
— NETWORK (LAN connection and streaming settings)	[ P. 39 ]
— SYSYEM (Recording format settings, etc.)	[ P. 42 ]
— OTHER (Writing user files, Initializing the device, etc.)	[ P. 43 ]

**[THUMBNAIL] Menu****3-1-1. PLAYBACK**

Item	Contents	Settings ( _ : Factory Setting)
CLIP SEL	Selecting clips to display on the thumbnail screen.	All SLOT, SLOT 1, SLOT 2, SAME FORMAT
RESUME PLAY	Choose whether to start playback from the position where it was stopped.	ON, <u>OFF</u>

**3-1-2. CLIP**

Item	Contents	Settings
CLIP	Settings for protecting and deleting clips.	PROTECT, DELETE, COPY, REPAIR*, RE-CONNECT*, INFORMATION

\*Available for setting when using CX20.

**3-1-3. DISPLAY**

Item	Contents	Settings ( _ : Factory Setting)
DATA	Selecting the content to be displayed in the time code display.	<u>Start TC</u> , CLIP NAME

**[CAMERA] Menu****3-1-4. SW MODE**

Item	Contents	Settings ( <u>  </u> : Factory Setting)
ZOOM RING	Sets the rear ring direction and zoom control.	<u>DOWN TELE</u> , UP TELE
IRIS RING	Sets the rear ring direction and iris control when adjusting the iris.	<u>DOWN OPEN</u> , UP OPEN
SUPER GAIN	Sets the Super Gain value assigned to a USER button.	<u>SUPER GAIN</u> , SUPER GAIN+, ALL* *When ALL is selected, each time you press the USER button, the selection switches in the order SUPER GAIN, SUPER GAIN+, normal gain.
AGC LIMIT	Sets the maximum gain value when the Automatic Gain Control is active.	3dB, 6dB, 12dB, 18dB, 24dB, <u>30dB</u>
O.I.S.	Optical Image Stabilizer ON/OFF.	<u>ON</u> , OFF
HYBRID O.I.S.	Stronger Optical Image Stabilizer function that combines optical and electronic methods ON/OFF.	<u>ON</u> , OFF
O.I.S. MODE	Switches Optical Image Stabilizer operation mode.	<u>NORMAL</u> PAN/TILT: Suitable for frequent use of panning and tilting STABLE: Suitable for a fixed composition
ATW	Assigning the Auto-Tracking White balance function to the WHITE BAL button.	Ach, Bch, PRE, <u>OFF</u>
ATW SPEED	Sets the control speed of the ATW function.	FAST, <u>NORMAL</u>
ATW TARGET R	Fine-tuning red output when ATW operation converges.	-10 - <u>0</u> - 10
ATW TARGET B	Fine-tuning blue output when ATW operation converges.	-10 - <u>0</u> - 10
W.BAL PRESET	Sets the color temperature to be assigned to the preset position of the WHITE BAL button.	<u>3200K</u> , 5600K, VAR
W.BAL VAR	Freely sets the color temperature to be assigned to the preset position of the WHITE BAL switch.	2000K - <u>3200K</u> - 15000K
H.ZOOM SPEED	Sets the zoom speed for handle zoom	1 - <u>4</u> - 7
i.ZOOM	Turns ON/OFF the i.ZOOM function i.e. image zoom which maintains image quality.	ON, <u>OFF</u>
FOCUS RING DRIVE	Switches the way focus is adjusted using the focus ring.	<u>NON-LINEAR</u> , LINEAR

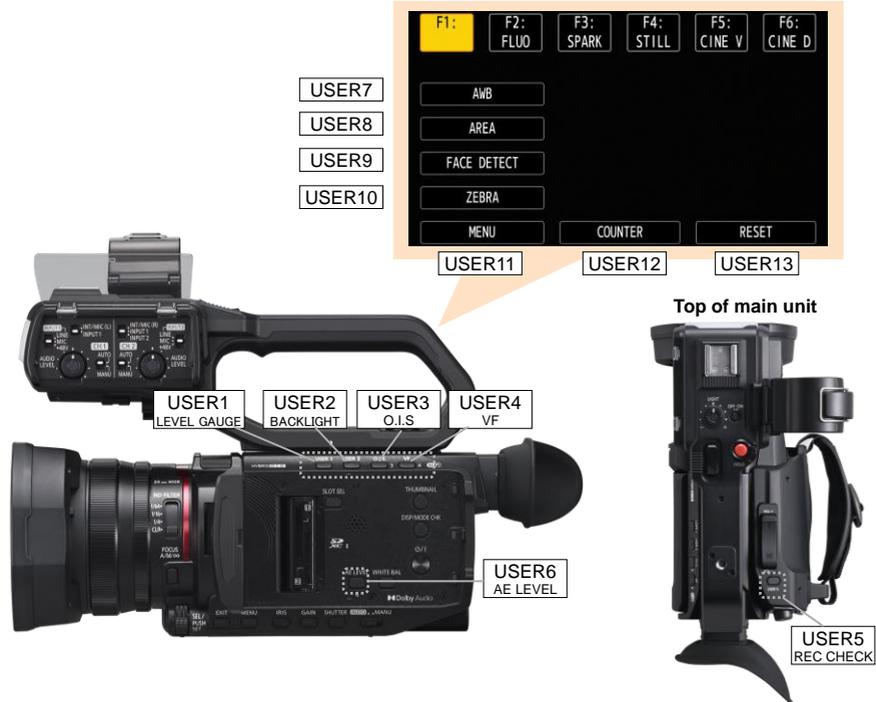
**[CAMERA] Menu****3-1-4. SW MODE (Continued)**

Item	Contents	Settings ( _ : Factory Setting)
FOCUS RING SETTING	[NON-LINEAR] Sets the focus adjustment way of the focus ring.	<u>SPEED</u> , COARSE, FINE
	[LINEAR] Sets the focus ring rotation angle.	90°, 120°, 150°, 180°, 210°, 240°, 270°, 300°, 330°, 360°
REAR RING	Switches rear ring operation settings.	<u>ZOOM</u> , IRIS, IRIS/AE LEVEL
AUTO SLOW SHUTTER	Slow shutter setting in auto Shutter Mode.	ON, <u>OFF</u>
AF SPEED	Sets the control speed of the Auto Focus function.	<u>NORMAL</u> , SLOW
AREA MODE	Sets functions to be performed within the area selected by touching the LCD monitor when shooting.	<u>INHIBIT FOCUS IRIS</u> Y GET (brightness display function) FOCUS/IRIS (simultaneous operation of FOCUS and IRIS) FOCUS/Y GET (simultaneous operation of FOCUS and Y GET)
IR REC	Turn ON/OFF the IR recording.	ON, <u>OFF</u>
IR REC COLOR	Switching the color of infrared images.	<u>WHITE</u> , GREEN
FACE DETECT/ TRACKING MODE	Switching between Auto Focus and exposure compensation settings when detecting/tracking faces.	<u>FACE DETECT/TRACKING AF</u> , <u>FACE DETECT/TRACKING AE&amp;AF</u>

[CAMERA] Menu

3-1-5. USER SW

Item	Factory Settings	Contents
USER1	LEVEL GAUGE	You can assign pre-defined functions to a total of 13 USER buttons on the main unit and built-in LCD touch panel .  For more details, please refer to the following sections: 2-5-1. USER SW Function Allocation (P.17)
USER2	BACKLIGHT	
USER3	O.I.S.	
USER4	VF	
USER5	REC CHECK	
USER6	AE LEVEL	
USER7	AWB	
USER8	AREA	
USER9	FACE DETECT	
USER10	ZEBRA	
USER11	MENU	
USER12	COUNTER	
USER13	RESET	



**[SCENE FILE] Menu**

**3-1-6. FILE SELECT**

For a list of the settings for each scene file setting, please refer to 6-1. Scene File Settings List (P.81) .

Item	Contents	Settings
FILE SELECT	Selects a scene file.	F1: Standard settings for versatile use F2: FLUO Optimal settings for indoor shooting under fluorescent lighting F3: SPARK Vivid and clear picture quality settings F4: STILL Digital still camera quality settings applied F5: CINE V Settings suitable for contrast-oriented photography F6: CINE D Settings suitable for shooting with emphasis on dynamic range

**3-1-7. NAME EDIT**

Item	Contents	Settings
NAME EDIT	Edits scene file names.	Maximum 8 characters

**3-1-8. LOAD/SAVE/INITIALIZE**

Item	Contents	Settings
LOAD/SAVE/INITIALIZE	Recalls and saves scene file data stored in the built-in memory or initialize to the factory settings.	LOAD, SAVE, INITIALIZE

**3-1-9. MASTER DTL**

Item	Contents	Settings (_: Factory Setting)
MASTER DTL	Adjusts the level of detail across the whole image.	-15 - <u>0</u> - 15

**3-1-10. DETAIL CORING**

Item	Contents	Settings (_: Factory Setting)
DETAIL CORING	Sets the level of signal (including noise) that does not activate the detail effect.	0 - <u>15</u> - 30

**3-1-11. V.DTL LEVEL**

Item	Contents	Settings (_: Factory Setting)
V.DTL LEVEL	Sets the intensity of the detail level in the vertical direction.	-7 - <u>0</u> - 7

**[SCENE FILE] Menu****3-1-12. RB GAIN CONTROL SETTING**

Item	Contents	Settings (_: Factory Setting)
R GAIN AWB A	Sets the Red gain when the WHITE BAL switch is in the A position.	-30 - <u>0</u> - 30
B GAIN AWB A	Sets the Blue gain when the WHITE BAL switch is in the A position.	-30 - <u>0</u> - 30
R GAIN AWB B	Sets the Red gain when the WHITE BAL switch is in the B position.	-30 - <u>0</u> - 30
B GAIN AWB B	Sets the Blue gain when the WHITE BAL switch is in the B position.	-30 - <u>0</u> - 30
AWB A GAIN OFFSET	When the white balance has been automatically performed with A position, set the value of R/B gain.	ON: Keeps the set value <u>OFF</u> : Sets R/B gain values to 0
AWB B GAIN OFFSET	When the white balance has been automatically performed with B position, set the value of R/B gain.	ON: Keeps the set value <u>OFF</u> : Sets R/B gain values to 0

**3-1-13. CHROMA LEVEL**

Item	Contents	Settings (_: Factory Setting)
CHROMA LEVEL	Sets the video color level. (The larger the value, the darker the image will be.)	-50 - <u>0</u> - 50

**3-1-14. CHROMA PHASE**

Item	Contents	Settings (_: Factory Setting)
CHROMA PHASE	Sets the video hue.	-31 - <u>0</u> - 31

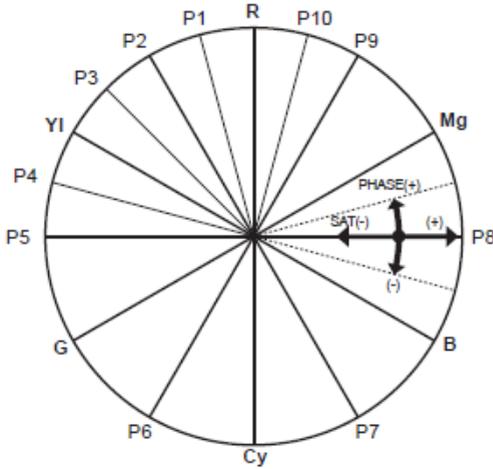
**3-1-15. MATRIX**

Item	Contents	Settings ( _: Factory Setting)
MATRIX	Changes color representation using color preset tables	<u>NORMAL1</u> : Suitable for shooting outdoors or under halogen lamps NORMAL2: More vivid colors than "Standard 1" FLUO: Suitable for shooting indoors under fluorescent lighting CINELIKE: Suitable for shooting with a cinematic feel STILL LIKE: Color settings for image quality tones of a digital still camera

[SCENE FILE] Menu

3-1-16. COLOR CORRECTION

Item	Contents	Settings ( <u>  </u> : Factory Setting)
COLOR CORRECTION	Individual settings for color saturation and phase for 16 different hues	-63 - <u>0</u> - 63



- R: Red
- P1: (YI-R)-R
- P2: (YI-R)
- P3: YI-(YI-R)
- YI: Yellow
- P4: (G-YI)-YI
- P5: (G-YI)
- G: Green
- P6: (Cy-G)
- Cy: Cyan
- P7: (B-Cy)
- B: Blue
- P8: (Mg-B)
- Mg: Magenta
- P9: (R-Mg)
- P10: R-(R-Mg)

Image of color correction adjustment effect

3-1-17. SKIN TONE DTL.

Item	Contents	Settings ( <u>  </u> : Factory Setting)
SKIN TONE DTL.	Isolates people's skin tones to make it look smoother.	ON, <u>OFF</u>

3-1-18. MASTER PED

Item	Contents	Settings ( <u>  </u> : Factory Setting)
MASTER PED	Sets the video black reference position.	-70 - <u>0</u> - 70

3-1-19. GAMMA MODE SEL

Item	Contents	Settings ( <u>  </u> : Factory Setting)
GAMMA MODE SEL	Selects the gamma curve.	<u>HD</u> , SD, FILMLIKE1, FILMLIKE2, FILMLIKE3, CINE-LIKE D, CINE-LIKE V, STILL LIKE

**[SCENE FILE] Menu****3-1-20. BLACK GAMMA**

Item	Contents	Settings ( __ : Factory Setting)
BLACK GAMMA	Adjusts the gamma curve in the dark areas. Negative direction compresses dark parts, positive direction expands dark areas.	-4 - <u>0</u> - 4

**3-1-21. KNEE MODE**

Item	Contents	Settings ( __ : Factory Setting)
KNEE MODE	Sets the knee mode to prevent over exposure.	<u>AUTO</u> , LOW, MEDIUM, HIGH, OFF

**3-1-22. WHITE CLIP SETTING**

Item	Contents	Settings ( __ : Factory Setting)
WHITE CLIP	Turns ON/OFF the white clip function.	<u>ON</u> , OFF
WHITE CLIP LEVEL	Sets the video level for white clipping.	90% - <u>109%</u>

**3-1-23. DRS**

DRS: A function that expands the dynamic range by compressing the video level of high-brightness areas.

Item	Contents	Settings ( __ : Factory Setting)
DRS	Turns ON/OFF the DRS function.	ON, <u>OFF</u>

**3-1-24. DRS EFFECT DEPTH**

Item	Contents	Settings ( __ : Factory Setting)
DRS EFFECT DEPTH	Sets the compression level for high-luminance areas of DRS function.	<u>1</u> , 2, 3

**3-1-25. NR CONTROL**

Item	Contents	Settings ( __ : Factory Setting)
NR CONTROL	Adjusts the image Noise Reduction effect and afterimage feeling.	-7 - <u>0</u> - 7

**3-1-26. AE LEVEL**

Item	Contents	Settings ( __ : Factory Setting)
AE LEVEL	Turns ON/OFF the AE level function (auto exposure).	<u>ON</u> , OFF

**3-1-27. AE LEVEL EFFECT**

Item	Contents	Settings ( __ : Factory Setting)
AE LEVEL EFFECT	Sets the exposure compensation value when AE level is enabled.	-2.0EV - <u>0</u> - 2.0EV

**[AUDIO] Menu**

**3-1-28. HANDLE UNIT INPUT SETTING**

This can be set when the handle unit (included) is attached to the unit.

Item	Contents	Settings (_: Factory Setting)
INPUT1 MIC LEVEL	Sets the input level of the external microphone connected to the INPUT1 terminal.	-40dB, <u>-50dB</u> , -60dB
INPUT2 MIC LEVEL	Sets the input level of the external microphone connected to the INPUT2 terminal.	-40dB, <u>-50dB</u> , -60dB
INPUT1 LINE LEVEL	Sets the input level of the external device connected to the INPUT1 terminal.	4dB, <u>0dB</u>
INPUT2 LINE LEVEL	Sets the input level of the external device connected to the INPUT2 terminal.	4dB, <u>0dB</u>

**3-1-29. MIC SETTING**

This can be set when the handle unit (included) is not attached to the unit.

Item	Contents	Settings (_: Factory Setting)
CH1 LEVEL	Sets the level adjustment method for audio channel 1.	<u>Auto</u> , Manual
CH2 LEVEL	Sets the level adjustment method for audio channel 2.	<u>Auto</u> , Manual
CH1 LEVEL CONTROL	Sets the recording level when CH1 LEVEL is set to MANUAL.	mute, -30dB - <u>0</u> - 12dB
CH2 LEVEL CONTROL	Sets the recording level when CH2 LEVEL is set to MANUAL.	mute, -30dB - <u>0</u> - 12dB

**3-1-30. INPUT SETTINGS**

Item	Contents	Settings (_: Factory Setting)
CH1 MIC LOWCUT	Turns ON/OFF the lowcut filter for audio channel 1.	ON, <u>OFF</u>
CH2 MIC LOWCUT	Turns ON/OFF the lowcut filter for audio channel 2.	ON, <u>OFF</u>
CH1 LIMITER	Turns ON/OFF the limiter when manually adjusting the audio input level on audio channel 1.	ON, <u>OFF</u>
CH2 LIMITER	Turns ON/OFF the limiter when manually adjusting the audio input level on audio channel 2.	ON, <u>OFF</u>
MIC LIMITER LINK	Sets whether to make the limiter work on the other audio channel when the limiter works in either audio channel 1 or 2.	ON, <u>OFF</u>
HEAD ROOM	Sets the standard level i.e. Head Room	12dB, 18dB, <u>20dB</u>

**[AUDIO] Menu****3-1-31. OUTPUT SETTINGS**

Item	Contents	Settings (_: Factory Setting)
AUDIO OUT	Sets the audio channel and the format to output from the headphone terminal and the built-in speaker.	CH1, CH2, <u>CH1/2 STEREO</u> , CH1/2 MIX

**3-1-32. ALARM**

Item	Contents	Settings (_: Factory Setting)
BATTERY END	Sets whether to sound the alarm when the battery runs out	HIGH, LOW, OFF
MEDIA END	Sets whether to sound the alarm when the memory card is full.	HIGH, LOW, OFF
WARNING	Sets whether to sound the alarm when a system error or warning occurs.	HIGH, LOW, OFF

[VIDEO OUT/LCD/VF] Menu

3-1-33. VIDEO OUT SEL

Item	Contents	Settings (_: Factory Setting)
SDI+HDMI OUTPUT	Switches enable/disable of simultaneous output from the SDI OUT and HDMI terminals.	ON, <u>OFF</u>
EXTERNAL OUT SEL	Switches the external video and audio output destination.	SDI, <u>HDMI</u>
SDI OUT FORMAT	Selects the signal to output from the SDI OUT terminal.	1920x1080p, <u>1920x1080i</u> , 1920x1080PsF, 1280x720p
HDMI OUT FORMAT	Selects the signal to output from the HDMI terminal.	3840x2160p, 3840x2160p (420/8bit), <u>1920x1080p</u> , 1920x1080i, 1280x720p, 720x480p, 720x576p
VF	Sets the display method of the LCD monitor/viewfinder.	<u>VF PRIORITY</u> , LCD
VF AUTO OFF	Sets for automatically turning off the viewfinder when no button or LCD monitor touch operations are performed.	<u>5 minutes</u> , OFF

3-1-34. SDI SETTING

Item	Contents	Settings (_: Factory Setting)
SDI REC REMOTE	Sets whether to control the recording operation of external recorders and other devices connected to the SDI OUT terminal.	ON: Controlling external devices <u>OFF</u> : No control
SDI OUT CHAR	Sets whether to superimpose the character to the output from the SDI OUT terminal.	ON, <u>OFF</u>
SDI OUT ZEBRA	Sets whether to superimpose the zebra signal to the output from the SDI OUT terminal.	ON, <u>OFF</u>

