

Panasonic[®]

Owner's Manual for advanced features

Digital Camera

Model No. **DC-TS7**



LUMIX

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

Message Display

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Finding the information you need

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P122

Register online at <http://shop.panasonic.com/support>
(U.S. customers only)

DVQP1681ZA

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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.

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

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

How to use this manual

- The screens used in this owner's manual are examples provided to describe operations.
- The product design and specifications described in this owner's manual may differ from the actual product due to improvements.

About the indication of the applicable mode

Applicable modes: 

The icons indicate the modes available for a function.

- Black icons: Applicable modes
- Gray icons: Unavailable modes

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.

: Tips for skillful use and points for recording.

: Conditions in which a particular function cannot be used.

- Click a cross reference in the text to jump to the corresponding page.

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

MENU →  **[Rec]** → **[Quality]** → **[.:.]**

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Care of the camera

■ Handling of the camera (to prevent water leakage and malfunction)

- Foreign objects may adhere to the inner side of the side door (around the rubber seal or connecting terminals) when the side door is opened or closed in places with sand or dust, etc. This may result in the impairment of the waterproof performance if the side door is closed with foreign objects adhered. Be extremely careful since it may result in malfunction, etc.
- In case foreign objects adhere to the inner side of the side door, wipe them off with a dry, lint-free cloth.
- If any liquid such as water droplets is adhered to the camera or inner side of the side door, wipe off with a soft, dry cloth. Do not open or close the side door near the water, when underwater, using wet hands, or when the camera is wet. It may cause water leakage.

Do not apply strong shock or vibration by dropping or knocking the camera. Also, do not apply strong pressure to the camera.

e.g.:

- Attach any items such as accessories to the strap attached to the camera.
- When strong pressure is applied using the camera at a depth exceeding 31 m (102 feet).
- Waterproof performance may be impaired.
- **The lens or the monitor may get damaged.**
 - If the monitor should get damaged, take care to avoid injury caused by the fragments of broken glass and other damaged components.
- It may cause malfunction in the performance or the function.

After the camera is used underwater, speaker and microphone performance may be temporarily degraded, so motion pictures may be recorded or played back with weak audio.

- After underwater use, perform steps **1** through **4** in "Caring of the camera after using it underwater" on [P16](#).

When the camera is used at cold temperatures, speaker and microphone performance may be temporarily degraded, so motion pictures may be recorded or played back with weak audio.

- Keep the camera warm by placing it in a warm place such as inside your cold protection gear or clothes during use.

If you shake the camera while it is turned off, a rattling sound will be heard. This is the sound of the lens moving and not a malfunction.

■ **When inner side of the lens, viewfinder or monitor is fogged (condensation)**

It is not a malfunction or failure of the camera. It may be caused by the environment in which the camera is used.

What to do when inner side is fogged

- Turn off the camera and open the side door in a place with constant ambient temperature, away from high temperatures, humidity, sand and dust. The fog will disappear naturally in approximately 2 hours with the side door open when the temperature of the camera gets close to the ambient temperature.
- Contact Panasonic if the fogging does not disappear.

Conditions in which inner side may be fogged

Condensation may occur and cause the inner side of the lens, viewfinder, and monitor to fog up when the camera is used under conditions with drastic temperature changes or high humidity levels, such as the following:

- **When the camera is used underwater suddenly after being on a hot beach, etc.**
- **When the camera is moved to a warm area from a cold area, such as at a ski resort or at high altitude**
- **When the side door is opened in a high-humidity environment**



MENU



(Important) About the Waterproof/Dustproof and Anti-shock Performance of the Camera

Waterproof/Dustproof Performance

This camera's waterproof/dustproof rating complies with the "IPX8" and "IP6X" ratings. Provided the care and maintenance guidelines described in this document are strictly followed, this camera can operate underwater, to a depth not exceeding 31 m (102 feet) for a time not exceeding 60 minutes. (*1)

Anti-shock Performance

This camera also complies with "MIL-STD 810F Method 516.5-Shock". The camera has cleared a drop test from a height of 2 m (6.6 feet) onto 3 cm (0.1 feet) thick plywood. In most cases this camera should not sustain any damage if dropped from a height not exceeding 2 m (6.6 feet). (*2)

Withstand Load Performance

This camera complies with 100 kgf/220.5 lbf load tests. (*3)

This does not guarantee no destruction, no malfunction, or waterproofing in all conditions.

- *1 This means that the camera can be used underwater for specified time in specified pressure in accordance with the handling method established by Panasonic.
- *2 "MIL-STD 810F Method 516.5-Shock" is the test method standard of the U.S. Defense Department, which specifies performing drop tests from a height of 122 cm (4 feet), at 26 orientations (8 corners, 12 ridges, 6 faces) using 5 sets of devices, and passing the 26 orientation drops within 5 devices. (If failure occurs during the test, a new set is used to pass the drop orientation test within a total of 5 devices)
Panasonic's test method is based on the above "MIL-STD 810F Method 516.5-Shock". However, the drop height was changed from 122 cm (4 feet) to 200 cm (6.6 feet) dropping onto 3 cm (0.1 feet) thick plywood. This drop test was passed.
(Disregarding appearance change such as loss of paint or distortion of the part where drop impact is applied.)
- *3 According to the test conditions specified by Panasonic.

■ Handling of the camera

- Waterproofing is not guaranteed if the unit is subject to an impact as a result of being hit or dropped etc. If an impact to the camera occurs, it should be inspected (subject to a fee) by Panasonic to verify that the waterproofing is still effective.
- Using the camera in environments where splashing with hot spring water, oil or alcohol is likely to occur may cause the water/dust resistance and impact resistance of the camera to deteriorate.
- When the camera is splashed with detergent, soap, hot spring, bath additive, sun oil, sun screen, chemical, etc., wipe it off immediately.
- Waterproof function of the camera is for sea water and fresh water only.
- Any malfunction caused by customer misuse, or mishandling will not be covered by the warranty.
- Panasonic offers no compensation for any accidents caused by use of the product (including both personal and property damage).
- The inside of this unit is not waterproof. Water leakage will cause malfunction.
- Supplied accessories such as battery pack etc. are not waterproof. (excluding hand strap)
- Card and battery are not waterproof. Do not handle with a wet hand. Also, do not insert wet card or battery into the camera.
- Do not leave the camera for a long period of time in cold places where the temperature reaches -10°C (14°F) or lower (ski resorts, places at high altitude, etc.) or hot places where the temperature reaches 40°C (104°F) or higher (in particular, places exposed to strong sunlight, inside a sun-heated automobile, near a heater, on a boat or beach, etc.). (Doing so will deteriorate the waterproof performance)

■ About the [Precautions] display

- [Precautions] is displayed when this unit is turned on for the first time after purchase, with the side door completely closed.
- Please check beforehand to maintain the waterproof performance.
- The [Precautions] screen will be displayed every time the camera is turned on if you select [No] before displaying the screen, turn off the camera while checking the screen, or press [MENU/SET] to force close the screen.

1 Press ◀ to select [Yes], and press [MENU/SET].

- The recording screen is displayed if you select [No].

2 Press ◀/▶ to change the screen.

- ◀: Return to the previous screen
- ▶: View the next screen

3 After the final screen (12/12), press [MENU/SET] to finish.

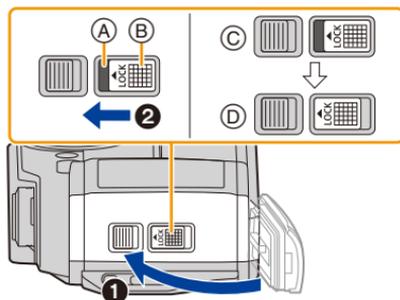
- When [MENU/SET] is pressed after the final screen (12/12), [Precautions] is not displayed from the next time this unit is turned on.
- This can also be viewed from [Precautions] in the [Setup] menu.

Check before using underwater

Always wipe the rubber seal on the side door and the area where rubber seal sits with a dry, lint-free cloth.

- 1 Check that there are no foreign objects on the inner side of the side door.**
 - If there is any foreign object, such as lint, hair, sand, etc., on the surrounding area, water will leak within a few seconds causing malfunction.
 - Wipe it off with a soft, dry cloth if there is any liquid.
 - It may cause water leaks and malfunction if you use the camera with liquid adhered.
 - If foreign objects are present, wipe them off with a dry, lint-free cloth.
 - Be extremely careful to remove the small sand etc. that may adhere to the sides and corners of the rubber seal.
- 2 Check for cracks and deformation of the rubber seal on the side door.**
 - The integrity of the rubber seals may decrease after about 1 year, with use and age. To avoid permanently damaging the camera, the seals should be replaced once each year. Please contact Panasonic for related costs and other information.
- 3 Close the side door securely.**
 - Lock the [LOCK] switch securely until the red part is no longer visible.
 - To prevent water intrusion, be careful not to catch foreign objects such as liquids, sand, hair, dust, or the strap cord.

- (A) Red part
 (B) [LOCK] switch
 (C) Released state
 (D) Locked state



Do not open or close the side door in places with sand and dust, close to water, or with wet hands. Sand or dust adhering may cause water leaks.

Using the camera underwater

- Use the camera underwater to 31 m (102 feet) with the water temperature between 0 °C and 40 °C (32 °F and 104 °F).
- Do not use the camera at a depth of over 31 m (102 feet).
- Do not use it in the hot water over 40 °C (104 °F) (in the bath or hot spring).
- Do not use the camera underwater for longer than 60 minutes continuously.
- Do not open or close the side door underwater.
- Do not apply shock to the camera underwater. (Waterproof performance may not be maintained, and there is a chance of water leak.)
- Do not dive into the water holding the camera. Do not use the camera in a location where the water will splash strongly, such as rapid flow or waterfall. It may cause malfunction.
- The camera will sink in the water. Take care not to drop the camera and lose it underwater by securely placing the strap around your wrist or similar measure.



Caring of the camera after using it underwater

Do not open or close the side door until the sand and dust is removed by rinsing the camera with water.

Make sure to clean the camera after using it.

- Thoroughly wipe off any water droplets, sand, and saline matter on your hands, body, hair, etc.
- It is recommended to clean the camera indoors, avoiding places where water spray or sand may fall.

After using it underwater, always clean the camera rather than leaving it in a dirty state.

- Leaving the camera with foreign objects or saline matter on it may cause damage, discoloration, corrosion, unusual odour, or deterioration of the waterproof performance.

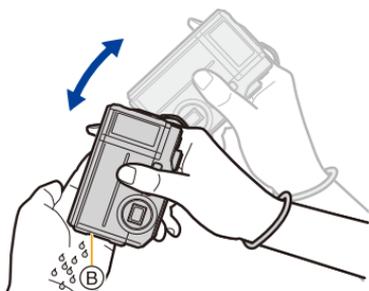
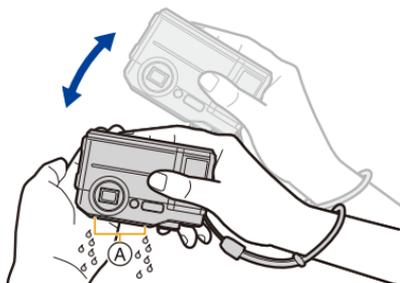
1 Rinse with fresh water with the side door closed.

- After use at the seaside or underwater, soak the unit in fresh water pooled in a shallow container for 10 minutes or less.
- Do not use chemicals such as benzine, thinner, alcohol or cleanser, soap or detergents.
- If the diopter adjustment dial, shutter button, the camera [ON/OFF] button or other parts are not moving smoothly, there may be trapped foreign objects. As continued use may cause these parts to get stuck or cause other malfunctions, shake the camera in fresh water to wash off any foreign objects. After that, check that the parts of the camera are moving smoothly.
- Bubbles may come out of the drainage hole when you immerse the camera in water, but this is not a malfunction.



2 Tap the camera lightly against your palm while holding it upside down and then with the illustrated side facing down, and then wipe off the water droplets with a soft, dry cloth.

- Repeat this step a few times if water is left in the microphone (A) or speaker (B) hole. If water is left in the microphone or speaker hole, weak or distorted audio may be recorded and played back.
- Fasten the strap firmly to your wrist to avoid dropping the camera.



3 Dry the camera by standing it on a dry cloth in a well ventilated shaded area.

- This unit incorporates drain design, draining water in gaps in the camera [ON/OFF] button and zoom button etc.
- Do not dry the camera with hot air from dryer or similar. Waterproof performance will deteriorate due to deformation.

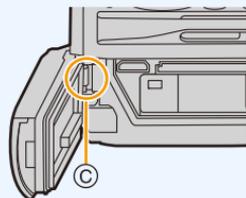


4 Confirm that there are no water droplets, open the side door, and wipe off any water droplets or sand left inside using a soft, dry cloth.

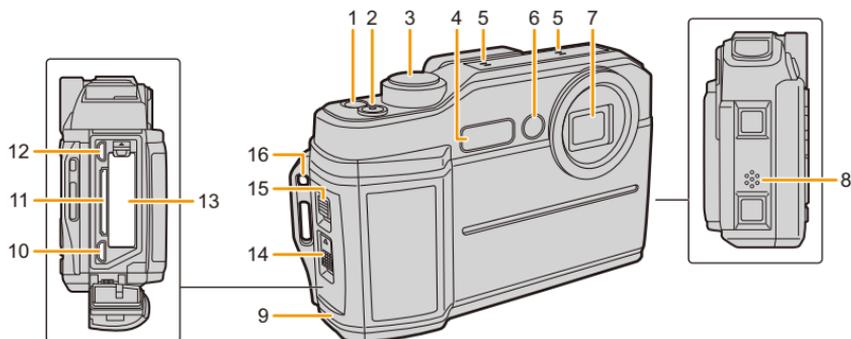
- Water droplets may adhere to the card or battery when the side door is opened without thoroughly drying. Also, water may accumulate in the gap around the card/battery slot or the terminal connector. Be sure to wipe any water off with a soft, dry cloth.
- The water droplets may seep into the camera when the side door is closed while it is still wet, causing condensation or failure.

- When particles such as salt residues from seawater are adhering to the camera, the arm of the side door and various other components may whiten. Use damp cotton swabs or similar to wipe until the whitened part is removed.

© Arm part



Names and Functions of Components



1 Camera [ON/OFF] button (P31)

2 Motion picture button (P105)

3 Shutter button (P35)

4 Flash (P101)

5 Stereo microphone (P194)
 • Be careful not to cover the microphone with your finger. Doing so may make sound difficult to record.

6 Self-timer indicator (P91)/
 AF Assist Lamp (P130)/
 LED light (P135)

7 Lens surface

8 Speaker (P194)

9 Side door (P14, 20)

10 [USB/CHARGE] socket (P173, 175)

11 Card slot (P20)

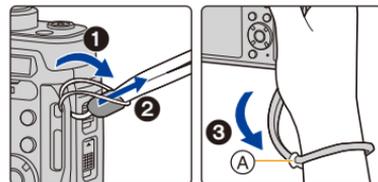
12 [HDMI] socket (P171)

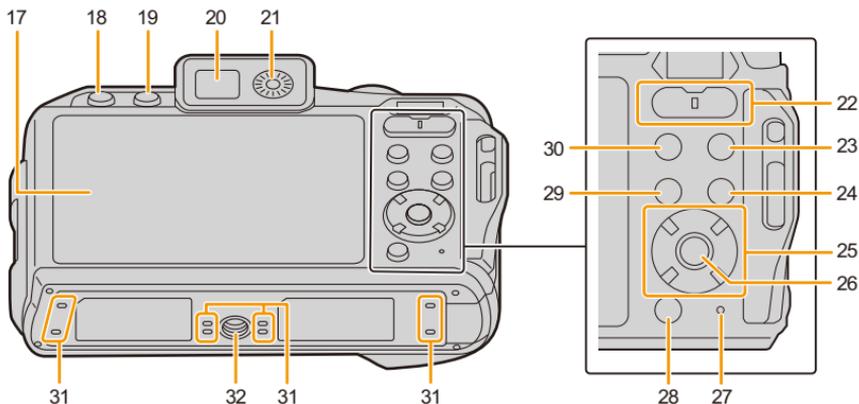
13 Battery slot (P20)

14 [LOCK] switch (P14)

15 Release lever (P20)

16 Strap eyelet
 • Be sure to attach the strap when using the camera to ensure that you will not drop it.
 • After placing the strap around your wrist, slide the adjuster (A) to fasten the strap.
 • Be sure to attach the strap to the strap eyelet.





| | | | |
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| 17 | Monitor (P34) | 26 | [MENU/SET] button (P36, 39) |
| 18 | [] (Post Focus) button (P83)/ [Fn2] button (P42) | 27 | Charging lamp (P23)/ Wi-Fi® connection lamp (P149) |
| 19 | [LVF] button (P34) | | [] (Delete) button (P121)/ |
| 20 | Viewfinder (P34) | 28 | [] (Cancel) button/ [Q.MENU] button (P41) |
| 21 | Diopter adjustment dial (P34) | 29 | [] (4K Photo Mode) button (P76)/ [Fn1] button (P42) |
| 22 | Zoom button (P98) | 30 | [MODE] button (P36) |
| 23 | [] (Playback) button (P116) | 31 | Drainage hole |
| | [DISP.] button (P37) | | Tripod mount (P197) |
| 24 | • Pressing [DISP.] switches the displayed information. | 32 | • It may not be possible to attach and securely fasten a tripod with a screw length of 5.5 mm (0.22 inch) or more to the camera. Doing so may also damage the camera. |
| | Cursor buttons (P36) | | |
| 25 | ▲/[] (Exposure Compensation) (P70) | | |
| | ▶/[] (Flash Mode) (P102) | | |
| | ◀/[] (Macro Mode) (P69) | | |
| | ▼/[] (Drive Mode) (P86) | | |

2.

Getting Started/Basic Operations

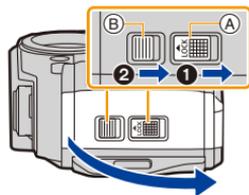
Inserting and Removing the Card (optional)/the Battery

- Check that this unit is turned off.
- Confirm that there is no foreign object. (P14)

1 ①: Slide the [LOCK] switch (A), and release the lock.

