Panasonic®

Owner's Manual for advanced features

Digital Camera

Model No. DMC-GH4

LUMIX

Please read these instructions carefully before using this product, and save this manual for future use.

Message Display	**P364**
Troubleshooting	**P393**
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Finding the information you need

In this “Owner’s Manual for advanced features”, you can find the information you need from the following pages.
By clicking a page number, you can jump to the linked page and quickly find the information.

Search from “Contents” P7

Search from the list of function names P13

Search from the list of buttons and dials P18

Search from the list of screens and icons P355

Search from “Message Display” P364

Search from “Menu list” P368

Search from “Troubleshooting” P393

1 Click this icon to jump to “Finding the information you need”.

2 Click this icon to jump to “Contents”.

MENU 3 Click this icon to jump to “Menu list”.

4 Click this icon to return to the previously displayed page.

For details on how to use this manual, see the next page. P3

Wi-Fi® function/NFC function P254

How to use this manual

About the indication of the applicable mode

Applicable modes: iA iA+ P A S M M C1 C2 C3

The icons indicate the modes available for a function.
- Black icons: Applicable modes
- Gray icons: Unavailable modes
- C1, C2 and C3 will differ depending on the Recording Modes registered under custom settings.

The icons indicate whether or not a function is available for still pictures and motion pictures.
- Black icons: Applicable functions
- Gray icons: Unavailable functions

- Click a cross reference in the text to jump to the corresponding page.
- By entering keywords in the search field at the top of the Adobe Reader screen, you can run a keyword search and jump to the corresponding page.
- Operations and other details of this manual may vary depending on the Adobe Reader version you are using.

About the symbols in the text

MENU: Indicates that the menu can be set by pressing [MENU/SET] button.

Wi-Fi: Indicates that the Wi-Fi setting can be made by pressing [Wi-Fi] button.

: Configurations that can be performed in the [Custom] menu.

: Tips for skillful use and points for recording.

: Conditions in which a particular function cannot be used.

: Continued to next page.

In this owner's manual, steps for setting a menu item are described as follows.

MENU → **[Rec]→[Quality]→[ ]**

- The descriptions in this owner's manual are based on the interchangeable lens (H-HS12035).
- The screen illustrations in this owner's manual assume that [Style] in [Clock Set] (P36) is set to [Y.M.D] and [System Frequency] (P220) is set to [24.00 Hz (CINEMA)].

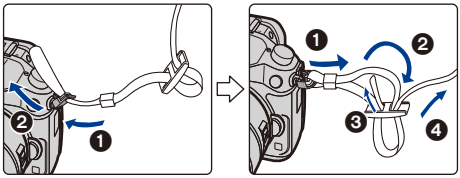
Quick Start Guide

If you want to start taking pictures now, refer to the steps for using the Intelligent Auto Mode as a guide. In Intelligent Auto Mode, you can leave the settings to the camera and take pictures easily.

1

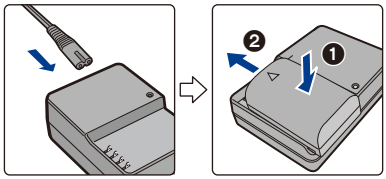
Attaching the Shoulder Strap. (P26)

- Attach the other side of the shoulder strap.



2

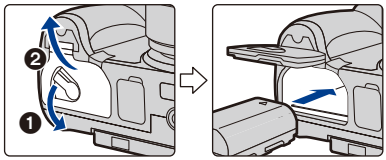
Charging the Battery. (P27)



3

Inserting the Battery. (P32)

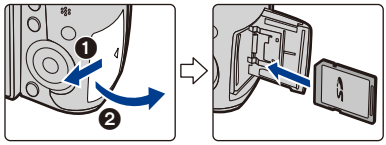
- Insert the battery all the way in until it clicks into place, paying attention to the orientation.



4

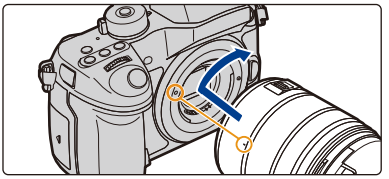
Inserting/Removing the Card (Optional). (P33)

- Insert the card all the way in until it clicks into place, paying attention to the orientation.



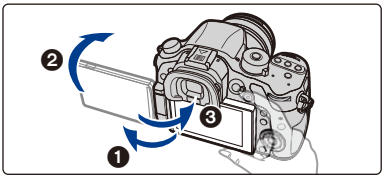
5 Attach the lens. (P23)

- To attach the lens, align the lens fitting marks, and rotate the lens in the direction of the arrow.

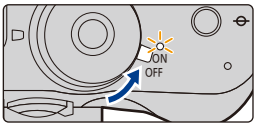


6 Open the monitor. (P35)

- Hold the monitor to open it, rotate it 180° to the lens side, and return it to its original position.



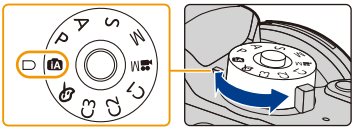
7 Turn the camera on and set the clock. (P36)



8 Formatting the card (initialization). (P58)

9 Set the mode dial to [iA]. (P41)

- The dial is locked if the mode dial lock button is depressed. Each press locks/unlocks the dial.
- The settings of the main functions are adjusted automatically.



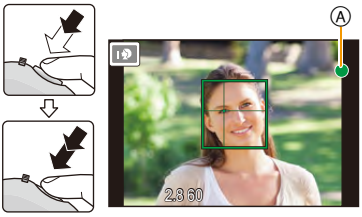
10

Press the shutter button halfway to focus.

Ⓐ Focus indication

- Once the subject is in focus, the focus indication is displayed.

Press the shutter button fully (push it in further), and take the picture. (P39)



11

Check the picture you have taken.

- The [Auto Review] function displays the picture you have just taken. (P311)
- To display the picture in Playback Mode, press [▶]. (P221)

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- Dubbing P335

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Care of this Camera

To avoid damaging your camera and to experience the maximum enjoyment you should exercise the following precautions.

- The lens, monitor and the camera body can sustain damage if the camera body is dropped or subjected to excessive temperature, moisture, water or dust.
- The monitor can be damaged if excessive pressure is applied to the screen surface, during actual use or while cleaning.

Splash Proof

Splash Proof is a term used to describe an extra level of protection this camera offers against exposure to a minimal amount of moisture, water or dust. Splash Proof does not guarantee that damage will not occur if this camera is subjected to direct contact with water.

In order to minimize the possibility of damage please be sure the following precautions are taken:

– The Splash Proof feature works in conjunction with the H-HS12035 and H-HS35100 lenses that were specifically designed to support this feature.
– Make sure the built-in flash is closed.
– Make sure that all doors, socket caps and terminal covers are securely closed.
– Make sure that you are in a dry and secure place when changing the battery, lens or memory card. After changing, make sure their protective doors are securely closed.
– If this camera is exposed to water, sand or any other foreign material clean it as soon as possible, taking the necessary precautions that the foreign substance does not get inside the camera.
– Under no circumstances should you touch or place any foreign objects within the camera or in close proximity of the camera's image sensor.

Condensation

- Condensation may occur on the lens, monitor or in the viewfinder when the room temperature or humidity changes rapidly. This may cause the image to temporarily become hazy. If this occurs, turn the camera off and allow the camera to sit in a temperature stable environment for several minutes. It will clear by itself.
- If you know that you will be moving between areas where there will be a large change in temperature or humidity, you can help prevent condensation forming on the camera by placing the camera in a large plastic zipper bag, so condensation will form on the bag, not the camera. Allow the temperature to stabilize before removing the camera from the bag.

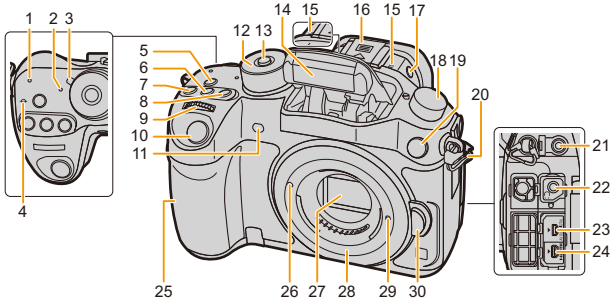
Standard Accessories

Check that all the accessories are supplied before using the camera.

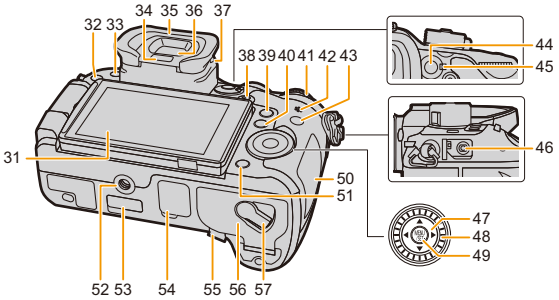
- The accessories and their shape will differ depending on the country or area where the camera was purchased.
  For details on the accessories, refer to “Basic Owner’s Manual”.
- Battery Pack is indicated as **battery pack** or **battery** in the text.
- Battery Charger is indicated as **battery charger** or **charger** in the text.
- SD Memory Card, SDHC Memory Card and SDXC Memory Card are indicated as **card** in the text.
- **The card is optional.**

Names and Functions of Components

Camera body



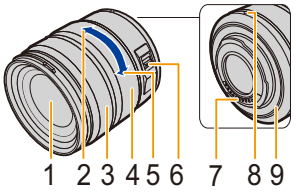
1	Wi-Fi® connection lamp (P255)
2	Status indicator (P36)
3	Camera ON/OFF switch (P36)
4	Focus distance reference mark (P110)
5	[Wi-Fi] button (P255)/[Fn1] button (P317)
6	[ISO](ISO sensitivity) button (P132)
7	[ ](Exposure Compensation) button (P157)
8	[WB](White Balance) button (P135)
9	Front dial (P42)
10	Shutter button (P39)
11	Self-timer indicator (P118)/ AF Assist Lamp (P307)
12	Mode dial (P41)
13	Mode dial lock button (P41)
14	Flash (P180)
15	Stereo microphone (P207) • Be careful not to cover the microphone with your finger. Doing so may make sound difficult to record.
16	Hot shoe (Hot shoe cover) (P347) • Keep the Hot Shoe Cover out of reach of children to prevent swallowing.
17	Flash open button (P180) • The flash opens, and recording with the flash becomes possible.
18	Drive mode dial Single (P112): Burst (P113): Auto Bracket (P116): Self-timer (P118): Time Lapse/Animation (P120, 124):
19	Flash synchro socket (Flash synchro socket cap) (P348)
20	Shoulder strap eyelet (P26)
21	[MIC] socket (P350)
22	Headphone socket (P62, 208)
23	[AV OUT/DIGITAL] socket (P326, 332, 335, 337)
24	[HDMI] socket (P325)
25	NFC antenna [ ] (P263)
26	Lens fitting mark (P23)
27	Sensor
28	Mount
29	Lens lock pin
30	Lens release button (P24)



31	Touch screen/monitor (P49)
32	[▶] (Playback) button (P221)
33	[LVF] button (P48)/[Fn5] button (P317)
34	Eye sensor (P48)
35	Eye Cup (P412)
36	Viewfinder (P48)
37	Diopter adjustment dial (P38)
38	Motion picture button (P191)
39	[Q.MENU] button (P53)/[Fn2] button (P317)
40	[ ] (Auto Focus Mode) button (P91)/ [Fn3] button (P317)
41	Rear dial (P42)
42	Speaker (P62) • Be careful not to cover the speaker with your finger. Doing so may make sound difficult to hear.
43	[DISP.] button (P44) • Each time this is pressed, the display on the monitor is switched.
44	[AF/AE LOCK] button (P159)
45	Focus mode lever (P91, 107)
46	[REMOTE] socket (P353)
47	Cursor buttons (P43)
48	Control dial (P42)
49	[MENU/SET] button (P43, 54)
50	Card door (P33)
51	[🗑/↩] (Delete/Cancel) button (P227)/ [Fn4] button (P317)
52	Tripod mount (P418) • A tripod with a screw length of 5.5 mm (0.22 inch) or more may damage this unit if attached.
53	Cover for the interface unit connector • Keep the cover for the interface unit connector out of reach of children to prevent swallowing.
54	Cover for the battery grip connector (P352) • Keep the cover for the battery grip connector out of reach of children to prevent swallowing.
55	DC coupler cover (P353) • When using an AC adaptor, ensure that the Panasonic DC coupler (optional) and AC adaptor (optional) are used.
56	Battery door (P32)
57	Release lever (P32)

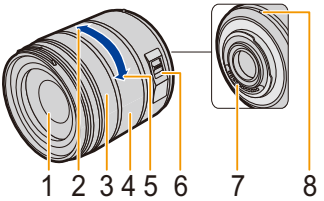
Lens

H-HS12035



1	Lens surface
2	Tele
3	Focus ring (P107)
4	Zoom ring (P162)
5	Wide
6	[O.I.S.] switch (P51)
7	Contact point
8	Lens fitting mark (P23)
9	Lens mount rubber (P413)

H-FS14140



About the Lens

■ Micro Four Thirds™ mount specification lens

This unit can use the dedicated lenses compatible with the Micro Four Thirds System lens mount specification (Micro Four Thirds mount).

■ Four Thirds™ mount specification lens

Lens with the Four Thirds mount specification can be used by using the mount adaptor (DMW-MA1: optional).

■ Leica mount specification lens

When you use the M mount adaptor or R mount adaptor (DMW-MA2M, DMW-MA3R: optional), you can use Leica M Mount or Leica R Mount interchangeable lenses.

- For certain lenses, the actual distance at which the subject is in focus may differ slightly from the rated distance.
- When using a Leica lens mount adaptor, set [Shoot w/o Lens] (P314) to [ON].

About the lens and functions

There are functions that cannot be used, or the operation may be different depending on the lens used.

Auto Focus/Auto aperture setting/[Stabilizer] (P51)/Defocus control function (P74)/[Shading Comp.] (P146)/[Power Zoom Lens] (P165)/Touch zoom (P167)/[Quick AF] (P306)/[Eye Sensor AF] (P306)

For details on the lens used, refer to the website.

Refer to catalogs/Web pages for most current information regarding compatible lenses.
http://panasonic.jp/support/global/cs/dsc/
(This Site is English only.)

- The available flash range etc. differs depending on the aperture value of the lens you are using.
- The focal length noted on the lens in use is equivalent to double when converted to the 35 mm film camera.
  (It will be equivalent to 100 mm lens when a 50 mm lens is used.)
  Refer to the website for details about the 3D interchangeable lens.

Cards Compatible with this unit

The following cards which conform to the SD standard can be used with this unit.
(These cards are indicated as **card** in the text.)

SD Memory Card (8 MB to 2 GB)	• SDHC Memory Cards and SDXC Memory Cards can be used only with their compatible devices. • Check that the PC and other equipment are compatible when using the SDXC Memory Cards. **http://panasonic.net/avc/sdcard/information/SDXC.html** • This unit is compatible with UHS-I UHS Speed Class 3 standard SDHC/SDXC memory cards. • Only the cards with capacity listed left can be used.
SDHC Memory Card (4 GB to 32 GB)	
SDXC Memory Card (48 GB, 64 GB)	

■ About the motion picture recording and speed class

According to the [Rec Format] (P193) and [Rec Quality] (P193) of a motion picture, the required card differs. Use a card that meets the following ratings of the SD Speed Class or UHS Speed Class.

• SD Speed Class and UHS Speed Class are the speed standards regarding continuous writing. To check the class, see the labelled side, etc. of the card.

[Rec Format]	Bit rate in [Rec Quality]*	Speed class	Label example
[AVCHD]	**All**	Class 4 or higher	CLASS 4 4
[MP4]	**100 Mbps**	UHS Speed Class 3	3
	28 Mbps or lower	Class 4 or higher	CLASS 4 4
[MP4 (LPCM)]/ [MOV]	**100 Mbps or higher**	UHS Speed Class 3	3
	50 Mbps	UHS Speed Class 1 or higher	1
		Class 10	CLASS 10 10

∗ Bit rates vary depending on the item selected in [Rec Quality] in the [Motion Picture] menu. For details, refer to P193.

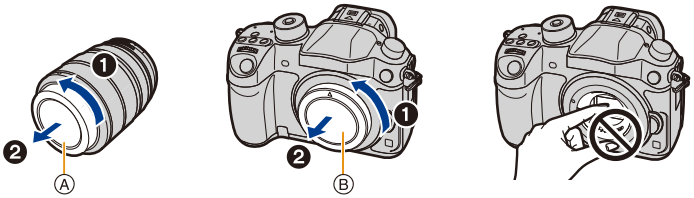
• **Please confirm the latest information on the following website.**
http://panasonic.jp/support/global/cs/dsc/
(This Site is English only.)

Changing the Lens

By changing the lens, you will increase your picture taking-options and further your enjoyment of the camera. Change the lens using the following procedure.
- Check that the camera is turned off.
- Change lenses where there is not a lot of dirt or dust. Refer to P411 when dirt or dust gets on the lens.

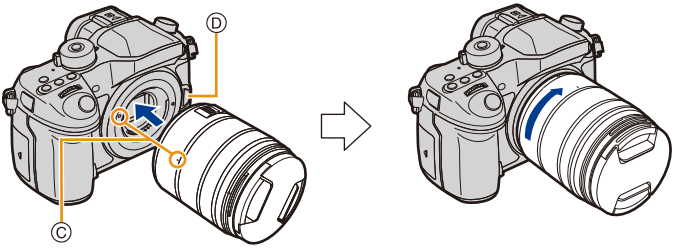
Attaching the lens

1 Turn the lens rear cap Ⓐ and the body cap Ⓑ in the direction of the arrow to detach them.



- Do not put your hands inside the mount.

2 Align the lens fitting marks Ⓒ and then rotate the lens in the direction of the arrow until it clicks.



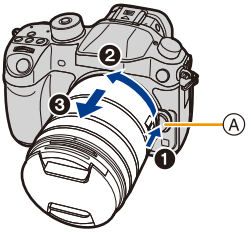
- **Do not press the lens release button Ⓓ when you attach a lens.**
- Do not try to attach the lens when holding it at an angle to the camera body as the lens mount may get scratched.

- It is recommended to attach the lens cap or attach the MC Protector (optional) to protect the lens surface when carrying. (P347)

Detaching the lens

• Attach the lens cap.

While pressing on the lens release button Ⓐ, rotate the lens toward the arrow until it stops and then remove.



Ⓐ Lens release button

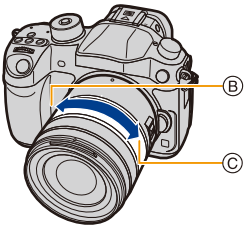
• When the lens is removed from the camera body, make sure to attach the body cap to the camera body and attach the lens rear cap to the lens.

Zoom operations

When using the interchangeable lens (H-HS12035/H-FS14140)

Rotate the zoom ring of the lens.

Ⓑ Tele
Ⓒ Wide



• If you operate the zoom after bringing the subject into focus, the subject may go out of focus slightly. Operate the zoom first.
• You can enhance the telescopic effect by setting [Ex. Tele Conv.] (Photo), [Ex. Tele Conv.] (Motion Picture), and [Digital Zoom]. (P163)

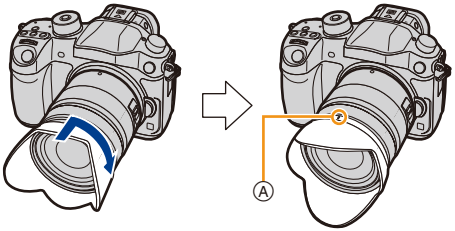
Attaching the Lens Hood

When recording into strong backlight, irregular reflection may occur within the lens. The lens hood reduces the inclusion of unwanted light in the recorded images and lowers the drop in contrast. The lens hood cuts off excess lighting and improves the picture quality.

To attach the lens hood (flower shape) that came with the interchangeable lens (H-HS12035)

Insert the lens hood into the lens with the short sides at the top and bottom, and turn in the direction of the arrow until it stops.

Ⓐ Fitting to the mark.



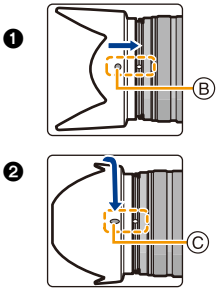
To attach the lens hood (flower shape) that came with the interchangeable lenses (H-FS14140)

Hold the lens hood by placing your fingers as shown in the figure.

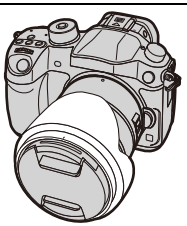
- Do not hold the lens hood in such a way that it will be bent.

1 **Align the fitting mark Ⓑ on the short side of the lens hood with the mark on the tip of the lens.**

2 **Turn the lens hood in the direction of the arrow until it clicks, and align the stop mark Ⓒ on the long side of the lens hood with the mark on the tip of the lens.**



When carrying, the lens hood can be temporarily attached in the reverse direction.

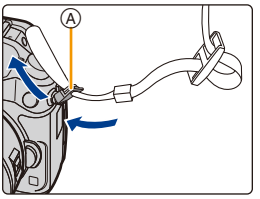


Attaching the Shoulder Strap

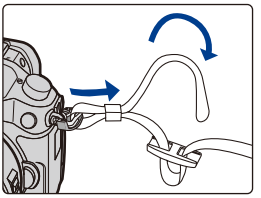
- **We recommend attaching the shoulder strap when using the camera to prevent it from dropping.**

1 **Pass the shoulder strap through the shoulder strap eyelet on the camera body.**

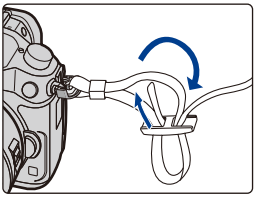
Ⓐ: Shoulder strap eyelet



2 **Pass the end of the shoulder strap through the ring in the direction of the arrow and then pass it through the stopper.**

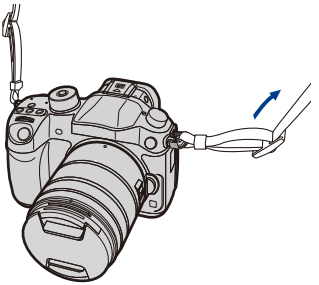


3 **Pass the end of the shoulder strap through the hole on the other side of the stopper.**



4 **Pull the other side of the shoulder strap and then check that it will not come out.**

- Perform steps **1** to **4** and then attach the other side of the shoulder strap.



- Use the shoulder strap around your shoulder.
  – Do not wrap the strap around your neck.
  – It may result in injury or accident.
- Do not leave the shoulder strap where an infant can reach it.
  – It may result in an accident by mistakenly wrapping around the neck.

Charging the Battery

■ About batteries that you can use with this unit

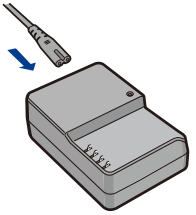
It has been found that counterfeit battery packs which look very similar to the genuine product are made available for purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used, we recommend that a genuine Panasonic battery pack is used.

- **Use the dedicated charger and battery.**

Charging

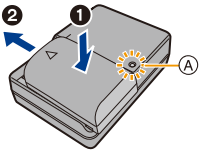
- **The battery is not charged when the camera is shipped. Charge the battery before use.**
- Charge the battery with the charger indoors.

1 **Connect the AC cable.**



2 **Attach the battery paying attention to the direction of the battery until it clicks.**

- The [CHARGE] indicator Ⓐ lights up and charging begins.



About the [CHARGE] indicator

On: **Charging.**

Off: **Charging has completed.**
(Disconnect the charger from the electrical socket and detach the battery after charging is completed.)

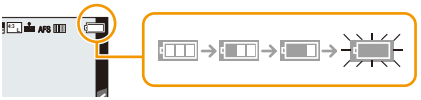
- **When the [CHARGE] indicator flashes**
  – The battery temperature is too high or too low. It is recommended to charge the battery again in an ambient temperature of between 10 °C and 30 °C (50 °F and 86 °F).
  – The terminals of the charger or the battery are dirty. In this case, wipe them with a dry cloth.

Charging time

Charging time	Approx. 220 min

- **The indicated charging time is for when the battery has been discharged completely. The charging time may vary depending on how the battery has been used. The charging time for the battery in hot/cold environments or a battery that has not been used for a long time may be longer than normal.**

Battery indication



- The indication turns red and blinks if the remaining battery power is exhausted.
  (The status indicator also blinks)
  Recharge the battery or replace it with a fully charged battery.

- **Do not leave any metal items (such as clips) near the contact areas of the power plug. Otherwise, a fire and/or electric shocks may be caused by short-circuiting or the resulting heat generated.**
- The battery can be recharged even when it still has some charge left, but it is not recommended that the battery charge be frequently topped up while the battery is fully charged.
  (Since characteristic swelling may occur.)

Approximate operating time and number of recordable pictures

Recording still pictures (when using the Monitor) (By CIPA standard in Program AE Mode)

When the interchangeable lens (H-HS12035) is used	
Number of recordable pictures	Approx. 530 pictures
Recording time	Approx. 265 min

When the interchangeable lens (H-FS14140) is used	
Number of recordable pictures	Approx. 530 pictures
Recording time	Approx. 265 min

Recording still pictures (when using the Viewfinder) (By CIPA standard in Program AE Mode)

When the interchangeable lens (H-HS12035) is used	
Number of recordable pictures	Approx. 500 pictures
Recording time	Approx. 250 min

When the interchangeable lens (H-FS14140) is used	
Number of recordable pictures	Approx. 500 pictures
Recording time	Approx. 250 min

Recording conditions by CIPA standard

- CIPA is an abbreviation of [Camera & Imaging Products Association].
- Temperature: 23 °C (73.4 °F)/Humidity: 50%RH when monitor/viewfinder is on.
- When using a Panasonic SDHC Memory Card.
- Using the supplied battery.
- Starting recording 30 seconds after the camera is turned on.
  (When attaching an interchangeable lens compatible with the Optical Image Stabilizer function, set the Optical Image Stabilizer to [((✋))])
- **Recording once every 30 seconds** using full flash every second recording.
- Turning the camera off every 10 recordings and leaving it until the temperature of the battery decreases.

The number of recordable pictures varies depending on the recording interval time. If the recording interval time becomes longer, the number of recordable pictures decreases.
[For example, if you were to take one picture every two minutes, then the number of pictures would be reduced to approximately one-quarter of the number of pictures given above (based upon one picture taken every 30 seconds).]

■ Recording motion pictures (when using the monitor)

[AVCHD] (Recording with picture quality set to [FHD/17M/60i]/[FHD/17M/50i])

When the interchangeable lens (H-HS12035) is used	
Recordable time	Approx. 220 min/240 min
Actual recordable time	Approx. 110 min/120 min

When the interchangeable lens (H-FS14140) is used	
Recordable time	Approx. 220 min/230 min
Actual recordable time	Approx. 110 min/115 min

[MP4] (Recording with picture quality set to [FHD/20M/30p]/[FHD/20M/25p])

When the interchangeable lens (H-HS12035) is used	
Recordable time	Approx. 250 min/260 min
Actual recordable time	Approx. 125 min/130 min

When the interchangeable lens (H-FS14140) is used	
Recordable time	Approx. 240 min/260 min
Actual recordable time	Approx. 120 min/130 min

[MP4 (LPCM)] (Recording with picture quality set to [FHD/50M/60p]/[FHD/50M/50p])

When the interchangeable lens (H-HS12035) is used	
Recordable time	Approx. 210 min/230 min
Actual recordable time	Approx. 105 min/115 min

When the interchangeable lens (H-FS14140) is used	
Recordable time	Approx. 210 min/230 min
Actual recordable time	Approx. 105 min/115 min

[MOV] (Recording with picture quality set to [FHD/50M/60p]/[FHD/50M/50p])

When the interchangeable lens (H-HS12035) is used	
Recordable time	Approx. 220 min/230 min
Actual recordable time	Approx. 110 min/115 min

When the interchangeable lens (H-FS14140) is used	
Recordable time	Approx. 210 min/230 min
Actual recordable time	Approx. 105 min/115 min

- These times are for an ambient temperature of 23 °C (73.4 °F) and a humidity of 50%RH. Please be aware that these times are approximate.
- Actual recordable time is the time available for recording when repeating actions such as turning this unit on and off, starting/stopping recording, etc.
- When the motion picture size is set to [FHD], [HD] or [VGA] in [MP4], you can continuously record a motion picture up to 29 minutes 59 seconds or until the file size reaches 4 GB. You can check the recordable time on the screen.
  – Since the file size becomes larger with [FHD], recording with [FHD] will stop before 29 minutes 59 seconds.
- You can continuously record a motion picture with its size set to [4K] in [MP4] without a pause even if the motion picture exceeds 4 GB. However, the recorded content has to be played back as multiple files.
- Though a [MP4 (LPCM)]/[MOV] motion picture can be recorded continuously without a pause even when its file size exceeds 4 GB, the recorded content is played back with multiple files.

■ Playback (when using the monitor)

When the interchangeable lens (H-HS12035) is used	
Playback time	Approx. 510 min

When the interchangeable lens (H-FS14140) is used	
Playback time	Approx. 510 min

- **The operating times and number of recordable pictures will differ according to the environment and the operating conditions.**
  For example, in the following cases, the operating times shorten and the number of recordable pictures is reduced.
  – In low-temperature environments, such as on ski slopes.
  – When flash is used repeatedly.
- When the operating time of the camera becomes extremely short even after properly charging the battery, the life of the battery may have expired. Buy a new battery.

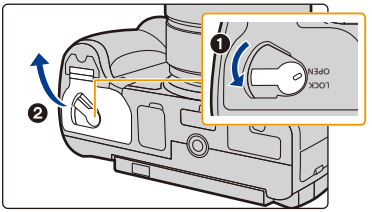
Inserting/Removing the Battery

• Check that this unit is turned off.

1 **❶: Slide the release lever in the direction of the arrow (to the OPEN side).**

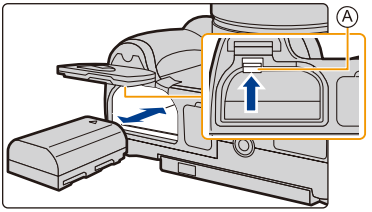
❷: Open the battery door.

- **Always use genuine Panasonic batteries.**
- **If you use other batteries, we cannot guarantee the quality of this product.**



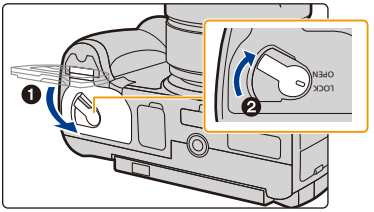
2 **Being careful about the battery orientation, insert all the way until you hear a locking sound and then check that it is locked by lever Ⓐ.**

Pull the lever Ⓐ in the direction of the arrow to remove the battery.



3 **❶: Close the battery door.**

❷: Slide the release lever in the direction of the arrow.

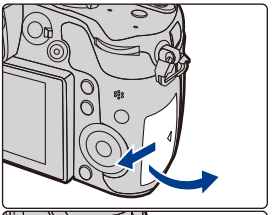


- Confirm that there is no foreign matter adhered on the inner side (rubber seal) of the battery door.
- Remove the battery after use.
  (The battery will be exhausted if left for a long period of time after being charged.)
- **The battery becomes warm after using it and during and after charging. The camera also becomes warm during use. This is not a malfunction.**
- Before removing the battery, turn the camera off, and wait until the status indicator has gone off completely. (Otherwise, this unit may no longer operate normally and the card itself may be damaged or the recorded pictures may be lost.)

Inserting/Removing the Card (Optional)

- Check that this unit is turned off.
- We recommend using a Panasonic card.

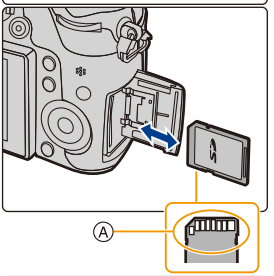
1 **Slide the card door to open it.**



2 **Push it securely all the way until you hear a "click" while being careful about the direction in which you insert it.**

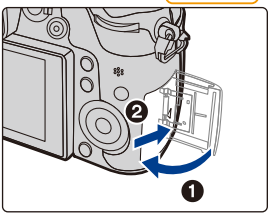
To remove the card, push the card until it clicks, then pull the card out upright.

Ⓐ: Do not touch the connection terminals of the card.



3 **❶: Close the card door.**

❷: Slide the card door to the end and then close it firmly.



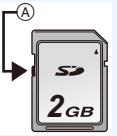
- Before removing the card, turn the camera off, and wait until the status indicator has gone off completely. (Otherwise, this unit may no longer operate normally and the card itself may be damaged or the recorded pictures may be lost.)

About the Card

Access to the card

The access indication displays red when pictures are being recorded on the card.

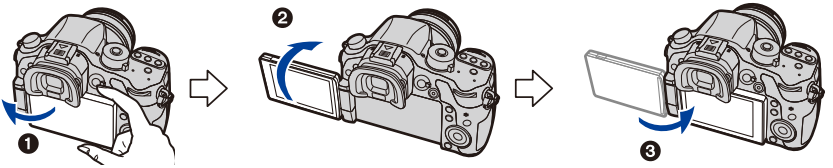
- **During access (image writing, reading and deleting, formatting etc.), do not turn this unit off, remove the battery, card or disconnect the AC adaptor (optional). Furthermore, do not subject the camera to vibration, impact or static electricity.**
  The card or the data on the card may be damaged, and this unit may no longer operate normally.
  If operation fails due to vibration, impact or static electricity, perform the operation again.



- If you set the Write-Protect switch Ⓐ to “LOCK”, you may not be able to write, delete or format the data or display it by recording date. These operations become available again when you unlock the switch.
- The data on the card may be damaged or lost due to electromagnetic waves, static electricity or breakdown of the camera or the card. We recommend storing important data on a PC etc.
- Keep the Memory Card out of reach of children to prevent swallowing.

Opening the Monitor/Adjusting the Monitor

At the time when this camera is purchased, the monitor is stowed in the camera body. Bring out the monitor as shown below.



❶ Open the monitor. (Maximum 180°)
❷ It can be rotated 180° forward.
❸ Return the monitor to its original position.

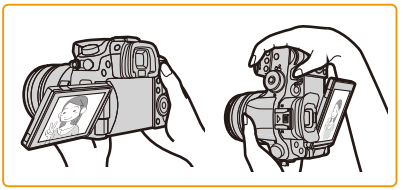
- **Only rotate the monitor after opening it wide enough, and be careful not to use excessive force as it may be damaged.**

■ Free angle shooting

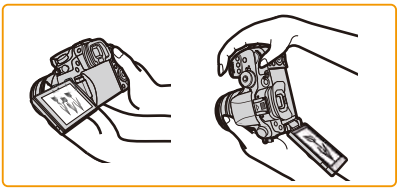
The monitor can be rotated to suit your needs. This is convenient as it allows you to take pictures from various angles by adjusting the monitor.

- Do not cover the AF Assist Lamp with your fingers or other objects.

Taking pictures at a high angle



Taking pictures at a low angle

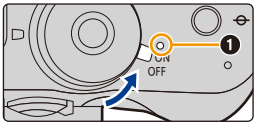


- When not using the monitor it is recommended that you close it with the screen facing inward to prevent dirt and scratches.

Setting Date/Time (Clock Set)

• **The clock is not set when the camera is shipped.**

1 Turn the camera on.



- **The status indicator ❶ lights when you turn this unit on.**
- If the language select screen is not displayed, proceed to step **4**.

2 Press [MENU/SET].

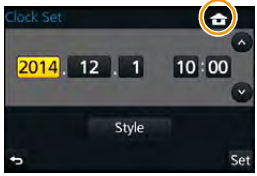
3 Press ▲/▼ to select the language, and press [MENU/SET].

4 Press [MENU/SET].

5 Press ◀/▶ to select the items (year, month, day, hour, minute), and press ▲/▼ to set.

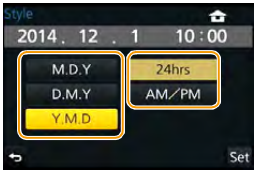
Ⓐ: Time at the home area
Ⓑ: Time at the travel destination

- You can cancel without setting the clock by pressing [🗑/↩].



To set the display order and the time display format.

- To display the setting screen of the order/time, select [Style] and then press [MENU/SET].



6 Press [MENU/SET].

- Confirmation screen is displayed. Press [MENU/SET].
- A message prompting you to set [Home] in [World Time] will be displayed. Press [MENU/SET].

7 Press ◀/▶ to select the home area, and then press [MENU/SET].

Changing the Clock Setting

Select [Clock Set] in the [Setup] menu. **(P54)**

- The clock can be reset as shown in steps **5** and **6** on P36.
- **The clock setting is maintained for 3 months using the built-in clock battery even without the battery.**
  (Leave the charged battery in the unit for 24 hours to charge the built-in battery.)

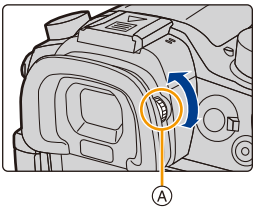
- If the clock is not set, the correct date cannot be printed when you stamp the date on the pictures with [Text Stamp] or order a photo studio to print the pictures.

Basic Operations

Diopter adjustment

Adjust the diopter to suit your vision so that you can see the characters displayed in the viewfinder clearly.

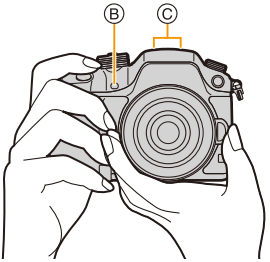
Ⓐ Diopter adjustment dial

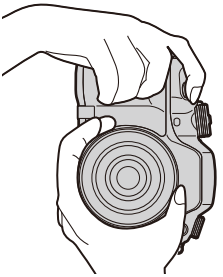


Tips for taking good pictures

Hold the camera gently with both hands, keep your arms still at your side and stand with your feet slightly apart.

- **Do not cover the flash, the AF assist lamp Ⓑ, speaker or the microphone Ⓒ (P18) with your fingers or other objects.**
- Be careful not to move the camera when you press the shutter button.
- Be sure to remove the lens cap when recording.
- When taking pictures, make sure your footing is stable and there is no danger of colliding with another person, an object etc.





■ Detects orientation of camera (Direction Detection Function)

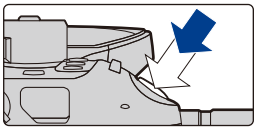
This function detects the vertical orientation when you record with the camera vertically orientated.
When you play back the recording, the recording is automatically displayed in vertical orientation.
(Only available when [Rotate Disp.] (P247) is set to [ON].)

- When recording with this unit, Direction Detection can be performed even if you are using a lens that is not compatible with the Direction Detection Function.
- When the camera is held vertically and tilted significantly up or down to record, the Direction Detection Function may not work correctly.
- Motion pictures taken with the camera held vertically are not displayed vertically.

Shutter button (Taking pictures)

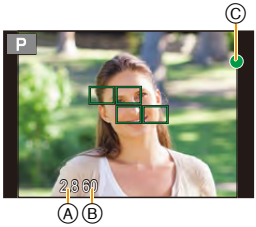
The shutter button works in two steps. To take a picture, press it.

Press the shutter button halfway to focus.

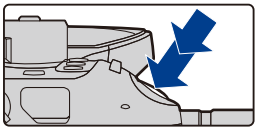


Ⓐ Aperture value
Ⓑ Shutter speed
Ⓒ Focus indication

- Aperture value and shutter speed are displayed.
  (It will flash in red if the correct exposure is not achieved, except when set to flash.)
- Once the subject is in focus, the focus indication is displayed.
  (When the subject is not in focus, the indication flashes)



Press the shutter button fully (push it in further), and take the picture.



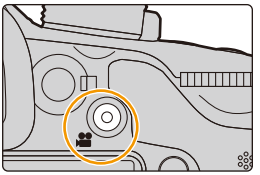
- **When the image is correctly focused, the picture will be taken, since the [Focus/Release Priority] (P307) is set initially to [FOCUS].**
- The focus range is different depending on the lens used.

When the interchangeable lens (H-HS12035) is used	0.25 m (0.82 feet) to ∞ (from the focus distance reference line)
When the interchangeable lens (H-FS14140) is used	0.3 m (0.98 feet) to ∞ (from the focus distance reference line) (focal length 14 mm to 21 mm) 0.5 m (1.6 feet) to ∞ (from the focus distance reference line) (focal length 22 mm to 140 mm)

- Even during menu operation or image playback, if you press the shutter button halfway, you can instantly set the camera ready for recording.

Motion picture button (Recording motion pictures)

Press the motion picture button to start and stop recording a motion picture.



Start recording by pressing the motion picture button.

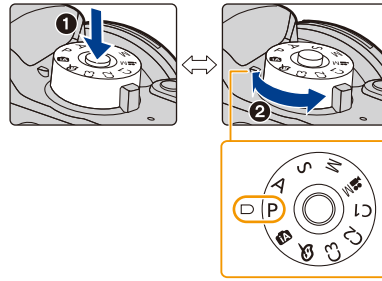
- Release the motion picture button right after you press it.

Stop the recording by pressing the motion picture button again.

- Since motion picture recording stops only after you press the motion picture button, the sound of the operation may be noticeable. (P191)

Mode dial (Selecting a Recording Mode)

Rotate the mode dial to switch the Recording Mode.



Press the mode dial lock button ❶ to release the lock.

- The dial is locked if the mode dial lock button is depressed. Each press locks/unlocks the dial.

Rotate the mode dial ❷ and adjust the recording mode.

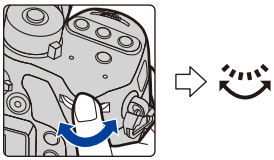
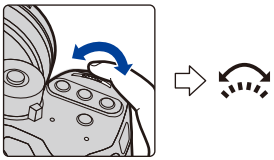
- After adjusting the recording mode, press the mode dial lock button to lock the dial.

iA	**Intelligent Auto Mode** (P69) The subjects are recorded using settings automatically selected by the camera.
iA+	**Intelligent Auto Plus Mode** (P76) Allows you to adjust the brightness and color hue when in Intelligent Auto Mode.
P	**Program AE Mode** (P148) Records at the aperture value and shutter speed set by the camera.
A	**Aperture-Priority AE Mode** (P150) The shutter speed is automatically determined by the aperture value you set.
S	**Shutter-Priority AE Mode** (P151) The aperture value is automatically determined by the shutter speed you set.
M	**Manual Exposure Mode** (P152) The exposure is adjusted by the aperture value and the shutter speed which are manually adjusted.
M	**Creative Video Mode** (P202) Records a motion picture with the aperture value and the shutter speed you specify. In this recording mode, all the motion picture functions become available. For example, you can record motion pictures in 4K (motion pictures with their size set to [4K] or [C4K] in [Rec Quality]). ∗ You cannot take still pictures.
C1 C2 C3	**Custom Mode** (P321) Use this mode to take pictures with previously registered settings.
	Creative Control Mode (P77) Record while checking the image effect.

Rear Dial/Front Dial

Rotating:
Selection of items or setting of values is performed during the various settings.

• This owner's manual describes operations of the rear dial/front dial as follows:

e.g.: When rotating the rear dial to the left or right	e.g.: When rotating the front dial to the left or right
	

Allows you to set the aperture, shutter speed, and other settings when in **P** / **A** / **S** / **M** modes.

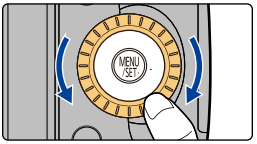
Mode dial	Rear Dial	Front dial
P (P148)	Program Shift	Program Shift
A (P150)	Aperture value	Aperture value
S (P151)	Shutter speed	Shutter speed
M (P152)	Shutter speed	Aperture value

• In [Dial Set.] in the [Custom] menu, you can change the operation methods of the front dial and rear dial. (P312)

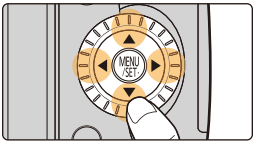
Control Dial

Rotating the control dial:
Selection of items or setting of values etc., is performed.

• The operation of rotating the control dial is illustrated as below in this owner's manual.
Example: When rotating the control dial to the left or right:



Cursor buttons/[MENU/SET] button



Pressing the cursor button:
Selection of items or setting of values etc., is performed.
Pressing [MENU/SET]:
Confirmation of setting contents, etc., is performed.

- This owner's manual expresses the up, down, left, and right of the cursor button as ▲/▼/◀/▶.

Even when the camera is operated using the touch screen, it is possible to operate with the cursor button and [MENU/SET] button if a guide like the one shown on the right is displayed. Even on menu screens etc. on which the guide is not displayed, you can make settings and selections by operating the buttons.

- By assigning [Cursor Button Lock] to a function button, you can disable the cursor buttons, the [MENU/SET] button, and the control dial. (P317)

[DISP.] button (Switching the displayed information)

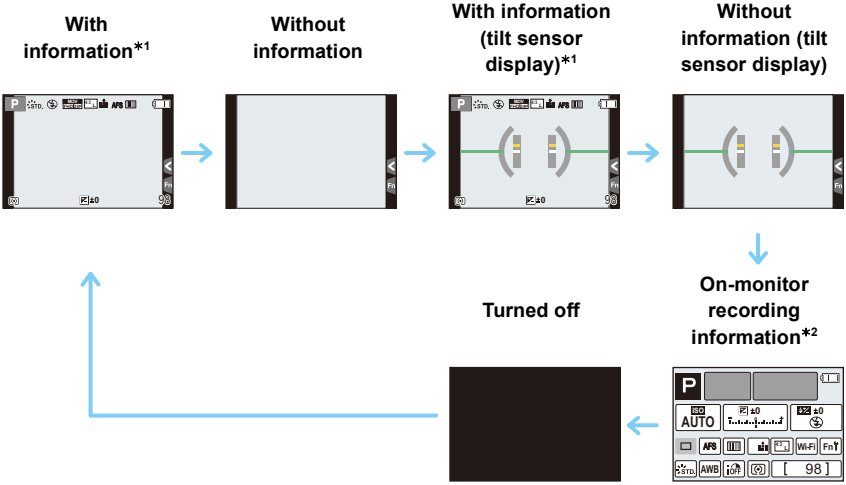
Press [DISP.] to switch the information displayed on the screen.

In Recording Mode

- You can select between [▭] (monitor style) and [▭] (viewfinder style) for each of the monitor and the viewfinder display screen using [Monitor Disp. Style] and [LVF Disp.Style] in the [Custom] menu.

([▭] monitor style)

- Screen will switch as follows:
  (Example of monitor display)



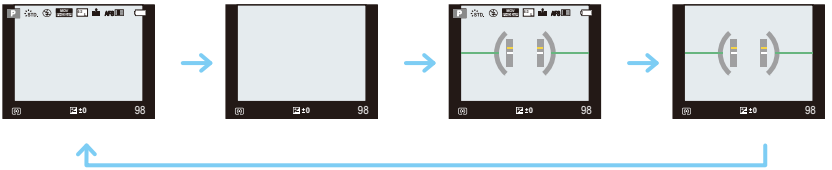
∗1 Histograms are displayed when the [Histogram] of the [Custom] menu is set to [ON]. (P309)
It is also possible to display the Exposure meter by setting the [Expo.Meter] of the [Custom] menu to [ON]. (P310)

∗2 It is displayed when the [Monitor Info. Disp.] of the [Custom] menu is set to [ON]. (P311)
Settings can be adjusted directly by touching each of the items displayed on the screen.

([ ] viewfinder style)

• Screen will switch as follows:
(Example of display on viewfinder)

With information (detailed information)* → **With information** → **With information (detailed information, tilt sensor display)*** → **With information (tilt sensor display)**



✳ Histograms are displayed when the [Histogram] of the [Custom] menu is set to [ON]. (P309)
It is also possible to display the Exposure meter by setting the [Expo.Meter] of the [Custom] menu to [ON]. (P310)

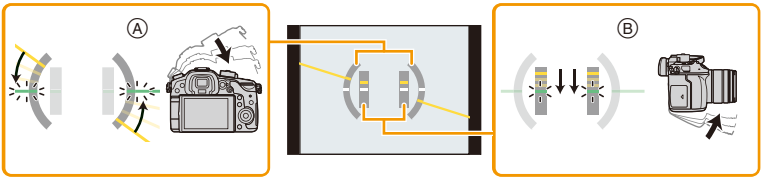
• If you set [Guide Line] in the [Custom] menu, the guide lines are displayed. (P309)
• If no operation is performed, part of the information on the screen will gradually become darker after approximately 10 seconds has passed, and will no longer be displayed after approximately 1 minute has passed. Pressing the [DISP.] button or touching the monitor will make the display reappear. This operation is to prevent screen burn-in and is not a malfunction.

■ About the tilt sensor display

With the tilt sensor displayed, it is easy to correct the tilt of the camera etc.

1 Press [DISP.] to display the tilt sensor.

2 Check the tilt of the camera.



Ⓐ Horizontal direction:
Correcting tilt to the left

Ⓑ Vertical direction:
Correcting downward tilt

- When the tilt of the camera is little, the indicator changes to green.
- When recording with a vertical orientation, the display automatically switches to a vertically orientated display.

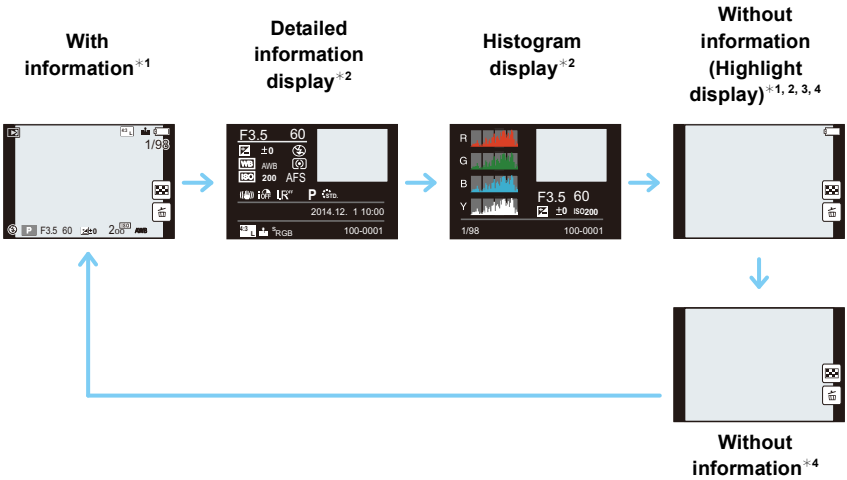
- Even after correcting the tilt, there may still be an error of approximately ± 1°.
- When a function button is set to [Level Gauge], the tilt sensor display can be switched on/off by pressing the function button.

Not available in these cases:

- Tilt sensor display may not be displayed correctly when this unit is in motion.
- When tilted significantly upwards or downwards to record, the tilt sensor display may not be displayed correctly, and the Direction Detection Function (P39) may not work correctly.

In Playback Mode

• Screen will switch as follows:



∗1 If no operation is performed, part of the information on the screen will gradually become darker after approximately 10 seconds has passed, and will no longer be displayed after approximately 1 minute has passed. Pressing the [DISP.] button or touching the monitor will make the display reappear. This operation is to prevent screen burn-in and is not a malfunction.

∗2 Not displayed during playback zoom, motion picture playback, sequential playback or a slide show.

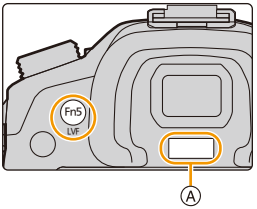
∗3 This is displayed if [Highlight] (P310) in the [Custom] menu is set to [ON].

∗4 If no operation is performed for a number of seconds, [🗑] and other touch icons will disappear.

• Histogram is displayed in R (red), G (green), B (blue), and Y (luminance) during the playback.

[LVF] button (Switching the Monitor/Viewfinder)

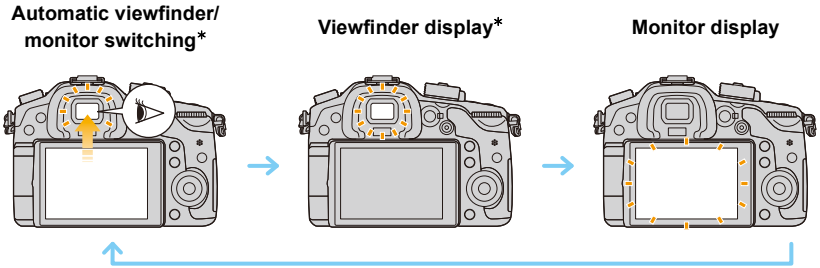
Press [LVF] to switch between the Monitor and Viewfinder.
Ⓐ Eye sensor



> [LVF]/[Fn5] button can be used in two ways, as [LVF] or as [Fn5] (function 5). At the time of purchase, it is initially set to [LVF/Monitor Switch].
> • Refer to P317 for details about the function button.

Press [LVF].

• The monitor/viewfinder will switch as follows:



∗ If [Eye Sensor AF] in the [Custom] menu is set to [ON], the camera automatically adjusts the focus as the eye sensor is activated. (P306)

• You can also switch between the viewfinder and the monitor in [LVF/Monitor Switch] in [Eye Sensor] in the [Custom] menu. (P313)

■ Using the eye sensor to switch between the Monitor and Viewfinder

Automatic viewfinder/monitor switching enables the eye sensor to switch the display to the viewfinder automatically when you bring your eye or an object near it.

• [LVF/MON AUTO] will be displayed for a few seconds after you have enabled automatic viewfinder/monitor switching or performed certain other operations.
• Eye sensor might not work properly depending on the shape of your eyeglasses, the way you hold the camera, or bright light shining around the eyepiece. In that case, press [LVF] to switch the display.
• During motion picture playback or a slide show, the camera does not automatically switch the display to the Viewfinder with the eye sensor.
• You can set the eye sensor sensitivity in [Eye Sensor] in the [Custom] menu. (P313)

• When the viewfinder surface becomes dirty, remove the eyecup, blow away the dust with a blower (commercially available), and wipe the surface lightly with a dry, soft cloth.

Touch panel (Touch operations)

Touch panel of this unit is capacitive. Touch the panel directly with your bare finger.

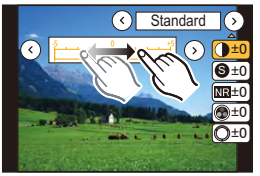
■ Touch

To touch and release the touch screen.

- When selecting features using the touch screen, be sure to touch the center of the desired icon.

■ Drag

A movement without releasing the touch screen.
This can also be used to move to the next image during playback, etc.



■ Pinch (enlarge/reduce)

Pinch the touch panel apart (enlarge) or together (reduce) with two fingers.

- Touch the panel with the clean and dry finger.
- If you use a commercially available monitor protection sheet, please follow the instructions that accompany the sheet.
  (Some monitor protection sheets may impair visibility or operability.)
- Do not press on the monitor with hard pointed tips, such as ball point pens.
- Do not operate with your fingernails.
- Wipe the monitor with dry soft cloth when it gets dirty with finger prints and others.
- Do not scratch or press the monitor too hard.
- For information about the icons displayed on the touch screen, refer to “Monitor Display/ Viewfinder Display” on P355.

Not available in these cases:

- The touch panel may not function normally in the following cases.
  – When touched by a gloved hand
  – When touched by a wet hand (water or hand cream, etc.)
  – When the touch panel is wet
  – When you use a commercially available monitor protect sheet
  – When touched by multiple hands or fingers at the same time

Optical Image Stabilizer

The camera detects jitter during recording and automatically corrects it, so you can record images with reduced jitter.

A lens which supports the stabilizer function is required.
– The interchangeable lens (H-HS12035/H-FS14140) supports the stabilizer function.

- When using an interchangeable lens with O.I.S. switch (such as H-HS12035), stabilizer function is activated if the O.I.S. switch of the lens is set to [ON]. ([((✋))] is set at the time of purchase)

■ Setting the Stabilizer in the [Rec] menu

1 Select the menu. (P54)

MENU → [Rec] → **[Stabilizer]**

2 Press ▲/▼ to select the item and then press [MENU/SET].

[((✋))] ([Normal])	Vertical and horizontal shake are compensated for.	
[((✋))] ([Panning])	Camera shake is corrected for up/down movements. This mode is ideal for panning (a method of taking pictures which involves turning the camera to track the movements of a subject which continues to move in a fixed direction).	
[OFF]	[Stabilizer] does not work. (This can be selected only when using a lens without the [O.I.S.] switch.)	

- The [Stabilizer] feature is only available if the lens you are using has an internal stabilizer.
- Exit the menu after it is set.

Preventing jitter (camera shake)

When the jitter alert [((📷))] appears, use [Stabilizer], a tripod or the self-timer (P118).

- Shutter speed will be slower particularly in the following cases. Keep the camera still from the moment the shutter button is pressed until the picture appears on the screen.
  We recommend using a tripod.
  – Slow Sync.
  – Slow Sync./Red-Eye Reduction
  – When you set to a slow shutter speed

- It is recommended to disable the Optical Image Stabilizer when using a tripod. [OFF] is displayed on the screen at that time.
- We recommend taking pictures with the viewfinder when panning in [ ].

Not available in these cases:

- The stabilizer function may not be effective in the following cases.
  Be careful of camera jitter when you press the shutter button.
  – When there is a lot of jitter
  – When the zoom magnification is high
  – When using the Digital Zoom
  – When taking pictures while following a moving subject
  – When the shutter speed becomes slower to take pictures indoors or in dark places
- The panning effect in [ ] is more difficult to achieve in the following cases.
  – In brightly lit places such as in broad daylight on a summer's day
  – When the shutter speed is faster than 1/100th of a second
  – When you move the camera too slowly because the subject is moving slowly (The background will not become a blur)
  – When the camera does not keep up with the subject satisfactorily

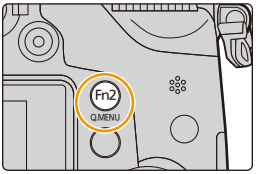
Calling frequently-used menus instantly

(Quick Menu)

By using the Quick Menu, some of the menu settings can be easily found.
- The features that can be adjusted using Quick Menu are determined by the mode or a display style the camera is in.

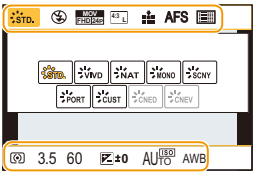
[Q.MENU]/[Fn2] button can be used in two ways, as [Q.MENU] or as [Fn2] (function 2). At the time of purchase, it is initially set to [Q.MENU].
- Refer to P317 for details about the function button.

1 **Press [Q.MENU] to display the Quick Menu.**



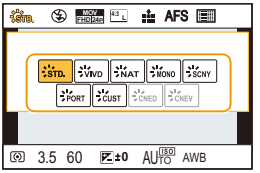
2 **Rotate the front dial to select the menu item.**

- Setting can also be performed by rotating the control dial.



3 **Rotate the rear dial to select the setting.**

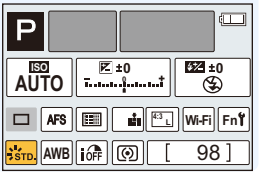
4 **Press [Q.MENU] to exit the menu once the setting is complete.**



- You can also set items by pressing the cursor buttons ▲/▼/◀/▶.

On-monitor recording information in [▭] (Monitor style) (P44)

Select the item by pressing the [Q.MENU] button and rotating the control dial, and then select the setting by rotating the front /rear dial.
- You can also set with ▲/▼/◀/▶ and [MENU/SET].



If you set [Q.MENU] (P315) in the [Custom] menu to [CUSTOM], you can change Quick Menu items as desired.

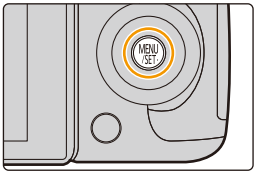
Setting menu items

You can set the menus using two types of operation—touch operations in which you touch the screen, and button operations in which you press the cursor button and rotate the control dials.

In this owner's manual, steps for setting a menu item are described as follows.
Example: In the [Rec] menu, change [Quality] from [▦] to [▟]

MENU → **[Rec]** → **[Quality]** → **[▟]**

1 Press [MENU/SET].



[Rec] (P371)	This menu lets you set the aspect ratio, number of pixels and other aspects of the pictures you are recording.
[Motion Picture] (P374)	This menu lets you set the [Rec Format], [Rec Quality], and other aspects for motion picture recording.
[Custom] (P304)	Operation of the unit, such as displaying of the screen and button operations, can be set up according to your preferences. Also, it is possible to register the modified settings.
[Setup] (P58)	This menu lets you perform the clock settings, select the operating beep tone settings and set other settings which make it easier for you to operate the camera. You can also configure the settings of Wi-Fi related functions.
[Playback] (P229)	This menu lets you set the Protection, Cropping or Print Settings, etc. of recorded pictures.

■ Switching to other menus

e.g.: Switching to the [Setup] menu from [Rec] menu.

1 Press ◄.

2 Press ▲/▼ to select [ ] or another of the menu toggle icons.

- You can also select the menu toggle icons by rotating the front dial.

3 Press [MENU/SET].

- Select a menu item next and set it.

(In touch operation)

Touch [ ] or another of the menu toggle icons.

2 Press ▲/▼ of the cursor button to select the menu item and press [MENU/SET].

- You can also select the menu item by rotating the rear dial or control dial.
- You can also move to the next screen by pressing [DISP.].

(In touch operation)

Touch the menu item.

- The page can be changed by touching [⊙]/[⊙].

3 Press ▲/▼ of the cursor button to select the setting and press [MENU/SET].

- You can also select the setting by rotating the rear dial or control dial.
- Depending on the menu item, its setting may not appear or it may be displayed in a different way.

(In touch operation)

Touch the Setting to set.

- There are functions that cannot be set or used depending on the modes or menu settings being used on the camera due to the specifications.

■ Close the menu

Press [🗑/↩] or press the shutter button halfway.

(In touch operation)

Touch [↩].

- When [Menu Information] (P66) in the [Setup] menu is set to [ON], explanations of the menu items and settings are displayed on the menu screen.
- If you set [Menu Resume] (P66) in the [Setup] menu to [ON], the screen shows the last selected menu item.
  It is set to [ON] at the time of purchase.

Entering Text

It is possible to enter babies' and pets' names and the locations when recording.
When a screen that looks like the one on the right is displayed, you can enter characters.
(Only alphabetical characters and symbols can be entered.)
• Example of operation for displaying a screen:

MENU → **[Rec]** → **[Profile Setup]** → **[SET]** → **[Baby1]** → **[Name]** → **[SET]**

1 Press ▲/▼/◀/▶ to select text and then press [MENU/SET] to register.

- Move the cursor to [A↹a] and then press [MENU/SET] to switch text between [A] (capitals), [a] (lower case), [1] (numbers) and [&] (special characters).
- To enter the same character again, rotate the control dial right to move the cursor.
- The following operations can be performed by moving the cursor to the item and pressing [MENU/SET]:
  – [␣]: Enter a blank
  – [Delete]: Delete a character
  – [◀]: Move the entry position cursor to the left
  – [▶]: Move the entry position cursor to the right
- A maximum of 30 characters can be entered.
  (Maximum of 9 characters when setting names in [Face Recog.])
- A maximum of 15 characters can be entered for [╲], [┌], [┘], [•] and [—].
  (Maximum of 6 characters when setting names in [Face Recog.])

2 Press ▲/▼/◀/▶ to move the cursor to [Set] and then press [MENU/SET] to end text input.

• Text can be scrolled if all of the entered text does not fit on the screen.

Configuring basic settings of this unit (Setup Menu)

Formatting the card (initialization)

Format the card before recording a picture with this unit.
Since data cannot be recovered after formatting, make sure to back up necessary data in advance.

Select the menu. (P54)

MENU → [Setup] → [Format]

- Confirmation screen is displayed. It is executed when [Yes] is selected.

- Use a battery with sufficient battery power or the AC adaptor (optional) (P353) when formatting. Do not turn the camera off during formatting.
- If the card has been formatted on a PC or other equipment, format it on the camera again.
- If the card cannot be formatted, please try another card before contacting Panasonic.

Restoring the default settings ([Reset])

The recording or setup/custom settings are reset to the default.

Select the menu. (P54)

MENU → [Setup] → [Reset]

- Confirmation screens are displayed in the sequence of the [Rec] settings and the [Setup]/[Custom] settings. It is executed when [Yes] is selected.

- When the recording setting is reset, the content of the following settings is also reset.
  – The [Face Recog.] setting
- When the setup/custom settings are reset, the following settings are also reset.
  – The [World Time] setting
  – The settings of [Travel Date] (departure date, return date, location)
  – The [Profile Setup] setting
  – The settings of [Rotate Disp.], [Picture Sort] and [Delete Confirmation] in the [Playback] menu
- If you changed [System Frequency] in the [Setup] menu, a message prompting you to restart the camera will be displayed after the camera is reset. Turn off and on the camera.
- The folder number and the clock setting are not changed.

Conserving the battery life ([Economy])

The unit can be set up to prevent unnecessary battery consumption.

Select the menu. (P54)

MENU → **[Setup]** → **[Economy]**

[Sleep Mode]	The camera is automatically turned off if the camera has not been used for the time selected on the setting. **[10MIN.]/[5MIN.]/[2MIN.]/[1MIN.]/[OFF]**
[Auto LVF/Monitor Off]	The monitor/viewfinder is automatically turned off if the camera has not been used for the time selected on the setting. **[5MIN.]/[2MIN.]/[1MIN.]**

- Press the shutter button halfway or turn the camera off and on to cancel [Sleep Mode].
- To turn the monitor/viewfinder on again, press any button or touch the monitor.
- When the monitor/viewfinder automatic switching (P48) is activated, [Auto LVF/Monitor Off] is canceled.
- [Economy] does not work in the following cases.
  - When connecting to a PC or a printer
  - When recording or playing back motion pictures
  - During a slide show
  - [Multi Exp.]
  - When using [Time Lapse Shot]
- When using the AC adaptor (optional), [Sleep Mode] is disabled.
- When using the AC adaptor (optional), [Auto Monitor Off] is fixed to [5MIN.].