3-1-35. HDMI SETTING

Item	Contents	Settings (_: Factory Setting)
HDMI TC OUT	Sets whether to output time code information from the HDMI terminal.	ON, <u>OFF</u>
HDMI REC REMOTE	Sets whether to control the recording operation of external recorders and other devices connected to the HDMI terminal.	ON: Controlling external devices <u>OFF</u> : No control
HDMI OUT CHAR	Set whether to superimpose the character to the output from the HDMI terminal.	ON, <u>OFF</u>
HDMI OUT ZEBRA	Sets whether to superimpose the zebra signal to the output from the HDMI terminal.	ON, <u>OFF</u>

[VIDEO OUT/LCD/VF] Menu

3-1-36. LCD

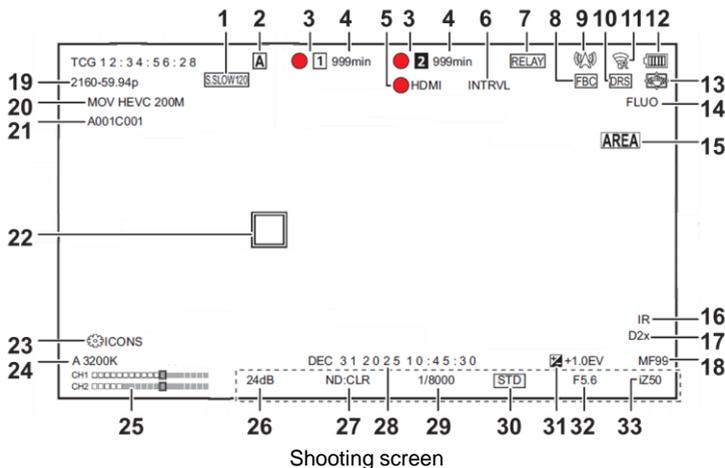
Item	Contents	Settings
BRIGHTNESS	Adjusts the LCD monitor brightness.	-15 - <u>0</u> - 15
COLOR LEVEL	Adjusts the color level of the LCD monitor.	-15 - <u>0</u> - 15
CONTRAST	Adjusts the contrast of the LCD monitor.	- 15 - <u>0</u> - 15
BACK LIGHT	Adjusts LCD monitor backlight.	-1, <u>0</u> , 1, 2
RED TINT	Adjusts the strength of red on the LCD monitor.	-10 - <u>0</u> - 10
BLUE TINT	Adjusts the strength of blue on the LCD monitor.	-10 - <u>0</u> - 10
SELF SHOOT	Sets the display for self-portrait shooting.	NORMAL, MIRROR (image flipped left and right)

3-1-37. VF

item	Contents	Settings
BRIGHTNESS	Adjusts the viewfinder brightness.	-15 - <u>0</u> - 15
COLOR LEVEL	Adjusts the color level of the viewfinder.	-15 - <u>0</u> - 15
CONTRAST	Adjusts the contrast of the viewfinder.	- 15 - <u>0</u> - 15
RED TINT	Adjusts the strength of red on the viewfinder.	-10 - <u>0</u> - 10
BLUE TINT	Adjusts the strength of blue on the viewfinder.	-10 - <u>0</u> - 10
VF COLOR	Sets whether to display video in the viewfinder in color or black and white.	<u>ON</u> , OFF

3-1-38. INDICATOR

Selects the type of information to be superimposed on the output image.



[VIDEO OUT/LCD/VF] Menu

3-1-38. INDICATOR (Continued)



Playback screen

No.	Item	Contents	Settings (_: Factory Setting)
1	FRAME RATE	Displays of the frame rate for super slow recording.	<u>ON</u> , OFF
2	FULL AUTO	Displays the status when the AUTO/MANU switch is at AUTO.	<u>ON</u> , OFF
3,4	SLOT 1/2 STATUS	Displays the card slot status and remaining recording capacity.	<u>ON</u> , OFF
5	REC REMOTE	Displays the control status of recording start and stop for external devices connected to the SDI OUT terminal and HDMI terminal.	<u>ON</u> , OFF
6	REC MODE	Displays the interval recording status.	<u>ON</u> , OFF
7	2 SLOTS FUNC.	Displays the setting status in the RECORDING menu > 2 SLOTS FUNC.	<u>ON</u> , OFF
8	FBC	Switches whether to display when the flash band compensation function is activated.	<u>ON</u> , OFF
9	STREAMING	Displays streaming status.	<u>ON</u> , OFF
10	DRS	Switches whether to display when the dynamic range stretcher function is operating.	<u>ON</u> , OFF
11	NETWORK	Displays wireless LAN, wired LAN or USB tethering connection status.	<u>ON</u> , OFF
12	BATTERY REMAIN	Displays the power status.	<u>ON</u> , OFF
13	O.I.S.	Switches whether to display when the optical image stabilizer function is operating.	<u>ON</u> , OFF
14	SCENE FILE	Displays the current scene file name.	<u>ON</u> , OFF

**[VIDEO OUT/LCD/VF] Menu****3-1-38. INDICATOR (Continued)**

No.	item	Contents	Settings (_: Factory Setting)
15	AREA/FACE	Switches whether to display when the Area mode function or face detection/tracking AE&AF function is operating.	<u>ON</u> , OFF
16	IR REC	Displays the setting status in the CAMERA menu > SW MODE > IR REC.	<u>ON</u> , OFF
17	D.ZOOM	Displays digital zoom ratio.	<u>ON</u> , OFF
18 33	ZOOM/ FOCUS	Switches the display units of zoom and focus values.	<u>NUMBER</u> , mm/feet, mm/m, OFF
19 20	REC FORMAT	Displays recording format settings.	<u>ON</u> , OFF
21	CLIP NAME	Displays the recorded clip file name.	<u>ON</u> , OFF
22	FACE DETECTION	Face detection frame when face detection/tracking AE&AF function is in operation display	<u>ALL</u> , MAIN FACE, OFF
23	MULTI MANUAL	Displays the multi manual function.	<u>ON</u> , OFF
24	WHITE BALANCE	Displays color temperature information.	<u>ON</u> , OFF
25	AUDIO LEVEL METER	Displays the audio level meter.	<u>ON</u> , OFF
26	GAIN	Displays the gain value.	<u>ON</u> , OFF
27	ND FILTER	Displays the ND filter transmittance rate.	<u>ON</u> , OFF
28	DATE/TIME	Displays the date and time Information	<u>OFF</u> , DATE, TIME, DATE&TIME
29	SHUTTER	Displays the shutter speed.	<u>ON</u> , OFF
30 32	IRIS	Displays the current iris value and auto iris control status.	<u>ON</u> , OFF
31	AE LEVEL	Displays the AE level.	<u>ON</u> , OFF
34	PLAYBACK STATUS	Displays the playback status.	<u>ON</u> , OFF

[VIDEO OUT/LCD/VF] Menu

3-1-39. MARKER

Item	Contents	Settings ( _ : Factory Setting)
CENTER MARKER	Switches the type of center marker.	OFF, <u>1: + (large)</u> , 2: Open center (large), 3: + (small), 4: Open center (small)
SAFETY MARKER	Selects the type of frame for the safety zone marker.	1: Box, <u>2: Corners</u> , OFF
FRAME MARKER	Sets the aspect ratio of the frame marker.	4:3, 13:9, 14:9, 16:9, 17:9, 1.85:1, 2.35:1, <u>OFF</u>
GUIDE LINES	Sets the guide lines to check if the image is horizontal.	<u>OFF</u> , HORIZONTAL, GRID1, GRID2

3-1-40. FOCUS ASSIST

Item	Contents	Settings ( _ : Factory Setting)
FOCUS ASSIST SW	When FOCUS ASSIST is set, sets the focus assist method.	<u>EXPAND</u> , PEAKING, EXPAND&PEAKING
EXPAND MODE	Sets the enlargement display function mode.	<u>10SEC</u> : Enlarge for 10 seconds HOLD: Keep zooming in until you zoom in again UNTIL REC: Zoom in until recording starts
EXPAND VALUE	Adjusts the enlargement factor of the enlarged function.	<u>x2</u> , x3, x4
PEAKING LEVEL	Sets the intensity of the peaking display.	LOW, <u>MID</u> , HIGH
PEAKING COLOR	Sets the color of the peaking display.	<u>RED</u> , GREEN, WHITE
DETAIL	Sets the intensity of the contour for the video for easier focusing.	ON, <u>OFF</u>
DETAIL LEVEL	Sets the intensity of the contours.	-3 - <u>0</u> - 3
DETAIL FREQ.	Adjusts the frequency of the contour highlights.	HIGH, <u>LOW</u>

**[VIDEO OUT/LCD/VF] Menu****3-1-41. EI ASSIST**

Item	Contents	Settings (_: Factory Setting)
ZEBRA	Sets whether to superimpose the zebra signal to the video output.	MOMENT, ON, <u>OFF</u>
ZEBRA1 DETECT	Sets the detection level of zebra pattern 1.	50% - <u>80%</u> - 105%
ZEBRA2 DETECT	Sets the detection level of zebra pattern 2.	50% - <u>80%</u> - 105%
ZEBRA2	Switches enable/disable of zebra pattern 2.	ON, <u>OFF</u>
WFM MODE	Sets the display of the waveform monitor. Displaying of the waveform and the vector can be switched.	<u>WAVE</u> : Displays the waveform <u>VECTOR</u> : Displays the vector <u>WAVE/VECTOR</u> : Each time you press the USER button, the display switches in the order waveform, vector and no display.
WFM TRANSPARENCE	Sets the transmittance of the waveform monitor.	0%, <u>25%</u> , 50%

**3-1-42. LEVEL GAUGE**

Item	Contents	Settings (_: Factory Setting)
LEVEL GAUGE	Turns ON/OFF the Level Gauge function.	<u>ON</u> , OFF
LEVEL GAUGE RESET	Resets the horizontal/vertical reference values set by LEVEL GAUGE SET in the USER button to the factory settings.	YES, NO

**[RECORDING] Menu**

**3-1-43. FORMAT MEDIA**

Item	Contents	Settings
FORMAT MEDIA	Initializes the memory card.	SLOT1, SLOT2

**3-1-44. CLIP NAME**

Item	Contents	Settings (_: Factory Setting)
CAM INDEX	Sets the CAM INDEX used for recorded MOV/MP4 format file names.	<u>A</u> - Z
NEXT CARD COUNT	Set the CARD COUNT used for recorded MOV/MP4 format file names.	<u>001</u> - 999

**3-1-45. FILE SPLIT \*Only CX20**

Item	Contents	Settings (_: Factory Setting)
FILE SPLIT	Selects the split method of P2 format file to be recorded. If you select SPLIT, the file will be split into approximately 4GB files for recording *1	ONE FILE, <u>SPLIT</u>

\* 1: When using a microP2 card with 32GB or less or when recording in AVC-I100/AVC-I50, recording is divided .

**3-1-46. 2 SLOTS FUNC.**

Item	Contents	Settings (_: Factory Setting)
2 SLOTS FUNC.	Sets the recording function using two memory cards.	OFF, <u>RELAY REC.</u> , SIMUL REC, BACKGR REC

**3-1-47. PRE REC**

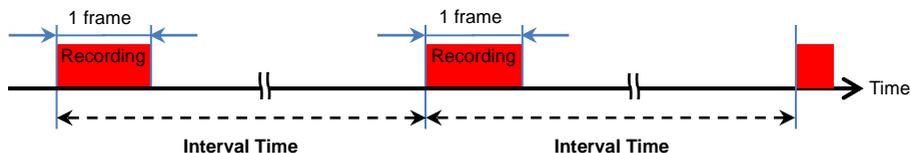
Item	Contents	Settings (_: Factory Setting)
PRE REC	Sets a function that uses memory to record video and audio a little before recording begins.	ON, <u>OFF</u>

**3-1-48. PROXY REC \*Only CX20**

Item	Contents	Settings (_: Factory Setting)
PROXY REC	Sets the proxy recording.	ON, <u>OFF</u>

**[RECORDING] Menu****3-1-49. REC FUNCTION**

Item	Contents	Settings ( _ : Factory Setting)
REC MODE	Sets interval recording (recording one frame at a set interval).	<u>NORMAL</u> , INTERVAL
INTERVAL TIME	Sets the interval duration when performing interval recording.	1s, 2s, 5s, 10s, 30s, 1min, <u>5min</u> , 10min



Interval recording example

**3-1-50. TC/UB**

Item	Contents	Settings ( _ : Factory Setting)
TC PRESET	Sets the default value of the time code to record.	Hour: <u>00</u> - 23 Minute: <u>00</u> - 59 Second: <u>00</u> - 59 Frame: <u>00</u> - 23/24/29
UB PRESET	Sets user bits.	<u>00</u> - FF
FREE/REC RUN	Sets the time code generator advance <sup>*1</sup> .	FREE RUN, <u>REC RUN</u>
DF/NDF	Sets the time code counting method <sup>*2</sup> .	<u>DF</u> , NDF
UB MODE	Selects the user bits to be recorded in clips or output as part of LTCUB and VITC UB of SDI signals.	FRAME RATE, <u>USER</u> , TIME, DATE, TC, CLIP NAME

\*1

- When SYSTEM menu > SUPER SLOW > ON is set, it is fixed to REC RUN.
- When RECORDING menu > PRE-REC > ON is set, it is fixed to FREE RUN.
- When RECORDING menu > 2 SLOT FUNC. > BACKGR RECORDING is set, it is fixed to FREE RUN.
- When RECORDING menu > REC FUNCTION > REC MODE > INTERVAL is set, it is fixed to REC RUN.

\*2

- When RECORDING menu > REC FUNCTION > REC MODE > INTERVAL is set, it is fixed to NDF.

**3-1-51. REC COUNTER**

Item	Contents	Settings ( _ : Factory Setting)
REC COUNTER	Sets the counter operation for recording.	<u>TOTAL</u> : Count until you press the RESET button CLIP: Reset at the beginning of each recording

**3-1-52. TIME STAMP**

Item	Contents	Settings ( _ : Factory Setting)
TIME STAMP	Selects whether to superimpose the date and time on videos you are shooting.	<u>OFF</u> , DATE, TIME, DATE&TIME

**[NETWORK] Menu**

**3-1-53. DEVICE SEL**

Item	Contents	Settings ( _: Factory Setting)
DEVICE SEL	Selects the device to connect the external device to this unit.	USB-LAN, WLAN, USB TETHERING, <u>OFF</u>

**3-1-54. NETWORK FUNC**

Item	Contents	Settings ( _: Factory Setting)
NETWORK FUNC	Selects the network function of the unit.	STREAMING, NDI® HX2*, <u>OFF</u>

\*Available for setting when using CX20.

**3-1-55. IP REMOTE**

Item	Contents	Settings ( _: Factory Setting)
ENABLE /DISABLE	Sets whether to enable the IP remote function via the HC ROP app.	ENABLE, <u>DISABLE</u>
HC ROP PORT	Specifies the standby port number to connect to HC ROP app.	Factory Setting: 49152
USER ACCOUNT	Registers a new account used for authentication in the network function of this unit.	Up to 10 Accounts Configurable
ACCOUNT LIST	Displays a list of registered users. Deleting accounts is also possible.	---

**3-1-56. STREAMING**

Item	Contents	Settings ( _: Factory Setting)
STREAMING PROTOCOL	Chooses the streaming protocol.	RTMP(S), <u>RTSP</u>
STREAMING FORMAT	Chooses the streaming format.	For more details, please refer to the following sections: 846-4. Streaming format (RTMP/RTSP) (p.84).
CONNECTION INFO	Selects the reference source for the streaming transfer destination.	<u>MEMORY</u> , SD CARD
RTMP(S) RECEIVER URL	the destination URL: rtmp://(server URL):(port number)/(path)/(stream key) rtmps://(server URL):(port number)/(path)/(stream key)	
RTSP SETTING	LISTEN PORT: Sets the port number to listen for RTSP commands.	Factory Setting: 554
	MULTICAST: Enables/disables the multicast function.	ENABLE, DISABLE
	MULTICAST ADDRESS: Sets for multicast distribution.	Factory Setting: 239.192.0.20
	MULTICAST PORT NUMBER: Sets the port number for multicast distribution.	Factory Setting: 37004
	TTL/HOP Limit: Setting the Multicast TTL/HOP limit values.	1 – <u>16</u> – 254

**[NETWORK] Menu****3-1-56. STREAMING (Continued)**

Item	Contents	Settings (_: Factory Setting)
LOAD (SD CARD)	Load the setting file from the memory card when CONNECTION INFO is set to MEMORY.	YES, NO
SAVE (SD CARD)	Encrypts and saves the destination URL information to the memory card.	YES, NO
CLEAR (MEMORY)	Clears the streaming settings in this unit.	YES, NO
START	Starts streaming.	ON, <u>OFF</u>

**3-1-57. NDI HX2 \*Only CX20**

Item	Contents	Settings (_: Factory Setting)
STREAMING FORMAT	Chooses the streaming format.	For more details, please refer to 6-5. Streaming Format (NDI® HX2) (p.85).
CAMERA TITLE	Sets the device name displayed when this unit is detected by NDI® HX2 compatible device.	
MULTICAST	Enables/disables the multicast function.	ENABLE, <u>DISABLE</u>
MULTICAST ADDRESS	Sets the address when using the streaming with the multicast.	Factory Setting: 239.192.0.20
TTL/HOP LIMIT	Sets the Multicast TTL/HOP limit values.	1 - <u>16</u> - 254
source name	Sets the channel name displayed when the unit is detected by NDI® HX2 compatible device.	Factory Setting: NDI_Device_Movie
mDNS	Sets the domain name to enable NDI® HX2 compatible devices to detect this unit.	Factory Setting: CX20

**3-1-58. WLAN PROPERTY**

Item	Contents	Settings ( _: Factory Setting)
TYPE	Sets the wireless LAN connection method.	<u>DIRECT</u> : Connects directly to a tablet device without using an access point INFRA(SELECT): Connects to the access point, select the access point from the list INFRA(MANUAL): Connect to the access point , enter access point information manually
SSID	Displays and sets the network name of this unit.	Factory Setting: AG-CX20/AG-CX18
CHANNEL	Sets the channel to be used when setting the type setting item directly	<u>AUTO</u> , CH1, CH6, CH11
ENCRYPTION	Sets the encryption method.	WPA2, WPA3, <u>WPA 3/WPA 2</u>
ENCRYPT KEY	Sets the encryption key.	A string of 8-63 characters or 64 hexadecimal digits Factory Setting: 01234567890123456789abcdef

**[NETWORK] Menu**

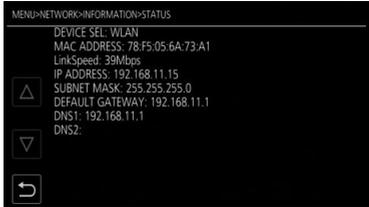
**3-1-59. WLAN IPv4 SETTING**

Item	Contents	Settings (⏏: Factory Setting)
DHCP	Sets whether to use automatic acquisition via DHCP or to use the DHCP server function of the unit.	<u>OFF</u> ,CLIENT, SERVER
IP ADDRESS	Sets IP Address.	Factory Setting: 192.168.0.1
SUBNET MASK	Sets the subnet mask.	Factory Setting: 255.255.255.0
DEFAULT GATEWAY	Sets the default gateway.	Factory Setting: 192.168.0.254
PRIMARY DNS	Sets the primary DNS server.	Factory Setting: 0.0.0.0
SECONDARY DNS	Sets the secondary DNS server.	Factory Setting: 0.0.0.0

**3-1-60. USB-LAN IPv4 SETTING**

item	Contents	Settings (⏏: Factory Setting)
DHCP	Sets whether to use automatic acquisition via DHCP or to use the DHCP server function of the unit.	<u>OFF</u> ,CLIENT, SERVER
IP ADDRESS	Sets IP Address.	Factory Setting: 192.168.0.1
SUBNET MASK	Sets the subnet mask.	Factory Setting: 255.255.255.0
DEFAULT GATEWAY	Sets the default gateway.	Factory Setting: 192.168.0.254
PRIMARY DNS	Sets the primary DNS server.	Factory Setting: 0.0.0.0
SECONDARY DNS	Sets the secondary DNS server.	Factory Setting: 0.0.0.0

**3-1-61. INFORMATION**

Item	Contents	Settings
STATUS	Displays the status of network functions.	