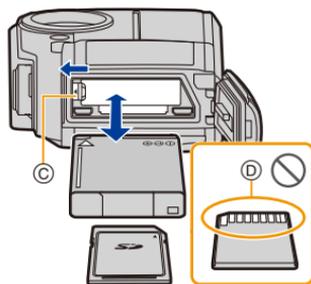
②: Slide the release lever (B) and open the side door.

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



2 **Battery:** 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 (C). Pull the lever (C) in the direction of the arrow to remove the battery.

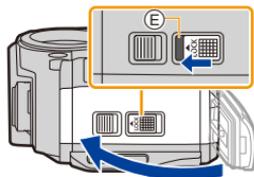
Card: Push it securely all the way until you hear a “click” while being careful about the direction in which you insert it. To remove the card, push the card until it clicks, then pull the card out upright.



- Ⓓ: Do not touch the connection terminals of the card.
Check the orientation of the card.

3 Close the side door until it clicks, and then lock the [LOCK] switch by sliding it toward [◀].

- Confirm that the red part ⑤ on the [LOCK] switch is not showing.



- Remove the battery after use. (The battery will be exhausted if left for a long period of time after being charged.)
- Turn the camera off and wait for the "LUMIX" display on the monitor to clear before removing the card or battery. (Otherwise, this unit may no longer operate normally and the card itself may be damaged or the recorded pictures may be lost.)

■ About the water leakage warning message

To maintain the waterproof performance of this unit, a message prompting to check for any foreign material inside the side door or to perform maintenance is displayed along with a warning sound when the following are performed.

- When this unit is turned on after opening the side door and replacing the card.
 - When this unit is turned on after opening the side door and replacing the battery.
-
- After opening the side door, close it securely taking care not to get any foreign objects caught.
 - If foreign objects are present, wipe them off with a dry, lint-free cloth.
 - Warning message display can be turned off by pressing any button.

Charging the Battery

Use the dedicated AC adaptor (supplied), USB connection cable (supplied) and battery.

- The battery is not charged when the camera is shipped. Charge the battery before use.
- Charge the battery only when it is inserted in the camera.

| Camera conditions | Charge |
|-------------------|--------|
| Turned off | ○ |
| Turned on | — |

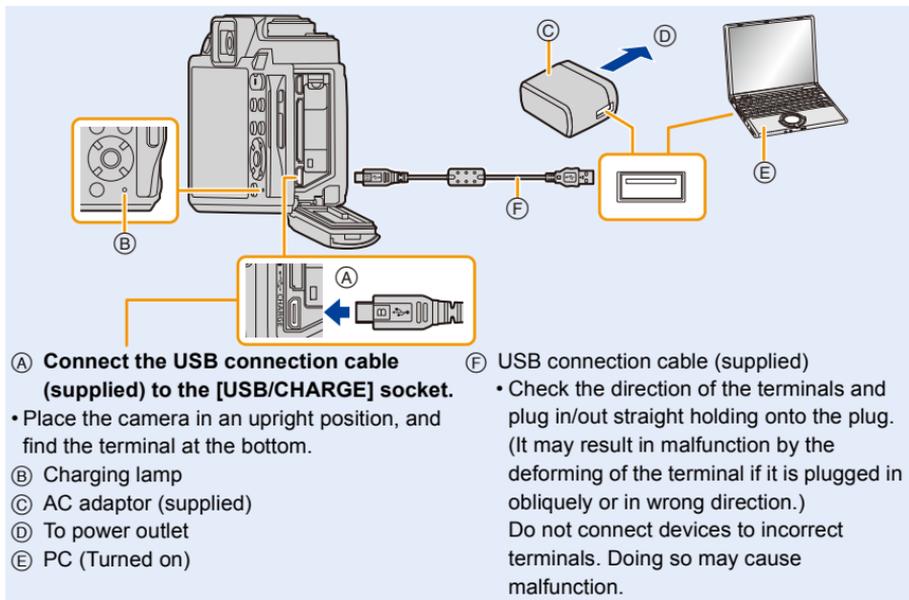
■ About batteries that you can use with this unit

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.

Charging

- Charge the battery in areas with an ambient temperature, between 10 °C and 30 °C (50 °F and 86 °F) (same as the battery temperature), is recommended.

Insert the battery into this unit.
Check that this unit is turned off.



(Charging from the power outlet)

Connect the AC adaptor (supplied) and this camera with the USB connection cable (supplied), and insert the AC adaptor (supplied) into the power outlet.

(Charging from a computer)

Connect the computer and this camera with the USB connection cable (supplied).

- If the computer enters a suspended state while charging the battery, charging will stop.
- Connecting this camera to a notebook computer that is not connected to a power outlet will cause the notebook computer battery to drain faster. Do not leave the camera connected for extended periods of time.
- Be sure to always connect the camera to a computer USB terminal.
Do not connect the camera to a monitor, keyboard or printer USB terminal, or a USB hub.

■ About the charging lamp

Lit: Charging.

Off: Charging has completed.

(When charging is complete, disconnect the camera from the power outlet or computer.)

• When the charging lamp flashes

- The battery temperature is high or low. Reconnect the USB connection cable (supplied) in a location where the ambient temperature (and the temperature of battery) is in a 10 °C to 30 °C (50 °F to 86 °F) range, and try charging again.
- If your PC is not capable of supplying sufficient power, charging is not possible.

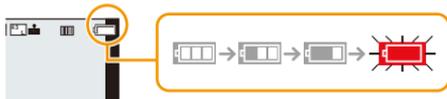
■ Charging time

When using the AC adaptor (supplied)

| Charging time | Approx. 170 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.
- When power is supplied from a computer, the power supply capacity of the computer determines the charging time.

■ Battery indication



- The indication turns red and blinks if the remaining battery power is exhausted. 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.**
- Do not use any other USB connection cables except the supplied one.
This may cause malfunction.
- Do not use any other AC adaptors except the supplied one.
- Do not use a USB extension cable.
- The AC adaptor (supplied) and USB connection cable (supplied) are for this camera only. Do not use them with other devices.
- **The battery becomes warm after using it and during and after charging. The camera also becomes warm during use. This is not a malfunction.**
- 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.)
- If a problem occurs in the power outlet, such as a power outage, charging may not be completed normally. If this happens, disconnect the USB connection cable (supplied) and connect it again.

Approximate operating time and number of recordable pictures

- The numbers of recordable pictures listed here are based on the CIPA (Camera & Imaging Products Association) standard.
- When a Panasonic SDHC memory card and the supplied battery are used.

■ Recording still pictures (when using the Monitor)

| | |
|-------------------------------|----------------------|
| Number of recordable pictures | Approx. 300 pictures |
| Recording time | Approx. 150 min |

■ Recording still pictures (when using the Viewfinder)

| | |
|-------------------------------|----------------------|
| Number of recordable pictures | Approx. 250 pictures |
| Recording time | Approx. 125 min |

■ Recording motion pictures (when using the Monitor)

When [Rec Quality] is set to [FHD/28M/60p]

| | |
|------------------------|----------------|
| Recordable time | Approx. 80 min |
| Actual recordable time | Approx. 60 min |

When [Rec Quality] is set to [4K/100M/30p]

| | |
|------------------------|----------------|
| Recordable time | Approx. 60 min |
| Actual recordable time | Approx. 50 min |

- Actual recordable time is the time available for recording when repeating actions such as turning this unit on and off, starting/stopping recording, zoom operation, etc.

■ Playback (when using the Monitor)

| | |
|---------------|-----------------|
| Playback time | Approx. 210 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.

– At low temperature or in cold locations such as ski resorts or at high altitude*

* The battery performance will temporarily decline. Refer to “When using in a cold climate or at low temperatures” (P192) in advance.

– When a function such as flash or zoom 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.

Card Information

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 (512 MB to 2 GB) | <ul style="list-style-type: none"> This unit is compatible with UHS-I UHS Speed Class 3 standard SDHC/SDXC memory cards. Operation of the cards on the left has been confirmed with Panasonic's cards. |
| SDHC Memory Card (4 GB to 32 GB) | |
| SDXC Memory Card (48 GB to 128 GB) | |

■ About motion picture/4K photo recording and speed class ratings

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 labeled side, etc. of the card.

| Size in [Rec Quality] | Speed class | Label example |
|---|-------------------|---|
| 4K | UHS Speed Class 3 |  |
| FHD/HD | Class 4 or higher |   |
| When recording in 4K Photo/ [Post Focus] | UHS Speed Class 3 |  |

• Please confirm the latest information on the following website.

<http://panasonic.jp/support/global/cs/dsc/>

(This Site is English only.)

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, or remove the battery, card. Furthermore, do not subject the camera to vibration, impact or static electricity.

Doing so may damage the card or recorded data or cause the camera to stop working correctly.

If operation fails due to vibration, impact or static electricity, perform the operation again.

- If you set the Write-Protect switch (A) to "LOCK", you may not be able to write, delete or format the data or display it by recording date.
- 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.



Formatting the card (initialization)

Format the card before recording a picture with this unit.

After formatting, all data stored on the card will be deleted and cannot be recovered. Back up necessary data on a PC or similar device first, and then format the card.

MENU →  [Setup] → [Format]

- Use a sufficiently charged battery when formatting, and do not turn off the camera while formatting is in progress.
- If the card has been formatted on a PC or other equipment, format it on the camera again.

Approximate number of recordable pictures and available recording time

- The numbers of recordable pictures listed here are based on the CIPA (Camera & Imaging Products Association) standard.
- When a Panasonic SDHC memory card and the supplied battery are used.

■ Number of recordable pictures

- Aspect ratio [4:3], Quality [FINE]

| [Picture Size] | Card capacity | | | |
|----------------|---------------|-------|-------|--------|
| | 16 GB | 32 GB | 64 GB | 128 GB |
| L (20M) | 2400 | 5000 | 10000 | 19900 |
| M (10M) | 4750 | 9700 | 19400 | 38600 |
| S (5M) | 9400 | 19000 | 38200 | 75800 |

■ 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.

| [Rec Quality] | Card capacity | | | |
|--------------------------------|---------------|-------|--------|--------|
| | 16 GB | 32 GB | 64 GB | 128 GB |
| [4K/100M/30p] [4K/100M/24p] | 18m | 38m | 1h15m | 2h30m |
| [FHD/28M/60p] | 1h00m | 2h10m | 4h30m | 9h00m |
| [FHD/20M/30p] | 1h30m | 3h00m | 6h15m | 12h30m |
| [HD/10M/30p] | 2h50m | 5h50m | 11h40m | 23h20m |

- Depending on the recording conditions and the type of card, the number of recordable pictures and available recording time vary.

- **Continuous motion picture recordable times**

| [Rec Quality] | Continuous recordable time | Size interval for dividing files |
|---------------|----------------------------|---|
| 4K | 29 minutes and 59 seconds | <p>When an SDHC card is used: Files exceeding 4 GB in size will be divided into smaller files for recording and playback.*</p> <p>When an SDXC card is used: Files are not divided for recording.</p> |
| FHD HD | | Files exceeding 4 GB in size will be divided into smaller files for recording and playback.* |

* You can continue recording without interruption.

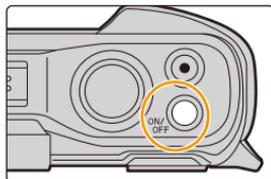
- **The maximum available continuous recording time is displayed on the screen.**

Setting Date/Time (Clock Set)

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

1 Press camera [ON/OFF] button.

- 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.

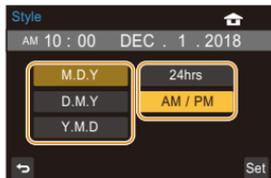
- Ⓐ: Time at the home area
- Ⓑ: Time at the travel destination



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] to set.



- 7 When [The clock setting has been completed.] is displayed, press [MENU/SET].
- 8 When [Please set the home area] is displayed, press [MENU/SET].
- 9 Press ◀/▶ to select the home area, and then press [MENU/SET].



[Precautions]

[Precautions] will be displayed.

Be sure to check this so that you can maintain the waterproof performance.

For details, refer to P13.

■ Re-adjusting the clock

MENU → ⚙ [Setup] → [Clock Set]

- The clock can be reset as shown in steps 5 and 6 on P31.
 - **The clock setting is maintained for about 7 days using the built-in clock battery even without the battery.**
(Leave the charged battery in the unit for 2 hours to charge the built-in battery.)
- To place the correct date on pictures, set the clock before recording.

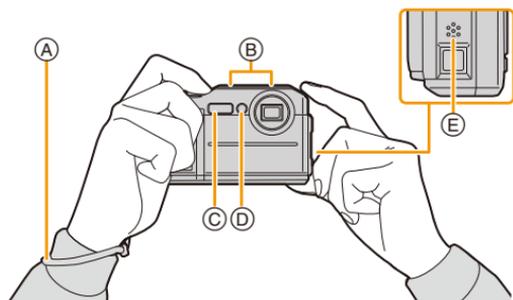
Basic Operations

Fit the strap and hold the camera carefully

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

- Before using the camera, be sure to attach the supplied strap and fasten it to your wrist to avoid dropping the camera. (P18)
- Do not swing around or pull forcefully on the unit with the strap attached. The strap may break.
- Be careful not to put your fingers on the flash, AF assist lamp/LED light, microphone, speaker or lens etc.
- Make sure your footing is stable and there is no danger of colliding with another person or object in the vicinity while taking pictures.

- (A) Strap
- (B) Microphone
- (C) Flash
- (D) AF Assist Lamp/LED light
- (E) Speaker



■ Detects orientation of camera (Direction Detection Function)

This function detects the vertical orientation when you record with the camera vertically orientated.

Images can be automatically displayed in vertical orientation during playback.



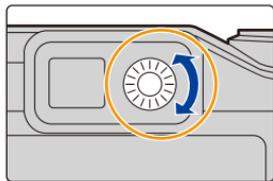
- When the camera is held vertically and tilted significantly up or down to record, the Direction Detection Function may not work correctly.
- Motion pictures, 4K burst files, and pictures taken with [Post Focus] cannot be displayed vertically.
- When you play back pictures on a PC, they cannot be displayed 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)".)

Using the Viewfinder

Diopter adjustment

Rotate the diopter adjustment dial.

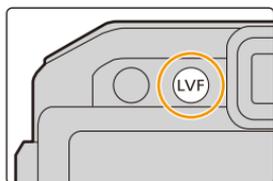
- Adjust until you can see the characters displayed in the viewfinder clearly.



Switching the Monitor/Viewfinder

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

Press [LVF].



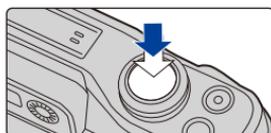
Shutter button (Taking pictures)

The shutter button works in two steps.

Press the shutter button halfway to focus.

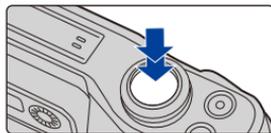
- Aperture value and shutter speed are displayed.
- Once the subject is in focus, the focus indication is displayed. (When the subject is not in focus, the indication flashes.)

- (A) Aperture value
- (B) Shutter speed
- (C) Focus indication



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

- [Long shutter noise reduction ongoing] may be displayed and noise caused by a slow shutter speed may be automatically removed for picture-taking.



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

■ About focus range

The focus range is displayed when operating the zoom.

The focus range may change gradually depending on the zoom position.

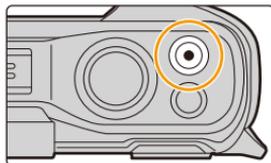


Motion picture button (Recording motion pictures)

Start recording by pressing the motion picture button.

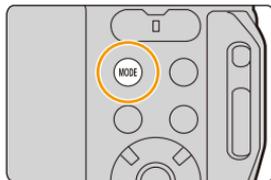
- Release the motion picture button right after you press it.

Stop the recording by pressing the motion picture button again.



[MODE] button (Selecting a Recording Mode)

- 1 Press [MODE].
- 2 Press ▲/▼/◀/▶ to select the Recording Mode.
- 3 Press [MENU/SET].



| | |
|---|-----------------------------|
|  | Intelligent Auto Mode (P45) |
|  | Program AE Mode (P49) |
|  | Manual Exposure Mode (P50) |
|  | Creative Control Mode (P52) |
|  | Scene Guide Mode (P57) |
|  | Sports Mode (P60) |
|  | Snow Mode (P60) |
|  | Beach & Surf Mode (P61) |
|  | Underwater Mode (P61) |
|  | Panorama Shot Mode (P62) |

Cursor buttons/[MENU/SET] button

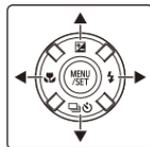
Pressing the cursor button:

Selection of items or setting of values etc., is performed.

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

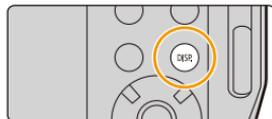
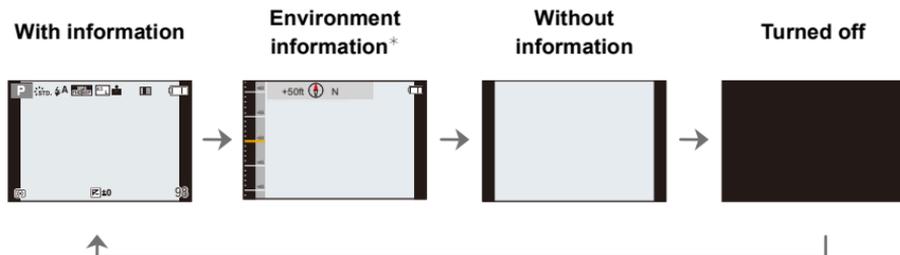
Pressing [MENU/SET]:

Confirmation of setting contents, etc., is performed.