Using the [Setup] menu

The [Setup] menu contains some important settings relating to the camera's clock and power.
Check the settings of this menu before proceeding to use the camera.

For details on how to select the [Setup] menu settings, refer to P54.

[Clock Set]	—

• Refer to P36 for details.

[World Time]	Set the time in your home area and travel destination. You can display the local times at the travel destinations and record them on the pictures you take. • Set [Home] first thing after purchasing. [Destination] can be set after setting up [Home]. **After selecting [Destination] or [Home], press ◄/► to select an area, and press [MENU/SET] to set.** **[Destination]:** Travel destination area Ⓐ Current time of the destination area Ⓑ Time difference from home area **[Home]:** Your home area Ⓒ Current time Ⓓ Time difference from GMT (Greenwich Mean Time)

• Press ▲ if you are using Daylight Savings [▲☼]. (The time will move forward by 1 hour.) Press ▲ once more to return to the normal time.
• If you cannot find the travel destination in the areas displayed on the screen, set by the time difference from the home area.

[Travel Date]	Departure date and return date of the trip as well as the name of the travel destination can be set. You can display the number of days that have passed when playing back the pictures and stamp it on the recorded pictures with [Text Stamp] (P239).
	[Travel Setup]: **[SET]:** Departure date and return date are set. Elapsed days (how many days after) of the trip are recorded. **[OFF]** • The travel date is automatically canceled if the current date is after the return date. If the [Travel Setup] is set to [OFF], [Location] will also be set to [OFF]. **[Location]:** **[SET]:** Travel destination is recorded at the time of recording. **[OFF]** • For details on how to enter characters, refer to “Entering Text” on P57.

- The number of days that have passed since the departure date can be printed out using the “PHOTOfunSTUDIO” bundled software on the DVD (supplied).
- The travel date is calculated using the date in the clock setting and the departure date you set. If you set [World Time] to the travel destination, the travel date is calculated using the date in the clock setting and the travel destination setting.
- The [Travel Date] feature is disabled when recording [AVCHD] motion pictures.
- While recording motion pictures, the [Location] feature is disabled.

[Wi-Fi]	**[Wi-Fi Function]/[Wi-Fi Setup]**

- Refer to P257, 302 for details.

[Beep]	Set the volume for electronic noises and the electronic shutter noise.	
	[Beep Volume]: **[🔊]** (High) **[🔉]** (Low) **[🔇]** (OFF)	**[E-Shutter Vol]:** **[♪]** (High) **[♪]** (Low) **[♪×]** (OFF)

- The [E-Shutter Vol] only works when [SH] for Burst Mode or [Electronic Shutter] is set to [ON].
- When [Silent Mode] is set to [ON], [Beep Volume] and [Shutter Vol.] is set to [OFF].

[Speaker Volume]	Adjust the volume of the speaker to any of the 7 levels.

- When you connect the camera to a TV, the volume of the TV speakers does not change. Also, when connected, no sound is output from the camera speakers.
- When [Silent Mode] is set to [ON], the volume is set to 0.

[Headphone Volume]	Adjust the volume of the connected headphone set (commercially available) in 16 steps.

[Live View Mode]	Set the frame rate of the recording screen (Live View screen).
	[30fps]: Reduces the power consumption, extending the operating time. **[60fps]**: Displays movements smoother.

- When [Live View Mode] is set to [30fps] the image quality on the recording screen may be worse than when it is set to [60fps], but this does not affect the recorded image.
- In a dark environment, the frame rate may become slower.
- When using the AC adaptor (optional), [Live View Mode] is fixed to [60fps].
- This function is not available in the following cases:
  - Creative Video Mode
  - When the image of the camera is output through the HDMI connection

[Monitor Display]/ [Viewfinder]	Brightness, color, or red or blue tint of the Monitor/viewfinder is adjusted.
	[☼] ([Brightness])**:** Adjust the brightness. **[◉]** ([Contrast · Saturation])**:** Adjust the contrast or clarity of colors. **[♣]** ([Red Tint])**:** Adjust the red tint. **[♣]** ([Blue Tint])**:** Adjust the blue tint.
	1 Select the settings by pressing ▲/▼, and adjust with ◀/▶. • Adjusting can also be performed by rotating the control dial. **2 Press [MENU/SET] to set.**

- It will adjust the monitor when the monitor is in use, and the viewfinder when the viewfinder is in use.
- Some subjects may appear differently from actuality on the monitor. However, this does not affect the recorded pictures.

[Monitor Luminance]	Sets the monitor brightness according to the ambient light level.
	[AUTO]: The brightness is adjusted automatically depending on how bright it is around the camera. **[MODE1]:** Make the monitor brighter. **[MODE2]:** Make the monitor darker.

- The brightness of pictures displayed on the monitor is enhanced, so some subjects on the monitor may appear different from the actual subjects. However, this enhancement does not affect recorded pictures.
- [AUTO] is only available in the Recording Mode.
- The initial setting when using the AC adaptor (optional) is [MODE1].

[Economy]	—

• Refer to P59 for details.

[Battery Use Priority]	**[BODY]/[BG]**

• Refer to P352 for details.

[USB Mode]	Select the USB communication system when connecting the camera to your PC or your printer with the USB connection cable (supplied).
	[Select on connection]: Select either [PC] or [PictBridge(PTP)] if you connected the camera to a PC or a printer supporting PictBridge. **[PictBridge(PTP)]:** Set when connecting to a printer supporting PictBridge. **[PC]:** Set when connecting to a PC.

[TV Connection]	This sets how the unit connects to a television etc. **[TV Aspect]:** Set to match the type of TV. **[16:9]:** When connecting to a 16:9 screen TV. **[4:3]:** When connecting to a 4:3 screen TV. • This will work when the AV cable (optional) is connected. **[HDMI Mode (Play)]:** Set the format for the HDMI output when playing back on the HDMI compatible high-definition TV connected with this unit using the HDMI micro cable. **[AUTO]:** The output resolution is automatically set based on the information from the connected TV. **[C4K]:** The progressive method with 2160 available scan lines is used for output. The output size is set to 4096×2160. **[4K]:** The progressive method with 2160 available scan lines is used for output. The output size is set to 3840×2160. **[1080p]:** The progressive method with 1080 available scan lines is used for output. **[1080i]:** The interlace method with 1080 available scan lines is used for output. **[720p]:** The progressive method with 720 available scan lines is used for output. **[576p]:** The progressive method with 576 available scan lines is used for output. **[480p]:** The progressive method with 480 available scan lines is used for output. • The available settings differ depending on the [System Frequency] setting, – [59.94 Hz (NTSC)]: [AUTO]/[4K]/[1080p]/[1080i]/[720p]/[480p] – [50.00 Hz (PAL)]: [AUTO]/[4K]/[1080p]/[1080i]/[720p]/[576p] – [24.00 Hz (CINEMA)]: [AUTO]/[C4K]/[4K]/[1080p] • This will work when the HDMI micro cable is connected. • This will work only during playback. • If no image appears on the TV with [AUTO], switch the setting to a constant setting other than [AUTO] to set a format supported by your TV. (Please read the operating instructions for the TV.)

[TV Connection]	**[3D Playback]:** Set the output method for 3D pictures. **[3D]:** Set when connecting to a 3D compatible television. **[2D]:** Set when connecting to a television not compatible with 3D. Set this when you would like to view pictures in 2D (conventional image) on a 3D compatible television. • This will work when the HDMI micro cable is connected. • Refer to P344 for the method to play back 3D pictures in 3D. **[VIERA Link]:** Settings that allow this unit to be controlled by the remote control of the VIERA equipment by automatically coupling this unit with the VIERA Link compatible equipment using HDMI micro cable. **[ON]:** Remote control operation of the VIERA Link compatible equipment is enabled. (Not all operations are possible) Button operation of the main unit will be limited. **[OFF]:** Operation is performed with the buttons on this unit. • This will work when the HDMI micro cable is connected. • Refer to P327 for details.

[Menu Resume]	Stores the location of the last-used menu item for each menu.
	[ON]/[OFF]

[Menu Background]	Set the background color for the menu screen.
	Press ▲/▼ to select the background color and then press [MENU/SET].

[Menu Information]	Explanations of the menu items and settings are displayed on the menu screen.
	[ON]/[OFF]

[Language]	Set the language displayed on the screen.

- If you set a different language by mistake, select [Q] from the menu icons to set the desired language.

[Version Disp.]	—

- This enables the firmware versions of the camera and lens to be checked.
- Press [MENU/SET] on the version display screen to display information about the software on the unit.

[Exposure Comp. Reset]	An exposure value can be reset when the Recording Mode is changed or the camera is turned off.
	[ON]/[OFF]

[No.Reset]	Reset the file number of the next recording to 0001.

- The folder number is updated and the file number starts from 0001.
- A folder number between 100 and 999 can be assigned.
  The folder number should be reset before it reaches 999. We recommend formatting the card (P68) after saving the data on a PC or elsewhere.
- To reset the folder number to 100, format the card first and then use this function to reset the file number.
  A reset screen for the folder number will then appear. Select [Yes] to reset the folder number.

[Reset]	—

- Refer to P58 for details.

[Reset Wi-Fi Settings]	Reset all settings in the [Wi-Fi] menu to factory default settings. (Excluding [LUMIX CLUB] (P290))

- Always reset the camera when disposing or selling it to prevent personal information saved within the camera from being misused.
- Always reset the camera after making a copy of personal information when sending the camera in to be repaired.

[System Frequency]	—

- Refer to P220 for details.

[Pixel Refresh]	It will perform optimization of imaging device and image processing.

- Imaging device and image processing is optimized when the camera is purchased. Use this function when bright spots that do not exist in the subject get recorded.
- Turn the camera off and on after the pixels are corrected.

[Sensor Cleaning]	Dust reduction to blow off the debris and dust that have affixed to the front of the imaging device is performed.

- Dust Reduction Function will operate automatically when the camera is turned on, but you can use this function when you see dust. (P411)

[Format]	—

- Refer to P58 for details.

Taking Pictures using the Automatic Function

(Intelligent Auto Mode)

Recording Mode: iA iA+

In this mode, the camera makes the optimal settings for the subject and scene, so we recommend it when you wish to leave the settings to the camera and record without thinking about them.

The camera detects scenes automatically (Scene Detection) (📷: When taking pictures, 🎥: When recording motion pictures)

[i-Portrait]

[i-Scenery]

[i-Macro]

[i-Night Portrait]*1

[i-Night Scenery]

[iHandheld Night Shot]*2

[i-Food]

[i-Baby]*3

[i-Sunset]

[i-Low Light]

iA

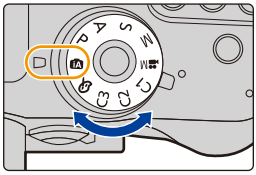
*1 Only displayed when the built-in flash is open.
*2 Only displayed when [iHandheld Night Shot] is set to [ON]. (P72)
*3 When [Face Recog.] is set to [ON], [ ] will be displayed for birthdays of registered faces already set only when the Face/Eye of a person 3 years old or younger is detected.

- [iA] is set if none of the scenes are applicable, and the standard settings are set.

The Intelligent Auto Mode adjusts the settings of the main functions automatically, allowing you to record images without having to make advanced settings. When you want to record images easily, use Intelligent Auto Mode.
(○: possible, —: not possible)

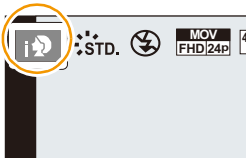
	iA+ Intelligent Auto Plus Mode	iA Intelligent Auto Mode
Setting the brightness	○	—
Setting the color tone	○	—
Defocus Control	○	○
Menus that can be set	Refer to P76 for details.	

1 Set the mode dial to [iA].



- The camera will switch to either the most recently used of Intelligent Auto Mode or Intelligent Auto Plus Mode. At the time of purchase, the mode is set to Intelligent Auto Plus Mode. (P76)

2 Align the screen with the subject.



- When the camera identifies the optimum scene, the icon of the scene concerned is displayed in blue for 2 seconds, after which its color changes to the usual red. (Automatic scene detection)

■ Functions that work automatically

- The following functions are performed automatically to allow the camera to make the optimal settings.
  - Scene Detection
  - Backlight Compensation
  - [Face/Eye Detection]
  - Auto White Balance
  - Intelligent ISO sensitivity control
  - [Red-Eye Removal]
  - [i.Resolution]
  - [i.Dynamic]
  - [Long Shtr NR]
  - [Shading Comp.]
  - [Quick AF]
  - [AF Assist Lamp]

Auto Focus, Face/Eye Detection, and Face Recognition

The Auto Focus Mode is automatically set to [ ]. If you touch the subject, the AF tracking function will work. The AF tracking function will also work if you press [ ] and then press the shutter button halfway. (About tracking AF, refer to 98 for details.)

- When [ ], [ ], or [ ] is set, an eye closer to the camera will be in focus, while the exposure will be optimized for the face. In Intelligent Auto Plus Mode or Intelligent Auto Mode, you cannot change the eye in focus. **([Face/Eye Detection])**
- An optimum scene for the specified subject will be chosen when set to AF tracking.
- When [Face Recog.] is set to [ON], and the face similar to the registered face is detected, [R] is displayed in the top right of [ ], [ ] and [ ].

About the flash

Flash mode is set to [ ] when the flash is closed, and [ ] (AUTO) when it is open. When the flash is open, the camera automatically sets [ ], [ ] (AUTO/Red-Eye Reduction), [ ] or [ ] to match the type of subject and brightness.

- **Open the flash when the flash is to be used.** (P180)
- When [ ] or [ ] is set, Red-Eye Removal is enabled.
- Shutter speed will be slower during [ ] or [ ].

Scene Detection

- If a tripod is used, for instance, and the camera has judged that camera shake is minimal when the scene detection has been identified as [ ], the shutter speed will be slower than normal. Take care not to move the camera while taking pictures.

- Due to conditions such as the ones below, a different scene may be identified for the same subject.
  - Subject conditions: When the face is bright or dark, the size, color and shape of the subject, the distance to the subject, the contrast of the subject, when the subject is moving
  - Recording conditions: Sunset, sunrise, under low brightness conditions, when the camera is shaken, when zoom is used

The Backlight Compensation

- When there is a backlight, the subject appears darker and the camera will automatically attempt to correct it by increasing the brightness of the picture.
  In Intelligent Auto Plus Mode or Intelligent Auto Mode, backlight compensation works automatically.

Recording night scenes ([iHandheld Night Shot])

Recording Mode: iA iA+

When [iHandheld Night Shot] is set to [ON] and [ ] is detected while taking handheld night shots, pictures of the night scenery will be taken at a high burst speed and composed into a single picture.
This mode is useful if you want to take stunning night shots with minimal jitter and noise, without using a tripod.

MENU → **[Rec]** → **[iHandheld Night Shot]** → **[ON]/[OFF]**

- The angle of view will be slightly narrower.
- A message notifying that multiple pictures will be taken is displayed. Do not move the camera during the continuous shooting after pressing the shutter button.
- If the camera is mounted on a tripod or other type of stand, [ ] will not be detected.
- Flash is fixed to [ ] (forced flash off).

Not available in these cases:

- [iHandheld Night Shot] does not work for the pictures taken during a motion picture recording.
- This function is not available in the following cases:
  - When [Quality] is set to [RAW], [RAW] or [RAW]
  - When [Ex. Tele Conv.] in the [Rec] menu is set
  - When using [Time Lapse Shot]
  - When using [Stop Motion Animation] (only when [Auto Shooting] is set)

Combining pictures into a single picture with rich gradation ([iHDR])

Recording Mode: iA iA+

When [iHDR] is set to [ON] and there is, for example, strong contrast between the background and the subject, multiple still pictures are recorded with differing exposures and combined to create a single still picture rich in gradation.
[iHDR] works automatically as needed. When it does, [HDR] is displayed on the screen.

MENU → **[Rec]** → **[iHDR]** → **[ON]/[OFF]**

- The angle of view will be slightly narrower.
- A message notifying that multiple pictures will be taken is displayed. Do not move the camera during the continuous shooting after pressing the shutter button.
- You cannot take the next picture until the combination of pictures is complete.
- A moving subject may be recorded with unnatural blurs.

Not available in these cases:

- [iHDR] does not work for the pictures taken during a motion picture recording.
- This function is not available in the following cases:
  - When recording using the flash
  - When recording in Burst Mode
  - When recording with Auto Bracket
  - When [Quality] is set to [RAW], [RAW] or [RAW]
  - When [Ex. Tele Conv.] in the [Rec] menu is set
  - When using [Time Lapse Shot]
  - When using [Stop Motion Animation] (only when [Auto Shooting] is set)

Taking a picture with a blurred background (Defocus Control)

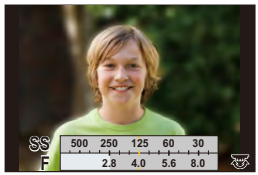
Recording Mode: iA iA+

You can easily set the blurriness of the background while checking the screen.

1 Press [Fn4] to display the setting screen.
2 Set the blurriness by rotating the rear dial.

Strong defocus

Weak defocus



- If you press [MENU/SET], you can return to the recording screen.

■ When operating the touch screen

❶ Touch [ ].

❷ Touch [ ] to display the setting screen.

❸ Drag the exposure meter to set the blurriness.
- If you press [MENU/SET], you can return to the recording screen.

- Pressing [Fn4] on the blurriness setting screen will cancel the setting.
- In Intelligent Auto Mode (iA or iA+), Auto Focus Mode is set to [ ].
  The position of the AF area can be set by touching the screen. (Its size cannot be changed)
- Depending on the lens used, you may hear a sound from the lens when the Defocus Control is used, but this is due to operation of the aperture of the lens and it is not a malfunction.
- Depending on the lens used, operational sound of the Defocus Control may be recorded during the recording of a motion picture when the function is used.

Not available in these cases:

- Depending on the lens used, Defocus Control function may not operate.
  Refer to the website for compatible lenses.

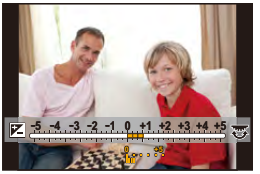
Recording images by changing the brightness or color tone

Recording Mode:

This mode enables you to change the brightness and color tone to your preferred settings from the ones set by the camera.

Setting brightness

1 **Press [ ].**
2 **Rotate the rear dial to adjust brightness.**
- Press [ ] again to return to the recording screen.



Setting color

1 **Press [WB].**
2 **Rotate the rear dial to adjust color.**
- This will adjust the color of the image from a reddish color to a bluish color.
- Press [WB] again to return to the recording screen.

Change the settings by using the touch panel

❶ Touch [ ].

❷ Touch the item you want to set.

[ ]: Color tone

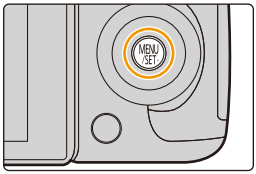
[ ]: Brightness

❸ Drag the slide bar to set.
- Press [MENU/SET] to return to the recording screen.

- If the [Exposure Comp. Reset] is set to [ON], the brightness setting will return to the default level (center point) when this unit is turned off or the camera is switched to another Recording Mode.
- The color setting will return to the default level (center point) when this unit is turned off or the camera is switched to another Recording Mode.

About Intelligent Auto Plus Mode and Intelligent Auto Mode

Switching between Intelligent Auto Plus Mode and Intelligent Auto Mode



1 **Press [MENU/SET].**
2 **Press ◄.**
3 **Press ▲/▼ to select the [iA+] or [iA] tab.**

4 **Press ◄/► to select [iA+] or [iA] and then press [MENU/SET].**
- If [DISP.] is pressed, the description of the selected mode will be displayed.

> It is also possible to display the selection screen by touching the Recording Mode icon in recording screen.
>
>
>

Menus that can be set

[Rec]:	Refer to “Available Menu Items (Listed by Recording Mode)” on P385.
[Motion Picture]:	Refer to “Available Menu Items (Listed by Recording Mode)” on P385.
[Setup]:	All menu items can be set. (P60)
[Custom]:	Only the following menus can be set.

Intelligent Auto Plus Mode
[Silent Mode]/[Half Press Release]/[Pinpoint AF Time]/[Focus/Release Priority]/[AF+MF]/[MF Assist]/[MF Guide]/[Peaking]/[Histogram]/[Guide Line]/[Center Marker]/[Highlight]/[Zebra Pattern]/[Monochrome Live View]/[Constant Preview]/[LVF Disp.Style]/[Monitor Disp. Style]/[Monitor Info. Disp.]/[Rec Area]/[Video-Priority Display]/[Auto Review]/[Fn Button Set]/[Q.MENU]/[Dial Set.]/[Video Button]/[Power Zoom Lens]/[Lens w/o Focus Ring]/[Eye Sensor]/[Touch Settings]/[Touch Scroll]/[Menu Guide]/[Shoot w/o Lens]

Intelligent Auto Mode
[Silent Mode]/[Guide Line]

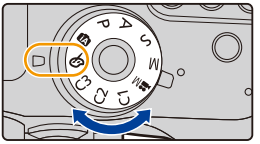
Taking Pictures with different image effects

(Creative Control Mode)

Recording Mode:

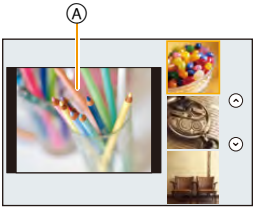
This mode records with additional image effects.
You can set the effects to add by selecting example images and checking them on the screen.

1 **Set the mode dial to [ ].**



2 **Press ▲/▼ to select the image effects (filters).**

- The image effect of the selected example image will be applied in a preview display Ⓐ.
- You can also select the image effects (filters) by touching the example images.



It is also possible to display the selection screen by touching the Recording Mode icon in recording screen.

3 **Press [MENU/SET] to set.**

■ Switching the image effect (filter) selection screen display

Press [DISP.] to switch the monitor screen.

- When the image effect selection screen display is set to the guide display, description of the selected image effect is displayed.

- To change Creative Control Mode, select the [ ] tab on the menu screen, select [Filter Switch], and then press [MENU/SET]. You can return to step **2**.
- White Balance will be fixed to [AWB], and [Sensitivity] will be fixed to [AUTO].

Adjust the effect to fit your preferences

The strength and colors of the effects can be easily adjusted to fit your preferences.

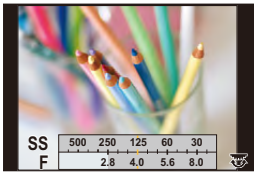
1 Press [WB].

2 Rotate the rear dial to set.

- The items that can be set differ depending on which Creative Control Mode is currently set.
  For information on each image effect, refer to “Items that can be set”.
- Press [WB] again to return to the recording screen.
- When making the effect setting, [ ] is displayed on the screen.
- If you do not change the settings, select the center (standard).

Taking a picture with a blurred background (Defocus Control)

You can easily set the blurriness of the background while checking the screen.



1 Press [Fn4] to display the setting screen.

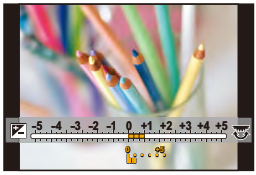
2 Rotate the rear dial to set.

- If you press [MENU/SET], you can return to the recording screen.
- Pressing [Fn4] on the blurriness setting screen will cancel the setting.

Not available in these cases:

- This function is not available in the following case:
  – [Miniature Effect] (Creative Control Mode)

Setting brightness



1 Press [ ].

2 Rotate the rear dial to set.

- Press [ ] again to return to the recording screen.

Change the settings by using the touch panel

❶ Touch [ ].

❷ Touch the item you want to set.

[ ]: Image effects

[ ]: Defocus level

[ ]: Brightness

❸ Drag the slide bar to set.

- Press [MENU/SET] to return to the recording screen.
- Pressing [Fn4] on the blurriness setting screen will cancel the setting.

For details on "Creative Control Mode" settings, refer to P77.

[Expressive]

This effect emphasizes the color to make a pop art picture.

Items that can be set

Freshness	Understated colors	⇔	Pop colors

[Retro]

This effect gives a faded image.

Items that can be set

Color	Yellow emphasized	⇔	Red emphasized

[Old Days]

This effect adds a bright, soft and nostalgic feel to the overall image.

Items that can be set

Contrast	Low contrast	⇔	High contrast

[High Key]

This effect adds a bright, airy and soft feel to the overall image.

Items that can be set

Color	Pink emphasized	⇔	Aquamarine emphasized

[Low Key]

This effect adds a dark and relaxing feel to the overall image and enhances bright parts.

Items that can be set

Color	Red emphasized	⇔	Blue emphasized

[Sepia]

This effect creates a sepia image.

Items that can be set

Contrast	Low contrast	⇔	High contrast

[Monochrome]

This effect creates a black and white picture.

Items that can be set

Contrast	Yellow emphasized	⇔	Blue emphasized

[Dynamic Monochrome]

This effect gives a higher contrast to create an impressive black and white picture.

Items that can be set

Contrast	Low contrast	⇔	High contrast

[Rough Monochrome]

This effect creates a black and white picture with granular noise.

Items that can be set

Grittiness	Less gritty	⇔	Grittier

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.

[Silky Monochrome]

This effect blurs the overall image to add a soft feel to a black and white picture.

Items that can be set

Extent of defocus	Weak defocus	⇔	Strong defocus

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.

[Impressive Art]

This effect gives your photo a dramatic contrast look.

Items that can be set

Freshness	Black and white	⇔	Pop colors

[High Dynamic]

This effect produces the optimum brightness for both dark and bright parts.

Items that can be set

Freshness	Black and white	⇔	Pop colors

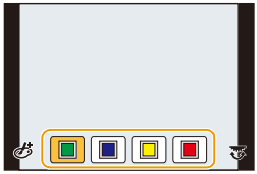
[Cross Process]

This effect gives your photo a dramatic color look.

Items that can be set

Color	Green tone/Blue tone/Yellow tone/Red tone

- Select the desired color tone by rotating the rear dial, and then press [WB].



[Toy Effect]

This effect reduces peripheral brightness to give the impression of a toy camera.

Items that can be set

Color	Orange emphasized	⇔	Blue emphasized

[Toy Pop]

This effect creates a vivid and bright image with the look of a toy camera.

Items that can be set

Area with reduced peripheral brightness	Small	⟺	Large

[Bleach Bypass]

This effect gives a higher contrast and a lower saturation to create a calm and tranquil picture.

Items that can be set

Contrast	Low contrast	⟺	High contrast

[Miniature Effect]

This effect blurs peripheral areas to give the impression of a diorama.

Items that can be set

Freshness	Understated colors	⟷	Pop colors

■ Setting the type of defocus

With [Miniature Effect] you can make the subject stand out by intentionally creating defocused and in-focus portions.
You can set the recording orientation (defocus orientation) and the position and size of the in-focus portion.

1 Press ▲ to display the setting screen.

- Setting screen can also be displayed by touching in order of [ ] then [ ].

2 Press ▲/▼ or ◄/► to move the in-focus portion.

- You can also move the in-focus portion by touching the screen on the recording screen.
- Touching [ ] allows you to set the recording orientation (defocus orientation).

3 Rotate the rear dial to change the size of in-focus portion.

- The portion can also be enlarged/reduced by pinching out/pinching in (P49) the screen.
- Pressing [DISP.] will return the in-focus portion setting back to the default setting.

4 Press [MENU/SET] to set.

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.
- No sound is recorded in motion pictures.
- When [System Frequency] is set to [59.94 Hz (NTSC)], the length of a recorded motion picture will be approximately 1/10 shorter than the actual length of time, and the displayed available recording time will be approximately 10 times longer than usual.
  When [System Frequency] is set to [50.00 Hz (PAL)] or [24.00 Hz (CINEMA)], the length of a recorded motion picture will be approximately 1/8 shorter than the actual length of time, and the displayed available recording time will be approximately 8 times longer than usual.
- If you end motion picture recording after a short time, the camera may go on recording for a certain period. Please continue to hold the camera until the recording finishes.
- When the [Focus Mode] is set to [MF], move the focused location to the in-focus portion.

[Soft Focus]

This effect blurs the overall image to produce a soft feel.

Items that can be set

Extent of defocus	Weak defocus	⇔	Strong defocus

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.

[Fantasy]

This effect creates a fantastical image in a pale color tone.

Items that can be set

Freshness	Understated colors	⇔	Pop colors

[Star Filter]

This effect transforms pin-points of light into a star effect.

Items that can be set

Length of shine	Short	⇔	Long

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.

[One Point Color]

This effect leaves one selected color to emphasize impressiveness.

Items that can be set

Amount of color left	Small amount of color	⇔	Large amount of color

■ Set the color to leave in

Set the color to leave in by selecting a location on the screen.

1 Press ▲ to display the setting screen.

- Setting screen can also be displayed by touching in order of [ ] then [ ].

2 Select the color you want to leave by moving the frame with ▲/▼/◀/▶.

- You can also select the color you want to leave by touching the screen.
- Pressing [DISP.] will return the frame back to the center.

3 Press [MENU/SET] to set.

- Depending on the subject, the set color may not be left in.

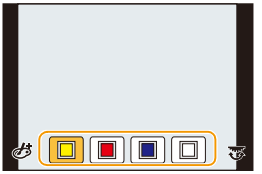
[Sunshine]

This effect adds a cast of light to the scene.

Items that can be set

Color	Yellow tone/Red tone/Blue tone/White tone

- Select the color tone by rotating the rear dial, and then press [MENU/SET].



Setting the light source

You can change the position and size of the light source.

1 Press ▲ to display the setting screen.

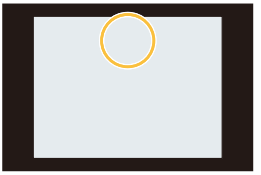
- Setting screen can also be displayed by touching in order of [ ] then [ ].

2 Press ▲/▼/◀/▶ to move the center position of the light source.

- The position of the light source can also be moved by touching the screen.
- The center of the light source can be moved to the edge of the screen.

Point for when placing the center of the light source

A more natural appearance can be created by placing the center of the light source outside the image.



3 Adjust the size of the light source by rotating the rear dial.

- It can be changed to 4 different sizes.
- The display can also be enlarged/reduced by pinching out/pinching in.
- Pressing [DISP.] will return the light source setting back to the default setting.

4 Press [MENU/SET] to set.

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.

Taking Pictures Using the Touch Function

Taking pictures using the Touch Shutter function

Applicable modes: P A S M C1 C2 C3

Just by touching the subject you want as your point of focus, the camera will focus on the subject and take the picture automatically.

1 **Touch [ ].**

2 **Touch [ ].**

- Icon will change to [ ], and taking a picture with the Touch Shutter function becomes possible.

3 **Touch the subject you wish to focus on, and then take a picture.**

- The picture is taken when the focus is achieved.

■ To cancel the Touch Shutter function

Touch [ ].

- If shooting with the touch shutter fails, the AF area turns red and disappears. In that case, try again.
- Measurement of brightness is performed on the spot touched when the [Metering Mode] (P161) is set to [ ].
  At the edge of the screen, the metering may be affected by the brightness around the touched location.

Easily Optimizing the Brightness for a Specified Area (Touch AE)

Applicable modes: iA iA+ P A S M M C1 C2 C3

You can easily optimize the brightness for a touched position. When the face of the subject appears dark, you can brighten the screen according to the brightness of the face.

1 **Touch [ ].**

2 **Touch [ ].**

- The setting screen for the brightness optimization position is displayed.
- [Metering Mode] is set to [ ], which is used exclusively for the Touch AE.

3 **Touch the subject you want to optimize the brightness for.**

- Touching [Reset] will bring the brightness optimization position back to the center.

4 **Touch [Set].**

■ Canceling the Touch AE function

Touch [ ].

- [Metering Mode] returns to the original setting, and the brightness optimization position is canceled.

Not available in these cases:

- This function is not available in the following cases:
  - When using the Digital Zoom.
  - When [Touch AF] in [Touch Settings] of the [Custom] menu has been set to [AF+AE]. (P105)

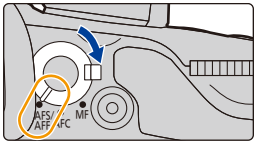
Taking Pictures with Auto Focus

Applicable modes: iA iA+ P A S M M C1 C2 C3

By setting the optimum Focus Mode or Auto Focus Mode for the subject or recording condition, you can let the camera automatically adjust focus in various scenes.

1 Set the focus mode lever to [AFS/AFF] or [AFC].

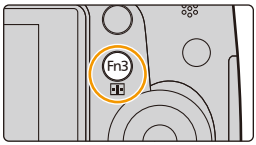
- The Focus Mode will be set. (P93)



2 Press [ ].

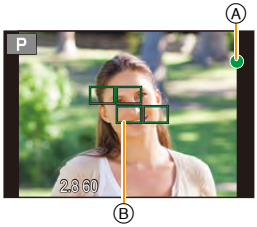
3 Press ◄/► to select AF Mode and then press [MENU/SET].

- The Auto Focus Mode will be set. (P94)



4 Press the shutter button halfway.

- Auto Focus will be activated.



Focus	When the subject is focused	When the subject is not focused
Focus indication Ⓐ	On	Blinks
AF area Ⓑ	Green	—
Sound	Beeps 2 times	—

- The focus indication is displayed as [LOW] in a dark environment, and focusing may take longer than usual.

- If you zoom in/out after focusing on a subject, the focus may lose its accuracy. In that case, re-adjust the focus.
- When the Focus Mode is set to [AFF] or [AFC].
  - A beep will be emitted when focus is first achieved during the pressing halfway.
  - When AF Mode is set to [▦], the first AF area at which focus is achieved may be displayed momentarily while pressing halfway.

Subjects and recording conditions which are difficult to focus

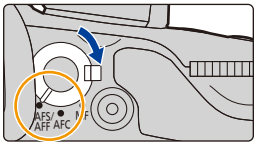
- Fast-moving subjects, extremely bright subjects or subjects without contrast.
- When recording subjects through windows or near shiny objects.
- When it is dark or when jitter occurs.
- When the camera is too close to the subject or when taking a picture of both distant and near subjects.

Selecting the Focus Mode (AFS/AFF/AFC)

Applicable modes: iA iA+ P A S M M C1 C2 C3

The method for achieving focus when the shutter button is pressed halfway is set.

Set the focus mode lever to [AFS/AFF] or [AFC].



Item		The movement of the subject and the scene (recommended)/Description of settings
[AFS/AFF]	[AFS] (Auto Focus Single)	**Subject is still** **(Scenery, anniversary photograph, etc.)** Focus is set automatically when the shutter button is pressed halfway. Focus will be fixed while it is pressed halfway.
	[AFF] (Auto Focus Flexible)	**Movement cannot be predicted** **(Children, pets, etc.)** In this mode, focusing is performed automatically when the shutter button is pressed halfway. If the subject moves while the shutter button is pressed halfway, the focus is corrected to match the movement automatically.
[AFC] (Auto Focus Continuous)		**Subject is moving** **(Sport, trains, etc.)** In this mode, while the shutter button is pressed halfway, focusing is constantly performed to match the movement of the subject. When the subject is moving, the focusing is performed by predicting the subject position at the time of recording. (Movement prediction)
[MF]		Set the focus manually. (P107)

■ About [AFS/AFF] of the focus mode lever

In [AFS/AFF] in the [Rec] menu or the [Motion Picture] menu, you can assign [AFS] or [AFF] to [AFS/AFF] of the focus mode lever.

When recording using [AFF], [AFC]

- It may take time to focus on the subject when you operate the zoom from Wide to Tele or suddenly change the subject from a distant one to a nearby one.
- Press the shutter button halfway again when it is difficult to focus on the subject.
- While the shutter button is pressed halfway, shake may be seen on the screen.

- When the brightness is insufficient for [AFF] or [AFC], the camera will operate as if [AFS] has been set. In this case, the display will change to the yellow [AFS].
- Depending on the lens used, [AFF] and [AFC] may not operate. Refer to the website on P21.

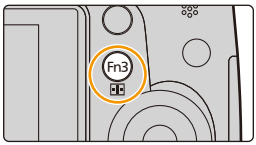
Selecting the Auto Focus Mode

Applicable modes: iA iA+ P A S M M C1 C2 C3

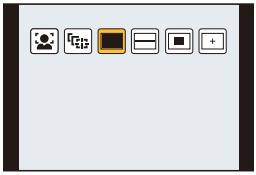
This allows the focusing method that suits the positions and number of the subjects to be selected.

[ ]/[Fn3] button can be used in two ways, as [ ] (AF Mode/MF) or as [Fn3] (function 3). At the time of purchase, it is initially set to [AF Mode/MF].
- Refer to P317 for details about the function button.

1 **Press [ ].**



2 **Press ◄/► to select AF Mode and then press [MENU/SET].**



([Face/Eye Detection])	The camera automatically detects the person's face and eyes. An eye closer to the camera will be in focus, while the exposure will be optimized for the face. (When [Metering Mode] is set to [◎]) • Up to 15 faces can be detected. Eyes that can be detected are only those of the face that is in focus. • You can change the eye to be in focus. (P97) • Position and size of the AF area can be changed. (P101)
([Tracking])	The camera focuses on the subject you specify. The exposure will be optimized for the subject. (When [Metering Mode] is set to [◎].) Focus and exposure will keep on following the subject even if it moves. (Dynamic tracking) (P98)
([49-Area])	Up to 49 AF areas can be focused. This is effective when a subject is not in the center of the screen. • You can select areas to be in focus. (P102)
, etc. ([Custom Multi])	From among 49 AF areas, you can freely set the optimum shape of the AF area for the subject. (P99)
([1-Area])	The camera focuses on the subject in the AF area on the center of the screen. • Position and size of the AF area can be changed. (P101)
([Pinpoint])	You can achieve a more precise focus on a point that is smaller than [■]. If you press the shutter button halfway, the screen that lets you check the focus will be enlarged. • The time for which the display is enlarged can be set using [Pinpoint AF Time] in the [Custom] menu. (P306) • The focus position can be set on an enlarged screen. (P103)

Pressing the shutter button halfway to adjust the composition

When the subject is not in the center of the composition in [■], you can bring the subject into the AF area, fix the focus and exposure by pressing the shutter button halfway, move the camera to the composition you want with the shutter button pressed halfway, and then take the picture.
(Only when the focus mode is set to [AFS].)

Restrictions on Auto Focus Mode

- The AF Mode is fixed to [■] in the following cases.
  - When using the Digital Zoom
  - [Miniature Effect] (Creative Control Mode)

([Face/Eye Detection])

- Under certain picture-taking conditions including the following cases, the Face/Eye Detection Function may fail to work, making it impossible to detect faces. The AF Mode is switched to [▦].
  - When the face is not facing the camera
  - When the face is at an angle
  - When the face is extremely bright or dark
  - When the facial features are hidden behind sunglasses, etc.
  - When the face appears small on the screen
  - When there is little contrast on the faces
  - When there is rapid movement
  - When the subject is other than a human being
  - When the camera is shaking

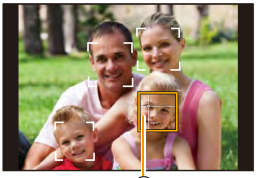
([Tracking])

- [ ] cannot be used with [Time Lapse Shot].
- In the following cases, [ ] operates as [■].
  - [Sepia]/[Monochrome]/[Dynamic Monochrome]/[Rough Monochrome]/[Silky Monochrome]/[Soft Focus]/[Star Filter]/[Sunshine] (Creative Control Mode)
  - [Monochrome] ([Photo Style])
- Dynamic Tracking function may not work in the following cases:
  - When the subject is too small
  - When the recording location is too dark or bright
  - When the subject is moving too fast
  - When the background has the same or similar color to the subject
  - When jitter is occurring
  - When zoom is operated

([Pinpoint])

- In the following case, [+] operates as [■].
  - When recording motion pictures
- It cannot be set to [+] in the following cases.
  - [AFF]/[AFC] (focus mode)

About [ ] ([Face/Eye Detection])



When the camera detects a face, the AF area and the mark indicating the eye to be in focus are displayed.
Yellow:
When the shutter button is pressed halfway, the frame turns green when the camera is focused.
White:
Displayed when more than one face is detected. Other faces that are the same distance away as faces within the yellow AF areas are also focused.
Ⓐ The eye to be in focus

■ Changing the eye to be in focus

Touch the eye to be in focus.

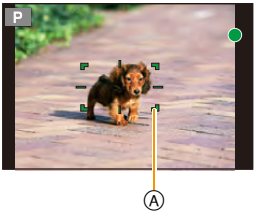
- Touch the eye in the yellow frame. If you touch any other location, the AF area setting screen will be displayed. (P101)
- If you touch [ ] or press [MENU/SET], the eye focus setting will be canceled.
- If the yellow frame moves to another face or the frame disappears after you change the composition or do something similar, the eye focus setting will be canceled.

Locking the subject to be tracked ([Tracking])

Button operation

Aim the AF tracking frame over the subject, and press the shutter button halfway.

Ⓐ AF tracking frame



- AF area will turn green when the camera detects the subject.
- The AF area turns yellow when the shutter button is released.
- Lock is canceled when [MENU/SET] is pressed.

Touch operation

Touch the subject.

- Perform the operation after canceling the touch shutter function.
- The AF area turns yellow while the subject is locked.
- Lock is canceled when [AF OFF] is touched.

- If it fails to lock, AF area will flash in red, and disappear. Try to lock again.
- When AF tracking fails, [■] is set.

Setting the shape of the AF area ([Custom Multi])

Selecting from 49 AF areas, you can freely set the optimum shape of the AF area for the subject.

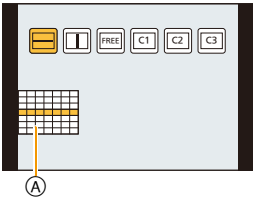
1 Press [ ].

2 Select a Custom Multi icon ([ ], etc.), and press ▲.

- If you press ▼, the AF area setting screen will be displayed.
- You can also display the AF area setting screen by touching the screen.

3 Press ◄/► to select a setting.

- The current shape of the AF area Ⓐ is displayed on the bottom left of the screen.



([Horizontal Pattern])	Horizontal line This shape is convenient for taking panning shots or similar shots.	
([Vertical Pattern])	Vertical line This shape is convenient for recording objects, such as buildings.	
([User Defined])	Free shape	
([Custom1]/ [Custom2]/ [Custom3])	You can select a customized setting.	

4 Press ▼.

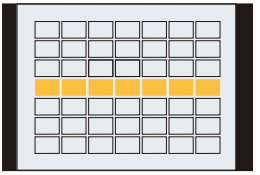
- AF area setting screen is displayed.

5 Select AF areas.

- The selected AF areas are displayed in yellow, while the areas that are not selected are displayed in white.

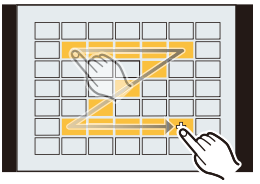
When selecting [⋯]/[⋮]

When [⋯] is selected, you can change the vertical size and position; when [⋮] is selected, you can change the horizontal size and position.



Button operation	Touch operation	Description of operation
▲/▼/◀/▶	Touching	Moves the position
/ /	Pinching in/out	Changes the size (Up to 3 lines)
[DISP.]	[Reset]	Restores the default setting

When selecting [FREE]/[C1]/[C2]/[C3]



Touch operation

Drag your finger over the parts you want to set as AF areas.

- If you touch one of the selected AF areas, the selection of the area will be canceled.

Button operation

Press ▲/▼/◀/▶ to select the AF area, and then press [MENU/SET] to set (repeat).

- The setting is canceled when [MENU/SET] is pressed again.
- If you press [DISP.], all the selections will be canceled.

6 Press [Fn2].

■ Registering the set AF area to [C1], [C2] or [C3]

1 On the screen in step 3 on P99, press ▲.

2 Press ▲/▼ to select a destination to which the setting will be registered, and press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.

- Settings registered to C1/C2/C3 will be stored even after this unit is turned off.
- Turning off this unit will return the setting adjusted with ⋯/⋮/FREE back to the default setting.
- If you press a cursor button when [Direct Focus Area] in the [Custom] menu is set to [ON], the AF area setting screen will be displayed.

Setting up position of the AF area/changing size of the AF area

Applicable modes: P A S M C1 C2 C3

When [ ], [ ], [ ], or [ ] in Auto Focus Mode is selected, you can change the position and size of the AF area.

- Perform the operation after canceling the touch shutter function.
- When setting with touch operation, set [Touch AF] in [Touch Settings] of the [Custom] menu to [AF].

- The spot metering target can also be moved to match the AF area when the [Metering Mode] (P161) is set to [ ]. At the edge of the screen, the metering may be affected by the brightness around the AF area.
- If you set [Direct Focus Area] in the [Custom] menu to [ON], you can move the AF area with the cursor buttons when [ ], [ ], or [ ] is selected, and you can move the enlarged part with the cursor buttons when [ ] is selected. (P307)

Not available in these cases:

- When using digital zoom, the position and size of the AF area cannot be changed.

When selecting [ ], [ ]

Position and size of the AF area can be changed.

1 Press [ ].

2 Select [ ] or [ ] and press ▼.

- AF area setting screen is displayed.
- You can also display the AF area setting screen by touching the screen.

3 Change the position and size of the AF area.

Button operation	Touch operation	Description of operation
▲/▼/◀/▶	Touching	Moves the AF area.
	Pinching in/out	Enlarges/reduces the AF area in small steps.
/	–	Enlarges/reduces the AF area in large steps.
[DISP.]	[Reset]	Resets the AF area back to the center. • If you press the button again, the frame size will be reset to the default setting.

- If you set the AF area over an eye in the yellow frame when [ ] is selected, the eye to be in focus will be changed. (P97)

4 Press [MENU/SET] to set.

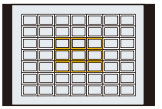
- AF area with the same function as [■] is displayed in the touched position, when the [ ] is selected.

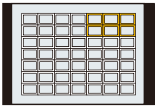
  Setting of the AF area is cleared when [MENU/SET] is pressed or [AF OFF] is touched.

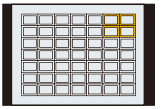
When selecting [ ]

The 49 AF areas are divided into groups, each consisting of 9 areas (on the edge of the screen, 6 or 4 areas).

Examples of group







1 Press [ ].

2 Select [ ] and press ▼.

- AF area setting screen is displayed.

3 Press ▲/▼/◀/▶ to select an AF area group.

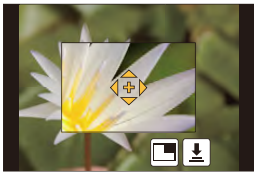
- You can also select a group by touching the screen.

4 Press [MENU/SET] to set.

- Only [+] display (center point of selected group) will remain on the screen.
- Setting of the AF area frame is cleared when [MENU/SET] is pressed or [AF OFF] is touched.

When selecting [⊞]

You can set the focus position precisely by enlarging the screen.
• The focus position cannot be set at the edge of the screen.



1 Press [⊞].
2 Select [⊞] and press ▼.
3 Press ▲/▼/◀/▶ to set the focus position and then press [MENU/SET].
- The assist screen for setting the focus position is displayed in an enlarged size.
- The assist screen can also be displayed by touching the subject.

4 Move [+] to the position to be in focus.

Button operation	Touch operation	Description of operation
▲/▼/◀/▶	Touching	Moves [+].
	Pinching in/ out	Enlarges/reduces the screen (by steps of 0.1×)
	–	Enlarges/reduces the screen (by steps of 1.0×)
		Switches the enlarged display (windowed/full screen)
[DISP.]	[Reset]	Resets [+] back to the center.

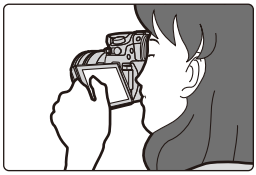
- When the picture is displayed in windowed mode, you can enlarge/reduce the picture by approximately 3 to 6×; when the picture is displayed in full screen, you can enlarge/ reduce the picture by approximately 3 to 10×.
- If you use the HDMI output during recording, the screen cannot be enlarged in windowed mode.
- On the assist screen, it is also possible to record a picture by touching [⬇].

Setting the AF area position with the Touch Pad

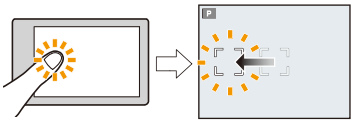
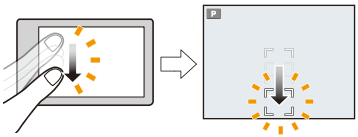
Applicable modes: P A S M C1 C2 C3

By setting [Touch Pad AF] in [Touch Settings] (P314) in the [Custom] menu, you can move the AF area displayed on the viewfinder by touching the monitor.

- If you touch the monitor when the Auto Focus Mode is set to [Custom Multi] such as [ ], the AF area setting screen will be displayed. (P99)



MENU → [Custom] → [Touch Settings] → [Touch Pad AF]

[EXACT]	Moves the AF area of the Viewfinder by touching a desired position on the Touch Pad.	
[OFFSET]	Moves the AF area of the viewfinder according to the distance you drag the touch pad (P49).	
[OFF]	—	

- Press the shutter button halfway to determine the focus position.
  If you press [DISP.] before determining the focus position, the AF area frame returns to the center position.
- To cancel the AF area frame when the Auto Focus Mode (P91) is set to [ ] ([Face/Eye Detection]), [ ] ([Tracking]) or [ ] ([49-Area]), press [MENU/SET].

- The Touch Shutter function (P89) is disabled when using [Touch Pad AF].

Optimizing the focus and brightness for a touched position

Applicable modes: iA iA+ P A S M M C1 C2 C3

By setting [Touch AF] (P314) in [Touch Settings] of the [Custom] menu to [AF+AE], you can optimize the focus and brightness for the position you have touched.

1 Select the menu. (P54)

MENU → [Custom] → [Touch Settings]

2 Select [Touch AF] and then touch [AF+AE].

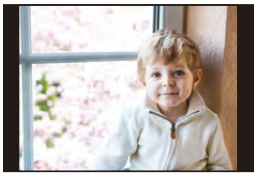
3 Touch the subject you want to optimize the brightness for.

- AF area setting screen is displayed. (P101)
- The brightness optimization position is displayed on the center of the AF area. The position follows the movement of the AF area.
- [Metering Mode] is set to [ ], which is used exclusively for the Touch AE.
- Touching [Reset] returns the brightness optimization position and the AF area to the center.

4 Touch [Set].

- The AF area with the same function as [ ] is displayed on the touched position.
- Touching [ ] returns [Metering Mode] to the original setting and cancels the brightness optimization position. The AF area setting is also canceled.
- Touching [ ] returns [Metering Mode] to the original setting and cancels the brightness optimization position.

When the background has become too bright, etc., the brightness contrast with the background can be adjusted by compensating the exposure.



- When recording with the Touch Shutter, the focus and brightness are optimized for the touched position before recording takes place.
- At the edge of the screen, the metering may be affected by the brightness around the touched location.

Not available in these cases:

- [AF+AE], which optimizes the focus and brightness, does not work in the following cases.
  – In Manual Focus
  – When using the Digital Zoom
  – When the AF area has been set by using the cursor button

Taking Pictures with Manual Focus

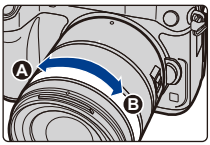
Applicable modes: iA iA+ P A S M M C1 C2 C3

Use this function when you want to fix the focus or when the distance between the lens and the subject is determined and you do not want to activate Auto Focus.

The operations used to focus manually differ depending on the lens.

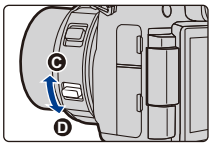
When using the interchangeable lens (H-HS12035/H-FS14140) having a focus ring

Rotate to Ⓐ side: Focuses on nearby subject
Rotate to Ⓑ side: Focuses on faraway subject



When using the interchangeable lens having a focus lever

Move to Ⓒ side: Focuses on nearby subject
Move to Ⓓ side: Focuses on faraway subject

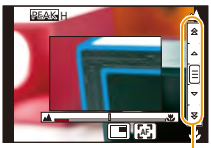


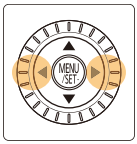
- The focusing speed varies depending on how far you move the focus lever.

When using an interchangeable lens with no focus ring

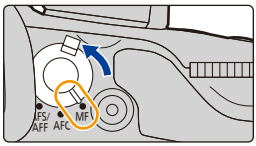
Press ◀: Focuses on close-up subjects
Press ▶: Focuses on distant subjects
Ⓐ Slide bar

- These operations are possible only on the focus adjustment screen.
- Pressing and holding ◀/▶ will increase the focus speed.
- Focus can also be adjusted by dragging the slide bar.





1 **Set the focus mode lever to [MF].**

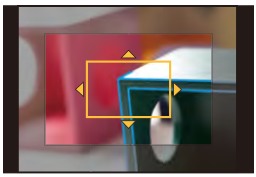


2 **Press [ ].**

- Press the function button to which [AF Mode/MF] in [Fn Button Set] (P317) has been assigned. (assigned to [ ]/[Fn3] at the time of purchase)

3 **Press ▲/▼/◀/▶ to determine the area to be enlarged, and press [MENU/SET].**

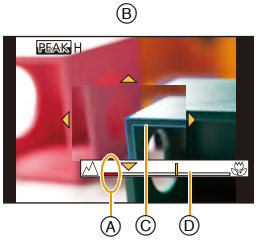
- The assist screen is displayed, enlarging the area. (MF Assist) (P308)



- You can also enlarge the area by rotating the focus ring, moving the focus lever, or pinching out (P49) the screen or touching the screen twice.
- You can also determine the area to be enlarged by dragging (P49) the screen.
- If you press [DISP.], the area to be enlarged will be reset to the center.

4 Adjust the focus.

Ⓐ Indicator for ∞ (infinity)
Ⓑ MF Assist (enlarged screen)
Ⓒ Peaking
Ⓓ MF Guide



- The in-focus portions will be highlighted. (Peaking) (P111)
- You can check whether the point of focus is to the near side or to the far side. (MF Guide) (P308)

You can perform the following operations:

Button operation	Touch operation	Description of operation
▲/▼/◀/▶*	**Dragging**	Moves the enlarged area
	Pinching in/out	Enlarges/reduces the screen (by steps of 0.1×)
	–	Enlarges/reduces the screen (by steps of 1.0×)
		Switches the enlarged display (windowed/full screen)
[DISP.]	**[Reset]**	Resets the area to be enlarged back to the center.

* When using an interchangeable lens with no focus ring, you cannot move the enlarged area. If you press ▼, the screen that lets you set the area to be enlarged will be displayed.

- When the picture is displayed in windowed mode, you can enlarge/reduce the picture by approximately 3 to 6×; when the picture is displayed in full screen, you can enlarge/reduce the picture by approximately 3 to 10×.
- If you use the HDMI output during recording, the screen cannot be enlarged in windowed mode.

5 Press the shutter button halfway.

- The assist screen will close. The recording screen will be displayed.
- You can also close the assist screen by pressing [MENU/SET].
- If you have enlarged the picture by rotating the focus ring or moving the focus lever, the assist screen will close approximately 10 seconds after the operation.

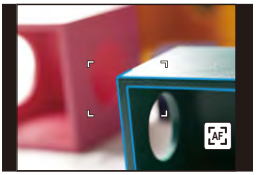
- MF Assist or MF guide may not display depending on the lens used, but you can display MF Assist by direct operation of the camera, using the touch screen or a button.
- If you press a cursor button on the recording screen when [Direct Focus Area] in the [Custom] menu is set to [ON], the screen that lets you set the area to be enlarged will be displayed.
- When using [Miniature Effect] in Creative Control Mode, you cannot enlarge the picture by touching the screen.
- The MF Assist is disabled when using the Digital Zoom or recording motion pictures.
- When using an interchangeable lens with no focus ring, you can change the method for enlarging MF Assist and the operation assigned to the control dial by changing the [Lens w/o Focus Ring] settings in the [Custom] menu. (P313)

Achieving focus quickly using Auto Focus

MENU → **[Custom]** → **[AF/AE Lock]** → **[AF-ON]**

If [AF/AE LOCK] is pressed in Manual Focus, Auto Focus will work.

- Auto Focus works at the center of the frame.
- If Auto Focus is used while the MF Assist screen is displayed, the center of the MF Assist screen will be focused.
- Auto Focus also works with the following touch operations.
  - Pressing the function button to which [AF-ON] is assinged
  - Touching [AF]
  - Dragging the monitor and releasing your finger at the position you want to focus on



Technique for Manual Focus

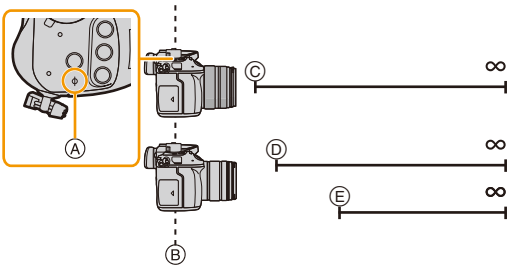
❶ Rotate the focus ring to focus on the subject.
❷ Rotate it a little more.
❸ Finely focus on the subject by rotating the focus ring slowly in reverse.

- If you zoom in/out after focusing on a subject, the focus may lose its accuracy. In that case, re-adjust the focus.
- After canceling Sleep Mode, focus on the subject again.
- If you are taking close-up pictures:
  – We recommend using a tripod and the self-timer (P118).
  – The effective focus range (depth of field) is significantly narrowed. Therefore, if the distance between the camera and the subject is changed after focusing on the subject, it may become difficult to focus on it again.
  – The resolution of the periphery of the picture may decrease slightly. This is not a malfunction.

About the focus distance reference mark

The focus distance reference mark is a mark used to measure the focus distance.
Use this when taking pictures with Manual Focus or taking close-up pictures.

Focus range



Ⓐ Focus distance reference mark
Ⓑ Focus distance reference line
Ⓒ 0.25 m (0.82 feet)
[When the interchangeable lens (H-HS12035) is used]
Ⓓ 0.3 m (0.98 feet) (Wide to focal length 21 mm)
[When the interchangeable lens (H-FS14140) is used]
Ⓔ 0.5 m (1.6 feet) (focal length 22 mm to Tele)
[When the interchangeable lens (H-FS14140) is used]

Highlighting/not highlighting in-focus portions

MENU → fc [Custom] → [Peaking]

[ON]	In-focus portions are highlighted with color.	
[OFF]	In-focus portions are not highlighted.	
[SET]	**[Detect Level]**	The detection level for in-focus portions is set. When [HIGH] is set, portions to be highlighted are reduced, allowing you to achieve a more precise focus. **[HIGH]/[LOW]** • The detection level setting does not affect the focus range.
	[Display Color]	Sets the highlighting color used for [Peaking]. • When [Detect Level] is set to [HIGH]: [ ] (Light blue)/[ ] (Yellow)/[ ] (Green) • When [Detect Level] is set to [LOW]: [ ] (Blue)/[ ] (Orange)/[ ] (White) • Changing the [Detect Level] setting also changes the [Display Color] setting as follows. – [ ] (Light blue) ⟷ [ ] (Blue) – [ ] (Yellow) ⟷ [ ] (Orange) – [ ] (Green) ⟷ [ ] (White)

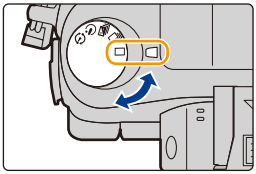
- When [Peaking] is set, [PEAK H] ([Detect Level]: [HIGH]) or [PEAK L] ([Detect Level]: [LOW]) will be displayed.
- Each time [PEAK] in [ ] is touched, the setting is switched in order of [ON] ([Detect Level]: [LOW]) → [ON] ([Detect Level]: [HIGH]) → [OFF].
- Each time the set function button is pressed when [Peaking] is set to [Fn Button Set] (P317) in the [Custom] menu, the peaking setting switches in order of [ON] ([Detect Level]: [LOW]) → [ON] ([Detect Level]: [HIGH]) → [OFF].
- This function works in Manual Focus or when focus is being adjusted manually with [AF+MF].
- Since portions with clear outlines on the screen are highlighted as in-focus portions, portions to be highlighted vary depending on the recording conditions.
- The color used for highlighting does not affect recorded images.
- [Peaking] does not work with [Rough Monochrome] in Creative Control Mode.

Select a Drive Mode

Applicable modes: iA iA+ P A S M M C1 C2 C3

You can change what the camera will do when you press the shutter button.

Rotating the drive mode dial.



[Single]	When the shutter button is pressed, only one picture is recorded.
[Burst] (P113)	Recordings are made in succession while the shutter button is pressed.
[Auto Bracket] (P116)	Each time the shutter button is pressed, recordings are made with different exposure settings according to the Exposure Compensation range.
[Self Timer] (P118)	When the shutter button is pressed, recording takes place after the set time has elapsed.
[Time Lapse/ Animation] (P120, 124)	Pictures are recorded with Time Lapse Shot or Stop Motion Animation.

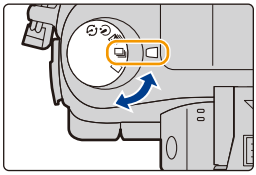
Taking Pictures using Burst Mode

Applicable modes: iA iA+ P A S M M C1 C2 C3

Pictures are taken continuously while the shutter button is pressed.

• Pictures taken with a burst speed of [SH] will be recorded as a single burst group (P225).

1 Set the drive mode dial to [ ].



2 Focus on the subject and take a picture.

• Hold down the shutter button fully to activate the Burst Mode.

■ Changing the burst speed

1 Select the menu. (P54)

MENU → [Rec] → [Burst Rate]

2 Press ▲/▼ to select the burst speed and then press [MENU/SET].

		[SH]*2 (Super high speed)	[H] (High speed)	[M] (Middle speed)	[L] (Low speed)
Burst speed (pictures/second)		40	12 (AFS) 7 (AFC)	7	2
Live View during Burst Mode		None	None	Available	Available
*1	With RAW files	—	40*3, 4, 5		
	Without RAW files	Max. 120	100 or more*3, 4, 5		

*1 Number of burst shots

*2 The electronic shutter will operate.

*3 Recording conditions are based on CIPA standards and an SDHC card manufactured by Panasonic is used.

*4 Depending on the recording conditions, the number of frames in a burst may be reduced. (For example, when you set [i.Resolution] of the recording menu, the number of frames in a burst may be reduced)

*5 Pictures can be taken until the capacity of the card becomes full. However the burst speed will become slower halfway. The exact timing of this depends on the aspect ratio, the picture size, the setting for the quality and the type of card used.

- The Burst speed may become slower depending on the following settings.
  – [Picture Size] (P129)/[Quality] (P130)/[Sensitivity] (P132)/[Focus Mode] (P93)/[Focus/Release Priority] (P307)
- Refer to P130 for information about RAW files.
- Exit the menu after it is set.

About the maximum number of pictures that can be taken continuously

When you press the shutter button halfway, the maximum number of pictures you can take continuously will appear. You can check the approximate number of pictures that can be taken before the burst speed slows down.

Example: When 20 pictures can be taken: [r20]

- Once recording starts, the maximum number of pictures that can be taken continuously will decrease. When [r0] appears, the burst speed will slow down.
- When [r99+] is displayed, you can take 100 or more pictures continuously.

Focusing in Burst Mode

The way focus is achieved varies according to the focus mode (P93) setting and the [Focus/Release Priority] (P307) setting in the [Custom] menu.

Focus Mode	Focus/Release Priority	Focus
AFS	[FOCUS]	At the first picture
	[RELEASE]	
AFF/AFC*1	[FOCUS]	Normal focusing*2
	[RELEASE]	Predicted focusing*3
MF	—	Focus set with Manual Focus

*1 When the subject is dark or the burst speed is set to [SH], the focus is fixed on the first picture.
*2 The burst speed may become slower because the camera is continuously focusing on the subject.
*3 Burst speed takes priority, and focus is estimated within possible range.

- We recommend using the shutter remote control (DMW-RSL1: optional) when you want to keep the shutter button pressed fully while taking pictures in Burst Mode. Refer to P353 for information about the shutter remote control.
- When the burst speed is set to [SH] or [H] (when focus mode is [AFS] or [MF]), the exposure and White Balance are fixed at the settings used for the first picture for the subsequent pictures as well.
  When the burst speed is set to [H] (when focus mode is [AFF] or [AFC]), [M] or [L], they are adjusted each time you take a picture.
- Since the shutter speed becomes slower in dark places, the burst speed (pictures/second) may become slower.
- Depending on the operating conditions, it may take time to take the next picture if you repeat the recording of pictures.
- It may take time to save pictures taken in Burst Mode on the card. If you take pictures continuously while saving, the maximum number of recordable pictures decreases. For continuous shooting, use of a high speed memory card is recommended.

Not available in these cases:

- The Burst Mode is disabled in the following cases.
  – When White Balance Bracket is set
  – When recording using the flash
  – When recording with [iHandheld Night Shot]
  – When [HDR] is set to [ON]
  – [Multi Exp.]
- In the following cases, [SH] in Burst Mode cannot be used.
  – When [Quality] is set to [RAW], [RAW] or [RAW]
  – When using [Shutter Delay]

Taking Pictures using Auto Bracket

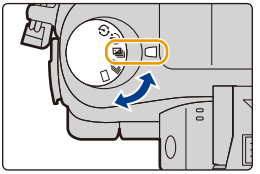
Applicable modes: P A S M C1 C2 C3

Maximum of 7 pictures will be recorded with different exposure settings following the Exposure Compensation range every time the shutter button is pressed.

With Auto Bracket
[Step]: [3•1/3], [Sequence]: [0/−/+]

1st picture	2nd picture	3rd picture
±0 EV	−1/3 EV	+1/3 EV

1 **Set the drive mode dial to [ ].**



2 **Focus on the subject and take a picture.**

- If you press and hold the shutter button, the number of pictures that you set is taken.
- The Auto Bracket indication blinks until the number of pictures that you set is taken.
- The picture count is reset to [0] if you change the Auto Bracket setting or turn the camera off before all the pictures that you set are taken.