**3-1-62. UTILITY**

Item	Contents	Settings
NETWORK INITIALIZE	Resets the network settings to the factory settings and restart the unit.	
NET CHECKER	Checks network connection status.	

About a Streaming Functionality for European Models: **AG-CX20EJ / AG-CX18EJ / AG-CX18EH**  
 For the purpose of compliance with RED DELEGATED REGULATION (EU) 2022/30, a streaming functionality with RTP/RTSP/RTMP/NDI® will no longer be provided from summer 2025 onward.

**[SYSTEM] Menu****3-1-63. FREQUENCY**

Item	Contents	Settings (_: Factory Setting)
FREQUENCY	Sets the system frequency.	<u>59.94Hz</u> , 50.00Hz

**3-1-64. FILE FORMAT**

Item	Contents	Settings (_: Factory Setting)
FILE FORMAT	Sets the file format to recording.	P2*, <u>MOV</u> , MP4, AVCHD

\*Available for setting when using CX20.

**3-1-65. REC FORMAT**

Item	Contents	Settings
REC FORMAT	Sets the signal format and codec mode for recording.	For more details, please refer to the following sections: 1-1. Recording Format and Recording Time (P.8)

**3-1-66. AUDIO SAMPLE RES. \*Only CX20**

Item	Contents	Settings (_: Factory Setting)
AUDIO SAMPLE RES.	Sets the audio bit depth when recording in AVC-I100/AVC-I50 format.	<u>16BIT</u> , 24BIT

**3-1-67. SUPER SLOW**

Item	Contents	Settings (_: Factory Setting)
SUPER SLOW	Sets the super slow recording.	ON, <u>OFF</u>

**[OTHERS] Menu****3-1-68. FILE**

Item	Contents	Settings (_: Factory Setting)
SCENE FILE (SD CARD)	Loads and saves scene files on an SD memory card.	LOAD, SAVE, SAVE AS
SETUP FILE (SD CARD)	Loads and saves setup files on an SD memory card.	LOAD, SAVE, SAVE AS
SETUP FILE (MEMORY)	Loads and saves setup files in the internal memory of the unit.	LOAD, SAVE, INITIALIZE
SLOT FOR LOAD/SAVE	Selects the card slot to load and save scene files, setup files, and streaming setting files.	<u>SLOT1</u> , SLOT2

**3-1-69. HANDLE TALLY LED**

Item	Contents	Settings (_: Factory Setting)
HANDLE TALLY LED	Sets whether to turn on the tally lamp	<u>ON</u> , OFF

**3-1-70. CLOCK**

Item	Contents	Settings ( _: Factory Setting)
CLOCK SETTING	Sets the calendar and time.	---
TIME ZONE	Sets the time by adding a time difference to the clock setting.	Factory Setting: +9:00
DATE FORMAT	Sets the display order of the year, month, and date of the calendar.	<u>Year-Month-Day</u> , Month-Day-Year, Day-Month-Year

**3-1-71. USB DEVICE**

Item	Contents	Settings
CARD READER MODE	Connects this unit to a computer or other device with a USB cable and use it as a card reader.	YES, NO
SERVICE MODE	Switches the unit to service mode.	YES, NO

**3-1-72. INFORMATION**

Item	Contents	Settings
VERSION	Displays the product number, serial number and version of the unit.	---
OPERATION TIME	Displays the total operation time.	---
UPDATE	Updates the firmware.	YES, NO

The firmware for this unit can be downloaded from the support site below.

<https://eww.pass.panasonic.co.jp/pro-av/support/content/download/EN/top.html>

**[OTHERS] Menu****3-1-73. ECO MODE**

Item	Contents	Settings (_: Factory Setting)
BATTERY	If no operation is performed for about 5 minutes, the unit turns off automatically.	<u>ON</u> , OFF
AC	If no operation is performed for about 15 minutes while using the AC adapter, the unit turns off automatically.	<u>ON</u> , OFF
NETWORK	If the device is not connected to the network and is not used for 15 minutes, the unit turns off automatically.	<u>ON</u> , OFFf

**3-1-74. APPROVED REGULATION**

Item	Contents	Settings
APPROVED REGULATION	Displays the authenticaton information for this unit.	---

**3-1-75. LANGUAGE**

Item	Contents	Settings
LANGUAGE	Sets the display language.	---

**3-1-76. MENU INITIALIZE**

Item	Contents	Settings
MENU INITIALIZE	Changing menu settings to factory defaults	YES, NO

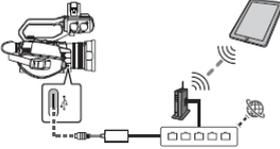
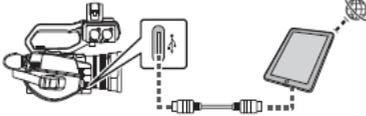
# 4. Mastering the features

AG-CX20

## 4-1. Network Connection Method and Available Functions

AG-CX20/CX18 can connect to the network via wired LAN, wireless LAN or USB tethering. Since it has built-in wireless functionality, there is no need to purchase a separate wireless module when using wireless LAN.

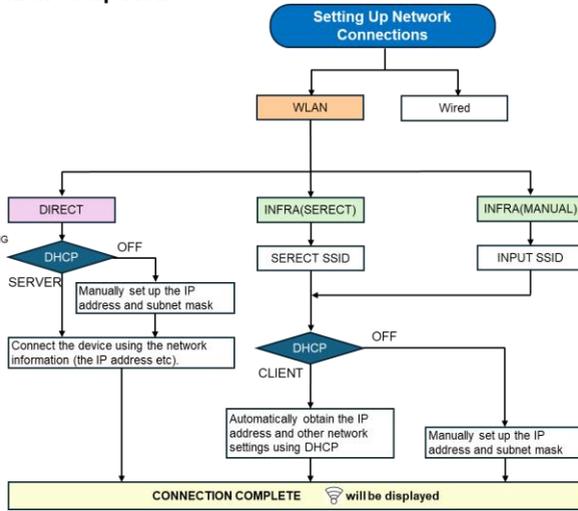
When you connect this unit to a network, the following functions are available.

How To Connect		Available Features		
		Remote Operation	Streaming	NDI® HX2*
Wireless	Direct connection via wireless LAN [DIRECT] 	○	-	-
	Connect to a wireless access point via wireless LAN [INFRA(SELECT)]/[INFRA(MANUAL)] 	○	○	-
Wired	Wired LAN [USB-LAN] 	○	○	○
	USB Tethering [USB TETHERING] 	○	○	-

\*Available for setting when using CX20.

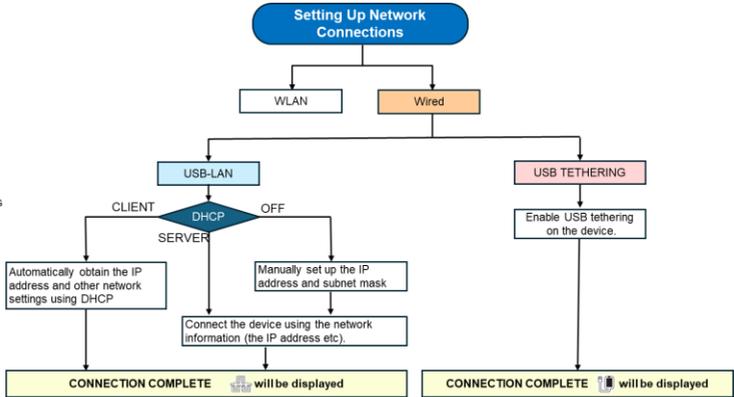
Wireless LAN Connection Setup Flow

MENU > NETWORK  
 DEVICE SEL :   
 MENU > NETWORK > WLAN PROPERTY  
 TYPE :   
 MENU > NETWORK > WLAN IPV4 SETTING  
 DHCP : 



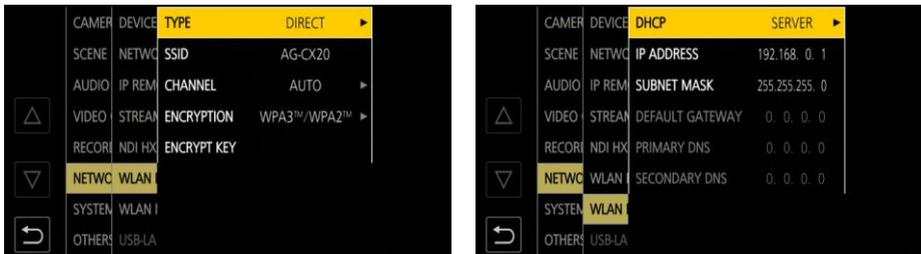
Wired Connection Setup Flow

MENU > NETWORK  
 DEVICE SEL :   
 MENU > NETWORK > WLAN IPV4 SETTING  
 DHCP : 



## 4-1-1. Settings for DIRECT Mode

Setting Items	Setting Value
<b>MENU &gt; NETWORK</b>	
DEVICE SEL	WLAN
<b>MENU &gt; NETWORK &gt; WLAN PROPERTY</b>	
TYPE	DIRECT
SSID	Factory Setting: AG-CX20/AG-CX18
ENCRYPTION	WPA2, WPA3, WPA3/WPA2 (Factory Setting: WPA3/WPA2)
ENCRYPT KEY	Set a password to be entered when connecting to this unit from a tablet device. (Factory Setting: 01234567890123456789abcdef)
<b>MENU &gt; NETWORK &gt; WLAN IPv4 SETTING</b>	
DHCP	SERVER: Accept the default settings OFF: Manually enter the desired IP address and subnet mask.
IP ADDRESS	Factory Setting: 192.168.0.1
SUBNET MASK	Factory Setting: 255.255.255.0



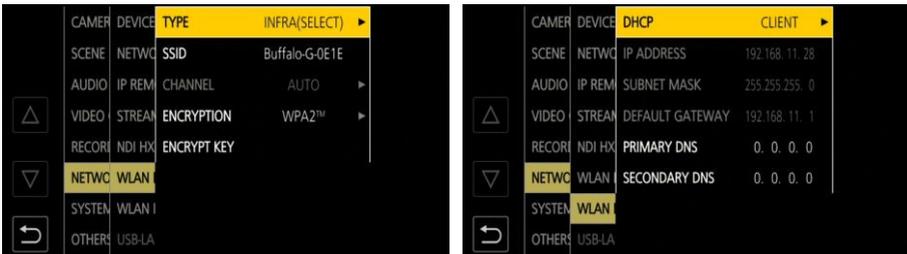
Example of the setting screen when connecting via DIRECT

After that, select the SSID of this unit from a device such as an iPad and enter the encryption key you set to connect.

When the connection is complete,  will be displayed on the screen.

4-1-2. Settings for INFRA(SELECT)/INFRA(MANUAL) Mode

Setting Items	Setting Value
<b>MENU &gt; NETWORK</b>	
DEVICE SEL	WLAN
<b>MENU &gt; NETWORK &gt; WLAN PROPERTY</b>	
TYPE	INFRA(SELECT) or INFRA(MANUAL)
SSID	INFRA(SELECT): Select SSID INFRA(MANUAL): Enter the SSID of the wireless access point
ENCRYPTION	WPA2, WPA3, WPA3/WPA2 (Factory Setting: WPA3/WPA2)
ENCRYPT KEY	Enter the encryption key for your wireless LAN
<b>MENU &gt; NETWORK &gt; WLAN IPv4 SETTING</b>	
DHCP	CLIENT: Automatically obtain IP address etc. OFF: Manually enter any IP address, etc.
IP ADDRESS	Factory Setting: 192.168.0.1 *Cannot be set to CLIENT
SUBNET MASK	Factory Setting: 255.255.255.0 *Cannot be set to CLIENT
DEFAULT GATEWAY	Factory Setting: 192.168.0.254 *Cannot be set to CLIENT
PRIMARY DNS	Factory Setting: 0.0.0.0
SECONDARY DNSr	Factory Setting: 0.0.0.0



Example of the setting screen when connecting via INFRA(SELECT)

When the connection is complete,  will be displayed on the screen.

## 4-1-3. Settings for Wired LAN Mode

Setting Items	Setting Value
<b>MENU &gt; NETWORK</b>	
DEVICE SEL	USB-LAN
<b>MENU &gt; Network &gt; USB-LAN IPv4 Settings</b>	
DHCP	CLIENT: Automatically obtain IP address etc. SERVER: Accept the default setting OFF: Manually enter any IP address etc.
IP ADDRESS	Factory Setting: 192.168.0.1 *Cannot be set to CLIENT
SUBNET MASK	Factory Setting: 255.255.255.0 *Cannot be set to CLIENT
DEFAULT GATEWAY	Factory Setting: 192.168.0.254 *Cannot be set to CLIENT
PRIMARY DNS	Factory Setting: 0.0.0.0
SECONDARY DNSr	Factory Setting: 0.0.0.0

It will not work with LAN adapters that are integrated with USB hubs. Please check here for Ethernet adapters that have been confirmed to work.

[https://av.jp.n.support.panasonic.com/support/global/cs/e\\_cam/connect/hcx2100\\_1600\\_acc.html](https://av.jp.n.support.panasonic.com/support/global/cs/e_cam/connect/hcx2100_1600_acc.html)



Example of the setting screen when connecting to USB-LAN

When the connection is complete,  will be displayed on the unit's screen.

## 4-1-4. Settings for USB Tethering Mode

Setting Items	Setting Value
<b>MENU &gt; NETWORK</b>	
DEVICE SEL	USB TETHERING

Enable USB tethering (Internet sharing) on the network settings screen of the USB tethering device connected to this unit.

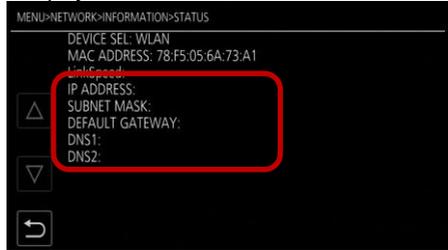
When the connection is complete,  will be displayed on the unit's screen.

### 4-1-5. Check the Network Status

**MENU > NETWORK > INFORMATION > STATUS** displays the status of the network function .



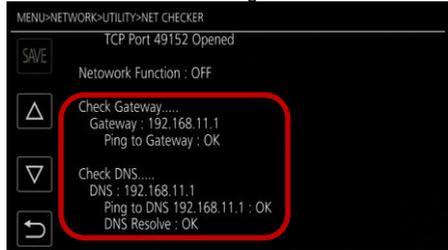
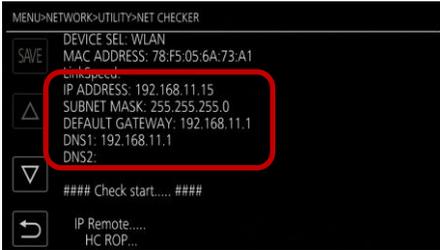
If connected



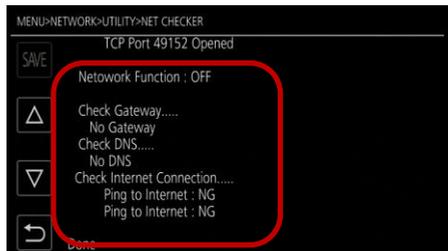
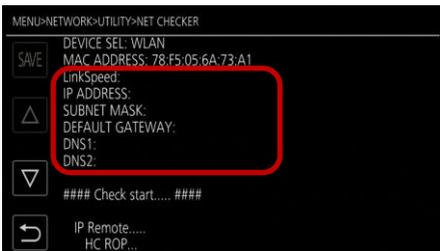
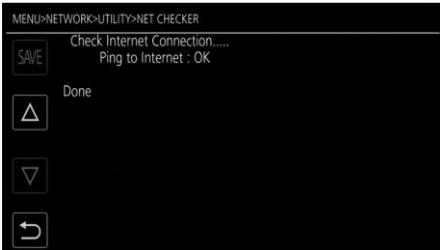
If not connected

If the IP address, subnet mask, default gateway, and DNS are displayed as they are in the settings, then the connection is established. If nothing is displayed, the connection is not established, so please check the network settings again.

**MENU > NETWORK > UTILITY > NET CHECKER** displays network information and connection status. You can also check the connection status of IP remote and streaming from here.



If connected



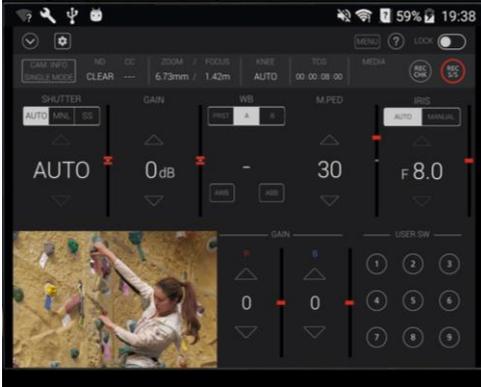
If not connected

**Troubleshooting Network Connection**

Phenomenon	Main Causes and Solutions
Cannot connect to network	<p>1. The camera settings are not correct.</p> <ul style="list-style-type: none"> <li>• Are the device and type selections, correct?</li> <li>• Have the property settings and IPv4 settings been entered correctly according to your environment? Selecting DHCP will allow you to connect most easily if you want to use the default settings as is, select SERVER, and if you want to obtain an IP address automatically, select CLIENT.</li> </ul> <p>2. Peripheral devices are not properly prepared</p> <ul style="list-style-type: none"> <li>• Is the USB port correct? The USB port for communication is on the right side of the main unit. The USB port on the rear of the main unit is for power supply only.</li> <li>• For wired LAN connection, a LAN adapter with a built-in USB hub will not work. Please refer to the list of adapters that have been confirmed to work.</li> </ul> <p>You can check the connection status with the icon in the upper right corner of the built-in LCD screen. Detailed information can also be viewed from MENU &gt; NETWORK &gt; INFORMATION &gt; STATUS.</p> <p>[Example] In the case of wireless LAN</p> <p> Connected state</p> <p> Unconnected state</p>

## 4-2. Mastering the Remote Operation Function

Remote operation using HC ROP is possible using the iPhone/iPad/Android app provided free of charge by our company.