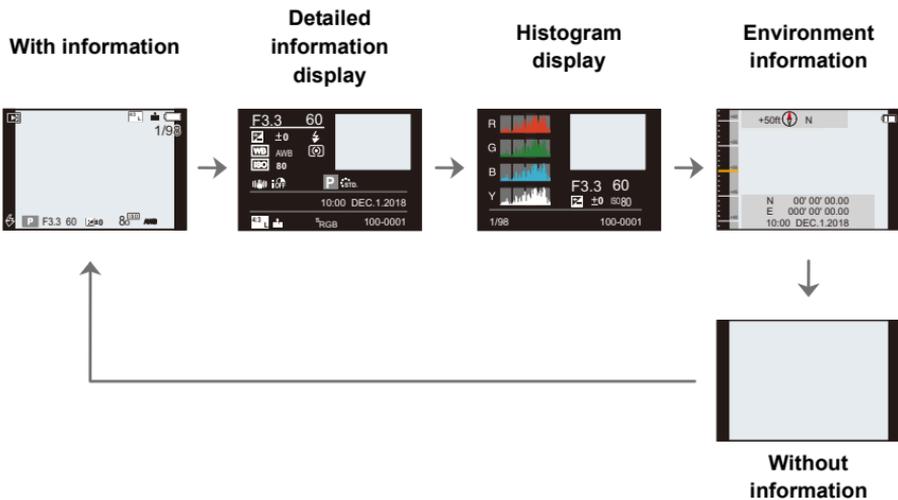
[DISP.] button (Switching the displayed information)

Press [DISP.].

**In Recording Mode****• Viewfinder display****• Monitor display**

* If you set [Sensor Settings] in the [Setup] menu to [ON], environment information measured by the compass and altimeter is displayed.

In Playback Mode

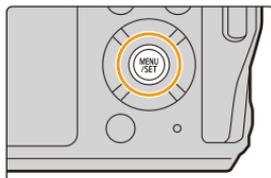


Setting menu items

1 Press [MENU/SET].

2 Press ◀.

3 Press ▲/▼ to select a menu selector icon, such as [📷].



| | |
|---|---|
|  [Rec] (P122) | This menu lets you set the aspect ratio, number of pixels, 4K Photo and other aspects of the pictures you are recording. |
|  [Motion Picture] (P129) | This menu lets you set the [Rec Quality], and other aspects for motion picture recording. |
|  [Custom] (P130) | Operation of the unit, such as displaying of the screen and button operations, can be set up according to your preferences. |
|  [Setup] (P132) | 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] (P138) | This menu lets you set the playback and editing settings for images. |

- 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.

4 Press [MENU/SET].

5 Press ▲/▼ to select the menu item and press [MENU/SET].

- You can also turn pages by pressing [DISP.] or the zoom button.

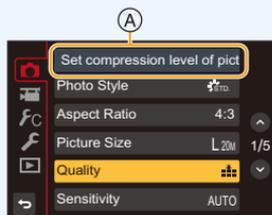


6 Press ▲/▼ to select the setting and press [MENU/SET].

- Depending on the menu item, its setting may not appear or it may be displayed in a different way.



- There are functions that cannot be set or used depending on the modes or menu settings being used on the camera.
- The description of each menu or setting item (A) is displayed on the menu screen.



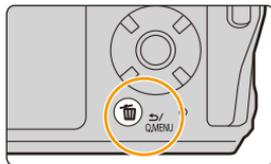
■ Close the menu

Press [DISP.] or press the shutter button halfway.

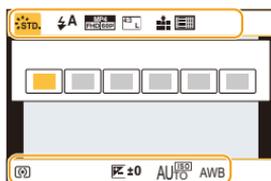
Calling frequently-used menus instantly (Quick Menu)

• The descriptions in this section use the monitor screen as examples.

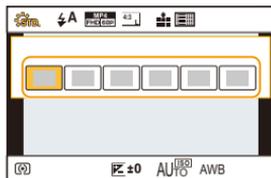
1 Press [Q.MENU] to display the Quick Menu.



2 Press ◀/▶ to select a menu item, and press ▼ or ▲.



3 Press ◀/▶ to select a setting.



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

- The same operation can be performed by pressing the shutter button.

• The features that can be adjusted using Quick Menu are determined by the mode or a display style the camera is in.

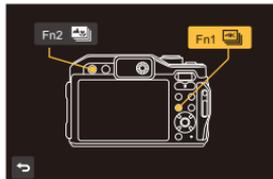
Assigning frequently used functions to the buttons (function buttons)

You can assign recording functions, etc. to specific buttons.

1 Select the menu.

MENU → **Fc [Custom]** → **[Fn Button Set]** → **[Setting in REC mode]/[Setting in PLAY mode]**

2 Press ▲/▼ to select the function button you want to assign a function to and then press [MENU/SET].



3 Press ▲/▼ to select the function you want to assign and then press [MENU/SET].

- For details on the functions that can be assigned in [Setting in REC mode], refer to [P43](#).
- For details on the functions that can be assigned in [Setting in PLAY mode], refer to [P43](#).
- To restore the default function button settings, select [Restore to Default].

• If you press and hold a function button (any of [Fn1] to [Fn2]) for 2 seconds, the screen displayed in step **3** can be displayed. In some cases, however, the screen cannot be displayed depending on the currently selected mode or the currently displayed screen.

Using the function buttons during recording

You can use assigned functions by pressing a function button when recording.

■ Functions that can be assigned in [Setting in REC mode]

| | |
|---------------------------------|------------------------------------|
| – [4K Photo Mode] (P76): [Fn1]* | – [Auto Bracket] (P89) |
| – [Post Focus] (P83): [Fn2]* | – [i.Dynamic] (P126) |
| – [Wi-Fi] (P149) | – [HDR] (P126) |
| – [Photo Style] (P122) | – [Shutter Type] (P127) |
| – [Aspect Ratio] (P124) | – [i.Zoom] (P99) |
| – [Picture Size] (P124) | – [Digital Zoom] (P100) |
| – [Quality] (P125) | – [Stabilizer] (P96) |
| – [Sensitivity] (P71) | – [Motion Pic. Rec Quality] (P107) |
| – [White Balance] (P73) | – [Histogram] (P130) |
| – [AF Mode] (P68) | – [Guide Line] (P131) |
| – [Metering Mode] (P125) | – [Rec Area] (P131) |
| – [Burst Rate] (P87) | – [Restore to Default] |

* Function button settings at the time of purchase.

Using the function buttons during playback

You can use an assigned function by pressing the appropriate function button during playback.

■ Functions that can be assigned in [Setting in PLAY mode]

| | |
|--------------------------|------------------------|
| – [Wi-Fi] (P149): [Fn1]* | – [Restore to Default] |
|--------------------------|------------------------|

* Function button settings at the time of purchase.

• No function is assigned to [Fn2] at the time of purchase.

Entering Text

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

- To continuously enter the same character, move the cursor by pressing [T] on the zoom button.
- The following operations can be performed by moving the cursor to the item and pressing [MENU/SET]:
 - [A→a]: Switch text between [A] (upper case characters), [a] (lower case characters), [1] (numbers), and [&] (special characters)
 - [␣]: 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.
- A maximum of 15 characters can be entered for [\], [Γ], [J], [•] and [–].



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

3.

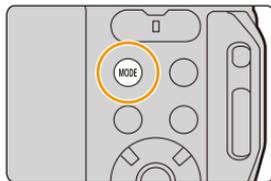
Recording Modes

Taking Pictures using the Automatic Function (Intelligent Auto Mode)

Recording Mode: 

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.

1 Press [MODE].



2 Press ▲/▼/◀/▶ to select , and then press [MENU/SET].

3 Hold the camera with the lens facing toward the subject.

- When the camera identifies the optimum scene, the icon of the scene concerned will change.
(Automatic Scene Detection)



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-Sunset]



[i-Low Light]



*1 Only displayed when the flash is set to [iA].

*2 Only displayed when [iHandheld Night Shot] is set to [ON]. (P47)

- [iA] is set if none of the scenes are applicable, and the standard settings are set.
- When recording 4K photos or when recording using [Post Focus], Scene Detection works the same way as when recording motion pictures.

Auto FocusThe Auto Focus Mode is automatically set to [.

- Face Detection may become slower or it may not detect underwater.
- You can set [] ([Tracking]) with [AF Mode] in the [Rec] menu. Aim the AF tracking frame over the subject and press the shutter button halfway to operate the AF tracking function. (P65)

**Flash**When [iA] is selected, [iA], [iA^o], [i^so] or [i^sS] is set depending on the type of subject and brightness.

- When [iA^o] or [i^so] is set, Red-Eye Removal is enabled.
- Shutter speed will be slower during [i^so] or [i^sS].

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.
- Depending on recording conditions, different scene types may be selected for the same subject.

Recording night scenes ([iHandheld Night Shot])

Recording Mode: 

When [] 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.

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

- The angle of view will be slightly narrower.
- Do not move the camera during the continuous shooting after pressing the shutter button.
- 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 recording in Burst Mode
 - When recording 4K photos
 - When recording with [Post Focus]
 - When using [Time Lapse Shot]

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

Recording Mode: 

When 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.
- 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 4K photos
 - When recording with [Post Focus]
 - When using [Time Lapse Shot]

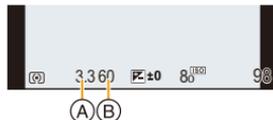
Taking Pictures with Automatically Adjusted Aperture and Shutter Speed (Program AE Mode)

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 Press [MODE].
- 2 Press ▲/▼/◀/▶ to select [**P**], and then press [MENU/SET].
- 3 Press the shutter button halfway and display the aperture value and shutter speed value on the screen.



(A) Aperture value

(B) 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.

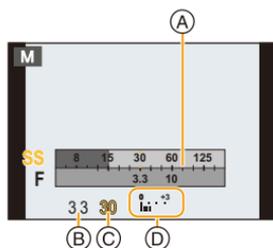
Taking picture by setting the exposure manually (Manual Exposure Mode)

Recording Mode: **[M]**

Determine the exposure by manually setting the aperture value and the shutter speed.

- 1** Press **[MODE]**.
- 2** Press **▲/▼/◀/▶** to select **[M]**, and then press **[MENU/SET]**.
- 3** Press **▲**.
 - Each press of **▲** switches the operation between setting the aperture value and shutter speed.
- 4** Press **◀/▶** to adjust.

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



| Available Aperture Value (Wide) | Available Shutter Speed (Sec) |
|---------------------------------|-------------------------------|
| F3.3, F10 | 4 to 1/16000th |

- The available aperture values vary depending on the zoom magnification.
- The available shutter speeds vary depending on the [Shutter Type] (P127) and flash settings.

**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**

| | |
|--|--|
| | The exposure is adequate. |
| | Set to faster shutter speed or larger aperture value. |
| | 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.

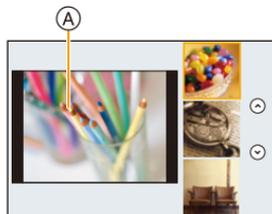
- The brightness of the screen and the recorded pictures may differ. Check the pictures on the playback screen.
- The exposure meter indicates inappropriate ranges of exposure in red.
- If the exposure is not adequate, the aperture value and the shutter speed turn red and blink when the shutter button is pressed halfway.

Taking Pictures with different image effects (Creative Control Mode)

Recording Mode: 

You can set the effects to add by selecting example images and checking them on the screen.

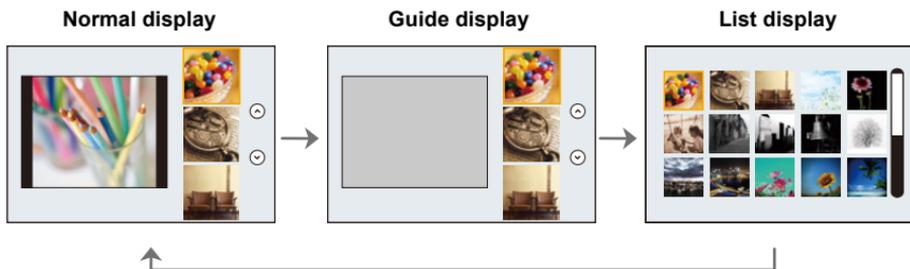
- 1 Press [MODE].
- 2 Press ▲/▼/◀/▶ to select [, and then press [MENU/SET].
- 3 Press ▲/▼ to select the image effects (filters).
 (A) Preview display
- 4 Press [MENU/SET].



Displaying the description of each image effect

Press [DISP.] while the image effect selection screen is displayed.

- When it is set to the guide display, explanations for each picture effect are displayed.



• If you select the [] tab on the menu screen, you can select the following menu items:

- [Filter Effect]: Displays the image effect (filter) selection screen.
- [Simultaneous Record w/o Filter]: Allows you to set the camera to take a picture with and without an image effect simultaneously.

• White Balance will be fixed to [AWB], and [Sensitivity] will be fixed to [AUTO].

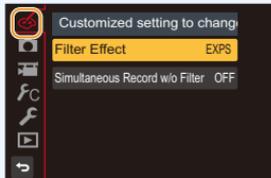
• Depending on the image effect, the recording screen may seem as if frames are missed.



Not available in these cases:

• In the following case, [Simultaneous Record w/o Filter] does not work:

- When recording in Burst Mode
- When recording 4K photos
- When recording with [Post Focus]
- When recording with the Auto Bracket function
- When recording motion pictures
- When recording still pictures while recording a motion picture
- When using [Time Lapse Shot]



Types of image effects



[Expressive]



[Retro]



[Old Days]



[High Key]



[Low Key]



[Sepia]



[Monochrome]



[Dynamic Monochrome]



[Rough Monochrome]



[Silky Monochrome]



[Impressive Art]



[High Dynamic]



[Cross Process]



[Toy Effect]



[Toy Pop]



[Bleach Bypass]



[Miniature Effect]



[Soft Focus]



[Fantasy]



[Star Filter]



[One Point Color]



[Sunshine]

■ Adjusting the color with [Cross Process] and [Toy Effect]

- 1 Press ► to display the setting screen.
- 2 Press ◀/▶ to adjust.
 - Press [MENU/SET] to return to the recording screen.



| Image effect | Items that can be set | |
|-----------------|-----------------------|---|
| [Cross Process] | Color | Green tinge/Blue tinge/Yellow tinge/Red tinge |
| [Toy Effect] | Color | Orange tinge ◀→ Blue tinge |

■ Setting the type of defocus ([Miniature Effect])

- 1 Select [Miniature Effect], and press [MENU/SET].
- 2 Press ▲/▼ or ◀/▶ to move the in-focus portion.

| Frame orientation | Button operation | Description of operation |
|---|------------------|--|
|  | ▲/▼ | Moves the frame up and down. |
| | ◀/▶ | Changes the frame orientation to vertical. |
|  | ▲/▼ | Changes the frame orientation to horizontal. |
| | ◀/▶ | Moves the frame left and right. |



- Pressing [DISP.] will return the in-focus portion setting back to the default setting.

3 Press [MENU/SET] to set.

- To change the setting, press [MODE], and select [Miniature Effect] again.

- No sound is recorded in motion pictures.
- Approximately 1/10 of the time period is recorded.
(If you record for 10 minutes, the resulting motion picture recording will be approximately 1 minute long.)
- If you end motion picture recording after a short time, the camera may go on recording for a certain period.

■ Set the color to leave in ([One Point Color])

- 1 Select [One Point Color], and press [MENU/SET].
- 2 Fit the color you want to leave in the frame at the center of the screen, and then press [MENU/SET].
- 3 Check the color you have set, and then press [MENU/SET].
 - If you press [DISP.], you will return to step 2.



- To change the setting, press [MODE], and select [One Point Color] again. The set color is memorized even if the camera is turned off. In that case, the operation starts from step 3.
- Depending on the subject, the set color may not be left in.

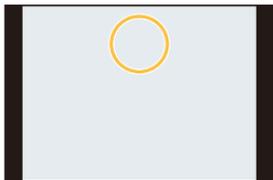
■ Setting the position and size of the light source ([Sunshine])

- 1 Select [Sunshine], and press [MENU/SET].
- 2 Press ▲/▼/◀/▶ to move the center position of the light source.



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.



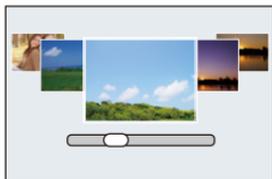
- Pressing [DISP.] will return the light source setting back to the default setting.
- 3 Press [MENU/SET] to set.
 - To change the setting, press [MODE], and select [Sunshine] again.

Taking Pictures that match the Scene being recorded (Scene Guide Mode)

Recording Mode: 

If you select a scene to suit the subject and recording conditions with reference to the example images, the camera will set optimal exposure, color, and focus, allowing you to record in a manner appropriate to the scene.

- 1 Press [MODE].
- 2 Press ▲/▼/◀/▶ to select [, and then press [MENU/SET].
- 3 Press ◀/▶ to select the scene.
- 4 Press [MENU/SET].



- To change the Scene Guide Mode, select the [, select [Scene Switch], and then press [MENU/SET]. You can return to step 3 on P57.
- The following items cannot be set in Scene Guide Mode because the camera automatically adjusts them to the optimal setting.
 - Items other than the picture quality adjustment in [Photo Style]
 - [Sensitivity]
 - [Metering Mode]
 - [HDR]
- Although White Balance is fixed to [AWB] for certain types of scenes, you can use [White Balance] in the [Rec] menu to fine-adjust the White Balance (P75).

Types of Scene Guide Mode



Displaying the description of each scene and recording tips

Press [DISP.] while the scene selection screen is displayed.

- When it is set to the guide display, detailed explanations and tips for each scene are displayed.

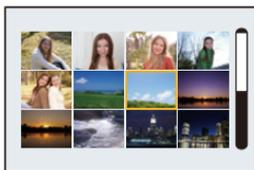
Normal display



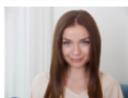
Guide display



List display



[Clear Portrait]



[Silky Skin]

- The smoothing effect is applied to the part that has a similar tone to the complexion of a subject, as well.
- This mode may not be effective under insufficient lighting.



[Backlit Softness]



[Clear in Backlight]



[Relaxing Tone]



[Distinct Scenery]



[Bright Blue Sky]



[Romantic Sunset Glow]



[Vivid Sunset Glow]



[Glistening Water]

- Star filter used in this mode may cause glistening effects on the objects other than water surface.

**[Clear Nightscape]****[Warm Glowing Nightscape]****[Handheld Night Shot]**

- Do not move the unit during the continuous shooting after pressing the shutter button.
- The angle of view will be slightly narrower.

**[Soft Image of a Flower]**

- We recommend setting the flash to [☺] when you take pictures at close range.

**[Cute Dessert]**

- We recommend setting the flash to [☺] when you take pictures at close range.