Changing the settings for [Single/Burst Settings], [Step] and [Sequence] in Auto Bracket

1 Select the menu. (P54)

MENU → [Rec] → [Auto Bracket]

2 Press ▲/▼ to select [Single/Burst Settings], [Step] or [Sequence] and then press [MENU/SET].

3 Press ▲/▼ to select the setting and then press [MENU/SET].

[Single/Burst Settings]	[□] (single)
	[□] (burst)
[Step]	[3•1/3] (3 pictures)
	[3•2/3] (3 pictures)
	[3•1] (3 pictures)
	[5•1/3] (5 pictures)
	[5•2/3] (5 pictures)
	[5•1] (5 pictures)
	[7•1/3] (7 pictures)
	[7•2/3] (7 pictures)
	[7•1] (7 pictures)

[Sequence]	[0/–/+]
	[–/0/+]

- You can take one picture at a time when set to [□].
- You can continuously take pictures up to set numbers when set to [□].
- Exit the menu after it is set.

- When taking pictures using Auto Bracket after setting the Exposure Compensation value, the pictures taken are based on the selected Exposure Compensation value.

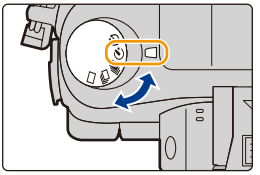
Not available in these cases:

- Auto Bracket is disabled in the following cases.
  - When White Balance Bracket is set.
  - When recording using the flash
  - When recording with [iHandheld Night Shot]
  - When [HDR] is set to [ON]
  - [Multi Exp.]

Taking Pictures with the Self-timer

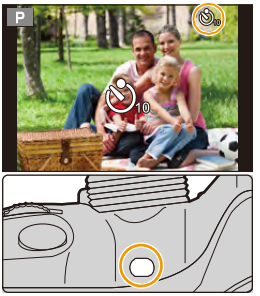
Applicable modes: iA iA+ P A S M M C1 C2 C3

1 **Set the drive mode dial to [⏲].**



2 **Press the shutter button halfway to focus and then press it fully to take the picture.**

- Focus and exposure will be set when the shutter button is pressed halfway.
- After the self-timer indicator flashes, recording starts.



■ Changing the time setting for the self-timer

1 Select the menu. (P54)

MENU → [Rec] → [Self Timer]

2 Press ▲/▼ to select the mode and then press [MENU/SET].

10	Picture is taken 10 seconds after shutter is pressed.
10	After 10 seconds the camera takes 3 pictures at about 2 seconds intervals.
2	Picture is taken 2 seconds after shutter is pressed. • When using a tripod, etc., this setting is a convenient way to avoid the jitter caused by pressing the shutter button.

• Exit the menu after it is set.

We recommend using a tripod when recording with the self-timer.

• The flash output may vary slightly when the [10] is selected.

Not available in these cases:

• It cannot be set to [10] in the following cases.
– When White Balance Bracket is set
– [Multi Exp.]

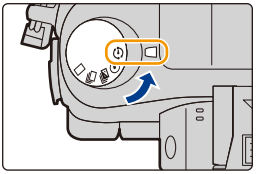
Taking Pictures Automatically at Set Intervals

([Time Lapse Shot])

Applicable modes: iA iA+ P A S M M C1 C2 C3

If you set the start time of recording, the recording interval and the number of pictures, the camera can automatically take pictures of subjects such as animals or plants as time elapses and create a motion picture.

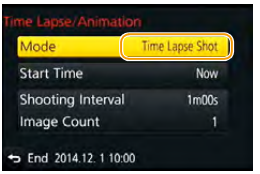
- **Set the date and time settings in advance.** (P36)
- Pictures taken with Time Lapse Shot are displayed as a set of group pictures. (P225)
- When [System Frequency] is set to [24.00 Hz (CINEMA)], you can take pictures, but you cannot create motion pictures from them.



1 Set the drive mode dial to [⏱].
- To use the settings you used in the previous recording with the drive mode [⏱], start recording without changing the settings.

2 Press [MENU/SET].
- The screen selected with [Time Lapse/Animation] in the recording menu will be displayed. (The screen will be displayed only when you press [MENU/SET] for the first time after switching the drive mode dial to [⏱]. In other cases, the camera operates as usual, displaying the menu screen.)
- If you touch [ ] before taking pictures, the setting screen for [Time Lapse/Animation] in the [Rec] menu will be displayed.

3 Press [MENU/SET].



4 Select [Mode] with ▲/▼, and then press [MENU/SET].
- If [Time Lapse Shot] is already selected, proceed to step **6**.

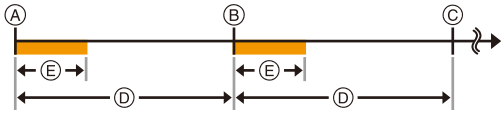
5 Select [Time Lapse Shot] with ▲/▼, and then press [MENU/SET].

6 Press ▲/▼ to select the item and then press [MENU/SET].

[Start Time]	**[Now]**	Starts the recording by fully-pressing the shutter button.
	[Start Time Set]	You can set the time to start recording. Any time up to 23 hours 59 minutes ahead can be set. **Select the item (hour or minute) by pressing ◀/▶, set the start time by pressing ▲/▼, and then press [MENU/SET].**
[Shooting Interval]/ [Image Count]	The recording interval and the number of pictures can be set. **◀/▶:** Select the item (minute/second/number of pictures) **▲/▼:** Setting **[MENU/SET]:** Set • A recording interval ranging from 1 second to 99 minutes and 59 seconds can be set at 1 second interval. • The number of pictures ranging from 1 to 9999 can be set.	

• Set the recording interval Ⓓ so that it will be longer than the exposure time (shutter speed) Ⓔ. (The figure below)
Recording may be skipped when the recording interval Ⓓ is shorter than the exposure time (shutter speed) Ⓔ, for example during night-time recording.

Ⓐ:First
Ⓑ:Second
Ⓒ:Third



7 Press the shutter button halfway.

• The recording screen will be displayed. You can also perform the same operation by pressing and holding [🗑/↩] until the recording screen is displayed.

8 Press the shutter button fully.

• The recording starts automatically.
• During recording standby, the power will turn off automatically if no operation is performed for a certain period. The Time Lapse Shot is continued even with the power turned off. When the recording start time arrives, the power turns on automatically.
To turn on the power manually, press the shutter button halfway.
• If [Fn1] is pressed or [ ] is touched while this unit is turned on, a selection screen asking you to pause or end will be displayed. Operate in accordance with the screen. Also, if [Fn1] is pressed or [ ] is touched during the pause, a selection screen asking you to resume or end will be displayed. Pressing the shutter button fully will also enable you to resume from the pause.
• Confirmation screen for creating a motion picture is displayed next, so select [Yes].

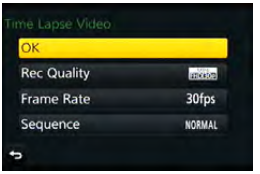
9 Select the methods for creating a motion picture.

- The recording format is set to [MP4].

[Rec Quality]	Sets the quality of a motion picture. • When [System Frequency] is set to [59.94 Hz (NTSC)] [4K/30p]/[FHD/60p]/[FHD/30p]/[HD/30p]/[VGA/30p] • When [System Frequency] is set to [50.00 Hz (PAL)] [4K/25p]/[FHD/50p]/[FHD/25p]/[HD/25p]/[VGA/25p]
[Frame Rate]	Sets the number of frames per second. The larger the number is, the smoother the motion picture will be. • When [System Frequency] is set to [59.94 Hz (NTSC)] [60fps]*/[30fps]/[15fps]/[10fps]/[7.5fps]/[6fps]/[3fps]/[1fps] • When [System Frequency] is set to [50.00 Hz (PAL)] [50fps]*/[25fps]/[12.5fps]/[8.3fps]/[6.25fps]/[5fps]/[2.5fps]/[1fps] * Only when set to [FHD/60p]/[FHD/50p]
[Sequence]	**[NORMAL]:** Splices pictures together in recording order. **[REVERSE]:** Splices pictures together in reverse recording order.

10 Select [OK] with ▲/▼, and then press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.
- Motion pictures can also be created from [Time Lapse Video] in the [Playback] menu. (P243)



Changing the Time Lapse Shot settings

You can change the settings in [Time Lapse/Animation] in the [Rec] menu.

- This function is not for use in a security camera.
- **If you leave the unit somewhere to perform [Time Lapse Shot], please be careful of theft.**
- **Recording for long periods in cold places such as ski resorts or places at high altitude, or in warm, wet environments may cause a malfunction, so please be careful.**
- Recording may not be consistent with the set recording interval or the set number of pictures depending on recording conditions.
- Recording may be skipped when the recording time is longer than the recording interval, such as long time exposure.
- We recommend that you use a sufficiently charged battery or an AC adaptor (optional) and a DC coupler (optional).
- [Time Lapse Shot] is paused in the following cases.
  – When the charge on the battery runs out
  – Turning the camera off
  During [Time Lapse Shot], you can replace the battery and the card, and then restart by turning on this unit. (Note that pictures taken after the restart will be saved as a separate set of group pictures) Turn off this unit when replacing the battery or the card.
- Do not connect the AV cable (optional), the HDMI micro cable, or the USB connection cable (supplied) during Time Lapse Shooting.
- When a picture quality different from the aspect ratio of the original pictures is selected, black strips will be displayed on the top and bottom or the left and right of the motion picture.
- If power supply is lost by unplugging the AC adaptor or due to a blackout while creating a motion picture with the AC adaptor, the motion picture you are creating will not be recorded.
- A motion picture that exceeds the recording time of 29 minutes and 59 seconds a motion picture that exceeds the file size of 4 GB cannot be created.
- A motion picture shorter than 1 second is displayed as “0s” on the motion picture recording time (P222).
- When only one picture is taken, it will not be saved as a group picture.

Creating Stop Motion Pictures ([Stop Motion Animation])

Applicable modes: iA iA+ P A S M M C1 C2 C3

A stop motion picture is created by splicing pictures together.

- **Set the date and time settings in advance.** (P36)
- Pictures taken with [Stop Motion Animation] are displayed as a set of group pictures. (P225)
- When [System Frequency] is set to [24.00 Hz (CINEMA)], you can take pictures, but you cannot create motion pictures from them.

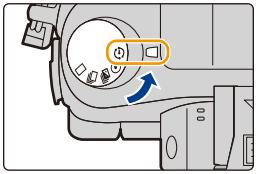
Before creating a motion picture with [Stop Motion Animation]

With [Stop Motion Animation], you can make a motion picture in which objects appear to be moving by making a recording each time you move a doll, etc., in small increments, and then splicing the recordings together.

- With this unit, pictures of 1 to 60 frames have to be taken per second of a motion picture.
- For smoother motion, record movement in as small increments as possible, and set the frame rate per second (frame rate) to a large value.

1 Set the drive mode dial to [ ].

- To use the settings you used in the previous recording with the drive mode [ ], start recording without changing the settings.



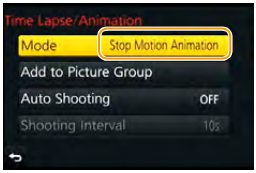
2 Press [MENU/SET].

- The screen selected with [Time Lapse/Animation] in the recording menu will be displayed. (The screen will be displayed only when you press [MENU/SET] for the first time after switching the drive mode dial to [ ]. In other cases, the camera operates as usual, displaying the menu screen.)
- If you touch [ ] before taking pictures, the setting screen for [Time Lapse/Animation] in the [Rec] menu will be displayed.

3 Press [MENU/SET].

4 Select [Mode] with ▲/▼, and then press [MENU/SET].
- If [Stop Motion Animation] is already selected, proceed to step **6**.

5 Select [Stop Motion Animation] with ▲/▼, and then press [MENU/SET].



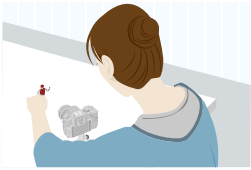
6 Press ▲/▼ to select the recording method, and then press [MENU/SET].

[Auto Shooting]	**[ON]**	Takes pictures automatically at a set recording interval. When the shutter button is pressed fully, recording starts.
	[OFF]	This is for taking pictures manually, frame by frame.
[Shooting Interval]	**(Only when [Auto Shooting] is set to [ON])** Sets the interval for automatic recording. A value between 1 and 60 seconds can be set in 1 second intervals. **Press ◄/► to select the recording interval (seconds), press ▲/▼ to set it, and press [MENU/SET].**	

7 Press the shutter button halfway.
- The recording screen will be displayed. You can also perform the same operation by pressing and holding [🗑/↩] until the recording screen is displayed.

8 Press the shutter button fully.
- Up to 9999 frames can be recorded.

9 Move the subject to decide on the composition.
- Repeat recording in the same way.
- If the camera is turned off during recording, a message for resuming the recording is displayed when the camera is turned on. Selecting [Yes] allows you to resume the recording from the interruption point.



Recording materials skillfully
- The recording screen displays up to two pictures taken previously. Use them as reference for the amount of movement.
- Pressing [▶] allows you to check recorded pictures. Unnecessary pictures can be deleted by pressing [🗑/↩]. Pressing [▶] again will return you to the recording screen.

10 Touch [ ] to end the recording.

- It can also be ended by selecting [Time Lapse/Animation] from the [Rec] menu and then pressing [MENU/SET].
- When [Auto Shooting] is set to [ON], select [End] on the confirmation screen.
  (If [Pause] has been selected, press the shutter button fully to resume the recording.)
- Confirmation screen is displayed. It is ended when [Yes] is selected.
- Confirmation screen for creating a motion picture is displayed next, so select [Yes].

11 Select the methods for creating a motion picture.

- The recording format is set to [MP4].

[Rec Quality]	Sets the quality of a motion picture. • When [System Frequency] is set to [59.94 Hz (NTSC)] [4K/30p]/[FHD/60p]/[FHD/30p]/[HD/30p]/[VGA/30p] • When [System Frequency] is set to [50.00 Hz (PAL)] [4K/25p]/[FHD/50p]/[FHD/25p]/[HD/25p]/[VGA/25p]
[Frame Rate]	Sets the number of frames per second. The larger the number is, the smoother the motion picture will be. • When [System Frequency] is set to [59.94 Hz (NTSC)] [60fps]*/[30fps]/[15fps]/[10fps]/[7.5fps]/[6fps]/[3fps]/[1fps] • When [System Frequency] is set to [50.00 Hz (PAL)] [50fps]*/[25fps]/[12.5fps]/[8.3fps]/[6.25fps]/[5fps]/[2.5fps]/[1fps] * Only when set to [FHD/60p]/[FHD/50p]
[Sequence]	**[NORMAL]:** Splices pictures together in recording order. **[REVERSE]:** Splices pictures together in reverse recording order.

12 Press ▲/▼ to select [OK] and then press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.
- Motion pictures can also be created from [Stop Motion Video] in the [Playback] menu. (P243)

■ Changing the settings of Stop Motion Animation

You can change the settings in [Time Lapse/Animation] in the [Rec] menu.

■ Adding pictures to the Stop Motion Animation group

Selecting [Add to Picture Group] in step **6** will display group pictures recorded with [Stop Motion Animation].
Select a set of group pictures, press [MENU/SET], and then select [Yes] on the confirmation screen.

- Automatic recording may not take place at set intervals because recording takes time under certain recording conditions, such as when the flash is used for recording.
- When a picture quality different from the aspect ratio of the original pictures is selected, black strips will be displayed on the top and bottom or the left and right of the motion picture.
- We recommend that you use a sufficiently charged battery or an AC adaptor (optional) and a DC coupler (optional).
- If power supply is lost by unplugging the AC adaptor or due to a blackout while creating a motion picture with the AC adaptor, the motion picture you are creating will not be recorded.
- A motion picture that exceeds the recording time of 29 minutes 59 seconds and a motion picture that exceeds the file size of 4 GB cannot be created.
- A motion picture shorter than 1 second is displayed as “0s” on the motion picture recording time (P222).
- If only one picture was taken, the picture is not saved as a group picture. A picture cannot be selected from [Add to Picture Group] when it is the only one that was taken.

5. Picture Quality and Color Tone Settings

This chapter introduces functions that work for pictures and those that work for both pictures and motion pictures.

• For information on functions that work only for motion pictures, refer to P206.

Setting the Picture Quality and Size — P129

- [Aspect Ratio] (P129)
- [Picture Size] (P129)
- [Quality] (P130)

Setting the Light Sensitivity — P132

- [Sensitivity] (P132)
  – In Creative Video Mode, you can also set the ISO sensitivity for motion pictures.
- [ISO Limit Set] (P133)
- [ISO Increments] (P134)
- [Extended ISO] (P134)

Adjusting the White Balance — P135

Adjusting the Picture Quality by Adding an Effect — P140

- [Photo Style]

Adjusting Bright/Dark Portions — P142

- [Highlight Shadow]

Compensating the contrast and exposure — P144

- [i.Dynamic]

Setting the resolution effect — P144

- [i.Resolution]

Combining pictures with different exposures — P145

- [HDR]

Reducing the long shutter noise — P146

- [Long Shtr NR]

Adjusting the amount of light on the periphery of the lens — P146

- [Shading Comp.]

Setting the color space — P147

Setting the Picture Quality and Size

Setting the aspect ratio of pictures

Applicable modes: iA iA+ P A S M M C1 C2 C3

This allows you to select the aspect ratio of the pictures to suit printing or the playback method.

MENU → [Rec] → **[Aspect Ratio]**

[4:3]	[Aspect Ratio] of a 4:3 TV
[3:2]	[Aspect Ratio] of a 35 mm film camera
[16:9]	[Aspect Ratio] of a high-definition TV, etc.
[1:1]	Square aspect ratio

- The ends of the recorded pictures may be cut at printing so check before printing. (P408)
- If you use the HDMI output during recording, the setting is fixed to [16:9].

Setting the number of pixels

Applicable modes: iA iA+ P A S M M C1 C2 C3

Set the number of pixels. The higher the numbers of pixels, the finer the detail of the pictures will appear even when they are printed onto large sheets.

MENU → [Rec] → **[Picture Size]**

When the aspect ratio is [4:3].

Settings	Image size
[L] (16M)	4608×3456
[EX M] (8M)	3264×2448
[EX S] (4M)	2336×1752

When the aspect ratio is [3:2].

Settings	Image size
[L] (14M)	4608×3072
[EX M] (7M)	3264×2176
[EX S] (3.5M)	2336×1560

When the aspect ratio is [16:9].

Settings	Image size
[L] (12M)	4608×2592
[EX M] (8M)	3840×2160
[EX S] (2M)	1920×1080

When the aspect ratio is [1:1].

Settings	Image size
[L] (12M)	3456×3456
[EX M] (6M)	2448×2448
[EX S] (3M)	1744×1744

- When [Ex. Tele Conv.] (P163) is set, [EX] is displayed on the picture sizes of each aspect ratio except for [L].
- The picture size will be fixed to [S] when [Burst Rate] is set to [SH].

Setting the compression rate of pictures ([Quality])

Applicable modes: iA iA+ P A S M M C1 C2 C3

Set the compression rate at which the pictures are to be stored.

MENU → [Rec] → [Quality]

Settings	File format	Description of settings
[ ]	JPEG	A JPEG image in which image quality was given priority.
[ ]		A standard image quality JPEG image. This is useful for increasing the number of shots without changing the number of pixels.
[RAW]	RAW+JPEG	You can record a RAW image and a JPEG image ([ ] or [ ]) simultaneously.*1
[RAW]		
[RAW]	RAW	You can only record RAW images.*2 [RAW] images are recorded with a smaller data volume than [RAW] or [RAW].

*1 If you delete a RAW file from the camera, the corresponding JPEG image will also be deleted.

*2 It is fixed to maximum recordable pixels ([L]) for each image aspect ratio.

About RAW

RAW format refers to a data format of images that have not been processed. Playback and editing of RAW images require the camera or the dedicated software.
You can make advanced adjustments by editing RAW images. For example, you can adjust the White Balance after taking pictures or save them in file formats that are capable of displaying them on a PC. Pictures taken in RAW format will have higher image quality than those taken in JPEG format, but the data size will be larger.

- You can process RAW images in [RAW Processing] in the [Playback] menu. (P233)
- To process and edit RAW files on a PC, use the software “SILKYPIX Developer Studio” by Ichikawa Soft Laboratory on the DVD (supplied).

Not available in these cases:

- The following effects are not reflected in RAW images:
  - Intelligent Auto Mode
  - Intelligent Auto Plus Mode
  - Creative Control Mode
  - White Balance*1
  - [Photo Style]*1/[Highlight Shadow]*1/[i.Dynamic]*1/[Red-Eye Removal]*2/[i.Resolution]*1/[Color Space]*1 ([Rec] menu)

*1 If you perform [RAW Processing] in the [Playback] menu on a picture, you can process it into a picture in JPEG format with the settings at the time of recording. The settings will be used as initial settings when you start [RAW Processing].

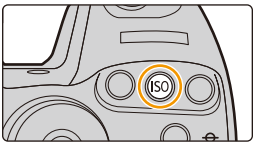
*2 If you perform [RAW Processing] in the [Playback] menu on a picture taken with [Red-Eye Removal], the effect will be applied to the processed picture in JPEG format.

Setting the Light Sensitivity

Applicable modes: P A S M C1 C2 C3

This allows the sensitivity to light (ISO sensitivity) to be set. Setting to a higher figure enables pictures to be taken even in dark places without the resulting pictures coming out dark.

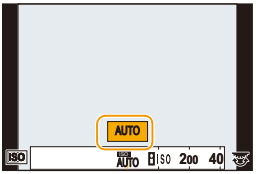
1 **Press [ISO].**



2 **Select the ISO sensitivity by rotating the rear dial or the front dial.**

3 **Press [ISO] to set.**

- You can also press the shutter button halfway to set.



AUTO	The ISO sensitivity is automatically adjusted according to the brightness. • Maximum [ISO3200] (With the flash on [ISO1600])*1
ISO (Intelligent)	The camera detects movement of the subject and then automatically sets the optimum ISO sensitivity and shutter speed to suit the movement of the subject and brightness of the scene to minimize the jitter of the subject. • Maximum [ISO3200] (With the flash on [ISO1600])*1 • The shutter speed is not fixed when the shutter button is pressed halfway. It is continuously changing to match the movement of the subject until the shutter button is pressed fully.
100*2/200/400/800/1600/3200/6400/12800/25600	The ISO sensitivity is fixed to various settings. • When the [ISO Increments] in [Rec] menu (P134) is set to [1/3 EV], items of ISO sensitivity that can be set will increase.

*1 When the [ISO Limit Set] (P133) of [Rec] menu is set to anything except [OFF], it is set automatically within the value set in [ISO Limit Set].

*2 Only available when [Extended ISO] is set.

Characteristics of the ISO sensitivity

	200 ⟷ 25600	
Recording location (recommended)	When it is light (outdoors)	When it is dark
Shutter speed	Slow	Fast
Noise	Less	Increased
Jitter of the subject	Increased	Less

- For the focus range of flash when [AUTO] is set, refer to P181.
- [ISO] is not available in Shutter-Priority AE Mode and Manual Exposure Mode.
- When [Multi Exp.] is set, the maximum setting is [ISO3200].
- Setting items below will be selectable in Creative Video Mode.
  [AUTO]/[200] to [6400]
- When [Electronic Shutter] is set to [ON], the ISO sensitivity can be set up to [ISO3200].

Setting the upper limit on ISO sensitivity

Applicable modes: P A S M C1 C2 C3

It will select optimal ISO sensitivity with set value as limit depending on the brightness of the subject.

- It will work when the [Sensitivity] is set to [AUTO] or [ISO].

MENU → **[Rec]** → **[ISO Limit Set]**

Settings: [400]/[800]/[1600]/[3200]/[6400]/[12800]/[25600]/[OFF]

Setting the step increment of ISO sensitivity

Applicable modes: P A S M C1 C2 C3

You can adjust the ISO sensitivity settings for every 1/3 EV.

MENU → [Rec] → **[ISO Increments]**

[1/3 EV]	[L.100]*/[L.125]*/[L.160]*/[200]/[250]/[320]/[400]/[500]/[640]/[800]/[1000]/[1250]/[1600]/[2000]/[2500]/[3200]/[4000]/[5000]/[6400]/[8000]/[10000]/[12800]/[16000]/[20000]/[25600]
[1 EV]	[L.100]*/[200]/[400]/[800]/[1600]/[3200]/[6400]/[12800]/[25600]

* Only available when [Extended ISO] is set.

- When the setting is changed from [1/3 EV] to [1 EV], [Sensitivity] will be set to value closest to the value set during the [1/3 EV].

Extending ISO sensitivity

Applicable modes: P A S M C1 C2 C3

ISO sensitivity can be set up to minimum [ISO100].

MENU → [Rec] → **[Extended ISO]**

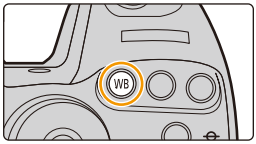
Settings: [ON]/[OFF]

Adjusting the White Balance

Applicable modes: P A S M C1 C2 C3

In sunlight, under incandescent lights or in other such conditions where the color of white takes on a reddish or bluish tinge, this item adjusts to the color of white which is closest to what is seen by the eye in accordance with the light source.

1 Press [WB].



2 Rotate the rear dial or front dial to select the White Balance.

- Setting can also be performed by rotating the control dial.

3 Press [WB] to set.

- You can also press the shutter button halfway to set.

[AWB]	Automatic adjustment
[☼]	When taking pictures outdoors under a clear sky
[☁]	When taking pictures outdoors under a cloudy sky
[⌂]	When taking pictures outdoors in the shade
[☼]	When taking pictures under incandescent lights
[⚡WB]*	When taking pictures with the flash only
[1]/[2]/[3]/[4]	The manually set value is used
[K]	When using the preset color temperature setting

* It will operate as [AWB] during motion picture recording.

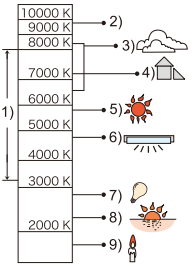
Under fluorescent lighting, LED lighting fixture etc., the appropriate White Balance will vary depending on the lighting type, so use [AWB] or [1], [2], [3], [4].

• The White Balance is only calculated for subjects within the range of the camera's flash. (P181)

■ Auto White Balance

Depending on the conditions prevailing when pictures are taken, the pictures may take on a reddish or bluish tinge. Furthermore, when a multiple number of light sources are being used or there is nothing with a color close to white, Auto White Balance may not function properly. In a case like this, set the White Balance to a mode other than [AWB].

1 Auto White Balance will work within this range.
2 Blue sky
3 Cloudy sky (Rain)
4 Shade
5 Sunlight
6 White fluorescent light
7 Incandescent light bulb
8 Sunrise and sunset
9 Candlelight
K=Kelvin Color Temperature



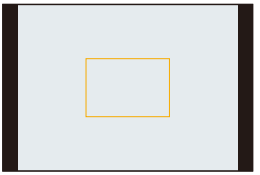
Setting the White Balance manually

Set the White Balance value. Use to match the condition when taking photographs.

1 **Press [WB].**

2 **Rotate the rear dial or front dial to select [1], [2], [3], or [4], and then press ▲.**

3 **Aim the camera at a sheet of white paper etc. so that the frame in the center is filled by the white object only and then press [MENU/SET].**
- The same operation can be performed by pressing the shutter button.



- White Balance may not be set when the subject is too bright or too dark. Set the White Balance again after adjusting to appropriate brightness.

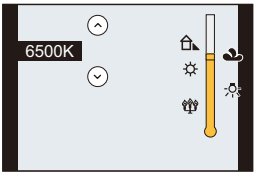
Setting the color temperature

You can set the color temperature manually for taking natural pictures in different lighting conditions. The color of light is measured as a number in degrees Kelvin. As the color temperature increases, the picture becomes more bluish. As the color temperature decreases, the picture becomes more reddish.

1 **Press [WB].**

2 **Rotate the rear or front dial to select [K], and then press ▲.**

3 **Press ▲/▼ to select the color temperature and then press [MENU/SET].**
- You can set a color temperature from [2500K] to [10000K].



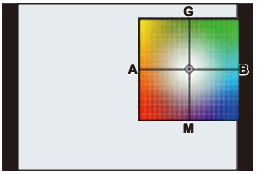
Finely adjusting the White Balance

You can finely adjust the White Balance when you cannot acquire the desired hue by setting the White Balance.

1 Press [WB].

2 Rotate the rear dial or front dial to select the White Balance, and then press ▼.

3 Press ▲/▼/◄/► to fine-adjust the White Balance.



◄ : A (AMBER: ORANGE)
► : B (BLUE: BLUISH)
▲ : G (GREEN: GREENISH)
▼ : M (MAGENTA: REDDISH)

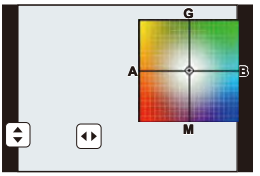
- You can also make fine adjustments by touching the White Balance graph.
- Pressing [DISP.] resets the position back to the center.

4 Press [MENU/SET].

- If you finely adjust the White Balance to [A] (amber), the White Balance icon on the screen will change to orange. If you finely adjust the White Balance to [B] (blue), the White Balance icon on the screen will change to blue.
- If you finely adjust the White Balance to [G] (green) or [M] (magenta), [+] (green) or [−] (magenta) appears beside the White Balance icon on the screen.
- The White Balance fine adjustment setting is reflected in the picture when using the flash.
- The White Balance fine adjustment level returns to the standard setting (center point) in the following cases.
  – When you reset the White Balance in [1], [2], [3] or [4]
  – When you reset the color temperature manually in [K]

White Balance Bracket

Bracket setting is performed based on the adjustment values for the White Balance fine adjustment, and 3 pictures with different colors are automatically recorded when the shutter button is pressed once.



1 **Press [WB].**

2 **Rotate the rear dial or front dial to select the White Balance, and then press ▼.**

3 **Rotate the control dial to set the bracket.**

Rotating the control dial to the right: Horizontal ([A] to [B])
Rotating the control dial to the left: Vertical ([G] to [M])

- You can also set the bracket by touching [⬍]/[◀▶].
- To reset, press [DISP.].

4 **Press [MENU/SET].**

- [BKT] is displayed in White Balance icon in the screen when the White Balance Bracket is set.
- The White Balance Bracket setting is released when this unit has been turned off (including Sleep Mode).
- You will only hear the shutter sound once.

Not available in these cases:

- The White Balance Bracket does not work in the following cases:
  – When recording motion pictures
  – When [Quality] is set to [RAW], [RAW] or [RAW]
  – When [HDR] is set to [ON]
  – [Multi Exp.]
  – When using [Time Lapse Shot]

Adjusting the Picture Quality by Adding an Effect ([Photo Style])

Applicable modes: iA iA+ P A S M M C1 C2 C3

6 effects can be selected to match the image you wish to record. It is possible to adjust the items such as color or picture quality of the effect to your desire.

MENU → [Rec] → **[Photo Style]**

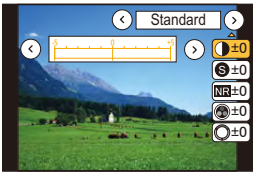
STD. **[Standard]**	This is the standard setting.
VIVD **[Vivid]**∗1	Brilliant effect with high saturation and contrast.
NAT **[Natural]**∗1	Soft effect with low saturation.
MONO **[Monochrome]**	Monochrome effect with no color shades.
SCNY **[Scenery]**∗1	An effect appropriate for sceneries with vivid blue skies and greens.
PORT **[Portrait]**∗1	An effect appropriate for portraits with a healthy and beautiful skin tone.
CUST **[Custom]**∗1	Use the setting registered in advance.
CNED **[Cinelike D]**∗1, 2	Gives priority to the dynamic range by using a gamma curve∗3 designed to create film-like images. Suited for editing.
CNEV **[Cinelike V]**∗1, 2	Gives priority to the contrast by using a gamma curve∗3 designed to create film-like images.

∗1 This is disabled when Intelligent Auto Plus Mode is selected.
∗2 These can be set only in Creative Video Mode.
∗3 When the actual brightness and the brightness to be captured are adjusted at each brightness level, the relationship between these two kinds of brightness is plotted as a nonlinear curve. This is called the gamma curve.

- In Intelligent Auto Plus Mode, the setting will be reset to [Standard] when the camera is switched to another Recording Mode or this unit is turned on and off.
- Those menu items are shared by the [Rec] menu and the [Motion Picture] menu. When the setting for either of the two is changed, the setting for the other is also changed.

Adjusting the picture quality

- Picture quality cannot be adjusted in the Intelligent Auto Plus Mode.



1 Press ◄/► to select the type of Photo Style.

2 Press ▲/▼ to select the items, and then press ◄/► to adjust.

[Contrast]	**[+]**	Increases the difference between the brightness and the darkness in the picture.
	[−]	Decreases the difference between the brightness and the darkness in the picture.
[Sharpness]	**[+]**	The picture is sharply defined.
	[−]	The picture is softly focused.
[Noise Reduction]	**[+]**	The noise reduction effect is enhanced. Picture resolution may deteriorate slightly.
	[−]	The noise reduction effect is reduced. You can obtain pictures with higher resolution.
[Saturation]*1	**[+]**	The colors in the picture become vivid.
	[−]	The colors in the picture become natural.
[Color Tone]*1	**[+]**	Adds a bluish tone.
	[−]	Adds a yellowish tone.
[Hue]*2	**[+]**	Adjusts the color tone of the entire image. If you see red as a reference point, this shifts the hue closer to violet/magenta.
	[−]	Adjusts the color tone of the entire image. If you see red as a reference point, this shifts the hue closer to yellow/green.
[Filter Effect]*2	**[Yellow]**	Enhances the contrast of an subject. (Effect: Weak) The blue sky can be recorded clearly.
	[Orange]	Enhances the contrast of an subject. (Effect: Medium) The blue sky can be recorded in darker blue.
	[Red]	Enhances the contrast of an subject. (Effect: Strong) The blue sky can be recorded in much darker blue.
	[Green]	The skin and lips of people and green leaves appear in natural tones. Green leaves appear brighter and more enhanced.
	[Off]	—

*1 [Color Tone] is displayed only when [Monochrome] is selected. In other cases, [Saturation] will be displayed.

*2 [Filter Effect] is displayed only when [Monochrome] is selected. In other cases, [Hue] will be displayed.

- If you adjust the picture quality, [+] is displayed beside the Photo Style icon on the screen.

3 Press [MENU/SET].

■ Registering settings to [Custom]

Adjust the picture quality following step 2 of "Adjusting the picture quality", and then press [DISP.].

- Confirmation screen is displayed. It is executed when [Yes] is selected.

Adjusting Bright/Dark Portions ([Highlight Shadow])

Applicable modes: P A S M C1 C2 C3

You can adjust the brightness of bright and dark portions on an image while checking the brightness on the screen.

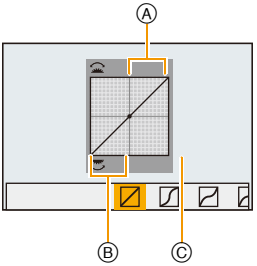
1 Select the menu. (P54)

MENU → [Rec] → [Highlight Shadow]

2 Press ◀/▶ to select the item.

(Standard)	A state with no adjustments is set.
(Raise the contrast)	Bright areas are brightened, and dark areas are darkened.
(Lower the contrast)	Bright areas are darkened, and dark areas are brightened.
(Brighten dark areas)	Dark areas are brightened.
/ / **(Custom)**	Registered custom settings can be applied.

3 Rotate the front/rear dial to adjust the brightness of bright/dark portions.

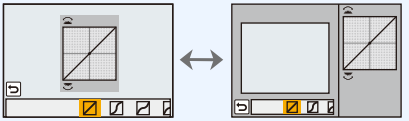


Ⓐ Bright portion
Ⓑ Dark portion
Ⓒ Preview display

- The rear dial is for adjusting dark areas, and the front dial is for adjusting bright areas.
- To register a preferred setting, press ▲, and select the destination where the custom setting will be registered to ([Custom1] ( )/[Custom2] ( )/[Custom3] ( )).
- Adjustments can also be made by dragging the graph.

4 Press [MENU/SET].

- The screen display can be switched by pressing [DISP.] on the brightness adjustment screen.



- Settings registered to C1 / C2 / C3 will be stored even after this unit is turned off.
- Turning off this unit will return the setting adjusted with / / back to the default setting.
- Those menu items are shared by the [Rec] menu and the [Motion Picture] menu. When the setting for either of the two is changed, the setting for the other is also changed.

Using Image Correction Functions

Compensating the contrast and exposure ([i.Dynamic])

Applicable modes: P A S M C1 C2 C3

Contrast and exposure are compensated when the brightness difference between the background and subject is great, etc.

MENU → [Rec] → **[i.Dynamic]**

Settings: [AUTO]/[HIGH]/[STANDARD]/[LOW]/[OFF]

- [AUTO] automatically sets the intensity of the effect according to the recording conditions.
- Those menu items are shared by the [Rec] menu and the [Motion Picture] menu. When the setting for either of the two is changed, the setting for the other is also changed.

Not available in these cases:

- This feature may be automatically disabled, depending on the lighting conditions.
- In the following cases, [i.Dynamic] does not work:
  – When [HDR] is set to [ON]

Raising the resolution ([i.Resolution])

Applicable modes: P A S M C1 C2 C3

Pictures with sharp profile and resolution can be taken by using the Intelligent Resolution Technology.

MENU → [Rec] → **[i.Resolution]**

Settings: [HIGH]/[STANDARD]/[LOW]/[EXTENDED]/[OFF]

- [EXTENDED] allows you to take natural pictures with a higher resolution.
- When recording a motion picture, [EXTENDED] changes to [LOW].
- Those menu items are shared by the [Rec] menu and the [Motion Picture] menu. When the setting for either of the two is changed, the setting for the other is also changed.

Combining pictures with different exposures ([HDR])

Applicable modes: P A S M C1 C2 C3

You can combine 3 pictures with different levels of exposure into a single picture with rich gradation. You can minimize the loss of gradations in bright areas and dark areas when, for example, the contrast between the background and the subject is large.
An image combined by HDR is recorded in JPEG.

MENU → [Rec] → **[HDR]**

[ON]	Records HDR pictures.
[OFF]	Does not record HDR pictures.
[SET]	**[Dynamic Range]** **[AUTO]:** Automatically adjusts the exposure range according to the differences between the bright and dark areas. **[±1 EV]/[±2 EV]/[±3 EV]:** Adjusts the exposure within the selected exposure parameters. **[Auto Align]** **[ON]:** Automatically corrects camera shake (jitter) and other problems that can cause the images to misalign. Recommended for use during hand-held shooting. **[OFF]:** Image misalignment not adjusted. Recommended when a tripod is used.

■ What is HDR?

HDR stands for High Dynamic Range and refers to a technique for expressing a wide contrast range.

- Do not move the camera during the continuous shooting after pressing the shutter button.
- You cannot take the next picture until the combination of pictures is complete.
- A moving subject may be recorded with unnatural blurs.
- The angle of view becomes narrow slightly when [Auto Align] is set to [ON].
- Flash is fixed to [⊛] (forced flash off).

Not available in these cases:

- [HDR] does not work for the pictures taken during a motion picture recording.
- [HDR] is not available in the following cases.
  - When [Quality] is set to [RAW], [RAW] or [RAW]
  - When using [Time Lapse Shot]
  - When using [Stop Motion Animation] (only when [Auto Shooting] is set)

Reducing the long shutter noise ([Long Shtr NR])

Applicable modes: P A S M C1 C2 C3

The camera automatically removes noise that appears when the shutter speed becomes slower to take pictures of night scenery etc. so you can take beautiful pictures.

MENU → [Rec] → **[Long Shtr NR]**

Settings: [ON]/[OFF]

- [Long shutter noise reduction ongoing] is displayed for the same time as the shutter speed for signal processing.
- We recommend using a tripod when the shutter speed is slowed to take pictures.

Not available in these cases:

- In the following cases, [Long Shtr NR] does not work:
  – When [Burst Rate] is set to [SH]
  – When [Electronic Shutter] is set to [ON]

Correcting the brightness on the screen periphery ([Shading Comp.])

Applicable modes: P A S M C1 C2 C3

When the screen periphery darkens as a result of the lens characteristics, you can record pictures with the brightness of the screen periphery corrected.

MENU → [Rec] → **[Shading Comp.]**

Settings: [ON]/[OFF]

- This feature may be automatically disabled, depending on the recording conditions.
- Noise in the periphery of the picture may stand out with higher ISO sensitivity.

Not available in these cases:

- Correction is not possible in the following cases:
  – Recording still pictures while recording a motion picture [only when set to [ ] (motion picture priorities)].
  – When [Burst Rate] is set to [SH].
- Depending on the lens used, [Shading Comp.] may not operate.
  Refer to the website for compatible lenses.

Setting the color space ([Color Space])

Applicable modes: P A S M C1 C2 C3

Set this when you want to correct the color reproduction of the recorded pictures on a PC, printer etc.

MENU → [Rec] → **[Color Space]**

[sRGB]	Color space is set to sRGB color space. This is widely used in computer related equipment.
[AdobeRGB]	Color space is set to AdobeRGB color space. AdobeRGB is mainly used for business purposes such as professional printing because it has a greater range of reproducible colors than sRGB.

- Set to sRGB if you are not very familiar with AdobeRGB.
- The setting is fixed to [sRGB] in the following case.
  – When recording motion pictures

Taking Pictures with Your Favorite Settings

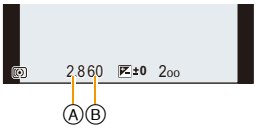
(Program AE Mode)

Recording Mode: [P]

The camera automatically sets the shutter speed and the aperture value according to the brightness of the subject.
You can take pictures with greater freedom by changing various settings in the [Rec] menu.

1 Set the mode dial to [P].

2 Press the shutter button halfway and display the aperture value and shutter speed value on the screen.



Ⓐ Aperture value
Ⓑ Shutter speed

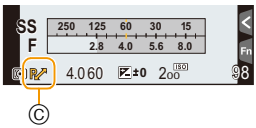
- If the exposure is not adequate when the shutter button is pressed halfway, the aperture value and shutter speed turn red and blink.

Program Shift

In Program AE Mode, you can change the preset aperture value and shutter speed without changing the exposure. This is called Program Shift.
You can make the background more blurred by decreasing the aperture value or record a moving subject more dynamically by slowing the shutter speed when taking a picture in Program AE Mode.

1 Press the shutter button halfway and display the aperture value and shutter speed value on the screen.

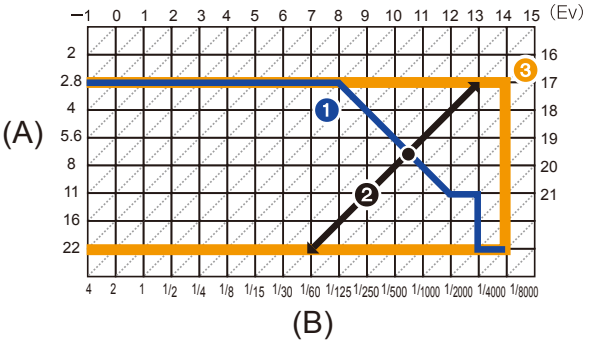
2 While the values are displayed (about 10 seconds), perform Program Shift by rotating the rear dial or front dial.



Ⓒ Program Shift indication

- To cancel Program Shift, turn off this unit or rotate the front/rear dial until the Program Shift indication disappears. Program Shift can easily be canceled by setting a function button to [One Push AE]. (P156)

Example of Program Shift
[When the interchangeable lens (H-HS12035) is used]



(A): Aperture value
(B): Shutter speed

❶ Program Shift line chart
Represents the aperture and shutter speed set automatically by the camera at each exposure value.

❷ Program Shift amount
Represents the range of the aperture and shutter speed combination you can change with Program Shift at each exposure value.

❸ Program Shift limit
Represents the range of the aperture and shutter speed you can select when you use Program Shift with the camera.

- “EV” is an abbreviation of “Exposure Value”.
  The EV changes with the aperture value or the shutter speed.

Not available in these cases:

- Program Shift is available in all [Sensitivity] settings except [ISO].

Taking Pictures by Specifying the Aperture/ Shutter Speed

Recording Mode: A S M

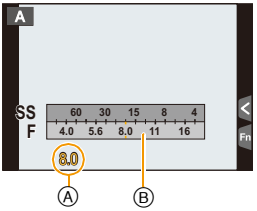
- The effects of the set aperture value and shutter speed will not be visible on the recording screen. To check on the recording screen, please use [Preview]. (P155)
- The brightness of the screen and the recorded pictures may differ. Check the pictures on the playback screen.

Aperture-Priority AE Mode

When you set the aperture value, the camera automatically optimizes the shutter speed for the brightness of the subject.
Set the aperture value to a higher number when you want a sharp focus background. Set the aperture value to a lower number when you want a soft focus background.

1 **Set the mode dial to [A].**

2 **Set the aperture value by rotating the rear dial or the front dial.**



Ⓐ Aperture value
Ⓑ Exposure meter

Aperture value: Reduces
It becomes easier to defocus the background.

Aperture value: Increases
It becomes easier to maintain focus as far as the background.

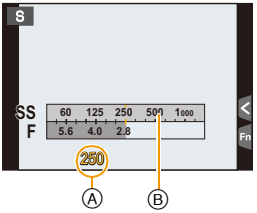
- Rotate the front/rear dial to display the Exposure Meter. Unsuitable areas of the range are displayed in red.
- If the exposure is not adequate, the aperture value and the shutter speed turn red and blink when the shutter button is pressed halfway.
- When using a lens having an aperture ring, set the position of the aperture ring to [A] to activate the front/rear dial settings. At positions other than [A], the ring setting takes priority.

Shutter-Priority AE Mode

When you set the shutter speed, the camera automatically optimizes the aperture value for the brightness of the subject.
When you want to take a sharp picture of a fast moving subject, set with a faster shutter speed. When you want to create a trail effect, set to a slower shutter speed.

1 Set the mode dial to [S].

2 Set the shutter speed by rotating the rear dial or the front dial.



Ⓐ Shutter speed
Ⓑ Exposure meter

Shutter speed: Slow
It becomes easier to express movement.

Shutter speed: Fast
It becomes easier to freeze movement.

- Rotate the front/rear dial to display the Exposure Meter. Unsuitable areas of the range are displayed in red.
- If the exposure is not adequate, the aperture value and the shutter speed turn red and blink when the shutter button is pressed halfway.
- We recommend using a tripod when the shutter speed is slow.
- When the ISO sensitivity is set to [ISO], it will switch to [AUTO].

Not available in these cases:

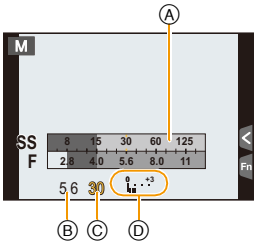
- When the flash is activated, the fastest shutter speed that can be selected is 1/250th of a second. (P184)
- The shutter speed slower than 1 second is not available when [Electronic Shutter] is set to [ON].

Manual Exposure Mode

Determine the exposure by manually setting the aperture value and the shutter speed. The Manual Exposure Assistance appears on the lower portion of the screen to indicate the exposure.

1 **Set the mode dial to [M].**

2 **Rotate the rear dial to set the shutter speed, and rotate the front dial to set the aperture value.**



Ⓐ Exposure meter
Ⓑ Aperture value
Ⓒ Shutter speed
Ⓓ Manual Exposure Assistance

Aperture value	**Reduces** It becomes easier to defocus the background.	**Increases** It becomes easier to maintain focus as far as the background.
Shutter speed	**Slow** It becomes easier to express movement.	**Fast** It becomes easier to freeze movement.

Optimizing the ISO sensitivity for the shutter speed and aperture value

When the ISO sensitivity is set to [AUTO], the camera sets the ISO sensitivity automatically so that the exposure will be appropriate for the shutter speed and aperture value.

- Depending on recording conditions, an appropriate exposure may not be set or the ISO sensitivity may become higher.

Manual Exposure Assistance

±0	The exposure is adequate.
0 +3	Set to faster shutter speed or larger aperture value.
−3 0	Set to slower shutter speed or smaller aperture value.

- The Manual Exposure Assistance is an approximation. We recommend checking the pictures on the playback screen.

About [B] (Bulb)

If you set the shutter speed to [B], the shutter stays open while the shutter button is pressed fully (up to approximately 60 minutes).
The shutter closes if you release the shutter button.
Use this when you want to keep the shutter open for a long time to take pictures of fireworks, a night scene etc.

- If you set the shutter speed to [B], [B] is displayed on the screen.
- When you take pictures with the shutter speed set to [B], use a sufficiently charged battery. (P27)
- The Manual Exposure Assistance does not appear.
- When the ISO sensitivity is set to [AUTO] or [ISO], it will switch to [200].
- This cannot be used when [Electronic Shutter] is set to [ON].
- It can only be used with Manual Exposure Mode.

- We recommend using a tripod or the shutter remote control (DMW-RSL1: optional) when you take pictures with the shutter speed set to [B].
  Refer to P353 for information about the shutter remote control.
- When you take pictures with the shutter speed set to [B], noise may become visible. To avoid picture noise, we recommend setting [Long Shtr NR] in the [Rec] menu to [ON] before taking pictures. (P146)

Checking/not checking the effects of aperture and shutter speed on the recording screen

MENU → **[Custom]** → **[Constant Preview]** → **[ON]/[OFF]**

- Close the flash.
- It can only be used with Manual Exposure Mode.

- Rotate the front/rear dial to display the Exposure Meter. Unsuitable areas of the range are displayed in red.
- If the exposure is not adequate, the aperture value and the shutter speed turn red and blink when the shutter button is pressed halfway.
- We recommend using a tripod when the shutter speed is slow.
- When you use a lens with an aperture ring, the aperture ring setting takes priority.
- When the ISO sensitivity is set to [ISO], it will switch to [AUTO].

Not available in these cases:

- When the flash is activated, the fastest shutter speed that can be selected is 1/250th of a second. (P184)
- The shutter speed slower than 1 second is not available when [Electronic Shutter] is set to [ON].

Confirm the Effects of Aperture and Shutter Speed (Preview Mode)

Applicable modes: iA iA+ P A S M M C1 C2 C3

The effects of aperture and shutter speed can be checked by using the Preview Mode.

- **Confirm the effects of aperture:**
  You can check the depth of field (effective focus range) before taking a picture by closing the leaf shutter to the aperture value you set.
- **Confirm the effects of shutter speed:**
  Movement can be confirmed by displaying the actual picture that will be taken with that shutter speed. When the shutter speed is set for high speed, display in the shutter speed preview will be displayed like a time-release film. It is used in cases such as stopping the movement of running water.

1 Set a function button to [Preview]. (P317)
- The following step is an example in which [Preview] is assigned to [Fn4].

2 Switch to confirmation screen by pressing [Fn4].
- Screen is switched every time [Fn4] is pressed.

Normal recording screen	Aperture effect preview screen Aperture effect: ○ Shutter speed effect: —	Shutter speed effect preview screen Aperture effect: ○ Shutter speed effect: ○

Depth of field properties

∗1	Aperture value	Small	Large
	Focus length of the lens	Tele	Wide
	Distance to the subject	Near	Distant
Depth of field (effective focus range)		Shallow (Narrow)∗2	Deep (Wide)∗3

∗1 Recording conditions
∗2 Example: When you want to take a picture with a blurred background etc.
∗3 Example: When you want to take a picture with everything in focus including the background etc.

- It is possible to record while in Preview Mode.
- Range for shutter speed effect check is 8 seconds to 1/8000th of a second.

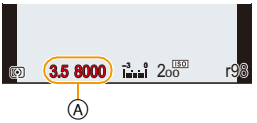
Easily set aperture/shutter speed for suitable exposure (One Push AE)

Applicable modes: P A S M C1 C2 C3

When the exposure setting is too bright or too dark, you can use one push AE to achieve a suitable exposure setting.

How to tell if the exposure is not adequate

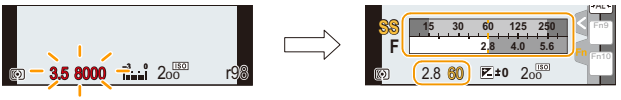
- If the aperture values and shutter speed blink red Ⓐ when the shutter button is pressed halfway.
- If the Manual Exposure Assistance is anything other than ±0 when in Manual Exposure mode.
  For more details on Manual Exposure Assistance, refer to P153.



1 Set a function button to [One Push AE]. (P317)
- The following step is an example in which [One Push AE] is assigned to [Fn8].

2 Touch [Fn].

3 (When exposure is not adequate)
Touch [Fn8].



- The exposure meter is displayed, and the aperture and shutter speed are changed to give a suitable exposure.
- In the following cases, suitable exposure cannot be set.
  - When the subject is extremely dark and it is not possible to achieve adequate exposure by changing the aperture value or shutter speed
  - When recording using the flash
  - In Preview Mode (P155)
  - When using a lens that includes an aperture ring

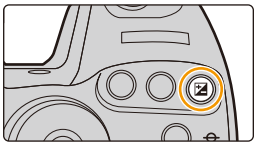
- In Program AE Mode, Program Shift can be canceled by pressing the function button to which [One Push AE] has been set.

Compensating the Exposure

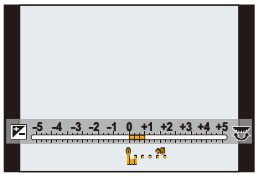
Applicable modes: iA iA+ P A S M M C1 C2 C3

Use this function when you cannot achieve appropriate exposure due to the difference in brightness between the subject and the background.

1 Press [ ].



2 Rotate the rear dial or the front dial to compensate the exposure.



Underexposed	Properly exposed	Overexposed
Compensate the exposure towards positive.		Compensate the exposure towards negative.

- The Exposure Compensation value can be set within a range of −5 EV to +5 EV. When recording motion pictures, the Exposure Compensation value can be set within a range of −3 EV to +3 EV.
- When not adjusting the setting, select [±0]

3 Press [ ] to set.

- You can also press the shutter button halfway to set.

- When [Auto Exposure Comp.] in [Flash] in the [Rec] menu is set to [ON], the brightness of the built-in flash will automatically be set to the level appropriate to the selected Exposure Compensation. (P186)
- When the exposure value is out of the −3 EV to +3 EV range, the brightness of the recording screen will no longer change. It is recommended to record by checking the actual brightness of the recorded image in the Auto Review or playback screen.
- The set Exposure Compensation value is stored even if the camera is turned off. (When [Exposure Comp. Reset] (P67) is set to [OFF])

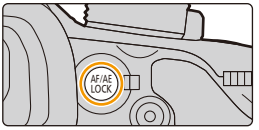
Fixing the Focus and the Exposure (AF/AE Lock)

Applicable modes: P A S M C1 C2 C3

This is useful when you want to take a picture of a subject outside the AF area or the contrast is too strong and you cannot achieve appropriate exposure.

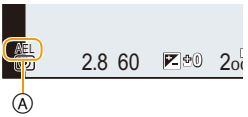
1 Align the screen with the subject.

2 Press and hold [AF/AE LOCK] to fix the focus or exposure.



- If you release [AF/AE LOCK], AF/AE Lock is canceled.
- Only the exposure is locked in the default setting.

3 While pressing [AF/AE LOCK], move the camera as you compose the picture and then press shutter button fully.



Ⓐ AE Lock indication

- When [AE LOCK] is set, after pressing the shutter button halfway to focus, press the shutter button fully.

- AF Lock only is effective when taking pictures in Manual Exposure Mode.
- AE Lock only is effective when taking pictures with Manual Focus.
- Only the AF lock is active during motion picture recording. Once you cancel the AF lock during the recording, the AF lock cannot be reactivated.
- The subject can be focused again by pressing the shutter button halfway even when AE is locked.
- Program Shift can be set even when AE is locked.

Setting the functions of [AF/AE LOCK]

MENU → [Custom] → [AF/AE Lock]

[AE LOCK]	Only the exposure is locked. • When the exposure is set, [AEL], the aperture value, and the shutter speed are displayed.
[AF LOCK]	Only the focus is locked. • When the subject is focused, [AFL], the focus indication, the aperture value, and the shutter speed are displayed.
[AF/AE LOCK]	Both focus and exposure are locked. • [AFL], [AEL], the focus indication, aperture value and shutter speed are displayed when the focus and the exposure are optimized.
[AF-ON]	Auto Focus is performed.

Maintaining/not maintaining the lock when [AF/AE LOCK] is released

MENU → [Custom] → [AF/AE Lock Hold] → [ON]/[OFF]

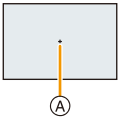
Selecting the Method for Measuring Brightness

([Metering Mode])

Applicable modes: P A S M C1 C2 C3

Type of optical measurement to measure brightness can be changed.

MENU → [Rec] → **[Metering Mode]**

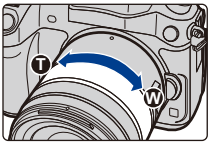
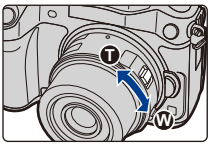
[ ] (Multiple)	This is the method in which the camera measures the most suitable exposure by judging the allocation of brightness on the whole screen automatically. Usually, we recommend using this method.
[ ] (Center weighted)	This is the method used to focus on the subject on the center of the screen and measure the whole screen evenly.
[ ] (Spot)	This is the method to measure the subject in the spot metering target Ⓐ. 

- Those menu items are shared by the [Rec] menu and the [Motion Picture] menu. When the setting for either of the two is changed, the setting for the other is also changed.

Taking Pictures with the Zoom

Applicable modes: iA iA+ P A S M M C1 C2 C3

You can zoom-out to record landscapes etc. in wide angle (Wide) or zoom-in to make people and objects appear closer (Tele).

When using the interchangeable lens (H-HS12035/H-FS14140) that does not support the power zoom	Zoom ring of an interchangeable lens 	Cursor buttons of this unit*2, 3
When using the interchangeable lens that supports the power zoom (electrically operated zoom)	Zoom lever of an interchangeable lens*1 	Cursor buttons of this unit*2, 4
When using the interchangeable lens that does not support the zoom	Cursor buttons of this unit*2, 4	
	T side: Enlarges distant subject **W side:** Widens angle of view	**▲/▶:** Enlarges distant subject **▼/◀:** Widens angle of view

*1 The zoom speed varies depending on how far you move the lever.

*2 When operating the zoom with the cursor buttons, press the function button to which [Zoom Control] in [Fn Button Set] (P317) of the [Custom] menu has been set.
The zoom operation is terminated when the function button is pressed again or a certain amount of time passes.

*3 Operation with the cursor buttons is available only when [Ex. Tele Conv.] in the [Rec] menu is set to [ZOOM].

*4 Zoom quickly with ▲/▼, and zoom slowly with ◀/▶.

Raising the telescopic effect

[Ex. Tele Conv.]

Applicable modes: P A S M C1 C2 C3

The Extended Tele Conversion enables you to take pictures that are further enlarged without deteriorating the picture quality.

When taking pictures	[Ex. Tele Conv.]	1.4×: [EX M] ([4:3]/[3:2]/[16:9]/[1:1]) 2.0×: [EX S] ([4:3]/[3:2]/[16:9]/[1:1])

- **Set the picture size to [M] or [S] (picture sizes indicated with EX), and set the quality to [ ] or [ ].**

When recording motion pictures	[Ex. Tele Conv.]	2.4× (motion pictures size is set to [FHD] in [Rec Quality]) 3.6× (motion pictures size is set to [HD] in [Rec Quality]) 4.8× (motion pictures size is set to [VGA] in [Rec Quality])

Zooming in with the Extended Tele Conversion in steps

MENU → [Rec] → [Ex. Tele Conv.] → [ZOOM]

- This can be used only when recording pictures.

Ⓐ Magnification level of the Extended Tele Conversion

The operation can be performed by using the zoom lever or ▲/▼/◀/▶.

- When using an interchangeable lens that supports the power zoom, Extended Tele Conversion becomes available after zooming in to the Tele end of the optical zoom.

Ⓑ Optical Zoom range (Focal length)*

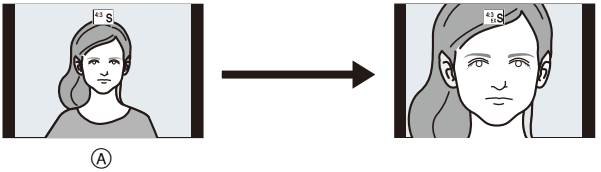
Ⓒ Extended Tele Conversion range for still picture recording (Zoom magnification)

* This zoom slider is displayed when using an interchangeable lens that supports the power zoom.

- A constant zoom speed will be set.
- The indicated zoom magnification is an approximation.

Simply zooming in with the Extended Tele Conversion

MENU → [Rec] → [Ex. Tele Conv.] → [TELE CONV.]
MENU → [Motion Picture] → [Ex. Tele Conv.] → [ON]



Ⓐ [OFF]

- When the Extended Tele Conversion is used, angle of view for still pictures will be different from the angle of view for motion pictures because the zoom factor is different between them. Angle of view for recording can be checked beforehand by matching the [Rec Area] (P311) setting to the mode you wish to record in.

Not available in these cases:

- This function is not available in the following cases:
  – When the motion picture size is set to [4K] or [C4K] in [Rec Quality]
  – When a frame rate with a number of frames greater than 60fps is set in [Variable Frame Rate]
  – When [Quality] is set to [RAW], [RAW] or [RAW]
  – When [Burst Rate] is set to [SH]
  – When [HDR] is set to [ON]
  – [Multi Exp.]
  – When the image of the camera is output through the HDMI connection (except for Creative Video Mode)

[Digital Zoom]

Applicable modes: P A S M C1 C2 C3

Although the image quality deteriorates every time you zoom in further, you can zoom in up to four times the original zoom magnification.
(Continuous zooming is not possible.)

MENU → **[Rec]** → **[Digital Zoom]** → **[4×]/[2×]**

- When using the Digital Zoom, we recommend using a tripod and the self-timer (P118) for taking pictures.
- Those menu items are shared by the [Rec] menu and the [Motion Picture] menu. When the setting for either of the two is changed, the setting for the other is also changed.

Not available in these cases:
- This function is not available in the following cases:
  – [Multi Exp.]

Changing the settings for a power zoom lens

Applicable modes: P A S M C1 C2 C3

MENU → **[Custom]** → **[Power Zoom Lens]**

Sets the screen display and lens operations when using an interchangeable lens that is compatible with power zoom (electrically operated zoom).
This may only be selected when using a lens that is compatible with power zoom (electrically operated zoom).
- The interchangeable lenses (H-HS12035/H-FS14140) are not compatible with power zoom.

(For compatible lenses, please refer to our website.)

[Disp Focal Length]	When you zoom, the focal distance is displayed and you can confirm the zoom position. Ⓐ Focal distance indication Ⓑ Current focal distance **[ON]/[OFF]**
[Step Zoom]	When you operate the zoom with this setting [ON], the zoom will stop at positions corresponding to predetermined distances. Ⓒ Step zoom indication • [Step Zoom] is disabled during motion picture recording. **[ON]/[OFF]**
[Zoom Resume]	When you turn this unit on, the zoom positions when you last turned this unit off are automatically restored. **[ON]/[OFF]**
[Zoom Speed]	You can set the zoom speed for zoom operations. • If you set [Step Zoom] to [ON], the zoom speed will not change. **[Photo]:** **[H]** (High speed)/**[M]** (Middle speed)/**[L]** (Low speed) **[Video]:** **[H]** (High speed)/**[M]** (Middle speed)/**[L]** (Low speed)
[Zoom Ring]	This may only be selected when a power zoom-compatible lens with a zoom lever and zoom ring is attached. When set to [OFF], the operations controlled by the zoom ring are disabled to prevent accidental operation. **[ON]/[OFF]**

Zooming using touch operations

You can perform zoom operations by touching. (Touch zoom)
(Optical Zoom and Extended Tele Conversion for still picture recoding are operable)

1 **Touch [ ].**

2 **Touch [ ].**

- The slide bar is displayed.

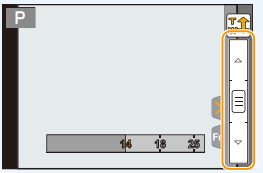
3 **Perform zoom operations by dragging the slide bar.**

- The zoom speed varies depending on the touched position.

[▲]/[▼]	Zooms slowly
[▲▲]/[▼▼]	Zooms quickly

- Touch [ ] again to end touch zoom operations.

- When [Step Zoom] (P166) is set to [ON], the slide bar for step zoom is displayed.



Making Multiple Exposures on One Picture

([Multi Exp.])

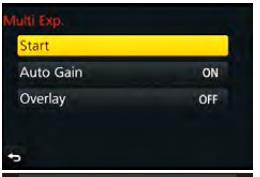
Applicable modes: P A S M C1 C2 C3

Gives an effect like multi exposure. (up to 4 times equivalent per a single image)

1 Select the menu. (P54)

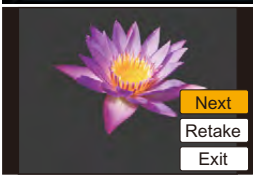
MENU → [Rec] → [Multi Exp.]

2 Press ▲/▼ to select [Start] and then press [MENU/SET].



3 Decide on the composition, and take the first picture.

- After taking the picture, press the shutter button halfway down to take the next picture.
- Press ▲/▼ to select the item and then press [MENU/SET] for one of the following operations.
  - [Next]: Advance to the next picture.
  - [Retake]: Return to the first picture.
  - [Exit]: Record the image of the first picture, and finish the multiple exposure picture-taking session.

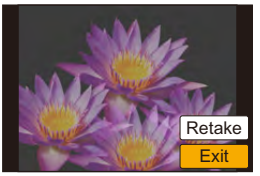


4 Shooting the second, third, and fourth exposures.

- If [Fn4] is pressed while taking pictures, the photographed images are recorded, and the multiple exposure picture-taking session will be completed.