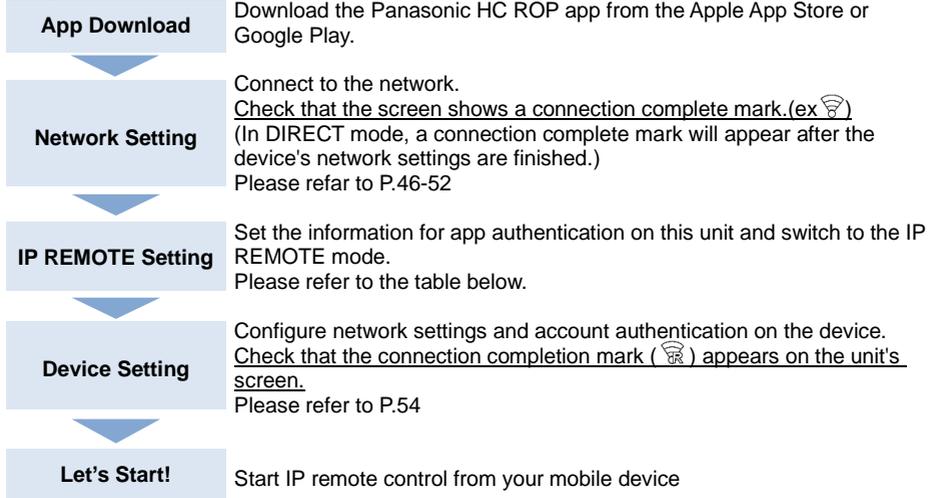


HC ROP app operation screen example



HC ROP App

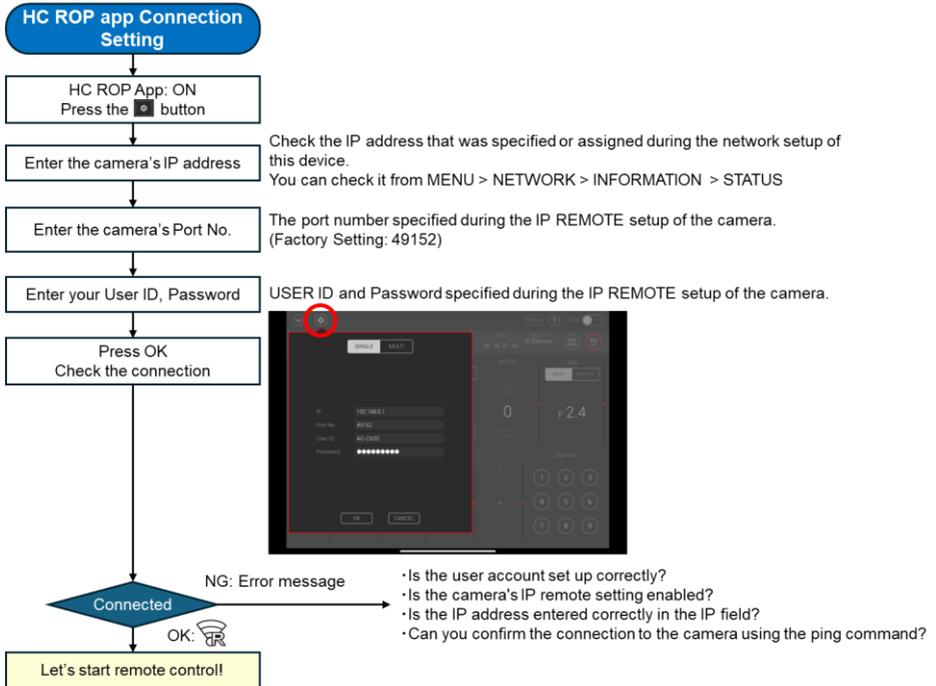
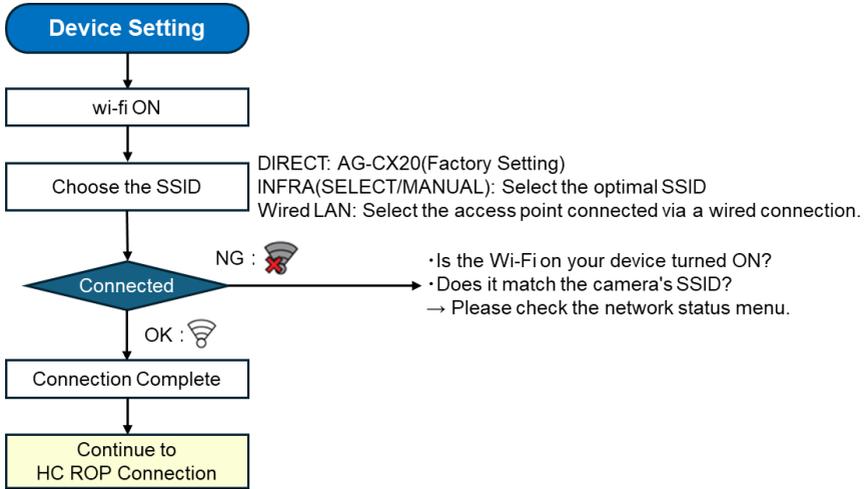
### Setup Instructions



### IP Remote Settings

Setting Items	Setting Value
<b>MENU &gt; NETWORK &gt; IP REMOTE</b>	
ENABLE/DISABLE	ENABLE
HC ROP PORT	Factory Setting: 49152
USER ACCOUNT	Set the account name and password for HC ROP app authentication. <u>Account name: Up to 31 characters</u> <u>Password: 8 to 15 characters</u>

Mobile Device Setup Flow

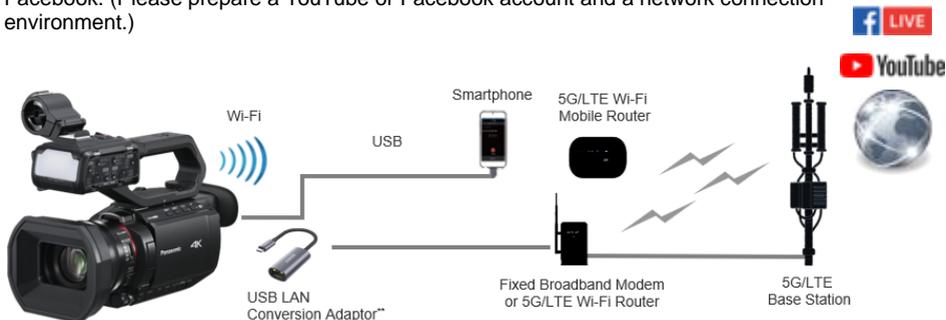


### Troubleshooting Remote Operations

Phenomenon	Main Causes and Solutions
<p>The app is unresponsive.</p>	<p>The camera cannot connect to the app.</p> <ul style="list-style-type: none"> <li>• Are the network connection settings correct?</li> <li>• Is the connection information (IP address, Port No., User ID, Password) registered correctly? You can check the unit's IP address from MENU &gt; NETWORK &gt; INFORMATION &gt; STATUS.</li> <li>• You cannot connect to the app while the menu or thumbnail screen is being displayed on the unit.</li> <li>• the app's local network setting turned on? You can check this in the Settings menu of your device.</li> </ul> <p>The connection status can be checked using the icon in the upper right corner of the screen.</p> <p> Set up for wireless LAN and connected to ROP</p> <p> Set to wireless LAN and not connected to ROP</p> <p> Set to wireless LAN but not connected</p>
<p>The app is connected, but it cannot be operated.</p>	<p>There are some items that cannot be operated while the app is connected.</p> <ul style="list-style-type: none"> <li>• The THUMBNAIL button on this unit cannot be used.</li> <li>• Recording can be controlled either on the unit or through the HC ROP app.</li> <li>• Playback operations are not possible.</li> </ul>

### 4-3. Mastering the Live Streaming Function (YouTube, Facebook)

AG-CX20/CX18 is equipped with FHD live streaming functionality via RTMP(S) and RTSP protocols. Video and audio can be distributed using live streaming features such as YouTube and Facebook. (Please prepare a YouTube or Facebook account and a network connection environment.)



\*\* 3<sup>rd</sup> Party Operation Confirmed Adaptors:  
Anker A8313 or A83130A2

#### Setup Instructions

##### Network Setting

Connect via WLAN (INFRA), USB-LAN, or USB TETHERING  
Check that the screen shows the connection completion mark (ex ).  
Please refer to P.46-52

##### Streaming Setting

Set the recording format on this unit and switch to streaming function.  
Please refer to the table below.

##### Protocol Setting

RTMP(S): Specify the video destination from the camera.  
RTSP: Specify the camera's IP address and password of the camera from the video receiving device.  
Please refer to P.57-58

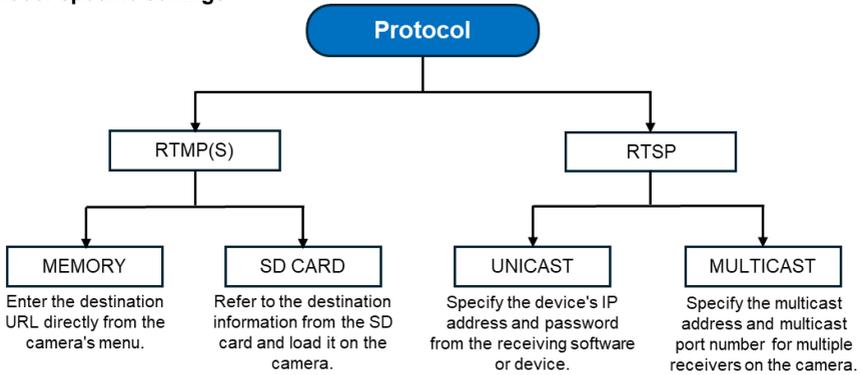
##### Let's Start!

Start broadcasting from each broadcasting tool.  
Please refer to P.59

#### Common Streaming Settings

Setting Items	Setting Value
<b>MENU &gt; SYSTEM</b>	
FREQUENCY	59.94Hz or 50.00Hz
FILE FORMAT REC FORMAT	Select the recording format. Available formats vary depending on the system settings , so please refer to the following sections: 1-1. Recording Format and Recording Time (P.8) for details.
<b>MENU &gt; NETWORK</b>	
NETWORK	STREAMING

Protocol-specific settings



4-3-1. RTMP(S) MEMORY

Setting Items	Setting Value
<b>MENU &gt; NETWORK &gt; STREAMING</b>	
STREAMING PROTOCOL	RTMP(S)
STREAMING FORMAT	Select the optimal format. Available formats vary depending on the system settings, so please refer to the following section: 6-4. Streaming Format (RTMP/RTSP) (P.84) for details.
CONNECTION INFO.	MEMORY
RTMP(S) RECEIVER URL	Enter the destination URL in the following format: - rtmp://(server URL):(port number)/(path)/(stream key) - rtmps://(server URL):(port number)/(path)/(stream key)
START	ON (Set after all settings are completed.)

4-3-2. RTMP(S) SD CARD

Insert the memory card containing the destination information into the card slot.

Setting Items	Setting Value
<b>MENU &gt; OTHERS &gt; FILE</b>	
SLOT FOR LOAD/SAVE	SLOT1 or SLOT2
<b>MENU &gt; NETWORK &gt; STREAMING</b>	
STREAMING PROTOCOL	RTMP(S)
STREAMING FORMAT	Select the optimal format. Available formats vary depending on the system settings, so please refer to the following section: 6-4. Streaming Format (RTMP/RTSP) (P.84) for details.
CONNECTION INFO.	SD CARD
START	ON (Set after all settings are completed)

The setting information that can be read by this unit is as follows:

- Information stored on this device
- Setting file created with the P2 Network Setting software (Please refer to P.60 for details)

**Information Management**

Setting Items	Setting Value
<b>MENU &gt; NETWORK &gt; STREAMING</b>	
SAVE (SD CARD)	Save destination information to memory card
LOAD (SD CARD)	Read destination information from memory card

**4-3-3. RTSP UNICAST**

The streaming is performed by operating the receiving application software or device.

Setting items	Setting Value
<b>MENU &gt; NETWORK &gt; STREAMING</b>	
STREAMING PROTOCOL	RTSP
STREAMING FORMAT	Select the distribution format. Available formats vary depending on the system settings , so please refer to the following section: 6-4. Streaming Format (RTMP/RTSP) (P.84) for details.
<b>MENU &gt; NETWORK &gt; STREAMING &gt; RTSP SETTING</b>	
LISTEN PORT	Factory Setting: 554

On the receiving side, specify the IP address and password of this unit as follows to start distribution .

rtsp://(IP address):(port number)/stream

**4-3-4. RTSP MULTICAST**

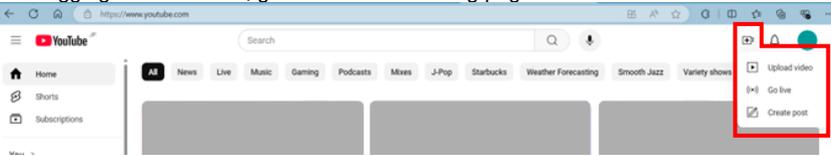
A single streaming stream to multiple receivers via a compatible router.

Setting Items	Setting Value
<b>MENU &gt; NETWORK &gt; STREAMING</b>	
STREAMING PROTOCOL	RTSP
STREAMING FORMAT	Select the distribution format. Available formats vary depending on the system settings , so please refer to the following section: 6-4. Streaming Format (RTMP/RTSP) (P.84) for details.
<b>MENU &gt; Network &gt; Streaming &gt; RTSP Settings</b>	
LISTEN PORT	Factory Setting: 554
MULTICAST	ENABLE
MULTICAST ADDRESS	Factory Setting: 239.192.0.20
MULTICAST PORT NUMBER	Factory Setting: 37004

Specify the address of this unit in your application software and start streaming.

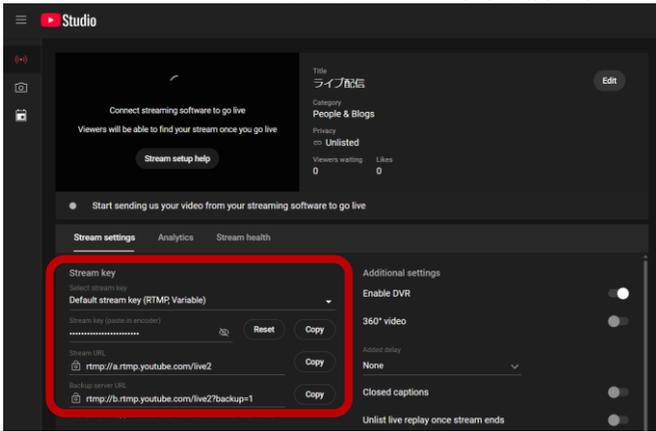
**RTMP(S) Distribution Procedure (e.g. YouTube)**

1. Complete the network settings, streaming settings, and protocol settings for this unit (for more details, please refer to P.46-52 and P.56-58).
2. After logging in to YouTube, go to the live streaming page.



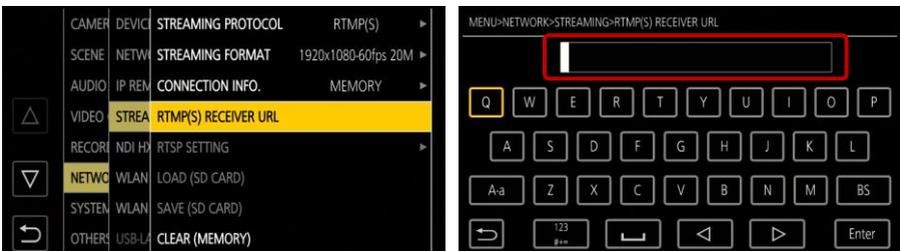
Example of YouTube login page

3. Live Streaming page > Stream settings and check the "Server URL" and "Stream key" which are the information needed to access the server from the AG-CX20/CX18 .



Example of YouTube live streaming settings page

4. ①When setting the destination from the unit's menu on MENU > NETWORK > STREAMING > RTMP(S) RECEIVER URL screen, enter the Server URL and Stream key consecutively, separated by "/" (slash)".



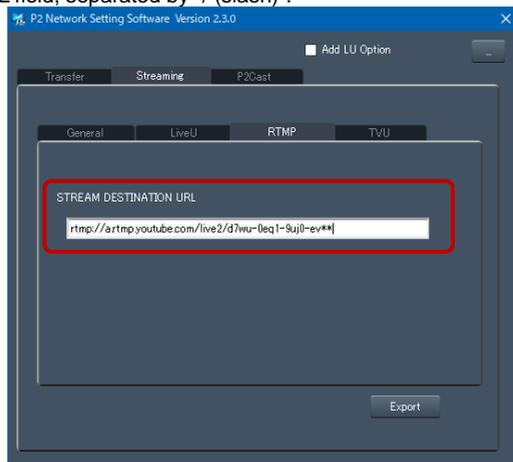
Receiver URL input screen

②When using the setting tool to enter the settings:

Download Windows P2 Network Setting software from

[https://eww.pass.panasonic.co.jp/pro-av/support/content/download/EN/ep2main/nw\\_setting\\_e.htm](https://eww.pass.panasonic.co.jp/pro-av/support/content/download/EN/ep2main/nw_setting_e.htm), then unzip it and run the executable file “P2netGen.exe” to mount the SD memory card on your PC.

Select the Streaming > RTMP tab and enter the Server URL and Stream key in the STREAM DESTINATION URL field, separated by “/ (slash)”.



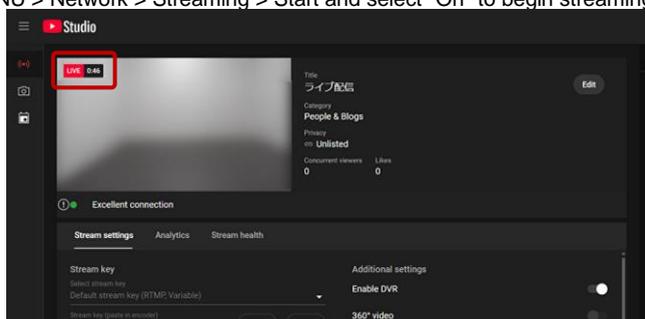
Windows P2 Network Setting software setting screen

Press the Export button at the bottom right to save the data to the SD card, then load the SD card on MENU > NETWORK > STREAMING > LOAD(SD CARD).



Reading the SD card

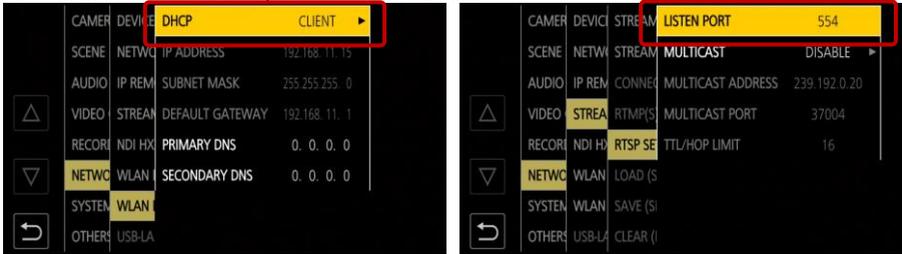
5. Go to MENU > Network > Streaming > Start and select "On" to begin streaming.



Streaming screen

## RTSP distribution procedure (e.g. VLC media player)

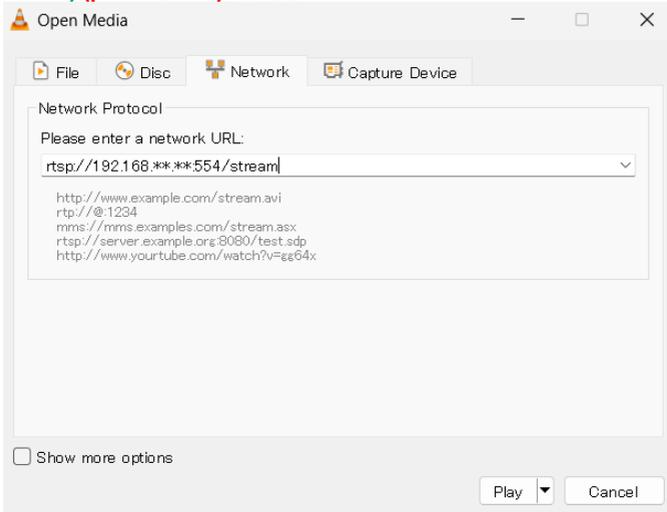
1. Set the IP address and port number of this unit .



