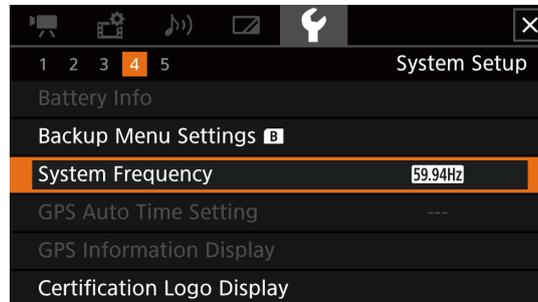


Switching the System Frequency

After upgrading the camcorder, you can use the **MENU** \blacktriangleright [**F** 4 System Setup] \blacktriangleright [System Frequency] setting to switch the camcorder's system frequency to **[59.94Hz]** 59.94 Hz] or **[50.00Hz]** 50.00 Hz]. In playback mode, clips recorded with a system frequency that differs from the camcorder's cannot be played back. Make sure that the camcorder's system frequency is set to that of the clip to be played back.



Some settings and functions will differ depending on the selected system frequency. The major differences are explained below. For details, download the latest version of the instruction manuals for the 59.94 Hz ("NTSC") camcorder or 50.00 Hz ("PAL") camcorder as necessary.

1 Frame Rate

Available frame rates will differ depending on the system frequency your camcorder is set to.

For a system frequency of 59.94 Hz

| Resolution (Bit rate) | Frame rate | | |
|-----------------------|------------|--------|--------|
| | 59.94P | 29.97P | 23.98P |
| 3840x2160 (150 Mbps) | ● | ● | ● |
| 1920x1080 (35 Mbps) | ● | ● | ● |
| 1920x1080 (17 Mbps) | ● | ● | ● |
| 1280x720 (8 Mbps)* | ● | — | — |
| 1280x720 (4 Mbps)* | — | ● | — |

* The frame rate is fixed and cannot be changed. Also, the audio format is automatically set to **[2CH]** AAC 16bit 2CH].

For a system frequency of 50.00 Hz

| Resolution (Bit rate) | Frame rate | |
|-----------------------|------------|--------|
| | 50.00P | 25.00P |
| 3840x2160 (150 Mbps) | ● | ● |
| 1920x1080 (35 Mbps) | ● | ● |
| 1920x1080 (17 Mbps) | ● | ● |
| 1280x720 (8 Mbps)* | ● | — |
| 1280x720 (4 Mbps)* | — | ● |

* The frame rate is fixed and cannot be changed. Also, the audio format is automatically set to **[2CH]** AAC 16bit 2CH].

2 Slow & Fast Motion Recording

Available slow/fast motion rates depend on the recording mode and frame rate. Refer to the table below that applies to the system frequency your camcorder is set to.

For a system frequency of 59.94 Hz

| Resolution | Frame rate | Available slow/fast motion rates |
|---|------------|--|
| 3840x2160 (150 Mbps) | 59.94P | x2, x4, x10, x20, x60, x120, x600, x1200 |
| | 29.97P | x0.5* |
| | 23.98P | x0.8 |
| 1920x1080 (35 Mbps), 1920x1080 (17 Mbps) | 59.94P | x0.5, x2, x4, x10, x20, x60, x120, x600, x1200 |
| | 29.97P | x0.25, x0.5 |
| | 23.98P | x0.2, x0.4, x0.8 |
| 1280x720 (8 Mbps) | 59.94P | x2, x4, x10, x20, x60, x120, x600, x1200 |
| 1280x720 (4 Mbps) | 29.97P | x0.5 |

* The playback bit rate will change automatically to 90 Mbps.