5 Press ▼ to select [Exit] and then press [MENU/SET].

- You can also press the shutter button halfway to finish.



About Automatic Gain Control setting

Select [Auto Gain] on the screen shown in step **2** and set it.

- **[ON]:** The brightness level is adjusted according to the number of pictures taken and the pictures are superimposed over each other.
- **[OFF]:** Compensate the exposure to match the subject so that all the superimposed exposure effects will be just right.

Superimposing pictures on a picture already taken

On the screen shown in step **2**, set [Overlay] to [ON].
After [Start], images in the card will be displayed. Select the RAW images, press [MENU/SET], and continue recording.

- [Overlay] is available only for RAW images taken with this unit.

- Image is not recorded until completion.
- The recording information displayed for pictures taken with multiple exposures is the recording information for the last picture taken.
- Items shown in gray on the menu screen cannot be set during multiple exposures.

Not available in these cases:

- This function is not available in the following cases:
  – When using [Time Lapse Shot]
  – When using [Stop Motion Animation]

Disabling Operational Sounds and the Output of Light at once ([Silent Mode])

Applicable modes: iA iA+ P A S M M C1 C2 C3

This function is useful for recording images in a quiet environment, public facility, etc. or recording images of subjects such as babies or animals.

Select the menu. (P54)

MENU → [Custom] → [Silent Mode]

Settings: [ON]/[OFF]

- Operational sounds are muted, and the flash and the AF Assist lamp are forced off.
  The following settings are fixed.
  – [Electronic Shutter]: [ON]
  – [Flash Mode]: [] (forced flash off)
  – [AF Assist Lamp]: [OFF]
  – [Beep Volume]: [] (OFF)
  – [E-Shutter Vol]: [] (OFF)
  – [Speaker Volume]: 0

- Even when [ON] is set, the following functions light up/flash.
  – Status indicator
  – Self-timer indicator
  – Wi-Fi connection lamp
- Sounds that are produced by the camera regardless of your operations, such as the lens aperture sound, cannot be muted.
- **Be sure to pay special attention to the privacy, the likeness rights, etc. of the subject when you use this function. Use at your own risk.**

Taking Pictures with No Shutter Sound

([Electronic Shutter])

Applicable modes: iA iA+ P A S M M C1 C2 C3

The shutter sound can be turned off for recording in a quiet environment. The mechanical shutter is disabled, making it easier to take pictures with minimized blur.
We recommended making a trial recording in advance because distorted subjects and horizontal stripes may be recorded depending on the recording conditions.

Select the menu. (P54)

MENU → [Rec] → [Electronic Shutter]

Settings: [ON]/[OFF]

- **Flash is fixed to [⊛] (forced flash off).**
- **Under fluorescent or LED lighting, etc., horizontal stripes may appear on recorded pictures. In such cases, lowering the shutter speed may reduce the effect of the horizontal stripes.**
- **If a subject is moving, the subject may appear distorted on the picture taken.**
- If jitter occurs during recording, distorted subjects may be recorded. Use of a tripod is recommended.
- You can turn off the shutter sound at [E-Shutter Vol] in [Beep]. (P62)
- **Be sure to pay special attention to the privacy, the likeness rights, etc. of the subject when you use this function. Use at your own risk.**

Not available in these cases:

- [Electronic Shutter] will be fixed to [ON] when [Burst Rate] is set to [SH].
- If you set [Silent Mode] to [ON], [Electronic Shutter] will be fixed to [ON].

Minimizing vibration of the shutter

Applicable modes: P A S M C1 C2 C3

To reduce the influence of hand shake or shutter vibration, shutter is released after the specified time has passed.

Select the menu. (P54)

MENU → [Rec] → [Shutter Delay]

Settings: [8SEC]/[4SEC]/[2SEC]/[1SEC]/[OFF]

Not available in these cases:

- [Shutter Delay] is not available in the following cases.
  – When [HDR] is set to [ON]

Taking Clear Pictures by Registering Faces ([Face Recog.])

Applicable modes: iA iA+ P A S M C1 C2 C3

Face Recognition is a function which finds a face resembling a registered face and prioritizes focus and exposure automatically. Even if the person is located towards the back or on the end of a line in a group photo, the camera can still take a clear picture.

Select the menu. (P54)

MENU → [Rec] → [Face Recog.]

Settings: [ON]/[OFF]/[MEMORY]

- [Face Recog.] will turn [ON] automatically when the face image is registered.
- **The following functions will also work with the Face Recognition function.**

  In Recording Mode

  – Display of corresponding name when camera detects a registered face* (if name has been set for the registered face)

  In Playback Mode

  – Display of name and age (if information has been registered)

  – Selective playback of pictures chosen from pictures registered with Face Recognition ([Category Play] (P231))

  * Names of up to 3 people are displayed.
  Precedence for the names displayed when taking pictures is determined according to the order of registration.

- **[Face Recog.] only works when the AF Mode is set to [ ].**
- During the Burst Mode, [Face Recog.] picture information can be attached to only the first picture.
- When group pictures are played back, the name of the first picture of the set is displayed.
- Face Recognition may take more time to select and recognize distinctive facial features than regular Face/Eye Detection.
- Even when face recognition information has been registered, pictures taken with [Name] set to [OFF] will not be categorized by face recognition in [Category Play].
- **Even when Face Recognition information is changed (P177), Face Recognition information for the pictures already taken will not be changed.**
  For instance, if the name is changed, pictures recorded before the change will not be categorized by face recognition in [Category Play].
- To change the name information of the pictures taken, perform the [REPLACE] in [Face Rec Edit] (P252).

Not available in these cases:

- You cannot use [Face Recog.] in the following cases.
  – When using [Time Lapse Shot]

Face Settings

You can register information such as names and birthdays for face images of up to 6 people.

■ Point of recording when registering the face images

- Face front with eyes open and mouth closed, making sure the outline of the face, the eyes, or the eyebrows are not covered with hair when registering.
- Make sure there is no extreme shading on the face when registering. (Flash will not flash during registration.)

(Good example for registering)

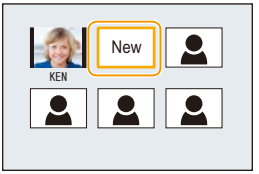
■ When face is not recognized during recording

- Register the face of same person indoors and outdoors, or with different expressions or angles. (P176)
- Additionally register at the location of recording.
- When a person who is registered is not recognized, correct by re-registering.
- Face Recognition may not be possible or may not recognize faces correctly even for registered faces, depending on the facial expression and environment.

1 Press ▲/▼ to select [MEMORY] and then press [MENU/SET].

2 Press ▲/▼/◀/▶ to select the Face Recognition frame that is not registered, and then press [MENU/SET].

- [New] will not display if there are 6 people already registered. Delete a person already registered to register a new person.



3 Take the picture adjusting the face with the guide.

- Confirmation screen is displayed. It is executed when [Yes] is selected.
- The faces of subjects other than people (pets, etc.) cannot be registered.
- To display the description of the face registration, press ▶ or touch [ⓘ].

4 Press ▲/▼ to select the item and then press [MENU/SET].

- You can register up to 3 face images.

[Name]	It is possible to register names. ❶ Press ▼ to select [SET] and then press [MENU/SET]. ❷ Enter the name. • For details on how to enter characters, refer to “Entering Text” section on P57.
[Age]	It is possible to register the birthday. ❶ Press ▼ to select [SET] and then press [MENU/SET]. ❷ Press ◄/► to select the items (Year/Month/Day), and then press ▲/▼ to set and then press [MENU/SET].
[Add Images]	To add additional face images. **(Add Images)** ❶ Select the unregistered face recognition frame, and then press [MENU/SET]. ❷ Perform step **3** in “Face Settings”.
	To delete one of the face images. **(Delete)** **Press ◄/► to select the face image to delete, and then press [MENU/SET].** • This feature requires that at least one facial image remain, once registered. • Confirmation screen is displayed. It is executed when [Yes] is selected.

Change or delete the information for a registered person

You can modify the pictures or information of an already registered person. You can also delete the information of the registered person.

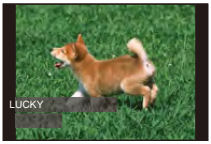
1 **Press ▼ to select [MEMORY] and press [MENU/SET].**
2 **Press ▲/▼/◄/► to select the face image to edit or delete and then press [MENU/SET].**
3 **Press ▲/▼ to select the item and then press [MENU/SET].**

[Info Edit]	Changing the information of an already registered person. **Perform step 4 in "Face Settings".**
[Priority]	The focus and exposure are preferentially adjusted for higher-priority faces. **Press ▲/▼/◄/► to select the priority and then press [MENU/SET].**
[Delete]	Deleting information of a registered person. • Confirmation screen is displayed. It is executed when [Yes] is selected.

Recording Profiles of Babies and Pets on Images

Applicable modes: P A S M C1 C2 C3

By setting the name and birthday of your baby or pet in advance, you can record their name and age in months and years on images.
You can display them during playback or stamp them on recorded images using [Text Stamp] (P239).



■ Setting [Age] or [Name]

1 Select the menu. **(P54)**

MENU → [Rec] → [Profile Setup]

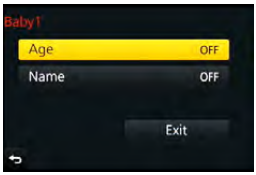
Settings: [1] ([Baby1])/[2] ([Baby2])/[ ] ([Pet])/[OFF]/[SET]

2 Press ▲/▼ to select [SET] and then press [MENU/SET].

3 Press ▲/▼ to select [Baby1], [Baby2] or [Pet] and then press [MENU/SET].

4 Press ▲/▼ to select [Age] or [Name] and then press [MENU/SET].

5 Press ▲/▼ to select [SET] and then press [MENU/SET].



Enter [Age] (birthday)
◄/►: Select the items (year/month/day)
▲/▼: Setting
[MENU/SET]: Set
Enter [Name]
For details on how to enter characters, refer to “Entering Text” on P57.

6 Press ▼ to select [Exit] and then press [MENU/SET] to finish.

■ To cancel [Age] and [Name]

Select the [OFF] setting in step **1**.

- The age and name can be printed out using the "PHOTOfunSTUDIO" bundled software on the DVD (supplied).

Not available in these cases:

- Still pictures recorded during motion picture recording ([ ] (motion picture priorities)) (P200) will not record age or name.

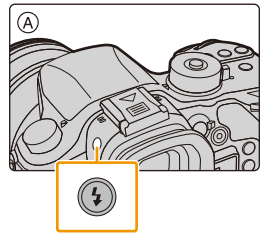
Taking pictures by using the flash

Applicable modes: iA iA+ P A S M C1 C2 C3

Taking a picture using the flash becomes possible by opening the built-in flash.

Ⓐ To open the flash

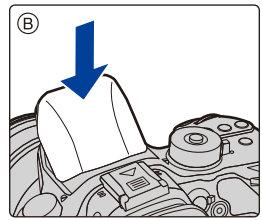
Turn the camera on, and press the flash open button.



Ⓑ To close the flash

Push the top part of the built-in flash from directly above.

- Forcibly closing the flash can damage the camera.
- Make sure to close the built-in flash when it is not in use.
- The flash setting is fixed to [⊛] while the flash is closed.
- **Be careful not to catch a finger when closing a flash bulb.**



Forcing the flash off ([⊛])

When the flash is closed or pictures cannot be taken with the flash due to motion picture recording, etc., [⊛] (forced flash off) is displayed on the recording screen and the flash will not fire.

- **Close the flash in places where its use is prohibited so that it will not fire.**

Using the flash skillfully

- When recording with the flash, white saturation can occur if the subject is too close. If [Highlight] of the [Custom] menu is set to [ON], regions of white saturation will blink black and white when you play back or use Auto Review. In this case, we recommend that you adjust [Flash Adjust.] (P186) in the minus direction and record the pictures again.
- When taking pictures with flash with the lens hood attached, the lower portion of the photo may turn dark and the control of the flash may be disabled because the photo flash may be obscured by the lens hood. We recommend detaching the lens hood.

■ The available flash range (approximation)

When you use certain lenses, light from the flash may be blocked or fail to cover the lens field of view, causing dark areas to appear in the resulting pictures.

The distance at which light from the flash is blocked by lens, and the distance to which light from the flash is delivered vary depending on the lens used.

When the interchangeable lens (H-HS12035) is used	
Wide	**Tele**
30 cm (0.98 feet) to 17.1 m (56 feet)	30 cm (0.98 feet) to 17.1 m (56 feet)

When the interchangeable lens (H-FS14140) is used	
Wide	**Tele**
50 cm (1.6 feet) to 13.7 m (45 feet)	50 cm (1.6 feet) to 8.5 m (28 feet)

- The ranges are those of when the ISO sensitivity is set to [AUTO] and [ISO Limit Set] (P133) is set to [OFF].

- Observe the following points. Not doing so may cause the camera to deform, discolor or malfunction.
  – Do not bring objects too close to the flash.
  – Do not close the flash while it is firing.
  – When using a setting that uses a pre-flash, such as [Forced On/Red-Eye], do not close the flash immediately after the camera emits a pre-flash.
- It may take time to charge the flash if you repeatedly take pictures. You must wait a moment to take the next picture while the flash icon is blinking red indicating the flash is charging. Take a picture after the access indication disappears.
- When you attach an external flash, it takes priority over the built-in flash. Refer to P347 for the external flash.
- In the following cases, the flash is fixed to [⊛] (forced flash off).
  – When recording motion pictures
  – When [Electronic Shutter] is set to [ON]
  – When [HDR] is set to [ON]
  – When [Silent Mode] is set to [ON]

Setting the Flash Functions

Changing the firing mode

Applicable modes: P A S M C1 C2 C3

Select whether to set the flash output automatically or manually.

1 Select the menu. (P54)

MENU → [Rec] → [Flash] → [Firing Mode]

2 Press ▲/▼ to select the item and then press [MENU/SET].

[TTL]	The camera automatically sets the flash output.
[MANUAL]	Set the luminosity ratio of the flash manually. In [TTL] you can shoot the photograph you want even when shooting dark scenes that may otherwise be too brightly lit by the flash. • This item is not available when an external flash is being used.

• When [MANUAL] is set, the luminosity ratio ([1/1], etc.) is displayed on the flash icon on the screen.

Setting the output ratio manually

1 Select the menu. (P54)

MENU → [Rec] → [Flash] → [Manual Flash Adjust.]

2 Press ◄/► to select an item and then press [MENU/SET].

• You can set from [1/1] (full brightness) to [1/128] in steps of [1/3].

• This item is available only when [Firing Mode] is set to [MANUAL].

Changing Flash Mode

Applicable modes: P A S M C1 C2 C3

Set the built-in flash to match the recording.

1 Select the menu. (P54)

MENU → [Rec] → [Flash] → [Flash Mode]

2 Press ▲/▼ to select the item and then press [MENU/SET].

([Forced Flash On]) ([Forced On/ Red-Eye])*	The flash is activated every time regardless of the recording conditions. • **Use this when your subject is back-lit or under fluorescent light.**
([Slow Sync.]) ([Slow Sync./ Red-Eye])*	When taking pictures against a dark background landscape, this feature will slow the shutter speed when the flash is activated. Dark background landscape will appear brighter. • **Use this when you take pictures of people in front of a dark background.** • **Using a slower speed can cause motion blur. Using a tripod can enhance your photos.**

* It can be set only when [Wireless] in [Flash] is set to [OFF] and [Firing Mode] is set to [TTL].

The flash is activated twice.
The interval between the first and second flash is longer when [ ] or [ ] is set. The subject should not move until the second flash is activated.

- The Red-Eye Reduction effect differs between people. Also, if the subject was far away from the camera or was not looking at the first flash, the effect may not be evident.

■ Correcting red eyes

When Red-Eye Reduction ([ ], [ ]) is selected, Red-Eye Removal is performed whenever the flash is used. The camera automatically detects red-eye and corrects the picture.

Select the menu. (P54)

MENU → [Rec] → [Red-Eye Removal]

Settings: [ON]/[OFF]

- [ ] is displayed on the icon when it is set to [ON].
- Under certain circumstances, red-eye cannot be corrected.

Available flash settings by Recording Mode

The available flash settings depend on the Recording Mode.
(○: Available, —: Not available)

Recording Mode						
iA	Intelligent Auto Mode	—*1	—*1	—*1	—*1	○
iA+	Intelligent Auto Plus Mode	—*1	—*1	—*1	—*1	○
P	Program AE Mode	○	○	○	○	○
A	Aperture-Priority AE Mode	○	○	○	○	○
S	Shutter-Priority AE Mode	○	○	—	—	○
M	Manual Exposure Mode	○	○	—	—	○
M	Creative Video Mode	—	—	—	—	○
	Creative Control Mode	—	—	—	—	○

*1 Cannot be set using the [Rec] menu.
[A] is set when the flash is opened. (P71)

- The flash setting may change if the Recording Mode is changed. Set the flash setting again if necessary.

Shutter speed for each flash setting

Flash setting	Shutter speed (Sec.)
	1/60*2 to 1/250th

Flash setting	Shutter speed (Sec.)
S	1 to 1/8000th
S	
	60*3 to 1/8000th

*2 This becomes 60 seconds in Shutter-Priority AE Mode and B (Bulb) in the Manual Exposure Mode.
*3 This becomes B (Bulb) in the Manual Exposure Mode.
- When the flash is activated the fastest shutter speed that can be selected is 1/250th of a second.
- In Intelligent Auto (iA or iA+) Mode, shutter speed changes depending on the identified scene.

Setting to the 2nd Curtain Synchro

Applicable modes: P A S M C1 C2 C3

2nd curtain synchro activates the flash just before the shutter closes when taking pictures of moving objects such as cars using a slow shutter speed.

1 Select the menu. (P54)

MENU → [Rec] → [Flash] → [Flash Synchro]

2 Press ▲/▼ to select the item and then press [MENU/SET].

[1ST]	1st curtain synchro The normal method when taking pictures with the flash.	
[2ND]	2nd curtain synchro The light source appears behind the subject and picture becomes dynamic.	

- Set it to [1ST] for normal use.
- [2nd] is displayed in the flash icon on the screen if you set [Flash Synchro] to [2ND].
- Only available when [Wireless] in [Flash] is set to [OFF]. (P187)
- The [Flash Synchro] settings also apply to an external flash. (except the wireless flash) (P347)
- When a fast shutter speed is set, the effect of [Flash Synchro] may deteriorate.
- You cannot set [⚡👁] or [⚡S👁] when [Flash Synchro] is set to [2ND].

Adjust the flash output

Applicable modes: P A S M C1 C2 C3

Adjust the flash brightness when pictures taken with the flash are over or underexposed.

1 Select the menu. (P54)

MENU → [Rec] → **[Flash]** → **[Flash Adjust.]**

2 Press ◄/► to set the flash output and then press [MENU/SET].

- You can adjust from [−3 EV] to [+3 EV] in steps of 1/3 EV.
- Select [±0] to return to the original flash output.

- [+] or [−] is displayed on the flash icon in the screen when the flash level is adjusted.
- It can be set only when [Wireless] in [Flash] is set to [OFF] and [Firing Mode] is set to [TTL]. (P182, 187)
- The [Flash Adjust.] setting also applies to an external flash. (excluding the wireless flash) (P347)

Synchronizing the output of the flash to the Exposure Compensation

Applicable modes: P A S M C1 C2 C3

The camera automatically optimizes the flash output for the Exposure Compensation value.

Select the menu. (P54)

MENU → [Rec] → **[Flash]** → **[Auto Exposure Comp.]**

Settings: [ON]/[OFF]

- For details on Exposure Compensation, refer to P157.
- The [Auto Exposure Comp.] setting also applies to an external flash. (P347)

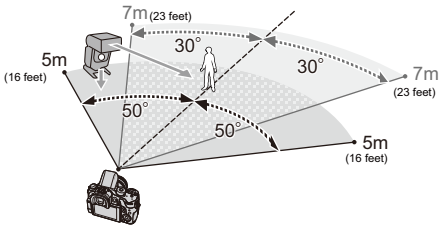
Taking Pictures with Wireless Flashes

Applicable modes: P A S M C1 C2 C3

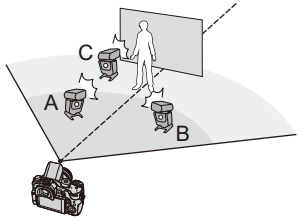
By using flashes that support the wireless control (DMW-FL360L, DMW-FL580L: optional), you can control firing of the built-in flash (or a flash attached to the hot shoe of this unit) and three flash groups separately.

■ Placing wireless flashes

Place the wireless flash with its wireless sensor facing toward the camera.
The following figure shows the estimated controllable range when you take pictures by holding the camera horizontally. Controllable range differs depending on the surrounding environment.



Placement example



- In this placement example, flash C is placed to erase the shadow of the subject that flashes A and B will create.
- The recommended number of wireless flashes for each group is three or less.
- If the subject is too close, signal flashing may affect the exposure.
  If you set [Communication Light] to [LOW] or lower the output with a diffuser or similar product, the effect will be reduced.

1 Set the wireless flashes to RC Mode and then place them.

- Set a channel and groups for the wireless flash.

2 Press the flash button to open the built-in flash or attach a flash (DMW-FL360L or DMW-FL580L: optional) to the camera.

3 Select the menu. (P54)

MENU → [Rec] → [Flash] → [Wireless]

4 Press ▲/▼ to select [ON] and then press [MENU/SET].

- When [Wireless] is set to [ON], [WL] is displayed on the flash icon on the recording screen.

5 **Press ▲/▼ to select [Wireless Channel] and then press [MENU/SET].**

6 **Press ▲/▼ to select the channel and then press [MENU/SET].**

- Select the channel you have set for the external flashes in step 1.

7 **Press ▲/▼ to select [Wireless Setup] and then press [MENU/SET].**

8 **Press ▲/▼ to select an item and then press [MENU/SET].**

- Press the [DISP.] button to fire a test-flash.

Ⓐ Firing Mode
Ⓑ Flash output
Ⓒ Luminosity ratio

[Built-in Flash]*1/ [External Flash]*1	**[Firing Mode]** **[TTL]:** The camera automatically sets the output. **[AUTO]:*2** Flash output is set by the external flash. **[MANUAL]:*2** Set the luminosity ratio of the external flash manually. **[OFF]:** The flash on the camera side emits only communication light.
	[Flash Adjust.] Set the output of the external flash manually when [Firing Mode] is set to [TTL].
	[Manual Flash Adjust.] Set the luminosity ratio of the external flash when [Firing Mode] is set to [MANUAL]. • You can set from [1/1] (full brightness) to [1/128] in steps of 1/3.
	• When a flash is not attached to the camera, these settings will be set for the built-in flash; when a flash is attached to the camera, they will be set for the flash.
[A Group]/ [B Group]/ [C Group]	**[Firing Mode]** **[TTL]:** The camera automatically sets the output. **[AUTO]:*1** The wireless flashes automatically set the output. **[MANUAL]:** Set the luminosity ratio of the external flash manually. **[OFF]:** The wireless flashes of the specified group will not fire.
	[Flash Adjust.] Adjust the output of the wireless flashes manually when [Firing Mode] is set to [TTL].
	[Manual Flash Adjust.] Set the luminosity ratio of the external flash when [Firing Mode] is set to [MANUAL]. • You can set from [1/1] (full brightness) to [1/128] in steps of 1/3.

*1 Not available when [Wireless FP] is set to [ON].
*2 You can select these options only when the external flash is attached to the camera.

Using other settings for wireless flash recording

Enabling FP firing for the wireless flashes

During wireless recording, an external flash fires an FP flash (high speed repetition of flash firing). This firing allows recording with the flash at a fast shutter speed.
Select the menu. (P54)

MENU → **[Rec]** → **[Flash]** → **[Wireless FP]**

Settings: [ON]/[OFF]

Setting the output of communication light

Set the communication light level for wireless recording.
Select the menu. (P54)

MENU → **[Rec]** → **[Flash]** → **[Communication Light]**

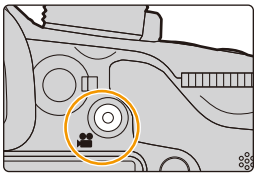
Settings: [HIGH]/[STANDARD]/[LOW]

Recording Motion Picture

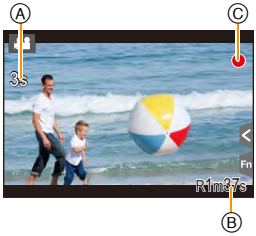
Applicable modes: iA iA+ P A S M M C1 C2 C3

This can record full high definition motion pictures compatible with the AVCHD format or motion pictures recorded in MP4, MOV.
The functions available when recording motion pictures differ according to the lens you are using, and the operational sound of the lens may be recorded.
Refer to P21 for details.

1 Start recording by pressing the motion picture button.



Ⓐ Elapsed recording time
Ⓑ Available recording time



- Recording of motion picture appropriate for each mode is possible.
- The recording state indicator (red) Ⓒ will flash while recording motion pictures.
- If no operation is performed, part of the information on the screen will gradually become darker after approximately 10 seconds has passed, and will no longer be displayed after approximately 1 minute has passed. Pressing the [DISP.] button or touching the monitor will make the display reappear. This operation is to prevent screen burn-in and is not a malfunction.
- Release the motion picture button right after you press it.

2 Stop the recording by pressing the motion picture button again.

- Still picture recording is also possible during the motion picture recording by fully pressing the shutter button. (P200)

About the operation sound that is produced when you stop recording

Since motion picture recording stops only after you press the motion picture button, the sound of the operation may be noticeable. If the sound bothers you, try the following:
– Divide the last part of the motion picture using [Video Divide] (P242) in the [Playback] menu.
The motion picture may not be divided near the very end of it. To avoid this, record approximately 3 seconds longer.
– Set the camera to Creative Video Mode, and use a shutter remote control (optional) to record motion pictures. (P353)

- The operational sound of the zoom or button operation may be recorded when it is operated during the recording of a motion picture.
- The available recording time displayed on the screen may not decrease regularly.
- Depending on the type of the card, the card access indication may appear for a while after recording motion pictures. This is not a malfunction.
- When the aspect ratio setting is different in still and motion pictures, the angle of view changes at the start of motion picture recording. When [Rec Area] (P311) is set to [ ], angle of view during motion picture recording is displayed.
- The [Sensitivity] will be set to [AUTO] (for motion pictures) when recording motion pictures. Also, the [ISO Limit Set] will not operate.
- When recording a motion picture, [Stabilizer] will be fixed to [ ] even if it is set to [ ].
- It is recommended to use a fully charged battery or AC adaptor (optional) when recording motion pictures. (P353)
- If while recording motion pictures using the AC adaptor (optional) the power supply is cut off due to a power cut or if the AC adaptor (optional) is disconnected etc., the motion picture will not be recorded.
- It will be recorded in the following categories for certain Recording Modes. A motion picture recording matching each Recording Mode will be performed for the ones not listed below.

Selected Recording Mode	Recording Mode while recording motion picture
– Program AE Mode – Aperture-Priority AE Mode – Shutter-Priority AE Mode – Manual Exposure Mode	Normal motion picture

Not available in these cases:

- Motion pictures cannot be recorded in the following cases.
  - [Rough Monochrome]/[Silky Monochrome]/[Soft Focus]/[Star Filter]/[Sunshine] (Creative Control Mode)
  - When using [Time Lapse Shot]
  - When using [Stop Motion Animation]

Recording motion pictures in 4K

Applicable modes: iA iA+ P A S M M C1 C2 C3

You can create finely-detailed motion pictures in 4K by recording motion pictures with their size set to [4K] or [C4K] in [Rec Quality].

- You can record motion pictures in 4K only in Creative Video Mode.
- The angle of view of motion pictures in 4K is narrower than those of motion pictures in other sizes.
- When recording motion pictures in 4K, use a card rated as UHS Speed Class 3. (P22)

To record motion pictures in 4K:

1. Set the mode dial to [M]. (P41)
2. Set [Rec Format] in the [Motion Picture] menu to [MP4], [MP4 (LPCM)] or [MOV]. (P193)
3. Set the motion picture size to [4K] or [C4K] in [Rec Quality] in the [Motion Picture] menu. (P193)

Setting the format, size and recording frame rate

Applicable modes: iA iA+ P A S M M C1 C2 C3

1 Select the menu. (P54)

MENU → [Motion Picture] → [Rec Format]

2 Press ▲/▼ to select the item and then press [MENU/SET].

[AVCHD]	This data format is suitable for when playing back on a high-definition TV, etc.
[MP4]	The MP4 data format is suitable for playback on a PC, etc.
[MP4 (LPCM)]	The MP4 data format for image editing.
[MOV]	Data format for image editing.

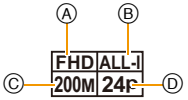
- When [MP4 (LPCM)] or [MOV] is selected, confirmation screen is displayed. Select [Yes] to execute.

3 Press ▲/▼ to select [Rec Quality] and then press [MENU/SET].

4 Press ▲/▼ to select the item and then press [MENU/SET].

- Available items differ depending on [Rec Format] and [System Frequency] (P220).
- Exit the menu after it is set.

Indication of the icon



Ⓐ Size
Ⓑ ALL-Intra
Ⓒ Bit rate
Ⓓ Recording frame rate (Sensor output)

- "ALL-Intra" refers to a data compression method in which each frame is compressed. The file size of motion pictures recorded in this method becomes larger, but this method can prevent the loss of image quality because editing does not require re-encoding.
- What is bit rate
  This is the volume of data for a definite period of time, and the quality becomes higher when the number gets bigger. This unit is using the "VBR" recording method. "VBR" is an abbreviation for "Variable Bit Rate", and the bit rate (volume of data for definite period of time) is changed automatically depending on the subject to record. Therefore, the recording time is shortened when a subject with fast movement is recorded.
- Depending on the [Rec Format] and [Rec Quality] of a motion picture, the speed class rating required for the card differs. Use a card that meets the rating. For details, refer to "About the motion picture recording and speed class" on P22.

When [AVCHD] is selected

(○: Available, —: Not available)

Item	System frequency			Size	Recording frame rate	Sensor output*2	Bit rate
	59.94Hz (NTSC)	50.00Hz (PAL)	24.00Hz (CINEMA)				
[FHD/28M/60p]*1	○	—	—	1920×1080	59.94p	59.94	28 Mbps
[FHD/28M/50p]*1	—	○	—	1920×1080	50.00p	50.00	28 Mbps
[FHD/17M/60i]	○	—	—	1920×1080	59.94i	59.94	17 Mbps
[FHD/17M/50i]	—	○	—	1920×1080	50.00i	50.00	17 Mbps
[FHD/24M/30p]	○	—	—	1920×1080	59.94i	29.97	24 Mbps
[FHD/24M/25p]	—	○	—	1920×1080	50.00i	25.00	24 Mbps
[FHD/24M/24p]	○	—	—	1920×1080	23.98p	23.98	24 Mbps

*1 AVCHD Progressive

*2 Frames/second

When [MP4] is selected

(○: Available, —: Not available)

Item	System frequency			Size	Recording frame rate	Sensor output*2	Bit rate
	59.94Hz (NTSC)	50.00Hz (PAL)	24.00Hz (CINEMA)				
[4K/100M/30p]*1	○	—	—	3840×2160	29.97p	29.97	100 Mbps
[4K/100M/25p]*1	—	○	—	3840×2160	25.00p	25.00	100 Mbps
[FHD/28M/60p]	○	—	—	1920×1080	59.94p	59.94	28 Mbps
[FHD/28M/50p]	—	○	—	1920×1080	50.00p	50.00	28 Mbps
[FHD/20M/30p]	○	—	—	1920×1080	29.97p	29.97	20 Mbps
[FHD/20M/25p]	—	○	—	1920×1080	25.00p	25.00	20 Mbps
[HD/10M/30p]	○	—	—	1280×720	29.97p	29.97	10 Mbps
[HD/10M/25p]	—	○	—	1280×720	25.00p	25.00	10 Mbps
[VGA/4M/30p]*3	○	—	—	640×480	29.97p	29.97	4 Mbps
[VGA/4M/25p]*3	—	○	—	640×480	25.00p	25.00	4 Mbps

*1 These can be set only in Creative Video Mode.
*2 Frames/second
*3 If you use the HDMI output during recording, these items are not available.

- When the motion picture size is set to [FHD], [HD] or [VGA] in [MP4], you can continuously record a motion picture up to 29 minutes 59 seconds or until the file size reaches 4 GB. You can check the recordable time on the screen.
  – Since the file size becomes larger with [FHD], recording with [FHD] will stop before 29 minutes 59 seconds.
- You can continuously record a motion picture with its size set to [4K] in [MP4] without a pause even if the motion picture exceeds 4 GB. However, the recorded content has to be played back as multiple files.

When [MP4 (LPCM)], [MOV] is selected

(○: Available, —: Not available)

Item	System frequency			Size	Recording frame rate	Sensor output*3	Bit rate
	59.94Hz (NTSC)	50.00Hz (PAL)	24.00Hz (CINEMA)				
[C4K/100M/24p]*1	—	—	○	4096×2160	24.00p	24.00	100 Mbps
[4K/100M/30p]*1	○	—	—	3840×2160	29.97p	29.97	100 Mbps
[4K/100M/25p]*1	—	○	—	3840×2160	25.00p	25.00	100 Mbps
[4K/100M/24p]*1	—	—	○	3840×2160	24.00p	24.00	100 Mbps
	○	—	—	3840×2160	23.98p	23.98	100 Mbps
[FHD/ALL-I*2/ 200M/60p]	○	—	—	1920×1080	59.94p	59.94	200 Mbps
[FHD/100M/60p]	○	—	—	1920×1080	59.94p	59.94	100 Mbps
[FHD/50M/60p]	○	—	—	1920×1080	59.94p	59.94	50 Mbps
[FHD/ALL-I*2/ 200M/50p]	—	○	—	1920×1080	50.00p	50.00	200 Mbps
[FHD/100M/50p]	—	○	—	1920×1080	50.00p	50.00	100 Mbps
[FHD/50M/50p]	—	○	—	1920×1080	50.00p	50.00	50 Mbps
[FHD/ALL-I*2/ 200M/30p]	○	—	—	1920×1080	29.97p	29.97	200 Mbps
[FHD/100M/30p]	○	—	—	1920×1080	29.97p	29.97	100 Mbps
[FHD/50M/30p]	○	—	—	1920×1080	29.97p	29.97	50 Mbps
[FHD/ALL-I*2/ 200M/25p]	—	○	—	1920×1080	25.00p	25.00	200 Mbps
[FHD/100M/25p]	—	○	—	1920×1080	25.00p	25.00	100 Mbps
[FHD/50M/25p]	—	○	—	1920×1080	25.00p	25.00	50 Mbps
[FHD/ALL-I*2/ 200M/24p]	—	—	○	1920×1080	24.00p	24.00	200 Mbps
	○	—	—	1920×1080	23.98p	23.98	200 Mbps
[FHD/100M/24p]	—	—	○	1920×1080	24.00p	24.00	100 Mbps
	○	—	—	1920×1080	23.98p	23.98	100 Mbps
[FHD/50M/24p]	—	—	○	1920×1080	24.00p	24.00	50 Mbps
	○	—	—	1920×1080	23.98p	23.98	50 Mbps

*1 These can be set only in Creative Video Mode.
*2 ALL-Intra
*3 Frames/second

- Though a [MP4 (LPCM)]/[MOV] motion picture can be recorded continuously without a pause even when its file size exceeds 4 GB, the recorded content is played back with multiple files.

■ About the compatibility of the recorded motion pictures

Even when a compatible device is used, recorded motion pictures may be played back with reduced picture and sound quality, or they may not be played back.
Also, recording information may not be displayed correctly. Use this unit to playback in such case.

- To play back motion pictures recorded with the recording frame rate set to [24p] in [Rec Quality] on an external device or to export the motion pictures to it, you need a compatible Blu-ray disc recorder or a PC installed with PHOTOfunSTUDIO.
- If you want to use another device to play back or edit motion pictures recorded in [MP4 (LPCM)] or [MOV], a high-performance PC environment or a PC installed with “PHOTOfunSTUDIO” is required.

How to set focus when recording a motion picture ([Continuous AF])

Applicable modes: P A S M C1 C2 C3

Focusing changes depending on the Focus Mode setting (P93) and the [Continuous AF] setting in the [Motion Picture] menu.

[Focus Mode]	[Continuous AF]	Description of settings
[AFS]/[AFF]/[AFC]	[ON]	The camera automatically keeps focusing on subjects during recording. (P93)
	[OFF]	The camera maintains the focus position at the start of recording.
[MF]	[ON]/[OFF]	You can focus manually. (P107)

- When the focus mode is set to [AFS], [AFF] or [AFC], if you press the shutter button halfway while recording a motion picture, the camera will re-adjust the focus.
- Depending on the recording conditions or lens used, operational sound may be recorded when the Auto Focus is operated while recording a motion picture.
  It is recommended to record with [Continuous AF] in the [Motion Picture] menu set to [OFF], if the sound of operation bothers you to avoid recording the lens noise.
- When operating the zoom when recording motion pictures, it may take time to come into focus.

Recording still pictures while recording motion pictures

Applicable modes: P A S M C1 C2 C3

Still pictures can be recorded even while recording a motion picture. (Simultaneous recording)

During motion picture recording, press the shutter button fully to record a still picture.

- Simultaneous recording indicator is displayed while recording still pictures.
- Recording with the Touch Shutter function (P89) is also available.

■ Setting motion picture and still picture priorities

Applicable modes: P A S M C1 C2 C3

Recording method for the still pictures taken while recording a motion picture can be set with [Picture Mode] in the [Motion Picture] menu.

[ ] (Motion picture priorities)	• Pictures will be recorded with a picture size of [S] (2 M). The picture quality may be different to [S] (2 M) of standard pictures. • Only JPEG images are recorded when [Quality] is set to [RAW], [RAW] or [RAW]. (When set to [RAW], still pictures will be recorded in [Quality] of [].) • Up to 40 still pictures can be recorded during recording of the motion picture. • In [Miniature Effect] of Creative Control Mode, there may be a slight delay between fully pressing the shutter button and recording.
[ ] (Still picture priorities)	• Pictures will be recorded with the set picture size and quality. • The screen will go dark while recording pictures. A still picture will be recorded in the motion picture during that period, and audio is not recorded. • Up to 10 still pictures can be recorded during recording of the motion picture.

- The picture aspect ratio will be fixed to [16:9].

Not available in these cases:

- This function is not available in the following cases:
  - When the motion picture size is set to [VGA] in [Rec Quality]
  - When the frame rate for motion pictures is set to [24p] in [Rec Quality] [only when [ ] (still picture priorities) is set]
  - When using [Ex. Tele Conv.] in the [Motion Picture] menu [only when [ ] (still picture priorities) is set]

Recording motion pictures with manually set aperture value/shutter speed (Creative Video Mode)

Recording Mode: 🎥M

It is possible to manually change the aperture and shutter speed and record motion pictures.

1 **Set the mode dial to [🎥M].**

2 **Select the menu.** (P54)

MENU → 🎥 **[Motion Picture]** → **[Exposure Mode]**

3 **Press ▲/▼ to select [P], [A], [S] or [M], and then press [MENU/SET].**

- The operation for changing the aperture value or shutter speed is the same as the operation for setting the mode dial to **P**, **A**, **S** or **M**.

> It is also possible to display the selection screen by touching the Recording Mode icon in recording screen.
>
>
>

4 **Start recording.**

- Press the motion picture button or the shutter button to start recording a motion picture. (Still pictures cannot be taken.)

5 **Stop recording.**

- Press the motion picture button or the shutter button to stop recording a motion picture.

- **Aperture value**
  - Set the aperture value to a higher number when you want a sharp focus background. Set the aperture value to a lower number when you want a soft focus background.
- **Shutter speed**
  - When you want to take a sharp picture of a fast moving subject, set with a faster shutter speed. When you want to create a trail effect, set to a slower shutter speed.
  - Manually setting a higher shutter speed may increase the noise on-screen due to the higher sensitivity.
  - When subjects are recorded in an extremely bright place or under fluorescent/LED lighting, the color tone or brightness of the image may change, or horizontal stripes may appear on the screen. In that case, change the Recording Mode or manually adjust the shutter speed to 1/60 or 1/100.
    If you use [Synchro Scan] (P218), you can adjust the reduction setting in even finer increments.
- If you set [Variable Frame Rate] (P215), the shutter speed may change.
- When [Exposure Mode] is set to [M], [AUTO] of the ISO sensitivity will switch to [200].

Minimizing operational sounds during motion picture recording

The operational sound of the zoom or button operation may be recorded when it is operated during the recording of a motion picture.
Using touch icons allows silent operation while recording motion pictures.
• Set [Silent Operation] in the [Motion Picture] menu to [ON].

1 Start recording.

2 Touch [ ].

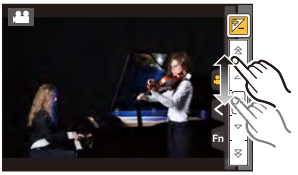
3 Touch icon.

T W	Zoom (When an interchangeable lens compatible with power zoom is used)
F	Aperture value
SS	Shutter speed
	Exposure Compensation
ISO / GAIN	ISO sensitivity/Gain (dB) (P209)
	Mic level adjustment

4 Drag the slide bar to set.

• The speed of the operation varies depending on the position you touch.

[▲]/[▼]	changes the setting slowly
[⏶]/[⏷]	changes the setting quickly



5 Stop recording.

Using Advanced Settings and Recording Functions for Motion Pictures

Setting the luminance level for images ☞ P206

- [Motion Picture] menu: [Master Pedestal Level]/[Luminance Level]

About image settings other than the luminance level
The following functions work for both still pictures and motion pictures. For details, refer to “Picture Quality and Color Tone Settings” on P128.
- [White Balance]/[Photo Style]/[Highlight Shadow]/[i.Dynamic]/[i.Resolution]

About gamma settings/hue adjustments for motion pictures
If you select [Photo Style] in the [Motion Picture] menu, you can record motion pictures with a gamma curve suited for editing, fine-adjust the hue, and add a variety of other effects. For details, refer to “Adjusting the Picture Quality by Adding an Effect ([Photo Style])” on P140.

Adjusting the sound settings/monitoring the sound while recording ☞ P207

- [Motion Picture] menu: [Mic Level Adj.]/[Mic Level Limiter]/[Wind Cut]/[Lens Noise Cut]
- Checking the sound while recording motion pictures ([Motion Picture] menu: [Sound Output])
- For information on [Special Mic.] in the [Motion Picture] menu, which is available only when a stereo shotgun microphone (DMW-MS2: optional) is used, refer to P350.

Using screens and displays suitable for motion picture recording ☞ P208

- [Motion Picture] menu: [Mic Level Disp.]/[SS/Gain Operation]
- [Custom] menu: [Center Marker]/[Zebra Pattern]/[Monochrome Live View]/[Video-Priority Display]

Recording while monitoring camera images ☞ P212

- [Motion Picture] menu: [HDMI Rec Output]

Setting the recording method of time code ☞ P214

- [Motion Picture] menu: [Time Code]

Recording in Slow or Fast Motion ([Variable Frame Rate]) ☞ P215

- [Motion Picture] menu: [Variable Frame Rate]

Reducing flickering and horizontal stripes on images ([Synchro Scan]) ☞ P218

- [Motion Picture] menu: [Synchro Scan]

Displaying color bars/Outputting a test tone ☞ P219

- [Motion Picture] menu: [Color Bars]

Changing the system frequency ☞ P220

- [Setup] menu: [System Frequency]

Setting the luminance level for images

Adjusting the black luminance level ([Master Pedestal Level])

Applicable modes: P A S M C1 C2 C3

You can adjust black, which serves as the reference for images in Creative Video Mode, in 31 steps. Acting as the reference for luminance signals, black is called the master pedestal. By adjusting the range defined as black, not only can you adjust the way black appears, but also the luminance balance of the entire image.

• This function is available only when the camera is set to Creative Video Mode.

− Side

This side creates a high contrast image with a crisp atmosphere.

±0 (Standard)

This is the standard setting.

+ Side

This side creates a slightly misty atmosphere.

1 Select the menu. (P54)

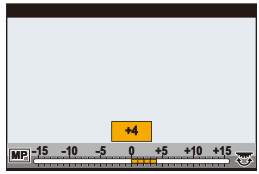
MENU → [Motion Picture] → [Master Pedestal Level]

2 Rotate the rear dial or front dial to adjust the setting.

• When not adjusting the setting, select [0].

3 Press [MENU/SET].

• Exit the menu after it is set.



[Luminance Level]

Applicable modes: P A S M C1 C2 C3

You can set the luminance range for motion pictures. When you combine multiple materials into a single motion picture, set a range that covers all materials.

MENU → [Motion Picture] → [Luminance Level]

Settings: [0—255]/[16—235]/[16—255]

• This function works only for motion pictures. Still pictures (including those you take during motion picture recording) will be taken with [0—255].
• When [Rec Format] is set to [AVCHD] or [MP4], [0-255] in [Luminance Level] will switch to [16-255].

Adjusting the sound settings/monitoring the sound while recording

You can adjust the sound settings for motion pictures.

- For information on [Special Mic.] in the [Motion Picture] menu, which is available only when a stereo shotgun microphone (DMW-MS2: optional) is used, refer to P350.

[Mic Level Adj.]

Applicable modes: iA iA+ P A S M C1 C2 C3

Adjust the sound input level to 19 different levels (−12 dB ～ +6 dB).

MENU → [Motion Picture] → [Mic Level Adj.]

- Displayed dB values are approximate.

Adjusting the sound input level automatically ([Mic Level Limiter])

Applicable modes: iA iA+ P A S M C1 C2 C3

The camera adjusts the sound input level automatically, minimizing the sound distortion (crackling noise) when the volume is too high.

MENU → [Motion Picture] → [Mic Level Limiter]

Settings: [ON]/[OFF]

[Wind Cut]

Applicable modes: iA iA+ P A S M C1 C2 C3

This prevents the recording of wind-noise automatically.

MENU → [Motion Picture] → [Wind Cut]

Settings: [AUTO]/[HIGH]/[STANDARD]/[LOW]/[OFF]

- Setting [Wind Cut] may alter the usual sound quality.

[Lens Noise Cut]

Applicable modes: iA iA+ P A S M C1 C2 C3

You can reduce the zoom sound of an interchangeable lens compatible with power zoom that is produced during motion picture recording.

MENU → [Motion Picture] → [Lens Noise Cut]

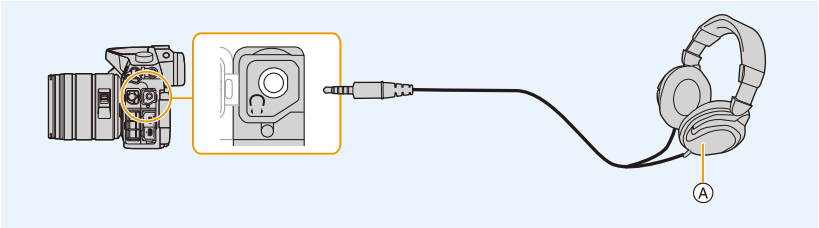
Settings: [ON]/[OFF]

- This function works only when an interchangeable lens that supports power zoom is used.
- When this function is used, the sound quality may differ from that during normal operation.

Checking the sound while recording motion pictures

Applicable modes: iA iA+ P A S M M C1 C2 C3

You can record motion pictures while hearing the sounds that are being recorded by connecting a commercially available headphones to this unit.



Ⓐ Commercially available headphone

- Do not use the headphone cables with the length of 3 m (9.8 feet) or more.
- When headphones are connected, electronic sounds and electronic shutter sounds are muted.

■ Switch the sound output method

MENU → [Motion Picture] → [Sound Output]

[REAL TIME]	Actual sound without time lag. It may be different to the audio recorded in the motion picture.
[REC SOUND]	Sound that is being recorded in motion pictures. The audio may be output slower than the actual audio.

- The sound level you set in [Mic Level Adj.] is displayed as a mic level.
- If you use the HDMI output during recording, the setting is fixed to [REC SOUND].

Using screens and displays suitable for motion picture recording

You can change the screen and display settings so that it will be convenient for you to handle motion pictures with the camera.

[Mic Level Disp.]

Applicable modes: iA iA+ P A S M M C1 C2 C3

Set whether or not the mic levels are displayed on the recording screen.

MENU → [Motion Picture] → [Mic Level Disp.]

Settings: [ON]/[OFF]

- When [Mic Level Limiter] is set to [OFF], [Mic Level Disp.] is fixed to [ON].

Switching the units of values ([SS/Gain Operation])

Applicable modes: P A S M C1 C2 C3

You can switch the units of shutter speed values and gain (sensitivity) values in Creative Video Mode.

• This function is available only when the camera is set to Creative Video Mode.

1 Select the menu. (P54)

MENU → [Motion Picture] → [SS/Gain Operation]

2 Press ▲/▼ to select the item and then press [MENU/SET].

[SEC/ISO]	Displays the shutter speed in seconds and the gain in ISO.	
[ANGLE/ ISO]	Displays the shutter speed in degrees and the gain in ISO. • The shutter speed below will be selectable. (When [Synchro Scan] is set to [OFF]): 11 d to 360 d	
[SEC/dB]	Displays the shutter speed in seconds and the gain in dB. • The gain (sensitivity) below will be selectable: AUTO or −6 dB to 24 dB	

• Exit the menu after it is set.

Displaying the center of the screen ([Center Marker])

Applicable modes: P A S M C1 C2 C3

The center of the recording screen will be displayed as [+]. This is convenient for operating the zoom while keeping the subject at the center of the screen.

MENU → [Custom] → [Center Marker]

Settings: [ON]/[OFF]

Checking areas that may be white saturated ([Zebra Pattern])

Applicable modes: P A S M C1 C2 C3

You can check areas that may be white saturated by displaying areas above a certain luminance level in a zebra pattern. You can also set the minimum luminance level (brightness) to be processed as a zebra pattern.

MENU → **[Custom]** → **[Zebra Pattern]**

[ZEBRA1]	Displays areas above a certain luminance level by a right-leaning zebra pattern.	
[ZEBRA2]	Displays areas above a certain luminance level by a left-leaning zebra pattern.	
[OFF]	—	
[SET]	Sets the minimum brightness level for each zebra pattern. **[Zebra 1]/[Zebra 2]** **Press ▲/▼ to select the brightness, and press [MENU/SET].** • You can select a brightness value between [50%] and [105%]. In [Zebra 2], you can select [OFF]. If you select [100%] or [105%], only the areas that are already white saturated are displayed in a zebra pattern. The smaller the value is, the wider the brightness range to be processed as a zebra pattern will be. • When [Luminance Level] is set to [16–235], you can select only a brightness level up to [95%].	

- If there are any white saturated areas, we recommend compensating the exposure towards negative (P157) referring to the histogram (P309) and then taking the picture.
- Displayed zebra patterns will not be recorded.
- If you assign [Zebra Pattern] to [Fn Button Set] (P317) in the [Custom] menu, each time you press the function button to which the setting is assigned, the zebra pattern toggles as follows: [Zebra 1] → [Zebra 2] → [OFF].
  When [Zebra 2] is set to [OFF], the setting toggles in the order of [Zebra 1] → [OFF], allowing you to switch the setting quickly.

Displaying the recording screen in black and white ([Monochrome Live View])

Applicable modes: P A S M C1 C2 C3

You can display the recording screen in black and white. This function is convenient when a black and white screen will make it easier to set focus with Manual Focus.

MENU → [Custom] → **[Monochrome Live View]**

Settings: [ON]/[OFF]

- Even if you use the HDMI output during recording, this function will not work for the connected device.
- Recorded images will not be affected.

[Video-Priority Display]

Applicable modes: P A S M C1 C2 C3

You can switch screens, such as the recording screen or the on-monitor recording information screen, to those that are suitable for motion picture recording.

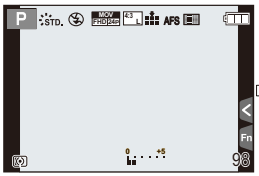
MENU → [Custom] → **[Video-Priority Display]**

Settings: [ON]/[OFF]

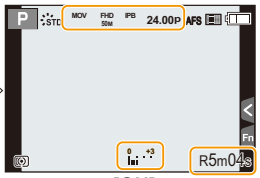
In Recording Mode

The details of [Rec Quality] and the available recording time will be displayed. The on-monitor recording information will be switched to those of the motion pictures.

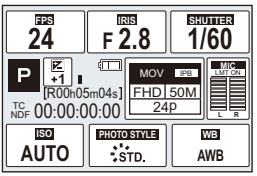
- The exposure compensation value display will be switched within the available range for motion pictures. When adjusting the exposure compensation, the range available only for pictures will be indicated as [ ].
- The icons for functions that are not available for motion pictures, such as the ones for the flash or the number of pixels, will not be displayed.



[OFF]



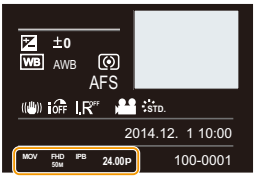
[ON]



On-monitor recording information screen ([ON])

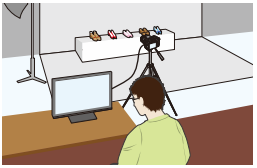
In Playback Mode

The details of [Rec Quality] will be displayed.



Recording while monitoring camera images

Applicable modes: iA iA+ P A S M M C1 C2 C3



During HDMI output, you can record while monitoring motion pictures on the TV, etc.

- Refer to P325 on how to connect with TV by using HDMI micro cable.
- The [Rec Quality] setting in the motion picture recording menu will be applied to screens that are output through the HDMI connection during recording.
- If you output an image being played back, it will be output with the [HDMI Mode (Play)] setting in [TV Connection] in the [Setup] menu. (P65)

Limitations on the use of the HDMI output

- When using the Auto Focus Mode [+] or MF assist, the screen cannot be enlarged in windowed mode ([PIP]).
- Ex. Tele Conv. (motion picture) does not work (excluding Creative Motion Picture Mode).
- [Aspect Ratio] in the [Rec] menu is fixed to [16:9].
- [Rec Quality] in the [Motion Picture] menu is not available for motion pictures with their size set to [VGA].
- [Sound Output] in the [Motion Picture] menu is fixed to [REC SOUND].
- Electronic sounds and electronic shutter sounds are muted.

Setting the output method of the HDMI connection

MENU → [Motion Picture] → [HDMI Rec Output]

[Bit Mode]	Sets the picture quality for the HDMI output. **[4:2:2 8bit]:** Allows you to record the image being output through the HDMI connection as a motion picture. This option is ideal for monitoring the image on the external monitor while recording it. **[4:2:2 10bit]:** Allows you to output the image through the HDMI connection in high picture quality. This option is ideal for saving the image on the external device. • You can select [4:2:2 10bit] only in Creative Video Mode. • If you output the image through the HDMI connection when [Bit Mode] is set to [4:2:2 10bit], motion pictures cannot be recorded. • If you use the HDMI output with [Bit Mode] set to [4:2:2 10bit], the Wi-Fi function will be disabled.
[Info Display]	Shows or hides the displays of information. **[ON]:** Outputs the displays on the camera as they are. **[OFF]:** Outputs only the image. • If you output the image through the HDMI connection when [Bit Mode] is set to [4:2:2 10bit], this setting is fixed to [OFF].
[4K Down Convert]	Switches the picture quality according to the connected device. **[AUTO]:** When the motion picture size is set to [4K] or [C4K] in [Rec Quality] and the connected device is not responding, the HDMI output picture quality automatically switches to [1080p]. **[1080p]:** When the motion picture size is set to [4K] or [C4K] in [Rec Quality], the HDMI output picture quality switches to [1080p]. **[OFF]:** Outputs the image through the HDMI connection with the picture quality set in [Rec Quality]. • When [OFF] is set, the image may not be displayed depending on the connected device.

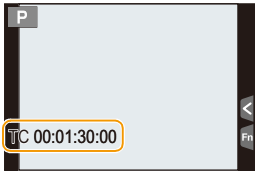
- If [4K Down Convert] works when the motion picture size is set to [4K] or [C4K] in [Rec Quality] and the image is output through the HDMI connection, it may take longer than usual to adjust the focus with Auto Focus and the camera may respond slower to continuous focus adjustment.
- If you use the Wi-Fi function while using the HDMI output with [Bit Mode] set to [4:2:2 8bit], the image will not be displayed on the camera's screen.
- When you use the HDMI output during recording, the image may be displayed with a time lag.

Setting the recording method of time code

Applicable modes: P A S M C1 C2 C3

Time code represents the recording time by the units of hour, minute, second and frame, and can be used as a time scale for editing motion pictures. This unit automatically records time code during motion picture recording.

- Time codes are not recorded on motion pictures recorded when the [Rec Format] is set to [MP4].



1 Select the menu. (P54)

MENU → [Motion Picture] → [Time Code]

2 Press ▲/▼ to select the item and then press [MENU/SET].

[Time Code Display]	Set whether or not the time code is displayed on the recording screen/playback screen. **[ON]/[OFF]**
[Count Up]	Sets the time code count method. **[REC RUN]:** Counts the time code only when recording motion pictures. **[FREE RUN]:** Counts the time code even when not recording (including when this unit is turned off).
[Time Code Value]	Sets the start point (starting time) for the time code. **[Reset]:** Sets to 00:00:00:00 (hour: minute: second: frame) **[Manual Input]:** Manually input hour, minute, second and frame. **[Current Time]:** Sets hour, minute and second to current time and sets frame to 00.
[Time Code Mode]	Sets the time code recording method. **[DF] (Drop frame):** The camera modifies the difference between recorded time and time code. This method is used for producing TV programs and other situations where an exact time period needs to be recorded. • Seconds and frames are separated by ".". (Example: 00:00:00.00) **[NDF] (Non-drop frame):** Records the time code without drop frame. Used in image production, etc. • Seconds and frames are separated by ":". (Example: 00:00:00:00) • The setting is fixed to [NDF] in the following cases. – When [System Frequency] is set to [50.00 Hz (PAL)] or [24.00 Hz (CINEMA)] – When [System Frequency] is set to [59.94 Hz (NTSC)] and the motion picture frame rate is set to [24p] in [Rec Quality]

Recording in Slow or Fast Motion ([Variable Frame Rate])

Applicable modes: P A S M C1 C2 C3

You can record slow motion or fast motion pictures by changing the frame rate. In [Variable Frame Rate], you can set the frame rate for recording.

Slow motion pictures (overcrank recording)
Used in scenes such as climaxes, a slow motion effect creates a dramatic impression. Set a frame rate that provides more frames than the recording frame rate in [Rec Quality] does.
Example: If you set [FHD/100M/24p] to [48fps] and record a motion picture, a slow motion effect of 1/2 can be gained.

Fast motion pictures (undercrank recording)
A fast motion effect is used in scenes showing the flow of clouds, people standing in the middle of crowds, etc. Set a frame rate that provides less frames than the recording frame rate in [Rec Quality] does.
Example: If you set [FHD/100M/24p] to [12fps] and record a motion picture, a quick motion effect of 2× can be gained.

- This function is available only when the camera is set to Creative Video Mode.
- Recording with a variable frame rate is possible with the following settings in [Rec Format] and [Rec Quality].

[AVCHD]	**When [System Frequency] is set to [59.94 Hz (NTSC)]** • [FHD/24M/30p]/[FHD/24M/24p] **When [System Frequency] is set to [50.00 Hz (PAL)]** • [FHD/24M/25p]
[MP4 (LPCM)]/ [MOV]	**When [System Frequency] is set to [59.94 Hz (NTSC)]** • [FHD/100M/30p]/[FHD/100M/24p] **When [System Frequency] is set to [50.00 Hz (PAL)]** • [FHD/100M/25p] **When [System Frequency] is set to [24.00 Hz (CINEMA)]** • [FHD/100M/24p]

∗ When [Rec Format] is set to [MP4], recording with a variable frame rate is not possible.

- Auto Focus does not work.
- Audio is not recorded.

1 Select the menu. (P54)

MENU → [Motion Picture] → [Rec Quality]

2 Press ▲/▼ to select an item and then press [MENU/SET].

- Items available for recording with a variable frame rate are indicated as [VFR available] on the screen.

3 Select [Variable Frame Rate] with ▲/▼, and then press [MENU/SET].

4 Select [ON] with ▲/▼, and then press [MENU/SET].

- If you switch the [Variable Frame Rate] setting from [OFF] to [ON], the frame rate setting screen will be displayed.

5 Press ◄/► to select the frame rate you will record the item with.

- You can select a value between [2fps] and [96fps].
- You can also select a frame rate by rotating the rear, front, or control dial.

6 Press [MENU/SET].

- Exit the menu after it is set.

■ To cancel [Variable Frame Rate]

Select the [OFF] setting in step **4**.

■ To change the frame rate

Select the [SET] setting in step **4**.

- When [Rec Format] is set to [AVCHD], you cannot set a frame rate with a number of frames greater than 60fps.
- If you set a frame rate greater than 60fps when [Ex. Tele Conv.] in the [Motion Picture] menu is set to [ON], [Ex. Tele Conv.] in the [Motion Picture] menu will be canceled.
- If you set a frame rate with a number of frames greater than 60fps, the picture quality may deteriorate.
- If you assign [Variable Frame Rate] to [Fn Button Set] (P317) in the [Custom] menu and press the assinged function button, the frame rate setting screen will be displayed. (Only when [Variable Frame Rate] is set to [ON])
- If you end motion picture recording after a short time, the camera may go on recording for a certain period. Please continue to hold the camera until the recording finishes.
- When using an interchangeable lens with no focus ring, you cannot set focus with Manual Focus. Set focus before setting [Variable Frame Rate].
- To play back motion pictures recorded with [Variable Frame Rate] on an external device or to export the motion pictures to it, you need a compatible Blu-ray disc recorder or a PC installed with PHOTOfunSTUDIO.
- When [Variable Frame Rate] is set, audio-related items in the [Motion Picture] menu are disabled.
- We recommend using a tripod.
- When you play back a motion picture recorded with [Variable Frame Rate], the recording time display for motion pictures on the top right of the screen will look different from the one that appears during normal motion picture playback.
  [▶ XXmXXs]: Actual playback time
  [🎥 XXmXXs]: Actual elapse of time during which you recorded the motion picture

Reducing flickering and horizontal stripes on images ([Synchro Scan])

Applicable modes: P A S M C1 C2 C3

You can reduce flickering and horizontal stripes on images in Creative Video Mode. By fine-adjusting the shutter speed, you can reduce flickering and horizontal stripes that appear on the camera's image when recording the screen of a TV or PC.

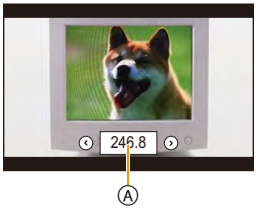
- **This function is available when [Exposure Mode] is set to either [S] or [M] in Creative Video Mode.**

1 Select the menu. (P54)

MENU → **[Motion Picture] → [Synchro Scan]**

2 Select [ON] with ▲/▼, and then press [MENU/SET].

3 Select Shutter Speed with ◄/►, and then press [MENU/SET].



Ⓐ Shutter speed

- You can fine-adjust the shutter speed.
- Adjust the shutter speed while looking at the screen so that flickering and horizontal stripes will be minimized.
- If you press and hold ◄/►, the shutter speed will be adjusted faster.
- You can also adjust the shutter speed setting on the recording screen in increments finer than the normal adjustment method.

■ Canceling [Synchro Scan]

Select the [OFF] setting in step **2**.

- When you set [Synchro Scan] to [ON], the available shutter speed range becomes narrower. The shutter speed range differs depending on the settings of [Rec Quality], [Variable Frame Rate], and others.

Displaying color bars/Outputting a test tone

Applicable modes: iA iA+ P A S M M C1 C2 C3

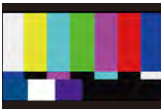
You can display color bars, which is convenient for adjusting settings such as the picture quality of an external monitor. When you display color bars, a test tone will also be output.

- The brightness and color tone that appear on the camera's monitor or viewfinder may differ from those that appear on another device such as an external monitor. Check the final picture quality on another device such as an external monitor.

1 Select the menu. (P54)

MENU → [Motion Picture] → [Color Bars]

2 Press ▲/▼ to select an item and then press [MENU/SET].

[SMPTE]	Color bars compliant with SMPTE	
[EBU]	Color bars compliant with EBU	
[ARIB]	Color bars compliant with ARIB	

- Color bars will be displayed and a test tone will be output.
- You can set the test tone level from among three options (−12 dB, −18 dB, and −20 dB) by rotating the control dial.
- If you press the motion picture button, the color bars and the test tone will be recorded as a motion picture.

3 Press [MENU/SET].

- The color bars will disappear and the test tone will stop.

- If you press [MENU/SET] while recording color bars as a motion picture, the color bars will disappear, but you can continue the recording. This operation allows you to record color bars in the beginning of a motion picture.
- If you assign [Color Bars] to [Fn Button Set] (P317) in the [Custom] menu, each time you press the function button to which the setting is assigned, you can display or hide color bars. In this operation, the color bars you used last time will be displayed.

Changing the system frequency

Applicable modes: iA iA+ P A S M M C1 C2 C3

You can change the system frequency of the motion pictures you record and play back. When creating a motion picture that has a broadcasting system different from your region or when recording a motion picture for a film, change the system frequency.

1 Select the menu. (P54)

MENU → [Setup] → [System Frequency]

2 Press ▲/▼ to select an item and then press [MENU/SET].

[59.94 Hz (NTSC)]	For regions where the TV broadcasting system is NTSC
[50.00 Hz (PAL)]	For regions where the TV broadcasting system is PAL
[24.00 Hz (CINEMA)]	This system frequency is for creating films

- A message prompting you to restart the camera will be displayed. Turn off and on the camera.