RTSP configuration example

2. Open Media > Stream in VLC media player and specify the IP address and port number of this unit in the Network tab as follows:

**rtsp://(IP address):(port number)/stream**



VLC media player settings screen

3. Start broadcasting by playing the stream.

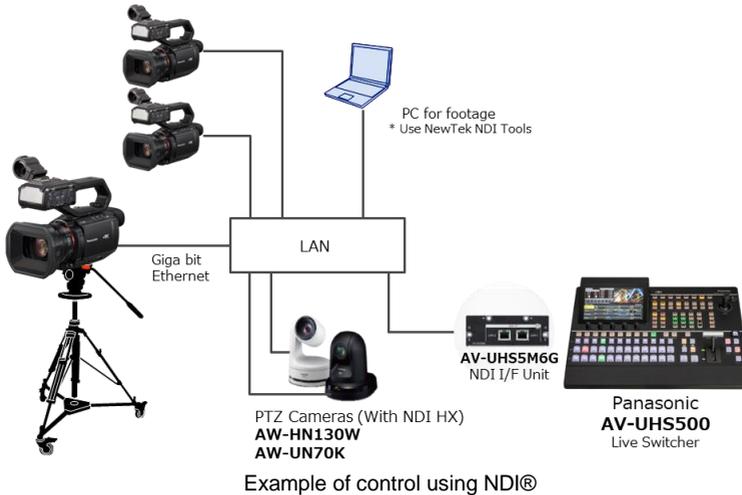
**Troubleshooting Live Streaming**

Phenomenon	Main Causes and Solutions
Streaming won't start	<p>The camera cannot reach the live streaming server.</p> <ul style="list-style-type: none"> <li>• Are the network connection settings correct?</li> <li>• the connection information (Server URL, Stream key, IP address, etc.) registered correctly?</li> <li>• Is the port used for streaming (TCP1935) being blocked somewhere along the way?</li> </ul> <p>The streaming status can be checked using the icon in the upper right corner of the built-in LCD screen.</p> <p> This unit is connected to a device that receives streaming video and delivers streaming video.</p> <p> The streaming function is enabled and not functioning properly and streaming video is not being distributed.</p> <p> An error has occurred in the streaming function, and it is not working properly.</p>
MENU > NETWORK > NETWORK FUNCTION is grayed out and the Streaming item cannot be selected	<p>The streaming function is not available due to other settings.</p> <ul style="list-style-type: none"> <li>• Is MENU &gt; SYSTEM &gt; RECORDING FORMAT set to UHD?</li> <li>• Is MENU &gt; Recording &gt; 2 Slot Function &gt; Background Recording enabled?</li> <li>• MENU &gt; Recording &gt; Recording Function &gt; Check that Interval Recording is enabled.</li> <li>• Check that MENU &gt; SYSTEM &gt; SUPER SLOW is set to ON.</li> </ul>

**About a Streaming Functionality for European Models: AG-CX20EJ / AG-CX18EJ / AG-CX18EH**  
 For the purpose of compliance with RED DELEGATED REGULATION (EU) 2022/30, a streaming functionality with RTP/RTSP/RTMP will no longer be provided from summer 2025 onward.

#### 4-4. Using the NDI® HX2 Connection Function \*Only CX20

AG-CX20 can also connect to and control other devices via NDI® HX2.



#### What is NDI®?

NDI® stands for Network Device Interface and is a connectivity and streaming specification for video devices over a network. Since audio and video data can be transmitted over the network, simple wiring using only Ethernet cables is possible, and high-quality, low-latency IP video transmission is possible. In addition, by connecting NDI®-compatible devices such as switchers, camera systems, and media servers on the same network, a variety of sources can be used in video production, making it possible to build a more flexible video system.

#### What is IP Video?

This refers to video transmitted over an IP network, where IP is a set of rules for communication over computer networks. NDI® is one type of IP video and is well known for its use in live streaming and video production.

#### [Advantages of IP Video]

##### ① High scalability

In video production, it can be difficult to add sources to an existing video system. With IP video, you can easily increase video sources with minimal system changes.

##### ② Decentralization of video

There is no need to consolidate video sources, and video can be sent and received anywhere on the network.

##### ③ Transmission distance

Long distance transmission is possible compared to SDI and HDMI cables.

##### ④ No need for expensive broadcasting equipment

Another advantage is the low cost of peripherals, so there's no need for expensive broadcast equipment.

**Setup Instructions****Network Setting**

Connect via wired LAN ( NDI® HX2 only works when connected via wired LAN). Check that the screen shows the connection completion mark (  ).  
Please refer to P.46-52

**NDI® HX2 Setting**

Set the recording format anit and switch to NDI HX2 mode.  
Please refer to the table below

**Device Setting**

Connect the camera and other devices on the same network.  
Please refer to P.46

**Let's Start!**

Start NDI HX2 connect from your camera.

**NDI® HX2 Setting**

Setting Items	Setting Value
<b>MENU &gt; SYSTEM</b>	
FREQUENCY	59.94Hz or 50.00Hz
FILE FORMAT REC FORMAT	Select the recording format. Available formats vary depending on the system settings , so please refer to the following sections: 1-1. Recording Format and Recording Time (P.8) for details.
<b>MENU &gt; NETWORK</b>	
NETWORK FUNK	NDI HX2
<b>MENU &gt; NETWORK &gt; NDI HX2</b>	
STREAMING FORMAT	Select the distribution format. Available formats vary depending on the system settings , so please refer to the following section: 6-5. Streaming Format (NDI® HX2) (P.85) for details. 6-5. Streaming Format (NDI® HX2)
MULTICAST	ENABLE, DISABLE
MULTICAST ADDRESS	Set according to your environment (Factory setting: 239.192.0.20)

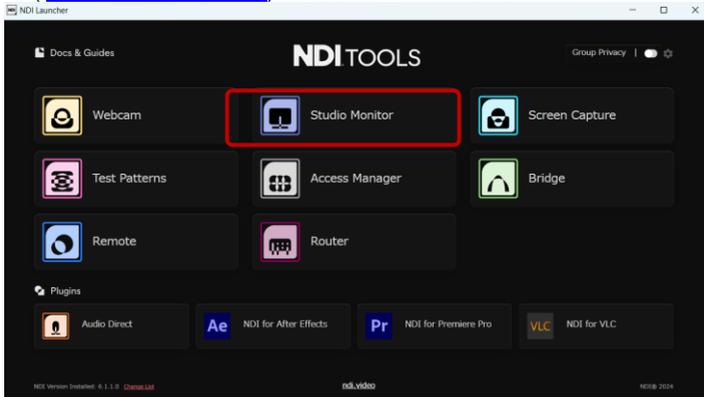
**Operating instructions (e.g. NDI TOOLS)**

1. the wired LAN and NDI HX2 functions . (For details, see P.50-52 and P.63-64.)



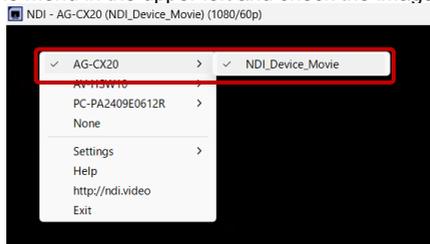
Example of setting up NDI HX2 function

2. Connect the devices you want to connect to this unit, such as a PC or switcher, to the network set up in step 1.
3. NDI TOOLS ( <https://ndi.video/tools/> ) and select Studio Monitor.



Example of NDI TOOLS top screen

4. Select this unit from the menu in the upper left and check the image on the monitor.



Studio Monitor screen example

About a Streaming Functionality for European Models: **AG-CX20EJ / AG-CX18EJ / AG-CX18EH**  
 For the purpose of compliance with RED DELEGATED REGULATION (EU) 2022/30, a streaming functionality with NDI® will no longer be provided from summer 2025 onward.

## 4-5. Monitoring/Recording Video

This unit is equipped with an HDMI output terminal and an SDI (3G -SDI compatible) output terminal, and it is possible to set different output resolutions for each and output them simultaneously.



### SDI Output Settings

1. MENU > SYSTEM > FREQUENCY
2. MENU > SYSTEM > FILE FORMAT
3. MENU > SYSTEM > REC FORMAT
4. MENU > VIDEO OUT/LCD/VF > VIDEO OUT SEL > SDI OUT FORMAT

The format of the output video will change based on the system settings and output settings of the main unit. For more details, please refer to following section: 6-2. List of Output Resolutions for External Output (SDI) (P.82).

### HDMI Output Settings

1. MENU > SYSTEM > FREQUENCY
2. MENU > SYSTEM > FILE FORMAT
3. MENU > SYSTEM > REC FORMAT
4. MENU > VIDEO OUT/LCD/VF > VIDEO OUT SEL > HDMI OUT FORMAT

The format of the output video will change based on the system settings and output settings of the main unit. For more details, please refer to following section: 6-3. List of Output Resolutions for External Output (HDMI) (P.83).

## 4-6. Mastering the Focus Assist Function

This unit is equipped with the following two types of focus assist functions. These are used by assigning them to USER buttons in advance.

### View larger image



Enlarges the image by x2, x3, or x4. You can also select the time to enlarge the image.

#### How to use

1. Select EXPAND or EXPAND&PEAKING in MENU > VIDEO OUT/LCD/VF > FOCUS ASSIST > FOCUS ASSIST SW.
2. Assign FOCUS ASSIST to any USER button.
3. Set the expand mode.  
MENU > VIDEO OUT/LCD/VF > FOCUS ASSIST > EXPAND MODE  
10SEC: Enlarge for 10 seconds  
HOLD: Enlarge until you press the USER button again  
UNTIL REC: Zoom in until recording starts
4. Set the expand value.  
MENU > VIDEO OUT/LCD/VF > FOCUS ASSIST > EXPAND VALUE (x2, x3, x4)
5. Press the USER button to which a function is assigned.

### Peaking



Emphasizes the outline of the area in focus. You can change the strength and color of the emphasis.  
It is also possible to add peaking to the enlarged image as shown on the right image.

#### How to use

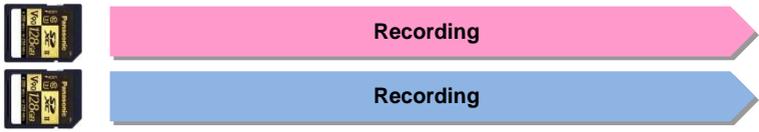
1. Select PEAKING or EXPAND&PEAKING in MENU > VIDEO OUT/LCD/VF > FOCUS ASSIST > FOCUS ASSIST SW.
2. Assign PEAKING to any USER button.
3. Sets the strength of the highlight.  
MENU > VIDEO OUT/LCD/VF > FOCUS ASSIST > PEAKING LEVEL
4. Sets the highlight color.  
MENU > VIDEO OUT/LCD/VF > FOCUS ASSIST > PEAKING COLOR (Red, Green, White)
5. Press the USER button to which a function is assigned.

## 4-7. Mastering the Dual Card Slots

This unit is equipped with two memory card slots, allowing you to make use of them for a variety of recording purposes.

### Simultaneous Recording

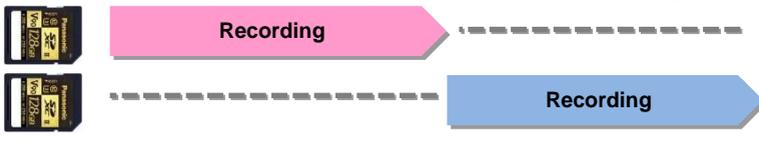
This mode records the same content onto two memory cards. If an error occurs on one of the cards during recording and recording stops on that card, the other card will continue to record



- one of the memory cards runs out of recording space, simultaneous recording will stop. To start simultaneous recording again, replace the memory card and press the REC button.
- For simultaneous recording, we recommend using memory cards with the same speed class and capacity. If you use a memory card with a different speed class or capacity, recording may stop due to insufficient speed. When recording stops, the video immediately before stopping may be recorded incorrectly.

### Relay Recording

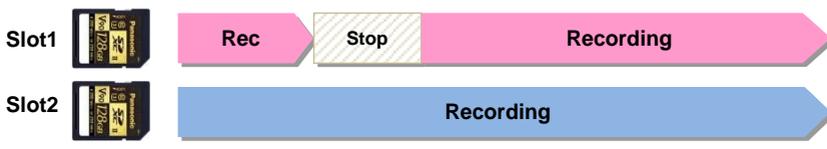
When the memory card becomes full during shooting. It is suitable for long periods of continuous shooting. It is also possible to change the other card during recording.



- The maximum continuous recording time for relay recording is 10 hours. If the recording time exceeds 10 hours, recording will stop. After a few seconds, recording will automatically resume.

### Background Recording

This mode repeatedly starts and stops recording on the memory card in slot 1 while continuing to record to the card in slot 2 (solid shooting). This is useful for preventing missed shots.



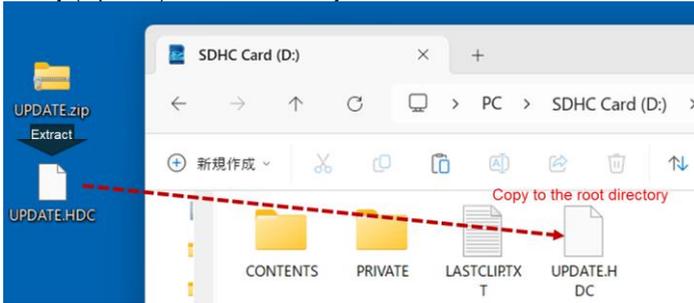
- To stop recording on Slot 2, press the USER button to which the BACKGR PAUSE is assigned. Press and hold for 5 seconds.

How to use the 2 slot function?

**MENU > RECORDING > 2 SLOTS FUNC. > SIMUL REC, RELAY REC, BACKGR REC**

### 4-8. Firmware Update Procedure

1. Download the firmware package from the support site (<https://eww.pass.panasonic.co.jp/pro-av/support/content/download/EN/top.html>).
2. Extract the downloaded ZIP package and copy the resulting firmware ( UPDATE.HDC file ) to the root directory (top level) of the SD memory card .



ZIP package procedure image

3. Mount the SD memory card to which you copied the UPDATE.HDC file into card slot 1 of this unit .
4. Select MENU > OTHERS > INFORMATION > UPDATE > YES to perform the firmware update .



5. The operation indicator lamp will flash, and after about 30 seconds, the unit will automatically restart. When the message "Update successful" appears, press OK..
6. Check the updated version information in MENU > OTHER > INFORMATION > VERSION.

### Troubleshooting of Updates

Error Content	Checkpoints, causes and solutions
 <p>REINSERT OR CHECK CARD.</p>	<ul style="list-style-type: none"> <li>• Is the file name original (UPDATE.HDC) (e.g. UPDATE.HDC 2 , UPDATE.HDC -1 , etc.)? Files that have been renamed cannot be used.</li> <li>• Is the memory card mounted in Slot1? It will not work in Slot2.</li> <li>• Has the UPDATE.HDC file been copied to the root directory of the memory card?</li> </ul>

# 5. Effects of image quality adjustment

AG-CX20

## 5-1. Scene File Preset List

This camera is equipped with six types of image setting presets (scene files) for various shooting scenes. Each image setting item of all presets can be customized to your liking.

Scene Number	Examples of Recommended Shooting Scenes
F1:	Standard settings.
F2: FLUO	This setting is suitable for shooting indoors, etc., taking into account the characteristics of fluorescent lights. Most settings are equivalent to F1, and the matrix is a setting for fluorescent lights. This is not particularly necessary under fluorescent lights with a color temperature close to natural light, such as daylight white, but it is suitable when shooting under conditions where color reproduction is poor, such as under fluorescent lights with a strong bluish tint.
F3: SPARK	When you want to add sharpness to the color and contrast. It produces a bright, flashy image with strong colors.
F4: STILL	This setting expresses the image quality tone of a digital still camera. Most settings are equivalent to F1, and Matrix is a setting for still cameras.
F5: CINE V	This setting is suitable for cinematic shooting with emphasis on contrast.
F6: CINE D	This setting is suitable for cinematic shooting with emphasis on dynamic range.

For a list of menu settings for each preset, please refer to 6-1. Scene File Setting List (P.8181)..

## 5-2. Changing the Texture of the Image (Detail Function)

Detail function (adjusting the amount of contour correction) is effective in expressing the gloss and texture of the subject more naturally.

The image below shows the result of adjusting the Master Detail, which is the detail of the entire screen. The outline of the building and the texture of the plants have changed as a result of the detail adjustment.

Master Detail: +15



Master Detail: -15



MENU > SCENE FILE ( \_\_\_ is the factory setting)

**MASTER DTL -15 ... 0 ... 15**

Adjusts the overall level of detail effect.

**DTL CORING 0 ... 1 ... 30**

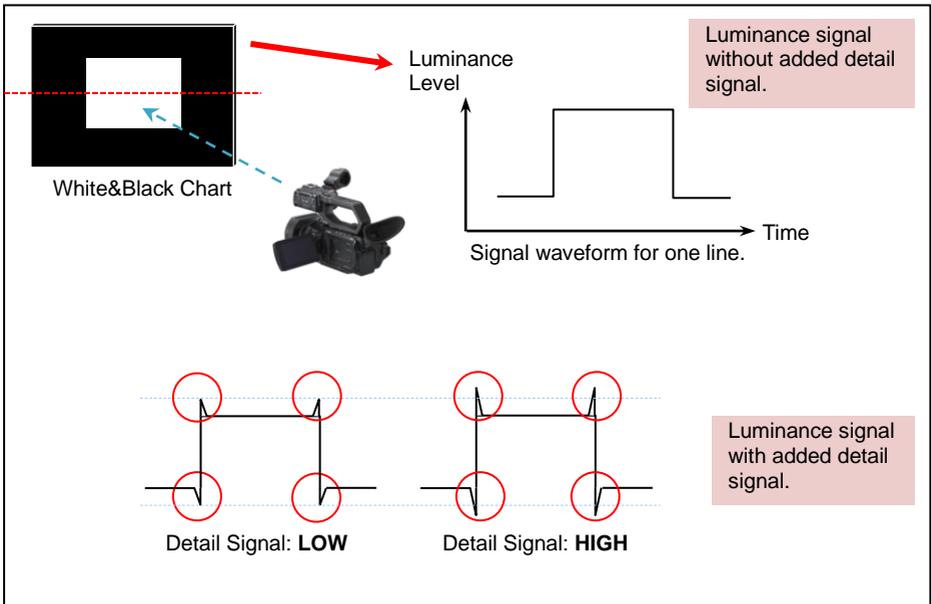
Sets the level of signals (including noise) that do not require the detail effect to be applied .

**V.DTL LEVEL -7 ... 0 ... 7**

Sets the vertical detail level strength.

**5-2-1. What Is a Detail Function?**

Adjusts the level of the detail (contour) signal added to the video signal. Increasing the detail level increases the signal strength of the edges of the video signal, resulting in sharper image contours. Decreasing the detail level decreases the signal strength of the edges of the video signal, resulting in a softer image with less emphasis on the edges of the image.