**[Monochrome]****[Cool Night Sky]****[Glittering Illuminations]****[Clear Night Portrait]**

- We recommend using a tripod and the self-timer.
- When [Clear Night Portrait] is selected, keep the subject still for about 1 second after taking the picture.

**[Appetizing Food]**

- We recommend setting the flash to [☺] when you take pictures at close range.

**[Freeze Animal Motion]**

- The initial setting for the AF assist lamp is [OFF].



MENU



Take the Outdoors Scene Expressively

Recording Mode:    

By setting the Recording Mode to [, [, [, or [, pictures can be taken more effectively matching the conditions such as Sports, Snow, Beach & Surf Mode.

- Scenes for which the selected mode is not intended may be recorded with color tones that differ from the actual color tones.
- The following cannot be set as the camera adjusts automatically.
 - [Photo Style]/[Sensitivity]/[Metering Mode]/[HDR]
- Although White Balance is fixed to [AWB], you can use [White Balance] in the [Rec] menu to fine-adjust the White Balance (P75).
- **(Important) To prevent water leakage, make sure that there are no foreign objects, such as sand, hair, dust, etc., clamped and close the side door all the way until it clicks. Also, read “(Important) About the Waterproof/Dustproof and Anti-shock Performance of the Camera” (P12) before using the camera.**
- **If the camera has been used at the beach or underwater, soak it in fresh water pooled in a shallow container for approximately 10 minutes, and then wipe off the water with a soft dry cloth. (P16)**

Sports Mode

Set here when you want to take pictures of sports scenes or other fast-moving events.

- 1 Press [MODE].
- 2 Press /// to select [, and then press [MENU/SET].

- Shutter speed may slow down up to 1 second.
- This mode is suitable for taking pictures of subjects at distances of 5 m (16 feet) or more.

Snow Mode

This allows you to take pictures that show the snow as white as possible at a ski resort or a snow-covered mountain.

- 1 Press [MODE].
- 2 Press /// to select [, and then press [MENU/SET].

Beach & Surf Mode

This is optimal for recording images underwater at a depth of up to 3 m (9.8 feet) and at the beach.

- 1 Press [MODE].
- 2 Press ▲/▼/◀/▶ to select [, and then press [MENU/SET].

■ Fixing the focus (AF Lock)

You can fix the focus before taking a picture with AF lock. This is useful if you want to take pictures of a fast moving subject, etc.

Press ◀ on the recording screen to fix the focus.

- When the subject is focused, [AFL] is displayed.
- Press ◀ again to cancel AF lock.
- When you press the zoom button, the AF lock is canceled. In this case, focus on the subject and fix the focus again.
- You cannot set to AF lock when [AF Mode] is set to [].

Underwater Mode

This is optimal for recording images underwater at a depth exceeding 3 m (9.8 feet).

* This camera has a waterproof/dustproof function equivalent to "IP68". In addition, it can take pictures at a depth of up to 31 m (102 feet) for up to 60 minutes.

- 1 Press [MODE].
- 2 Press ▲/▼/◀/▶ to select [, and then press [MENU/SET].

■ Fixing the focus (AF Lock)

You can fix the focus before taking a picture with AF lock. This is useful if you want to take pictures of a fast moving subject, etc.

Press ◀ on the recording screen to fix the focus.

- When the subject is focused, [AFL] is displayed.
- Press ◀ again to cancel AF lock.
- When you press the zoom button, the AF lock is canceled. In this case, focus on the subject and fix the focus again.
- You cannot set to AF lock when [AF Mode] is set to [].

• When there is a significant amount of matter floating in the water, set the flash to [].

Taking panorama pictures (Panorama Shot Mode)

Recording Mode: 

Consecutive photos taken while the camera is moved are combined to form a panorama.

- 1 Press [MODE].
- 2 Press ▲/▼/◀/▶ to select [, and then press [MENU/SET].
 - After the screen that asks you to check the recording direction is displayed, the horizontal/vertical guidelines will be displayed.
- 3 Press the shutter button halfway to focus.
- 4 Press the shutter button fully and move the camera in a small circle in the direction of the arrow on the screen.

Recording from left to right



Picture size: [STANDARD]



Picture size: [WIDE]



Ⓐ Recording direction and progress (Guide)

- Move the camera at a constant speed.
Pictures may not be able to be recorded properly if the camera is moved too fast or slow.

- 5 Press the shutter button once again to end the picture recording.

- Recording can also be ended by keeping the camera still while recording.
- Recording can also be ended by moving the camera to the end of the guide.

■ Changing panorama picture settings

MENU →  **[Rec]** → **[Panorama Settings]**

| | |
|------------------------|---|
| [Direction] | Sets the recording direction. |
| [Picture Size] | Sets the angle of view (image size). [STANDARD]/[WIDE] |
| [Filter Select] | <ul style="list-style-type: none"> • You can add the same image effect as the Creative Control Mode with the same operation as the mode. (except for [Toy Effect]/[Toy Pop]/[Miniature Effect]/[Sunshine]) • Read P52–54 for details on the respective effects. • During panorama picture recording, the following image effects of the Creative Control Mode are not visible on the screen: <ul style="list-style-type: none"> – [Rough Monochrome]/[Silky Monochrome]/[Soft Focus]/[Star Filter] • The available ISO sensitivity settings will be limited up to [ISO 3200]. • If you are not going to add an image effect, select [No Effect]. |

- The number of recording pixels in the horizontal and vertical directions of the panorama picture varies depending on the image size, the recording direction and the number of combined pictures.

The maximum number of pixels is shown below.

| Image size | Recording direction | Horizontal Resolution | Vertical Resolution |
|-------------------|---------------------|-----------------------|---------------------|
| [STANDARD] | Horizontal | 8176 pixels | 1648 pixels |
| | Vertical | 2288 pixels | 7680 pixels |
| [WIDE] | Horizontal | 8176 pixels | 752 pixels |
| | Vertical | 1088 pixels | 7680 pixels |

■ Technique for Panorama Shot Mode



- Ⓐ Move the camera in the recording direction without shaking it. (If the camera shakes too much, pictures may not be able to be recorded, or the recorded panorama picture may become narrower (smaller).)
- Ⓑ Move the camera towards the edge of the range you wish to record.

■ About playback

Pressing ▲ will start scrolling playback automatically in the same direction as the recording.

- The following operations can be performed during scrolling playback.

| | |
|---|--------------------------------|
| ▲ | Start panorama playback/Pause* |
| ▼ | Stop |



- * You can perform frame-by-frame forward/rewind by pressing ►/◀ during a pause.

- The zoom position is fixed to Wide.
- The shutter type is fixed to the electronic shutter.
- The focus, White Balance, and exposure are fixed at the optimum values for the first picture. As a result, if the focus or brightness changes substantially during recording, the entire panorama picture may not be recorded at the suitable focus or brightness.
- When multiple pictures are combined to create a single panorama picture, the subject may appear distorted or the connection points may be noticeable in some cases.



Not available in these cases:

- A panorama picture may not be able to be created, or the pictures may not be combined properly when recording the following subjects or under the recording conditions below.
 - Subjects with a single, uniform color or repetitive pattern (such as the sky or a beach)
 - Moving subjects (person, pet, car, waves, flowers blowing in the breeze, etc.)
 - Subjects where the color or patterns change in a short time (such as an image appearing on a display)
 - Dark places
 - Locations with flickering light sources such as fluorescent lights or candles

4.

Focus, Brightness (Exposure) and Color tone Settings

Adjusting Focus Automatically

Applicable modes:          

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

1 Select the menu.

MENU →  **[Rec]** → **[AF Mode]**

| | |
|--|---|
|  ([Face Detection]) | <p>The camera automatically detects the person's face.</p> <ul style="list-style-type: none"> The following AF area frames are displayed when the camera detects the faces. <p>Yellow: This is the AF area for the person to be brought into focus. The camera automatically selects the person.</p> <p>White: These are the AF areas for people other than the person to be brought into focus. This type of AF area is displayed when more than one person is detected. The focus and exposure can then be adjusted to fit that face no matter what portion of the picture it is in. The camera can detect the faces of up to 14 people.  </p> |
|  ([Tracking]) | <p>The camera keeps adjusting the focus and exposure automatically to the specified moving object. (Dynamic Tracking)</p> <ul style="list-style-type: none"> Perform either of the following operations to lock the subject to be tracked: Aim the AF tracking frame over the subject, and press the shutter button halfway. <p> AF tracking frame</p> <ul style="list-style-type: none"> If it fails to lock, AF area will flash in red, and disappear. The AF area turns yellow while the subject is locked (green while the shutter button is pressed halfway). Lock is canceled when [MENU/SET] is pressed.  |

| | | |
|---|---|--|
|  [[49-Area]] | Up to 49 AF areas can be focused. This is effective when a subject is not in the center of the screen. |  |
|  [[1-Area]] | The camera focuses on the subject in the AF area on the screen. |  |
|  [[Spot]] | The camera focuses on a limited narrow area in the screen. |  |

- Press the shutter button halfway to exit the menu.

2 Press the shutter button halfway.

- Auto Focus will be activated.



| Focus | When the subject is focused | When the subject is not focused |
|----------------------|-----------------------------|---------------------------------|
| Focus indication (A) | On | Blinks |
| AF area (B) | Green | Red |
| Sound | Beeps 2 times | Beeps 4 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.



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.



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.

■ Restrictions on Auto Focus Mode

- The AF Mode is fixed to [■] in the following case.
 - [Miniature Effect] (Creative Control Mode)
- It cannot be set the Auto Focus Mode in the following cases.
 - When recording with [Post Focus]
 - When using the Digital Zoom
- For [High Speed Video] recording, the operation of [■] is performed.

👤 ([Face Detection])

- The camera may not detect faces in certain situations, such as when the subjects are moving fast. In such situations, the camera performs the operation of [■].
- It cannot be set to [👤] in the following cases.
 - [Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Glittering Illuminations]/[Handheld Night Shot]/[Appetizing Food]/[Cute Dessert] (Scene Guide Mode)
 - Underwater Mode

🔍 ([Tracking])

- AF Tracking may not work correctly in certain recording situations, such as when the subject is small or the location is dark.
- [🔍] 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)
 - [Glistening Water]/[Glittering Illuminations]/[Soft Image of a Flower]/[Monochrome] (Scene Guide Mode)
 - [Monochrome] ([Photo Style])

Setting up position of the AF area

Applicable modes:

You can set the AF area position with , , or of Auto Focus Mode.

• With , if you move the AF area to anywhere other than detected faces, Auto Focus operates in the same way as when using .

1 Select the menu.

MENU → [Rec] → [AF Mode]

2 Select , , or and press ▼.

3 Adjust the AF area position.

| Button operation | Description of operation |
|------------------|--|
| ▲/▼/◀/▶ | Moves the AF area. |
| [DISP.] | Resets the AF area back to the center. |



4 Press [MENU/SET] to set.

• To cancel the AF area setting when or has been selected, press [MENU/SET].

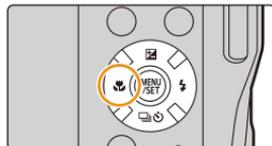
• The spot metering target can also be moved to match the AF area when the [Metering Mode] (P125) is set to .

Taking Close-up Pictures

Applicable modes:  **P** **M**  **SCN**    

This mode allows you to take close-up pictures of a subject, e.g. when taking pictures of flowers.

- 1 Press .
- 2 Press  to select the mode and then press **[MENU/SET]**.



| | |
|--|---|
| AF  ([AF Macro]) | You can take pictures of a subject as close as 5 cm (0.16 feet) from the lens by pressing the zoom button upmost to Wide (1×). |
|  ([Macro Zoom]) | Use this setting to take pictures of further enlarged subjects. You can take a picture with the Digital Zoom up to 3× while maintaining the distance to the subject for the extreme Wide position (5 cm (0.16 feet)). <ul style="list-style-type: none"> • The image quality is poorer than during normal recording. • Zoom range will be displayed in blue. (digital zoom range) |
|  OFF ([Off]) | — |

- Keep the following points in mind when taking close-up pictures:
 - If the distance between the camera and the subject is beyond the focus range of the camera, the picture may not be properly focused even if the focus indication lights.
 - We recommend using a tripod and the Self-timer.
 - We recommend setting the flash to .
 - When a subject is close to the camera, the effective focus range 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.

Not available in these cases:

- [Macro Zoom] cannot be set in the following cases.
 - [Impressive Art]/[Toy Effect]/[Toy Pop]/[Miniature Effect] (Creative Control Mode)
 - [Handheld Night Shot] (Scene Guide Mode)
 - Panorama Shot Mode
 - When [HDR] is set to [ON]
 - When recording with [High Speed Video]

Compensating the Exposure

Applicable modes:         

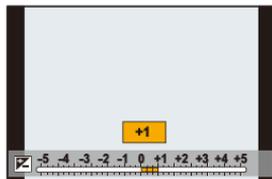
Use this function when you cannot achieve appropriate exposure due to the difference in brightness between the subject and the background.

1 Press .



2 Press   to compensate the exposure and then press [MENU/SET].

- The exposure compensation value appears on the screen.
- Select [0] to return to the original exposure.



- You can set the exposure compensation value in the range between -5 EV and $+5$ EV. Settings can be made within a range of -3 EV to $+3$ EV while recording motion pictures, recording 4K photos, or recording in [Post Focus].
- 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 value is memorized even if the camera is turned off. (When [Exposure Comp. Reset] (P136) is set to [OFF])

Setting the Light Sensitivity

Applicable modes: 

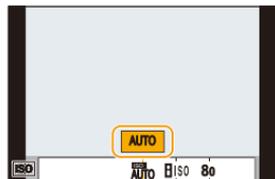
This allows the sensitivity to light (ISO sensitivity) to be set.

1 Select the menu.

MENU →  **[Rec]** → **[Sensitivity]**

2 Press ◀/▶ to select the ISO sensitivity.

3 Press [MENU/SET] to set.



| | |
|--|---|
| AUTO | <p>The ISO sensitivity is automatically adjusted according to the brightness.</p> <ul style="list-style-type: none"> • Maximum [ISO1600]^{*1} |
|  ISO (Intelligent ISO) | <p>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.</p> <ul style="list-style-type: none"> • Maximum [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. |
| from 80 to 3200, H.6400^{*2} | The ISO sensitivity is fixed to various settings. |

*1 When the [ISO Limit Set] (P128) 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**

| | 80 \longleftrightarrow 3200 | |
|------------------------------|-------------------------------|-----------------|
| Recording location | When it is light (outdoors) | When it is dark |
| Shutter speed | Slow | Fast |
| Noise | Less | Increased |
| Jitter of the subject | Increased | Less |

- For information on the focus range of flash when [AUTO] is set, refer to P104.
- [ISO] is not available in Manual Exposure Mode.
- The following settings are available when recording with the 4K Photo or Post Focus function: [AUTO]/[80] to [3200]

Adjusting the White Balance

Applicable modes:

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 Select the menu.

MENU → **[Rec]** → **[White Balance]**

2 Press to select the White Balance.



| | |
|--------------|--|
| [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 |
| * | When taking pictures with the flash only |

| | | |
|--|--|--|
| | <p>Set the White Balance value. Use to match the condition when taking photographs.</p> <ol style="list-style-type: none"> Press . Place a white object such as a piece of paper within the frame at the center of the screen, and press [MENU/SET]. <ul style="list-style-type: none"> This will set the White Balance and return you to the recording screen. 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. | |
|--|--|--|

* **[AWB]** is applied when you record motion picture or perform recording with the 4K Photo or Post Focus function.

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



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

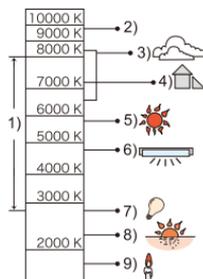
- The White Balance is only calculated for subjects within the range of the camera's flash. (P104)
- In the Scene Guide Mode, settings suitable for each scene are made.
- In Scene Guide Mode, changing the scene or Recording Mode will return White Balance settings (including the White Balance fine adjustment setting) back to [AWB].

■ 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



Finely adjusting the White Balance

Applicable modes:        

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

- 1 Select the White Balance and then press **▼**.
- 2 Press **▲/▼/◀/▶** to fine-adjust the White Balance.

◀: [A] (AMBER: ORANGE)

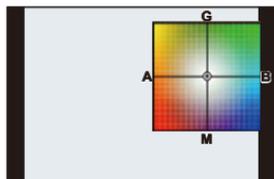
▶: [B] (BLUE: BLUISH)

▲: [G] (GREEN: GREENISH)

▼: [M] (MAGENTA: REDDISH)

• Pressing [DISP.] resets the position back to the center.

- 3 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), [+] or [-] appears beside the White Balance icon on the screen.

Recording 4K Photos

Applicable modes:         

The camera allows you to take burst pictures of 8 million pixels (approx.) at 30 frames/second. After taking these pictures, you can save the desired moment extracted from their burst file.

- Use a UHS Speed Class 3 card. (P27)

1 Press [].

- The same operation can be performed by pressing [] (▼), using ◀/▶ to select a 4K photo icon ([]), etc.), and pressing ▲. (P86)



2 Select the recording method with ◀/▶, and then press [MENU/SET].

- You can also set the recording method in [4K PHOTO] in the [Rec] menu.

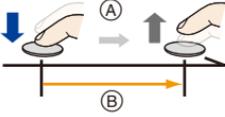
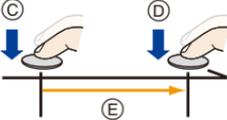
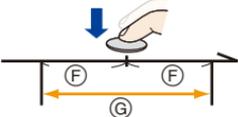


| | | |
|--|---|--|
|  [4K Burst] | For capturing the best shot of a fast-moving subject (e.g., sports, aeroplanes, trains) Audio recording: Not available |  |
|  [4K Burst(S/S)] “S/S” is an abbreviation of Start/Stop. | For capturing unpredictable photo opportunities (e.g., plants, animals, children) Audio recording: Available* |  |
|  [4K Pre-Burst] | For recording as needed whenever a photo opportunity arises (e.g., the moment when a ball is thrown) Audio recording: Not available |  |

* Audio is not played back when you perform playback with the camera.