- By default, the system frequency is set to the broadcasting system of your purchase region, [59.94 Hz (NTSC)] or [50.00 Hz (PAL)].
- **When [System Frequency] is set to a broadcasting system different from that of your region, images may not be played back correctly on the TV.**
- **If you are not familiar with broadcasting systems or will not be creating any motion pictures for films, we recommend that you use the default setting.**
- If you changed the setting but are not sure about the system frequency for the broadcasting system of your region, perform [Reset] in the [Setup] menu (P58).

■ Once you change the system frequency

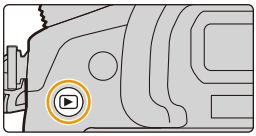
After changing the [System Frequency] setting, motion pictures may not be recorded or played back if you continue to use the card that was inserted in the camera. We recommend that you replace the card with another one and format (P58) it on the camera.

- If you continue to use the card that was inserted in the camera before you changed the setting, the camera will operate as follows:

[Rec Format]	[Rec]	[Playback]
[AVCHD]	Recording is not possible	You cannot play back motion pictures recorded before you changed the setting. • Motion pictures recorded with a different [System Frequency] setting cannot be played back.
[MP4]/[MP4 (LPCM)]/[MOV]	Recording is possible	

Playing Back Pictures

1 Press [▶].



2 Press ◀/▶.

◀: Play back the previous picture
▶: Play back the next picture

- If you press and hold ◀/▶, you can play back the pictures in succession.
- Pictures can also be forwarded or rewound by rotating the control dial or dragging the screen horizontally. (P49)
- You can forward or rewind pictures continuously by keeping your finger on the left or right sides of the screen after forwarding/rewinding a picture.
  (Pictures are displayed reduced in size)
- Speed of picture forwarding/rewinding changes depending on the playback status.

■ To finish playback

Press [▶] again, press the shutter button halfway or press the motion picture button.

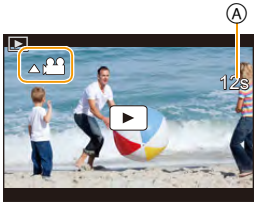
Not available in these cases:

- This camera complies with the DCF standard “Design rule for Camera File system” established by JEITA “Japan Electronics and Information Technology Industries Association” and with Exif “Exchangeable Image File Format”.
  This camera can only display pictures that comply with the DCF standard.
- The camera may not play back images recorded on other devices correctly, and the functions of the camera may not be available for the images.

Playing Back Motion Pictures

This unit was designed to play motion pictures using the AVCHD, MP4 and MOV formats.

- Motion pictures are displayed with the motion picture icon ([🎥]).



Press ▲ to play back.

Ⓐ Motion picture recording time

- After playback starts, the elapsed playback time is displayed on the screen.
  For example, 8 minutes and 30 seconds is displayed as [8m30s].
- Some information (recording information, etc.) is not displayed for motion pictures recorded in [AVCHD].
- Touching [▶] in the middle of the screen allows you to play back motion pictures.

■ Operations during Motion Picture Playback

Button operation	Touch operation	Description of operation
▲	▶/❚❚	Play/Pause
◀	◀◀	Fast rewind*
	◀❚❚	Frame-by-frame rewind (while pausing)
(◎)	−	Reduce volume level

Button operation	Touch operation	Description of operation
▼	■	Stop
▶	▶▶	Fast forward*
	❚❚▶	Frame-by-frame forward (while pausing)
(◎)	+	Increase volume level

* The fast forward/rewind speed increases if you press ▶/◀ again.

- If you do not operate the camera for approximately 2 seconds, touch icons and other screen displays will disappear. To display them, touch the screen.
- If you press [MENU/SET] during a pause, you can create a picture from a motion picture. (P223)

- To play back the motion pictures recorded by this unit on a PC, use the “PHOTOfunSTUDIO” software on the DVD (supplied).

Not available in these cases:

- Motion pictures recorded with a different [System Frequency] setting cannot be played back. (P220)

Creating Still Pictures from a Motion Picture

You can create a single still picture from a recorded motion picture.

1 Press ▲ to pause motion picture playback.

2 Press [MENU/SET].

- The same operation can be performed by touching [ ].
- Confirmation screen is displayed. It is executed when [Yes] is selected.

- Still pictures will be saved with [Aspect Ratio] set to [16:9] and [Quality] set to [ ]. The number of pixels will differ according to the motion picture you play back.
  – When the motion picture size is set to [C4K] in [Rec Quality]: 4096×2160 (9 M)
  – When the motion picture size is set to [4K] in [Rec Quality]: [M] (8 M)
  – When the motion picture size is set to [FHD], [HD] in [Rec Quality]: [S] (2 M)
- Still pictures created from a motion picture may be coarser than with normal picture quality.
- [ ] is displayed during playback of still pictures created from motion pictures.

Not available in these cases:

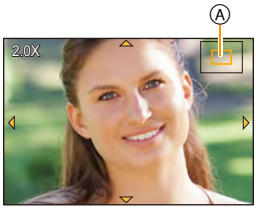
- If you create a motion picture when the motion picture size for [MP4] is set to [VGA] in [Rec Quality], still pictures cannot be created from the motion picture.

Switching the Playback Method

Using the Playback Zoom

Rotate the rear dial right.

1× → 2× → 4× → 8× → 16×



- If the rear dial is rotated to the left after the image is enlarged, the magnification will be reduced.
- When you change the magnification, the zoom position indication Ⓐ appears for about 1 second.
- The more a picture is enlarged, the more its quality deteriorates.
- You can move the enlarged part by pressing ▲/▼/◄/► of the cursor button or dragging the screen. (P49)
- You can also enlarge (2×) the image by double-touching the part you want to enlarge. If you double-touch the enlarged image, the magnification is reset to 1×.
- You can also enlarge/reduce the image by pinching out/pinching in (P49) on the part you want to enlarge/reduce.
- You can forward or rewind the image while maintaining the same zoom magnification and zoom position for the Playback Zoom by rotating the control dial during Playback Zoom.

Displaying multiple screens (Multi Playback)

Rotate the rear dial left.

1 screen → 12 screens → 30 screens → Calendar screen display

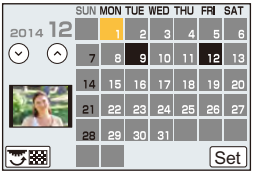
- If the rear dial is rotated to the right, the previous playback screen will be displayed.
- It is possible to switch the playback screen by touching the following icons.
  - [ ]: 1 screen
  - [ ]: 12 screens
  - [ ]: 30 screens
  - [CAL]: Calendar screen display
- The screen can be switched gradually by dragging the screen up or down.
- Pictures displayed using [[!]] cannot be played back.

■ To return to Normal Playback

Press ▲/▼/◄/► to select a picture and then press [MENU/SET].

Displaying Pictures by Recording Date (Calendar Playback)

1 **Rotate the rear dial left to display the Calendar screen.**
2 **Press ▲/▼/◄/► to select the date to be played back.**
3 **Press [MENU/SET] to display the images that are recorded in selected date.**
4 **Press ▲/▼/◄/► to select a picture and then press [MENU/SET].**
- Rotate the rear dial left to return to the Calendar screen display.

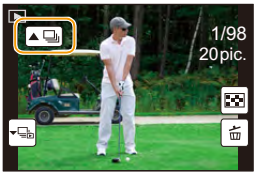


- The recording date of the picture selected in the playback screen becomes the date selected when the Calendar screen is first displayed.
- You can display the Calendar between January 2000 and December 2099.
- If the date is not set in the camera, the recording date is set as January 1st, 2014.
- If you take pictures after setting the travel destination in [World Time], the pictures are displayed by the dates at the travel destination in Calendar Playback.

Playing Back Group Pictures

A picture group consists of multiple pictures. You can play back pictures in a group either continuously or one by one.
- You can edit or delete all pictures in a group at once.
  (For example, if you delete a picture group, all pictures in the group are deleted.)

[▲]:
A picture group consisting of pictures taken in the Burst Mode with the burst speed [SH]. (P113)
[▲]:
A picture group consisting of pictures taken in a Time Lapse Shot. (P120)
[▲]:
A picture group consisting of pictures taken in the Stop Motion Animation. (P124)



- Pictures will not be grouped if recorded without setting the clock.

Continuously playing back Group Pictures

Select a picture with the group picture icon ([▲], [▲], [▲]), and then press ▲.

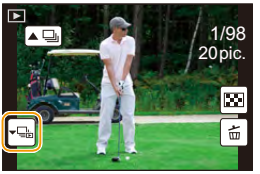
- The same operation can be performed by touching the group picture icon ([▲], [▲], [▲]).
- When playing back group pictures one at a time, options are displayed.

[From the first picture]:	Pictures are played back continuously from the first picture of the group.
[From the current picture]:	Pictures are played back continuously from the picture being played back.

■ Operations during Group Pictures playback

▲	▶/II	Continuous playback/Pause	▼	■	Stop
◀	◀◀	Fast rewind	▶	▶▶	Fast forward
	I◀◀	Rewind (while pausing)		▶▶I	Forward (while pausing)

Playing back each Group Pictures



1 Select a picture with the group display icon ([▼], [▼], [▼]), and then press ▼.

- The same operation can be performed by touching the group display icon ([▼], [▼], [▼]).

2 Press ◀/▶ to flip through images.

- Touch [▼▶] or press ▼ again to return to the normal playback screen.
- Each picture in a group can be treated same as normal pictures when they are played back. (Such as Multi Playback, Playback Zoom and deleting images)

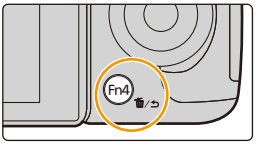
Deleting Pictures

Once deleted, pictures cannot be recovered.
• Pictures that are not in the DCF standard or those that are protected cannot be deleted.

To delete a single picture

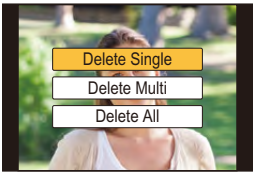
1 In Playback Mode, select the picture to delete and then press [🗑/↩].

• The same operation can be performed by touching [🗑].



2 Press ▲ to select [Delete Single] and then press [MENU/SET].

• Confirmation screen is displayed.
Picture is deleted by selecting [Yes].



• [Delete Confirmation] in the [Playback] menu enables you to set which option on the delete confirmation screen, [Yes] or [No], will be highlighted first.
The default setting is [No]. (P253)
• A single picture can be deleted directly by pressing the function button to which [Delete Single] has been set. (P320)

To delete multiple pictures (up to 100*) or all the pictures

* Picture groups are treated as a single picture.
(All the pictures in the selected picture group will be deleted.)

1 In Playback Mode, press [🗑/↩].

2 Press ▲/▼ to select [Delete Multi] or [Delete All] and then press [MENU/SET].

- [Delete All] → Confirmation screen is displayed.
Pictures are deleted by selecting [Yes].
- It is possible to delete all pictures except the ones set as favorite when [All Delete Except Favorite] is selected with the [Delete All] set.

3 (When [Delete Multi] is selected)

Press ▲/▼/◀/▶ to select the picture, and then press [MENU/SET] to set. (Repeat this step.)

- [🗑] appears on the selected pictures.
If [MENU/SET] is pressed again, the setting is canceled.

4 (When [Delete Multi] is selected)

Press ◀ to select [OK], and then press [MENU/SET] to execute.

- Confirmation screen is displayed.
Pictures are deleted by selecting [Yes].

- Do not turn the camera off while deleting. Use a battery with sufficient battery power or the AC adaptor (optional) (P353).
- Depending on the number of pictures to be deleted, it may take some time to delete them.

Using the [Playback] Menu

With this menu, you can use various playback functions such as cropping and other editing of recorded images, protect settings, etc.
- With [RAW Processing], [Clear Retouch], [Text Stamp], [Time Lapse Video], [Stop Motion Video], [Resize] or [Cropping], a new edited picture is created. A new picture cannot be created if there is no free space on the card so we recommend checking that there is free space before editing the picture.
- The camera may not play back images recorded on other devices correctly, and the functions of the camera may not be available for the images.

[2D/3D Settings]

Playback methods for the 3D pictures can be switched.
- This is a menu that is only displayed when 3D playback is possible. Refer to P344 for details.

[Slide Show]

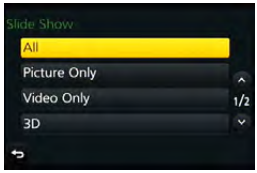
You can play back the pictures you have taken in synchronization with music, and you can do this in sequence while leaving a fixed interval between each of the pictures.
You can also put together a slide show composed of only still pictures, only motion pictures, only 3D pictures etc.
We recommend this feature when you view your pictures by connecting the camera to a TV.

1 Select the menu. (P54)

MENU → ▶ [Playback] → [Slide Show]

2 Select the group to play back by pressing ▲/▼, and then press [MENU/SET].
- Refer to P344 for the method to play back [3D] pictures in 3D.
- During [Category Selection], press ▲/▼/◀/▶ to select a category, and then press [MENU/SET].
  Refer to P231 for category details.

3 Press ▲ to select [Start] and then press [MENU/SET].



Operations during a slide show

Button operation	Touch operation	Description of operation
▲	▶/II	Play/Pause
◀	⏮	Back to previous picture
(◎)	−	Reduce volume level

Button operation	Touch operation	Description of operation
▼	■	Exit slide show
▶	⏭	Ahead to next picture
(◎)	+	Increase volume level

- Normal playback resumes after the slide show finishes.

Changing the slide show settings

You can change the settings for slide show playback by selecting [Effect] or [Setup] on the slide show menu screen.

[Effect]

This allows you to select the screen effects when switching from one picture to the next.
[AUTO]/[NATURAL]/[SLOW]/[SWING]/[URBAN]/[OFF]

- When [URBAN] has been selected, the picture may appear in black and white as a screen effect.
- [AUTO] can be used only when [Category Selection] has been selected. The pictures are played back with the recommended effects in each category.
- [Effect] is fixed to [OFF] when in [Video Only] or during the slide show for [ ], [ ], [ ] in [Category Selection].
- Even if [Effect] is set, it does not work during a slide show of Group Pictures.
- When pictures are displayed on a TV connected via an HDMI micro cable or when vertically-displayed pictures are played back, some of the [Effect] settings will not work.

[Setup]

[Duration] or [Repeat] can be set.

[Duration]	**[5SEC]/[3SEC]/[2SEC]/[1SEC]**	
[Repeat]	**[ON]/[OFF]**	
[Sound]	**[AUTO]:**	Music is played when the still pictures are played back, and audio is played when the motion pictures are played back.
	[Music]:	Music is played back.
	[Audio]:	Audio (only for motion pictures) is played back.
	[OFF]:	There will be no sound.

- [Duration] can be set only when [OFF] has been selected as the [Effect] setting.
- When playing back the following pictures, the [Duration] setting is disabled.
  - Motion pictures
  - Group Pictures

[Playback Mode]

Playback in [Normal Play], [Picture Only], [Video Only], [3D Play], [Category Play] or [Favorite Play] can be selected.

1 Select the menu. (P54)

MENU → ▶ **[Playback]** → **[Playback Mode]**

2 Select the group to play back by pressing ▲/▼, and then press [MENU/SET].

- Refer to P344 for the method to play back [3D Play] pictures in 3D.

When [Category Play] is selected in above step 2

3 Press ▲/▼/◀/▶ to select the category and then press [MENU/SET] to set.

- Pictures are sorted into the categories shown below.

	– [Face Recog.]*
	– [i-Portrait]/[i-Night Portrait]/[i-Baby] (Scene Detection)
	– [i-Scenery]/[i-Sunset] (Scene Detection)
	– [i-Night Portrait]/[i-Night Scenery]/[iHandheld Night Shot] (Scene Detection)
	– [i-Food] (Scene Detection)
	– [Travel Date]
	– Still pictures recorded continuously with burst speed set to [SH]
	– [Time Lapse Shot]/[Time Lapse Video]
	– [Stop Motion Animation]/[Stop Motion Video]

* Press ▲/▼/◀/▶ to select the person to play back and then press [MENU/SET]. As for group pictures, the entire group is treated as a single picture with Face Recognition information.

- Categorization of the motion pictures differ from the still pictures depending on the Recording Mode. Some motion pictures may not be played back.

[Location Logging]

You can write location information sent from a smartphone/tablet (latitude and longitude) on images.

- **You can send location information and write it on images using a smartphone/tablet. (P267)**
- You need to install "Panasonic Image App" on your smartphone/tablet. (P258)
- Read the [Help] in the "Image App" menu for further details on how to operate.

Preparation:
Sending location information to the camera from the smartphone/tablet.

1 Select the menu. (P54)

MENU → ▶ [Playback] → [Location Logging] → [Add Location Data]

2 Press ▲/▼ to select the period you intend to record location information on images, then press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.
- Images with location information are indicated with [GPS].

■ To pause the recording of location information

Press [MENU/SET] while recording of the location information onto images is taking place.

- During a suspended period, [○] is displayed.
  Select the period with [○] to restart the recording process from the picture you left off.

■ To delete the received location information

1 Select the menu. (P54)

MENU → ▶ [Playback] → [Location Logging] → [Delete Location Data]

2 Press ▲/▼ to select the period you want to delete, then press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.

- Location information can be written only to images taken on this camera.

Not available in these cases:

- Location information will not be written on pictures taken after the location information had been sent (P267).
- Location information is not written onto the images recorded when [Rec Format] is set to [AVCHD].
- When there is insufficient free space on the card of the camera, location information might not be able to be written.
- Location information cannot be written on images that were recorded when the clock was not set.

[RAW Processing]

You can process the pictures taken in RAW format. The processed pictures will be saved in JPEG format. You can check how effects are applied to each picture while processing it.

1 Select the menu. (P54)

MENU → ▶ [Playback] → [RAW Processing]

2 Select RAW images with ◀/▶, and then press [MENU/SET].

3 Press ▲/▼ to select an item.

- You can set the following items. The settings you used for the recording are selected when you start setting these items.

[White Balance]	Allows you to select a White Balance preset and adjust it. If you select an item with [📷], you can process the image with the setting at the time of recording.
[Exposure Comp.]	Allows you to correct the exposure within the range between −1 EV and +1 EV.
[Photo Style]	Allows you to select a photostyle effect ([Standard]/[Vivid]/[Natural]/[Monochrome]/[Scenery]/[Portrait])
[i.Dynamic]	Allows you to select an [i.Dynamic] setting ([HIGH]/[STANDARD]/[LOW]/[OFF]).
[Contrast]	Allows you to adjust the contrast.
[Highlight]	Allows you to adjust the brightness of bright portions.
[Shadow]	Allows you to adjust the brightness of dark portions.
[Saturation]/[Color Tone]	Allows you to adjust the saturation. (When [Monochrome] is selected in [Photo Style], you can adjust the color tone.)
[Hue]/[Filter Effect]	Allows you to adjust the hue. (When [Monochrome] is selected in [Photo Style], you can adjust the filter effect.)
[Noise Reduction]	Allows you to adjust the noise reduction setting.
[i.Resolution]	Allows you to select an [i.Resolution] setting ([HIGH]/[STANDARD]/[LOW]/[EXTENDED]/[OFF]).
[Sharpness]	Allows you to adjust the resolution effect.
[Setup]	You can set the following items: **[Reinstate Adjustments]:** Returns the settings to the ones you used during the recording. **[Color Space]:** Allows you to select a [Color Space] setting from [sRGB] or [Adobe RGB]. **[Picture Size]:** Allows you to select the size in which the image will be saved in JPEG format ([L]/[M]/[S]).

4 Press [MENU/SET] and set.

- The setting method differs according to the item. For details, refer to “How to set each item” on P234.

5 Press [MENU/SET].

- This operation returns you to the screen in step **3**. To set other items, repeat steps **3** through **5**.

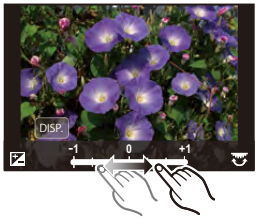
6 Select [Begin Processing] with ▲/▼, and then press [MENU/SET].

- A confirmation screen will be displayed. Selecting [Yes] will execute the operation. After the operation, exit the menu.

■ How to set each item

When you select an item, the setting screen will be displayed.

Button operation	Touch operation	Description of operation
◀/▶	Dragging	Selects a setting.
▲	[WB K Set]	Displays the screen that lets you set the color temperature. (P137) (only when [White Balance] is set to K)
▼	[Adjust.]	Displays the screen that lets you fine-adjust the White Balance. (P138) (only when [White Balance] is set)
[DISP.]	[DISP.]	Displays the comparison screen.
[MENU/SET]	[Set]	Sets the adjusted level and returns you to the item selection screen.



- When [Noise Reduction], [i.Resolution] or [Sharpness] is selected, the comparison screen cannot be displayed.
- If you touch the picture twice, the picture will be enlarged. If you touch the picture twice when it is enlarged, it will be reduced to the original size.

On the comparison screen, you can use the following operations to make adjustments:
Ⓐ Current setting

Button operation	Touch operation	Description of operation
◀/▶	Dragging	Selects a setting.
[DISP.]	[DISP.]	Returns you to the setting screen.
[MENU/SET]	[Set]	Sets the adjusted level and returns you to the item selection screen.

- If you touch the picture at the center, it will be enlarged. If you touch [↩], the picture will be reduced to the original size.

[Setup] setting

When you select an item, the screen that asks you to select [Reinstate Adjustments], [Color Space], or [Picture Size] will be displayed.

❶ Press ▲/▼ to select an item, and press [MENU/SET].
- If you select [Reinstate Adjustments], a confirmation screen will be displayed. Selecting [Yes] will execute the operation and return you to the item selection screen.

❷ Press ▲/▼ to select a setting, and press [MENU/SET].
- This operation will apply the setting and return you to the item selection screen.

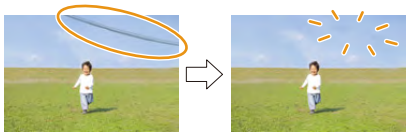
- The effects applied through the RAW processing on the camera and those applied through the RAW processing on the DVD software (supplied) “SILKYPIX Developer Studio” are not completely identical.
- The range within which you can correct the exposure differs from the one you can correct during recording.
- The [White Balance] setting of pictures taken with multiple exposures is fixed to the setting at the time of recording.
- If you perform [RAW Processing] in the [Playback] menu on a picture taken with [Red-Eye Removal], the effect will be applied to the processed picture in JPEG format.
- You can process only one RAW image at a time.

Not available in these cases:
- When an AV cable (optional) or an HDMI micro cable is connected, [RAW Processing] is not available.
- You can process only the RAW images you recorded with the camera. [RAW Processing] is not available for images recorded with other models and images that are not stored in RAW format.

Removing unnecessary parts ([Clear Retouch])

You can erase unnecessary parts recorded on the pictures taken.

- The erasure operation can only be performed by touching. [Clear Retouch] automatically enables the touch operation.



1 Select the menu. (P54)

MENU → ▶ [Playback] → [Clear Retouch]

2 Press ◀/▶ to select a picture, and then press [MENU/SET].

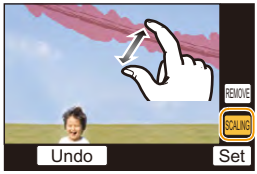
3 Drag your finger over the part you want to delete.

- The parts to be erased are colored.
- Touching [Undo] will return the colored part back to its previous state.

Erasing details (enlarging the display)

❶ Touch [SCALING].

- Pinching out/pinching in (P49) the screen allows you to enlarge/reduce it.
- Enlarge/reduce can also be performed by rotating the rear dial.
- The enlarged part can be moved by dragging the screen or pressing the cursor buttons.



❷ Touch [REMOVE].

- Operation returns to that of selecting the parts you want to delete. The parts you want to delete can be selected while the enlargement is maintained.

4 Touch [Set].

- Preview screen is displayed.

5 Touch [Save] or press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected. Exit the menu after it is executed.

- Pictures may appear unnatural because the background of deleted parts is artificially created.
- For group pictures, perform [Clear Retouch] on each picture. (They cannot be edited at once.)
- When [Clear Retouch] is performed on group pictures, they are saved as new pictures separate from the original ones.

Not available in these cases:

- Not available when the viewfinder is in use.
- [Clear Retouch] cannot be performed on the following images.
  - Motion pictures
  - Pictures taken with [RAW], [RAW] or [RAW]
  - Pictures created from a motion picture which had been recorded when the motion picture size had been set to [C4K] in [Rec Quality]

[Title Edit]

You can add text (comments) to pictures. After text has been registered, it can be stamped in prints using [Text Stamp] (P239).

1 Select the menu. **(P54)**

MENU → ▶ **[Playback]** → **[Title Edit]** → **[Single]/[Multi]**

2 Select the picture.

- [✎] is displayed for pictures with titles already registered.

[Single] setting

❶ Press ◀/▶ to select the picture.

❷ Press [MENU/SET].

[Multi] setting

❶ Press ▲/▼/◀/▶ to select the picture and then press [MENU/SET] (repeat).

- The setting is canceled when [MENU/SET] is pressed again.

❷ Press ◀ to select [OK], and then press [MENU/SET] to execute.

3 Enter the text. **(P57)**

- Exit the menu after it is set.

- To delete the title, erase all the text in the text input screen.
- You can print out texts (comments) using the "PHOTOfunSTUDIO" bundled software on the DVD (supplied).
- You can set up to 100 pictures at one time with [Multi].

Not available in these cases:

- You cannot use [Title Edit] for the following pictures.
  - Motion pictures
  - Pictures taken with [RAW], [RAW] or [RAW]

[Text Stamp]

You can stamp the recording date/time, name, location or travel date onto the recorded pictures.

1 Select the menu. (P54)

MENU → [Playback] → [Text Stamp] → [Single]/[Multi]

2 Select the picture.

- [ ] appears on screen if the picture is stamped with text.

[Single] setting

❶ Press ◀/▶ to select the picture.
❷ Press [MENU/SET].

[Multi] setting

❶ Press ▲/▼/◀/▶ to select the picture and then press [MENU/SET] (repeat).
- The setting is canceled when [MENU/SET] is pressed again.

❷ Press ◀ to select [OK], and then press [MENU/SET] to execute.

3 Press ▲/▼ to select [Set], and then press [MENU/SET].

4 Press ▲/▼ to select text stamp items, and then press [MENU/SET].

5 Press ▲/▼ to select the settings, and then press [MENU/SET].

[Shooting Date]	**[W/O TIME]:**	Stamp the year, month and date.
	[WITH TIME]:	Stamp the year, month, day, hour and minutes.
	[OFF]	
[Name]	**[ ]:** ([Face Recognition])	Name registered in [Face Recog.] will be stamped.
	[/]: ([Baby/Pet])	Name registered in [Profile Setup] will be stamped.
	[OFF]	
[Location]	**[ON]:**	Stamps the travel destination name set under [Location].
	[OFF]	
[Travel Date]	**[ON]:**	Stamps the travel date set under [Travel Date].
	[OFF]	
[Title]	**[ON]:**	Title input in the [Title Edit] will be stamped.
	[OFF]	

6 Press [/].

7 Press ▲ to select [OK], and then press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.

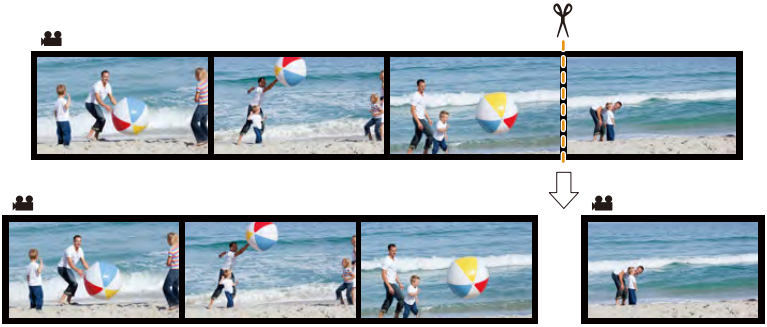
- When you print pictures stamped with text, the date will be printed over the stamped text if you specify printing of the date at the photo shop or on the printer.
- You can set up to 100 pictures at one time in [Multi].
- The picture quality may deteriorate when text stamping is carried out.
- Depending on the printer being used, some characters may be cut at printing. Check before printing.
- When you stamp pictures in a group, the stamped ones are saved separately from the original ones in the group.

Not available in these cases:

- You cannot use [Text Stamp] for the following pictures.
  - Motion pictures
  - Pictures recorded without setting the clock and title
  - Pictures that were previously stamped with [Text Stamp]
  - Pictures taken with [RAW], [RAW] or [RAW]
  - Pictures created from a motion picture which had been recorded when the motion picture size had been set to [C4K] in [Rec Quality]

[Video Divide]

Recorded motion picture can be divided in two. It is recommended for when you want to divide a part you need with a part you do not need.
Dividing a motion picture is permanent. Decide before you divide!



1 Select the menu. (P54)

MENU → ▶ [Playback] → [Video Divide]

2 Press ◀/▶ to select the motion picture to divide, and then press [MENU/SET].

3 Press ▲ at the location to divide.

- You can finely adjust the location for division by pressing ◀/▶ while the motion picture is paused.

4 Press ▼.

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.
- Motion picture may be lost if the card or battery is removed while processing the dividing.

Not available in these cases:

- Avoid trying to divide motion picture near the very beginning or end of the motion picture.
- You cannot use [Video Divide] for the following pictures.
  – Motion pictures with a short recording time

[Time Lapse Video]

This function allows you to create a motion picture from a picture group recorded with [Time Lapse Shot].
The created motion picture is saved in MP4 recording format.

1 Select the menu. (P54)

MENU → ▶[Playback] → [Time Lapse Video]

2 Select the [Time Lapse Shot] picture group with ◀/▶, and then press [MENU/SET].

3 Create a motion picture by selecting the methods for creating it.

- The steps are the same as those for creating a motion picture following the recording of [Time Lapse Video].
  Refer to step **9** onwards on P122 for details.
  Also refer to the notes on P123 for created motion pictures.

Not available in these cases:

- [Time Lapse Video] is not available in the following cases.
  – When [System Frequency] is set to [24.00 Hz (CINEMA)]

[Stop Motion Video]

A Motion picture is created from group pictures taken with [Stop Motion Animation].
Created motion pictures are saved in MP4 recording format.

1 Select the menu. (P54)

MENU → ▶[Playback] → [Stop Motion Video]

2 Select the Stop Motion Animation group with ◀/▶, and then press [MENU/SET].

3 Create a motion picture by selecting the methods for creating it.

- The steps are the same as those for creating a motion picture following the recording of [Stop Motion Animation].
  Refer to step **11** onwards on P126 for details.
  Also refer to the notes on P127 for created motion pictures.

Not available in these cases:

- [Stop Motion Video] is not available in the following cases.
  – When [System Frequency] is set to [24.00 Hz (CINEMA)]

[Resize]

To allow easy posting to web pages, attachment to e-mail etc., picture size (number of pixels) is reduced.

1 Select the menu. (P54)

MENU → ▶ [Playback] → [Resize] → [Single]/[Multi]

2 Select the picture and size.

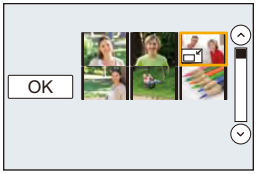
[Single] setting

❶ Press ◀/▶ to select the picture, and then press [MENU/SET].

❷ Press ▲/▼ to select the size, and then press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.

[Multi] setting



❶ Press ▲/▼ to select the size, and then press [MENU/SET].

❷ Press ▲/▼/◀/▶ to select the picture, and then press [MENU/SET] to set (repeat).

- The setting is canceled when [MENU/SET] is pressed again.

❸ Press ◀ to select [OK], and then press [MENU/SET] to execute.

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.

- You can set up to 100 pictures at one time in [Multi].
- The picture quality of the resized picture will deteriorate.

Not available in these cases:

- This function is not available in the following cases:
  - Motion pictures
  - Group Pictures
  - Pictures stamped with [Text Stamp]
  - Pictures taken with [RAW], [RAW] or [RAW]
  - Pictures created from a motion picture which had been recorded when the motion picture size had been set to [C4K] in [Rec Quality]

[Cropping]

You can enlarge and then clip the important part of the recorded picture.

1 Select the menu. (P54)

MENU → ▶[Playback] → [Cropping]

2 Press ◀/▶ to select the picture, and then press [MENU/SET].

3 Use the rear dial and press ▲/▼/◀/▶ to select the parts to be cropped.

Rear dial (right):	Enlargement
Rear dial (left):	Reduction
▲/▼/◀/▶:	Move

- You can also touch [ ]/[ ] to enlarge/reduce.
- You can also move by dragging on the screen.

4 Press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.

- The picture quality of the cropped picture will deteriorate.
- Crop one picture at a time when you want to crop the pictures in a picture group.
  (You cannot edit all pictures in a group at once.)
- When you crop pictures in a group, the cropped ones are saved separately from the original ones in the group.
- Information regarding the Face Recognition in the original picture will not be copied to images having undergone [Cropping].

Not available in these cases:

- This function is not available in the following cases:
  – Motion pictures
  – Pictures stamped with [Text Stamp]
  – Pictures taken with [RAW], [RAW] or [RAW]
  – Pictures created from a motion picture which had been recorded when the motion picture size had been set to [C4K] in [Rec Quality]

[Rotate]/[Rotate Disp.]

This mode allows you to automatically display pictures vertically if they were recorded holding the camera vertically or rotate pictures manually in 90° steps.

[Rotate] (The picture is rotated manually)

• The [Rotate] function is disabled when [Rotate Disp.] is set to [OFF].

1 Select the menu. (P54)

MENU → ▶[Playback] → [Rotate]

2 Press ◀/▶ to select the picture and then press [MENU/SET].

• The [Rotate] function is disabled for Group Pictures.

3 Press ▲/▼ to select the direction to rotate the picture and then press [MENU/SET].

↱:
The picture rotates clockwise in steps of 90°.
↰:
The picture rotates counter-clockwise in steps of 90°.

• Exit the menu after it is set.

[Rotate Disp.] (The picture is automatically rotated and displayed)

Select the menu. (P54)

MENU → ▶[Playback] → [Rotate Disp.] → [ON]

• The pictures are displayed without being rotated when you select [OFF].
• Exit the menu after it is set.

Not available in these cases:

• When you play back pictures on a PC, they cannot be displayed in the rotated direction unless the OS or software is compatible with Exif.
Exif is a file format for still pictures which allows recording information etc. to be added. It was established by “JEITA (Japan Electronics and Information Technology Industries Association)”.
• [Rotate Disp.] may not work on a screen that plays back multiple pictures, such as the one displayed after [Delete Multi] is selected.

[Favorite]

You can do the following if a mark has been added to pictures and they have been set as favorites.
- Play back the pictures set as favorites only as a slide show.
- Play back only the pictures set as favorites. ([Favorite Play])
- Delete all the pictures not set as favorites. ([All Delete Except Favorite])

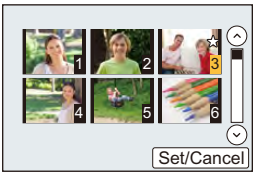
1 Select the menu. (P54)

MENU → ▶[Playback] → [Favorite] → [Single]/[Multi]

2 Select the picture.

[Single] setting
Press ◀/▶ to select the picture, and then press [MENU/SET].
- The setting is canceled when [MENU/SET] is pressed again.
- Exit the menu after it is set.

[Multi] setting
Press ▲/▼/◀/▶ to select the picture, and then press [MENU/SET] to set (repeat).
- The setting is canceled when [MENU/SET] is pressed again.
- Exit the menu after it is set.



■ Canceling all the [Favorite] settings

Select the menu. (P54)

MENU → ▶[Playback] → [Favorite] → [Cancel]

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.
- In [Playback Mode], the [Cancel] is disabled.

- You can set up to 999 pictures as favorites.
- When you set pictures in a group as [Favorite], the number of your [Favorite] pictures is displayed on the [Favorite] icon of the group's top picture.

Not available in these cases:
- This function is not available in the following case:
  – Pictures taken with [RAW]

[Print Set]

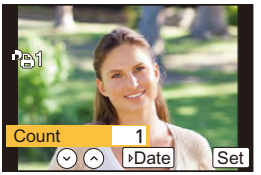
DPOF “Digital Print Order Format” is a system that allows the user to select which pictures to print, how many copies of each picture to print and whether or not to print the recording date on the pictures when using a DPOF compatible photo printer or photo printing store.
For details, ask at your photo printing store.
When you set [Print Set] for a group pictures, the print setting for the number of prints will be applied to every picture in the group.
For more information visit:
http://panasonic.jp/dc/dpof_110/white_e.htm

1 Select the menu. (P54)

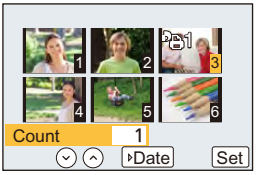
MENU → ▶ **[Playback]** → **[Print Set]** → **[Single]/[Multi]**

2 Select the picture.

[Single] setting
Press ◀/▶ to select the picture, and then press [MENU/SET].



[Multi] setting
Press ▲/▼/◀/▶ to select the picture and then press [MENU/SET].



3 Press ▲/▼ to set the number of prints, and then press [MENU/SET] to set.
- When [Multi] has been selected.
  – Repeat steps **2** and **3** for each picture.
  (It is not possible to use the same setting for a multiple number of pictures.)
- [999+] is displayed on the screen, if the total number of prints you set for a group pictures is more than 1000 pictures.
- Exit the menu after it is set.

Canceling all the [Print Set] settings

Select the menu. (P54)

MENU → ▶**[Playback]** → **[Print Set]** → **[Cancel]**

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.

To print the date

After setting the number of prints, set/cancel printing with the recording date by pressing ▶.

- Depending on the photo printing store or the printer, the date may not be printed even if you set to print the date. For further information, ask at your photo printing store or refer to the operating instructions for the printer.
- The date print feature is disabled for pictures that are stamped with text.

- The number of prints can be set from 0 to 999.
- Depending on the printer, the date print settings of the printer may take precedence so check if this is the case.
- It may not be possible to use the print settings with other equipment. In this case, cancel all the settings, and reset the settings.
- When you set pictures in a group to [Print Set], the number of pictures added to [Print Set] and the total number of pictures to be printed are displayed on the [Print Set] icon of the group's top picture.

Not available in these cases:

- This function is not available in the following cases:
  – Motion pictures
  – Pictures taken with [RAW]
  – File that does not comply with the DCF standard

[Protect]

You can set protection for pictures you do not want to delete by mistake.

1 Select the menu. (P54)

MENU → ▶[Playback] → [Protect] → [Single]/[Multi]

2 Select the picture.

[Single] setting

Press ◀/▶ to select the picture, and then press [MENU/SET].

- The setting is canceled when [MENU/SET] is pressed again.
- Exit the menu after it is set.

[Multi] setting

Press ▲/▼/◀/▶ to select the pictures and then press [MENU/SET] (repeat).

- The setting is canceled when [MENU/SET] is pressed again.
- Exit the menu after it is set.

■ Canceling all the [Protect] settings

Select the menu. (P54)

MENU → ▶[Playback] → [Protect] → [Cancel]

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.

Even if you do not protect pictures on a card, they cannot be deleted when the card's Write-Protect switch is set to [LOCK].

- The [Protect] feature is only designed to work with this camera.
- Even if you protect pictures on a card, they will be deleted if the card is formatted.
- When you set pictures in a group to [Protect], the number of pictures with the [Protect] setting is displayed on the [Protect] icon of the group's top picture.

[Face Rec Edit]

You can clear and replace all information relating to face recognition in selected images.

1 Select the menu. (P54)

MENU → ▶[Playback] → [Face Rec Edit] → [REPLACE]/[DELETE]

2 Press ◀/▶ to select the picture and then press [MENU/SET].

3 Press ◀/▶ to select the person and then press [MENU/SET].

4 (When [REPLACE] is selected)
Press ▲/▼/◀/▶ to select the person to replace and then press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.
  Exit the menu after it is executed.

- Cleared information regarding the [Face Recog.] cannot be restored.
- When all Face Recognition information in a picture has been canceled, the picture will not be categorized using Face Recognition in [Category Play].
- The Face Recognition information of pictures in a group has to be edited at once. (You cannot edit one picture at a time.)
- Editing of group pictures can be performed only on the first picture of each set.

[Picture Sort]

You can set the order in which the camera displays images during playback.

1 Select the menu. (P54)

MENU → ▶[Playback] → [Picture Sort]

2 Press ▲/▼ to select an item and then press [MENU/SET].

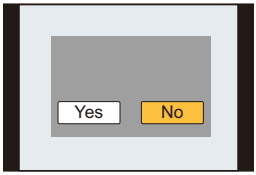
[FILE NAME]	Displays images by folder name/file name. This display format allows you to locate images in the card easily.
[DATE/TIME]	Displays images by recording date. If the card contains pictures taken with more than one camera, this display format is convenient for looking for images.

- Exit the menu after it is set.

- When you insert another card, images may not be displayed by [DATE/TIME] first. The images will be displayed by [DATE/TIME] if you wait for a while.

[Delete Confirmation]

This sets which option, [Yes] or [No], will be highlighted first when the confirmation screen for deleting a picture is displayed.



1 Select the menu. (P54)

MENU → ▶ **[Playback]** → **[Delete Confirmation]**

2 Press ▲/▼ to select an item and then press [MENU/SET].

["Yes" first]	[Yes] is highlighted first, so deletion can be done quickly.
["No" first]	[No] is highlighted first. Accidental deletion of pictures is avoided.

- Exit the menu after it is set.

Wi-Fi® function/NFC function

■ Use the camera as a wireless LAN device

When using equipment or computer systems that require more reliable security than wireless LAN devices, ensure that the appropriate measures are taken for safety designs and defects for the systems used. Panasonic will not take any responsibility for any damage that arises when using the camera for any purpose other than as a wireless LAN device.

■ Use of the Wi-Fi function of this camera is presumed to be in countries where this camera is sold

There is the risk that the camera violates the radiowave regulations if used in countries other than those where this camera is sold, and Panasonic takes no responsibility for any violations.

■ There is the risk that data sent and received via radio waves may be intercepted

Please note that there is the risk that data sent and received via radio waves may be intercepted by a third party.

■ Do not use the camera in areas with magnetic fields, static electricity or interference

- Do not use the camera in areas with magnetic fields, static electricity or interference, such as near microwave ovens. These may cause the interruption of the radio waves.
- Using the camera near devices such as microwave ovens or cordless telephones that use the 2.4 GHz radio wave band may cause a decrease in performance in both devices.

■ Do not connect to the wireless network you are not authorized to use

When the camera utilizes its Wi-Fi function, wireless networks will be searched automatically. When this happens, wireless networks that you are not authorized to use (SSID*) may be displayed, however do not attempt to connect to the network as it may be considered as unauthorized access.

* SSID refers to the name that is used to identify a network over a wireless LAN connection. If the SSID matches for both devices, transmission is possible.

■ Before Use

To use the Wi-Fi function on this unit, a wireless access point or a destination device equipped with the wireless LAN function is required.

■ This unit is compatible with NFC

Using the NFC "Near Field Communication" function, you can easily transfer data necessary for a Wi-Fi connection between this camera and the smartphone/tablet.

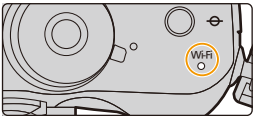
Compatible models

This function can be used with the NFC compatible device with Android (OS version 2.3.3 or higher). (excluding some models)

- For information on the operation and settings of NFC-compatible smartphones/tablets, refer to the operating instructions of your device.

■ About the Wi-Fi connection lamp

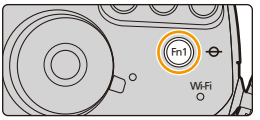
Lit blue:	The Wi-Fi connection is on standby
Blinking blue:	Sending/receiving data through the Wi-Fi connection



■ About the [Wi-Fi] button

[Wi-Fi]/[Fn1] button can be used in two ways, as [Wi-Fi] or as [Fn1] (function 1). At the time of purchase, it is initially set to [Wi-Fi].

- Refer to P317 for details about the function button.



Pressing and holding [Wi-Fi] before connecting to Wi-Fi (When connecting to a smartphone/tablet)

- The information required for connecting the smartphone/tablet to this unit (QR code, SSID and password) is displayed. (P259)

Pressing [Wi-Fi] before connecting to Wi-Fi

- Following items can be selected.

[New Connection]
[Select a destination from History] (P297)
[Select a destination from Favorite] (P297)

- These operating instructions describe the procedure for [New Connection].

What you can do with the [Wi-Fi] button when connected to Wi-Fi

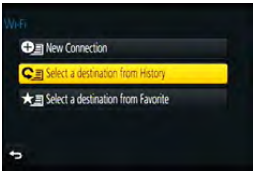
• Following items can be selected.

[Terminate the Connection]	Terminates the Wi-Fi connection.
[Change the Destination]	Terminates the Wi-Fi connection, and allows you to select a different Wi-Fi connection.
[Change Settings for Sending Images]*	Refer to P301 for details.
[Register the Current Destination to Favorite]	Registering the current connection destination or the connection method, you can easily connect with the same connection method next time.
[Network Address]	Displays the MAC address and IP address of this unit.

* This is not displayed when the destination of [Remote Shooting & View], [Playback on TV] or [Send Images Stored in the Camera] is set to [Printer].

■ Describing method

When **"select [Select a destination from History]"**, etc. is described in a step, perform any of the following operations.



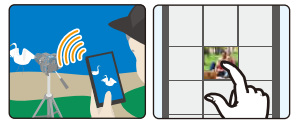
Button operation: Select [Select a destination from History] with the cursor button, and then press [MENU/SET].

Touch operation: Touch [Select a destination from History].

• The camera cannot be used to connect to a public wireless LAN connection.
• Use a IEEE802.11b, IEEE802.11g or IEEE802.11n compatible device when using a wireless access point.
• It is recommended to use a fully charged battery when sending images.
• When the battery indicator is flashing red, the connection with other equipment may not start or the connection may be disrupted.
(A message such as [Communication error] is displayed.)
• When sending images on a mobile network, high packet communication fees may be incurred depending on the details of your contract.
• Pictures may not be completely sent depending on radio wave conditions. If the connection is terminated while sending pictures, pictures with missing sections may be sent.
• **Do not remove the memory card or battery or move to an area without any reception while sending images.**
• The monitor display may become distorted for an instant while connected to the service, however this will not affect the image being sent.
• If you use the HDMI output during recording with [Bit Mode] in [HDMI Rec Output] set to [4:2:2 10bit], the Wi-Fi function will be disabled.

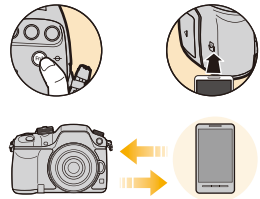
What you can do with the Wi-Fi function

Controlling with a Smartphone/Tablet (P258)



Recording with a smartphone (P264)
Playing back pictures in the camera (P265)
Saving images stored in the camera (P265)
Sending images to an SNS (P267)
Writing location information on images stored in the camera (P267)

Easy connection, easy transfer
You can use easily by pressing and holding [Wi-Fi] or by using the NFC function.



Displaying pictures on a TV (P272)

Printing Wirelessly (P273)

When sending images to AV device (P274)

You can send pictures and motion pictures to AV devices in your house (home AV devices). You can also send them to the devices (external AV devices) of your family or friends living away from you via “LUMIX CLUB”.

When sending images to PC (P276)

Using Web services (P280)

You can send pictures and motion pictures to an SNS, etc. via “LUMIX CLUB”.
By using [Cloud Sync. Service], you can receive pictures and motion pictures on a PC or smartphone.

This owner’s manual refers to both smartphones and tablets as “smartphones” from this point on unless noted otherwise.

Controlling with a Smartphone/Tablet

Using a smartphone, you can record images on the camera and save them.
You need to install "Panasonic Image App" (referred to as "Image App" from this point on) on your smartphone.

Installing the smartphone/tablet app "Image App"

The "Image App" is an application provided by Panasonic.

• OS (As of March 2014)

App for Android™:	Android 2.3.3 or higher*
App for iOS:	iOS 5.0 or higher

* Connecting to this unit with [Wi-Fi Direct] requires Android OS 4.0 or higher and Wi-Fi Direct™ support.

1 Connect the smartphone to a network.

2 (Android) Select "Google Play™ Store".

(iOS) Select "App Store℠".

3 Enter "Panasonic Image App" into the search box.

4 Select "Panasonic Image App" and install it.

- Use the latest version.
- Read the [Help] in the "Image App" menu for further details on how to operate.
- The screen differs depending on the OS.
- The screens and procedures described from this point on are those at the time when the model first became available for purchase. The screens and procedures may change with version updates.
- The service may not be able to be used properly depending on the type of smartphone being used.
  For information on the "Image App", refer to the support site below.
  http://panasonic.jp/support/global/cs/dsc/
  (This Site is English only.)
- When downloading the app on a mobile network, high packet communication fees may be incurred depending on the details of your contract.

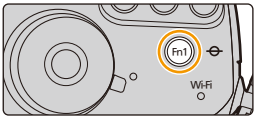
Connecting to a smartphone/tablet

A connection can be easily established by pressing and holding [Wi-Fi] or by using the NFC function.

Preparations:

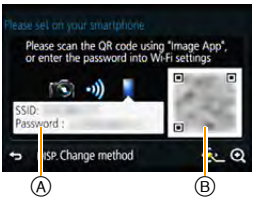
- Install the “Image App” in advance. (P258)

1 Press and hold [Wi-Fi] on the camera.



- The information required for connecting the smartphone to this unit (QR code, SSID and password) is displayed.
- If you press [MENU/SET] on the camera, the QR code will be enlarged. When it is difficult to scan the QR code, try enlarging it.
- To change the connection method, press [DISP.], and then select the connection method. (P262)
- The same screen can be displayed by selecting the following menu items.

Wi-Fi → [New Connection] → [Remote Shooting & View]



Ⓐ SSID and password
Ⓑ QR code

2 Operate the smartphone/tablet.

- Once the connection is complete, the image from the camera will be displayed on the screen of the smartphone.
  (After this operation, it may take a while for the connection to be completed.)
- The connection method differs according to your smartphone.

If you are using an iOS device

When scanning the QR code to set up a connection

(If you are reconnecting the camera, steps ❶ to ❺ are not required)

❶ Start "Image App". (P258)

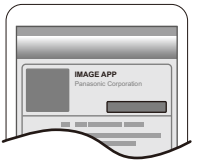
❷ Select [QR code], and then select [OK].

❸ Using "Image App", scan the QR code displayed on the screen of the camera.

- If you press [MENU/SET] on the camera, the QR code will be enlarged. When it is difficult to scan the QR code, try enlarging it.

❹ Install the profile of "IMAGE APP".

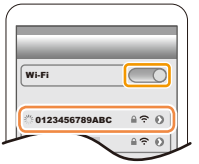
- A message will be displayed on the browser.
- If the smartphone is locked with a passcode, enter the passcode to unlock the smartphone.



❺ Press the home button to close the browser.

❻ Turn on the Wi-Fi function in the setting menu of the smartphone/tablet.

❼ Select the SSID displayed on the screen of the camera.

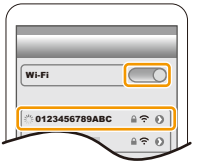


❽ Return to the home screen, and then start "Image App". (P258)

- The connection method differs according to your smartphone/tablet.

When using an SSID and password to set up a connection

1. Turn on the Wi-Fi function in the setting menu of the smartphone/tablet.
2. Select the SSID displayed on the screen of the camera.



3. Enter the password displayed on the screen of the camera.
   (Only when connecting for the first time)
4. Start "Image App". (P258)
   - The connection method differs according to your smartphone/tablet.

If you are using an Android device

When scanning the QR code to set up a connection

1. Start "Image App". (P258)

2. Select [QR code].
3. Using "Image App", scan the QR code displayed on the screen of the camera.
   - If you press [MENU/SET] on the camera, the QR code will be enlarged. When it is difficult to scan the QR code, try enlarging it.

When using an SSID and password to set up a connection

1. Start "Image App". (P258)
2. Select [Wi-Fi].
3. Select the SSID displayed on the screen of the camera.

4. Enter the password displayed on the screen of the camera.
   (Only when connecting for the first time)
   - If you mark the box that enables the smartphone to display the password, you can see the password as you enter it.

■ Changing the connection method

To change the connection method, press [DISP.], and then select the connection method.

When connecting with [Via Network]:

On the camera

1 **Select [Via Network].**
- Follow the connection procedure described on P293 to connect the camera to a wireless access point.

(On your smartphone)

2 **Turn on the Wi-Fi function.**

3 **Connect the smartphone/tablet to the wireless access point to which the camera is connected.**

4 **Start "Image App". (P258)**

When connecting with [WPS Connection]* in [Direct]:

On the camera

1 **Select [Direct].**
- Follow the connection procedure described on P296 to connect the camera to the smartphone.

(On your smartphone)

2 **Start "Image App". (P258)**

* WPS is a function that allows you to easily set up a connection with a wireless LAN device and make security-related settings. To check whether your smartphone supports the function, refer to the operating instructions of the smartphone.

■ Terminating the connection

After use, terminate the connection to the smartphone.

1 **Press [Wi-Fi] on the camera. (P256)**

2 **On the smartphone, close "Image App".**

If you are using an iOS device
On the screen of "Image App", press the home button to close the app.

If you are using an Android device
On the screen of "Image App", press the return button twice to close the app.

Connecting to a smartphone/tablet by using the NFC function

Using the NFC "Near Field Communication" function, you can easily transfer data necessary for a Wi-Fi connection between this camera and the smartphone/tablet.

■ Compatible models
This function can be used with the NFC compatible device with Android (OS version 2.3.3 or higher). (excluding some models)

Preparation:	
(On the camera) • Set [NFC Operation] to [ON]. (P302)	(On your smartphone/tablet) • Check that your smartphone/tablet is a compatible model. • Turn on the Wi-Fi function. • Install the "Image App" in advance. (P258)

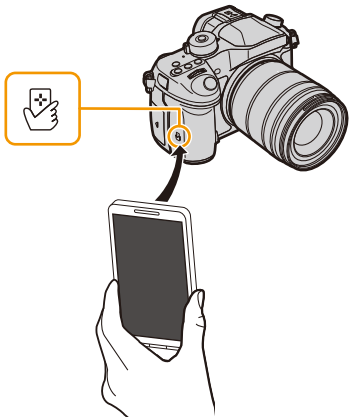
1 Launch "Image App" on your smartphone/tablet.

2 While [ ] is displayed on the screen of the smartphone, touch the smartphone to [ ] of the camera.

3 When the connection confirmation screen is displayed on the camera, select [Yes].

4 Touch the smartphone to [ ] of the camera again.

- Steps **3** through **4** are not required from the second time on.
- It may take time to complete the connection.
- When the smartphone has connected, an image of this camera will be displayed on the smartphone.
- The connected smartphone is registered to this camera.
- If a connection attempt by touching fails, restart the "Image App", and then display the screen in step **1** again.
- If a connection is established during single picture playback, the picture will be transferred to the smartphone. (P266)



- You can register up to 20 smartphones. When the number exceeds 20, registrations will be deleted, starting from the oldest touched one.
- Performing [Reset Wi-Fi Settings] will delete the smartphone registration.
- If the camera is not recognized even when touching the smartphone, change positions and try again.
- Do not touch the smartphone to this camera strongly.
- For information on the operation and settings of NFC-compatible smartphones, refer to the operating instructions of your device.
- If there is a metal object between this camera and the smartphone, reading may fail. Also, putting a sticker around the NFC area may deteriorate the communication performance.
- This function is not available in the following cases:
  – When connecting to a PC or a printer
  – When recording motion pictures
  – When using [Time Lapse Shot]

Taking images via a smartphone/tablet (remote recording)

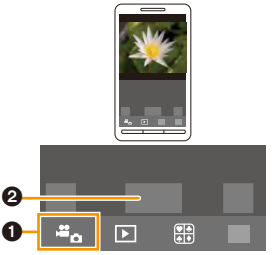
1 Connect to a smartphone. (P259)

2 Operate the smartphone.

❶ Select [ ].

❷ Record an image.

- The recorded images are saved in the camera.
- Some settings are not available.



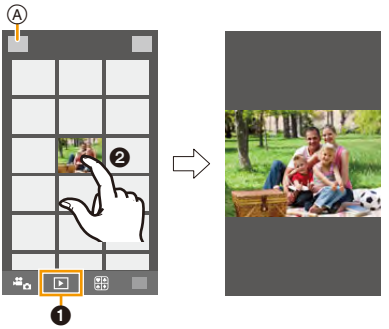
Playing back images in the camera

1 Connect to a smartphone. (P259)

2 Operate the smartphone.

❶ Select [▷].
- You can switch the images to be displayed by selecting the icon (Ⓐ) on the top left of the screen. To display images stored in the camera, select [LUMIX].

❷ Touch the image to enlarge it.



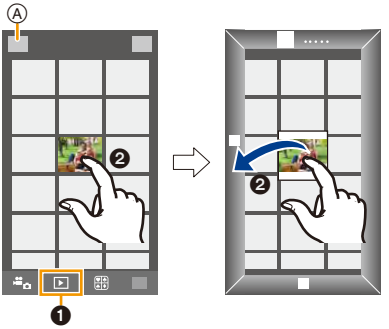
Saving images stored in the camera

1 Connect to a smartphone. (P259)

2 Operate the smartphone.

❶ Select [▷].
- You can switch the images to be displayed by selecting the icon (Ⓐ) on the top left of the screen. To display images stored in the camera, select [LUMIX].

❷ Touch and hold an image, and drag it to save it.



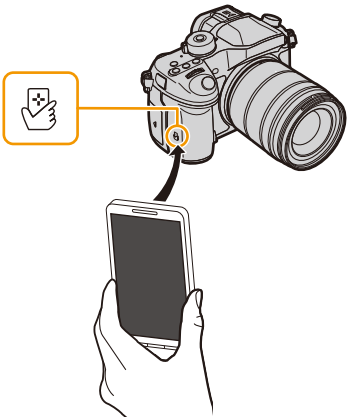
- The function can be assigned to the top, bottom, left or right according to your preference.
- Pictures in RAW format and motion pictures of [AVCHD], [MP4] (only when the motion picture size is set to [4K] in [Rec Quality]), [MP4 (LPCM)] and [MOV] cannot be saved.
- 3D pictures (MPO format) will be saved as 2D pictures (JPEG format).

Transferring images stored in the camera easily

A Wi-Fi connection using NFC function is possible by touching the smartphone to this unit, and you can easily transfer images displayed on the screen.
An image can be sent on site immediately after taking it, so you can easily send it to the smartphone* of your family or friend.
* Installing the "Image App" is required for use.

Preparation:	
(On the camera) • Set [NFC Operation] to [ON]. (P302) • Set [Touch Sharing] to [ON]. (P303)	(On your smartphone) • Check that your smartphone is a compatible model. • Turn on the Wi-Fi function. • Install the "Image App" in advance. (P258)

1 Play back the picture in the camera.
2 Launch "Image App" on the smartphone.
3 While [ ] is displayed on the connection screen of the "Image App", touch the smartphone to [ ] of the camera.
- It may take time to complete the connection.
- If a connection attempt by touching fails, restart the "Image App", and then display the screen in step **2** again.
- To transfer more than one image, repeat steps **1** and **3**.
  (They cannot be transferred as a batch.)



- Depending on the environment you are using, it may take a few minutes to complete the image transfer.

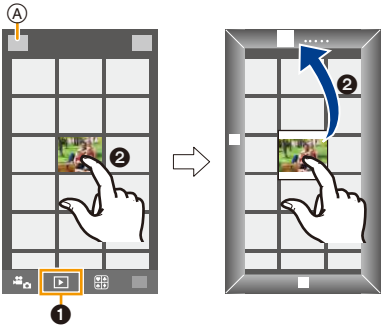
Sending images in the camera to an SNS

1 Connect to a smartphone. (P259)

2 Operate the smartphone.

❶ Select [▶].
- You can switch the images to be displayed by selecting the icon (Ⓐ) on the top left of the screen. To display images stored in the camera, select [LUMIX].

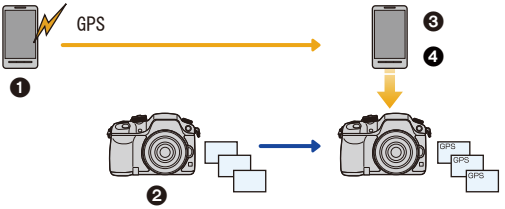
❷ Touch and hold an image, and drag it to send it to an SNS, etc.
- The image is sent to a web service such as an SNS.



- The function can be assigned to the top, bottom, left or right according to your preference.

Adding location information to images stored in the camera from a smartphone/tablet

You can send location information acquired with a smartphone to the camera. After sending the information, you can also write it on images stored in the camera.



❶ Start recording location information
❷ Start recording images
❸ Finish recording the location information
❹ Sending and writing location information

- Location information different from that at the time of recording may be written. Keep the following points in mind:
  – Set the camera's [Home] setting in [World Time] to your region.
  – Once you start recording location information with your smartphone, do not change the camera's [Home] setting in [World Time].
- Location information cannot be written on images that were recorded when the clock was not set.

Start recording location information

Operate the smartphone.

❶ Select [ ].
❷ Select [Geotagging].
❸ Select [ ].

Finish recording the location information

Operate the smartphone.

❶ Select [ ].
❷ Select [Geotagging].
❸ Select [ ].

Sending and writing location information

1 Connect to a smartphone. (P259)

2 Operate the smartphone.

❶ Select [ ].
❷ Select [Geotagging].
❸ Select [ ].

- Follow the on-screen messages to operate the smartphone.
- Location information is not written onto the images recorded when [Rec Format] is set to [AVCHD].
- When the card in the camera lacks sufficient free space, writing location information may not be possible.
- Once the location information is sent to the camera, you can also write it on images by performing [Location Logging] in the [Playback] menu.

- **Cautions for Use:**
  Be sure to pay special attention to the privacy, the likeness rights, etc. of the subject when you use this function. Use at your own risk.
- On the smartphone, you can set the acquisition interval of location information and check the transfer status of location information.
  Refer to [Help] in the “Image App” menu for details.
- (When using “Image App” for iOS)
  If you press the Home or On/Off button of the smartphone while location information is being recorded, the recording will stop.

Not available in these cases:

- The smartphone may fail to acquire location information in China and the border area in the neighbouring countries of China.
  (As of March 2014)

Sending images to a smartphone/tablet by controlling the camera

Methods for sending and images that can be sent

	JPEG	RAW	MP4	AVCHD	MP4 (LPCM)	MOV	3D
Sending an image each time a recording is made ([Send Images While Recording])	○	—	—	—	—	—	—
Select and send the images ([Send Images Stored in the Camera])	○	—	○*	—	—	—	—

* Excluding motion pictures recorded with their size set to [4K] in [Rec Quality]

- Some images may not be played back or sent depending on the device.
- For information on the playback of images, check the operating instructions of the destination device.
- For details on how to send images, refer to P299.

Preparations:

- Install the "Image App" in advance. (P258)

Sending an image each time a recording is made ([Send Images While Recording]) P270

Select and send the images ([Send Images Stored in the Camera]) P271

Sending an image each time a recording is made ([Send Images While Recording])

1 Select the menu.

Wi-Fi → [New Connection] → [Send Images While Recording] → [Smartphone]

2 Select [Via Network] or [Direct], and connect. (P292)

On your smartphone

When connecting with [Via Network]:

1. Turn on the Wi-Fi function.
2. Select the wireless access point you want to connect to, and set.
3. Start "Image App". (P258)

When connecting with [Wi-Fi Direct] or [WPS Connection] in [Direct]:

1. Start "Image App". (P258)

When connecting with [Manual Connection] in [Direct]:

1. Turn on the Wi-Fi function.
2. Select the SSID that matches the one displayed on the screen of this unit, and then enter the password.
3. Start "Image App". (P258)

3 Select a device you want to connect.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

4 Take pictures.

- The pictures are sent automatically after taking them.
- To change the setting or disconnect, press [Wi-Fi]. (P256)
  You cannot change the settings while sending pictures. Wait until sending is complete.

Select and send the images ([Send Images Stored in the Camera])

1 Select the menu.

Wi-Fi → [New Connection] → [Send Images Stored in the Camera] → [Smartphone]

2 Select [Via Network] or [Direct], and connect. (P292)

On your smartphone

When connecting with [Via Network]:

1. Turn on the Wi-Fi function.
2. Select the wireless access point you want to connect to, and set.
3. Start "Image App". (P258)

When connecting with [Wi-Fi Direct] or [WPS Connection] in [Direct]:

1. Start "Image App". (P258)

When connecting with [Manual Connection] in [Direct]:

1. Turn on the Wi-Fi function.
2. Select the SSID that matches the one displayed on the screen of this unit, and then enter the password.
3. Start "Image App". (P258)

3 Select a device you want to connect.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

4 Select [Single Select] or [Multi Select].

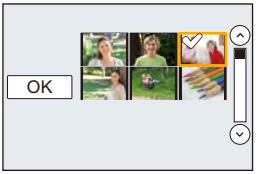
- To change the setting or disconnect, press [Wi-Fi]. (P256)

[Single Select] setting

1. Select the picture.
2. Select [Set].

[Multi Select] setting

1. Select the picture. (repeat)
   - The setting is canceled when the picture is selected again.
2. Select [OK].
   - The number of pictures that can be sent by [Multi Select] is limited.



- Confirmation screen is displayed. It is executed when [Yes] is selected.

Displaying pictures on a TV

You can display pictures on a TV that supports the Digital Media Renderer (DMR) function of the DLNA standard.

- If you display pictures using the Wi-Fi function, they cannot be output in 4K resolution. To output them in 4K resolution, connect the camera and the TV with an HDMI micro cable. (P325)

Preparations:

Set the TV to DLNA waiting mode.
- Read the operating instructions for your TV.