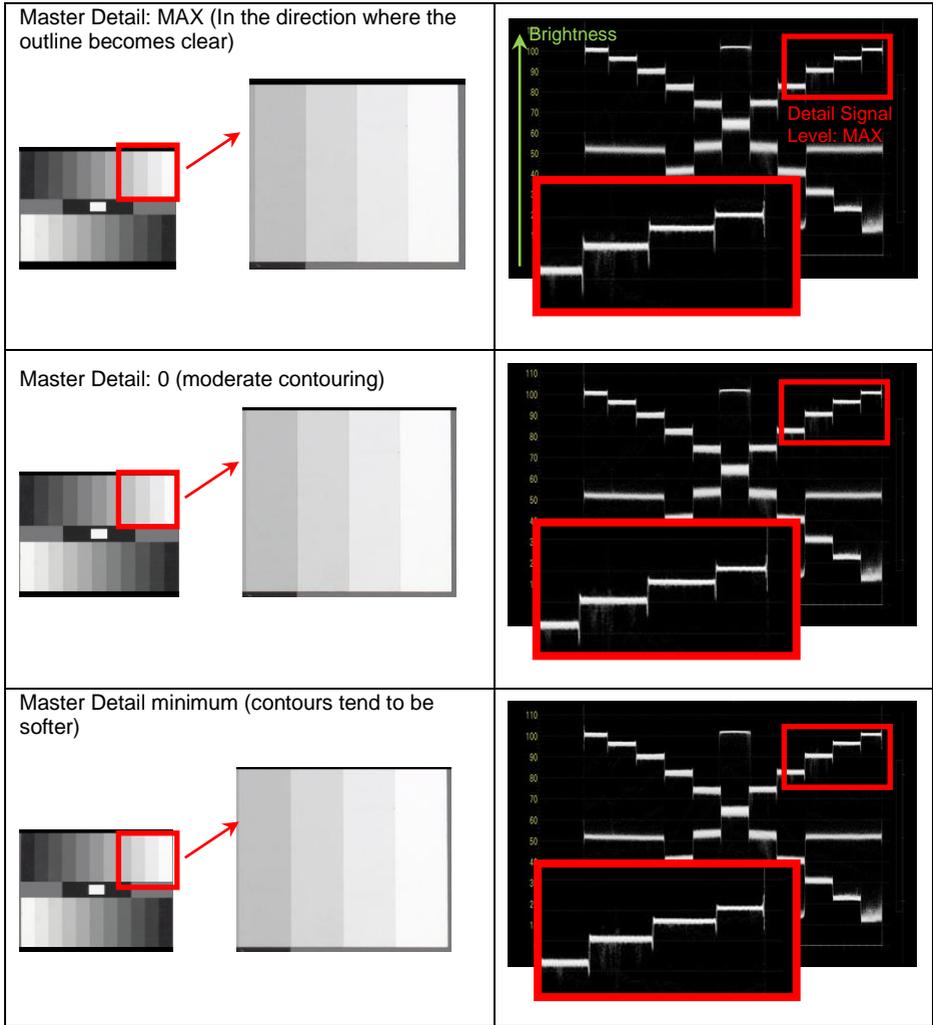
**[Related Information]**

**WFM**

WFM stands for Waveform Monitor, which is a monitor used for monitoring, adjusting, and measuring waveforms. It visualizes electrical signals that are usually not visible to the naked eye, allowing you to check the status of these signals in real time. By using the WFM during detail adjustments or knee adjustments, you can operate while visually confirming the effects. Please set it to any user switch for your convenience.84

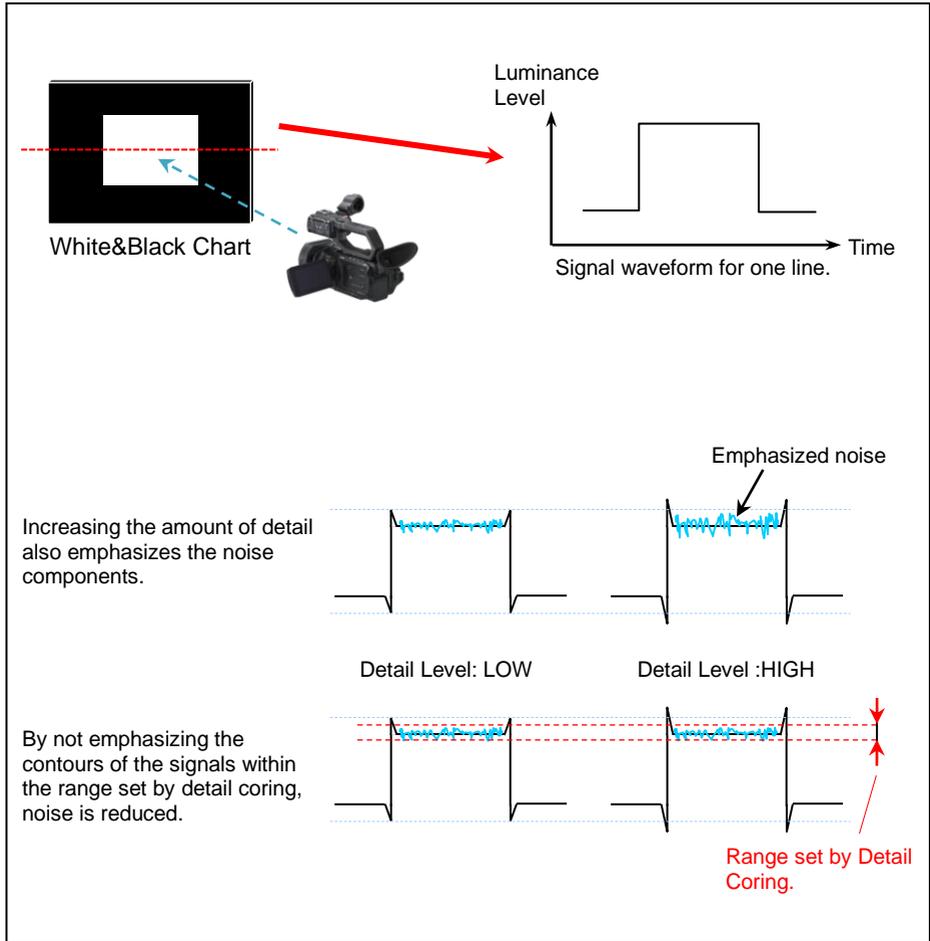
### 5-2-2. Master Detail Adjustment

To adjust the detail signal in both positive and negative directions, adjust the Master Detail item. The effect is shown below.



### 5-2-3. Detail Coring Adjustment

While emphasizing edges can produce clearer images, it can also make the overall image grainy. This is because the added detail signal also affects low-level signals such as noise. The detail coring function allows you to adjust the range to which the detail signal is added, thereby reducing noise caused by detail adjustment.



## 5-3. Expressing the Gradation of Images (Knee and Gamma Mode Settings)

### 5-3-1. Knee Adjustment

When photographed outdoors on a sunny day or due to lighting conditions, bright areas may appear crushed or blown out.

This phenomenon occurs because the luminance signal in this area exceeds the dynamic range (processing range) of the camera. The knee adjustment function can be used to compress the gradation in order to bring this high luminance signal within the processing range of the camera.

MENU > SCENE FILE ( \_\_\_ is the factory setting )

---

#### [ KNEE MODE ] AUTO / LOW / MEDIUM / HIGH / OFF

The knee point and slope are adjusted automatically according to the received signal level .

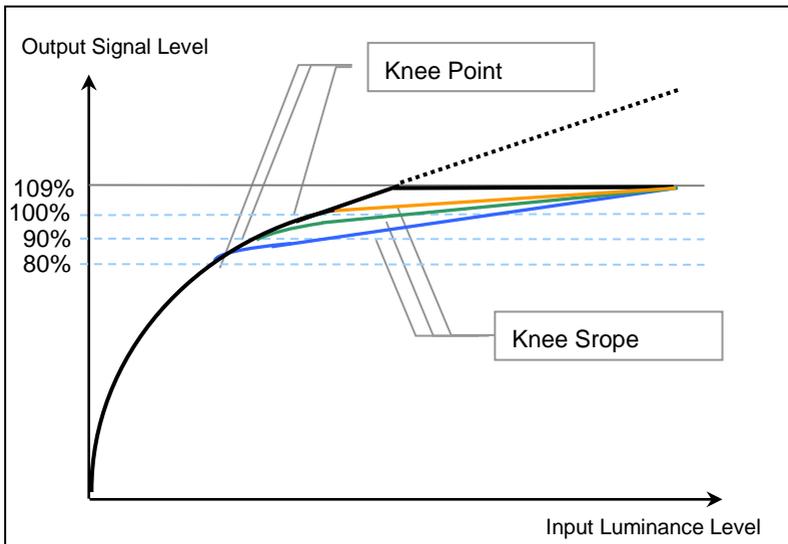
LOW: Compression starts at about 100%.

MEDIUM: Compression starts at about 90%.

HIGH: Compression starts at about 80%.

OFF: The knee function is not used.

---



The diagram is for illustrative purposes and may not reflect actual measurements.

**KNEE MODE: OFF**

The fluff and leaf parts are overexposed.

**KNEE MODE: HIGH**

The fluff and leaves show a range of color gradation.

**5-3-2. Gamma Mode Selection**

Sometimes the natural color and sharpness seen by the eye cannot be fully expressed in the image. In such cases, it is effective to adjust the gradation of the output signal. Select the appropriate gamma curve according to the subject. The AG-CX20/CX18 has eight types of gamma curves.

<p><b>HD</b> Video gamma characteristics for HD (High Definition). Settings determined by ARIB, EBU, SMPTE, etc. This is the gamma setting that complies with the EN 1001001 standard. Use this when shooting in standard HD.</p>
<p><b>SD</b> The gain in dark areas is higher than in HD gamma. This is the gamma curve to use when you want to apply the gamma used for SD shooting as is.</p>
<p><b>FILMLIKE1</b> Compared to HD gamma, this has the characteristic of being able to reproduce more detailed gradations in the highlight areas.</p>
<p><b>FILMLIKE2</b> Compared to FILMLIKE1, this has the characteristic of being able to reproduce more pronounced gradation in highlight areas.</p>
<p><b>FILMLIKE3</b> Compared to FILMLIKE2, this has the characteristic of being able to reproduce more detailed gradations in highlight areas.</p>
<p><b>CINE-LIKE D</b> This gamma characteristic emphasizes contrast and creates a cinematic image.</p>
<p><b>CINE-LIKE V</b> This is a gamma characteristic that creates a cinematic image.</p>
<p><b>STILL LIKE</b> This is the gamma characteristic of the image quality tone of a digital still camera.</p>

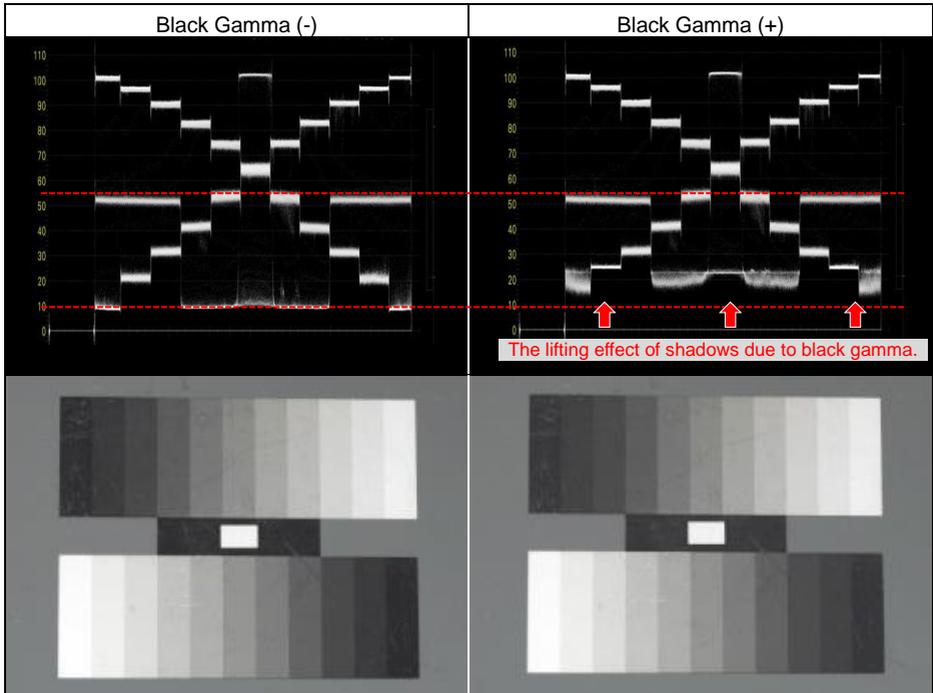
### 5-3-3. Black Gamma

You can adjust the black gamma to bring out or suppress the dark areas of the image. The image changes when you adjust the black gamma.

MENU > SCENE FILE ( \_\_\_ is the factory setting )

**[BLACK GAMMA] -4 ... 0 ... 4**

Sets the gamma curve for the dark areas.



By utilizing black gamma adjustment, you can achieve effects such as expressing each individual strand of black hair or making the shadow areas of a landscape stand out without changing the brightness of the entire image.

# 6. Appendix

AG-CX20

## 6-1. Scene File Settings List

Setting Items	File Selection					
	F1:	F2: FLUO	F3: SPARK	F4: STILL	F5: CINE V	F6: CINE D
Master Detail	0	0	3	0	-4	-4
Detail Coring	1	1	1	1	1	1
V Detail Level	0	0	0	0	0	0
RB Gain Control Settings						
R Gain AWB A	0	0	0	0	0	0
B Gain AWB A	0	0	0	0	0	0
R Gain AWB B	0	0	0	0	0	0
B Gain AWB B	0	0	0	0	0	0
AWB A Gain Offset	OFF	OFF	OFF	OFF	OFF	OFF
AWB A Gain Offset	OFF	OFF	OFF	OFF	OFF	OFF
Chroma Level	0	0	4	0	-10	-10
Chroma Phase	0	0	5	0	0	0
Matrix	NORMA L1	FLUO	NORMA L2	STILL LIKE	CINEMA LIKE	CINEMA LIKE
Color Correction	0	0	0	0	0	0
Skin Tone Detail	OFF	OFF	OFF	OFF	OFF	OFF
Master Pedestal	0	0	0	0	0	0
Gamma Mode Selection	HD	HD	HD	STILL LIKE	CINE- LIKE V	CINE- LIKE D
Black Gamma	0	0	-1	0	0	0
Knee Mode	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
White Clip Setting						
White Clip	0	0	0	0	0	0
White Clip Level	0	0	0	0	0	0
DRS	ON	ON	ON	ON	ON	ON
DRS Effect	1	1	1	1	1	1
Noise Reduction Control	0	0	0	0	0	0
AE Level	ON	ON	ON	ON	ON	ON
AE Level Effect	0EV	0EV	0EV	0EV	0EV	0EV

## 6-2. List of Output Resolutions for External Output (SDI)

The format that can be output from the SDI OUT terminal changes depending on the combination of the following settings.

**MENU > SYSTEM > FREQUENCY**  
**MENU > SYSTEM > FILE FORMAT**  
**MENU > SYSTEM > REC FORMAT**  
**MENU > VIDEO OUTPUT/LCD/VF > VIDEO OUT SEL > SDI OUT FORMAT**

System Frequency	Item		Output Format (_: Factory Setting)	
	Resolution	Frame Rate		
59.94Hz	3840x2160	59.94p	1920x1080 59.94p, <u>1920x1080 59.94i</u>	
		29.97p	1920x1080 29.97p, <u>1920x1080 29.97PsF</u>	
		23.98p	1920x1080 23.98p, <u>1920x1080 23.98PsF</u>	
	1920x1080	59.94p	1920x1080 59.94p, <u>1920x1080 59.94i</u>	
		59.94i	1920x1080 59.94i	
		29.97p	1920x1080 29.97p, <u>1920x1080 29.97PsF</u>	
		23.98p	1920x1080 23.98p, <u>1920x1080 23.98PsF</u>	
	1280x720	59.94p	1280x720 59.94p	
	50.00Hz	3840x2160	50.00p	1920x1080 50.00p, <u>1920x1080 50.00i</u>
			25.00p	1920x1080 25.00p, <u>1920x1080 25.00PsF</u>
1920x1080		50.00p	1920x1080 50.00p, <u>1920x1080 50.00i</u> ,	
		50.00i	1920x1080 50.00i	
		25.00p	1920x1080 25.00p, <u>1920x1080 25.00PsF</u>	
1280x720		50.00p	1280x720 50.00p	

**6-3. List of Output Resolutions for External Output (HDMI)**

The format that can be output from the HDMI terminal changes depending on the combination of the following settings.

**MENU > SYSTEM > FREQUENCY**  
**MENU > SYSTEM > FILE FORMAT**  
**MENU > SYSTEM > REC FORMAT**  
**MENU > VIDEO OUT/LCD/VF > VIDEO OUT SEL > HDMI OUT FORMAT**

System Frequency	Item		Output Format (_: Factory Setting)	
	Recording Format			
	Resolution	Frame Rate		
59.94Hz	3840x2160	59.94p	3840x2160 59.94p, 3840x2160 59.94p (4:2:0/8bit), <u>1920x1080 59.94p</u> , 1920x1080 59.94i	
		29.97p	3840x2160 29.97p, <u>1920x1080 29.97p</u>	
		23.98p	3840x2160 23.98p, <u>1920x1080 23.98p</u>	
	1920x1080	59.94p	<u>1920x1080 59.94p</u> , 1920x1080 59.94i 720x480 59.94p <sup>*1</sup>	
		59.94i	<u>1920x1080 59.94i</u> , 720x480 59.94p <sup>*1</sup>	
		29.97p	1920x1080 29.97p	
		23.98p	<u>1920x1080 23.98p</u> , 720x480 59.94p <sup>*1</sup>	
	1280x720	59.94p	<u>1280x720 59.94p</u> , 720x480 59.94p <sup>*1</sup>	
	50.00Hz	3840x2160	50.00p	3840x2160 50.00p, 3840x2160 50.00p (4:2:0/8bit), <u>1920x1080 50.00p</u> , 1920x1080 50.00i
			25.00p	3840x2160 25.00p, <u>1920x1080 25.00p</u>
1920x1080		50.00p	<u>1920x1080 50.00p</u> , 1920x1080 50.00i, 720x576 50.00p <sup>*1</sup>	
		50.00i	<u>1920x1080 50.00i</u> , 720x576 50.00p <sup>*1</sup>	
		25.00p	1920x1080 25.00p	
1280x720		50.00p	<u>1280x720 50.00p</u> , 720x576 50.00p <sup>*1</sup>	

\*1: Can be selected when the file format is AVCHD.

## 6-4. Streaming Format (RTMP/RTSP)

The formats that can be output using the network streaming function of this unit are shown below. This item can be selected from the following menu items.

### MENU > NETWORK > STREAMING > STREAMING FORMAT

Item		Output Format (_: Factory Setting)
File Format	Recording Format	
P2 MOV MP4 AVCHD	1080/59.94p	1920x1080-60fps 24M, 1920x1080-60fps 20M, 1920x1080-60fps 16M, 1280x720-60fps 14M, 1280x720-60fps 8M, 1280x720-60fps 3M, 640x360-30fps 4M, 640x360-30fps 1.5M, <u>640x360-30fps 0.7M</u> , 320x180-30fps 4M, 320x180-30fps 1.5M, 320x180-30fps 0.5M
P2 MOV MP4 AVCHD	1080/50.00p	1920x1080-50fps 24M, 1920x1080-50fps 20M, 1920x1080-50fps 16M, 1280x720-50fps 14M, 1280x720-50fps 8M, 1280x720-50fps 3M, 640x360-25fps 4M, 640x360-25fps 1.5M, <u>640x360-25fps 0.7M</u> , 320x180-25fps 4M, 320x180-25fps 1.5M, 320x180-25fps 0.5M
MOV	1080/59.94i 1080/29.97p	1920x1080-30fps 14M, 1920x1080-30fps 6M, 1920x1080-30fps 1M, 1280x720-30fps 8M, 1280x720-30fps 2M, 1280x720-30fps 1M, 640x360-30fps 4M, 640x360-30fps 1.5M, <u>640x360-30fps 0.7M</u> , 320x180-30fps 4M, 320x180-30fps 1.5M, 320x180-30fps 0.5M
P2 AVCHD	1080/59.94i	
MOV	1080/50.00i 1080/25.00p	1920x1080-25fps 14M, 1920x1080-25fps 6M, 1920x1080-25fps 1M, 1280x720-25fps 8M, 1280x720-25fps 2M, 1280x720-25fps 1M, 640x360-25fps 4M, 640x360-25fps 1.5M, <u>640x360-25fps 0.7M</u> , 320x180-25fps 4M, 320x180-25fps 1.5M, 320x180-25fps 0.5M
P2 AVCHD	1080/50.00i	
MOV MP4 AVCHD	1080/23.98p	1920x1080-24fps 14M, 1920x1080-24fps 6M, <u>1920x1080-24fps 1M</u>
P2 AVCHD	720/59.94p	1280x720-60fps 14M, 1280x720-60fps 8M, 1280x720-60fps 3M, 640x360-30fps 4M, 640x360-30fps 1.5M, <u>640x360-30fps 0.7M</u> , 320x180-30fps 4M, 320x180-30fps 1.5M, 320x180-30fps 0.5M,
P2 AVCHD	720/50.00p	1280x720-50fps 14M, 1280x720-50fps 8M, 1280x720-50fps 3M, 640x360-25fps 4M, 640x360-25fps 1.5M, <u>640x360-25fps 0.7M</u> , 320x180-25fps 4M, 320x180-25fps 1.5M, 320x180-25fps 0.5M,

### 6-5. Streaming Format (NDI® HX2)

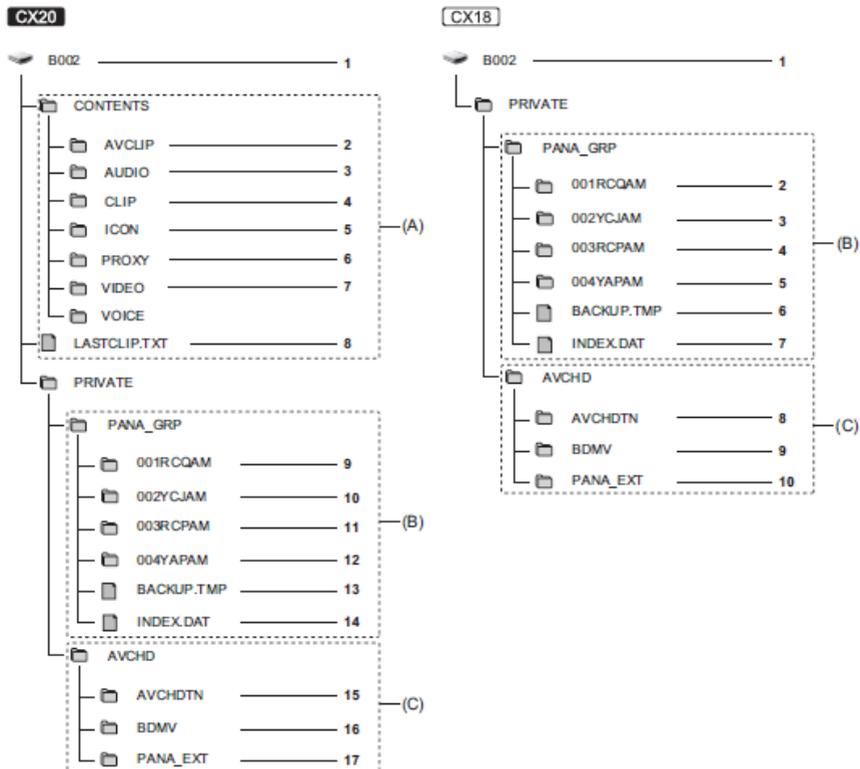
The formats that can be output using the NDI® network streaming function of this unit are shown below.