3 Record a 4K photo.

- [Continuous AF] will work during recording. Focus will be adjusted continuously.

| | |
|---|---|
|  <p>[4K Burst]</p> | <ol style="list-style-type: none"> 1 Press the shutter button halfway. 2 Press and hold the shutter button fully for as long as you want to perform recording. <ul style="list-style-type: none"> (A) Press and hold (B) Recording is performed <ul style="list-style-type: none"> • Press the button fully slightly in advance. Recording starts approximately 0.5 seconds after it has been pressed fully. • If you remove your finger from the shutter button immediately after the start of recording, up to a period of approximately 1.5 seconds after the moment that the finger has been removed may be recorded.  |
|  <p>[4K Burst(S/S)]</p> | <ol style="list-style-type: none"> 1 Press the shutter button fully. <ul style="list-style-type: none"> (C) Start (First) 2 Press the shutter button fully again to stop recording. <ul style="list-style-type: none"> (D) Stop (Second) (E) Recording is performed <p> Adding markers to select and save pictures</p> <p>You can add markers if you press [Fn1] during recording. (Up to 40 markers per recording) When selecting and saving pictures from a 4K burst file, you can skip to the positions where you added markers.</p>  |
|  <p>[4K Pre-Burst]</p> | <p>Press the shutter button fully.</p> <ul style="list-style-type: none"> (F) Approximately 1 second (G) Recording is performed <ul style="list-style-type: none"> • Images may not appear as smooth as they do on the normal recording screen.  |

- The camera will perform burst recording of a 4K photo and save it as a 4K burst file in MP4 format.
- When [Auto Review] is enabled, the picture selection screen will be displayed automatically. To continue recording, press the shutter button halfway to display the recording screen.
- For information on how to select and save pictures from recorded 4K burst files, refer to [P80](#).

■ Canceling 4K Photo

In step 2, select []. (P76)

- The operation can be canceled by pressing [] (▼) and then selecting [] ([Single]) or [].



Battery drainage and camera temperature

- When [] ([4K Pre-Burst]) is set, the battery drains faster and the camera temperature rises. Select [] ([4K Pre-Burst]) only when recording.

- Recording stops when the continuous recording time exceeds 29 minutes and 59 seconds. When using an SDHC memory card, you can continue the recording of a 4K photo without interruption even if the file size exceeds 4 GB, but the 4K photo will be recorded and played back in separate burst files. With an SDXC memory card, you can save a 4K photo with a burst file size exceeding 4 GB as a single file.

Notes on the 4K Photo function

■ To change the aspect ratio

Selecting [Aspect Ratio] in the [Rec] menu allows you to change the aspect ratio for 4K photos.

■ Shutter sound for 4K photo recording

- When using [] ([4K Burst]) or [] ([4K Pre-Burst]), you can change the electronic shutter sound settings in [Shutter Vol.] and [Shutter Tone]. (P133)
- When recording with [] ([4K Burst(S/S)]), you can set the start/stop tone volume in [Beep Volume].

■ Scenes not suitable for the 4K Photo function

Recording in extremely bright locations or indoors

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.

Lowering the shutter speed may reduce the effect of the horizontal stripes.

Subjects that are moving fast

If you record a subject moving fast, the subject in the recorded pictures may appear distorted.

■ The camera's setup for the 4K Photo function

The camera's setup is automatically optimized for 4K photo recording.

- The following [Rec] menu items are fixed to the settings below:

| | | | |
|----------------|---|----------------|---|
| [Picture Size] | [4K] (8M) | [Quality] | [ |
| | [4:3]: 3328×2496 [3:2]: 3504×2336 [16:9]: 3840×2160 [1:1]: 2880×2880 | [Shutter Type] | Fixed to the electronic shutter |

- 4K burst files are recorded with the settings indicated below:
Settings in the [Motion Picture] menu are not applied to 4K burst files.

| | | | |
|---------------|---------------|-----------------|------|
| [Rec Quality] | [4K/100M/30p] | [Continuous AF] | [ON] |
|---------------|---------------|-----------------|------|

- When recording with the 4K Photo function, the ranges for the following functions differ from the ones available for taking pictures:
 - Shutter speed: 1/30th to 1/16000th
 - Exposure Compensation: –3 EV to +3 EV
 - ISO sensitivity: [AUTO], 80 to 3200
- When recording with the 4K Photo function, the following functions are disabled:
 - Flash
 - White Balance (
- The following menu items are disabled:

| | |
|----------|---|
| [Rec] | [Picture Size]/[Quality]/[iHandheld Night Shot]/[iHDR]/[HDR]/ [Panorama Settings]/[Shutter Type]/[Extended ISO] |
| [Custom] | [Rec Area] |
| [Setup] | ([) ([4K Pre-Burst]) only [Wi-Fi]/[Economy] |

- The angle of view may become narrower during recording.
- When recording with the 4K Photo function, the following menu item is disabled:
 - [Simultaneous Record w/o Filter] (Creative Control Mode)
- Scene Detection in Intelligent Auto Mode works the same way as when recording motion pictures.

Not available in these cases:

- The 4K Photo function is disabled when using the following settings:
 - [Rough Monochrome]/[Silky Monochrome]/[Miniature Effect]/[Soft Focus]/[Star Filter]/[Sunshine] (Creative Control Mode)
 - [Clear in Backlight]/[Glistening Water]/[Glittering Illuminations]/[Handheld Night Shot]/[Clear Night Portrait]/[Soft Image of a Flower] (Scene Guide Mode)
 - When recording motion pictures
 - When using [Time Lapse Shot]
 - When using a Wi-Fi connection

Selecting pictures from 4K burst file and saving

1 Select an image with the [▲] icon on the playback screen, and press ▲.

- The slide view screen, where you select pictures, is displayed.



2 Press ◀/▶ to select the frame to be saved as a picture.

- Select [◀]/[▶] and press [MENU/SET] to switch to the previous or next slide view.
- Press [Fn1] to switch to marker operation. You can press ◀/▶ to skip to the next marker position. ([4K Burst(S/S)] only)
- You can also select scenes on the 4K burst playback screen by pressing [Fn2]. ([4K Burst]/[4K Burst(S/S)] only) (P82)



3 Press [MENU/SET] to save the picture.

- The picture will be saved in JPEG format.



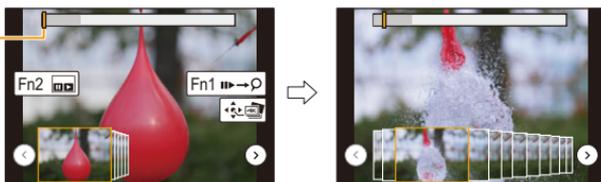
You can save pictures taken during a 5 second period at once by using [4K PHOTO Bulk Saving] in the [Playback] menu. (P142)

- The picture will be saved with recording information (Exif information), including its shutter speed, aperture and ISO sensitivity information.
- 4K burst files saved on a PC will be treated as MP4 motion pictures.

Operations during selecting pictures

■ Navigating the slide view screen

Position of the displayed frame

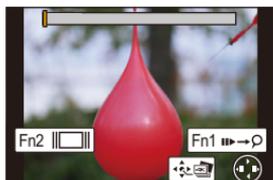


| Button operation | Description of operation |
|------------------------------|---|
| | Selects a frame. • You can select a frame from 60 frames (continuous burst time of approximately 2 seconds). |
| Select / → [MENU/SET] | Displays the previous or next frames (45 pictures) in slide view. |
| | Enlarges the display. |
| | Reduces the display (during enlarged display). |
| | Moves the enlarged area (during enlarged display). |
| [Fn2] | Displays the 4K burst playback screen. |
| [Fn1] | Switches to marker operation. |
| [MENU/SET] | Saves the picture. |

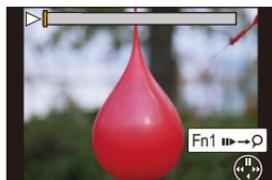
- During marker operation, you can skip to the markers that you added or the beginning or end of the 4K burst file. Press [Fn1] again to return to the original operation.

| Button operation | Description of operation |
|------------------|-------------------------------|
| | Moves to the next marker. |
| | Moves to the previous marker. |

■ Navigating the 4K burst playback screen



During pause



During continuous playback

| Button operation | Description of operation |
|---|---|
| ▲ | Continuous playback/Pause (during continuous playback). |
| ▼ | Continuous rewind/Pause (during continuous rewind). |
| ▶ | Fast forward/Frame-by-frame forward (during pause). |
| ◀ | Fast rewind/Frame-by-frame rewind (during pause). |
|  | Enlarges the display (during pause). |
|  | Reduces the display (during enlarged display). |
| ▲/▼/◀/▶ | Moves the enlarged area (during enlarged display). |
| [Fn2] | Displays the slide view screen (during pause). |
| [Fn1] | Switches to marker operation. |
| [MENU/SET] | Saves the picture (during pause). |

Selecting and saving pictures on the TV screen

- If you display 4K burst files on a TV connected to the camera, they will be displayed only on the 4K burst playback screen.
- Even if you insert the SD card to a 4K-compatible TV with an SD card slot, you cannot play back 4K burst files recorded with [Aspect Ratio] set to an option other than [16:9]. (As of May 2018)

Controlling Focus After Recording (Post Focus)

Applicable modes:          

The camera allows you to take 4K burst pictures while shifting the focus to different areas. After taking these pictures, you can select the desired focus area.

This function is suited for recording still objects.



4K burst recording while automatically shifting the focus.



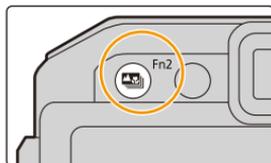
Select the desired focus point.



A picture with the desired focus point is made.

- Use a UHS Speed Class 3 card. (P27)

1 Press [].

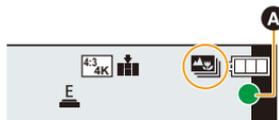


2 Press   to select [ON] and press [MENU/SET].

- You can also set the function to [ON] by pressing [] () , pressing   to select the Post Focus icon (), and then pressing [MENU/SET]. (P86)

3 Decide on the composition, and press the shutter button halfway.

- Auto Focus will detect focus areas on the screen. (Excluding the edges of the screen)
- If no areas on the screen can be brought into focus, the focus display (A) will flash. Recording is not possible in this case.



4 Press the shutter button fully to start recording.

- The focus point changes automatically while recording. When the icon (Ⓟ) disappears, recording automatically ends.



From the time you press the shutter button halfway until the end of recording:

- Maintain the same distance to the subject and the same composition.
- A motion picture in MP4 format will be recorded. (Audio will not be recorded.)
- When [Auto Review] is enabled, a screen that lets you select the desired focus area will be displayed. (P85)

■ Canceling [Post Focus]

Select [OFF] in step 2. (P83)

■ Limitations in [Post Focus]

- Since recording is performed in the same image quality as 4K photos, certain limitations apply to recording functions and menu settings. For details, refer to “The camera’s setup for the 4K Photo function” on P79.
- In addition to the limitations of the 4K Photo function, the following limitations apply to [Post Focus] recording:
 - Auto Focus Mode is disabled.
 - Motion pictures cannot be recorded.
 - [Digital Zoom] is disabled.
 - [Remaining Disp.] is disabled.
- The angle of view may become narrower during recording.

Ⓟ Not available in these cases:

- The [Post Focus] function is disabled when using the following settings:
 - [Rough Monochrome]/[Silky Monochrome]/[Miniature Effect]/[Soft Focus]/[Star Filter]/[Sunshine] (Creative Control Mode)
 - [Clear in Backlight]/[Glistening Water]/[Glittering Illuminations]/[Handheld Night Shot]/[Clear Night Portrait]/[Soft Image of a Flower] (Scene Guide Mode)
 - When using [Time Lapse Shot]
 - When using a Wi-Fi connection

Selecting the desired focus area and saving a picture

1 Select an image with the [] icon on the playback screen, and press **▲**.



2 Press **▲/▼/◀/▶** to select the focus area.

- If a picture that is in focus is not available for the selected area, a red frame will be displayed. You cannot save a picture in this case.
- You cannot select the edges of the screen.



| Button operation | Description of operation |
|---|---|
| ▲/▼/◀/▶ | Selects a focus area. • It cannot be selected during enlarged display. |
|  | Enlarges the display. |
|  | Reduces the display (during enlarged display). |
| [Fn2] | In-focus portions are highlighted with color. (Peaking) • Switches in order of [OFF] → [PEAK L] ([LOW]) → [PEAK H] ([HIGH]). |
| [MENU/SET] | Saves the picture. |

- You can fine-adjust the focus by pressing **◀/▶** during enlarged display.



3 Press **[MENU/SET]** to save the picture.

- The picture will be saved in JPEG format.

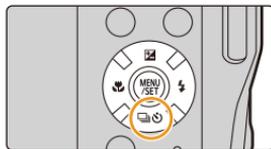
- You cannot choose and save the picture from a TV screen even if the camera is connected to a TV through an HDMI micro cable.

Select a Drive Mode

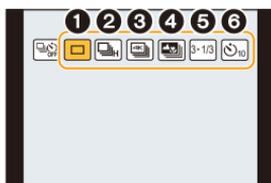
Applicable modes:

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

1 Press **▼** ().



2 Press **◀/▶** to select the drive mode, and then press **[MENU/SET]**.



| | |
|-------------------------------|---|
| 1 [Single] | When the shutter button is pressed, only one picture is recorded. |
| 2 [Burst] (P87) | Recordings are made in succession while the shutter button is pressed. |
| 3 [4K PHOTO] (P76) | When the shutter button is pressed, a 4K photo is recorded. |
| 4 [Post Focus] (P83) | When the shutter button is pressed, Post Focus recording is performed. |
| 5 [Auto Bracket] (P89) | Each time the shutter button is pressed, recordings are made with different exposure settings according to the Exposure Compensation range. |
| 6 [Self Timer] (P91) | When the shutter button is pressed, recording takes place after the set time has elapsed. |

■ To cancel the drive mode

Select [] ([Single]) or [] in step 2.

- The self-timer can also be canceled by turning off the camera. (When [Self Timer Auto Off] (P136) is set to [ON])

Taking Pictures using Burst Mode

Applicable modes:

Pictures are taken continuously while the shutter button is pressed.

1 Press \blacktriangledown ().

2 Press $\blacktriangleleft/\blacktriangleright$ to select the burst icon (), etc.), and then press \blacktriangle .

3 Select the burst speed with $\blacktriangleleft/\blacktriangleright$, and then press [MENU/SET].



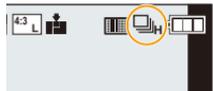
| | Burst speed (pictures/second) | Focus | Number of recordable pictures* |
|--|----------------------------------|-------------|--|
| | 10 | Fixed to AF | 11 |
| | 5 | AF tracking | 15 |
| | 2 | AF tracking | Depends on the capacity of the card |

* When recording is performed under the test conditions specified by Panasonic. The burst speed will become slower halfway. However, pictures can be taken until the capacity of the card becomes full. Depending on recording conditions, the number of burst pictures that can be taken will be reduced.

- The Burst speed may become slower depending on the following settings.
 - [Picture Size]/[Quality]/[Sensitivity]
- Burst speed can also be set with [Burst Rate] in the [Rec] menu.

4 Focus on the subject and take a picture.

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



■ Canceling the Burst Mode

Select [] ([Single]) or [] from among the drive modes. (P86)

- When [] is set, the exposure and White Balance will be fixed to the settings of the first picture.
When [] or [] is set, the exposure and White Balance will be adjusted for each picture.
- When [] is set, depending on changes in the brightness of the subject, the recording may be brighter or darker from the second picture.
- **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.
 - [Rough Monochrome]/[Silky Monochrome]/[Miniature Effect]/[Soft Focus]/[Star Filter]/[Sunshine] (Creative Control Mode)
 - [Glistening Water]/[Glittering Illuminations]/[Handheld Night Shot]/[Soft Image of a Flower] (Scene Guide Mode)
 - When recording motion pictures
 - When recording using the flash
 - When using [Time Lapse Shot]

Taking Pictures using Auto Bracket

Applicable modes:          

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

Compensation range: [3•1/3]

1st picture



±0 EV

2nd picture



-1/3 EV

3rd picture



+1/3 EV

1 Press  ().

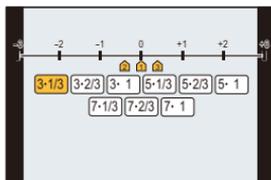
2 Press to  /  to select the Auto Bracket icon ([3•1/3] , etc.), and then press  .

3 Press  /  to select the compensation range, and then press [MENU/SET].

- You can also set the compensation range for Auto Bracket with [Auto Bracket] in the [Rec] menu.

4 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.



■ Canceling the Auto Bracket

Select [] ([Single]) or [] from among the drive modes. (P86)

- 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.
 - [Rough Monochrome]/[Silky Monochrome]/[Miniature Effect]/[Soft Focus]/[Star Filter]/[Sunshine] (Creative Control Mode)
 - [Glistening Water]/[Glittering Illuminations]/[Handheld Night Shot]/[Soft Image of a Flower] (Scene Guide Mode)
 - When recording motion pictures
 - When using [Time Lapse Shot]



MENU



Taking Pictures with the Self-timer

Applicable modes: 

1 Press \blacktriangledown ( .

2 Press $\blacktriangleleft/\blacktriangleright$ to select the self-timer icon (, etc.), and then press \blacktriangle .



3 Press $\blacktriangleleft/\blacktriangleright$ to select the time setting for the self-timer, and then press [MENU/SET].



| | |
|---|--|
|  | Picture is taken 10 seconds after shutter is pressed. |
|  | After 10 seconds the camera takes 3 pictures at about 2 seconds intervals. |
|  | 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. |

- Time setting for the self timer can also be set by [Self Timer] in the [Rec] menu.

4 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.



■ Canceling the self-timer

Select [] ([Single]) or [] from among the drive modes. (P86)

- The self-timer can also be canceled by turning off the camera. (When [Self Timer Auto Off] (P136) is set to [ON])

- We recommend using a tripod when recording with the self-timer.
- The flash output may vary slightly when the [] is selected.