1 Select the menu.

Wi-Fi → [New Connection] → [Playback on TV]

2 Select [Via Network] or [Direct], and connect. **(P292)**

3 Select a device you want to connect.
- When the connection is established, the screen is displayed.

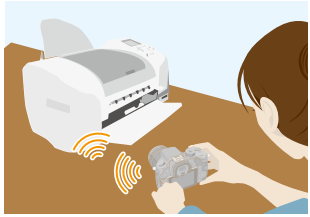
4 Take or play back pictures on this unit.
- To change the setting or disconnect, press [Wi-Fi]. (P256)

- When a TV is connected to this unit, the TV screen may temporarily return to the status before the connection. Pictures are displayed again when you take or play back pictures.
- [Effect] and [Sound] of the Slide Show are disabled.

Not available in these cases:
- Motion pictures cannot be played back.
- During the multi/calendar playback, pictures displayed on the screen of this unit are not displayed on TV.

Printing Wirelessly

You can send images to a compatible printer, and print them wirelessly.



■ Methods for sending and images that can be sent

	JPEG	RAW	MP4	AVCHD	MP4 (LPCM)	MOV	3D
Select and send the images ([Send Images Stored in the Camera])	○	—	—	—	—	—	—

- Some images may not be sent depending on the device.
- For details on how to send images, refer to P299.

Preparations:

- You can print out recorded pictures wirelessly from a PictBridge (wireless LAN-compatible)* printer.
  * Compliant with the DPS over IP standards.
  For details on the PictBridge (wireless LAN-compatible) printer, contact the respective company.

1 Select the menu.

Wi-Fi → [New Connection] → [Send Images Stored in the Camera] → [Printer]

2 Select [Via Network] or [Direct], and connect. **(P292)**

3 Select a printer you want to connect.

4 Select pictures, and then print.

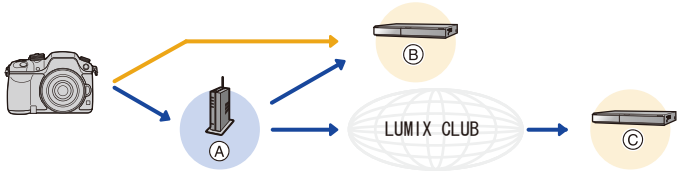
- The procedure for selecting pictures is the same as the one for when the USB connection cable is connected.
  For details, refer to P339.
- To change the setting or disconnect, press [Wi-Fi]. (P256)

Not available in these cases:

- Motion pictures cannot be printed out.

When sending images to AV device

You can send pictures and motion pictures to AV devices in your house (home AV devices). You can also send them to the devices (external AV devices) of your family or friends living away from you via “LUMIX CLUB”.



Ⓐ Wireless access point Ⓑ Home AV device Ⓒ External AV device

■ Methods for sending and images that can be sent

	JPEG	RAW	MP4	AVCHD	MP4 (LPCM)	MOV	3D
Sending an image each time a recording is made ([Send Images While Recording])	○	—	—	—	—	—	○
Select and send the images ([Send Images Stored in the Camera])	○	—	—	—	—	—	○

- Some images may not be played back or sent depending on the device.
- For information on the playback of images, check the operating instructions of the destination device.
- For details on how to send images, refer to P299.

Preparations:

When sending a picture to [Home], set your device to DLNA waiting mode.
- Read the operating instructions of your device for details.

When sending images to [External], the following are required:
- Registration to “LUMIX CLUB” (P286)
- Address number and access number acquired by the destination External AV device. (P291)

Sending an image each time a recording is made ([Send Images While Recording]) ☞ P275

Select and send the images ([Send Images Stored in the Camera]) ☞ P275

Sending an image each time a recording is made ([Send Images While Recording])

1 Select the menu.

Wi-Fi → [New Connection] → [Send Images While Recording] → [AV device]

2 Select [Home] or [External].

3 Select [Via Network] or [Direct], and connect. (P292)

- When [External] is selected, [Direct] cannot be selected.

4 Select a device you want to connect.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

5 Take pictures.

- To change the setting or disconnect, press [Wi-Fi]. (P256)
  You cannot change the settings while sending pictures. Wait until sending is complete.

Select and send the images ([Send Images Stored in the Camera])

1 Select the menu.

Wi-Fi → [New Connection] → [Send Images Stored in the Camera] → [AV device]

2 Select [Home] or [External].

3 Select [Via Network] or [Direct], and connect. (P292)

- When [External] is selected, [Direct] cannot be selected.

4 Select a device you want to connect.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

5 Select [Single Select] or [Multi Select].

- To change the setting or disconnect, press [Wi-Fi]. (P256)

[Single Select] setting

❶ Select the picture.
❷ Select [Set].

[Multi Select] setting

❶ Select the picture. (repeat)
- The setting is canceled when the picture is selected again.

❷ Select [OK].
- The number of pictures that can be sent by [Multi Select] is limited.

- Confirmation screen is displayed. It is executed when [Yes] is selected.

When sending images to PC

You can send pictures and motion pictures recorded with this unit to a PC.

■ Methods for sending and images that can be sent

	JPEG	RAW	MP4	AVCHD*	MP4 (LPCM)	MOV	3D
Sending an image each time a recording is made ([Send Images While Recording])	○	○	—	—	—	—	○
Select and send the images ([Send Images Stored in the Camera])	○	○	○	○	○	○	○

* A motion picture recorded in [AVCHD] can be sent to [PC] if the file size is 4 GB or smaller. It cannot be sent if the size is greater than 4 GB.

- Some images may not be played back or sent depending on the device.
- For information on the playback of images, check the operating instructions of the destination device.
- For details on how to send images, refer to P299.

Preparations:	
(On the camera) • If the workgroup of the destination PC has been changed from the standard setting, you also need to change the setting of this unit in [PC Connection]. (P302)	(On your PC) • Turn the computer on. • Prepare folders for receiving images on the PC before sending a picture to the PC. (P277)

Sending an image each time a recording is made ([Send Images While Recording]) ☞ P278

Select and send the images ([Send Images Stored in the Camera]) ☞ P279

To create a folder that receives images

- Create a PC user account [account name (up to 254 characters) and password (up to 32 characters)] consisting of alphanumeric characters. An attempt to create a receive folder may fail if the account includes non-alphanumeric characters.

■ When using "PHOTOfunSTUDIO"

1 Install "PHOTOfunSTUDIO" to the PC.
- For details on hardware requirements and installation, read "About the supplied software" (P330).

2 Create a folder that receives images with "PHOTOfunSTUDIO".
- To create the folder automatically, select [Auto-create]. To specify a folder, create a new folder, or set a password to the folder, select [Create manually].
- For details, refer to the operating instructions of "PHOTOfunSTUDIO" (PDF).

■ When not using "PHOTOfunSTUDIO"

(For Windows)
Supported OS: Windows XP/Windows Vista/Windows 7/Windows 8/Windows 8.1

Example: Windows 7

1 Select a folder you intend to use for receiving, then right-click.

2 Select [Properties], then enable sharing of the folder.
- For details, refer to the operating instructions of your PC or Help on the OS.

(For Mac)
Supported OS: OS X v10.5 to v10.9
Example: OS X v10.8

1 Select a folder you intend to use for receiving, then click on the items in the following order.
[File] → [Get Info]

2 Enable sharing of the folder.
- For details, refer to the operating instructions of your PC or Help on the OS.

Sending an image each time a recording is made ([Send Images While Recording])

1 Select the menu.

Wi-Fi → [New Connection] → [Send Images While Recording] → [PC]

2 Select [Via Network] or [Direct], and connect. (P292)

3 Select the PC you want to connect to.

- When the PC you want to connect to is not displayed, select [Manual Input], and enter the computer name of the PC (NetBIOS name for Apple Mac computers).

4 Select the folder you want to send.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

5 Take pictures.

- To change the setting or disconnect, press [Wi-Fi]. (P256)
  You cannot change the settings while sending pictures. Wait until sending is complete.

Select and send the images ([Send Images Stored in the Camera])

1 Select the menu.

Wi-Fi → [New Connection] → [Send Images Stored in the Camera] → [PC]

2 Select [Via Network] or [Direct], and connect. (P292)

3 Select the PC you want to connect to.

- When the PC you want to connect to is not displayed, select [Manual Input], and enter the computer name of the PC (NetBIOS name for Apple Mac computers).

4 Select the folder you want to send.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

5 Select [Single Select] or [Multi Select].

- To change the setting or disconnect, press [Wi-Fi]. (P256)

[Single Select] setting

❶ Select the picture.
❷ Select [Set].

[Multi Select] setting

❶ Select the picture. (repeat)
- The setting is canceled when the picture is selected again.

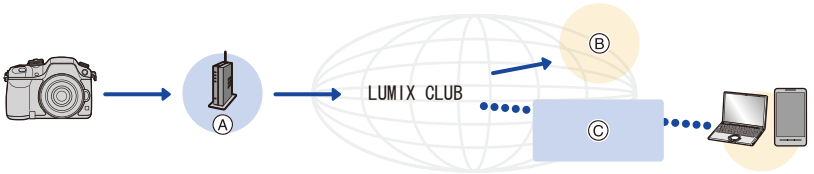
❷ Select [OK].
- The number of pictures that can be sent by [Multi Select] is limited.

- Confirmation screen is displayed. It is executed when [Yes] is selected.

- Folders sorted by the sent date are created in the specified folder, and pictures are saved in those folders.
- If the screen for a user account and password entry appears, enter the one you set on your PC.
- When the computer name (NetBIOS name for Apple Mac computers) contains a space (blank character), etc., it may not be recognized correctly.
  If a connection attempt fails, we recommend that you change the computer name (or NetBIOS name) to the one consisting of only alphanumeric characters, with a maximum of 15 characters.

Using Web services

You can send pictures and motion pictures to an SNS, etc. via “LUMIX CLUB”.
By setting up automatic transfers of pictures and motion pictures to the Cloud Sync. Service, you can receive the transferred pictures or motion pictures on a PC or smartphone.



Ⓐ Wireless access point Ⓑ Web service Ⓒ Cloud Sync. Service

Preparations:
To send images to a web service or a cloud folder, you need to register to “LUMIX CLUB” (P286). **To send images to a web service, you need to register the web service. (P282)**

When sending images to web service	☞ **P281**
When sending images to Cloud Sync. Service	☞ **P284**

When sending images to web service

Methods for sending and images that can be sent

	JPEG	RAW	MP4	AVCHD	MP4 (LPCM)	MOV	3D
Sending an image each time a recording is made ([Send Images While Recording])	○	—	—	—	—	—	○
Select and send the images ([Send Images Stored in the Camera])	○	—	○*	—	—	—	○

* Excluding motion pictures recorded with their size set to [4K] in [Rec Quality]
- Some images may not be played back or sent depending on the device.
- For information on the playback of images, check the web service.
- For details on how to send images, refer to P299.

Sending an image each time a recording is made ([Send Images While Recording])	☞ P282
Select and send the images ([Send Images Stored in the Camera])	☞ P283

- Images uploaded to the web service cannot be displayed or deleted with this camera. Check images by accessing the web service with your smartphone/tablet or computer.
- If sending images fails, a report email outlining the failure will be sent to the email address registered with “LUMIX CLUB”.
- **Images may contain personal information that can be used to identify the user, such as a title, the time and date when the images was taken, and the location where the image was taken. Check this information before uploading images to web services.**

- Panasonic assumes no responsibility for the damages resulting from the leakage, loss, etc. of images uploaded on web services.
- When uploading images to the web service, do not delete images from this camera, even after they have finished sending, until you have checked that they have been properly uploaded to the web service. Panasonic assumes no responsibility for the damages resulting from the deletion of images stored in this unit.

Registering web services

When sending images to web services, the web service being used must be registered with the “LUMIX CLUB”. (P286)
• Check the “FAQ/Contact us” on the following site for compatible web services.
http://lumixclub.panasonic.net/eng/c/lumix_faqs/

Preparation:
Make sure that you have created an account on the web service you want to use, and have the login information available.

1 **Connect to the “LUMIX CLUB” site using a smartphone or computer.**
http://lumixclub.panasonic.net/eng/c/
2 **Enter your “LUMIX CLUB” login ID and password and log in to the service.** **(P286)**
3 **Register your email address.**
4 **Select the web service to be used and register it.**
• Follow the instructions on the screen to register the service.

Sending an image each time a recording is made ([Send Images While Recording])

1 **Select the menu.**

Wi-Fi → [New Connection] → [Send Images While Recording] → [Web service]

2 **Select [Via Network], and connect.** **(P292)**
3 **Select a web service you want to connect.**
• When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)
4 **Take pictures.**
• To change the setting or disconnect, press [Wi-Fi]. (P256)
You cannot change the settings while sending pictures. Wait until sending is complete.

Select and send the images ([Send Images Stored in the Camera])

1 Select the menu.

Wi-Fi → [New Connection] → [Send Images Stored in the Camera] → [Web service]

2 Select [Via Network], and connect. (P292)

3 Select a web service you want to connect.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

4 Select [Single Select] or [Multi Select].

- To change the setting or disconnect, press [Wi-Fi]. (P256)

[Single Select] setting

❶ Select the picture.
❷ Select [Set].

[Multi Select] setting

❶ Select the picture. (repeat)
- The setting is canceled when the picture is selected again.

❷ Select [OK].
- The number of pictures that can be sent by [Multi Select] is limited.

- Confirmation screen is displayed. It is executed when [Yes] is selected.

When sending images to Cloud Sync. Service

■ Using [Cloud Sync. Service] (As of March 2014)

Preparations:

You need to register to “LUMIX CLUB” (P286) and configure the Cloud Sync. setting to send a picture to a Cloud Folder.
For a PC, use “PHOTOfunSTUDIO” to set up Cloud Sync settings. For a smartphone, use “Image App” to set them up.

- If you set the picture destination to [Cloud Sync. Service], sent pictures are temporarily saved in the cloud folder, and they can be synchronized with the device in use, such as the PC or smartphone.
- A Cloud Folder stores transferred images for 30 days (up to 1000 pictures). Transferred images are deleted automatically 30 days after the transfer. Furthermore, when the number of stored images exceeds 1000, some images may be deleted depending on the [Cloud Limit] (P301) setting even within 30 days after the transfer.
- When the download of images from a Cloud Folder to all specified devices is complete, images may be deleted from the Cloud Folder even within 30 days after the transfer.

■ Methods for sending and images that can be sent

	JPEG	RAW	MP4	AVCHD	MP4 (LPCM)	MOV	3D
Sending an image each time a recording is made ([Send Images While Recording])	○	—	—	—	—	—	○
Select and send the images ([Send Images Stored in the Camera])	○	—	○*	—	—	—	○

* Excluding motion pictures recorded with their size set to [4K] in [Rec Quality]

- Some images may not be played back or sent depending on the device.
- For information on the playback of images, check the operating instructions of the destination device.
- For details on how to send images, refer to P299.

Sending an image each time a recording is made ([Send Images While Recording])	☞ P285
Select and send the images ([Send Images Stored in the Camera])	☞ P285

Sending an image each time a recording is made ([Send Images While Recording])

1 Select the menu.

Wi-Fi → **[New Connection] → [Send Images While Recording] → [Cloud Sync. Service]**

2 Select [Via Network], and connect. (P292)

3 Check the send setting.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

4 Take pictures.

- To change the setting or disconnect, press [Wi-Fi]. (P256)
  You cannot change the settings while sending pictures. Wait until sending is complete.

Select and send the images ([Send Images Stored in the Camera])

1 Select the menu.

Wi-Fi → **[New Connection] → [Send Images Stored in the Camera] → [Cloud Sync. Service]**

2 Select [Via Network], and connect. (P292)

3 Check the send setting.

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P301)

4 Select [Single Select] or [Multi Select].

- To change the setting or disconnect, press [Wi-Fi]. (P256)

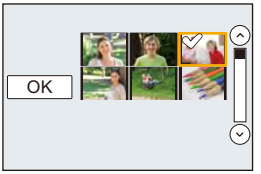
[Single Select] setting

❶ Select the picture.
❷ Select [Set].

[Multi Select] setting

❶ Select the picture. (repeat)
- The setting is canceled when the picture is selected again.

❷ Select [OK].
- The number of pictures that can be sent by [Multi Select] is limited.



- Confirmation screen is displayed. It is executed when [Yes] is selected.

Registering to the “LUMIX CLUB”

About the [LUMIX CLUB]

Acquire a “LUMIX CLUB” login ID (free).
If you register this unit to the “LUMIX CLUB”, you can synchronize images between the devices you are using, or transfer these images to web services.
Use the “LUMIX CLUB” when uploading pictures to web services or external AV device.
• You can set the same “LUMIX CLUB” login ID for this unit and a smartphone. (P289)

Refer to the “LUMIX CLUB” site for details.
http://lumixclub.panasonic.net/eng/c/

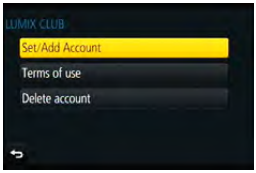
Please note:
• The service may be suspended due to regular maintenance or unexpected troubles, and the service contents may be changed or added, without prior notice to the users.
• The service may be stopped in whole or in part with a reasonable period of advance notice.

Acquiring a new login ID ([New account])

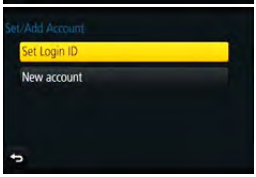
1 Select the menu. (P54)

MENU → [Setup] → [Wi-Fi] → [Wi-Fi Setup] → [LUMIX CLUB]

2 Select [Set/Add Account].



3 Select [New account].
• Connect to the network.
Proceed to the next page by selecting [Next].
• A confirmation screen will be displayed if a login ID has already been acquired for the camera. Select [Yes] to acquire a new login ID, or [No] if you do not need to acquire a new login ID.



4 Select the method for connecting to a wireless access point, and set.
• Refer to P293 for details.
• A setting screen will be displayed only when connecting for the first time.
Once you set the connection method, it will be saved on this unit and used when connecting the next time. To change the wireless access point you want to connect to, press [DISP.], and change the connection destination.
• Proceed to the next page by selecting [Next].

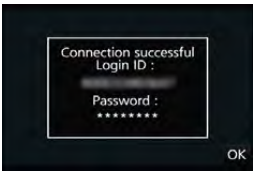
5 Read through the "LUMIX CLUB" terms of use and select [Agree].

- You can switch pages by ▲/▼.
- You can enlarge (2×) the display by rotating the rear dial to the right.
- You can reset the enlarged display to its original size (1×) by rotating the rear dial to the left.
- You can move the position of the enlarged display with ▲/▼/◄/►.
- Press [🗑/↩] to cancel the process without acquiring a login ID.

6 Enter a password.

- Enter any combination of 8 to 16 characters and numbers for the password.
- For details on how to enter characters, refer to "Entering Text" section on P57.

7 Check the login ID and select [OK].



- The login ID (12-digit number) will be displayed automatically.
  When logging in to the "LUMIX CLUB" with a computer, you only need to enter the numbers.
- A message is displayed when the connection is complete. Select [OK].
- **Be sure to make a note of the login ID and password.**
- Exit the menu after it is set.

Using the acquired login ID/Checking or changing the login ID or password ([Set Login ID])

Preparation:
When using the acquired login ID, check the ID and password.
To change the “LUMIX CLUB” password on the camera, access the “LUMIX CLUB” website from your smartphone or PC and change the “LUMIX CLUB” password in advance.
• The login ID and password registered to the “LUMIX CLUB” cannot be changed on this unit.

1 Select the menu. (P54)

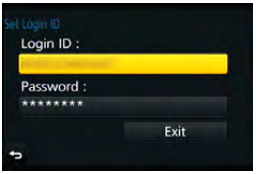
MENU → [Setup] → [Wi-Fi] → [Wi-Fi Setup] → [LUMIX CLUB]

2 Select [Set/Add Account].

3 Select [Set Login ID].
- The login ID and password are displayed.
- The password is displayed as “*”.
- Close the menu if only checking the login ID.

4 Select the item to change.

5 Enter the login ID or password.
- Refer to “Entering Text” (P57) for information on how to enter text.
- Enter the new password you have created on your smartphone/tablet or PC into the camera. If the password differs from the one you created on your smartphone/tablet or PC, you will not be able to upload images.
- Exit the menu after it is set.



To set the same login ID for the camera and the smartphone/tablet

- Setting the same login ID on this unit and your smartphone/tablet is convenient for sending images on this unit to other devices or web services.

When either this unit or the smartphone/tablet has acquired the login ID:

1 **Connect this unit to the smartphone.** (P259)

2 **From the "Image App" menu, set the common login ID.**
- The login IDs for this unit and the smartphone become the same.

- After connecting this unit to the smartphone, the setup screen for a common login ID may appear when you display the playback screen. You can also set a common login ID by following the on-screen instructions.
- This operation is not available for [Wi-Fi Direct] connection.

When this unit and the smartphone/tablet have acquired different login IDs:

(When you want to use the smartphone's login ID for this unit)
Change the login ID and password for this unit to those acquired by the smartphone.

(When you want to use this unit's login ID for the smartphone)
Change the login ID and password for the smartphone to those acquired by this unit.

Check the "LUMIX CLUB" terms of use

Check the details if the terms of use have been updated.

1 **Select the menu.** (P54)

MENU → **[Setup]** → **[Wi-Fi]** → **[Wi-Fi Setup]** → **[LUMIX CLUB]**

2 **Select [Terms of use].**
- The camera will connect to the network and the terms of use will be displayed. Close the menu after checking the terms of use.

Delete your login ID and account from the “LUMIX CLUB”

Delete the login ID from the camera when transferring it to another party or disposing of it. You can also delete your “LUMIX CLUB” account.

1 Select the menu. (P54)

MENU → [Setup] → [Wi-Fi] → [Wi-Fi Setup] → [LUMIX CLUB]

2 Select [Delete account].
- The message is displayed. Select [Next].

3 Select [Yes] in the login ID delete confirmation screen.
- The message is displayed. Select [Next].

4 Select [Yes] on the confirmation screen for deleting the “LUMIX CLUB” account.
- If you want to continue using the service, selecting [No] will only delete the login ID. Exit the menu after it is executed.

5 Select [Next].
- The login ID is deleted, and then the message notifying the deletion of your account is displayed. Select [OK].
- Exit the menu after it is executed.

- Changes and other actions to login IDs can only be made to the login ID acquired with the camera.

Configuring the external AV device settings

Images can be sent to the AV device of relatives and acquaintances via “LUMIX CLUB”.

Preparations:

Check the address number (16-digit number) and access number (4-digit number) of the destination AV device issued by “LUMIX CLUB”.
(Refer to the AV device instruction manual for details)

1 Select the menu. (P54)

MENU → [Setup] → [Wi-Fi] → [Wi-Fi Setup] → [External AV device]

2 Select [Add new device].

3 Enter the address number.

4 Enter the access code.

5 Enter any name.

- A maximum of 28 characters can be entered. A two-byte character is treated as two characters.
- Exit the menu after it is set.

- Refer to “Entering Text” (P57) for information on how to enter text.

Change or delete information on registered AV device

Information on AV device that has already been saved can be changed or deleted.

1 Select the menu. (P54)

MENU → [Setup] → [Wi-Fi] → [Wi-Fi Setup] → [External AV device]

2 Select the AV device you want to change or delete.

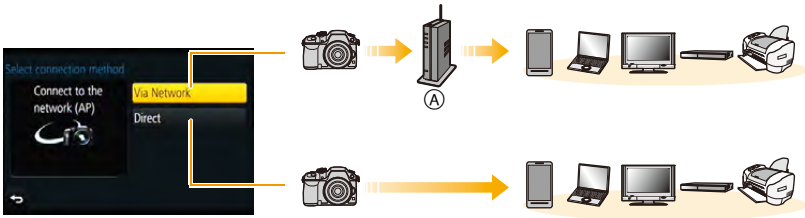
3 Select [Edit] or [Delete].

[Edit]	Change information on AV device that has already been registered. **Perform steps 3 through 5 of “Configuring the external AV device settings”.**
[Delete]	Delete information on AV device that has already been registered. • Confirmation screen is displayed. It is executed when [Yes] is selected.

- Exit the menu after it is set.

About Connections

You can select a connection method after selecting a Wi-Fi function and a destination.
Performing a direct connection is convenient for when you are in a place away from home where wireless access points are not available or for when connecting temporarily to a device you do not usually use.
When connecting with the same settings as the previous ones, you can use the Wi-Fi function quickly by connecting via [Select a destination from History] or [Select a destination from Favorite].



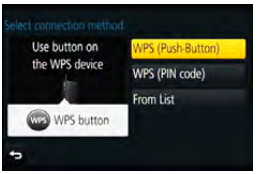
Ⓐ Wireless access point

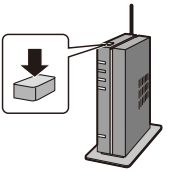
[Via Network]	Connects via a wireless access point.	P293
[Direct]	Your device connects directly to this unit.	P296

Connecting from your house (via the network)

You can select the method for connecting to a wireless access point.

∗ WPS refers to a function that allows you to easily configure the settings related to the connection and security of wireless LAN devices.
To check if the wireless access point you are using is compatible with WPS, refer to the manual of the wireless access point.



[WPS (Push-Button)]	Save push button type wireless access point that is compatible with Wi-Fi Protected Setup™ with a WPS mark. **Press the wireless access point WPS button until it switches to WPS mode.** • Refer to the wireless access point instruction manual for details. e.g.: 
[WPS (PIN code)]	Save PIN code type wireless access point that is compatible with Wi-Fi Protected Setup with a WPS mark. **1 Select the wireless access point you are connecting to.** **2 Enter the PIN code displayed on the camera screen into the wireless access point.** **3 Press [MENU/SET].** • Refer to the wireless access point instruction manual for details.
[From List]	Select this option when you are not sure about the WPS compatibility, or when you want to search for and connect to a wireless access point. • Refer to P294 for details.

If you are not sure about the WPS compatibility (connecting by [From List])

Search for available wireless access points.

- Confirm encryption key of the selected wireless access point if the network authentication is encrypted.
- When connecting by [Manual Input], confirm SSID, encryption type, encryption key of the wireless access point you are using.

1 Select the wireless access point you are connecting to.

- Pressing [DISP.] will search for a wireless access point again.
- If no wireless access point is found, refer to “When connecting with [Manual Input]”.

2 (If network authentication is encrypted) Enter the encryption key.

- For details on how to enter characters, refer to “Entering Text” section on P57.

■ When connecting with [Manual Input]

1 On the screen displayed in step 1 of “If you are not sure about the WPS compatibility (connecting by [From List])”, select [Manual Input].

2 Enter the SSID of the wireless access point you are connecting to, then select [Set].

- For details on how to enter characters, refer to “Entering Text” section on P57.

3 Select the network authentication type.

- For information on network authentication, see the manual of the wireless access point.

4 Select the encryption type.

- The type of settings that can be changed may vary depending on the details of network authentication settings.

Network authentication type	Encryption types that can be set
[WPA2-PSK]	[TKIP]/[AES]
[WPA-PSK]	[TKIP]/[AES]
[Common Key]	[WEP]
[Open]	[No Encryption]/[WEP]

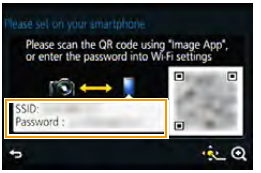
5 (When an option other than [No Encryption] is selected)
Enter the encryption key.

- Check the wireless access points instruction manual and settings when saving a wireless access point.
- If no connection can be established, the wireless access point's radio waves may be too weak. Refer to "Message Display" (P364) and "Troubleshooting" (P393) for details.
- Transmission speed may decrease, or may not be usable depending on the environment it is used in.

Connecting from a location away from your house (direct connection)

You can select the method for connecting to the device you are using.
Select the connection method supported by your device.

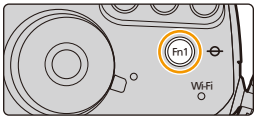
[Wi-Fi Direct]	**1 Set the device to Wi-Fi Direct™ mode.** **2 Select [Wi-Fi Direct].** **3 Select the device to connect to.** • Read the operating instructions of your device for details.
[WPS Connection]	**[WPS (Push-Button)]** **1 Select [WPS (Push-Button)].** **2 Set the device to WPS mode.** • You can wait longer for a connection by pressing the [DISP.] button on this unit.
	[WPS (PIN code)] **1 Select [WPS (PIN code)].** **2 Enter the PIN code of the device into this unit.**
[Manual Connection]	**Enter the SSID and password into the device. The SSID and password are displayed on the connection waiting screen of this unit.** • If the destination is [Smartphone], you can set up a connection by scanning the QR code with the smartphone. (P260, 261) • If you press [MENU/SET] on the camera, the QR code will be enlarged. When it is difficult to scan the QR code, try enlarging it.



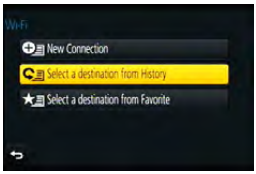
Connecting quickly with the same settings as the previous ones ([Select a destination from History]/[Select a destination from Favorite])

When the Wi-Fi function is used, a record is saved in the history. You can register records as favorites.
Connecting from the history or favorites allows you to easily connect with the same settings as the previous ones.

1 **Press [Wi-Fi].**

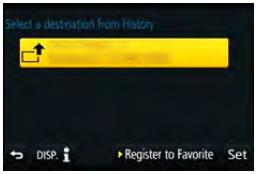


2 **Select [Select a destination from History] or [Select a destination from Favorite].**



[Select a destination from History]	Connects with the same settings as the previous ones.
[Select a destination from Favorite]	Connects with settings registered as favorites.

3 **Select item.**



Registering records as favorites

1 **Press [Wi-Fi].**
2 **Select [Select a destination from History].**
3 **Select the item you want to register to favorites, and then press ►.**
4 **Enter a registration name.**
- For details on how to enter characters, refer to “Entering Text” section on P57.
- A maximum of 30 characters can be entered. A two-byte character is treated as two characters.

Editing the items registered to favorites

1 **Press [Wi-Fi].**
2 **Select [Select a destination from Favorite].**
3 **Select the favorite item you want to edit, and then press ►.**
4 **Select the item.**

[Remove from Favorite]	—
[Change the Order in Favorite]	Select the destination.
[Change the Registered Name]	• For details on how to enter characters, refer to "Entering Text" section on P57. • A maximum of 30 characters can be entered. A two-byte character is treated as two characters.

Save frequently-used Wi-Fi connection settings as favorites

The number that can be saved in the history is limited.
We recommend that you save frequently-used Wi-Fi connection settings by registering them as favorites. (P297)

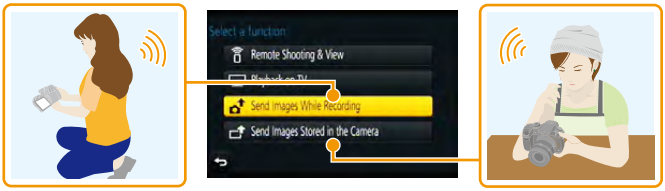
Checking the connection detail of the history or favorite

If [DISP.] is pressed when selecting an item in the history or favorites, the detail of the connection can be displayed.

- Performing [Reset Wi-Fi Settings] clears the history and the contents saved in [Select a destination from Favorite].
- When connecting to a network to which many PCs are connected by using [Select a destination from History] or [Select a destination from Favorite], a connection attempt may fail because the previously-connected device will be identified from among many devices.
  If a connection attempt fails, reconnect by using [New Connection].

About settings for sending images

When sending images, select the method for sending them after selecting [New Connection].
After the connection has been completed, settings for sending, such as the image size for sending, can also be changed.



■ Images that can be sent

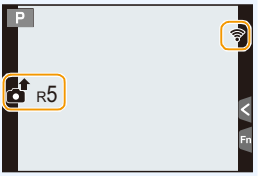
Destination	JPEG	RAW	MP4∗1	AVCHD∗1, 2	MP4 (LPCM)∗1	MOV∗1	3D
[Smartphone]	○	—	○∗3	—	—	—	—
[PC]	○	○	○	○	○	○	○
[Cloud Sync. Service]	○	—	○∗3	—	—	—	○
[Web service]	○	—	○∗3	—	—	—	○
[AV device]	○	—	—	—	—	—	○
[Printer]∗1	○	—	—	—	—	—	—

∗1 Sending by [Send Images While Recording] is not available.
∗2 A motion picture recorded in [AVCHD] can be sent to [PC] if the file size is 4 GB or smaller. It cannot be sent if the size is greater than 4 GB.
∗3 Excluding motion pictures recorded with their size set to [4K] in [Rec Quality]
• Some images may not be played back or sent depending on the device.
• Refer to the manual of the destination equipment or the web service for more information on how to playback pictures.

Send Images While Recording

A picture can be automatically sent to a specified device every time you take it.
- Since the camera gives priority to recording, sending may take longer during the recording.

- When connected with [Send Images While Recording], [ ] is displayed on the recording screen, and [ ] is displayed while sending a file.
- If you turn off this unit or the Wi-Fi connection before sending is complete, unsent pictures will not be resent.
- You may not be able to delete files or use the playback menu while sending.



Not available in these cases:
- Motion pictures cannot be sent.

Send Images Stored in the Camera

Images can be selected and sent after recording.

- Details of the playback menu [Favorite] or [Print Set] settings will not be sent.

Not available in these cases:
- Some images taken with a different camera may not be able to be sent.
- Images that have been modified or edited with a computer may not be able to be sent.

Changing the settings for sending images

Pressing [DISP.] after completing a connection allows you to change the settings for sending such as the image size for sending.

[Size]	Resize the image to send. **[Original]/[Auto]**∗1**/[Change]** • If you select [Auto], the image size is determined by the circumstances at the destination. • You can select the image size for [Change] from [M], [S] or [VGA]. The aspect ratio does not change.
[File Format]∗2	**[JPG]/[RAW+JPG]/[RAW]**
[Delete Location Data]∗3	Select whether to delete the location information from images before sending them. **[ON]:** Delete the location information, then send. **[OFF]:** Keep the location information and send. • This operation only deletes the location information from the images that are set to be sent. (The location information will not be deleted from the original images stored in this unit.)
[Cloud Limit]∗4	You can select whether to send images when the Cloud Folder runs out of free space. **[ON]:** Do not send images. **[OFF]:** Delete images from the oldest ones, then send new images.

∗1 Only available when the destination is set to [Web service].
∗2 Only available when the destination is set to [PC].
∗3 Only available when the destination is set to [Cloud Sync. Service], [Web service] or [External] in [AV device].
∗4 Only available when the destination is set to [Cloud Sync. Service].

[Wi-Fi Setup] Menu

Configure the settings required for the Wi-Fi function.
The settings cannot be changed when connected to Wi-Fi.

Select the menu. (P54)

MENU → **[Setup]** → **[Wi-Fi]** → **[Wi-Fi Setup]** → **Desired item to be set**

[LUMIX CLUB]	Acquires or changes the “LUMIX CLUB” login ID.

• Refer to P286 for details.

[PC Connection]	You can set the workgroup. To send images to a PC, a connection to the same workgroup as the destination PC is required. (The default setting is “WORKGROUP”.)
	[Change Workgroup Name]: Enter the workgroup of the connecting PC. **[Restore to Default]:** Restores the default state.

• For details on how to enter characters, refer to “Entering Text” section on P57.
• If you are using the PC with standard settings, you do not need to change the workgroup.

[Device Name]	You can change the name of this unit.
	1 Press [DISP.]. **2 Enter the desired device name.** • For details on how to enter characters, refer to “Entering Text” section on P57. • A maximum of 32 characters can be entered.

[External AV device]	Images can be sent to the AV device of relatives and acquaintances via “LUMIX CLUB”.

• Refer to P291 for details.

[NFC Operation]	Configures the settings for the NFC function.
	[ON]: NFC function is worked. **[OFF]**

[Touch Sharing]	Sets the camera operation after the connection with the NFC function is complete.
	[ON]: When a Wi-Fi connection is complete by using the NFC function during single picture playback, the single picture can be transferred. **[OFF]**

[Wi-Fi Password]	To prevent incorrect operation or use of the Wi-Fi function by a third party and to protect saved personal information, it is recommended that you protect the Wi-Fi function with a password. Setting a password will automatically display the password input screen when the Wi-Fi function is used.
	[Setup]: Enter any 4-digit numbers as the password. **[Delete]**

- For details on how to enter characters, refer to “Entering Text” section on P57.
- Make a copy of password.
  If you forget the password, you can reset it with [Reset Wi-Fi Settings] in the [Setup] menu, however other settings will also be reset. (excluding [LUMIX CLUB])

[Network Address]	Displays the MAC address and IP address of this unit.

- A “MAC Address” is a unique address that is used to identify network equipment.
- “IP address” refers to a number that identifies a PC connected to a network such as the Internet. Usually, the addresses for homes are automatically assigned by the DHCP function such as a wireless access point. (Example: 192.168.0.87)

[Approved Regulations]*	Displays the certification number for radio regulations.

* [Approved Regulations] is only available on the version DMC-GH4P.

Using the [Custom] menu

Operation of the unit, such as displaying of the screen and button operations, can be set up according to your preferences.

Custom Mode P305

[Cust.Set Mem.]

Silent operation P305

[Silent Mode]

AF/AE lock P305

[AF/AE Lock] [AF/AE Lock Hold]

Shutter button P305

[Shutter AF] [Half Press Release]

Auto Focus P306

[Quick AF] [Eye Sensor AF] [Pinpoint AF Time]
[AF Assist Lamp] [Direct Focus Area] [Focus/Release Priority]
[AF+MF]

Manual Focus P308

[MF Assist] [MF Guide] [Peaking]

Screen display P309

[Histogram] [Guide Line] [Center Marker]
[Highlight] [Zebra Pattern] [Monochrome Live View]
[Constant Preview] [Expo.Meter] [LVF Disp.Style]
[Monitor Disp. Style] [Monitor Info. Disp.] [Rec Area]
[Video-Priority Display] [Auto Review]

Buttons and dials P312

[Fn Button Set] [Q.MENU] [Dial Set.]
[Video Button]

Touch operations and others P313

[Power Zoom Lens] [Lens w/o Focus Ring] [Eye Sensor]
[Touch Settings] [Touch Scroll] [Menu Guide]
[Shoot w/o Lens]

For details on how to select the [Custom] menu settings, refer to P54.

Custom Mode

Registering Personal Menu Settings

[Cust.Set Mem.]
Refer to P321 for details.

Silent operation

Disabling Operational Sounds and the Output of Light at once

[Silent Mode]
Refer to P170 for details.

AF/AE lock

Setting the functions of [AF/AE LOCK]

[AF/AE Lock]
Refer to P160 for details.

Maintaining/not maintaining the lock when [AF/AE LOCK] is released

[AF/AE Lock Hold] → [ON]/[OFF]
Refer to P160 for details.

Shutter button

Focusing/not focusing when the shutter button is pressed halfway

[Shutter AF] → [ON]/[OFF]

Releasing/not releasing the shutter by pressing the shutter button halfway

[Half Press Release] → [ON]/[OFF]

For details on how to select the [Custom] menu settings, refer to P54.

Auto Focus

Focusing/Not focusing in advance

[Quick AF] → [ON]/[OFF]

As long as the camera is held steady, the camera will automatically adjust the focus and focus adjustment will then be quicker when the shutter is pressed. This is useful when you do not want to miss a picture-taking opportunity.

- The battery will be consumed faster than usual.
- Press the shutter button halfway again when it is difficult to focus on the subject.
- The [Quick AF] feature is disabled in the following conditions:
  - In Preview Mode
  - In low light situations
  - With lenses that only offer Manual Focus
  - With some Four Thirds lenses that do not support contrast AF

Adjusting/not adjusting the focus automatically when the eye sensor is activated

[Eye Sensor AF] → [ON]/[OFF]

If [Eye Sensor AF] in the [Custom] menu is set to [ON], the camera automatically adjusts the focus as the eye sensor is activated.

- Beep sounds are not emitted when the focus is achieved in [Eye Sensor AF].
- [Eye Sensor AF] may not work in dimly lit conditions.
- The [Eye Sensor AF] feature is disabled in the following conditions:
  - With lenses that only offer Manual Focus
  - With some Four Thirds lenses

Setting the duration for which the screen is enlarged

[Pinpoint AF Time]

[LONG] (Approx. 1.5 seconds)/**[MID]** (Approx. 1.0 second)/**[SHORT]** (Approx. 0.5 second)

For details on how to select the [Custom] menu settings, refer to P54.

Turning on/not turning on the AF Assist Lamp

[AF Assist Lamp] → [ON]/[OFF]

AF assist lamp will illuminate the subject when the shutter button is pressed halfway, making it easier for the camera to focus when recording in low light conditions. (Larger AF area is displayed depending on the recording conditions.)

- The effective range of the AF Assist Lamp is different depending on the lens used.
  - When the interchangeable lens (H-HS12035) is attached:
    Approx. 1.0 m (3.3 feet) to 3.0 m (9.8 feet)
  - When the interchangeable lens (H-FS14140) is attached:
    Approx. 1.0 m (3.3 feet) to 3.0 m (9.8 feet)
- The AF Assist Lamp is valid only for the subject in the center of the screen. Use it by positioning the subject in the center of the screen.
- Remove the lens hood.
- When you do not want to use the AF Assist Lamp (e.g. when taking pictures of animals in dark places), set the [AF Assist Lamp] to [OFF]. In this case, it will become more difficult to focus on the subject.
- The AF Assist Lamp gets slightly blocked when the interchangeable lens (H-HS12035/H-FS14140) is used, but it does not affect the performance.
- The AF Assist Lamp may be greatly blocked, and it may become harder to focus when a lens with large diameter is used.
- The setting for the [AF Assist Lamp] is fixed to [OFF] in the following cases.
  - When [Silent Mode] is set to [ON]

Moving/not moving the AF area with the cursor button

[Direct Focus Area] → [ON]/[OFF]

When [ ], [ ], or [ ] is selected, the AF area can be moved; when [ ] is selected, the enlarged position can be moved.

- When [Custom Multi] such as [ ] is selected, the AF area setting screen will be displayed.
- [Direct Focus Area] is fixed to [OFF] in the following case.
  - Creative Control Mode

Recording/not recording even when focus is not achieved

[Focus/Release Priority]

[FOCUS]:

You cannot take a picture until the subject is brought into focus.

[RELEASE]:

This gives priority to the best time to take a picture so you can take a picture when the shutter button is pressed fully.

- When set to [RELEASE], please be aware that focus may not be achieved even with focus mode set to [AFS], [AFF] or [AFC].
- [Focus/Release Priority] is disabled during motion picture recording.

For details on how to select the [Custom] menu settings, refer to P54.

Adjusting/not adjusting the focus manually after achieving Auto Focus

[AF+MF] → [ON]/[OFF]

When AF Lock is ON (press the shutter button halfway with the focus mode set to [AFS] or set AF Lock using [AF/AE LOCK]), you can make fine adjustments to the focus manually.

Manual Focus

Setting the operations for displaying the MF Assist

[MF Assist]

• Available settings vary depending on the lens used.

When an interchangeable lens having a focus ring (H-HS12035/H-FS14140) is used	
[ ]	Enlarge by operating the lens's focus ring or focus lever or pressing [ ]*.
[FOCUS]	Enlarge by operating the lens's focus ring or focus lever.
[ ]	Enlarge by pressing [ ]*.
[OFF]	The MF Assist cannot be enlarged even if you operate the lens's focus ring or focus lever or press [ ]*.

• If you press [ ]* when this item is set to [FOCUS] or [OFF], the screen that lets you set the area to be enlarged will be displayed.

When an interchangeable lens with no focus ring is used	
[ON]	You can adjust the focus when the screen that lets you set the area to be enlarged is displayed after pressing [ ]*.
[OFF]	You can adjust the focus after pressing [ ]* without displaying the screen that lets you set the area to be enlarged.

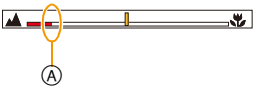
* Press the function button to which [AF Mode/MF] in [Fn Button Set] (P317) has been assigned. (assigned to [ ]/[Fn3] at the time of purchase)

Displaying/not displaying the MF Guide

[MF Guide] → [ON]/[OFF]

Ⓐ Indicator for ∞ (infinity)

When [MF Guide] on the [Custom] menu is set to [ON] and you focus manually, the MF guide is displayed on the screen. You can check whether the point of focus is to the near side or the far side.



For details on how to select the [Custom] menu settings, refer to P54.

Highlighting/not highlighting in-focus portions

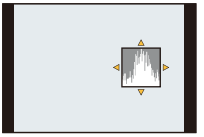
[Peaking]
Refer to P111 for details.

Screen display

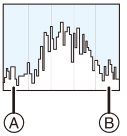
Displaying/not displaying the histogram

[Histogram] → [ON]/[OFF]

You can set the position by pressing ▲/▼/◀/▶.
• Direct touch operation is also possible from the recording screen.



• A histogram is a graph that displays brightness along the horizontal axis (black to white) and the number of pixels at each brightness level on the vertical axis.
It allows you to easily check a picture's exposure.
Ⓐ dark
Ⓑ bright

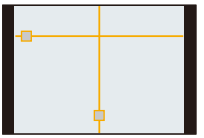


• **When the recorded picture and the histogram do not match each other under the following conditions, the histogram is displayed in orange.**
– When the Manual Exposure Assistance is other than [±0] during Exposure Compensation or in the Manual Exposure Mode
– When the flash is activated
– When suitable exposure is not achieved with the flash closed
– When the brightness of the screen is not correctly displayed in dark places
• The histogram is an approximation in the Recording Mode.
• The histogram displayed in this camera does not match histograms displayed by picture editing software used in PCs etc.

Displaying/not displaying the guide lines

[Guide Line] → [⊞]/[⊠]/[⊟]/[OFF]

When [⊟] is set, guideline positions can be set by pressing ▲/▼/◀/▶.
• You can also set the position directly by touching [▢] on the guideline of the recording screen.



For details on how to select the [Custom] menu settings, refer to P54.

Displaying the center of the screen

[Center Marker]
Refer to P209 for details.

Displaying/not displaying white saturated areas

[Highlight] → [ON]/[OFF]
When the Auto Review function is activated or when playing back, white saturated areas appear blinking in black and white.
This does not affect the recorded image.

- If there are any white saturated areas, we recommend compensating the exposure towards negative (P157) referring to the histogram (P309) and then taking the picture again. It may result in a better quality picture.
- This does not work while in Multi Playback, Calendar Playback, or Playback Zoom.

[ON]

[OFF]

Displaying areas that may be white saturated

[Zebra Pattern]
Refer to P210 for details.

Displaying the recording screen in black and white

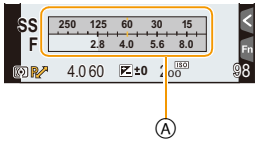
[Monochrome Live View]
Refer to P211 for details.

Checking/not checking the effects of aperture and shutter speed on the recording screen

[Constant Preview] → [ON]/[OFF]
Refer to P154 for details.

Displaying/not displaying the exposure meter

[Expo.Meter] → [ON]/[OFF]
Ⓐ Exposure meter



- Set to [ON] to display the Exposure meter when correcting exposure, performing Program Shift, setting aperture, and setting shutter speed.
- Unsuitable areas of the range are displayed in red.
- When the Exposure meter is not displayed, switch the display information for screen by pressing [DISP.]. (P44)
- The Exposure meter disappears after approximately 4 seconds if no operation is performed.

For details on how to select the [Custom] menu settings, refer to P54.

Switching the display method of the viewfinder

[LVF Disp.Style] → [ ]: viewfinder style/[ ]: monitor style

Switching the display method of the monitor

[Monitor Disp. Style] → [ ]: viewfinder style/[ ]: monitor style

Displaying/not displaying the on-monitor recording information screen

[Monitor Info. Disp.] → [ON]/[OFF]

Switching between the angle of view for taking pictures and the one for recording motion pictures

[Rec Area] → [ ] (Picture)/**[ ]** (Motion picture)

- When the aspect ratio setting is different in still and motion pictures, the angle of view changes at the start of motion picture recording.
  When [Rec Area] is set to [ ], angle of view during motion picture recording is displayed.
- The recording area indicated is an approximation.

Switching screens to those suitable for motion picture recording

[Video-Priority Display]

Refer to P211 for details.

Displaying a picture right after it is taken

[Auto Review]

[Duration Time]	Set the length of time that the picture is displayed after taking the still picture. **[HOLD]:** The pictures are displayed until shutter button is pressed halfway. **[5SEC]/[4SEC]/[3SEC]/[2SEC]/[1SEC]/[OFF]**	
[Playback Operation Priority]	**[ON]**	Switching the display of the playback screen, deleting pictures, etc. are possible during [Auto Review].
	[OFF]	Button operations during [Auto Review] become the same as those for recording.

- When [Duration Time] is set to [HOLD], [Playback Operation Priority] is fixed to [ON].

For details on how to select the [Custom] menu settings, refer to P54.

Buttons and dials

Assigning functions to the function buttons

[Fn Button Set]
Refer to P317 for details.

Switching the method for setting Quick Menu items

[Q.MENU]
[PRESET]:
The default items can be set.
[CUSTOM]:
The Quick Menu will consist of desired items. (P315)

Setting the operation methods of the rear dial and front dial

[Dial Set.]

[Assign Dial (F/SS)]	Assigns the operations of the aperture value and shutter speed in Manual Exposure Mode. **[F SS]:** Assigns the aperture value to the front dial, and the shutter speed to the rear dial. **[SS F]:** Assigns the shutter speed to the front dial, and the aperture value to the rear dial.
[Rotation (F/SS)]	Changes the rotation direction of the dials for adjusting the aperture value and shutter speed. **[ ]/[ ]**
[Exposure Comp.]	Assigns the Exposure Compensation to the front dial or rear dial so that you can directly adjust it. **[ ]** (Front Dial)/**[ ]** (Rear Dial)/**[OFF]**

For details on how to select the [Custom] menu settings, refer to P54.

Enabling/disabling the motion picture button

[Video Button] → [ON]/[OFF]
• This function is for preventing accidental operation of the button.

Touch operations and others

Changing the settings for a power zoom lens

[Power Zoom Lens]
Refer to P165 for details.

Setting the display method and operation of manual focus when using an interchangeable lens with no focus ring

[Lens w/o Focus Ring]
• These items can be set only when an interchangeable lens with no focus ring is used.
[Control Dial (MF)]
[DISP.]:
Rotating the control dial allows you to switch the enlarged display (windowed/full screen).
[FOCUS]:
Rotating the control dial allows you to adjust the focus.
[MF Assist Display]
[FULL]:
Enlarges the display in a window on the screen.
[PIP]:
Enlarges the display in full screen.

Setting the eye sensor sensitivity and the method for switching between the monitor and viewfinder

[Eye Sensor]

[Sensitivity]	This will set the sensitivity of the eye sensor. **[HIGH]/[LOW]**
[LVF/Monitor Switch]	This will set the method for switching between the monitor and viewfinder. (P48) **[LVF/MON AUTO] (automatic switching between the monitor and viewfinder)/ [LVF] (viewfinder)/[MON] (monitor)** • If you press [LVF] to switch the display, the [LVF/Monitor Switch] setting will also switch.

For details on how to select the [Custom] menu settings, refer to P54.

Enabling/disabling the touch operation

[Touch Settings]
• When set to [OFF], no corresponding touch tab or touch icon is displayed on the screen.

[Touch Screen]	All touch operations. When set to [OFF], only button and dial operations can be used. **[ON]/[OFF]**
[Touch Tab]	Operation to display the touch icons by touching tabs such as [ ] displayed on the right of the screen. **[ON]/[OFF]**
[Touch AF]	Operation to optimize the focus or both the focus and brightness for a touched subject. **[AF]** (P101)/**[AF+AE]** (P105)/**[OFF]**
[Touch Pad AF]	Operation to move the AF area by touching the monitor when the viewfinder is in use. (P104) **[EXACT]/[OFFSET]/[OFF]**

Switching the speed for forwarding or rewinding pictures continuously

[Touch Scroll] → **[H]** (High speed)/**[L]** (Low speed)

Displaying/not displaying the selection screen when the mode dial is switched to .

[Menu Guide]
[ON]:
Displays the selection screen for the Creative Control Mode.
[OFF]:
Displays the recording screen of the currently selected mode of the Creative Control Mode.

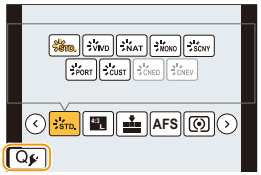
To enable/disable the shutter release without lens.

[Shoot w/o Lens]
[ON]:
Shutter will operate regardless of the lens on the unit.
[OFF]:
Shutter will not operate when a lens is not attached to the camera body or is not attached correctly.
• When using a Leica lens mount adaptor (DMW-MA2M, DMW-MA3R: optional), set it to [ON].

Change the Quick Menu to your preferred item

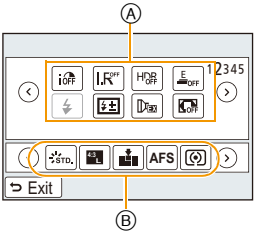
When [Q.MENU] (P312) in the [Custom] menu is set to [CUSTOM], the Quick Menu can be changed as desired.
Up to 15 items can be set to the Quick Menu.

1 Press [Q.MENU] to display the Quick Menu.
2 Press ▼ to select [Q] and then press [MENU/SET].



3 Press ▲/▼/◀/▶ to select the menu item in the top row and then press [MENU/SET].
4 Press ◀/▶ to select the empty space in the bottom row and then press [MENU/SET].

Ⓐ Items that can be setup as Quick Menus.
Ⓑ Items that can be displayed in the Quick Menu screen.



- You can also set the menu item by dragging it from the top row to the bottom row.
- If there is no empty space in the bottom row, you can replace an existing item with a new select item by selecting the existing item.
- To cancel the setting, move to the bottom row by pressing ▼ and select an item to cancel, and then press [MENU/SET].
- Items that can be set are as follows:

[Rec] menu/Recording functions	
– [Photo Style] (P140) – [Picture Setting] ([Aspect Ratio] (P129)/[Picture Size] (P129)) – [Quality] (P130) – [AFS/AFF] (P93) – [Metering Mode] (P161) – [Burst Rate] (P113) – [Auto Bracket] (P117) – [Self Timer] (P119) – [i.Dynamic] (P144)	– [i.Resolution] (P144) – [HDR] (P145) – [Electronic Shutter] (P171) – [Flash Mode] (P183) – [Flash Adjust.] (P186) – [Ex. Tele Conv.] (still pictures/motion pictures) (P163) – [Digital Zoom] (P165) – [Stabilizer] (P51) – [AF Mode] (P91)

[Motion Picture] menu
– [Motion Pic. Rec Format] (P193)
– [Motion Pic. Rec Quality] (P193)
– [Variable Frame Rate] (P215)
– [Picture Mode] (P200)
– [Synchro Scan] (P218)
– [Time Code Display] (P214)

[Custom] menu
– [Silent Mode] (P170)
– [Peaking] (P111)
– [Histogram] (P309)
– [Guide Line] (P309)
– [Zebra Pattern] (P210)
– [Monochrome Live View] (P211)
– [Rec Area] (P311)
– [Video-Priority Display] (P211)
– [Step Zoom] (P166)
– [Zoom Speed] (P166)
– [Touch Screen] (P314)

5 Press [🗑/↩].

- It will return to screen of step **1**.
  Press [MENU/SET] to switch to the recording screen.

Assigning frequently used functions to the buttons (function buttons)

You can assign frequently-used functions to particular buttons or icons.

1 Select the menu. (P54)

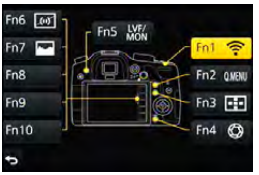
MENU → [Custom] → **[Fn Button Set]**

2 Press ▲/▼ to select [Setting in REC mode] or [Setting in PLAY mode] and then press [MENU/SET].

3 Press ▲/▼ to select the function button you want to assign a function to and then press [MENU/SET].

4 Press ▲/▼ to select the function you want to assign and then press [MENU/SET].

- Some functions cannot be assigned depending on the function button.
- Refer to P318 for [Setting in REC mode] and P320 for [Setting in PLAY mode].



Making the function button settings for recording

You can use assigned functions by pressing a function button when recording.

- The following functions can be assigned to the button [Fn1], [Fn2], [Fn3], [Fn4], or [Fn5]; or the icon [Fn6], [Fn7], [Fn8], [Fn9], or [Fn10].

[Rec] menu/Recording functions	
– [Wi-Fi] (P255): [Fn1]*	– [AFS/AFF] (P91)
– [Q.MENU] (P53): [Fn2]*	– [Metering Mode] (P161)
– [LVF/Monitor Switch] (P48): [Fn5]*	– [Burst Rate] (P113)
– [AF/AE LOCK] (P160)	– [Auto Bracket] (P117)
– [AF-ON] (P109, 160)	– [Self Timer] (P119)
– [Preview] (P155): [Fn4]*	– [Highlight Shadow] (P142)
– [One Push AE] (P156)	– [i.Dynamic] (P144)
– [Touch AE] (P90)	– [i.Resolution] (P144)
– [Level Gauge] (P46): [Fn6]*	– [HDR] (P145)
– [Focus Area Set] (P319)	– [Electronic Shutter] (P171)
– [Zoom Control] (P162)	– [Flash Mode] (P183)
– [1 Shot RAW+JPG]	– [Flash Adjust.] (P186)
– [1 Shot Spot Metering]	– [Ex. Tele Conv.] (still pictures/motion pictures) (P163)
– [Cursor Button Lock]	
– [Photo Style] (P140)	– [Digital Zoom] (P165)
– [Aspect Ratio] (P129)	– [Stabilizer] (P51)
– [Picture Size] (P129)	– [AF Mode/MF] (P91): [Fn3]*
– [Quality] (P130)	– [Restore to Default] (P319)
[Motion Picture] menu	
– [Motion Pic. Rec Format] (P191)	– [Synchro Scan] (P218)
– [Motion Pic. Rec Quality] (P193)	– [Time Code Display] (P214)
– [Variable Frame Rate] (P215)	– [Mic. Directivity Adjust] (P350)
– [Picture Mode] (P200)	– [Color Bars] (P219)
[Custom] menu	
– [Silent Mode] (P170)	– [Rec Area] (P311)
– [Peaking] (P309)	– [Video-Priority Display] (P211)
– [Histogram] (P309): [Fn7]*	– [Step Zoom] (P166)
– [Guide Line] (P309)	– [Zoom Speed] (P166)
– [Zebra Pattern] (P210)	– [Touch Screen] (P314)
– [Monochrome Live View] (P211)	

* Function button settings at the time of purchase.
(At the time of purchase, function button settings are not assigned to [Fn8], [Fn9] and [Fn10].)

Configuring the function button settings from the on-monitor recording information screen

Touching [Fn] on the on-monitor recording information screen (P44) also allows you to display the screen in step **3.**

Using function buttons with touch operations

[Fn6], [Fn7], [Fn8], [Fn9], and [Fn10] are used by touching function buttons.

1 Touch [Fn].

2 Touch [Fn6], [Fn7], [Fn8], [Fn9] or [Fn10].

- The assigned function will operate.

- Some functions cannot be used depending on the mode or displayed screen.
- When set to [Focus Area Set], it is possible to display the position setting screen of either AF area or MF Assist.
- When [1 Shot RAW+JPG] is set, it will record the RAW file and a fine JPEG image simultaneously once only. It will return to original quality after recording.
- When [1 Shot Spot Metering] is set, it will record with [Metering Mode] set to [⊙] (spot) once only. It will return to original Metering Mode after recording.
- Operations of the cursor button, [MENU/SET], and the control dial are disabled when [Cursor Button Lock] is set. Press the function button again to enable them.
- When [Restore to Default] is set, function button settings return to the default configuration.

Not available in these cases:

- [Fn4] cannot be used in the following cases.
  – Intelligent Auto Mode
  – Intelligent Auto Plus Mode
  – Creative Control Mode
  – When using [Multi Exp.]
- [Fn1] cannot be used during Time Lapse Shooting.
- [Fn6], [Fn7], [Fn8], [Fn9], and [Fn10] cannot be used when the viewfinder is in use.

Making the function button settings for playback

You can directly set an assigned function to a selected image by pressing the function button during playback.
• The following functions can be assigned to the button [Fn1], [Fn2] or [Fn5].

[Playback] Menu/Playback functions	
– [Favorite] (P248): [Fn2]*	– [Delete Single] (P227)
– [Print Set] (P249)	– [Off]: [Fn1]*/[Fn5]*
– [Protect] (P251)	– [Restore to Default]

* Function button settings at the time of purchase.
• When [Restore to Default] is set, function button settings return to the default configuration.

■ Using the function buttons during playback

Example: When [Fn2] is set to [Favorite]

❶ Press ◄/► to select the picture.
❷ Press [Fn2], and then set the image as [Favorite].
- When assigning [Print Set], set the number of pictures to be printed next.
- When assigning [Delete Single], select [Yes] on the confirmation screen.

Registering your preferred settings (Custom Mode)

You can register the current camera settings as custom settings.
If you then record in Custom Mode, you can use the registered settings.
• Initial setting of the Program AE Mode is registered as the custom settings initially.

Registering Personal Menu Settings (Registering custom settings)

To allow recording using the same settings, up to 5 sets of current camera settings can be registered using [Cust.Set Mem.]. (C1, C2, C3-1, C3-2, C3-3)

Preparations: Set in advance the Recording Mode you wish to save and select the desired menu settings on the camera.

1 Select the menu. (P54)

MENU → [Custom] → [Cust.Set Mem.]

2 Press ▲/▼ to select the custom set to register and then press [MENU/SET].

C1	The settings are registered for C1 on the mode dial. • You can record using by simply rotating the mode dial to the corresponding position. If you register the custom settings you use often, it is then convenient to use them.
C2	The settings are registered for C2 on the mode dial. • You can record using by simply rotating the mode dial to the corresponding position. If you register the custom settings you use often, it is then convenient to use them.
C3-1	The settings are registered for C3 on the mode dial. • You can register up to 3 sets of custom settings and use the different sets as condition demand.
C3-2	
C3-3	

• Confirmation screen is displayed. It is executed when [Yes] is selected.
Exit the menu after it is executed.

• The following menu items are not registered as custom settings.

[Rec] menu	[Setup] menu	[Custom] menu	[Playback] menu
– Data registered with [Face Recog.] – The [Profile Setup] setting	– All menus	– [Touch Scroll] – [Menu Guide]	– [Rotate Disp.] – [Picture Sort] – [Delete Confirmation]

Recording using registered custom set

You can easily call up the settings you have registered using [Cust.Set Mem.].

Set the mode dial to [C1], [C2] or [C3]

- The custom set will be called up. If you set the mode dial to [C3], the custom set you used last time ([C3-1], [C3-2], or [C3-3]) will be called up.

■ To change a custom set in [C3]

1 **Set the mode dial to [C3].**

2 **Press [MENU/SET] to display the menu.**

3 **Press ◄/► to select the custom setting you want to use, and then press [MENU/SET].**

> It is also possible to display the selection screen by touching the Recording Mode icon in recording screen.

- Saving of the selected custom settings is displayed on the screen.

■ Changing the settings

Registered contents do not change when the menu setting is changed temporarily with the mode dial set to C1, C2 or C3. To change the registered settings, overwrite the registered content using [Cust.Set Mem.] on the custom settings menu.

Enjoying Motion Pictures in 4K

Watching motion pictures in 4K

■ Playing Back on a TV Screen

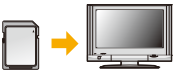
By connecting the camera to a TV that supports motion pictures in 4K and playing back motion pictures recorded with their size set to [4K] or [C4K] in [Rec Quality], you can enjoy finely-detailed motion pictures in 4K. Even though the output resolution will be lower, you can also play them back by connecting the camera to a TV that does not support motion pictures in 4K.

Preparation: If the size is [4K], set [HDMI Mode (Play)] (P65) to [AUTO] or [4K].
If the size is [C4K], set [HDMI Mode (Play)] (P65) to [AUTO] or [C4K].

- To play back motion pictures recorded with [System Frequency] set to [59.94 Hz (NTSC)] and the recording frame rate set to 24p in [Rec Quality], set [HDMI Mode (Play)] to [AUTO]. For settings other than [AUTO], it cannot output at 24 frames/second.

Connect the camera and a 4K-compatible TV with an HDMI micro cable, and display the playback screen. **(P325)**

- When [VIERA Link] is set to [ON] and the camera is connected to a TV supporting VIERA Link, input of the TV will be switched automatically and playback screen will be displayed. Refer to P327 for details.
- When [System Frequency] is set to a broadcasting system different from that of your region, images may not be played back correctly.
- When you have motion pictures recorded with [Rec Format] set to [MP4] and their size set to [4K] in [Rec Quality], you can also play them back by inserting the card into the SD card slot of a TV that supports motion pictures in 4K.



- Read the operating instructions for the TV.

■ Watching on a PC

To play back motion pictures recorded with their size set to [4K] or [C4K] in [Rec Quality] on a PC, use the software “PHOTOfunSTUDIO” on the DVD (supplied).

- To play back and edit motion pictures in 4K, you need a high-performance PC environment.
- Refer to the operating instructions of “PHOTOfunSTUDIO” (PDF).

Storing 4K motion pictures

■ Storing on a PC

You can acquire recorded pictures to a PC by connecting the camera and the PC.
Refer to P329 for details.

■ Storing on a DVD or CD

You cannot dub motion pictures recorded with their size set to [4K] or [C4K] in [Rec Quality] to Blu-ray discs and DVDs with Panasonic recorders. (As of March 2014)
With the “PHOTOfunSTUDIO” software on the DVD (supplied), you can convert 4K motion pictures into smaller sized motion pictures or copy 4K motion pictures to a DVD or CD.
• Refer to the operating instructions of “PHOTOfunSTUDIO” (PDF).