For a system frequency of 50.00 Hz

| Resolution | Frame rate | Available slow/fast motion rates |
|---|------------|--|
| 3840x2160 (150 Mbps) | 50.00P | x2, x4, x10, x20, x60, x120, x600, x1200 |
| | 25.00P | x0.5* |
| 1920x1080 (35 Mbps), 1920x1080 (17 Mbps) | 50.00P | x0.5, x2, x4, x10, x20, x60, x120, x600, x1200 |
| | 25.00P | x0.25, x0.5 |
| 1280x720 (8 Mbps) | 50.00P | x2, x4, x10, x20, x60, x120, x600, x1200 |
| 1280x720 (4 Mbps) | 25.00P | x0.5 |

* The playback bit rate will change automatically to 90 Mbps.

3 Shutter Speed

The following shutter speeds are available depending on the shooting mode used.

For a system frequency of 59.94 Hz

1/6 (23.98P only), 1/8, 1/9, 1/10, 1/12, 1/15, 1/17, 1/20, 1/24, 1/25, 1/30, 1/34, 1/40, 1/48, 1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/210, 1/250, 1/300, 1/360, 1/420, 1/500, 1/600, 1/720, 1/840, 1/1000, 1/1200, 1/1400, 1/1700, 1/2000

For a system frequency of 50.00 Hz

1/6, 1/7, 1/8, 1/10, 1/12, 1/14, 1/17, 1/20, 1/25, 1/29, 1/30, 1/33, 1/40, 1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/210, 1/250, 1/300, 1/350, 1/400, 1/500, 1/600, 1/700, 1/800, 1/1000, 1/1200, 1/1400, 1/1600, 1/2000

4 Time code

For a system frequency of 59.94 Hz

With the **MENU**  [ 3] Recording Setup]  [DF/NDF] setting, you can select between a drop frame (DF) or non-drop frame (NDF) time code, depending on how you plan to use your recording. When the frame rate is set to 23.98P, the time code will be set to non-drop frame.

For a system frequency of 50.00 Hz

You cannot select between a drop frame or non-drop frame time code.

5 Color bars

For a system frequency of 59.94 Hz

You can choose between SMPTE and ARIB color bars.

For a system frequency of 50.00 Hz

You can choose between EBU and SMPTE color bars.

6 Video Output Configuration

The video signal output from the SDI OUT terminal (**XF405** only) and HDMI OUT terminal depends on the clip's video configuration and on various menu settings.

For a system frequency of 59.94 Hz

Internal Recording Priority

| Video configuration of the clip | | XF405 Output terminal ¹ | HDMI maximum resolution ² | Video output configuration | |
|---------------------------------|--|--|---|----------------------------------|--|
| Resolution | Frame rate | | | XF405 SDI OUT terminal | HDMI OUT terminal |
| 3840x2160 | 59.94P 29.97P 23.98P | [SDI SDI] | — | 1920x1080 YCbCr 4:2:2 8 bit | — |
| | | [HDMI HDMI] | [3840x2160] | — | 3840x2160 YCbCr 4:2:2 8 bit ³ |
| [1920x1080] | 1920x1080 YCbCr 4:2:2 8 bit | | | | |
| 1920x1080 | 59.94P 29.97P 23.98P | [SDI SDI] | — | 1920x1080 YCbCr 4:2:2 8 bit | — |
| | | [HDMI HDMI] | | — | 1920x1080 YCbCr 4:2:2 8 bit, 720x480 YCbCr 4:2:2 8 bit ⁴ |
| 1280x720 | 59.94P 29.97P | [SDI SDI] | — | 1280x720 YCbCr 4:2:2 8 bit | — |
| | | [HDMI HDMI] | | [1920x1080] | — |
| [1280x720] | 1280x720, 720x480 YCbCr 4:2:2 8 bit ⁴ | | | | |

¹ [ Display Setup]  [Output Terminal] setting.

² [ Display Setup]  [HDMI Max Resolution] setting.

³ YCbCr 4:2:0 8 bit when the frame rate is set to 59.94P.

⁴ Only when the frame rate is set to 59.94P.