Not available in these cases:

- It cannot be set to [] in the following case.
 - When [Simultaneous Record w/o Filter] of Creative Control Mode is set to [ON]
- Self-timer is disabled in the following cases.
 - When recording motion pictures
 - When using [Time Lapse Shot]



Taking Pictures Automatically at Set Intervals ([Time Lapse Shot])

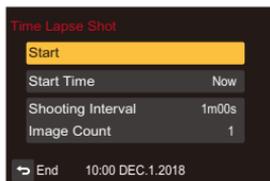
Applicable modes:          

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. (P31)
- Recorded pictures are displayed as group pictures.

1 Select the menu.

MENU →  **[Rec]** → **[Time Lapse Shot]**



| | | |
|---------------------------------------|---|---|
| [Start Time] | [Now] | Starts the recording by fully-pressing the shutter button. |
| | [Start Time Set] | 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 | |

- Recording may not be consistent with the set recording interval or the set number of pictures depending on recording conditions.

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

3 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 camera manually, press the camera [ON/OFF] button.
- Operations during recording standby (The camera is turned on)

| Button operation | Description of operation |
|------------------|---|
| [Fn1] | Displays a selection screen that lets you pause or stop the recording |
| | Displays a selection screen that lets you resume or stop the recording (during pause) |

- After the recording stops, a confirmation screen will be displayed, asking whether to proceed to create a motion picture.
To create a motion picture, select [Yes].

4 Select the methods for creating a motion picture.

- The recording format is set to MP4.

| | |
|---------------|---|
| [Rec Quality] | Sets the quality of a motion picture. |
| [Frame Rate] | Sets the number of frames per second. The larger the number is, the smoother the motion picture will be. |
| [Sequence] | [NORMAL]: Splices pictures together in recording order. [REVERSE]: Splices pictures together in reverse recording order. |

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

- Motion pictures can also be created from [Time Lapse Video] in the [Playback] menu. (P144)

- This function is not for use in a security camera.
- **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.**
- We do not recommend using [Time Lapse Shot] while underwater.
- [Time Lapse Shot] is paused in the following cases.
 - When the charge on the battery runs out
 - Turning the camera offDuring pause, you can replace the battery and the card, and then turn on the camera to restart the operation. (Note that the pictures taken after replacing the card will be saved as a separate set of group pictures.) Turn off this unit when replacing the battery or the card.
- When creating motion pictures with a [Rec Quality] setting of [4K], recording times are limited to 29 minutes and 59 seconds.
 - In addition, when using an SDHC memory card, you cannot create motion pictures with a file size exceeding 4 GB.
 - When using an SDXC memory card, you can create motion pictures with a file size exceeding 4 GB.
- A motion picture with a [Rec Quality] setting of [FHD] or [HD] cannot be created if the recording time exceeds 29 minutes and 59 seconds or the file size exceeds 4 GB.



Not available in these cases:

- This function is not available in the following cases:
 - [Handheld Night Shot] (Scene Guide Mode)
 - When recording motion pictures

Image Stabilizer

Applicable modes:  **P** **M**  **SCN**     

Using this mode, jitter during picture taking is detected, and the camera automatically compensates for the jitter, enabling jitter-free images to be taken.

MENU →  **[Rec]** → **[Stabilizer]**

| | | |
|--|---|--|
|  ((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. | |

- ((Normal)) is selected automatically in Intelligent Auto Mode.



Preventing jitter (camera shake)

When the jitter alert [] appears, use **[Stabilizer]**, a tripod or the self-timer (**P91**).

- 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
- [Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Glittering Illuminations]/[Clear Night Portrait] (Scene Guide Mode)
- When you set to a slow shutter speed

- It is recommended to disable the Image Stabilizer when using a tripod.
- 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

 **Not available in these cases:**

- The Image Stabilizer does not work for [High Speed Video] recording.
- In Panorama Shot Mode, the [Stabilizer] setting will switch to [👉] ([Panning]) even if it is set to [👉] ([Normal]).
- In the following cases, the [Stabilizer] will switch to [👉] ([Normal]), even if it is set to [👉] ([Panning]):
 - When recording 4K photos
 - When recording using [Post Focus]

Taking Pictures with the Zoom

You can zoom in to make people and objects appear closer or zoom out to record landscapes in wide angle.

To make subjects appear further away use (Wide)

Press [W] on the zoom button.



To make subjects appear closer use (Tele)

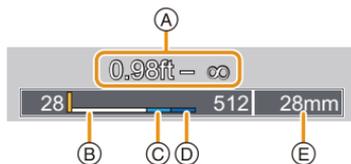
Press [T] on the zoom button.

Zoom types and use

■ Screen display

The illustration is an example of when using Optical Zoom, [i.Zoom], and [Digital Zoom] in program AE Mode.

- (A) Focus range
- (B) Optical Zoom range (including the Extended Optical Zoom range)
- (C) Intelligent Zoom range
- (D) Digital Zoom range
- (E) Current zoom position (Focal lengths the same as those of a 35 mm film camera)



Optical Zoom

Applicable modes: tA P M SCN

Zooms in without deteriorating the image quality.

Maximum magnification: 4.6×

Not available in these cases:

- This function is not available in the following case:
 - When recording with Zoom Macro

Extended Optical Zoom

Applicable modes:         

This function works when any of the picture sizes (P124) indicated with **EX** is selected. You can zoom in further than you can with the Optical Zoom without deteriorating the image quality.

Maximum magnification: 9×

(This includes the optical zoom magnification. The magnification level differs depending on [Picture Size] setting.)

Not available in these cases:

- This function is not available in the following cases:
 - [Toy Effect]/[Toy Pop] (Creative Control Mode)
 - [Handheld Night Shot] (Scene Guide Mode)
 - When recording 4K photos
 - When recording with [Post Focus]
 - When [HDR] is set to [ON]
 - When [iHandheld Night Shot] is set to [ON]
 - When [iHDR] is set to [ON]
 - When recording with Zoom Macro
 - When recording motion pictures

Intelligent Zoom

Applicable modes:         

You can zoom in up to twice the original zoom magnification while minimizing the deterioration of the image quality.

MENU →  **[Rec]/**  **[Motion Picture]** → **[i.Zoom]**

Settings: [ON]/[OFF]

- This function works automatically in Intelligent Auto Mode.

Not available in these cases:

- This function is not available in the following cases:
 - [Impressive Art]/[Toy Effect]/[Toy Pop] (Creative Control Mode)
 - [Handheld Night Shot] (Scene Guide Mode)
 - When [HDR] is set to [ON]
 - When [iHandheld Night Shot] is set to [ON]
 - When [iHDR] is set to [ON]
 - When recording with Zoom Macro

Digital Zoom

Applicable modes:         

Although the image quality deteriorates every time you zoom in further, you can zoom in up to four times the original zoom magnification.

MENU →  **[Rec]/** **[Motion Picture]** → **[Digital Zoom]**

Settings: [ON]/[OFF]

- When using the [i.Zoom], the maximum magnification of the Digital Zoom is limited to 2×.
- When using the Digital Zoom, we recommend using a tripod and the self-timer (P91) for taking pictures.
- In the Digital Zoom range, the AF area is displayed at the center in a larger size.

Not available in these cases:

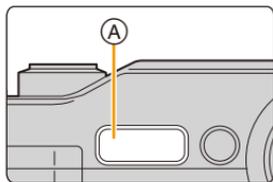
- This function is not available in the following cases:
 - [Impressive Art]/[Toy Effect]/[Toy Pop]/[Miniature Effect] (Creative Control Mode)
 - [Handheld Night Shot] (Scene Guide Mode)
 - When recording with [Post Focus]
 - When [HDR] is set to [ON]
 - When recording with Zoom Macro
 - When recording with [High Speed Video]

Taking pictures by using the flash

Applicable modes:           

Flash

- Do not cover the flash with your fingers or other objects.



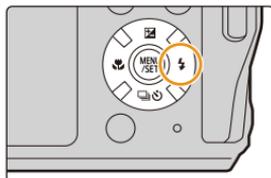
In the following cases, the flash is fixed to [☹] (forced flash off).

- When recording motion pictures
- When recording 4K photos
- When recording with [Post Focus]
- When recording with the Auto Bracket function
- When using the electronic shutter
- When [HDR] is set to [ON]

Changing Flash Mode

Set the flash to match the recording.

- 1 Press **▶** (⚡).
- 2 Press **◀/▶** to select the mode and then press **[MENU/SET]**.



| | |
|---|---|
| ⚡A ([Auto]) | The flash is automatically activated when the recording conditions make it necessary. |
| ⚡A ([Auto])* ¹ | The flash is automatically activated when the recording conditions make it necessary. |
| ⚡A [Ⓢ] ([Auto/Red-Eye])* ² | <p>The flash is automatically activated when the recording conditions make it necessary.</p> <p>It is activated once before the actual recording to reduce the red-eye phenomenon (eyes of the subject appearing red in the picture) and then activated again for the actual recording.</p> <p>• Use this when you take pictures of people in low lighting conditions.</p> |
| ⚡ ([Forced Flash On]) ⚡ [Ⓢ] ([Forced On/Red-Eye])* ² | <p>The flash is activated every time regardless of the recording conditions.</p> <p>• Use this when your subject is back-lit or under fluorescent light.</p> |
| ⚡S ([Slow Sync.]) ⚡S [Ⓢ] ([Slow Sync./Red-Eye])* ² | <p>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.</p> <p>• Use this when you take pictures of people in front of a dark background.</p> <p>• Using a slower speed can cause motion blur. Using a tripod can enhance your photos.</p> |
| ⊘ ([Forced Flash Off]) | <p>The flash is not activated in any recording conditions.</p> <p>• Use this when you take pictures in places where the use of the flash is not permitted.</p> |



*1 This can be set only when Intelligent Auto Mode is set. The icon changes depending on the type of subject and brightness. (P46)

*2 **The flash is activated twice. The subject should not move until the second flash is activated. Interval until the second flash depends on the brightness of the subject.** [Red-Eye Removal] (P128) on the [Rec] menu is set to [ON], [⚡] appears on the flash icon.

- 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.

■ Available flash settings by Recording Mode

The available flash settings depend on the Recording Mode.

(○: Available, —: Not available, ●: Initial setting of Scene Guide Mode)

| Recording Mode | | ⚡ | ⚡ [Ⓜ] | ⚡ | ⚡ [Ⓜ] | ⚡S | ⚡ [Ⓜ] | Ⓜ |
|--|-----------------------------|---|----------------|---|----------------|----|----------------|---|
| P | Program AE Mode | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| M | Manual Exposure Mode | ○ | ○ | ○ | ○ | — | — | ○ |
|  Scene Guide Mode | [Clear Portrait] | ○ | ● | ○ | ○ | — | — | ○ |
| | [Silky Skin] | ○ | ● | ○ | ○ | — | — | ○ |
| | [Backlit Softness] | — | — | — | — | — | — | ● |
| | [Clear in Backlight] | — | — | ● | — | — | — | ○ |
| | [Relaxing Tone] | — | — | — | — | — | — | ● |
| | [Distinct Scenery] | — | — | — | — | — | — | ● |
| | [Bright Blue Sky] | — | — | — | — | — | — | ● |
| | [Romantic Sunset Glow] | — | — | — | — | — | — | ● |
| | [Vivid Sunset Glow] | — | — | — | — | — | — | ● |
| | [Glistening Water] | — | — | — | — | — | — | ● |
| | [Clear Nightscape] | — | — | — | — | — | — | ● |
| | [Cool Night Sky] | — | — | — | — | — | — | ● |
| | [Warm Glowing Nightscape] | — | — | — | — | — | — | ● |
| | [Glittering Illuminations] | — | — | — | — | — | — | ● |
| | [Handheld Night Shot] | — | — | — | — | — | — | ● |
| | [Clear Night Portrait] | — | — | — | — | — | ● | ○ |
| | [Soft Image of a Flower] | ● | — | ○ | — | — | — | ○ |
| | [Appetizing Food] | ● | — | ○ | — | — | — | ○ |
| | [Cute Dessert] | ● | — | ○ | — | — | — | ○ |
| | [Freeze Animal Motion] | ● | — | ○ | — | — | — | ○ |
| [Monochrome] | ● | ○ | ○ | ○ | ○ | ○ | ○ | |
|  Sports Mode | | | | | | | | |
|  Snow Mode | | | | | | | | |
|  Beach & Surf Mode | ○ | — | ○ | — | — | — | ○ | |
|  Underwater Mode | | | | | | | | |

• In Intelligent Auto Mode, the flash will be set to [⚡A] or [Ⓜ].

• The Scene Guide Mode flash setting is returned to the initial value with each change of scene.

■ The available flash range (approximation)

The edges of flash pictures taken without using the zoom at short distances (close to the wide end) may appear dark. This may be alleviated by zooming in a little further.

| | Wide | Tele |
|-------------------------|--------------------------------------|--------------------------------------|
| [AUTO] in [Sensitivity] | 0.3 m (0.98 feet) to 5.6 m (18 feet) | 0.3 m (0.98 feet) to 3.1 m (10 feet) |

• This is the range when [ISO Limit Set] (P128) is set to [OFF].

- If you bring the flash too close to an object, the object may be distorted or discolored by the heat or lighting from the flash.
- It may take time to charge the flash if you repeatedly take pictures. When the flash is being charged, the flash icon blinks red, and you cannot take a picture even when you press the shutter button fully.

■ Shutter speed for each flash setting

| Flash setting | Shutter speed (Sec.) | Flash setting | Shutter speed (Sec.) |
|---|----------------------|---|----------------------|
|  | 1/60* to 1/1300 |  | 1 to 1/16000 |
|  | |  | |
|  | |  | 4 to 1/16000 |
|  | | | |

* The value changes to 4 seconds in Manual Exposure Mode.

• In Intelligent Auto Mode, shutter speed changes depending on the identified scene.

Recording Motion Picture/4K Motion Picture

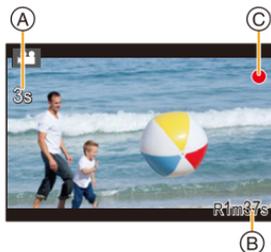
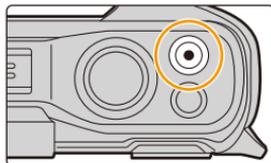
Applicable modes:          

You can record motion pictures and 4K motion pictures in MP4 recording format. Audio is recorded in stereo.

1 Start recording by pressing the motion picture button.

- (A) Elapsed recording time
- (B) Available recording time
- Recording of motion picture appropriate for each mode is possible.
- The recording state indicator (red) (C) will flash while recording motion pictures.
- Release the motion picture button right after you press it.
- m: minute, s: second

2 Stop the recording by pressing the motion picture button again.



About the operation sound that is produced when you stop recording

If the operation sound of the motion picture button pressed to end recording bothers you, try the following:

- Record the motion picture about three seconds longer, and then divide the last part of the motion picture using [Video Divide] (P144) in the [Playback] menu.

- The operational sound of the zoom or button operation may be recorded when it is operated during the recording of a motion picture.
- The zoom speed decreases during the recording of a motion picture.
- 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] is set to [], angle of view during motion picture recording is displayed.
- If the Extended Optical Zoom are used before pressing the motion picture button, those settings will be cleared, so the angle of view will change dramatically.
- Stereo effects may not be obtained underwater.
- Noise may be recorded underwater.
- If water is left in the microphone or speaker hole, weak or distorted audio may be recorded and played back. Drain the water, and use the camera only after letting it dry for a while. (P17)

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)
 - [Glistening Water]/[Glittering Illuminations]/[Soft Image of a Flower] (Scene Guide Mode)
 - When recording with [Post Focus]
 - When using [Time Lapse Shot]
- 4K motion pictures cannot be recorded during Wi-Fi connection.

Setting the size and recording frame rate

MENU →  **[Motion Picture]** → **[Rec Quality]**

| Item | Size | Recording frame rate | Sensor output | Bit rate |
|-----------------------|-----------|----------------------|------------------|----------|
| [4K/100M/30p]* | 3840×2160 | 30p | 30 frames/second | 100 Mbps |
| [4K/100M/24p]* | 3840×2160 | 24p | 24 frames/second | 100 Mbps |
| [FHD/28M/60p] | 1920×1080 | 60p | 60 frames/second | 28 Mbps |
| [FHD/20M/30p] | 1920×1080 | 30p | 30 frames/second | 20 Mbps |
| [HD/10M/30p] | 1280×720 | 30p | 30 frames/second | 10 Mbps |

* 4K motion picture

- The higher the “Bit rate” value is, the higher the picture quality becomes. Since the camera employs the “VBR” recording method, the bit rate is changed automatically depending on the subject to record. As a result, the recording time is shortened when a fast-moving subject is recorded.
- When [Miniature Effect] is selected for Creative Control Mode, you cannot select the items used for 4K motion pictures.
- When recording motion pictures in 4K, use a card rated as UHS Speed Class 3. (P27)
- The angle of view of motion pictures in 4K is narrower than those of motion pictures in other sizes.
- To ensure highly accurate focus, 4K motion pictures are recorded at reduced Auto Focus speeds. It may be difficult to focus on the subject with Auto Focus, but this is not a malfunction.

■ About the compatibility of the recorded motion pictures

Even if a compatible MP4 playback device is used, the video or sound quality of the recorded motion pictures may be poor, or they may not be able to be played. There may also be times when the recorded data is not displayed properly. If you experience such issues, please play back the video on this camera.

How to set focus when recording a motion picture ([Continuous AF])

Applicable modes:  **P** **M**         

Set the Auto Focus operation to be performed during motion picture recording.

MENU →  **[Motion Picture]** → **[Continuous AF]**

| | |
|--------------|---|
| [ON] | The camera automatically keeps focusing on subjects during recording. |
| [OFF] | The camera maintains the focus position at the start of recording. |

- Focus is readjusted if you press the shutter button halfway while recording a motion picture.
- Depending on the recording conditions, operational sound may be recorded when the Auto Focus is operated while recording a motion picture.
We recommend recording with [Continuous AF] in the [Motion Picture] menu set to [OFF], for example, if operational sound bothers you.
- When operating the zoom while recording motion pictures, it may take time to come into focus.

Not available in these cases:

- This function is not available in the following case:
 - When recording with [High Speed Video]

Recording still pictures while recording motion pictures

Applicable modes:         

You can record still pictures 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.



- The picture aspect ratio will be fixed to [16:9].
Still pictures will be recorded at an image size of 1920×1080.
- Up to 30 still pictures can be recorded during recording of the motion picture.