Playing Back Pictures on a TV Screen

Pictures recorded with this unit can be played back on a TV screen.

Preparations: Turn this unit and the TV off.

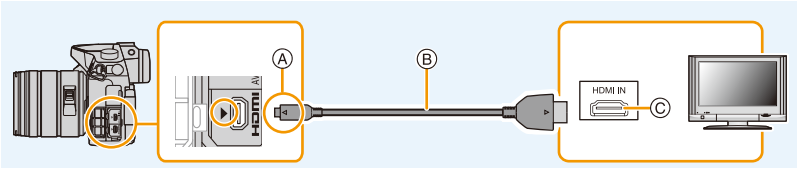
- Confirm the terminals on your TV and use a cable compatible with the terminals.
  Image quality may vary with the connected terminals.

❶ High quality
❷ HDMI socket
❸ Video socket

1 Connect the camera and a TV.

- Check the direction of the terminals and plug in/out straight holding onto the plug.
  (It may result in malfunction by the deforming of the terminal if it is plugged in obliquely or in wrong direction.)
  Do not connect devices to incorrect terminals. Doing so may cause malfunction.

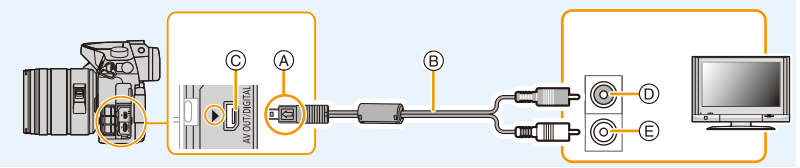
To connect with an HDMI micro cable



- Check the [HDMI Mode (Play)]. (P65)
- To play back motion pictures recorded with [System Frequency] set to [59.94 Hz (NTSC)] and the recording frame rate set to 24p in [Rec Quality], set [HDMI Mode (Play)] to [AUTO]. For settings other than [AUTO], it cannot output at 24 frames/second.
- Audio will be played back as stereo (2ch).
- No picture is displayed on the screen of this unit.
- Use a “High Speed HDMI micro cable” with the HDMI logo.
  Cables that do not comply with the HDMI standards will not work.
  “High Speed HDMI micro cable” (Type D–Type A plug, up to 2 m (6.6 feet) long)

Ⓐ Align the marks, and insert.
Ⓑ HDMI micro cable
Ⓒ HDMI socket

To connect with an AV cable (optional)



- Always use a genuine Panasonic AV cable (DMW-AVC1: optional).
- Check the [TV Aspect]. (P65)
- Audio will be played back in monaural.
- The viewfinder cannot be displayed when connected with a AV cable.
- When [System Frequency] is set to [24.00 Hz (CINEMA)], you cannot play back images on a TV connected with an AV cable.

Ⓐ Align the marks, and insert.
Ⓑ AV cable (optional)
Ⓒ [AV OUT/DIGITAL] terminal
- The color of the terminal is gold.

Ⓓ Yellow: to the video input socket
Ⓔ White: to the audio input socket

2 Turn on the TV and select the input to match the connector in use.

3 Turn the camera on and then press [▶].

- Input of the TV will switch automatically and playback screen is displayed when connected to a VIERA Link compatible TV using an HDMI micro cable with the [VIERA Link] set to [ON]. (P327)

- When [System Frequency] is set to a broadcasting system different from that of your region, images may not be played back correctly.
- Depending on the [Aspect Ratio], black bands may be displayed on the top and bottom or the left and right of the pictures.
- Change the screen mode on your TV if the picture is displayed with the top or bottom cut off.
- Output from the HDMI micro cable has priority when both AV cable (optional) and HDMI micro cable are connected.
- The connection with the USB connection cable (supplied) will take priority when you connect the USB connection cable (supplied) simultaneously with the HDMI micro cable.
- When you play back a picture vertically, it may be blurry.
- Proper playback will be dependent on the TV used for viewing.
- You can view pictures on TVs in other countries (regions) which use the NTSC or PAL system when you set [System Frequency] in the [Setup] menu.
- No sound is output from the camera speakers.
- Read the operating instructions for the TV.

The recorded pictures can be played back on a TV with an SD Memory Card slot

- Depending on the TV model, pictures may not be displayed on the full screen.
- The file format of the motion pictures that can be played back differs depending on the TV model.
- For cards compatible with playback, refer to the operating instructions of the TV.

Using VIERA Link (HDMI)

What is the VIERA Link (HDMI) (HDAVI Control™)?

- This function allows you to use your remote control for the Panasonic TV for easy operations when this unit has been connected to a VIERA Link compatible device using a HDMI micro cable for automatic linked operations.
  (Not all operations are possible.)
- VIERA Link is a unique Panasonic function built on a HDMI control function using the standard HDMI CEC (Consumer Electronics Control) specification.
  Linked operations with HDMI CEC compatible devices made by other companies are not guaranteed. When using devices made by other companies that are compatible with VIERA Link, refer to the operating instructions for the respective devices.
- This unit supports “VIERA Link Ver.5” function. “VIERA Link Ver.5” is the standard for Panasonic’s VIERA Link compatible equipment. This standard is compatible with Panasonic’s conventional VIERA Link equipment.

Preparations: Set the [VIERA Link] to [ON]. (P66)

1 Connect this unit to a Panasonic TV compatible with VIERA Link with an HDMI micro cable (P325).

2 Turn the camera on and then press [▶].

3 Operate with the remote control for the TV.

- Operate with reference to the operation icons displayed on the screen.

- To play back the sound of a film during a slide show, set [Sound] to [AUTO] or [Audio] on the Slide Show setting screen.
- It is recommended to connect this unit to an HDMI terminal other than the HDMI1 if there are 2 or more HDMI input terminals on the TV.
- Operation using the buttons on this unit will be limited.

Other linked operations

Turning this unit off:

If you use the remote control for the TV to turn the TV off, this unit is also turned off.

Automatic input switching:

- If you connect with an HDMI micro cable and then turn this unit on, and then press [▶], the input channel on the TV automatically switches to this unit's screen. If the TV's power is in standby status, it will turn on automatically (if [Set] has been selected for the TV's [Power on link] setting).
- Depending on your TV's HDMI connection, on some TV's it may be necessary to manually select the HDMI connection you are using. In this case, use the remote control for the TV to switch the input channel.
  (For details on how to switch input, please read the operating instructions for the TV.)
- If VIERA Link does not work properly, refer to P407.

- If you are unsure whether or not the TV you are using is compatible with VIERA Link, read the operating instructions for the TV.
- Available linked operations between this unit and a Panasonic TV are different depending on the types of Panasonic TVs even if they are compatible with VIERA Link. Refer to the operating instructions of the TV for the operations are supported on the TV.
- Be sure to use a cable that is HDMI certified.
- [HDMI Mode (Play)] for this unit is determined automatically when the VIERA Link is operating.
- Use a "High Speed HDMI micro cable" with the HDMI logo.
  Cables that do not comply with the HDMI standards will not work.
  "High Speed HDMI micro cable" (Type D–Type A plug, up to 2 m (6.6 feet) long)

Saving still pictures and motion pictures on your PC

You can acquire recorded pictures to a PC by connecting the camera and the PC.

- Some PCs can read directly from the card removed from the camera. For details, refer to the operating instructions of your PC.
- **If the computer being used does not support SDXC Memory Cards, a message prompting you to format may appear.**
  (Doing so will cause recorded images to be erased so do not choose to format.)
  If the card is not recognized, please refer to the below support site.
  http://panasonic.net/avc/sdcard/information/SDXC.html

PC that can be used

The unit can be connected to any PC capable of recognizing a mass storage device.

• Windows support:	Windows XP/Windows Vista/Windows 7/Windows 8/ Windows 8.1
• Mac support:	OS X v10.5 to v10.9

AVCHD motion pictures may not be imported correctly when copied as files or folder

- With Windows, always import AVCHD motion pictures using “PHOTOfunSTUDIO”, one of the programs on the DVD (supplied).
- With a Mac, AVCHD motion pictures can be imported using “iMovie”.
  Please note that importing is not possible depending on the picture quality.
  (For details about iMovie, please contact Apple Inc.)

About the supplied software

The supplied DVD includes the following software.
Install the software on to your computer before use.

- **PHOTOfunSTUDIO 9.5 PE (Windows XP/Windows Vista/Windows 7/Windows 8/Windows 8.1)**
  This software allows you to manage images. For example, you can send pictures and motion pictures to a PC and sort them by recording date or model name. You can also perform operations such as writing images to a DVD, processing and correcting images, and editing motion pictures.

- **SILKYPIX Developer Studio 4.1 SE (Windows XP/Windows Vista/Windows 7/Windows 8/Windows 8.1, Mac OS X v10.5/v10.6/v10.7/v10.8/v10.9)**
  This is software to edit RAW format images.
  Edited images can be saved in a format (JPEG, TIFF, etc.) that can be displayed on a personal computer.

For details on how to use the SILKYPIX Developer Studio, refer to the "Help" or the Ichikawa Soft Laboratory's support website:
http://www.isl.co.jp/SILKYPIX/english/p/support/

- **LoiLoScope 30 day full trial version (Windows XP/Windows Vista/Windows 7/Windows 8/Windows 8.1)**
  LoiLoScope is a video editing software where that draws out the full power of your PC. Creating videos is as easy as organizing cards on top of a desk. Use your music, picture and video files to create videos to share with your friends and family by burning it to a DVD, uploading it to websites, or simply share your videos with your friends via e-mail.
  – This will only install a shortcut to the trial version download site.

For more information on how to use LoiLoScope, read the LoiLoScope manual available for download at the link below.
Manual URL: http://loilo.tv/product/20

Installing supplied software

• Before inserting the DVD, close all running applications.

1 Check the environment of your PC.

- **Operating environment of "PHOTOfunSTUDIO"**
  - OS:
    Windows® XP (32bit) SP3,
    Windows Vista® (32bit) SP2,
    Windows® 7 (32bit/64bit) or SP1,
    Windows® 8 (32bit/64bit),
    Windows® 8.1 (32bit/64bit)
  - CPU:
    Pentium® III 500 MHz or higher (Windows® XP),
    Pentium® III 800 MHz or higher (Windows Vista®),
    Pentium® III 1 GHz or higher (Windows® 7/Windows® 8/Windows® 8.1)
  - Display:
    1024×768 pixels or more (1920×1080 pixels or more recommended)
  - RAM:
    512 MB or more (Windows® XP/Windows Vista®),
    1 GB or more (Windows® 7 32bit/Windows® 8 32bit/Windows® 8.1 32bit),
    2 GB or more (Windows® 7 64bit/Windows® 8 64bit/Windows® 8.1 64bit)
  - Free hard disk space:
    450 MB or more for installing software
- Refer to the operating instructions of "PHOTOfunSTUDIO" (PDF) for further operating environment.
- For details on "SILKYPIX Developer Studio", please read the support site given on P330.

2 Insert the DVD with the supplied software.

3 Click on the [Applications] on the install menu.

- If the automatic playback screen is displayed, you can display the menu by selecting and executing [Launcher.exe].
- In Windows 8/Windows 8.1, you can display the menu by clicking a message that is displayed after inserting the DVD and then selecting and executing [Launcher.exe].
- You can also display the menu by double-clicking [VFFXXXX] in [Computer] (XXXX differs depending on the model).

4 Click on the [Recommended Installation].

- Proceed with installation according to messages appearing on the screen.

• The software compatible with your PC will be installed.
• On the Mac, SILKYPIX can be installed manually.

1. Insert the DVD with the supplied software.
2. Double-click the application folder on the DVD.
3. Double-click on the automatically displayed folder.
4. Double-click the icon in the application folder.

Not available in these cases:

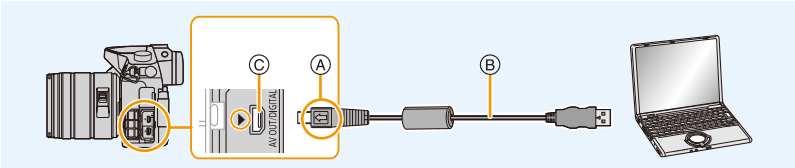
• "PHOTOfunSTUDIO" and "LoiLoScope" are not compatible with Mac.

■ Transferring pictures to a PC

Preparations: Install “PHOTOfunSTUDIO” to the PC.

1 Connect the computer and camera with the USB connection cable (supplied).

- Please turn this unit on and your PC before connecting.
- Turn the monitor toward you.
- Check the direction of the terminals and plug in/out straight holding onto the plug.
  (It may result in malfunction by the deforming of the terminal if it is plugged in obliquely or in wrong direction.)
  Do not connect devices to incorrect terminals. Doing so may cause malfunction.
- Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional).



Ⓐ Align the marks, and insert.
Ⓑ USB connection cable (supplied)
Ⓒ [AV OUT/DIGITAL] terminal
- The color of the terminal is gold.

2 Press ▲/▼ to select [PC], and then press [MENU/SET].

- If [USB Mode] (P64) is set to [PC] in the [Setup] menu in advance, the camera will be automatically connected to the PC without displaying the [USB Mode] selection screen.
- When the camera is connected to a PC while [USB Mode] is set to [PictBridge(PTP)], a message may appear on the PC screen. In that case, close the message, and remove the USB connection cable safely, and then set the [USB Mode] to [PC].

3 Copy the images to a PC using “PHOTOfunSTUDIO”.

- Do not delete or move copied files or folders in Windows Explorer.
  When viewing in “PHOTOfunSTUDIO”, you will not be able to play back or edit.

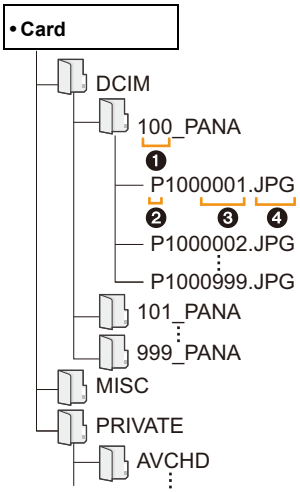
- Use a battery with sufficient battery power or the AC adaptor (optional). If the remaining battery power becomes low while the camera and the PC are communicating, the status indicator blinks and the alarm beeps.
  Disconnect the USB connection cable safely. Otherwise, data may be destroyed.
- Before connecting or disconnecting the AC adaptor (optional), turn the camera off.
- Before inserting or removing a card, turn the camera off and disconnect the USB connection cable. Otherwise, data may be destroyed.

Copying to a PC without using "PHOTOfunSTUDIO"

If you are not able to install "PHOTOfunSTUDIO", you can copy files and folders to your PC by dragging and dropping files from this unit.

- **The content (folder structure) on the card of this unit is as follows.**

For Windows:	**A drive ([LUMIX]) is displayed in [Computer]**
For Mac:	**A drive ([LUMIX]) is displayed on the desktop**



DCIM:	Images
❶ Folder number	
❷ Color space	P: sRGB _: AdobeRGB
❸ File number	
❹ JPG:	Still pictures
MP4:	[MP4] Motion pictures
MOV:	[MOV] Motion pictures
RW2:	Pictures in RAW files
MPO:	3D pictures
MISC:	DPOF print Favorite
AVCHD:	[AVCHD] Motion pictures

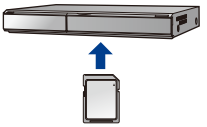
- A new folder is created when pictures are taken in the following situations.
  - After [No.Reset] (P67) in the [Setup] menu has been executed
  - When a card containing a folder with the same folder number has been inserted (such as when pictures were taken using another maker of camera)
  - When there is a picture with file number 999 inside the folder

Connection in the PTP Mode

Set [USB Mode] to [PictBridge(PTP)].

- Data can now be read only from the card in the PC.
- When there are 1000 or more pictures on a card, the pictures may not be imported in the PTP Mode.
- Motion picture cannot be played back in PTP Mode.

Saving still pictures and motion pictures on a Recorder



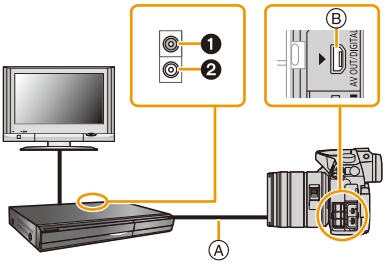
If you insert card holding content recorded with this unit into a Panasonic recorder, you can dub the content to a Blu-ray Disc or DVD etc.
Methods to export still pictures and motion pictures to other devices will vary depending on the file format. (JPEG, RAW, MPO, AVCHD, MP4 or MOV).

- See the operating instructions for the recorder about the details about copying and playing back.

■ Dubbing with non-compatible equipment

You can dub the content played back using this unit to non-compatible equipment such as recorders and video players by connecting this unit to the non-compatible equipment using an AV cable (optional).
Non-compatible equipment will be able to play back the content. This is convenient if you wish to pass around dubbed content. In this case, the content will be played back in standard rather than high-definition picture quality.

1 **Connect this unit with the recording equipment with an AV cable (optional).**
2 **Start the playback of this unit.**
3 **Start the recording on the recording equipment.**
- When ending the recording (copying), stop the playback on this unit after stopping the recording on recording equipment.



❶ Yellow: to the video input socket
❷ White: to the audio input socket
Ⓐ AV cable (optional)
Ⓑ [AV OUT/DIGITAL] terminal
- The color of the terminal is gold.

- When you play back motion pictures on 4:3 aspect ratio TV, you must set [TV Aspect] (P65) on this unit to [4:3] before starting a copy. The image will be vertically long if you play back motion pictures copied with [16:9] setting on a [4:3] aspect TV.
- When [System Frequency] is set to a broadcasting system different from that of your region, images may not be played back correctly.
- When [System Frequency] is set to [24.00 Hz (CINEMA)], you cannot play back images on a TV connected with an AV cable.
- Always use a genuine Panasonic AV cable (DMW-AVC1: optional).
- See the operating instructions for the recording equipment for details about copying and playing back.

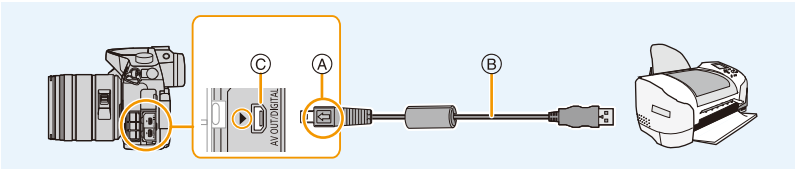
Printing the Pictures

If you connect the camera to a printer supporting PictBridge, you can select the pictures to be printed out and instruct that printing be started on the camera's monitor.
- Group pictures will not be displayed as group pictures but as single pictures.
- Some printers can print directly from the card removed from the camera. For details, refer to the operating instructions of your printer.

Preparations: Turn on the camera and the printer.
Perform the print quality and other settings at the printer before printing the pictures.

1 Connect the printer and camera with the USB connection cable (supplied).

- Turn the monitor toward you.
- Check the direction of the terminals and plug in/out straight holding onto the plug.
  (It may result in malfunction by the deforming of the terminal if it is plugged in obliquely or in wrong direction.)
  Do not connect devices to incorrect terminals. Doing so may cause malfunction.
- Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional).



Ⓐ Align the marks, and insert.
Ⓑ USB connection cable (supplied)
Ⓒ [AV OUT/DIGITAL] terminal
- The color of the terminal is gold.

2 Press ▲/▼ to select [PictBridge(PTP)], and then press [MENU/SET].

- Use a battery with sufficient battery power or the AC adaptor (optional). If the remaining battery power becomes low while the camera and the printer are connected, the status indicator blinks and the alarm beeps. If this happens during printing, stop printing at once. If not printing, disconnect the USB connection cable.
- Do not disconnect the USB connection cable while [⊗] (Cable disconnect prohibit icon) is displayed.
  (May not be displayed depending on the type of printer used.)
- Before connecting or disconnecting the AC adaptor (optional), turn the camera off.
- Before inserting or removing a card, turn the camera off, and disconnect the USB connection cable.

Not available in these cases:

- Motion pictures recorded cannot be printed out.

Selecting a single picture and printing it

1 Press ◄/► to select the picture and then press [MENU/SET].

2 Press ▲ to select [Print start] and then press [MENU/SET].
- Refer to P340 for the items that can be set before starting to print the pictures.
- Disconnect the USB connection cable after printing.

Selecting multiple pictures and printing them

1 Press ▲.

2 Press ▲/▼ to select an item and then press [MENU/SET].

[Multi Select]	Multiple pictures are printed at one time. • Press ▲/▼/◄/► to select the pictures and then press [MENU/SET]. (When [MENU/SET] is pressed again, the setting is canceled.) • After the pictures have been selected, press ◄ to select [OK], and then press [MENU/SET].
[Select All]	Prints all the stored pictures.
[Print Set (DPOF)]	Prints the pictures set in [Print Set] only. (P249)
[Favorite]	Prints the pictures set as favorites only. (P248)

3 Press ▲ to select [Print start] and then press [MENU/SET].
- If the print check screen has appeared, select [Yes], and print the pictures.
- Refer to P340 for the items which can be set before starting to print the pictures.
- Disconnect the USB connection cable after printing.

Print Settings

Select and set the items both on the screen in step 2 of the "Selecting a single picture and printing it" and in step 3 of the "Selecting multiple pictures and printing them" procedures.

- When you want to print pictures on a paper size or a layout which is not supported by the camera, set [Paper Size] or [Page Layout] to [🖶] and then set the paper size or the layout on the printer.
  (For details, refer to the operating instructions of the printer.)
- When [Print Set (DPOF)] has been selected, the [Print with Date] and [Num.of prints] items are not displayed.

■ [Print with Date]

[ON]	Date is printed.
[OFF]	Date is not printed.

- If the printer does not support date printing, the date cannot be printed on the picture.
- Depending on the printer, the date print settings of the printer may take precedence so check if this is the case.
- When printing images with a text stamp, please remember to set print with date to [OFF] or the date will print on top.
- In some printers, the picture date for pictures taken with the aspect ratio set to [1:1] will be printed vertically.

When asking the photo shop to print the pictures

- By stamping the date using [Text Stamp] (P239) or setting date printing at the time of the [Print Set] (P249) setting before going to a photo shop, the dates can be printed on the pictures at the photo shop.

■ [Num.of prints]

You can set the number of prints up to 999.

[Paper Size]

	Settings on the printer are prioritized.
[L/3.5″×5″]	89 mm×127 mm
[2L/5″×7″]	127 mm×178 mm
[POSTCARD]	100 mm×148 mm
[16:9]	101.6 mm×180.6 mm
[A4]	210 mm×297 mm
[A3]	297 mm×420 mm
[10×15cm]	100 mm×150 mm
[4″×6″]	101.6 mm×152.4 mm
[8″×10″]	203.2 mm×254 mm
[LETTER]	216 mm×279.4 mm
[CARD SIZE]	54 mm×85.6 mm

• Paper sizes not supported by the printer will not be displayed.

[Page Layout] (Layouts for printing that can be set with this unit)

	Settings on the printer are prioritized.
	1 picture with no frame on 1 page
	1 picture with a frame on 1 page
	2 pictures on 1 page
	4 pictures on 1 page

• An item cannot be selected if the printer does not support the page layout.

Layout printing

When printing a picture several times on 1 sheet of paper.

For example, if you want to print the same picture 4 times on 1 sheet of paper, set [Page Layout] to [⊞] and then set [Num.of prints] to 4 for the picture that you want to print.

When printing different pictures on 1 sheet of paper.

For example, if you want to print 4 different pictures on 1 sheet of paper, set [Page Layout] to [⊞] and then set [Num.of prints] to 1 for each of the 4 pictures.

- The camera is receiving an error message from the printer when the [●] indication lights orange during printing. After finishing printing, make sure there are no problems with the printer.
- If the number of prints is high, the pictures may be printed several times. In this case, the remaining number of prints indicated may differ from the number set.
- Only pictures taken in JPEG format can be printed. Those taken in RAW will use the JPEG pictures that were simultaneously created. If an equivalent JPEG picture is not available, no print will take place.

Enjoying 3D pictures

Taking 3D pictures

Attaching the 3D interchangeable lens (H-FT012: optional) to the camera allows you to take 3D pictures for extra impact.
To view 3D pictures, a television that supports 3D is required.

1 Attach the 3D interchangeable lens to the camera.

2 Bring the subject into the frame and record by pressing the shutter button fully.

- Focusing is not required when recording 3D pictures.
- Still pictures recorded with the 3D interchangeable lens attached are saved in MPO format (3D).

To ensure that the 3D pictures can be safely viewed, pay attention to the following points when recording.
- Where possible, record with the unit in a horizontal state.
- The suggested minimum subject distance is 0.6 m (2.0 feet).
- Be careful not to shake the camera while in a vehicle or walking.

It is recommended to use a tripod or a flash to record steady pictures.

- Up to approx. 490 3D pictures can be recorded on a 2 GB card.
  (When the aspect ratio is set to [4:3], and the quality is set to [3D].)
- Read the operating instructions of the 3D interchangeable lens for details.

Not available in these cases:
- **You cannot record 3D pictures in vertical orientation.**
- When a distance to the subject is 0.6 m (2.0 feet) to approximately 1 m (3.3 feet), horizontal disparity becomes too great, and you may not see the 3D effect at the edges of the image.

Playing back 3D pictures

Connecting the camera to a 3D compatible television and playing back pictures taken in 3D allows you to enjoy 3D pictures for extra impact.
It is also possible to play back the recorded 3D pictures by inserting an SD card into the 3D compatible television with an SD card slot.

Preparations: Set the [HDMI Mode (Play)] to [AUTO], [1080p] or [1080i]. (P65)
Set the [3D Playback] to [3D]. (P66)

Connect the unit to a 3D compatible television using the HDMI micro cable and display the playback screen. (P325)

- When [VIERA Link] is set to [ON] and the camera is connected to a TV supporting VIERA Link, input of the TV will be switched automatically and playback screen will be displayed. Refer to P327 for details.
- For the pictures recorded in 3D, [3D] will appear on the thumbnail display at playback.

■ Playback in 3D by selecting only the still pictures recorded in 3D

Select [3D Play] in [Playback Mode] in the [Playback] menu. (P231)

■ Playback as a 3D slide show by selecting only the still pictures recorded in 3D

Select [3D] in [Slide Show] in the [Playback] menu. (P229)

■ Switch the playback method for the still pictures recorded in 3D

1 **Select the picture recorded in 3D.**
2 **Select [2D/3D Settings] on the [Playback] menu. (P54)**
   - Playback method will switch to 3D if it is playing back in 2D (conventional image), or it will switch to 2D if it is playing back in 3D.
   - If you feel tired, uncomfortable or otherwise strange when playing back pictures recorded in 3D, set to 2D.

- A black screen is displayed for a few seconds when switching playback back and forth from 3D to 2D pictures.
- When you select a 3D picture thumbnail, it may take a few seconds for playback to start. After playback, the thumbnail display may take a few seconds to reappear.
- When viewing 3D pictures, your eyes may become tired if you are too close to the television screen.
- If your television does not switch to a 3D picture, make the necessary settings on the TV. (For details, refer to the operating instructions of the TV.)
- 3D pictures can be saved to your computer or Panasonic devices. (P329, 335)

Functions that cannot be used on 3D pictures

■ Functions that cannot be used during 3D recording

When recording with the 3D interchangeable lens (H-FT012: optional), the following feature will be disabled:

(Recording functions)

- Auto Focus/Manual Focus operation
- Aperture setting
- Zoom operation
- Recording motion pictures*1
- [Rough Monochrome]/[Impressive Art]/[High Dynamic]/[Toy Effect]/[Toy Pop]/[Star Filter]/[One Point Color]/[Sunshine] (Creative Control Mode)
- Defocus control function

*1 The motion picture button, Creative Video Mode and the [Motion Picture] menu will be unavailable or unusable.

([Rec] menu)

- [Picture Size]*2/[Quality]*3/[SH] of [Burst Rate]/[i.Dynamic]/[i.Resolution]/[iHandheld Night Shot]/[iHDR]/[HDR]/[Multi Exp.]/[Red-Eye Removal]/[Shading Comp.]/[Ex. Tele Conv.] (still pictures)/[Digital Zoom]/[Stabilizer]

*2 The setting is fixed as shown below.

Aspect ratio	Picture size
[4:3]	1824×1368
[3:2]	1824×1216
[16:9]	1824×1024
[1:1]	1712×1712

*3 When attaching 3D interchangeable lens, the following icons are displayed.

[3D] ([3D+Fine]): Both MPO images and fine JPEG images are recorded simultaneously.

[3D] ([3D+Standard]): Both MPO images and standard JPEG images are recorded simultaneously.

([Custom] menu)

- [AF/AE Lock]/[Shutter AF]/[Quick AF]/[Eye Sensor AF]/[Pinpoint AF Time]/[AF Assist Lamp]/[Direct Focus Area]/[Focus/Release Priority]/[AF+MF]/[MF Assist]/[MF Guide]/[Rec Area]/[Video Button]/[Power Zoom Lens]/[Lens w/o Focus Ring]/[Touch AF], [Touch Pad AF] in [Touch Settings]

■ Functions that cannot be used during 3D picture playback

During the 3D playback of 3D pictures on a 3D-compatible TV, the following functions are disabled.

- [Highlight] ([Custom] menu)
- Playback Zoom

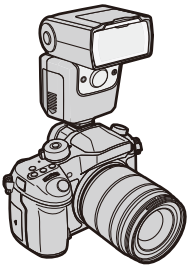
([Playback] menu)

- [Location Logging]/[RAW Processing]/[Clear Retouch]/[Title Edit]/[Text Stamp]/[Video Divide]/[Time Lapse Video]/[Stop Motion Video]/[Resize]/[Cropping]/[Rotate]/[Rotate Disp.]/[Favorite]/[Print Set]/[Protect]/[Face Rec Edit]/[Picture Sort]/[Delete Confirmation]

Optional accessories

External Flash (optional)

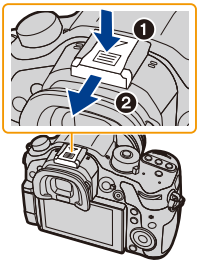
After attaching the flash (DMW-FL360L, DMW-FL580L, DMW-FL500: optional), the effective range will be increased when compared to the camera's built in flash.



Preparations:
- Turn off the camera and close the built-in flash.

Removing the Hot Shoe Cover
The camera comes with a hot shoe cover attached to the hot shoe.

Remove the hot shoe cover by pulling it in the direction indicated by arrow ❷ while pressing it in the direction indicated by arrow ❶.



- When the hot shoe is not in use, make sure to attach the hot shoe cover.
- Please be careful not to lose the hot shoe cover.
- Keep the Hot Shoe Cover out of reach of children to prevent swallowing.

■ Using the dedicated flash (DMW-FL360L: optional)

1 Attach the dedicated flash to the hot shoe and then turn on the camera and the dedicated flash.

2 Select the menu. (P54)

MENU → [Rec] → [Flash]

3 Press ▲/▼ to select [Flash Mode] and then press [MENU/SET].

4 Press ▲/▼ to select an item and then press [MENU/SET].

- While the external flash is connected, the following icons are displayed.

  ⚡: External flash Forced ON

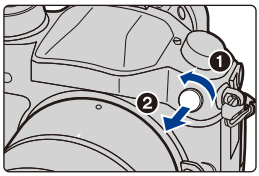
  ⚡S: External flash Slow Sync.

  ⊛: External flash Forced OFF
  - Signal-flashing with wireless flashes is also disabled.

When using other commercially available external flashes without communication functions with the camera (DMC-GH4)

- It is necessary to set the exposure on the external flash. If you want to use the external flash in Auto Mode, use an external flash that allows you to set the aperture value and the ISO sensitivity to match the settings on the camera.
- Set to Aperture-Priority AE Mode or Manual Exposure Mode on the camera and then set the same aperture value and ISO sensitivity on the external flash. (The exposure cannot be compensated adequately due to the change on the aperture value in Shutter-Priority AE Mode and the external flash cannot control the light adequately in Program AE Mode because the aperture value cannot be fixed.)

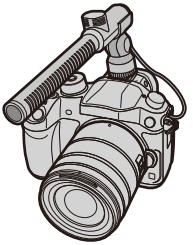
■ Using a external flash by connecting with a flash synchro socket



- You can use an external flash by connecting a synchro cable with a flash synchro socket. The socket has a lock screw to prevent the cable falling off.
- Remove the flash synchro socket cap by turning in the direction of the arrow.
- Be careful not to lose the flash synchro socket cap.
- The flash synchro socket has no polarity. You can use a synchro cable regardless of its polarity.
- Use the flash with a synchronization voltage of 400 V or less.
- Do not use the synchro cables with the length of 3 m (9.8 feet) or more.

- You can set the aperture value, the shutter speed and the ISO sensitivity on the camera even when attaching the external flash.
- Some commercial external flashes have synchro terminals with high-voltage or reversed polarity. Using such extra flashes may cause a malfunction or the camera may not operate normally.
- If you use commercially available external flashes with communication functions other than the dedicated one, they may not operate normally or they may be damaged. Do not use them.
- Even if the external flash is turned off, the camera may enter the external flash mode when the external flash is attached. When you are not using the external flash, detach it.
- Do not open the built-in flash when an external flash is attached.
- The camera will become unstable when attaching the external flash, it is recommended to use a tripod when taking picture.
- Detach the external flash when carrying the camera.
- When attaching the external flash, do not hold only the external flash because it may detach from the camera.
- If you use the external flash when the White Balance is set to [ ], finely adjust the White Balance depending on the picture quality. (P138)
- If you record at close range with a wide angle, light from the flash may be blocked by the lens, darkening the lower part of the screen.
- Refer to P187 about the settings for the wireless flash.
- Read the operating instructions of the external flash for details.

External Microphone (optional)



Using a stereo shotgun microphone (DMW-MS2: optional) or stereo microphone (VW-VMS10: optional), you can record sounds with quality superior to those recorded with the built-in microphone.
Using the stereo shotgun microphone (DMW-MS2:optional), you can switch between the gun (ultra-directional) recording and the wide range stereo recording.

Preparations:
- Close the built-in flash, and then turn this unit off.
- Remove the hot shoe cover that is attached to the camera. (P347)

■ Setting the range within which the stereo shotgun microphone (DMW-MS2: optional) will record sounds

1 Attach the dedicated stereo shotgun microphone to this unit, and then turn this unit on.

2 Select [Special Mic.] on the [Motion Picture] menu. **(P54)**
- The menu items are displayed only when the stereo shotgun microphone is connected.

3 Press ▲/▼ to select the Item and then press [MENU/SET].

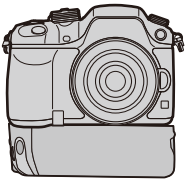
[STEREO]	Allows stereo recording of sound over a wide area.
[LENS AUTO]	Allows recording within the range that is set automatically according to the angle of view of the lens.
[SHOTGUN]	Allows recording from one direction by shutting out background and surrounding noise.
[S. SHOTGUN]	Allows recording within the range even narrower than that of [SHOTGUN].
[MANUAL]	Allows recording within the range you set manually.

4 (When [MANUAL] is selected) Press ◄/► to select a range, and press [MENU/SET].
- We recommend that you select the range while listening to the audio recorded in the motion picture with headphones.

- While the external microphone is connected, [🎤] is displayed on the screen.
- When the external microphone is connected, [Mic Level Disp.] (P208) is automatically set to [ON], and the mic level is displayed on the screen.
- When an external microphone is attached to the camera, do not hold only the external microphone to prevent the camera from falling.
- [Wind Cut] in the [Motion Picture] can reduce the wind noise effectively.
- When an external microphone is attached to the camera, do not open the built-in flash.
- If the noises are recorded when you use an AC adaptor (optional), use a battery.
- When a stereo shotgun microphone (VW-VMS10: optional) is used, [Special Mic.] is fixed to [STEREO].
- When [Special Mic.] is set to [LENS AUTO], [S. SHOTGUN] or [MANUAL], [Sound Output] in the [Motion Picture] menu is fixed to [REC SOUND].
- If you press the function button to which [Mic. Directivity Adjust] in [Fn Button Set] (P317) in the [Custom] menu is assigned when [Special Mic.] is set to [MANUAL], the screen that lets you set the range will be displayed.
- [LENS AUTO] is available only when a lens based on the Micro Four Thirds System standard/Four Thirds System standard is used. If your lens is based on the Micro Four Thirds System standard/Four Thirds System standard but does not have a communication function with the camera, [LENS AUTO] is not available.
- For details, refer to the operating instructions of the external microphone.

Battery Grip (optional)

Using a battery grip (DMW-BGGH3: optional) improves ease of operation and grip when held vertically. Installing a spare battery will allow you to record for a longer time.



■ Setting a priority for the use of spare batteries

You can set which battery should be used when the battery is inserted to both this unit and the battery grip.

Preparations:
- Turn this unit off, and then remove the terminal cover.

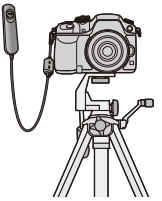
1 Attach the battery grip to this unit, and then turn this unit on.
2 Select [Battery Use Priority] in the [Setup] menu. (P54)
3 Press ▲/▼ to select the item, and then press [MENU/SET].

[BODY]:	The battery in this unit is used first.
[BG]:	The battery in the battery grip is used first.

- When the battery in the battery grip is used, [BG] is displayed on the screen.
- You can assign a function of your choice to the [Fn] button of the battery grip. (P317)
- If the terminal cover is hard to remove, flip the cover's corner by the camera's recess toward the center.
- Read the operating instructions of the battery grip for details.

Shutter Remote Control (optional)

If you use the shutter remote control (DMW-RSL1: optional), you can avoid jitter (camera shake) when using a tripod and you can keep the shutter pressed fully when taking pictures with [B] (Bulb) or Burst Mode. The shutter remote control works similar to the shutter button on the camera.



- Always use a genuine Panasonic shutter remote control (DMW-RSL1: optional).
- Record with Creative Video Mode (P202) when using for motion picture recording. Motion picture recording can be started/stopped with the shutter remote control.
- Read the operating instructions of the shutter remote control for details.

Not available in these cases:

- You cannot use the shutter remote control for the following operation.
  – Sleep Mode cancelation

AC adaptor (optional)/DC coupler (optional)

By connecting the AC adaptor (optional), and then plugging them into an electrical socket, you can connect this unit to a PC or printer and use without worrying about the capacity of the battery.
To use the AC adaptor, a DC coupler (optional) is required.

- Always use a genuine Panasonic AC adaptor (optional).
- When using an AC adaptor, use the AC cable supplied with the AC adaptor.
- When the DC coupler is being mounted, the DC coupler cover opens, so the structure ceases to be dust-proof and splash-proof. Be careful not to allow sand, dust and water etc. to adhere to or enter the structure. After use, check that there is no foreign matter attached to the coupler cover, and close it firmly.
- Also read the operating instructions for the AC adaptor and DC coupler.

Filters (optional)

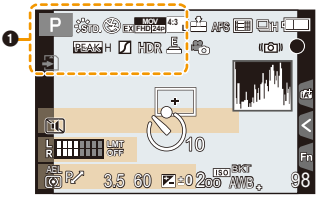
The MC protector is a transparent filter which affects neither the colors nor the amount of light, so it can always be used to protect the camera's lens.
The ND filter reduces the amount of light to approximately 1/8th (equal to adjusting the aperture value 3 increments) without affecting the color balance.
PL filter will suppress the reflected light from a metal or non spherical surfaces (flat non-metallic surfaces, water vapour or invisible particles in the air), making it possible to take a picture with enhanced contrast.

- Do not attach multiple filters at the same time.
- You can attach the lens cap or the lens hood when the filter is attached.
- Refer to the instructions for each filter for details.

Monitor Display/Viewfinder Display

- **The following images are examples of when the display screen is set to [ ] (monitor style) in the monitor.**

In recording

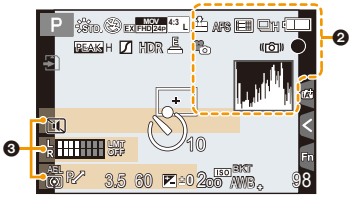


❶

iA iA+ P A S M MP P EXPS	Recording Mode (P41)
C 1	Custom settings (P321)
STD. VIVD NAT MONO SCNY PORT CUST CNED CNEV	Photo Style (P140)
	Creative control adjustment display (P78)
	Flash Mode (P183)
2nd WL	Flash (P185, 187)
MOV EX FHD 24p	Extended Tele Conversion (when recording motion pictures) (P163)
MOV FHD 24p	Recording quality (P193)

MOV FHD 100M IPB 12/24.00P	Recording format/ Recording quality*1 (P193)/ Variable Frame Rate*1 (P215)
4:3 L	Picture size/Aspect Ratio (P129)
4:3 EXM	Extended Tele Conversion (when taking still pictures) (P163)
	Card (displayed only during recording) (P34)
8m30s	Elapsed recording time*2 (P191)
	Simultaneous recording indicator (P200)
LVF/ MON AUTO	Automatic viewfinder/ monitor switching (P48)
PEAK H PEAK L	Peaking (P111)
	Highlight Shadow (P142)
HDR	HDR (P145)/iHDR (P73)
	Multi exposure (P168)
2.0x	Digital Zoom (P165)
E	Electronic shutter (P171)
100%	Variable Frame Rate (P215)

In recording



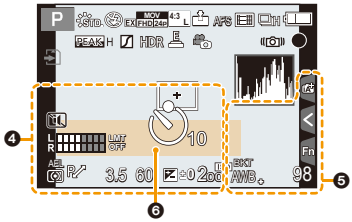
❷

RAW	Quality (P130)
AFS AFF AFC MF	Focus Mode (P93, 107)
	AF Mode (P91)
	Face Recognition (P173)
AFL	AF Lock (P159)
SH H M L	Burst (P113)
B	Auto Bracket (P116)
10 10 2	Self-timer (P118)
	Time Lapse Shot (P120)
	Stop Motion Animation (P124)
	Battery indication (P28)
BG	Battery Grip (P352)
	Picture Mode (Still picture priorities) (P200)
OFF	Optical Image Stabilizer*3 (P51)
	Jitter alert (P51)
●	Recording state (Flashes red.) (P191)/Focus (Lights green.) (P91)
● LOW	Focus (Under low illumination) (P91)
	Connected to Wi-Fi
	Histogram (P309)

❸

Name*4 (P178)
Number of days that have passed since the departure date*5 (P61)
Age*4 (P178)
Location*5 (P61)
Current date and time/Travel destination setting*5: ✈ (P60)

In recording



❹

▭	AF area (P91, 101)
+	Spot metering target (P161)
10 10 2	Self-timer*6 (P118)
	Silent Mode (P170)
	External Microphone (P350)
L R	Mic level display (P208)
LMT OFF	Mic Level Limiter (OFF) (P207)
TC 00:00:00:00	Time Code (P214)
AEL	AE Lock (P159)
	Metering Mode (P161)
P	Program Shift (P148)
3.5	Aperture value (P39)
60	Shutter speed (P39)
11d	Shutter speed (angle) (P209)
±0	Exposure compensation value (P157)
	Brightness (P75, 79)
	Manual Exposure Assistance (P153)
200 ISO	ISO sensitivity (P132)
0dB	Gain (dB) (P209)

❺

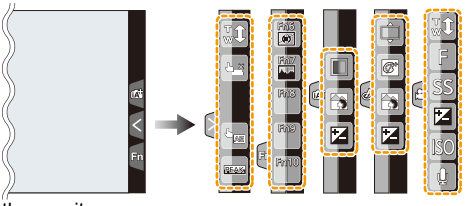
BKT AWB	White Balance Bracket (P139)
	White Balance Fine Adjustment (P138)
WB K	White Balance (P135)
	Color (P75)
98	Number of recordable pictures (P390)
r20	Maximum number of pictures that can be taken continuously (P114)
R8m30s	Available recording time*1, 2 (P390)
	Touch tab*7 (P314)
	Touch tab*7 (P314, 319)
	Touch tab*7 (P75, 314)
	Touch tab*7 (P79, 314)
	Touch tab*7 (P204, 314)

❻

Exposure meter (P310)
Focal distance display (P166)
Step zoom (P166)

∗1 This is displayed only when [Video-Priority Display] (P211) in the [Custom] menu is set to [ON].
∗2 h: hour, m: minute, s: second
∗3 Only available when a lens that supports the Stabilizer function is attached.
∗4 This is displayed for about 5 seconds when the camera is turned on if the [Profile Setup] setting is set.
∗5 This is displayed for about 5 seconds when the camera is turned on, after setting the clock and after switching from Playback Mode to Recording Mode.
∗6 This is displayed during countdown.
∗7 Only displayed in the monitor.

In recording



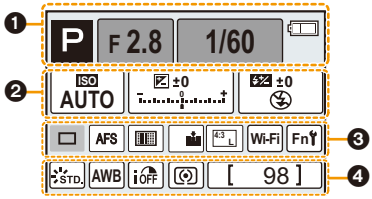
• Only displayed in the monitor.

	Touch zoom (P167)
	Touch Shutter (P89)
	Touch AE (P90)
	Peaking (P111)
	Fn6 (Function button) (P319)
	Fn7 (Function button) (P319)
	Fn8 (Function button) (P319)
	Fn9 (Function button) (P319)
	Fn10 (Function button) (P319)
	Color (P75)

	Defocus control function (P74, 79)
	Brightness (P75, 79)
	Type of defocus ([Miniature Effect]) (P85)
	One point color (P87)
	Position of the light source (P88)
	Creative control adjustment (P79)
F	Aperture value (P39)
SS	Shutter speed (P39)
ISO	ISO sensitivity (P132)
GAIN	Gain (dB) (P209)
	Microphone level adjustment (P207)

In recording

On-monitor recording information



❶

iA iA+ P A S M 3D P SCN	Recording Mode (P41)
F2.8	Aperture value (P39)
1/60	Shutter speed (P39)
11d	Shutter speed (angle) (P209)
	Battery indication (P28)

❷

ISO AUTO	ISO sensitivity (P132)
0dB	Gain (dB) (P209)
±0	Exposure compensation value (P157)
	Brightness (P75)
	Manual Exposure Assistance (P153)
	Flash Mode (P183)
±0 2nd WL	Flash (P185, 187)

❸

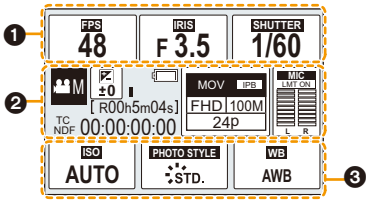
	Single (P112)
SH H M L	Burst (P113)
BKT 3·1/3	Auto Bracket (P116)
10 10 2	Self-timer (P118)
	Time Lapse Shot (P120)
	Stop Motion Animation (P124)
AFS AFF AFC MF	Focus Mode (P93, 107)
	AF Mode (P91)
RAW	Quality (P130)
4:3 L	Picture size/Aspect Ratio (P129)
Wi-Fi	Wi-Fi (P255)
Fn	Function button setting (P317)

❹

STD. VIVD NAT MONO SCNY PORT CUST CNED CNEV	Photo Style (P140)
AWB WB K	White Balance (P135)
iOFF	Intelligent Dynamic Range Control (P144)
	Metering Mode (P161)
98	Number of recordable pictures (P390)
r20	Maximum number of pictures that can be taken continuously (P114)
R8m30s	Available recording time (P390)

In recording

On-monitor recording information ([Video-Priority Display])



❶

FPS 48	Recording frame rate (P194)/Variable Frame Rate (P215)
IRIS F 3.5	Aperture value (P39)
SHUTTER 1/60	Shutter speed (P39)
SHUTTER 11d	Shutter speed (angle) (P209)

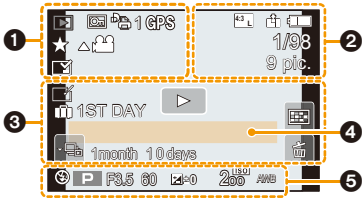
❷

iA iA+ P A S M MP P EXPS	Recording Mode (P41)
±0	Exposure compensation value (P157)
	Brightness (P75)
	Manual Exposure Assistance (P153)
	Battery indication (P28)
❚❚	Motion picture recording display (stopped)
●	Motion picture recording display (recording in progress)
	No card
R00h8m30s	Available recording time (P390)
98	Number of recordable pictures (P390)
TC NDF 00:00:00:00	Time Code (P214)
MOV IPB FHD 100M 24p	Recording format/ Recording quality (P193)
MIC LMT ON L R	Mic level display (P208)/Mic Level Limiter (P207)

❸

ISO AUTO	ISO sensitivity (P132)
0dB	Gain (dB) (P209)
STD. VIVD NAT MONO SCNY PORT CUST CNED CNEV	Photo Style (P140)
AWB WB 2500K	White Balance (P135)

In playback



❶

	Playback Mode (P231)
	Protected picture (P251)
1	Number of prints (P249)
GPS	Location Information display (P232)
★	Favorites (P248)
	Cable disconnect prohibit icon (P338)
	Motion picture playback (P222)
	Continuous Burst Picture Group Playback (P226)
	Continuous [Time Lapse Shot] Picture Group Playback (P226)
	Continuous playback of the Stop Motion Animation Group (P226)
	Stamped with text indication (P239)
8m30s	Elapsed playback time*1 (P222)

❷

	Picture size/Aspect Ratio (P129)
MOV FHD 24P	Recording quality (P193)
100%	Variable Frame Rate (P215)
MOV FHD 100M IPB 12/24.00P	Recording format/ Recording quality*2 (P193)/ Variable Frame Rate*2 (P215)
RAW	Quality (P130)
	Battery indication (P28)
BG	Battery Grip (P352)
1/98	Picture number/Total pictures
9 pic.	Number of pictures in burst
8m30s	Motion picture recording time*1 (P222)

❸

	Clear Retouch completed icon (P236)
	Currently retrieving information icon (P366)
	Playback (Motion Pictures) (P222)
1ST DAY	Number of days that have passed since the departure date (P61)
	Burst Picture Group Display (P226)
	[Time Lapse Shot] Picture Group Display (P226)
	Display for the Stop Motion Animation Group (P226)
	Silent Mode (P170)
1 month 10days	Age (P176, 178)
	Multi Playback (P224)
	Delete (P227)

❹

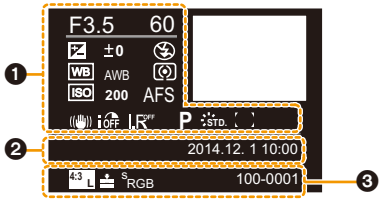
Name*3 (P176, 178)
Location*3 (P61)
Title*3 (P238)

❺

Recording information*4

In playback

Detailed information display



❶

Recording information	
iOFF	Intelligent Dynamic Range Control*4 (P144)
HDR ON	HDR*5 (P145)/iHDR*5 (P73)
I.R OFF	Intelligent Resolution (P144)
[ ]	Shading Compensation*5 (P146)

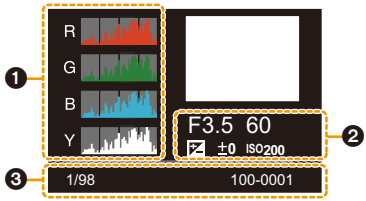
❷

Recorded date and time/World Time (P60)

❸

4:3 L	Picture size/Aspect Ratio (P129)
RAW	Quality (P130)
sRGB	Color space*4 (P147)
MOV FHD 24P	Recording format/Recording quality (P193)
100%	Variable Frame Rate (P215)
MOV FHD 100M IPB 12/24.00P	Recording format/Recording quality*2 (P193)/Variable Frame Rate*2 (P215)
100-0001	Folder/File number*4 (P334)

Histogram display



❶

Histogram (P47)

❷

Recording information*4

❸

1/98	Picture number/Total pictures
100-0001	Folder/File number*4 (P334)

*1 h: hour, m: minute, s: second
*2 This is displayed only when [Video-Priority Display] (P211) in the [Custom] menu is set to [ON].
*3 It is displayed in order of [Title], [Location], [Name] ([Baby1]/[Baby2], [Pet]), [Name] ([Face Recog.]).
*4 This is not displayed for motion pictures recorded in [AVCHD].
*5 This is not displayed for motion pictures.

Message Display

Confirmation messages or error messages will be displayed on the screen in some cases. The major messages are described below as examples.

[This picture is protected]

- Delete the picture after canceling the protect setting. (P251)

[Some pictures cannot be deleted]/[This picture cannot be deleted]

- This feature can only be used with pictures that comply with the DCF standard.
  Perform formatting (P58) on this unit after saving necessary data on a PC, etc.

[Cannot be set on this picture]

- [Title Edit], [Text Stamp] or [Print Set] cannot be set for pictures not based on the DCF standard.

[Memory Card Error
Format this card?]

- It is a format that cannot be used with this unit.
  – Insert a different card.
  – Format the card again with the camera after saving necessary data on a PC etc. (P58)
  Data will be deleted.

[Lens not found, or shoot w/o lens in Custom menu is set to off.]

- When using a Leica lens mount adaptor (DMW-MA2M, DMW-MA3R: optional), set [Shoot w/o Lens] (P314) to [ON] in the custom menu.

[The lens is not attached properly. Do not push lens release button while lens is attached.]

- Detach the lens once, and then attach it again without pressing the lens release button. (P23)
  Turn this unit on again, and if it is still displaying, contact the dealer.

[Lens attachment failed. Please make sure the lens is attached correctly.]

- Detach the lens from the camera body and gently wipe the contacts on the lens and the camera body using a dry cotton swab.
  Attach the lens, turn this unit on again, and if it is still displaying, contact the dealer.

[Lens not detected. Please turn camera on again.]

- This is displayed when the lens has stopped operating normally due to being pressed on by a hand etc.
  Turn the camera off and on. If the message persists, contact the dealer or Panasonic.

[Memory Card Error]/[This memory card cannot be used]

- Use a card compatible with this unit. (P34)

[Insert SD card again]/[Try another card]

- An error has occurred accessing the card.
  Insert the card again.
- Insert a different card.

[Read Error/Write Error Please check the card]

- It has failed to read or write data.
  Remove the card after turning this unit off. Insert the card again, turn this unit on, and try to read or write the data again.
- The card may be broken.
- Insert a different card.

[Cannot record due to incompatible format (NTSC/PAL) data on this card.]

- If you continue to use the same card after changing [System Frequency] (P220), motion pictures may not be recorded. To record with the same card, reset [System Frequency] to the original setting. To record motion pictures with the current setting, try the following:
  – Perform formatting (P58) on this unit after saving necessary data on a PC, etc.
  – Insert a different card.

[Motion recording was cancelled due to the limitation of the writing speed of the card]

- Depending on the [Rec Format] and [Rec Quality] of a motion picture, the speed class rating required for the card differs. Use a card that meets the rating. For details, refer to “About the motion picture recording and speed class” on P22.
- If the recording stops even when you are using a card that meets the speed class rating, the data writing speed is too slow. We recommend making a backup and then format the card (P58).
  Depending on the type of the card, motion picture recording may stop in the middle.

[A folder cannot be created]

- A folder cannot be created because there are no remaining folder numbers that can be used. Format the card on this unit after saving necessary data on a PC etc. (P58)
  If you execute [No.Reset] in the [Setup] menu after formatting, the folder number is reset to 100. (P67)

[Picture is displayed for 16:9 TV]/[Picture is displayed for 4:3 TV]

- Select [TV Aspect] in the [Setup] menu if you want to change the TV aspect. (P65)
- This message also appears when the USB connection cable is connected to the camera only. If the other end of the USB connection cable is connected to a PC or printer, the message will disappear. (P332, 337)

[Editing operation cannot proceed as information processing is ongoing.]

When there are too many image files, the currently retrieving information icon ([ ] or [ ]) may be displayed on the playback screen for a long period of time. During this time, use of some items in the [Playback] menu is not possible.

- If this unit is turned off while acquiring information, only the pictures that have already acquired the information are saved as a group.
  When you switch on again, the information retrieval will restart from the same point.

[This battery cannot be used]

- Use a genuine Panasonic battery. If this message is displayed even when a genuine Panasonic battery is used, contact the dealer or Panasonic.
- If the battery terminal is dirty, clean it and remove any objects.

[Failed to connect wireless access point]/[Connection failed]/[No destination found]

- Check following regarding the wireless access point.
  – The wireless access point information set on this unit is wrong.
    Check the authentication type, encryption type, and encryption key. (P294)
  – Power of the wireless access point is not turned on.
  – Setting of the wireless access point is not supported by this unit.
- Check the network setting of the destination.
- Radio waves from other devices may block the connection to a wireless access point.
  Check other devices that are connected to the wireless access point and devices that use the 2.4 GHz band.

[No picture to send]

- This is displayed when there is no image to transmit due to the restriction of the destination.
  Check the file format of the image to send. (P299)

[Connection failed. Please retry in a few minutes.]/[Network disconnected. Transfer stopped.]

- Radio waves from the wireless access point are getting weak.
  Perform the connection closer to the wireless access point.
- There is no reply from the server or it has exceeded the communication processing time.
  Try again after a while.
- Depending on the wireless access point, connection may be automatically disconnected after specific time has passed.
  Reconnect the connection again.

[Upload to the Cloud Folder is available after Cloud Sync settings have been set up on downloadable devices such as PCs or smartphones.]

- Devices that download images from a cloud folder are not registered.
- Perform Cloud Sync setting. Configure the settings on a PC with "PHOTOfunSTUDIO" or on a smartphone/tablet with "Image App".
  Refer to P284 for details on [Cloud Sync. Service].

[Connection failed]

- Check following regarding the smartphones/tablet you intend to connect.
  – The smartphone/tablet does not operate.
  – Change the access point to connect to in the smartphone/tablet Wi-Fi settings to this camera.
  – There is no free storage space on the smartphone/tablet.

[Login failed. Please check Login ID and Password.]

- Login ID or password for the "LUMIX CLUB" is not correct.
  Please enter it again.
  If you have forgotten the login ID or the password, there is information in the login screen of the "LUMIX CLUB" website.

[Some files cannot be sent because of destination limit]/[Transfer completed. Some files are left because of destination limit.]

- Check the file format of the image to send. (P299)
- Sending motion pictures may fail if the file size is too large.
  Split the motion picture using [Video Divide]. (P242)

[Unavailable. Please set Login settings on LUMIX CLUB web site.]

- Login to the "LUMIX CLUB" from your smartphone/tablet or PC, and set the login details of the destination web service.

[Both picture and video sharing service cannot be selected together]

- Web services designed only for pictures, and web services designed only for motion pictures cannot be selected at the same time.
  Deselect one of the services.

[Cannot get IP address. Please set wireless AP's IP address setting to DHCP.]

- Turn on DHCP settings of the IP address of the connected wireless access points.

[Cannot connect to server]

- If a message is displaying asking to update the root certificate, agree to update the root certificate.

Menu list

[Rec] (☞P371)

- [Photo Style]
- [Aspect Ratio]
- [Picture Size]
- [Quality]
- [AFS/AFF]
- [Metering Mode]
- [Burst Rate]
- [Auto Bracket]
- [Self Timer]
- [Time Lapse/Animation]
- [Highlight Shadow]
- [i.Dynamic]
- [i.Resolution]
- [iHandheld Night Shot]
- [iHDR]
- [HDR]
- [Multi Exp.]
- [Electronic Shutter]
- [Shutter Delay]
- [Flash]
- [Red-Eye Removal]
- [ISO Limit Set]
- [ISO Increments]
- [Extended ISO]
- [Long Shtr NR]
- [Shading Comp.]
- [Ex. Tele Conv.] (Photo)
- [Digital Zoom]
- [Color Space]
- [Stabilizer]
- [Face Recog.]
- [Profile Setup]

[Motion Picture] (☞P374)

- [Photo Style]
- [Rec Format]
- [Rec Quality]
- [Exposure Mode]
- [Variable Frame Rate]
- [AFS/AFF]
- [Picture Mode]
- [Continuous AF]
- [Metering Mode]
- [Highlight Shadow]
- [i.Dynamic]
- [i.Resolution]
- [Master Pedestal Level]
- [Luminance Level]
- [Synchro Scan]
- [Ex. Tele Conv.] (Motion Picture)
- [Digital Zoom]
- [Time Code]
- [HDMI Rec Output]
- [Sound Output]
- [Silent Operation]
- [Mic Level Disp.]
- [Mic Level Adj.]
- [Special Mic.]
- [Mic Level Limiter]
- [Wind Cut]
- [Lens Noise Cut]
- [SS/Gain Operation]
- [Color Bars]

• [Photo Style], [AFS/AFF], [Metering Mode], [Highlight Shadow], [i.Dynamic], [i.Resolution] and [Digital Zoom] are common to both the [Rec] menu and [Motion Picture] menu. Changing these settings in one of these menus is reflected in other menu.