External Recording Only

| Internal/external recording ¹ | Video configuration for external recording ² | XF405 SDI OUT terminal | HDMI OUT terminal |
|---|---|---------------------------------|---------------------------------|
| XF405 [SDI External Rec Only (SDI)] | [1920x1080 59.94P YCC422 10bit] | 1920x1080 YCbCr 4:2:2 10 bit | — |
| | [1920x1080 29.97P YCC422 10bit] | 1920x1080 YCbCr 4:2:2 10 bit | |
| [HDMI External Rec Only (HDMI)] | [3840x2160 59.94P YCC420 8bit] | — | 3840x2160 YCbCr 4:2:0 8 bit |
| | [3840x2160 29.97P YCC422 8bit] | | 3840x2160 YCbCr 4:2:2 8 bit |
| | [1920x1080 59.94P YCC422 10bit] | | 1920x1080 YCbCr 4:2:2 10 bit |
| | [1920x1080 29.97P YCC422 10bit] | | 1920x1080 YCbCr 4:2:2 10 bit |

¹ [Recording Setup] ➤ [Internal/External Rec] setting.

² [Recording Setup] ➤ [External Rec Video Config.] setting.

For a system frequency of 50.00 Hz

Internal Recording Priority

| Video configuration of the clip | | XF405 Output terminal ¹ | HDMI maximum resolution ² | Video output configuration | |
|---------------------------------|------------------|--|--------------------------------------|----------------------------------|--|
| Resolution | Frame rate | | | XF405 SDI OUT terminal | HDMI OUT terminal |
| 3840x2160 | 50.00P 25.00P | [SDI SDI] | — | 1920x1080 YCbCr 4:2:2 8 bit | — |
| | | [HDMI HDMI] | [3840x2160] | — | 3840x2160 YCbCr 4:2:2 8 bit ³ |
| | | | | [1920x1080] | — |
| 1920x1080 | 50.00P 25.00P | [SDI SDI] | — | 1920x1080 YCbCr 4:2:2 8 bit | — |
| | | [HDMI HDMI] | | — | 1920x1080 YCbCr 4:2:2 8 bit, 720x576 YCbCr 4:2:2 8 bit ⁴ |
| 1280x720 | 50.00P 25.00P | [SDI SDI] | [1920x1080] | 1280x720 YCbCr 4:2:2 8 bit | — |
| | | [HDMI HDMI] | | — | 1920x1080, 720x576 YCbCr 4:2:2 8 bit ⁴ |
| | | | | [1280x720] | — |

¹ [Display Setup] ➤ [Output Terminal] setting.

² [Display Setup] ➤ [HDMI Max Resolution] setting.

³ YCbCr 4:2:0 8 bit when the frame rate is set to 50.00P.

⁴ Only when the frame rate is set to 50.00P.

External Recording Only

| Internal/external recording ¹ | Video configuration for external recording ² | XF405 SDI OUT terminal | HDMI OUT terminal |
|---|---|---------------------------------|---------------------------------|
| XF405 [SDI External Rec Only (SDI)] | [1920x1080 50.00P YCC422 10bit] | 1920x1080 YCbCr 4:2:2 10 bit | — |
| | [1920x1080 25.00P YCC422 10bit] | 1920x1080 YCbCr 4:2:2 10 bit | |
| [HDMI External Rec Only (HDMI)] | [3840x2160 50.00P YCC420 8bit] | — | 3840x2160 YCbCr 4:2:0 8 bit |
| | [3840x2160 25.00P YCC422 8bit] | | 3840x2160 YCbCr 4:2:2 8 bit |
| | [1920x1080 50.00P YCC422 10bit] | | 1920x1080 YCbCr 4:2:2 10 bit |
| | [1920x1080 25.00P YCC422 10bit] | | 1920x1080 YCbCr 4:2:2 10 bit |

¹ [Recording Setup] ➤ [Internal/External Rec] setting.

² [Recording Setup] ➤ [External Rec Video Config.] setting.