This item can be selected from the following menu items .

**MENU > NETWORK > NDI HX2 > STREAMING FORMAT**

Item		Output Format (_: Factory Setting)
File Format	Recording Format	
P2 MOV MP4 AVCHD	1080/59.94p	1920x1080-60fps 24M, 1920x1080-60fps 16M, 1920x1080-60fps <u>10M</u> , 1920x1080-60fps 8M, 1280x720-60fps 14M, 1280x720-60fps 10M, 1280x720-60fps 6M
P2 MOV MP4 AVCHD	1080/50.00p	1920x1080-50fps 24M, 1920x1080-50fps 16M, <u>1920x1080-50fps 10M</u> , 1920x1080-50fps 8M, 1280x720-50fps 14M, 1280x720-50fps 10M, 1280x720-50fps 6M
MOV	1080/59.94i 1080/29.97p	1920x1080-30fps 14M, <u>1920x1080-30fps 10M</u> , 1920x1080-30fps 6M, 1280x720-30fps 8M, 1280x720-30fps 4M, 1280x720-30fps 2M
P2 AVCHD	1080/59.94i	
MOV	1080/50.00i 1080/25.00p	1920x1080-25fps 14M, <u>1920x1080-25fps 10M</u> , 1920x1080-25fps 6M, 1280x720-25fps 8M, 1280x720-25fps 4M, 1280x720-25fps 2M
P2 AVCHD	1080/50.00i	
P2 AVCHD	720/59.94p	1280x720-60fps 14M, 1280x720-60fps 10M, 1280x720-60fps 6M
P2 AVCHD	720/50.00p	1280x720-50fps 14M, 1280x720-50fps 10M, 1280x720-50fps 6M

## 6-6. Example of Memory Card Folder Structure



- (A) P2 Format  
 (B) MOV/MP4 Format  
 (C) AVCHD Format

1. Memory card volume label
2. Video data in MXF format (audio: LPCM) (when the recording format is AVC-G50/AVC-G25/AVC-G12)
3. Audio data in MXF format (when the recording format is AVC-I100/AVC-I50)
4. Meta data in MXF format
5. Thumbnail in BMP format
6. Proxy data in MOV format and realtime metadata in BIN format
7. Video data in MXF format (when the recording format is AVC-I100/AVC-I50)
8. The file to which the information of the final clip was recorded
9. Video data in MOV format: UHD (3840 x 2160), 29.97p MOV (audio: LPCM)
10. Video data in MOV format: FHD (1920 x 1080), 59.94i MOV (audio: LPCM)
11. Video data in MP4 format: UHD (3840 x 2160), 29.97p MP4 (audio: AAC)
12. Video data in MP4 format: FHD (1920 x 1080), 59.94p MP4 (audio: AAC)
13. Management file 1
14. Management file 2
15. Thumbnail of video data
16. Video data in AVCHD standard (00000.MTS, etc.)
17. Management Folder

## 6-7. Error and Warning System

If an abnormality is detected, the LCD monitor, tally lamp, etc. will notify you of the occurrence.

### System Error

Screen display	Description	Behavior and cause
Camera image screen		
[SYSTEM ERROR]	An error in the standard signal or communication error has occurred.	The tally lamp and all of the card access lamps (orange) flash 4 times each second, and an alarm sounds. <ul style="list-style-type: none"> <li>Press the power button to turn off the power.</li> </ul>

### Warning

Screen display	Description	Behavior and cause
Camera image screen		
[LOW BATTERY]	Remaining battery level is insufficient.	The tally lamp and all of the card access lamps (orange) flash 4 times each second, and an alarm sounds. The power status display becomes  , and it will flash once every second in red. <ul style="list-style-type: none"> <li>The power is turned off in approximately 5 seconds.</li> <li>Replace with a fully charged battery, or connect the AC adaptor.</li> </ul>
[HIGH TEMPERATURE]	Displayed when the internal temperature of the main unit has risen above assumed.	The tally lamp and all of the card access lamps (orange) flash 4 times each second, and an alarm sounds. <ul style="list-style-type: none"> <li>The power is turned off in approximately 5 seconds.</li> <li>Turn on the power again and check recording and playback operations. If the problem persists, consult the dealer.</li> </ul>
[FAN STOPPED]	The fan has stopped.	<ul style="list-style-type: none"> <li>Recording is stopped.</li> <li>The power turns off approximately 1 minute later.</li> <li>Stop the use immediately when the fan has stopped, and consult the dealer.</li> <li>If the fan has stopped, temperature of the unit will rise. Therefore, do not use the unit for a long period of time.</li> </ul>
[REC WARNING]	An error of the recording data has occurred during recording, and the recording has stopped.	The tally lamp and all of the card access lamps (orange) flash 4 times each second, and an alarm sounds. <ul style="list-style-type: none"> <li>Recording is stopped.</li> </ul>
	It has tried to record exceeding the maximum number of clips during recording.	The tally lamp and all of the card access lamps (orange) flash 4 times each second, and an alarm sounds. <ul style="list-style-type: none"> <li>Recording is stopped.</li> <li>[REC WARNING] [ &lt;OVER MAX NUM. OF CLIPS&gt; ] is displayed in the warning display field of the STATUS screen for the mode check.</li> <li>Replace the memory card or delete unnecessary clips.</li> </ul>
[Below functions are temporarily disabled due to a rise of the camera's internal temperature. Please wait for the camera to cool down. - VIDEO RECORDING - PRE REC - USB-LAN - USB-TETHERING]	Displayed when the internal temperature of the main unit has risen above assumed.	The tally lamp and the card access lamps (orange) flash 4 times each second, and an alarm sounds. <ul style="list-style-type: none"> <li>Recording stops if it was in progress.</li> <li>Streaming stops if streaming via a USB ethernet adaptor was in progress.</li> <li>[RECORDING] menu → [PRE REC] is fixed to [OFF]</li> <li>Wait until the temperature of the unit decreases.</li> </ul>

## 6-7. Error and Warning System (Continued)

## Warning (continued)

[CARD ERROR <SLOT 1>] [CARD ERROR <SLOT 2>]	A data error caused by the memory card has occurred during recording or playback.	The tally lamp and all of the card access lamps (orange) flash 4 times each second, and an alarm sounds. (When it was recording) • Recording is stopped. • The memory card where the error has occurred is write protected after recording stops. Replace the memory card in the card slot where the error has occurred. (When it was playing back) • Playback is stopped.
[END] (Memory card status display)	The remaining recording capacity of the memory card has exhausted during recording.	The tally lamp and all of the card access lamps (orange) flash 4 times each second, and an alarm sounds. • Recording is stopped. • Replace the memory card or delete unnecessary clips.
 (Once every second, flash in red)	Battery is almost consumed.	Tally lamp flashes once every second. • The current operation will continue. • Replace with a fully charged battery, or connect the AC adaptor.
Remaining recording capacity display of the memory card (Flashes once every second during recording)	The remaining recording capacity of the memory card is getting low.	Tally lamp flashes once every second. • Recording will continue. • Replace the memory card as necessary.

## Alerts

Screen display	Description	Behavior and cause
Camera image screen		
[SIMUL REC WARNING <SLOT 1>] [SIMUL REC WARNING <SLOT 2>]	An error has occurred in one of the memory cards during simultaneous recording.  Recording has been attempted while the number of clips has exceeded the limit on one of the memory cards during simultaneous recording.	• Recording to the other memory card will continue.  • Recording to the other memory card will continue. • [SIMUL REC WARNING <SLOT 1>] [<OVER MAX NUM. OF CLIPS>] [SIMUL REC WARNING <SLOT 2>] [<OVER MAX NUM. OF CLIPS>] is displayed in the warning display field of the STATUS screen for the mode check. • Replace the memory card or delete unnecessary clips.
[BACKGROUND REC WARNING <SLOT 1>] [BACKGROUND REC WARNING <SLOT 2>]	An error has occurred in one of the memory cards during background recording.  Recording has been attempted while the number of clips has exceeded the limit on one of the memory cards during background recording.	• Recording to the other memory card will continue. • [BACKGROUND REC WARNING <SLOT 1>] [<OVER MAX NUM. OF CLIPS>] [BACKGROUND REC WARNING <SLOT 2>] [<OVER MAX NUM. OF CLIPS>] is displayed in the warning display field of the STATUS screen for the mode check. • Replace the memory card or delete unnecessary clips.
[REINSERT OR CHECK CARD <SLOT 1>] [REINSERT OR CHECK CARD <SLOT 2>]	The memory card cannot be recognized properly because a recording medium which is not supported has been inserted or there is dirt on the terminal of the memory card.	• Check the memory card that is inserted. • Insert the memory card again if displayed when inserting a memory card.
[FORMAT ERROR CARD <SLOT 1>] [FORMAT ERROR CARD <SLOT 2>]	A memory card with management information out of specifications has been inserted. (Include when the system frequency (59.94 Hz system or 50.00 Hz system) for the AVCHD format of the memory card is different from the setting in the [SYSTEM] menu → [FREQUENCY])	• Insert a memory card that can record. • The system frequency information for the AVCHD format is confirmed at the time of formatting or at the first recording.
[NOT SDXC CARD <SLOT 1>] [NOT SDXC CARD <SLOT 2>]	When [FILE FORMAT] is set to MOV format/MP4 format, there is a memory card inserted to which MOV format/MP4 format data cannot be recorded.	<b>CX20</b> • Insert a SDXC memory card or 64 GB microP2 card. <b>CX18</b> • Insert a SDXC memory card.

## 6-7. Error and Warning System (Continued)

## Alerts (continued)

[INCOMPATIBLE CARD <SLOT 1>] [INCOMPATIBLE CARD <SLOT 2>]	A memory card that may not be able to record due to slow writing speed has been inserted.	<ul style="list-style-type: none"> <li>The current operation will continue.</li> <li>Use a memory card with sufficient writing speed.</li> </ul>
[DIR NG CARD <SLOT 1>] [DIR NG CARD <SLOT 2>]	A memory card with inappropriate directory placement is inserted when [FILE FORMAT] is set to P2 format.	<ul style="list-style-type: none"> <li>The current operation will continue.</li> <li>Take a backup of the card immediately, and use again after formatting.</li> </ul>
[RUN DOWN CARD <SLOT 1>] [RUN DOWN CARD <SLOT 2>]	A microP2 card exceeding the specified number of overwrites is inserted.	<ul style="list-style-type: none"> <li>The current operation will continue.</li> <li>Replacement of the memory card is recommended.</li> </ul>
[SD CARD <SLOT 1>] [SD CARD <SLOT 2>]	SDHC memory card is inserted when [FILE FORMAT] is set to P2 format.	<ul style="list-style-type: none"> <li>The current operation will continue.</li> <li>Recording to a SDXC memory card/microP2 card is recommended.</li> </ul>
[BACKUP BATT EMPTY]	A drop in the voltage of the backup battery for the internal clock was detected when the power button was pressed to turn the power on.	<ul style="list-style-type: none"> <li>The current operation will continue.</li> <li>Set the date/time again after charging the built-in battery.</li> </ul>

## message

Screen display	Description	Behavior and cause
Camera image screen		
[CANNOT PLAY.]	This is a clip that cannot be played back. (When it cannot be played back due to difference of the system frequency, etc.) An error has occurred during playback, and the playback has stopped.	<ul style="list-style-type: none"> <li>Confirm if the system frequency of the clip is the same as the system frequency of the unit.</li> <li>Check the clip.</li> </ul>
[CANNOT DELETE.]	This is a clip that cannot be deleted.	<ul style="list-style-type: none"> <li>Match the device and content versions.</li> </ul>
[CANNOT RECORD. THE NUMBER OF CLIPS HAS EXCEEDED THE MAXIMUM LIMIT.]	The number of clips that can be recorded has reached the maximum.	<ul style="list-style-type: none"> <li>Replace the memory card or delete unnecessary clips.</li> </ul>
[CARD ERROR. PLEASE REFORMAT.]	Formatting of the memory card has failed.	<ul style="list-style-type: none"> <li>Format it again.</li> </ul>
[CANNOT RE-CONNECT.]	As the clips are not ones that have been recorded across multiple memory cards they cannot be re-connected.	<ul style="list-style-type: none"> <li>Check the selected clips.</li> </ul>
[COPY IMPOSSIBLE. TOO LARGE CLIP CONTAINED.]	The file for P2 clip exceeding 4 GB cannot be copied to a memory card with 32 GB or less.	<ul style="list-style-type: none"> <li>Copy to a memory card with the capacity exceeding 32 GB.</li> </ul>
[CANNOT COPY TO SAME CARD.]	The clip recorded over multiple memory cards cannot be copied to a same card.	<ul style="list-style-type: none"> <li>Copy to a card not containing a clip that is recorded over multiple memory cards.</li> </ul>
[Repair failed.]	Repairing the clip where an error occurred has failed because the power was disconnected or the memory card was removed during recording. Restoring of the management information has failed.	<ul style="list-style-type: none"> <li>Check the memory card.</li> </ul>
[UNABLE TO FORMAT.]	This memory card cannot be formatted.	<ul style="list-style-type: none"> <li>Check the memory card.</li> </ul>
[CANNOT PROTECT.]	This is a clip that cannot be protected.	<ul style="list-style-type: none"> <li>Match the device and content versions.</li> </ul>
[THE CLIP IS PROTECTED. PLEASE CANCEL PROTECTION.]	The clip is protected so it cannot be deleted.	<ul style="list-style-type: none"> <li>Cancel the protect on the clip.</li> </ul>
[THUMBNAIL DATA ERROR IS DETECTED.]	An error occurred in the thumbnail information of the memory card.	<ul style="list-style-type: none"> <li>Restoring of the management information is performed automatically after this.</li> </ul>
[CANNOT RECORD - INCOMPATIBLE CONTROL DATA.]	The version of the management information on the memory card is not supported.	<ul style="list-style-type: none"> <li>Match the device and content versions.</li> </ul>
[CANNOT SET.]	This cannot be set.	<ul style="list-style-type: none"> <li>Perform the setting after making it possible to set.</li> </ul>
[THIS CLIP CANNOT BE COPIED.]	The clip cannot be copied.	<ul style="list-style-type: none"> <li>Copy the clips other than the corresponding clip.</li> </ul>
[CONTROL DATA ERROR HAS BEEN DETECTED. (SD CARD)]	An error occurred in the management information of the memory card.	<ul style="list-style-type: none"> <li>Restoring of the management information is performed automatically after this.</li> </ul>
[COPY FAILED. PLEASE CHECK THE CARD.]	The clip has failed to copy due to an error in the memory card.	<ul style="list-style-type: none"> <li>Check the memory card.</li> </ul>

## 6-7. Error and Warning System (Continued)

## Message (continued)

[CANNOT COPY - THE NUMBER OF CLIPS HAS REACHED MAXIMUM.]	The number of clips that can be copied has reached the maximum.	<ul style="list-style-type: none"> <li>Replace the memory card in the copy destination or delete unnecessary clips.</li> </ul>
[LOW BATTERY, PLEASE CONNECT AC ADAPTOR OR CHANGE BATTERY.]	It is trying to copy a clip or update the firmware of the unit when the remaining battery level is insufficient.	<ul style="list-style-type: none"> <li>Replace with a fully charged battery, or connect the AC adaptor.</li> </ul>
[CANNOT PLAY THIS CLIP ON THIS MODEL.]	This is a clip that cannot be played back with the unit.	<ul style="list-style-type: none"> <li>Playback on a device that can playback.</li> </ul>
[Cannot copy: contains recordings from other devices.]	The clip recorded in other device cannot be copied.	<ul style="list-style-type: none"> <li>Copy the clips other than the corresponding clip.</li> </ul>
[INVALID]	Operation is disabled.	<ul style="list-style-type: none"> <li>Operate after the operation becomes enabled.</li> </ul>
[Cannot record - Playlist capacity is full.]	The unit tried to record on a memory card where the number of playlists for recording has reached the maximum.	<ul style="list-style-type: none"> <li>Replace the memory card or delete unnecessary clips.</li> </ul>
[Cannot copy - Playlist capacity is full.]	The unit tried to copy to a memory card where the number of playlists for recording has reached the maximum.	<ul style="list-style-type: none"> <li>Replace the memory card or delete unnecessary clips.</li> </ul>
[Exceeds capacity. Please reselect.]	The remaining recording capacity of the memory card for the copy destination is insufficient.	<ul style="list-style-type: none"> <li>Select the clip to copy again, or secure enough space in the remaining recording capacity on the memory card for the copy destination.</li> </ul>
[Check the destination media.]	An error has occurred on the memory card for the copy destination while copying.	<ul style="list-style-type: none"> <li>Confirm the memory card for the copy destination.</li> </ul>
[LOAD NG]	Loading of the scene file has failed.	<ul style="list-style-type: none"> <li>Check the memory card.</li> </ul>
[SAVE NG]	Writing of the scene file has failed.	<ul style="list-style-type: none"> <li>Check the memory card.</li> </ul>
[DISCONNECT USB CABLE.]	Due to an OS non-compatible error, 5 minutes has elapsed until the service mode connection is established.	<ul style="list-style-type: none"> <li>Confirm if the OS in use is supported by the unit.</li> </ul>
[CARD LOCKED.]	The unit tried to protect or delete a clip on a memory card that has been locked. The unit tried to copy a clip to the memory card that has been locked.	<ul style="list-style-type: none"> <li>Unlock the memory card.</li> </ul>
[CANNOT SELECT MORE CLIPS.]	It has tried to select more than 99 clips.	<ul style="list-style-type: none"> <li>Execute the process such as copying by every 99 clips.</li> </ul>
[SELECT THE CLIP TO BE DELETED.]	It has tried to delete a clip without choosing any.	<ul style="list-style-type: none"> <li>Select a clip to be deleted.</li> </ul>
[SELECT THE CLIPS TO COPY.]	It has tried to copy a clip without choosing any.	<ul style="list-style-type: none"> <li>Select a clip to be copied.</li> </ul>
[SELECT THE CLIP TO RE-CONNECT.]	Re-connecting was tried to be executed without choosing any clips.	<ul style="list-style-type: none"> <li>Select the clips to be re-connected.</li> </ul>
[Insert a card in slot 1.]	Copying was tried to be executed without inserting a memory card into card slot 1.	<ul style="list-style-type: none"> <li>Insert a memory card into card slot 1.</li> </ul>
[Insert a card in slot 2.]	Copying was tried to be executed without inserting a memory card into card slot 2.	<ul style="list-style-type: none"> <li>Insert a memory card into card slot 2.</li> </ul>
[REINSERT OR CHECK CARD <SLOT 1>][REINSERT OR CHECK CARD <SLOT 2>]	It has tried to copy to an error card.	<ul style="list-style-type: none"> <li>Check the memory card.</li> </ul>
[CANNOT COPY.]	Copying was attempted while the system frequency (59.94 Hz and 50.00 Hz) of the memory card to copy from and the memory card to copy to are different for content recorded in AVCHD format.	<ul style="list-style-type: none"> <li>Set the same system frequency (59.94 Hz system or 50.00 Hz system) for the content of the memory card to copy from and the memory card to copy to.</li> <li>The system frequency information for the AVCHD format is confirmed at the time of formatting or at the first recording.</li> </ul>
[CANNOT RECORD.]	Cannot be recorded.	<ul style="list-style-type: none"> <li>Perform recording after making it possible.</li> </ul>
[REC PAUSE INVALID]	The unit tried to stop the next recording before the previous recording finished writing to the memory card.	<ul style="list-style-type: none"> <li>Stop recording after writing to the memory card is complete. Recording can be stopped after the message that is displayed disappears.</li> </ul>
[WRITE PROTECTED]	The memory card has been write-protected.	<ul style="list-style-type: none"> <li>Insert a memory card with write access.</li> </ul>

### 6-8. Introduction of Accessories and Genuine Accessory Part Numbers

The following parts are available as service parts. Please contact the store where you purchased the camera or a Panasonic repair service center.