[Custom] (☞P377)

- [Cust.Set Mem.]
- [Silent Mode]
- [AF/AE Lock]
- [AF/AE Lock Hold]
- [Shutter AF]
- [Half Press Release]
- [Quick AF]
- [Eye Sensor AF]
- [Pinpoint AF Time]
- [AF Assist Lamp]
- [Direct Focus Area]
- [Focus/Release Priority]
- [AF+MF]
- [MF Assist]
- [MF Guide]
- [Peaking]
- [Histogram]
- [Guide Line]
- [Center Marker]
- [Highlight]
- [Zebra Pattern]
- [Monochrome Live View]
- [Constant Preview]
- [Expo.Meter]
- [LVF Disp.Style]
- [Monitor Disp. Style]
- [Monitor Info. Disp.]
- [Rec Area]
- [Video-Priority Display]
- [Auto Review]
- [Fn Button Set]
- [Q.MENU]
- [Dial Set.]
- [Video Button]
- [Power Zoom Lens]
- [Lens w/o Focus Ring]
- [Eye Sensor]
- [Touch Settings]
- [Touch Scroll]
- [Menu Guide]
- [Shoot w/o Lens]

[Setup]
(☞P381)

- [Clock Set]
- [World Time]
- [Travel Date]
- [Wi-Fi]
- [Beep]
- [Speaker Volume]
- [Headphone Volume]
- [Live View Mode]
- [Monitor Display]/[Viewfinder]
- [Monitor Luminance]
- [Economy]
- [Battery Use Priority]
- [USB Mode]
- [TV Connection]
- [Menu Resume]
- [Menu Background]
- [Menu Information]
- [Language]
- [Version Disp.]
- [Exposure Comp. Reset]
- [No.Reset]
- [Reset]
- [Reset Wi-Fi Settings]
- [System Frequency]
- [Pixel Refresh]
- [Sensor Cleaning]
- [Format]

[Playback]
(☞P383)

- [2D/3D Settings]
- [Slide Show]
- [Playback Mode]
- [Location Logging]
- [RAW Processing]
- [Clear Retouch]
- [Title Edit]
- [Text Stamp]
- [Video Divide]
- [Time Lapse Video]
- [Stop Motion Video]
- [Resize]
- [Cropping]
- [Rotate]
- [Rotate Disp.]
- [Favorite]
- [Print Set]
- [Protect]
- [Face Rec Edit]
- [Picture Sort]
- [Delete Confirmation]

[Rec]

[Photo Style]	You can select effects to match the type of image you wish to record. You can adjust the color and image quality of the effects. • **[Standard]/[Vivid]/[Natural]/[Monochrome]/[Scenery]/[Portrait]/[Custom]**	P140
[Aspect Ratio]	Sets the aspect ratio of the image. • **[4:3]/[3:2]/[16:9]/[1:1]**	P129
[Picture Size]	Set the number of pixels. • **[L]/[M]/[S]**	P129
[Quality]	Set the compression rate at which the pictures are to be stored. • **[]/[]/[RAW]/[RAW]/[RAW]**	P130
[AFS/AFF]	Assigns [AFS] or [AFF] to [AFS/AFF] of the focus mode lever. • **[AFS]/[AFF]**	P93
[Metering Mode]	Sets the light metering method for measuring brightness. • **[]/[]/[]**	P161
[Burst Rate]	Sets the burst speed for burst recording. • **[SH]/[H]/[M]/[L]**	P113
[Auto Bracket]	Sets single/burst recording, compensation range and recording sequence for Auto Bracket recording. • **[Single/Burst Settings]/[Step]/[Sequence]**	P116
[Self Timer]	Sets the manner in which the self-timer works. • **[]/[]/[]**	P118
[Time Lapse/Animation]	Makes the recording settings for Time Lapse Shot and Stop Motion Animation.	P120, P124
[Highlight Shadow]	You can adjust the brightness of bright and dark portions on an image while checking the brightness on the screen. • **[ ]/[ ]/[ ]/[ ]/[ ]/[ ]/[ ]**	P142
[i.Dynamic] (Intelligent dynamic range control)	Adjusts the contrast and exposure. • **[AUTO]/[HIGH]/[STANDARD]/[LOW]/[OFF]**	P144
[i.Resolution]	Records pictures with more defined outlines and sense of clarity. • **[HIGH]/[STANDARD]/[LOW]/[EXTENDED]/[OFF]**	P144

[iHandheld Night Shot]	Pictures of the night scenery will be taken at a high burst speed and composed into a single picture. • **[ON]/[OFF]**	P72
[iHDR]	There is, for example, strong contrast between the background and the subject, multiple still pictures are recorded with differing exposures and combined to create a single still picture rich in gradation. • **[ON]/[OFF]**	P73
[HDR]	You can combine 3 pictures with different levels of exposure into a single picture with rich gradation. • **[ON]/[OFF]/[SET]**	P145
[Multi Exp.]	Gives an effect like multi exposure. (up to 4 times equivalent per a single image) • **[Start]/[Auto Gain]/[Overlay]**	P168
[Electronic Shutter]	The shutter sound can be turned off for recording in a quiet environment. • **[ON]/[OFF]**	P171
[Shutter Delay]	To reduce the influence of hand shake, the shutter is released when a specified time period has elapsed since the shutter button was pressed. • **[8SEC]/[4SEC]/[2SEC]/[1SEC]/[OFF]**	P172
[Flash]	Sets the manner in which the flash works.	P183
[Red-Eye Removal]	Automatically detects red-eye caused by the flash and corrects the image data accordingly. • **[ON]/[OFF]**	P183
[ISO Limit Set]	When the ISO sensitivity is set to [AUTO] or [ISO], an optimal ISO sensitivity is set with the selected value as an upper limit. • **[400]/[800]/[1600]/[3200]/[6400]/[12800]/[25600]/[OFF]**	P133
[ISO Increments]	The ISO sensitivity settings values changes in steps of 1/3 EV or 1 EV. • **[1/3 EV]/[1 EV]**	P134

[Extended ISO]	ISO sensitivity can be set up to minimum [ISO100]. • **[ON]/[OFF]**	P134
[Long Shtr NR]	You can eliminate the noise caused by recording with a slower shutter speed. • **[ON]/[OFF]**	P146
[Shading Comp.]	If the screen periphery darkens as a result of lens characteristics, the brightness in this region will be corrected. • **[ON]/[OFF]**	P146
[Ex. Tele Conv.]	When the number of pixels is set to anything other than [L], the Tele effect is increased without degradation in image quality. • **[ZOOM]/[TELE CONV.]/[OFF]**	P163
[Digital Zoom]	Increases the Tele effect. The higher the level of magnification, the greater the degradation in image quality. • **[4×]/[2×]/[OFF]**	P165
[Color Space]	Set this when you want to correct the color reproduction of the recorded pictures on a PC, printer etc. • **[sRGB]/[AdobeRGB]**	P147
[Stabilizer]	When camera shake is sensed during recording, the camera corrects it automatically. • **[ ]/[ ]/[OFF]**	P51
[Face Recog.]	Sets the focus and exposure automatically prioritizing registered faces. • **[ON]/[OFF]/[MEMORY]**	P173
[Profile Setup]	If you set the name and birthday of your baby or pet in advance, you can record their name and age in months and years in the images. • **[1]/[2]/[ ]/[OFF]/[SET]**	P178

[Motion Picture]

[Photo Style]	You can select effects to match the type of image you wish to record. You can adjust the color and image quality of the effects. • **[Standard]/[Vivid]/[Natural]/[Monochrome]/[Scenery]/[Portrait]/[Custom]/[Cinelike D]/[Cinelike V]**	P140
[Rec Format]	Sets the file format for the motion pictures you record. • **[AVCHD]/[MP4]/[MP4 (LPCM)]/[MOV]**	P193
[Rec Quality]	This sets up the picture quality of motion pictures.	P193
[Exposure Mode]	Select the method for setting the aperture value and shutter speed in Creative Video Mode. • **[P]/[A]/[S]/[M]**	P202
[Variable Frame Rate]	You can record slow motion or fast motion pictures in Creative Video Mode. • **[ON]/[OFF]/[SET]**	P215
[AFS/AFF]	Assigns [AFS] or [AFF] to [AFS/AFF] of the focus mode lever. • **[AFS]/[AFF]**	P93
[Picture Mode]	Sets the recording method for still pictures during motion picture recording. • **[ ]/[ ]**	P200
[Continuous AF]	Continues to focus on the subject for which focus has been achieved. • **[ON]/[OFF]**	P199
[Metering Mode]	Sets the light metering method for measuring brightness. • **[ ]/[ ]/[ ]**	P161
[Highlight Shadow]	You can adjust the brightness of bright and dark portions on an image while checking the brightness on the screen. • **[ ]/[ ]/[ ]/[ ]/[ ]/[ ]/[ ]**	P142
[i.Dynamic] (Intelligent dynamic range control)	Adjusts the contrast and exposure. • **[AUTO]/[HIGH]/[STANDARD]/[LOW]/[OFF]**	P144
[i.Resolution]	Records pictures with more defined outlines and sense of clarity. • **[HIGH]/[STANDARD]/[LOW]/[EXTENDED]/[OFF]**	P144

[Master Pedestal Level]	You can adjust black, which serves as the reference for images in Creative Video Mode, in 31 steps.	P206
[Luminance Level]	Sets the luminance range for motion pictures. • **[0—255]/[16—235]/[16—255]**	P206
[Synchro Scan]	You can reduce flickering and stripes on images in Creative Video Mode. • **[ON]/[OFF]**	P218
[Ex. Tele Conv.]	Increases the Tele effect. • **[ON]/[OFF]**	P163
[Digital Zoom]	Increases the Tele effect. The higher the level of magnification, the greater the degradation in image quality. • **[4×]/[2×]/[OFF]**	P165
[Time Code]	Sets the time code. • **[Time Code Display]/[Count Up]/[Time Code Value]/[Time Code Mode]**	P214
[HDMI Rec Output]	Sets the HDMI output method to be used during recording. • **[Bit Mode]/[Info Display]/[4K Down Convert]**	P212
[Sound Output]	Sets the sound output method for the connected headphone set (commercially available). The setting also applies to the sound to be displayed as a mic level. • **[REAL TIME]/[REC SOUND]**	P208
[Silent Operation]	Enables touch operations to allow silent use while recording motion pictures. • **[ON]/[OFF]**	P204
[Mic Level Disp.]	Set whether or not the mic levels are displayed on the recording screen. • **[ON]/[OFF]**	P208
[Mic Level Adj.]	Adjust the sound input level to 19 different levels.	P207
[Special Mic.]	Sets the sound recording method when a stereo shotgun microphone (optional) is connected. • **[STEREO]/[LENS AUTO]/[SHOTGUN]/[S. SHOTGUN]/[MANUAL]**	P350
[Mic Level Limiter]	Adjusts the sound input level automatically. • **[ON]/[OFF]**	P207

[Wind Cut]	This prevents the recording of wind-noise automatically. • **[AUTO]/[HIGH]/[STANDARD]/[LOW]/[OFF]**	P207
[Lens Noise Cut]	You can reduce the zoom sound of an interchangeable lens compatible with power zoom that is produced during motion picture recording. • **[ON]/[OFF]**	P207
[SS/Gain Operation]	You can switch the units of shutter speed values and gain (sensitivity) values. • **[SEC/ISO]/[ANGLE/ISO]/[SEC/dB]**	P209
[Color Bars]	Displays color bars, which are convenient for adjusting the picture quality of the external monitor and some other settings. • **[SMPTE]/[EBU]/[ARIB]**	P219

[Custom]

[Cust.Set Mem.]	Registers the current camera settings as custom set. • **[C 1]/[C 2]/[C 3-1]/[C 3-2]/[C 3-3]**	P321
[Silent Mode]	Disables operational sounds and output of light at once. • **[ON]/[OFF]**	P170
[AF/AE Lock]	Sets the fixed content for focusing and exposure when the AF/AE lock is on. • **[AE LOCK]/[AF LOCK]/[AF/AE LOCK]/[AF-ON]**	P160
[AF/AE Lock Hold]	This will set the operation of [AF/AE LOCK] button when taking a picture with fixed focus or exposure. • **[ON]/[OFF]**	P160
[Shutter AF]	Set whether or not the focus is adjusted automatically when the shutter button is pressed halfway. • **[ON]/[OFF]**	P305
[Half Press Release]	The shutter will immediately fire when the shutter button is pressed halfway. • **[ON]/[OFF]**	P305
[Quick AF]	Speeds up the focusing that takes place when you press the shutter button. • **[ON]/[OFF]**	P306
[Eye Sensor AF]	The camera automatically adjusts the focus when the eye sensor is active. • **[ON]/[OFF]**	P306
[Pinpoint AF Time]	Sets the time for which the screen is enlarged when the shutter button is pressed halfway with Auto Focus Mode set to [⊞]. • **[LONG]/[MID]/[SHORT]**	P306
[AF Assist Lamp]	AF assist lamp will illuminate the subject when the shutter button is pressed half-way making it easier for the camera to focus when recording in low light conditions. • **[ON]/[OFF]**	P307

[Direct Focus Area]	Moves the AF area or MF assist using the cursor button when recording. • **[ON]/[OFF]**	P307, P109
[Focus/Release Priority]	It will set so no picture can be taken when it is out of focus. • **[FOCUS]/[RELEASE]**	P307
[AF+MF]	You can set the focus manually after the automatic focus has finished. • **[ON]/[OFF]**	P308
[MF Assist]	Sets the display method of MF Assist (enlarged screen). • **[ ]/[FOCUS]/[ ]/[OFF]**	P308
[MF Guide]	When you set the focus manually, an MF guide that allows you to check the direction to achieve focus is displayed. • **[ON]/[OFF]**	P308
[Peaking]	In-focus portions are highlighted when focus is being adjusted manually. • **[ON]/[OFF]/[SET]**	P111
[Histogram]	This allows you to set either to display or not display the histogram. • **[ON]/[OFF]**	P309
[Guide Line]	This will set the pattern of guide lines displayed when taking a picture. • **[ ]/[ ]/[ ]/[OFF]**	P309
[Center Marker]	Displays [+], which indicates the center of the recording screen. • **[ON]/[OFF]**	P209
[Highlight]	When the Auto Review function is activated or when playing back, white saturated areas appear blinking in black and white. • **[ON]/[OFF]**	P310
[Zebra Pattern]	Indicates parts that may be whited out through overexposure in a zebra pattern. • **[Zebra 1]/[Zebra 2]/[OFF]/[SET]**	P210
[Monochrome Live View]	You can display the recording screen in black and white. • **[ON]/[OFF]**	P211

[Constant Preview]	You can check the effects of the chosen aperture and shutter speed on the recording screen in Manual Exposure Mode. • **[ON]/[OFF]**	P154
[Expo.Meter]	Set whether or not to display the exposure meter. • **[ON]/[OFF]**	P310
[LVF Disp.Style]	This will set the display style of the viewfinder. • **[ ]/[ ]**	P45
[Monitor Disp. Style]	This will set the display style of the monitor. • **[ ]/[ ]**	P44
[Monitor Info. Disp.]	Display the recording information screen. • **[ON]/[OFF]**	P311
[Rec Area]	This changes the angle of view during motion picture recording and still picture recording. • **[ ]/[ ]**	P311
[Video-Priority Display]	Switches screens to those suitable for motion picture recording. • **[ON]/[OFF]**	P211
[Auto Review]	Displays a picture immediately after it is taken. • **[Duration Time]/[Playback Operation Priority]**	P311
[Fn Button Set]	You can assign frequently-used functions to particular buttons or icons. • **[Setting in REC mode]/[Setting in PLAY mode]**	P317
[Q.MENU]	Switch the setting method of Quick Menu. • **[PRESET]/[CUSTOM]**	P312
[Dial Set.]	Changes the operation methods of the front dial and rear dial. • **[Assign Dial (F/SS)]/[Rotation (F/SS)]/[Exposure Comp.]**	P312
[Video Button]	Enables/disables the motion picture button. • **[ON]/[OFF]**	P313

[Power Zoom Lens]	Sets the screen display and lens operations when using an interchangeable lens that is compatible with power zoom (electrically operated zoom). • **[Disp Focal Length]/[Step Zoom]/[Zoom Resume]/[Zoom Speed]/[Zoom Ring]**	P165
[Lens w/o Focus Ring]	Sets the control dial operation for MF Assist. • **[Control Dial (MF)]/[MF Assist Display]**	P313
[Eye Sensor]	Setting the eye sensor sensitivity and the method for switching between the monitor and viewfinder. • **[Sensitivity]/[LVF/Monitor Switch]**	P313
[Touch Settings]	Enables/disables the Touch operation. • **[Touch Screen]/[Touch Tab]/[Touch AF]/[Touch Pad AF]**	P314
[Touch Scroll]	This allows you to set the speed of continuously forwarding or rewinding pictures using touch operation. • **[H]/[L]**	P314
[Menu Guide]	Set the screen that is displayed when the mode dial is set to . • **[ON]/[OFF]**	P314
[Shoot w/o Lens]	Sets whether or not the shutter can be released when no lens is attached to the main body. • **[ON]/[OFF]**	P314

[Setup]

[Clock Set]	Setting Date/Time.	P36
[World Time]	Sets the times for the region where you live and your holiday destination. • **[Destination]/[Home]**	P60
[Travel Date]	Departure date and return date of the trip as well as the name of the travel destination can be set. • **[Travel Setup]/[Location]**	P61
[Wi-Fi]	Configure the each setting for Wi-Fi functions. • **[Wi-Fi Function]/[Wi-Fi Setup]**	P302
[Beep]	Set the volume for electronic noises and the electronic shutter noise. • **[Beep Volume]/[E-Shutter Vol]**	P62
[Speaker Volume]	Adjust the volume of the speaker to any of 7 levels.	P62
[Headphone Volume]	Adjust the volume of the connected headphone set (commercially available) in 16 steps.	P62
[Live View Mode]	Set the frame rate of the recording screen (Live View screen). • **[30fps]/[60fps]**	P62
[Monitor Display]/ [Viewfinder]	Brightness, color, or red or blue tint of the Monitor/ viewfinder is adjusted. • **[ ]/[ ]/[ ]/[ ]**	P63
[Monitor Luminance]	Set the monitor brightness to suit the amount of surrounding light. • **[A]/[1]/[2]**	P63
[Economy]	Suppresses the unit's power consumption to prevent the battery from being run down. • **[Sleep Mode]/[Auto LVF/Monitor Off]**	P59
[Battery Use Priority]	When batteries are inserted to both this unit and the battery grip, you can set that which battery should be used first. • **[BODY]/[BG]**	P352
[USB Mode]	Sets the communication method when connecting using the USB connection cable (supplied). • **[Select on connection]/ [PictBridge(PTP)]/ [PC]**	P64

[TV Connection]	This sets how the unit connects to a television etc. • **[TV Aspect]/[HDMI Mode (Play)]/[3D Playback]/[VIERA Link]**	P65
[Menu Resume]	Stores the location of the last-used menu item for each menu. • **[ON]/[OFF]**	P66
[Menu Background]	Set the background color for the menu screen.	P66
[Menu Information]	Descriptions of menu items or their settings are displayed on the menu screen. • **[ON]/[OFF]**	P66
[Language]	Set the language displayed on the screen.	P67
[Version Disp.]	This enables the firmware versions of the camera and lens to be checked.	P67
[Exposure Comp. Reset]	An exposure value can be reset when the Recording Mode is changed or the camera is turned off. • **[ON]/[OFF]**	P67
[No.Reset]	Returns the image file number to 0001.	P67
[Reset]	The recording or setup/custom settings are reset to the default.	P58
[Reset Wi-Fi Settings]	Reset all settings in the [Wi-Fi] menu to factory default settings. (Excluding [LUMIX CLUB])	P68
[System Frequency]	Changes the system frequency of motion pictures you record with and play back on the camera. • **[59.94 Hz (NTSC)]/[50.00 Hz (PAL)]/[24.00 Hz (CINEMA)]**	P220
[Pixel Refresh]	It will perform optimization of imaging device and image processing.	P68
[Sensor Cleaning]	Dust reduction to blow off the debris and dust that have affixed to the front of the imaging device is performed.	P68
[Format]	The card is formatted.	P68

[Playback]

[2D/3D Settings]	Switches the playback method for 3D images.	P229
[Slide Show]	Selects the type etc. of the images and plays back in order. • **[All]/[Picture Only]/[Video Only]/[3D]/[Category Selection]/[Favorite]**	P229
[Playback Mode]	Selects the type etc. of the images and plays back only particular images. • **[Normal Play]/[Picture Only]/[Video Only]/[3D Play]/[Category Play]/[Favorite Play]**	P231
[Location Logging]	You can write location information (longitude/latitude) on images sent from the smartphone/tablet. • **[Add Location Data]/[Delete Location Data]**	P232
[RAW Processing]	You can convert the pictures taken in the RAW format into the JPEG format on the camera.	P233
[Clear Retouch]	You can erase unnecessary parts recorded on the pictures taken.	P236
[Title Edit]	Input texts (comments) on the recorded pictures. • **[Single]/[Multi]**	P238
[Text Stamp]	Stamps the recorded pictures with recording date and time, names, travel destination, travel date, etc. • **[Single]/[Multi]**	P239
[Video Divide]	Splits the recorded motion picture in two.	P242
[Time Lapse Video]	Creates a motion picture from a set of group pictures recorded with the [Time Lapse Shot].	P243
[Stop Motion Video]	Creates a motion picture from the Stop Motion Animation group.	P243
[Resize]	Reduces the image size (number of pixels). • **[Single]/[Multi]**	P244
[Cropping]	Crops the recorded image.	P246
[Rotate]	Rotate pictures manually in 90° steps.	P247
[Rotate Disp.]	This mode allows you to display pictures vertically if they were recorded holding the camera vertically. • **[ON]/[OFF]**	P247

[Favorite]	• Marks can be added to images, and images can be set as favorites. • **[Single]/[Multi]/[Cancel]**	P248
[Print Set]	Sets the images for printing and the number of prints. • **[Single]/[Multi]/[Cancel]**	P249
[Protect]	Protects images to prevent deletion by mistake. • **[Single]/[Multi]/[Cancel]**	P251
[Face Rec Edit]	Removes or changes information relating to personal identity. • **[REPLACE]/[DELETE]**	P252
[Picture Sort]	Sets the display order of the images you play back on the camera. • **[FILE NAME]/[DATE/TIME]**	P252
[Delete Confirmation]	This sets which option, [Yes] or [No], will be highlighted first when the confirmation screen for deleting a picture is displayed. • **[“Yes” first]/[“No” first]**	P253

Available Menu Items (Listed by Recording Mode)

(○: possible, —: not possible)

	iA	iA+	P	A	S	M	M
[AF Mode]	—	—	○	○	○	○	○
[White Balance]	—	—	○	○	○	○	○
White Balance Fine Adjustment	—	—	○	○	○	○	○
White Balance Bracket	—	—	○	○	○	○	—
[Sensitivity]	—	—	○	○	○	○	○
[Exposure Comp.]	—	○	○	○	○	—	○
Drive Mode							
[Burst]	○	○	○	○	○	○	—
[Auto Bracket]	—	○	○	○	○	○	
[Self Timer]	○	○	○	○	○	○	
[Time Lapse Shot]	○	○	○	○	○	○	
[Stop Motion Animation]	○	○	○	○	○	○	
[Rec] menu							
[Photo Style]	—	○	○	○	○	○	—
[Aspect Ratio]	○	○	○	○	○	○	
[Picture Size]	○	○	○	○	○	○	
[Quality]	—	○	○	○	○	○	
[AFS/AFF]	○	○	○	○	○	○	
[Metering Mode]	—	—	○	○	○	○	
[Burst Rate]	○	○	○	○	○	○	
[Auto Bracket]	—	○	○	○	○	○	
[Self Timer]	○	○	○	○	○	○	
[Time Lapse/Animation]	○	○	○	○	○	○	
[Highlight Shadow]	—	—	○	○	○	○	
[i.Dynamic]	—	—	○	○	○	○	
[i.Resolution]	—	—	○	○	○	○	
[iHandheld Night Shot]	○	○	—	—	—	—	
[iHDR]	○	○	—	—	—	—	
[HDR]	—	—	○	○	○	○	
[Multi Exp.]	—	—	○	○	○	○	
[Electronic Shutter]	—	○	○	○	○	○	
[Shutter Delay]	—	○	○	○	○	○	
[Flash]	—	—	○	○	○	○	
[Red-Eye Removal]	—	—	○	○	○	○	
[ISO Limit Set]	—	—	○	○	○	○	
[ISO Increments]	—	—	○	○	○	○	

(○: possible, —: not possible)

	iA	iA+	P	A	S	M	M
[Rec] menu							
[Extended ISO]	—	—	○	○	○	○	—
[Long Shtr NR]	—	—	○	○	○	○	
[Shading Comp.]	—	—	○	○	○	○	
[Ex. Tele Conv.] (Photo)	—	○	○	○	○	○	
[Digital Zoom]	—	—	○	○	○	○	
[Color Space]	—	○	○	○	○	○	
[Stabilizer]	—	○	○	○	○	○	
[Face Recog.]	○	○	○	○	○	○	
[Profile Setup]	—	○	○	○	○	○	
[Motion Picture] menu							
[Photo Style]	—	○	○	○	○	○	○
[Rec Format]	○	○	○	○	○	○	○
[Rec Quality]	○	○	○	○	○	○	○
[Exposure Mode]	—	—	—	—	—	—	○
[Variable Frame Rate]	—	—	—	—	—	—	○
[AFS/AFF]	○	○	○	○	○	○	○
[Picture Mode]	—	—	○	○	○	○	—
[Continuous AF]	—	○	○	○	○	○	○
[Metering Mode]	—	—	○	○	○	○	○
[Highlight Shadow]	—	—	○	○	○	○	○
[i.Dynamic]	—	—	○	○	○	○	○
[i.Resolution]	—	—	○	○	○	○	○
[Master Pedestal Level]	—	—	—	—	—	—	○
[Luminance Level]	—	○	○	○	○	○	○
[Synchro Scan]	—	—	—	—	—	—	○
[Ex. Tele Conv.] (Motion Picture)	—	○	○	○	○	○	○
[Digital Zoom]	—	—	○	○	○	○	○
[Time Code]	—	○	○	○	○	○	○
[HDMI Rec Output]	—	○	○	○	○	○	○
[Sound Output]	○	○	○	○	○	○	○
[Silent Operation]	—	—	—	—	—	—	○
[Mic Level Disp.]	—	○	○	○	○	○	○
[Mic Level Adj.]	—	○	○	○	○	○	○
[Special Mic.]	○	○	○	○	○	○	○
[Mic Level Limiter]	—	○	○	○	○	○	○
[Wind Cut]	—	○	○	○	○	○	○
[Lens Noise Cut]	—	○	○	○	○	○	○
[SS/Gain Operation]	—	—	—	—	—	—	○
[Color Bars]	—	○	○	○	○	○	○

(○: possible, —: not possible)

	❶[Expressive]/❷[Retro]/❸[Old Days]/❹[High Key]/❺[Low Key]/❻[Sepia]/❼[Monochrome]/❽[Dynamic Monochrome]/❾[Rough Monochrome]/❿[Silky Monochrome]/⓫[Impressive Art]/⓬[High Dynamic]/⓭[Cross Process]/⓮[Toy Effect]/⓯[Toy Pop]/⓰[Bleach Bypass]/⓱[Miniature Effect]/⓲[Soft Focus]/⓳[Fantasy]/⓴[Star Filter]/㉑[One Point Color]/㉒[Sunshine]																				
	❶	❷	❸	❹	❺	❻	❼	❽	❾	❿	⓫	⓬	⓭	⓮	⓯	⓰	⓱	⓲	⓳	⓴	㉑	㉒
[AF Mode]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	○	○	○	○	○
[White Balance]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
White Balance Fine Adjustment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
White Balance Bracket	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Sensitivity]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Exposure Comp.]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Drive Mode																						
[Burst]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	—	—	○	—	○	—
[Auto Bracket]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	—	—	○	—	○	—
[Self Timer]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Time Lapse Shot]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Stop Motion Animation]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Rec] menu																						
[Photo Style]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Aspect Ratio]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Picture Size]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Quality]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[AFS/AFF]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Metering Mode]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Burst Rate]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Auto Bracket]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Self Timer]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Time Lapse/Animation]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Highlight Shadow]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[i.Dynamic]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[i.Resolution]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[iHandheld Night Shot]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[iHDR]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[HDR]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Multi Exp.]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Electronic Shutter]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Shutter Delay]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Flash]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Red-Eye Removal]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[ISO Limit Set]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(○: possible, —: not possible)

	❶[Expressive]/❷[Retro]/❸[Old Days]/❹[High Key]/❺[Low Key]/❻[Sepia]/❼[Monochrome]/❽[Dynamic Monochrome]/❾[Rough Monochrome]/❿[Silky Monochrome]/⓫[Impressive Art]/⓬[High Dynamic]/⓭[Cross Process]/⓮[Toy Effect]/⓯[Toy Pop]/⓰[Bleach Bypass]/⓱[Miniature Effect]/⓲[Soft Focus]/⓳[Fantasy]/⓴[Star Filter]/㉑[One Point Color]/㉒[Sunshine]																				
	❶	❷	❸	❹	❺	❻	❼	❽	❾	❿	⓫	⓬	⓭	⓮	⓯	⓰	⓱	⓲	⓳	⓴	㉑	㉒
[Rec] menu																						
[ISO Increments]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Extended ISO]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Long Shtr NR]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Shading Comp.]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Ex. Tele Conv.] (Photo)	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○
[Digital Zoom]	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—	○	—	○	○	○	○	○
[Color Space]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Stabilizer]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Face Recog.]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	○	○	○	○	○
[Profile Setup]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
[Motion Picture] menu																						
[Photo Style]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Rec Format]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Rec Quality]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Exposure Mode]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Variable Frame Rate]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[AFS/AFF]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Picture Mode]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Continuous AF]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Metering Mode]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Highlight Shadow]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[i.Dynamic]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[i.Resolution]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Master Pedestal Level]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Luminance Level]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Synchro Scan]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Ex. Tele Conv.] (Motion Picture)	○	○	○	○	○	○	○	○	—	—	○	○	○	—	—	○	○	—	○	—	○	—
[Digital Zoom]	○	○	○	○	○	○	○	○	—	—	○	○	○	—	—	○	—	—	○	—	○	—
[Time Code]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[HDMI Rec Output]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Sound Output]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Silent Operation]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Mic Level Disp.]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	—	○	—	○	—
[Mic Level Adj.]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	—	○	—	○	—

(○: possible, —: not possible)

	❶[Expressive]/❷[Retro]/❸[Old Days]/❹[High Key]/❺[Low Key]/❻[Sepia]/❼[Monochrome]/❽[Dynamic Monochrome]/❾[Rough Monochrome]/❿[Silky Monochrome]/⓫[Impressive Art]/⓬[High Dynamic]/⓭[Cross Process]/⓮[Toy Effect]/⓯[Toy Pop]/⓰[Bleach Bypass]/⓱[Miniature Effect]/⓲[Soft Focus]/⓳[Fantasy]/⓴[Star Filter]/㉑[One Point Color]/㉒[Sunshine]																				
	❶	❷	❸	❹	❺	❻	❼	❽	❾	❿	⓫	⓬	⓭	⓮	⓯	⓰	⓱	⓲	⓳	⓴	㉑	㉒
[Motion Picture] menu																						
[Special Mic.]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—
[Mic Level Limiter]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	—	—	○	—	○	—
[Wind Cut]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	—	—	○	—	○	—
[Lens Noise Cut]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	—	—	○	—	○	—
[SS/Gain Operation]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[Color Bars]	○	○	○	○	○	○	○	○	—	—	○	○	○	○	○	○	○	—	○	—	○	—

Approximate number of recordable pictures and available recording time

■ Number of recordable pictures

• [9999+] is displayed if there are more than 10000 pictures remaining.

• **Aspect ratio [4:3], Quality [⁞⁞⁞]**

[Picture Size]	2 GB	8 GB	32 GB	64 GB
L (16M)	220	890	3610	7160
M (8M)	400	1620	6550	13000
S (4M)	660	2680	10850	20590

• **Aspect ratio [4:3], Quality [RAW⁞⁞⁞]**

[Picture Size]	2 GB	8 GB	32 GB	64 GB
L (16M)	68	270	1110	2220
M (8M)	79	310	1290	2580
S (4M)	86	340	1400	2790

■ Available recording time (when recording motion pictures)

• "h" is an abbreviation for hour, "m" for minute and "s" for second.

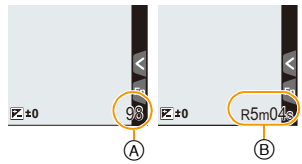
• The recordable time is the total time of all the motion pictures which have been recorded.

Switching the display between the number of recordable pictures and the available recording time

If you set [Video-Priority Display] in the [Custom] menu to [ON], you can display the available recording time. (P211)

Ⓐ Number of recordable pictures

Ⓑ Available recording time



• **[AVCHD]**

[Rec Quality]	2 GB	8 GB	32 GB	64 GB
[FHD/28M/60p]/ [FHD/28M/50p]	7m00s	35m00s	2h30m	5h00m
[FHD/17M/60i]/ [FHD/17M/50i]	12m00s	55m00s	4h05m	8h25m
[FHD/24M/30p]/ [FHD/24M/25p]/ [FHD/24M/24p]	9m00s	40m00s	2h50m	5h50m

• [MP4]

[Rec Quality]	2 GB	8 GB	32 GB	64 GB
[4K/100M/30p]/ [4K/100M/25p]	1m00s	8m00s	40m00s	1h20m
[FHD/28M/60p]/ [FHD/28M/50p]	7m00s	34m00s	2h25m	5h00m
[FHD/20M/30p]/ [FHD/20M/25p]	9m00s	45m00s	3h15m	6h45m
[HD/10M/30p]/ [HD/10M/25p]	20m00s	1h25m	6h20m	12h55m
[VGA/4M/30p]/ [VGA/4M/25p]	38m00s	3h15m	13h00m	26h00m

• [MP4 (LPCM)]

[Rec Quality]	2 GB	8 GB	32 GB	64 GB
[C4K/100M/24p]	1m00s	9m00s	40m00s	1h25m
[4K/100M/30p]/ [4K/100M/25p]/ [4K/100M/24p]	1m00s	9m00s	40m00s	1h25m
[FHD/ /200M/60p]/ [FHD/ /200M/50p]/ [FHD/ /200M/30p]/ [FHD/ /200M/25p]/ [FHD/ /200M/24p]	Less than 1m	3m00s	18m00s	40m00s
[FHD/100M/60p]/ [FHD/100M/50p]/ [FHD/100M/30p]/ [FHD/100M/25p]/ [FHD/100M/24p]	1m00s	8m00s	40m00s	1h20m
[FHD/50M/60p]/ [FHD/50M/50p]/ [FHD/50M/30p]/ [FHD/50M/25p]/ [FHD/50M/24p]	3m00s	18m00s	1h20m	2h50m

• **[MOV]**

[Rec Quality]	2 GB	8 GB	32 GB	64 GB
[C4K/100M/24p]	1m00s	9m00s	40m00s	1h25m
[4K/100M/30p]/ [4K/100M/25p]/ [4K/100M/24p]	1m00s	9m00s	40m00s	1h25m
[FHD/ /200M/60p]/ [FHD/ /200M/50p]/ [FHD/ /200M/30p]/ [FHD/ /200M/25p]/ [FHD/ /200M/24p]	Less than 1m	3m00s	18m00s	40m00s
[FHD/100M/60p]/ [FHD/100M/50p]/ [FHD/100M/30p]/ [FHD/100M/25p]/ [FHD/100M/24p]	1m00s	8m00s	40m00s	1h20m
[FHD/50M/60p]/ [FHD/50M/50p]/ [FHD/50M/30p]/ [FHD/50M/25p]/ [FHD/50M/24p]	3m00s	18m00s	1h20m	2h50m

- Depending on the recording conditions and the type of card, the number of recordable pictures and available recording time vary.
- When the motion picture size is set to [FHD], [HD] or [VGA] in [MP4], you can continuously record a motion picture up to 29 minutes 59 seconds or until the file size reaches 4 GB. You can check the recordable time on the screen.
  – Since the file size becomes larger with [FHD], recording with [FHD] will stop before 29 minutes 59 seconds.
- You can continuously record a motion picture with its size set to [4K] in [MP4] without a pause even if the motion picture exceeds 4 GB. However, the recorded content has to be played back as multiple files.
- Though a [MP4 (LPCM)]/[MOV] motion picture can be recorded continuously without a pause even when its file size exceeds 4 GB, the recorded content is played back with multiple files.
- **The maximum available continuous recording time is displayed on the screen.**

Troubleshooting

First, try out the following procedures (P393–P409).

If the problem is not resolved, it may be improved by selecting [Reset] (P67) on the [Setup] menu.

Battery and power source

The camera cannot be operated even when it is turned on.
The camera turns off immediately after it is turned on.

- The battery is exhausted.
  → Charge the battery.
- If you leave the camera on, the battery will be exhausted.
  → Turn the camera off frequently by using the [Economy] etc. (P59)

This unit is turned off automatically.

- Is the linked operation of VIERA Link enabled?
  → If you are not using VIERA Link, set [VIERA Link] to [OFF]. (P66)

The battery door does not close.

- Insert the battery securely all the way in. (P32)

The battery becomes flat too quickly.

- Is a Wi-Fi connection being used for a long period of time?
  The battery can become flat quickly when connected to Wi-Fi.
  → Turn the camera off frequently by using the [Economy] etc. (P59)

Recording

Taking pictures is not possible.
The shutter will not operate immediately when the shutter button is pressed.

- Is the subject focused?
  → [Focus/Release Priority] is set to [FOCUS] at the time of purchase, and so you cannot take pictures until the subject is in focus. (P307)

The recorded picture is whitish.

- Picture might look whitish when lens or image sensor gets dirty with fingerprints or similar.
  → If the lens is dirty turn the camera off and then gently wipe the lens surface with a soft, dry cloth.
  → Refer to P411 when the image sensor gets dirty.

The recorded picture is too bright or dark.

- Check that the exposure is correctly compensated. (P157)
- Is the AE Lock (P159) applied incorrectly?

Multiple pictures are taken at one time.

- Cancel the following settings:
  – Burst/Auto Bracket/[10] of the self-timer (P112)
  – White Balance Bracket (P139)

The subject is not focused properly.

- The subject is beyond the focus range of the camera. (P40)
- There is camera shake (jitter) or the subject is moving slightly. (P51)
- Is [Focus/Release Priority] in the [Custom] menu set to [RELEASE]? (P307)
- Is [Shutter AF] in the [Custom] menu set to [OFF]? (P305)
- Is the AF Lock (P159) applied incorrectly?

The recorded picture is blurred.
The Optical Image Stabilizer is not effective.

- The shutter speed will become slower and the Optical Image Stabilizer function may not work properly when taking pictures especially in dark places.
  → We recommend holding the camera firmly with both hands when taking pictures. (P38)
  → We recommend using a tripod and the self-timer (P118) when taking pictures with a slow shutter speed.

Taking pictures using White Balance Bracket is not possible.

- Is there any memory remaining on the card?

The recorded picture looks rough.
Noise appears on the picture.

- Try the following:
  → Take pictures in bright places.
  → Decrease the ISO sensitivity. (P132)
  → Increase the setting for [Noise Reduction] in [Photo Style] or lower the setting for each of the items other than [Noise Reduction]. (P140)
  → Set the [Long Shtr NR] to [ON]. (P146)
- Is the [Picture Size] (P129) or the [Quality] (P130) set low?
- Is the [Digital Zoom] set? (P165)

Striping or flicker may appear under lighting such as fluorescent lighting and LED lighting fixture.

- This is characteristic of MOS sensors which serve as the camera's pickup sensors.
  This is not a malfunction.
- Is [Electronic Shutter] set to [ON]? (P171)
  → If you set [Electronic Shutter] to [ON] and slow down the shutter speed, the stripes may appear less intense.

Stripes appear in high ISO sensitivity.
[When the interchangeable lens (H-H020) is used]

- Stripes may appear in high ISO sensitivity or depending on the lens you use.
  → Decrease the ISO sensitivity. (P132)

The brightness or the hue of the recorded picture is different from the actual scene.

- When recording under fluorescent or LED lighting fixture, etc., increasing the shutter speed may introduce slight changes to brightness and color. These are a result of the characteristics of the light source and do not indicate a malfunction.
- When recording subjects in extremely bright locations or recording under fluorescent lighting, LED lighting fixture, mercury lamp, sodium lighting, etc., the colors and screen brightness may change or horizontal striping may appear on the screen.

Bright spot not in subject is recorded.

- There may be defective pixels in the image sensor.
  → Perform [Pixel Refresh] (P68).

Subject cannot be locked. (AF tracking not possible)

- Set the AF area to the distinctive color of the subject if there is a part that is different from the surrounding color. (P98)

Operation sound is small.

- Is your finger covering up the speaker? (P19)

Motion pictures

Recording motion pictures is not possible.

- If you continue to use the same card after changing [System Frequency] (P220), motion pictures may not be recorded. To record with the same card, reset [System Frequency] to the original setting. To record motion pictures with the current setting, try the following:
  – Perform formatting (P68) on this unit after saving necessary data on a PC, etc.
  – Insert a different card.
- You may not be able to record for a short while after turning this unit on when using a large capacity card.

Motion picture recording stops in the middle.

- Depending on the [Rec Format] and [Rec Quality] of a motion picture, the speed class rating required for the card differs. Use a card that meets the rating. For details, refer to "About the motion picture recording and speed class" on P22.
- When a card with a slow data writing speed is used, motion picture recording may stop midway.
  → If a card on which recording and deleting have been repeated many times or a card that has been formatted on a PC or other equipment is being used, we recommend that you make a backup of the data and format (P68) the card on the unit.

When recording a motion picture, the screen may go dark.

- When recording a motion picture, the screen may go dark after a certain period to reduce battery consumption, but this will not affect the recorded motion picture.

The screen may be blacked out momentarily, or the unit may record noise.

- Depending on the environment at the time of motion picture recording, the screen may be blacked out momentarily or the unit may record noise due to static electricity or powerful electromagnetic waves (radio towers, high voltage power lines, etc.).

Striping or flicker appears under lighting such as a fluorescent or LED lighting fixture.
The subject appears distorted.

- This is characteristic of MOS sensors which serve as the camera's pickup sensors.
  This is not a malfunction.
  When a subject moves across the image very fast, the subject may appear slightly distorted.
- If flickering or horizontal stripes become noticeable under lighting such as fluorescent lights or LED lights, you can reduce them by manually setting the shutter speed to [1/60] or [1/100] in Creative Video Mode (P202). If you use [Synchro Scan] (P218), you can adjust the reduction setting in even finer increments.

In motion pictures, abnormal clicking and buzzing sounds are recorded.
The recorded sound is very quiet.

- With recording in a quiet environment, depending on the lenses used, the sound of aperture and focus actions may be recorded in motion pictures.
  Focus operation can be set to [OFF] in [Continuous AF] (P199).
- Use of [Silent Operation] is recommended if you are concerned about operational sounds. (P204)
- While recording motion pictures, plugging the aperture of the microphone with a finger may reduce the level of audio recording or audio may not record at all. Also be careful because the operation sound of lenses can easily be recorded at this time.

An operation sound is recorded at the end of a motion picture.

Since motion picture recording stops only after you press the motion picture button, the sound of the operation may be noticeable. If the sound bothers you, try the following:

→ Divide the last part of the motion picture using [Video Divide] (P242) in the [Playback] menu.
The motion picture may not be divided near the very end of it. To avoid this, record approximately 3 seconds longer.

→ Set the camera to Creative Video Mode, and use a shutter remote control (optional) to record motion pictures. (P353)

Lens

Recorded image may be warped, or nonexistent color is surrounding the subject.

- Depending on the lens used, picture may be warped slightly or you may see colors along the edge depending on the zoom factor, due to the characteristics of the lens. Also, the peripherals of the image might look warped because the perspective is enhanced when the wide angle is used. This is not a malfunction.

Flash

The flash is not activated.

- Is the flash closed?
  → Open the flash. (P180)
- When the electronic shutter is used, the flash is not activated. (P171)
  → Set [Electronic Shutter] to [OFF].
- When [Silent Mode] is set to [ON], the flash is not activated. (P170)
  → Set [Silent Mode] to [OFF].

The flash is activated 2 times.

- (Except for when [Firing Mode] in [Flash] is set to [MANUAL]) The flash is activated 2 times. The interval between the first and second flash is longer when Red-Eye Reduction (P183) is set so the subject should not move until the second flash is activated.

Monitor/Viewfinder

The Monitor/Viewfinder turns off although the camera is turned on.

- If no operations are performed during the set time period, [Auto LVF/Monitor Off] (P59) is activated, and the Monitor/Viewfinder turns off.
- When an object or your hand is positioned near the eye sensor, the Monitor display may switch to the Viewfinder display. (P48)

The Monitor/Viewfinder is too bright or dark.

- Check [Monitor Luminance] setting. (P63)
- Perform [Monitor Display]/[Viewfinder]. (P63)

It may flicker for an instant or the brightness of the screen may change significantly for an instant.

- This occurs due to the aperture of the lens changing when the shutter button is pressed halfway, or when the brightness of the subject changes. This is not a malfunction.

The picture is not displayed on the monitor.

- Does the picture appear on the viewfinder?
  → Press [LVF] to switch to monitor display. (P48)
- Is the monitor switched off?
  → Switch the display by pressing [DISP.]. (P44)

Monitor and viewfinder do not switch when [LVF] is pressed.

- It is only displayed on the monitor when the camera is connected to a PC or printer.

Black, white, red, blue and green dots appear on the Monitor/Viewfinder.

- This is not a malfunction.
  These pixels do not affect the recorded pictures.

Noise appears on the monitor.

- In dark places, noise may appear to maintain the brightness of the monitor.

Unevenly bright parts or irregular colors appear on the Monitor/Viewfinder.

- Monitor/viewfinder of this unit adopts OLED. Screen burn-in may occur on the screen/viewfinder when a same image is displayed for a long period of time, but it does not affect the recorded images.
  → Change the on-screen images frequently by using [Economy] (P59), [Eye Sensor] function (P48), or turning off the screen light (P44).

Monitor appears to be colored when you see it from an angle.

- This is a characteristic of this unit's monitor, and this is not a malfunction.

The color tone of the viewfinder differs from the actual tone.

- Being a characteristic of the viewfinder of this unit, this phenomenon is not a problem. Recorded images are not affected.

Playback

The picture being played back is not rotated, or is rotated in an unexpected direction, when displayed.

- You can display the pictures without being rotated when [Rotate Disp.] (P247) is set to [OFF].
- You can rotate pictures with the [Rotate] function. (P247)

The picture is not played back.
There are no recorded pictures.

- Is the card inserted?
- Is there a picture on the card?
- Is this a folder or picture which was processed in the PC?
  If it is, it cannot be played back by this unit.
  → It is recommended to use the "PHOTOfunSTUDIO" software in the DVD (supplied) to write pictures from PC to card.
- Has [Playback Mode] been set for playback?
  → Change to [Normal Play]. (P231)

Cannot play back motion pictures.

- Motion pictures recorded with a different [System Frequency] setting cannot be played back. (P220)
  → Return the [System Frequency] setting to the one you used during the recording.

The folder number and the file number are displayed as [—] and the screen turns black.

- Is this a non-standard picture, a picture which has been edited using a PC or a picture which was taken by another make of digital camera?
- Did you remove the battery immediately after picture-taking or did you take the picture using a battery with a low remaining charge?
  → To delete such pictures, make a backup of the data and format the card (P68).

Playback sound or operation sound is too low.

- Is something covering up the speaker? (P19)

Images with different date as recorded date are played back in the Calendar Playback.

- Is the clock in the camera set properly? (P36)
- Images edited on a PC or images recorded on other cameras might display a different date to the recorded date during the Calendar Playback.

White round spots like soap bubbles appear on the recorded picture.

- If you take a picture with the flash in a dark place or indoors, white round spots may appear on the picture caused by the flash reflecting of particles of dust in the air. This is not a malfunction.

[Thumbnail is displayed] appears on the screen.

- Is it a picture that has been recorded with other equipment?
  In such cases, these pictures may be displayed with a deteriorated picture quality.

Red part of the recorded image has changed color to black.

- When Red-Eye Removal ([⚡◎] or [⚡S◎]) is performed, red parts may be corrected to black.
  → It is recommended to take a pictures with the flash closed, Flash Mode set to [⚡], or [Red-Eye Removal] set to [OFF]. (P183)

Motion pictures recorded with this model cannot be played back on other equipment.

- The picture quality or sound quality of recorded motion pictures may be deteriorated even when these are played back with the compatible devices. Also, recording information may not be displayed correctly.

Wi-Fi function

A Wi-Fi connection cannot be established.
Radio waves get disconnected.
Wireless access point is not displayed.

General tips for using a Wi-Fi connection

- Use within the communication range of the device to be connected.
- Is any device, such as microwave oven, cordless phone, etc., that uses 2.4 GHz frequency operated nearby?
  → Radio waves may get interrupted when used simultaneously. Use them sufficiently away from the device.
- When the battery indicator is flashing red, the connection with other equipment may not start or the connection may be disrupted.
  (A message such as [Communication error] is displayed.)
- If you place the camera on a metal table or shelf, the radio waves may be adversely affected. In such cases, you may not be able to establish a connection. Move the camera away from the metal surface.

About a wireless access point

- Check if the wireless access point to connect is in operating state.
- The camera may not display or connect to a wireless access point depending on the radio wave condition.
  → Move this unit closer to the wireless access point.
  → Remove the obstacles between this unit and the wireless access point.
  → Change the direction of this unit.
  → Change the location and orientation of the wireless access point.
  → Perform the [Manual Input]. (P294)
- It may not display even if the radio waves exist depending on the setting of the wireless access point.
  → Check the settings of the wireless access point.
  → When the network SSID of the wireless access point is set not to broadcast, the wireless access point may not be detected. Enter the network SSID to start the connection (P294) or enable the SSID broadcast of the wireless access point.
- Connection types and security setting methods are different depending on the wireless access point. (Refer to the operating instructions of the wireless access point.)
- Is the 5 GHz/2.4 GHz switchable wireless access point connected to other equipment using the 5 GHz band?
  → The use of a wireless access point that can use 5 GHz/2.4 GHz simultaneously is recommended. It cannot be used simultaneously with this camera if it is not compatible.

It takes long time every time to connect to a smartphone/tablet.

- It may take longer time to connect depending on the Wi-Fi connection setting of the smartphone/tablet, but it is not a malfunction.

This unit is not displayed in the Wi-Fi setting screen of the smartphone/tablet.

- From the Wi-Fi setting menu on the smartphone/tablet, turn off and then on the Wi-Fi function.

I have forgotten the login ID or password for the “LUMIX CLUB”.

- Check the information in the login screen of “LUMIX CLUB”.
  http://lumixclub.panasonic.net/eng/c/

I cannot send images to an AV device.

- Sending may fail depending on the operational status of the AV device. Also, sending may take a while.

I do not have a wireless access point at my home, but I would like to perform service user registration of the “LUMIX CLUB”.

- Service user registration for the “LUMIX CLUB” is not possible in the environment without a wireless access point.

Images cannot be transmitted to a PC.

- When the firewall of the OS, security software, etc. is enabled, connecting to the PC may not be possible.

When I try to set up a Wi-Fi connection with a Windows 8 PC, my user name and password are not recognized, so I cannot connect to the PC.

- Some OS versions, including Windows 8, use two types of accounts: a local account and a Microsoft account.
  → Be sure to use the user name and password for the local account.
  If you haven’t set up a local account, please create one.

The PC is not recognized when I use a Wi-Fi connection. The camera cannot be connected to PC via Wi-Fi connection.

- The default workgroup name is set to “WORKGROUP”. If you changed the workgroup name, the PC will not be recognized.
  In [Change Workgroup Name] in [PC Connection] of the [Wi-Fi Setup] menu, change the workgroup name to that of the PC you are connecting to. Refer to P302 for details.
- Please confirm login name and password are correctly typed.
- When the system time of Mac computer or Windows PC connected to a camera differs severely from that of the camera, the camera cannot be connected to the computer or PC in some OSs.
  → Please confirm [Clock Set] and [World Time] of the camera matches with time, date and time zone in Windows PC or Mac computer. When both settings do not match severely, please match them.

Images cannot be transmitted to the web service.

- Confirm that the login information (login ID/user name/email address/password) is correct.
- Web service server or the network may be busy.
  → Try again after a while.
  → Check the site of the web service you are sending the image to.

It takes time to transmit an image to the web service.

- Is the size of the image too large?
  → Reduce the image size at [Size] (P301), and then send.
  → Transmit after dividing the motion picture with [Video Divide] (P242).
- It may take longer time to transmit when distance to the wireless access point is far.
  → Transmit closer to the wireless access point.

The image that was supposed to have uploaded to the web service is not there.

- Upload may not complete when it is disconnected while transmitting the image.
- It may take some time after uploading the image to be reflected in the web service depending on the status of the server.
  → Wait for a while and try again.
- You can check the transmission status on the web service link settings by logging into “LUMIX CLUB”.

I would like to return the image in the web service to the camera.

- The images in the web service cannot be saved (downloaded) to this unit.
  → Do not delete the uploaded images, and make a backup of them.

I cannot display or delete the images uploaded to the web service by this unit.

- The images uploaded to the web service cannot be displayed or deleted by this unit.
  → Perform the task using a smartphone/tablet or a PC.

Transmission of the image fails midway. Some images cannot be transmitted.

- Image cannot be transmitted when the battery indicator is flashing red.
- Is the size of the image too large?
  → Reduce the image size at [Size] (P301), and then send.
  → Transmit after dividing the motion picture with [Video Divide] (P242).
- File format of the motion picture that can be sent differs depending on the destination. (P299)
- Capacity or number of images in the web service is full.
  → Login to “LUMIX CLUB”, and check the status of the destination on the web service link settings.

Your “LUMIX CLUB” login ID and password were deleted after sending the camera in to be repaired.

- The settings stored in the camera may be deleted depending on the type of repair.
  → Always make a copy of important settings.

I have forgotten the password for the Wi-Fi.

- Execute the [Reset Wi-Fi Settings] in the [Setup] menu. (P68)
  However, all the information you have set on the [Wi-Fi Setup] menu will be reset. (excluding [LUMIX CLUB])

Cannot be connected using NFC.

- Is your smartphone compatible with NFC?
  → This unit can be used with NFC-compatible terminals via Android (OS version 2.3.3 or higher).
- Make sure the NFC function of your smartphone is ON.
- Is [NFC Operation] set to [OFF]? (P302)
- Some smartphones cannot be easily checked simply by touching.
  → If the camera is not recognized even after touching, change positions and try again by touching slowly.
- If the duration of touching is short, the smartphone may not be recognized.
  → Touch and hold the smartphone for a while.

TV, PC and printer

The picture does not appear on the television.

- Is the camera connected to the TV correctly?
  → Set the TV input to external input mode.

The picture is not displayed fully on the TV.
The display areas on the TV screen and the camera's monitor are different.

- Check [TV Aspect] setting. (P65)
- Depending on the TV model, the pictures may be extended horizontally or vertically or they may be displayed with their edges cut off.

The motion pictures cannot be played back on a TV.

- Are you trying to play back the motion pictures by directly inserting the card in the card slot of the TV?
  → Connect the camera to the TV with the AV cable (optional), or with the HDMI micro cable, and then play back the motion pictures on the camera. (P325)
- When [System Frequency] is set to a broadcasting system different from that of your region, images may not be played back correctly.
- When [System Frequency] is set to [24.00 Hz (CINEMA)], you cannot play back images on a TV connected with an AV cable.

Sound is not output from the speaker of the camera.

- When an AV cable (optional) or an HDMI micro cable is connected, sound is not output from the camera.

VIERA Link does not work.

- Is it connected properly with the HDMI micro cable? (P325)
- Is the [VIERA Link] on this unit set to [ON]? (P66)
  → If the input channel does not switch automatically, use the remote control for the TV to switch it.
  → Check the VIERA Link setting on the connected device.
  → Turn this unit off and on.
  → Set [HDAVI Control] to [Off] on the TV and then turn it back to [On].
  (Refer to the operating instructions of the TV for details.)
  → Check [System Frequency] setting. (P220)

Cannot communicate with the PC.

- Is the camera recognized by the PC correctly?
  → Set to [PC] in [USB Mode]. (P64, 332)
  → Turn this unit off and on.

The card is not recognized by the PC.

- Disconnect the USB connection cable. Connect it again while the card is inserted in the camera.
- If there are two or more USB terminal on a single PC, try connecting the USB connection cable to another USB terminal.

The card is not recognized by the PC. (SDXC memory card is used.)

- Check if your PC is compatible with SDXC memory cards.
  http://panasonic.net/avc/sdcard/information/SDXC.html
- A message prompting to format the card may be displayed when connecting, but do not format.
- If the [Access] displayed on the monitor does not disappear, disconnect the USB connection cable after turning this unit off.

The picture cannot be printed when the camera is connected to a printer.

- Pictures cannot be printed using a printer that does not support PictBridge.
  → Set to [PictBridge(PTP)] in [USB Mode]. (P64, 337)

The ends of the pictures are cut at printing.

- When using a printer with a Cropping or borderless printing function, cancel this function before printing.
  (For details, refer to the operating instructions for the printer.)
- When you order photo studios to print pictures, ask the photo studio if the 16:9 pictures can be printed.

Others

When I shake the camera, I hear a rattling sound from the attached lens.

- Depending on the lens you attach, it may move inside and create a sound. This is not a malfunction.

The camera makes a noise when this unit is turned on.

- This is the noise of the Dust Reduction Function working (P411); it is not a malfunction.

There is a sound from lens unit.

- It is a sound of lens movement or aperture operation when this unit is turned on or off, and it is not a malfunction.
- The sound, which is caused by the automatic adjustment of the aperture, is heard when the brightness has changed due to, for example, zooming or the movement of the camera. This is not a malfunction.

An unreadable language was selected by mistake.

- Press [MENU/SET], select the [Setup] menu icon [🔧] and then select the [Q] icon to set the desired language. (P67)

Part of the picture is flashing in black and white.

- This is a highlight function showing the white saturated area. (P310)

A red lamp sometimes turns on when the shutter button is pressed halfway.

- In dark places, the AF Assist Lamp (P307) lights red to make it easier to focus on a subject.

The AF Assist Lamp does not turn on.

- Is [AF Assist Lamp] set to [ON]? (P307)
- The AF Assist Lamp does not turn on in bright places.

The camera becomes warm.

- The surface of the camera and the reverse side of the monitor may become warm during use. This does not affect the performance or quality of the camera.

The clock is reset.

- If you do not use the camera for a long time, the clock may be reset.
  → [Please set the clock] message will be displayed; please reset the clock. (P36)

The file numbers are not recorded consecutively.

- When you perform an operation after taking a certain action, the pictures may be recorded in folders with different numbers from the ones used prior to the operation.

The file numbers are recorded with previously used numbers.

- If you insert or remove the battery before turning off this unit, the folder and file numbers for the pictures taken will not be stored in the memory. When this unit is turned on again and pictures are taken, they may be stored under file numbers which should have been assigned to previous pictures.

Cautions for Use

Optimal use of the camera

Keep this unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).

- If you use this unit on top of or near a TV, the pictures and/or sound on this unit may be disrupted by electromagnetic wave radiation.
- Do not use this unit near cell phones because doing so may result in noise adversely affecting the pictures and/or sound.
- Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
- Electromagnetic wave radiation may adversely affect this unit, disturbing the pictures and/or sound.
- If this unit is adversely affected by electromagnetic equipment and stops functioning properly, turn this unit off and remove the battery or disconnect AC adaptor (optional). Then reinsert the battery or reconnect AC adaptor and turn this unit on.

Do not use this unit near radio transmitters or high-voltage lines.

- If you record near radio transmitters or high-voltage lines, the recorded pictures and/or sound may be adversely affected.

Always use the supplied cords and cables.
If you use optional accessories, use the cords and the cables supplied with them.
Do not extend the cords or the cables.

Do not spray the camera with insecticides or volatile chemicals.

- If the camera is sprayed with such chemicals, the body of the camera may be damaged and the surface finish may peel off.

Do not keep rubber or plastic products in contact with the camera for a long period of time.

Cleaning

Before cleaning the camera, remove the battery or the DC coupler (optional), or disconnect the power plug from the outlet. Then wipe the camera with a dry, soft cloth.

- When the camera is soiled badly, it can be cleaned by wiping the dirt off with a wrung wet cloth, and then with a dry cloth.
- Wipe off any dirt or dust on the zoom ring and the focus ring with a dry, dustless cloth.
- Do not use solvents such as benzine, thinner, alcohol, kitchen detergents, etc., to clean the camera, since it may deteriorate the external case or the coating may peel off.
- When using a chemical cloth, be sure to follow the accompanying instructions.

■ About dirt on the image sensor

This camera features an interchangeable lens system so dirt may get inside the camera body when changing lenses. Depending on the recording conditions, dirt on the image sensor may appear on the recorded picture.
To prevent debris or dust adhering to internal parts of the body, avoid changing the lens in a dusty environment and always fit the body cap or a lens when storing the camera.
Remove any dirt on the body cap before attaching it.

Dust reduction function
This unit has a dust reduction function that will blow off the debris and dust that have affixed to the front of the imaging device.
This function will function automatically when the camera is turned on, but if you see dust, perform the [Sensor Cleaning] (P68) in the [Setup] menu.

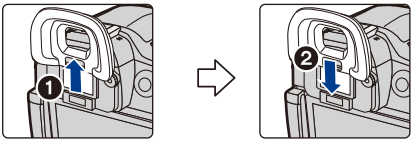
Removing dirt on the image sensor

The image sensor is very precise and delicate, so be sure to observe the following when you do have to clean it yourself.

- Blow off the dust on the surface of the image sensor with a commercially available blower brush. Be careful not to blow too strongly.
- Do not put the blower brush further inside than the lens mount.
- Do not let the blower brush touch the image sensor as the image sensor may get scratched.
- Do not use any objects except a blower brush to clean the image sensor.
- If you cannot remove the dirt or dust with the blower, consult the dealer or Panasonic.

For care of the viewfinder/eye cup

- Before you remove stains on the viewfiner and eyecup or start other types of cleaning, remove the eyecup (❶). Blow away the dust on the viewfinder surface with a blower (commercially available), and wipe the surface lightly with a dry, soft cloth. Attach the eye cup after the cleaning (❷).
- Be careful not to lose the eye cup.
- Keep the eye cup out of reach of children to prevent swallowing.



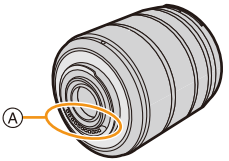
About the Monitor/Viewfinder

- Do not press the monitor with excessive force. Uneven colors may appear on the monitor and it may malfunction.
- If the camera is cold when you turn it on, the picture on the Monitor/Viewfinder will be slightly darker than usual at first. However, the picture will return to normal brightness when the internal temperature of the camera increases.

Extremely high precision technology is employed to produce the Monitor/Viewfinder screen. However there may be some dark or bright spots (red, blue or green) on the screen. This is not a malfunction. Though the Monitor/Viewfinder screen parts are produced with highly controlled precision technology, some pixels may be inactive or always lit. The spots will not be recorded on pictures on a card.

About the Lens

- Do not press the lens with excessive force.
- Do not leave the camera with the lens facing the sun as rays of light from the sun may cause it to malfunction. Also, be careful when placing the camera outside or near a window.
- When there is dirt (water, oil, and fingerprints, etc.) on the surface of the lens, the picture may be affected. Lightly wipe the surface of the lens with a soft, dry cloth before and after taking pictures.
- Do not place the lens mount facing downwards. Do not allow the lens mount contacts Ⓐ to become dirty.
- To improve the dust- and splash-proof performance, the mount of the interchangeable lens (H-HS12035) is embedded with the lens mount rubber. If you change the lens repeatedly, friction with the lens mount rubber may leave scratches on the camera's mount. However, those scratches do not affect the performance of this unit. For the replacement of the lens mount rubber, contact Panasonic.



Battery

The battery is a rechargeable lithium ion battery. Its ability to generate power comes from the chemical reaction that takes place inside it. This reaction is susceptible to the surrounding temperature and humidity. If the temperature is too high or too low, the operating time of the battery will become shorter.

Always remove the battery after use.
- Place the removed battery in a plastic bag, and store or keep away from metallic objects (clips, etc.).

If you drop the battery accidentally, check to see if the body of the battery and the terminals are damaged.
- Inserting a damaged battery in the camera will damage the camera.

Bring charged spare batteries when going out.
- Be aware that the operating time of the battery becomes shorter in low temperature conditions such as at a ski resort.
- When you travel, do not forget to bring the battery charger (supplied) and the AC cable (supplied) so that you can charge the battery in the country that you are traveling in.

Dispose of unusable battery.
- The battery has a limited life.
- Do not throw the battery into fire because it may cause an explosion.
- The unusable battery should be discarded in accordance with battery recycling laws. Call the RBRC hotline at 1-800-822-8837 for information.

Do not allow battery terminals to come into contact with metal objects (such as necklaces, hairpins, etc.).
- This can cause short-circuiting or heat generation and you may be badly burned if you touch a battery.

Charger

- The [CHARGE] indicator may blink under the influence of static electricity or electromagnetic wave. This phenomenon has no effects on charging.
- If you use the battery charger near a radio, the radio reception may be disturbed. Keep the charger 1 m (3.3 feet) or more away from radio.
- The charger may generate whirring sounds when it is being used. This is not a malfunction.
- After use, be sure to disconnect the power supply device from the electrical outlet. (A very small amount of current is consumed if it is left connected.)
- Keep the terminals of the charger and battery clean.

About 3D

About 3D recording

With the 3D interchangeable lens attached, do not record a subject at less than the minimum focus distance.

- The 3D effects may be more pronounced, and therefore cause tiredness or discomfort.
- When the 3D interchangeable lens (H-FT012: optional) is used, the minimum focus distance is 0.6 m (2.0 feet).

When recording with the 3D interchangeable lens attached, be careful not to shake the unit.

- Tiredness or discomfort may result if the shake is pronounced, due to riding in a vehicle or walking etc.
- We recommend using a tripod.

About 3D viewing

Anyone who is hyper sensitive to light, suffers from heart disease or is otherwise unwell should avoid viewing 3D contents.

- Viewing 3D contents may have an adverse effect to the individual.

If you feel tired, uncomfortable or otherwise strange when viewing 3D contents, stop viewing at once.

- Continuing to view may cause illness.
- After stopping viewing, please rest appropriately.

When viewing 3D contents, we recommend taking a break every 30 to 60 minutes.

- Viewing for extended periods may cause eye-fatigue.

Short-sighted or long-sighted persons, those with differences in the sight of their right and left eyes, and those with astigmatism are advised to correct their vision by wearing glasses etc.
Stop viewing if you can clearly see a double image while viewing 3D contents.

- There are differences in the way that different people experience 3D contents. Please correct your sight appropriately before viewing 3D contents.
- You can change the 3D setting of your television or 3D output setting of the unit to 2D.

Card

Do not leave the card where the temperature is high, where electromagnetic waves or static electricity are easily generated or exposed to direct sunlight.
Do not bend or drop the card.

- The card may be damaged or the recorded content may be damaged or deleted.
- Put the card in the card case or the storage bag after use and when storing or carrying the card.
- Do not allow dirt, dust, or water to get into the terminals on the back of the card and do not touch the terminals with your fingers.

Notice for when transferring to another party, or disposing of the memory card
“Format” or “delete” using the camera or a PC will only modify the file management information, it will not erase the data in the memory card completely.
It is recommended to physically destroy the memory card or use the commercially available computer data deletion software to completely erase the data in the memory card before transferring to another party or disposing.
Management of data in the memory card is the responsibility of the user.

About the personal information

If a name or birthday is set for [Profile Setup]/Face Recognition function, this personal information is kept in the camera and recorded in the image.
Setting a Wi-Fi password is recommended to protect personal information. (P303)

Disclaimer

- Information including personal information may be altered or vanish due to erroneous operation, effect of static electricity, accident, malfunction, repair, or other handlings.
  Please note in advance that Panasonic is not liable in any way for any direct or indirect damage from the alteration or vanishing of information or personal information.

When requesting a repair, transferring to another party, or disposing.

- After making a copy of personal information, always delete information such as personal information and wireless LAN connection settings that you have saved within the camera with [Reset Wi-Fi Settings]/[Delete account] (P68, 290).
- Reset the settings to protect the personal information. (P58)
- Remove the memory card from the camera when requesting a repair.
- Settings may return to factory default when camera is repaired.
- Please contact the dealer where you purchased the camera or Panasonic if above operations are not possible due to malfunction.

When transferring to another party, or disposing of the memory card, please refer to "Notice for when transferring to another party, or disposing of the memory card". **(P416)**

When uploading images on web services

- Images may contain information that can be used for identifying individuals such as titles, recording dates, and location information. When uploading images on web services, check carefully, and then upload.

When not using the camera for a long period of time

- Store the battery in a cool and dry place with a relatively stable temperature: [Recommended temperature: 15 °C to 25 °C (59 °F to 77 °F), Recommended humidity: 40%RH to 60%RH]
- Always remove the battery and the card from the camera.
- If the battery is left inserted in the camera, it will discharge even if the camera is turned off. If the battery continues to be left in the camera, it will discharge excessively and may become unusable even if charged.
- When storing the battery for a long period of time, we recommend charging it once a year. Remove the battery from the camera and store it again after it has completely discharged.
- We recommend storing the camera with a desiccant (silica gel) when you keep it in a closet or a cabinet.
- **Check all the parts before taking pictures when you have not used the camera for a long period of time.**

About the picture data

- Recorded data may be damaged or lost if the camera breaks down due to inappropriate handling. Panasonic will not be liable for any damage caused due to loss of recorded data.

About tripods or unipods

- When you use a tripod, make sure the tripod is stable when this unit is attached to it.
- You may not be able to remove the card or the battery when using a tripod or unipod.
- Make sure that the screw on the tripod or unipod is not at an angle when attaching or detaching the camera. You may damage the screw on the camera if you use excessive force when turning it. Also, the camera body and the rating label may be damaged or scratched if the camera is attached too tightly to the tripod or unipod.
- When using this unit with a large-diameter lens, the lens may come into contact with the pedestal depending on the tripod/unipod. Tightening the screw with the lens and pedestal in contact with each other may damage this unit or the lens. Therefore it is recommended to attach the tripod adaptor (DMW-TA1: optional) before mounting on the tripod/unipod.
- Read the operating instructions for the tripod or unipod carefully.

About the shoulder strap

- If you attach a heavy interchangeable lens (more than about 1 kg/35.3 oz) to the camera body, do not carry the camera by the shoulder strap.
  Hold the camera and the lens when carrying them.

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