Not available in these cases:

- This function is not available in the following cases:
 - When recording a motion picture with its size set to 4K in [Rec Quality]
 - When recording with [High Speed Video]

Recording slow motion pictures ([High Speed Video])

Applicable modes:          

You can record motion pictures in approximately 1/4× slow motion by performing high-speed recording at 120 frames/second. The motion is displayed slower during playback.

- Recording will be performed at [HD/10M/30p].

1 Select the menu.

MENU →  **[Motion Picture]** → **[High Speed Video]** → **[ON]**

2 Start recording by pressing the motion picture button.

3 Stop the recording by pressing the motion picture button again.

- Audio is not recorded.
- You can continuously record a High Speed Video up to 7 minutes and 29 seconds or the file size of 4 GB.
- Under fluorescent lighting, flicker or horizontal bars may be seen.



Not available in these cases:

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

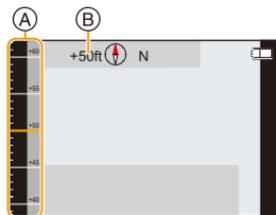
Using the altimeter

Applicable modes: 

You can check the altitude of the current location. Altimeter is not adjusted at the time of purchase.

• Displaying range is -500 m (-1640 feet) to 9000 m (29530 feet).

- (A) Altitude
- (B) Current altitude



About altitude conversion

The displayed altitude is a relative altitude*1. The altitude is a value calculated by converting an atmospheric pressure within the unit to an altitude with 0 m (0 feet) (sea level) = 1013 hPa*2 as a reference.

- *1 Altitude can be expressed in two forms — as an altitude above sea level (absolute height from sea surface) or as a relative altitude (difference in altitude between two locations). This unit displays a relative altitude estimated by a method which uses the relationship between the altitude and atmospheric pressure in the ISA [International Standard Atmosphere], as specified by the ICAO [International Civil Aviation Organization].
- *2 “hPa (hectopascal)” is a unit used to represent atmospheric pressure.

About the measured altitude and atmospheric pressure

- Altitude value may show errors depending on the change in atmospheric pressure compared to areas such as locations with altimeter reference signs. Adjust frequently with [Altimeter Adjust].
- Altitude announced onboard an airplane is measured using the atmospheric pressure surrounding the airplane. It does not match the altitude actually measured inside the airplane.
- Even if the unit is fixed at a constant altitude, the measured altitude may fluctuate due to the effects of change in atmospheric pressure.

In coastal areas, the altitude changes by 1 m (3.3 feet) per 0.12 hPa.

- Altitude and atmospheric pressure may not be measured accurately in the following cases:
 - When there is a significant change in weather conditions (Pressure and air temperature)
 - When there is a movement with a rapid change in altitude
 - When pressure is applied to the front or rear of this unit (Hold this unit as shown in the figure when measuring.)
 - When this unit is wet (after using underwater, etc.)*3
 - When closing the side door*3



- *3 It will adapt to the ambient atmospheric pressure within a few minutes, and display correct measurement values.

Adjusting the Altimeter

You can manually adjust the altimeter.

To measure altitude with greater accuracy, we recommend that you make adjustments regularly by comparing a reference altitude on a sign or other accurate altitude information with the altitude indicated by the camera.

1 Select the menu.

MENU → ⚙ [Setup] → [Altimeter Adjust]

2 Press ◀/▶ to select the items, and press ▲/▼ to set.

- The current altitude will be displayed. Set a value that matches the actual altitude.
- Altitudes outside the display range cannot be set.
- To reset to the unadjusted altitude, press [DISP].

3 Press [MENU/SET].

- A negative number may be displayed as a relative altitude even at a location actually higher than sea level.
- After adjustment, errors of a few metres may still occur. For information on preserving the adjusted accuracy, read “About the measured altitude and atmospheric pressure” (P112).

Using the compass

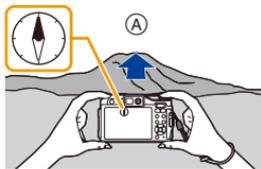
Applicable modes:          

16 bearings are displayed based on the direction the lens of the camera is pointing in.

- The colored portion of the needle points north.

(A) North

- It may not measure correctly when you measure with this unit upside down.



- The camera uses its magnetic compass to measure bearings. As a result, there is a difference in angle (declination) between magnetic north, the north that the camera points to, and true north, the exact north on Earth.
- The bearing measurement value may be affected in locations with weak geomagnetism.
- It may not measure accurately if close to the following objects:
 - Permanent magnets (metals in magnetic necklaces, etc.)/metallic objects (steel desks, lockers, etc.)/high-voltage lines or overhead wires/household appliances (TVs, PCs, mobile phones, speakers, etc.)
- It may not measure accurately in the following locations:
 - Inside cars/trains/ships/airplanes/rooms (when the steel beams are magnetised)

Adjusting the compass

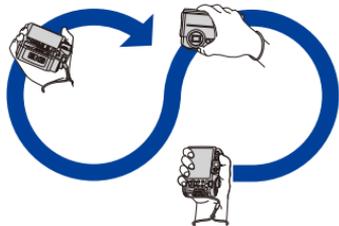
Adjust the compass when the measurement value does not match the actual bearing.

1 Select the menu.

MENU → ⚙ [Setup] → [Calibrate compass]

2 Securely hold the unit vertically, and adjust by turning it in a figure of 8 by rolling your wrist a few times.

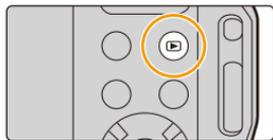
- An adjustment completed message is displayed when the adjustment is successful.



- **Perform the adjustment with the strap around your wrist to avoid dropping the unit.**
- When the adjustment fails, move to a location with no effect from surrounding magnetism, and perform the adjustment again.

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.



■ To finish playback

Press [▶] again or press the shutter button halfway.

- When the camera is turned off, press and hold [▶]. If you turn it on this way, the playback screen will be displayed automatically.



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 MP4 format.

- Motion pictures are displayed with the motion picture icon (()).

Press **▲** to play back.

- (A) Motion picture recording time

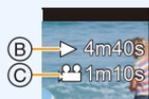
- After playback starts, the elapsed playback time is displayed on the screen.

For example, 8 minutes and 30 seconds is displayed as [8m30s].



- High Speed Video images are displayed with motion picture recording time and playback time.

- (B) Playback time
(C) Motion picture recording time



■ Operations during Motion Picture Playback

| Button operation | Description of operation | Button operation | Description of operation |
|---|---------------------------------------|---|--|
|  | Play/Pause |  | Stop |
|  | Fast rewind* |  | Fast forward* |
| | Frame-by-frame rewind (while pausing) | | Frame-by-frame forward (while pausing) |
|  | Reduce volume level |  | Increase volume level |

* The fast forward/rewind speed increases if you press **▶**/**◀** again.

Creating Still Pictures from a Motion Picture

1 Press ▲ to pause motion picture playback.

- Press ◀▶ to fine-adjust the pause position while the motion picture is paused.

2 Press [MENU/SET].

- 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.
 - [4K]: 3840×2160
 - [FHD], [HD]: 1920×1080
- 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.

Switching the Playback Method

Using the Playback Zoom

Press [T] on the zoom button.

1× → 2× → 4× → 8× → 16×

- After enlarging the display, if you press [W] on the zoom button, the magnification will be reduced.
- You can move the enlarged area by pressing ▲/▼/◀/▶.



Displaying multiple screens (Multi Playback)

Press [W] on the zoom button.

1 screen → 12 screens → 30 screens → Calendar screen display

- Press [T] on the zoom button to return to the previous screen.



■ To return to Normal Playback

Press ▲/▼/◀/▶ to select a picture and then press [MENU/SET].

Displaying Pictures by Recording Date (Calendar Playback)

1 Press [W] on the zoom button to display the Calendar screen.

2 Press ▲/▼/◀/▶ to select the recording date and press [MENU/SET].

- Only the images recorded on that date will be displayed.
- To return to the Calendar screen, press [W] on the zoom button.

3 Press ▲/▼/◀/▶ to select a picture and then press [MENU/SET].



- 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, 2018.
- 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.

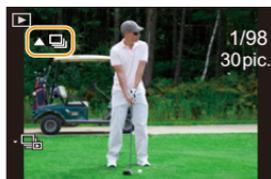
- You can edit or delete all pictures in a group at once.
(For example, if you delete a picture group, all pictures in the group are deleted.)

[▲📁]:

A picture group saved at once with [4K PHOTO Bulk Saving].
(P142)

[▲📷]:

A picture group consisting of pictures taken in a Time Lapse Shot. (P93)



- Pictures will not be grouped if recorded without setting the clock.

■ Continuously playing back Group Pictures

Press ▲.

- When playing back group pictures one by one, options are displayed.

Select either of the following playback methods:

[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

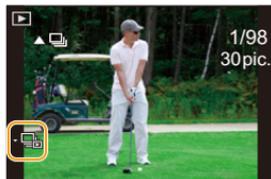
| | | | |
|---|---------------------------|---|----------------------------|
| ▲ | Continuous playback/Pause | ▼ | Stop |
| ◀ | Fast rewind | ▶ | Fast forward |
| | Rewind (while pausing) | | Forward (while pausing) |

■ Playing back group pictures one by one

1 Press ▼.

2 Press ◀/▶ to flip through images.

- 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)

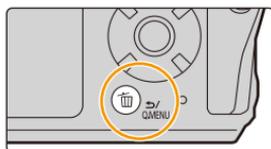


Deleting Pictures

Once deleted, pictures cannot be recovered.

■ To delete a single picture

- 1 In Playback Mode, select the picture to delete and then press [].
- 2 Press ▲ to select [Delete Single] and then press [MENU/SET].



■ To delete multiple pictures or all the pictures

- 1 In Playback Mode, press [].
- 2 Press ▲/▼ to select the picture deletion method, and then press [MENU/SET].

| | |
|----------------|---|
| [Delete Multi] | Up to 100 pictures can be selected at once. • Group pictures are treated as a single picture. All pictures in a group will be deleted. |
| [Delete All] | All images on the card will be deleted. |

- 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.

- Depending on the number of pictures to be deleted, it may take some time to delete them.

10. Using Menu Functions

Menu list

| | | | | | |
|------------------|------|----------|------|------------|------|
| [Rec] | P122 | [Custom] | P130 | [Playback] | P138 |
| [Motion Picture] | P129 | [Setup] | P132 | | |

: [Rec] menu

- [Photo Style] (P122)
- [Aspect Ratio] (P124)
- [Picture Size] (P124)
- [Quality] (P125)
- [Sensitivity] (P71)
- [White Balance] (P73)
- [AF Mode] (P65)
- [Metering Mode] (P125)
- [Burst Rate] (P87)
- [4K PHOTO] (P76)
- [Auto Bracket] (P89)
- [Self Timer] (P91)
- [i.Dynamic] (P126)
- [i.Handheld Night Shot] (P47)
- [i.HDR] (P48)
- [HDR] (P126)
- [Time Lapse Shot] (P93)
- [Panorama Settings] (P63)
- [Shutter Type] (P127)
- [Red-Eye Removal] (P128)
- [ISO Limit Set] (P128)
- [Extended ISO] (P128)
- [i.Zoom] (P99)
- [Digital Zoom] (P100)
- [Stabilizer] (P96)

[Photo Style]

Applicable modes:

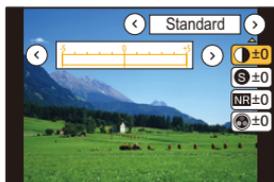
You can select effects to match the type of image you wish to record.

MENU → [Rec] → [Photo Style]

| | |
|---------------------|---|
| [Standard] | This is the standard setting. |
| [Vivid] | Brilliant effect with high saturation and contrast. |
| [Natural] | Soft effect with low contrast. |
| [Monochrome] | Monochrome effect with no color shades. |
| [Scenery] | An effect appropriate for sceneries with vivid blue skies and greens. |
| [Portrait] | An effect appropriate for portraits with a healthy and beautiful skin tone. |

■ Adjusting the picture quality

- 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. |
| NR [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. |
| ⊗ [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 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.

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

3 Press [MENU/SET].

- Only picture quality adjustment can be set in the Scene Guide Mode.

[Quality]

Applicable modes: P M SCN L S P M A

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. |

- The setting is fixed to when recording 4K photos or recording in [Post Focus].

[Metering Mode]

Applicable modes: P M SCN L S P M A

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 . • If you set the spot metering target on the edge of the screen, the metering may be affected by the brightness around the location. | |

[i.Dynamic]**Applicable modes:**          

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

MENU →  **[Rec]** → **[i.Dynamic]****Settings: [AUTO]/[OFF]** **Not available in these cases:**

- Compensation effect may not be achieved depending on the recording conditions.
- In the following case, [i.Dynamic] does not work:
 - When [HDR] is set to [ON]

[HDR]**Applicable modes:**         

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.

MENU →  **[Rec]** → **[HDR]****Settings: [ON]/[OFF]**

- Do not move the unit 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 will be slightly narrower.
- 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.
- This function is not available in the following cases:
 - When recording in Burst Mode
 - When recording 4K photos
 - When recording with [Post Focus]
 - When recording with the Auto Bracket function
 - When using [Time Lapse Shot]

[Red-Eye Removal]

Applicable modes:           

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.

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.

[ISO Limit Set]

Applicable modes:           

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: [200]/[400]/[800]/[1600]/[3200]/[OFF]

 **Not available in these cases:**

- This function is not available in the following cases:
 - [Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Handheld Night Shot] (Scene Guide Mode)

[Extended ISO]

Applicable modes:           

You can extend the numeric values that can be set for ISO sensitivity.

MENU →  **[Rec]** → **[Extended ISO]**

Settings: [ON]/[OFF]

 **Not available in these cases:**

- This function is not available in the following cases:
 - When recording 4K photos
 - When recording with [Post Focus]

 : **[Motion Picture] menu**

- [Photo Style] (P122)
- [Rec Quality] (P107)
- [High Speed Video] (P110)
- [AF Mode] (P65)
- [Continuous AF] (P108)
- [Metering Mode] (P125)
- [i.Dynamic] (P126)
- [i.Zoom] (P99)
- [Digital Zoom] (P100)
- [Wind Cut] (P129)

[Wind Cut]

Applicable modes:           

The camera will effectively reduce the wind noise when recording sound.

MENU →  **[Motion Picture]** → **[Wind Cut]**

Settings: [ON]/[OFF]

- Setting [Wind Cut] may alter the usual sound quality.

ƒC: [Custom] menu

- [AF Assist Lamp] (P130)
- [Histogram] (P130)
- [Guide Line] (P131)
- [Rec Area] (P131)
- [Remaining Disp.] (P131)
- [Auto Review] (P131)
- [Fn Button Set] (P42)

MENU → ƒC [Custom]

[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.

- The effective distance of the assist lamp is a maximum of approximately 1.5 m (4.9 feet).
- The AF Assist Lamp is valid only for the subject in the center of the screen.
- The setting is fixed to [OFF] in the following cases.
 - [Distinct Scenery]/[Bright Blue Sky]/[Romantic Sunset Glow]/[Vivid Sunset Glow]/[Glistening Water]/[Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Handheld Night Shot] (Scene Guide Mode)
- In the following case, [AF Assist Lamp] does not work:
 - When recording with [4K Pre-Burst] of the 4K Photo function

[Histogram]

Display the histogram.

You can set the position by pressing ▲/▼/◀/▶.

- 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.

- (A) dark
- (B) bright



- **When the recorded picture and the histogram do not match each other under the following conditions, the histogram is displayed in orange.**
 - During Exposure Compensation
 - When the flash is activated
 - When the correct exposure is not achieved, such as when the lighting is low.
- The histogram is an approximation in the Recording Mode.
- The histogram is not displayed in Intelligent Auto Mode.

[Guide Line]

This will set the pattern of guide lines displayed when taking a picture. When [] is set, guideline positions can be set by pressing ▲/▼/◀/▶.

- The guideline is not displayed in the Panorama Shot Mode.

[Rec Area]

This changes the angle of view during motion picture recording and still picture recording.

| | |
|------------|--|
| [📷] | Displays the recording area according to the angle of view for still picture recording. |
| [🎥] | Displays the recording area according to the angle of view for motion picture recording. |

- The recording area indicated is an approximation.
- When recording with the 4K Photo function or Post Focus function, [Rec Area] is fixed to [📷].

[Remaining Disp.]

This will switch display between the number of recordable pictures and available recording time.

- [9999+] is displayed if there are 10000 or more pictures remaining.

[Auto Review]

Set the length of time that the picture is displayed after taking the still picture.

- If you select [HOLD], the picture taken stays displayed until the shutter button is pressed halfway.
- When recording with the 4K Photo or Post Focus function, the setting items for [Auto Review] change to [ON] and [OFF].

 : [Setup] menu

- [Precautions] (P13)
- [Online Manual] (P132)
- [Clock Set] (P31)
- [World Time] (P133)
- [Wi-Fi] (P133)
- [Sensor Settings] (P111)
- [Altimeter Adjust] (P113)
- [Calibrate compass] (P115)
- [Beep] (P133)
- [Live View Mode] (P134)
- [Monitor Display]/[Viewfinder] (P134)
- [Monitor Luminance] (P134)
- [LED Light] (P135)
- [Economy] (P135)
- [m/ft] (P136)
- [Language] (P136)
- [Version Disp.] (P136)
- [Exposure Comp. Reset] (P136)
- [Self Timer Auto Off] (P136)
- [No.Reset] (P137)
- [Reset] (P137)
- [Reset Wi-Fi Settings] (P137)
- [Format] (P28)

MENU →  [Setup]

[Online Manual]

Settings: [URL display]/[QR Code display]

[World Time]

Sets the times for the region where you live and your holiday destination.

• [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.

[Wi-Fi]

| | | | |
|-------------------------|------|----------------------|------|
| [Wi-Fi Function] | P148 | [Wi-Fi Setup] | P169 |
|-------------------------|------|----------------------|------|

[Beep]

This allows you to set the volume for electronic sound and the electronic shutter sound.

Settings: [Beep Volume]/[Shutter Vol.]/[Shutter Tone]

[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. |

- The [Live View Mode] setting does not affect recorded images.
- The viewfinder is fixed to [60fps].