**[ Accessories ]**



## 6-8. Introduction of Accessories and Genuine Accessory Part Numbers

### (Continued)

The following products are available as genuine accessories. Please contact the store where you purchased your camera.

#### [ AG-CX20/CX18 Genuine Accessories ]

Battery Pack	Battery Charger
 <p><b>AG-VBR59</b> ( 5,900mAh )</p>	 <p><b>AG-BRD50</b> (With quick charging function for VBR series batteries)</p>
AC Adapter	Stereo Microphone
 <p><b>DMW-AC11</b></p>	 <p><b>VW-VMS10</b> (Plug-in Power/Stereo Mini Jack)</p>
Super-Directional Microphone	
 <p><b>AG-MC200G</b> (Super-Directional/XLR 3-Pin)</p>	

The appearance and model number of the product may change without notice. Please note. For the latest information, please check our website

[https://connect.panasonic.com/jp-ja/products-services/proav\\_camcorder/lineup/ag-cx20](https://connect.panasonic.com/jp-ja/products-services/proav_camcorder/lineup/ag-cx20).

## 6-9. Specifications

General	
Power Supply	DC 7.28V (when using battery) DC 9.0V (when using AC adapter)
Power Consumption	8.4W (recording) 14.1W (charging)
Ambient Operating Temperature	0°C to 40°C
Ambient Operating Humidity	10% to 80% (non-condensing)
Mass	Main unit: Approx. 0.85kg (Body only. Handle unit, lens hood, battery and eyecup excluded) When shooting: Approx. 1.5kg (including handle unit, lens hood, battery and eyecup)
External Dimensions	129mm (W) x 159mm (H) x 267mm (D) (Including handle unit, lens hood, and eyecup. Excluding microphone holder and protrusions)
Camera	
Pickup Device	1/2.5-type MOS solid-state image sensor
Number of Pixels	Effective Pixels: Approximately 8.29 million pixels
Lens	Optical image stabilization lens, motorized 24x zoom F value: F1.8-F4.0 Focal length: f=4.12 mm-98.9 mm 35 mm equivalent: 25.0 mm-600.0 mm Filter diameter: 62 mm ND filter: Clear, 1/4, 1/16, 1/64 IR cut filter: Switchable ON/OFF Minimum object distance (MOD): Approx. 10 cm from the front ball (wide end)/1.2 m (full zoom range)
Gain Setting	0dB to 30dB (When USER button S.GAIN is assigned, SUPER GAIN/SUPER GAIN+ can be set)
Color Temperature Setting	ATW, ATW LOCK, Ach, Bch, Preset 3200K/Preset 5600K/VAR (2000K to 15000K)
Shutter Speed	System frequency = 59.94Hz 59.94i/59.94p mode: 1/60s, 1/100s, 1/120s, 1/180s, 1/250s, 1/350s, 1/500s, 1/750s, 1/1000s, 1/1500s, 1/2000s, 1/3000s, 1/4000s, 1/8000s 29.97p mode: 1/30s, 1/50s, 1/60s, 1/100s, 1/120s, 1/180s, 1/250s, 1/350s, 1/500s, 1/750s, 1/1000s, 1/1500s, 1/2000s, 1/3000s, 1/4000s, 1/8000s 23.98p mode: 1/24s, 1/48s, 1/50s, 1/60s, 1/100s, 1/120s, 1/180s, 1/250s, 1/350s, 1/500s, 1/750s, 1/1000s, 1/1500s, 1/2000s, 1/3000s, 1/4000s, 1/8000s

## 6-9. Specifications (Continued)

Camera (Continued)	
Shutter Speed (Continued)	System frequency = 50.00Hz 50.00i/50.00p mode: 1/50s, 1/60s, 1/100s, 1/125s, 1/180s, 1/250s, 1/350s, 1/500s, 1/750s, 1/1000s, 1/1500s, 1/2000s, 1/3000s, 1/4000s, 1/8000s 25.00p mode: 1/25s, 1/50s, 1/60s, 1/100s, 1/125s, 1/180s, 1/250s, 1/350s, 1/500s, 1/750s, 1/1000s, 1/1500s, 1/2000s, 1/3000s, 1/4000s, 1/8000s
Slow Shutter Speed	System frequency = 59.94Hz 59.94i/59.94p mode: 1/8s, 1/15s, 1/30s 29.97p mode: 1/8s, 1/15s 23.98p mode: 1/6s, 1/12s System frequency = 50.00Hz 50.00i/50.00p mode: 1/6s, 1/12s, 1/25s 25.00p mode: 1/6s, 1/12s
Super Slow Recording	System frequency = 59.94Hz 1920x1080 (FHD): Shooting frame rate 120 fps System frequency = 50.00 Hz 1920x1080 (FHD): Shooting frame rate 100 fps
Minimum Illuminance of Subject	1.5lx (F1.8, [Super Gain+] enabled, shutter speed 1/30 sec.)
Digital Zoom	2x, 5x, 10x, i.Zoom* * For UHD (3840x2160) recording format: up to 32x For FHD (1920x1080) recording format: up to 48x
Built-in LED Light	(When using the handle unit) Illuminance: Approx. 70lx (1.0 m) Beam angle: Approx. 30° Color temperature: approx. 4600 K
Lens Hood	Lens hood with cover
Memory Card Recorder	
Recording Media	SDHC memory card (4 GB to 32 GB) SDXC memory card (over 32 GB to 512GB) microP2 card (A series, B series) *Only CX20
Recording Slot	2 Slots
System Frequency	59.94Hz / 50.00Hz
File Format	P2(Only CX20), MOV, MP4, AVCHD
Recording Format	MOV 4:2:0 10bit UHD: HEVC LongGOP 200M, HEVC LongGOP 150M, HEVC LongGOP 100M MOV 4:2:0 8bit UHD: 420 LongGOP 150M, 420 LongGOP 100M MOV 4:2:2 10bit UHD: 422 LongGOP 150M FHD: 422 LongGOP 100M, 422 LongGOP 50M, 422ALL-I 200M, 422ALL-I 100M

## 6-9. Specifications (Continued)

Memory Card Recorder (Continued)	
Recording Format (Continued)	MP4 4:2:0 10bit UHD: HEVC LongGOP 100M, HEVC LongGOP 72M MP4 4:2:0 8bit UHD: 420LongGOP 72M FHD: 420LongGOP 50M AVCHD 4:2:0 8bit FHD: PS, PH, HA HD: PM P2 4:2:2 10bit *Only CX20 AVC-I100, AVC-G50, AVC-G25 P2 4:2:0 10bit *Only CX20 AVC-I50 P2 4:2:0 8bit *Only CX20 AVC-G12 P2 Proxy 4:2:0 8bit (recorded in MOV format) *Only CX20 AVC-G6
2 Slot Function	Relay recording, Simultaneous recording, Background recording
Still Image Recording	Recording format: JPEG (DCF/Exif2.2)
Recording Pixel Count/ Recording Video Signal	3840x2160: 59.94p, 50.00p, 29.97p, 25.00p, 23.98p 1920x1080: 59.94p, 50.00p, 29.97p, 25.00p, 23.98p, 59.94i, 50.00i 1280x720: 59.94p, 50.00p
Recording and Playback Time	When using a 64GB SDXC memory card and setting the file format to MOV/MP4: 200 Mbps recording format: approx. 40m 150 Mbps recording format: approx. 55m 100 Mbps recording format: approx. 1h 20m 72 Mbps recording format: approx. 1h 50m 50 Mbps recording format: approx. 2h 40m When using a 64GB SDXC memory card and setting the file format to AVCHD: PS recording format: approx. 5h 20m PH recording format: approx. 6h HA recording format: approx. 8h 30m PM recording format: approx. 17h 10m When using a 64GB microP2 card and the file format is set to P2 (Only CX20): 1080-59.94i/AVC-I100, 1080-50.00i/AVC-I100, 720-59.94p/AVC-I100, 720-50.00p/AVC-I100: approx. 1h 4m 1080-59.94p/AVC-G25, 1080-50.00p/AVC-G25, 1080-59.94i/AVC-I50, 1080-50.00i/AVC-I50, 720-59.94p/AVC-I50, 720-50.00p/AVC-I50, 1080-59.94i/AVC-G50, 1080-50.00i/AVC-G50, 720-59.94p/AVC-G50, 720-50.00p/AVC-G50: approx. 2h 8m 1080-59.94p/AVC-G12, 1080-50.00p/AVC-G12: Approximately 4 hours 1080-59.94i/AVC-G25, 1080-50.00i/AVC-G25, 720-59.94p/AVC-G25, 720-50.00p/AVC-G25: approx. 4h 16m 1080-59.94i/AVC-G12, 1080-50.00i/AVC-G12, 720-59.94p/AVC-G12, 720-50.00p/AVC-G12: approx. 8h

## 6-9. Specifications (Continued)

Digital Video	
Number of Quantizing Bits	MOV: 4:2:2 10bit, 4:2:0 10bit (HEVC), 4:2:0 8bit, MP4: 4:2:0 10bit (HEVC), 4:2:0 8bit AVCHD :4:2:0 8 bit P2 (Only CX20): 4:2:2 10bit (AVC-I100, AVC-G50, AVC-G25) 4:2:0 10 bit (AVC-I50) 4:2:0 8bit (AVC-G12, AVC-G6 (Proxy))
Video Compression Format	MOV/MP4: H.264/MPEG-4 AVC High Profile, H.265/MPEG-4 HEVC Main10 Profile AVCHD: H.264/MPEG-4 AVC High Profile P2 (Only CX20): H.264/MPEG-4 AVC Intra Profile (AVC-I100, AVC-I50) H.264/MPEG-4 AVC High Profile (AVC-G50, AVC-G25, AVC-G12, AVC-V6(Proxy))
Digital Audio	
Recording Format	MOV: 48kHz/24bit, 2ch, LPCM MP4: 48 kHz/16 bit, 2ch, AAC AVCHD : 48 kHz/16 bit, 2ch, Dolby Audio™ P2 (Only CX20): 48 kHz/24 bit, 2ch, Linear PCM (AVC-I100, AVC-I50, AVC-G50, AVC-G25) 48 kHz/16 bit, 2ch, Linear PCM (AVC-I100, AVC-I50, AVC-G12, AVC-G6 (proxy)) AVC-I100/50 allows switching between 24/16 bit via menu
Headroom	12dB, 18dB, 20dB (switchable via menu)
Streaming	
Video Compression Format	H.264/MPEG-4 AVC Main Profile H.264/MPEG-4 AVC High Profile
Video Resolution	1920x1080 (FHD), 1280x720 (HD), 640x360, 320x180
Streaming Method	Unicast, Multicast
Frame Rate	System frequency = 59.94Hz 60fps, 30fps, 24fps System frequency = 50.00Hz 50fps, 25fps
Bit Rate	24Mbps, 20Mbps, 16Mbps, 14Mbps, 8Mbps, 6Mbps, 4Mbps, 3Mbps, 2Mbps, 1.5Mbps, 1Mbps, 0.7Mbps, 0.5Mbps
Audio Compression Format	AAC-LC: 48KHz, 16bit, 2ch
Supported Protocol	RTSP, RTP, RTMP, RTMPS
NDI® *Only CX20	
Supported Protocol	NDI® HX2 (only supported when connected to a commercially available USB Ethernet adapter)
Video Compression Format	H.264/MPEG-4 AVC High Profile

## 6-9. Specifications (Continued)

NDI® *Only CX20 (Continued)	
Video Resolution	1920x1080 (FHD), 1280x720 (HD)
Delivery Method	Unicast, Multicast
Frame rate	System frequency = 59.94Hz 60fps, 30fps System frequency = 50.00Hz 50fps, 25fps
Bit Rate	24Mbps, 16Mbps, 14Mbps, 10Mbps, 8Mbps, 6Mbps, 4Mbps, 2Mbps
Audio Compression Format	AAC-LC: 48KHz, 16bit, 2ch
Wi-Fi	
Compliance Standard	IEEE802.11a, b, g, n, ac (standard wireless LAN protocol)
Frequency Range Used (Central Frequency)	2412MHz~2462MHz (1~11ch) 5180 MHz to 5320 MHz (36 40 44, 48, 52, 56, 60, 64ch) 5500MHz to 5720MHz (100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144ch)
Encryption Method	Wi-Fi Compliant WPA2™, WPA3™
Access Method	Infrastructure Mode
Video Output	
SDI OUT Terminal	BNC x1Time code output, SDI remote recording control support0.8 V [pp], 75 Ω, 3G/1.5G HD-SDI supported Output formats (4:2:2 10 bit): 1920x1080: 59.94p, 50.00p, 59.94i, 50.00i, 29.97p, 29.97Psf, 25.00p, 25.00Psf, 23.98p, 23.98Psf 1280x720: 59.94p, 50.00p
HDMI Terminal	HDMI x1, Type A, time code output, remote recording control Not compatible with VIERA Link Output formats (4:2:2 10 bit): 3840x2160: 59.94p, 50.00p, 29.97p, 25.00p, 23.98p 1920x1080: 59.94p, 50.00p, 59.94i, 50.00i, 29.97p, 25.00p, 23.98p 1280x720: 59.94p, 50.00p 720x480: 59.94p 720x576: 50.00p
Audio Input	
Built-in Microphone	Stereo microphone
MIC Terminal	1 x 3.5mm stereo mini jack, plug-in power supported
INPUT1/2 Terminal	(When using the handle unit) XLR (3pin) x2 (INPUT1/2), high impedance input LINE, MIC, +48V (switchable) LINE: 4dBu, 0dBu (menu switching) MIC : -40dBu, -50dBu, -60dBu (menu switching)

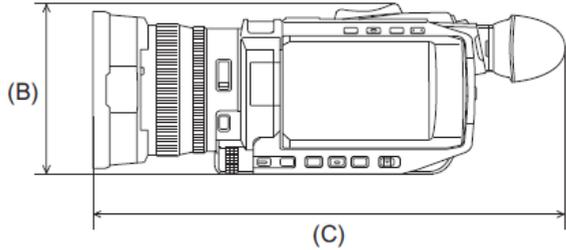
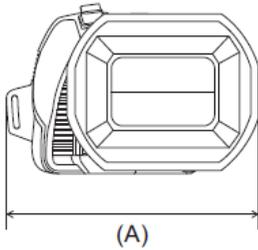
## 6-9. Specifications (Continued)

Audio Output	
SDI OUT Terminal	LPCM 2ch
HDMI Terminal	LPCM 2ch
Headphone Jack	3.5 mm diameter stereo mini jack x1
Speaker Terminal	15 mm diameter, round type x1
Other Inputs and Outputs	
REMOTE Terminal	2.5mm diameter super mini jack Serial communication remote control terminal Analog remote controls used in previous models cannot be used.
USB Terminal	Type-C x1, USB2.0 Host/Device compatible (switchable via menu) Host: Bus powered (5V, 0.5A) , USB tethering connection function, USB Ethernet adapter connection function Device: USB mass storage function (read only)
DC IN Terminal	9V/3A, USB Type-C x1, USB-PD compatible
Monitor	
LCD Monitor	Capacitive touch panel 3.5-inch LCD monitor : approx. 2.76M dots
Viewfinder	0.39-inch OLED (organic light-emitting diode display), approx. 2.36M dots, Image display area (16:9): approx. 1.77M dots
Handle Unit	
Input Voltage	DC 23.6V , 5V , 3.15V
Power Consumption	Maximum approx. 3.1 W (when connected to the camera body)
Mass	Approx. 305g (Handle unit only, excluding microphone holder and microphone holder screws)
External Dimensions	71mm (W) x 89mm (H) x 207mm (D) (Including protrusions, excluding microphone holder)
Battery Pack (AG-VBR59)	
Voltage /Capacity	DC 7.28V , 5900mAh 43Wh
Charging Current	Maximum 4000mA
Ambient Operating Humidity	0% to 80% (non-condensing)
Mass	Approx. 230g
External dimensions	41.3mm (W) x 51.3mm (H) x 69.6mm (D)

## 6-10. External Dimensions

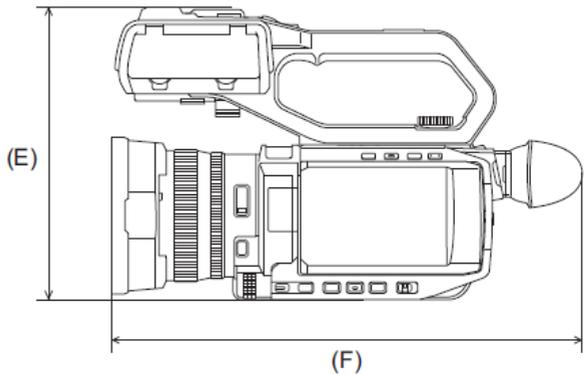
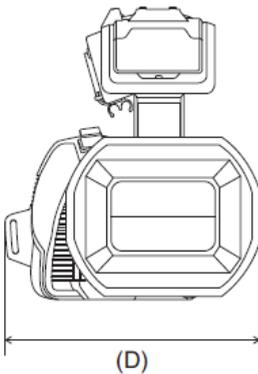
Unit: mm

### [Main Unit]



- (A) 129 mm (5.1 ")
- (B) 93 mm (3.7 ")
- (C) 267 mm (10.5 ")

### [When the Handle Unit is Attached]



- (D) 129 mm (5.1 ")
- (E) 159 mm (6.3 ")
- (F) 267 mm (10.5 ")

## 6-11. Firmware Ver.1.1

- MP4 Recording Formats Added
- Syncro Scan Functions Added
- Functionality Added to Set Current Time as the Time Code
- Automatic Time Synchronizing Functionality Added
- Dual Codec Recording Functions Added
- Support for NDI HX2 Function with Wireless LAN Connection [CX20]
- STREAMING PROTOCOL Setting Items Added [CX20]
- EasyIP Setup Tool Plus Supported [CX20]
- Specifications(Items Added)
- Menu Added

Download the firmware package from the support site

( <https://www.pass.panasonic.co.jp/pro-av/support/content/download/EN/top.html> ) .

**Revision History**

Edition (published date)	Revision History	Magazine version
June 2025	First edition	V1.00E

# Panasonic

Download firmware, check frequently asked questions for the AG-CX20/CX18 at <https://www.pass.panasonic.co.jp/p2ui/quest/TopLogin.do?lang=en>