[Monitor Display]/[Viewfinder]

Brightness, color, or red or blue tint of the Monitor/viewfinder is adjusted.

- 1 Select the settings by pressing ▲/▼, and adjust with ◀/▶.**
- 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 how they actually look. However, this does not affect the recorded pictures.

[Monitor Luminance]

| | |
|---------------------|---|
| [A*] [AUTO] | The brightness is adjusted automatically depending on how bright it is around the camera. |
| [1*] [MODE1] | Make the monitor brighter. |
| [2*] [MODE2] | Set the monitor to the standard brightness. |
| [3*] [MODE3] | Make the monitor darker. |

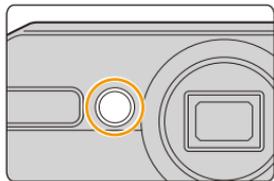
- Some subjects may appear differently from how they actually look. However, this does not affect the recorded pictures.
- The monitor automatically returns to standard brightness if no operations are performed for 30 seconds when recording in [MODE1]. It will light up brightly again by button operation.
- When [AUTO] or [MODE1] is set, the usage time is reduced.
- [AUTO] is only available in the Recording Mode.

[LED Light]

The LED light comes on while recording motion pictures.

To use a simple light

If you set to [ON], and press and hold down **▶ (⚡)** on the recording standby screen, the LED light will come on for approximately 60 seconds. The LED light can be conveniently used as a simple light when you wish to illuminate your immediate surroundings in a dark location. To turn off the light at any time, press [MENU/SET].



- Maximum illuminating range of the LED light is 0.5 m (1.6 feet).
- The life of battery will decrease when the LED light is turned on constantly.
- In locations where the use of light is prohibited, set to [OFF].
- It is fixed to [OFF] in the following cases.
 - Underwater Mode
 - Panorama Shot Mode

[Economy]

| | |
|--------------------------------|--|
| [Auto Power Off] | The camera is automatically turned off if the camera has not been used for the time selected on the setting. |
| [Auto Power Off(Wi-Fi)] | The camera is automatically turned off if it is not connected to a Wi-Fi network and has not been used for 15 minutes (approx.). |
| [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. |

- Press any button to turn the monitor/viewfinder on again.
- [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
 - When recording with [] ([4K Pre-Burst]) of the 4K Photo function
 - When using [Time Lapse Shot]

[m/ft]

Select how distance is displayed, in “ft” or “m”.

[Language]

Set the language displayed on the screen.

- If you set a different language by mistake, select [00] from the menu icons to set the desired language.

[Version Disp.]

It is possible to check which version of firmware is on the camera.

- 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.

[Self Timer Auto Off]

Set the self-timer to cancel if the camera is turned 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 (P28) after saving the data on a PC or elsewhere.
- To reset the folder number to 100:
 - 1 Perform [Format] to format the card.
 - 2 Perform [No.Reset] to reset the file number.
 - 3 Select [Yes] on the folder number reset screen.

[Reset]

The following settings are reset to the default:

- Recording settings and drive mode
 - Setup/custom settings
- When the setup/custom settings are reset, the following setting is also reset.
 - The [World Time] setting
 - The folder number and the clock setting are not changed.

[Reset Wi-Fi Settings]

Reset all settings in the [Wi-Fi] menu to factory default settings.

- 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.

: **[Playback] menu**

- [Slide Show] (P139)
- [Playback Mode] (P140)
- [Location Logging] (P141)
- [4K PHOTO Bulk Saving] (P142)
- [Title Edit] (P142)
- [Text Stamp] (P143)
- [Video Divide] (P144)
- [Time Lapse Video] (P144)
- [Resize] (P145)
- [Cropping] (P146)
- [Protect] (P147)

- The [Playback] menu items below save edited images as new files. If the card is full, new images cannot be created. We recommend that you check the card capacity in advance.
 - [4K PHOTO Bulk Saving]/[Text Stamp]/[Time Lapse Video]/[Resize]/[Cropping]
- 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.

■ How to select an image(s) after selecting [Single] or [Multi]

- When [Single] and [Multi] are not available, select an image in the same way as when [Single] is selected.

[Single] setting

- 1 Press **◀/▶** to select the picture.
- 2 Press **[MENU/SET]**.
 - If [Set/Cancel] is displayed at the right bottom of the screen, the setting is canceled when [MENU/SET] is pressed again.



[Multi] setting

When a screen similar to the one on the right is displayed:

- 1 Press **▲/▼/◀/▶** to select the picture and then press **[MENU/SET]** (repeat).
 - The setting is canceled when [MENU/SET] is pressed again.
- 2 Press **◀** to select [OK], and then press **[MENU/SET]** to execute.



When a screen similar to the one on the right is displayed:

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

- The setting is canceled when [MENU/SET] is pressed again.



[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, etc.

We recommend this feature when you view your pictures by connecting the camera to a TV.

MENU →  **[Playback]** → **[Slide Show]**

- Select the group to play back by pressing ▲/▼, and then press [MENU/SET].**
 - If you select [Picture Only], 4K burst files and images recorded with [Post Focus] will also be played back.
 - Only an in-focus representative image will be played back from pictures recorded using [Post Focus].
- Press ▲ to select [Start] and then press [MENU/SET].**

■ Operations during a slide show

| Button operation | Description of operation |
|---|--------------------------|
| ▲ | Play/Pause |
| ◀ | Back to previous picture |
|  | Reduce volume level |

| Button operation | Description of operation |
|---|--------------------------|
| ▼ | Exit slide show |
| ▶ | Ahead to next picture |
|  | Increase volume level |

■ 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. | |
| [Setup] | [Duration] | • [Duration] can be set only when [OFF] has been selected as the [Effect] setting. |
| | [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. |

- When playing back the following pictures, the [Effect] and [Duration] settings are disabled.
 - Motion pictures
 - 4K burst files
 - Images recorded with [Post Focus]
 - Group pictures

[Playback Mode]

Playback in [Normal Play], [Picture Only] or [Video Only] can be selected.

MENU →  **[Playback]** → **[Playback Mode]**

Select the group to play back by pressing ▲/▼, and then press [MENU/SET].

- If you select [Picture Only], 4K burst files and images recorded with [Post Focus] will also be played back.

[Location Logging]

You can write location information sent from a smartphone (latitude and longitude) on images.

- You can send location information and write it on images using a smartphone. (P157)
- You need to install “Panasonic Image App” on your smartphone. (P151)
- 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.

MENU →  **[Playback]** → **[Location Logging]**

- 1 Press **▲/▼** to select **[Add Location Data]**, then press **[MENU/SET]**.
- 2 Press **▲/▼** to select the period you intend to record location information on images, then press **[MENU/SET]**.
 - 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, **[O]** is displayed.
Select the period with **[O]** to restart the recording process from the picture you left off.

■ To delete the received location information

- 1 Press **▲/▼** to select **[Delete Location Data]**, then press **[MENU/SET]**.
- 2 Press **▲/▼** to select the period you want to delete, then press **[MENU/SET]**.

 **Not available in these cases:**

- This function is not available in the following cases:
 - Images recorded after location information was sent to the camera (P157)
 - Images with location information already written to them

[4K PHOTO Bulk Saving]

You can save pictures of a 4K burst file that were extracted from any 5 second period at once.

MENU →  **[Playback]** → **[4K PHOTO Bulk Saving]**

- 1 **Press /▶ to select the 4K photo burst files and press [MENU/SET].**
 - If the burst time is 5 seconds or less, all frames will be saved as pictures.
- 2 **Select the first frame of the pictures to be saved at once.**
 - Select the frame in the same way as you select pictures from a 4K burst file. Refer to [P80](#) for details.
 - Pictures will be saved as a groups of Burst Mode pictures in JPEG format. ([P120](#))

[Title Edit]

You can add text (comments) to pictures. After text has been registered, it can be stamped in prints using [Text Stamp] ([P143](#)).

MENU →  **[Playback]** → **[Title Edit]**

- 1 **Select the picture. ([P138](#))**
 -  is displayed for pictures with titles already registered.
- 2 **Enter the text. ([P44](#))**

- To delete the title, erase all the text in the text input screen.
- You can set up to 100 pictures at one time with [Multi].

**Not available in these cases:**

- This function is not available in the following cases:
 - Motion pictures
 - 4K burst files
 - Images recorded with [Post Focus]

[Text Stamp]

You can stamp recording information on recorded images.

MENU →  **[Playback]** → **[Text Stamp]**

1 Select the picture. (P138)

-  appears on screen if the picture is stamped with text.

2 Press ▲/▼ to select [Setup], and then press [MENU/SET].

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

| | |
|------------------------|--|
| [Shooting Date] | Stamps the recording date. |
| [Title] | Title input in the [Title Edit] will be stamped. |

4 Press [↶] to return to the previous screen.

5 Press ▲ to select [OK], and then press [MENU/SET].

- 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.
- 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:**

- This function is not available in the following cases:
 - Motion pictures
 - 4K burst files
 - Images recorded with [Post Focus]
 - Pictures taken in Panorama Shot Mode
 - Pictures recorded without setting the clock and title
 - Pictures stamped with [Text Stamp]

[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!

MENU →  **[Playback]** → **[Video Divide]**

- 1 Press   to select the motion picture to divide, and then press **[MENU/SET]**.
- 2 Press  at the location to divide.
 - You can finely adjust the location for division by pressing   while the motion picture is paused.
- 3 Press .
 - 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.
- 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].

MENU →  **[Playback]** → **[Time Lapse Video]**

- 1 Select the **[Time Lapse Shot]** picture group with   , and then press **[MENU/SET]**.
- 2 Create a motion picture by selecting the methods for creating it.
 - Refer to step 4 onwards on [P94](#) for details.
 - Also refer to the notes on [P95](#) for created motion pictures.

[Resize]

To allow easy posting to web pages, attachment to e-mail etc., picture size (number of pixels) is reduced.



MENU → **[Playback]** → **[Resize]**

Select the picture and size.

[Single] setting

- 1 Press / to select the picture, and then press [MENU/SET].
- 2 Press / to select the size, and then press [MENU/SET].

**[Multi] setting**

- 1 Press / to select the size, and then press [MENU/SET].
- 2 Press / / / to select the picture, and then press [MENU/SET] to set (repeat).
 - The setting is canceled when [MENU/SET] is pressed again.
- 3 Press to select [OK], and then press [MENU/SET] to execute.



- 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
 - 4K burst files
 - Images recorded with [Post Focus]
 - Pictures taken in Panorama Shot Mode
 - Group pictures
 - Pictures stamped with [Text Stamp]
 - Images whose size in [Picture Size] is [S]

[Cropping]

You can enlarge and then clip the important part of the recorded picture.



MENU → **[Playback]** → **[Cropping]**

- 1 Press **◀/▶** to select the picture, and then press **[MENU/SET]**.
- 2 Use the zoom button and press **▲/▼/◀/▶** to select the parts to be cropped.

: Reduction

: Enlargement

▲/▼/◀/▶ : Move

- 3 Press **[MENU/SET]**.

- 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.

Not available in these cases:

- This function is not available in the following cases:
 - Motion pictures
 - 4K burst files
 - Images recorded with [Post Focus]
 - Pictures taken in Panorama Shot Mode
 - Pictures stamped with [Text Stamp]

[Protect]

You can set protection for pictures you do not want to delete by mistake.

MENU →  **[Playback]** → **[Protect]**

Select the picture. (P138)

■ Canceling all the [Protect] settings

Press **▲/▼** to select **[Cancel]**, and then press **[MENU/SET]**.



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.

What you can do with the Wi-Fi® function

Controlling with a Smartphone/Tablet (P151)

Recording with a smartphone (P155)
Playing back or saving images stored on the camera, or uploading them on social media sites (P156)

Writing location information on images stored in the camera (P157)



Easy connection

You can easily set up a direct connection to your smartphone without entering a password.



When sending images to PC (P163)

This owner's manual refers to both smartphones and tablets as "smartphones" from this point on unless noted otherwise.

Wi-Fi function

■ Before Use

- Set the date and time settings in advance. (P31)
- 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.

■ About the Wi-Fi connection lamp

- Lit: When the Wi-Fi function is ON or connected by Wi-Fi
- Blinking: When sending image data by operating the camera



■ About the [Wi-Fi] button

In this owner's manual, a function button to which [Wi-Fi] is assigned is referred to as the [Wi-Fi] button.

- For information about the function button, refer to P42.

When the camera is not connected to Wi-Fi, press [Wi-Fi]. The camera will then be ready to be connected to the smartphone. You can connect the camera directly to the smartphone. (P152)

- When the camera is ready to be connected, you can press [DISP.] to connect with the same settings as used previously. This is a convenient and quick way to establish a connection. (P167)

After connecting to a Wi-Fi network, you can perform the following operations by pressing [Wi-Fi]:

- When the camera is connected using [Remote Shooting & View], the screen on P154 is displayed.

| | |
|--|--|
| [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 P160 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. |

- 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.
- We strongly recommend that you set an encryption to maintain information security.
- 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.
- 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.**



MENU



Controlling with a Smartphone/Tablet

With a smartphone, you can record images remotely, play back images on the camera or save them to the smartphone.

- 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

App for Android™: Android 4.2 or higher

App for iOS: iOS 9.0 or higher

- 1 Connect the smartphone to a network.**
- 2 (Android) Select “Google Play™ Store”.**
(iOS) Select “App Store”.
- 3 Enter “Panasonic Image App” or “LUMIX” into the search box.**
- 4 Select “Panasonic Image App”  and install it.**

- Use the latest version.
- Supported OSs are current as of May 2018 and are subject to change.
- Read the [Help] in the “Image App” menu for further details on how to operate.
- When you operate the “Image App” on the smartphone that is connected to the camera via Wi-Fi, [Help] in the “Image App” may not be displayed depending on the smartphone. In this case, after terminating the connection to the camera, reconnect the smartphone to a mobile phone network such as the 3G or LTE network or to a Wi-Fi router, and then display [Help] in the “Image App”.
- Some of the screens and information provided in this owner’s manual may differ from your device depending on the supported OS and “Image App” version.
- 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

Connecting without using the password

You can easily set up a direct connection to your smartphone without entering a password.

On the camera

MENU →  [Setup] → [Wi-Fi] → [Wi-Fi Function] → [New Connection] → [Remote Shooting & View]

A SSID

- When the camera is ready to be connected to the smartphone, the SSID is displayed.
- You can also display the information by pressing [Wi-Fi] on the camera.



On your smartphone

- 1 Turn on the Wi-Fi function in the setting menu.
- 2 On the Wi-Fi setting screen, select the SSID displayed on the camera.
- 3 Start “Image App”.
 - When the connection confirmation screen is displayed on the camera, select [Yes] to connect. (For first time connection only)



At the time of purchase, [Wi-Fi Password] is set to [OFF].

Before connecting to a Wi-Fi network, ensure that the device displayed on the connection confirmation screen is the one you actually want to connect to. When a wrong device is displayed, if you select [Yes], the camera will automatically connect to that device.

We recommend that you set [Wi-Fi Password] to [ON] if, for example, there is another Wi-Fi device nearby. (P153)

Using a password to set up a connection

Connecting with a password further enhances security. You can scan a QR code or manually enter a password to set up a connection.

Preparations: (On the camera)

MENU →  **[Setup]** → **[Wi-Fi]** → **[Wi-Fi Setup]** → **[Wi-Fi Password]** → **[ON]**

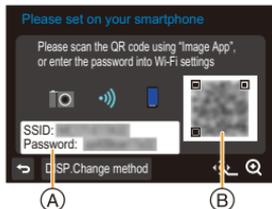
Using the QR code to set up a connection

On the camera

MENU →  **[Setup]** → **[Wi-Fi]** → **[Wi-Fi Function]** → **[New Connection]** → **[Remote Shooting & View]**

- (A) SSID and password
- (B) QR code

- When the camera is ready to be connected to the smartphone, the QR code, SSID and password are displayed.
- You can also display the information by pressing [Wi-Fi] on the camera.



On your smartphone

- 1 **Start "Image App".**
- 2 **Select [QR code].**
 - When the smartphone is connected to a wireless access point, it may take time to display [QR code].
 - (For iOS devices) A confirmation screen will be displayed. Select [OK] to proceed.
- 3 **Use the "Image App" to 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.

For iOS devices only (iPhone/iPod touch/iPad)

- 4 **Install the profile.**
 - If a pass code is set on the smartphone, you need to enter it.
- 5 **Press the home button to close the browser.**
- 6 **Turn on the Wi-Fi function in the setting menu.**
- 7 **On the Wi-Fi setting screen, select the SSID displayed on the camera.**
- 8 **Start "Image App".**
 - (For iOS devices) Steps 1 through 5 are not required from the second time on.



Manually entering a password to set up a connection

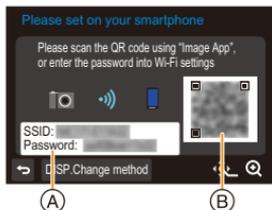
On the camera

MENU →  [Setup] → [Wi-Fi] → [Wi-Fi Function] → [New Connection] → [Remote Shooting & View]

(A) SSID and password

(B) QR code

- When the camera is ready to be connected to the smartphone, the QR code, SSID and password are displayed.
- You can also display the information by pressing [Wi-Fi] on the camera.



On your smartphone

- 1 Turn on the Wi-Fi function in the setting menu.
- 2 On the Wi-Fi setting screen, select the SSID displayed on the camera.
- 3 Enter the password displayed on the camera into the smartphone. (For first time connection only)
- 4 Start "Image App".



Terminating the connection

- 1 Press any button on the camera, and press **[MENU/SET]**.
 - Confirmation screen is displayed. It is executed when [Yes] is selected.
- 2 On the smartphone, close "Image App".



Taking images via a smartphone (remote recording)

- 1 Connect to a smartphone. (P152)
- 2 Operate the smartphone.

① Select [].

② Record an image.

- The recorded images are saved in the camera.
- Some functions, such as 4K Photo, Post Focus, and 4K motion picture recording, are not available.



Not available in these cases:

- In the following cases, remote recording does not work:
 - When recording with [] ([4K Pre-Burst]) of the 4K Photo function
 - When using [Time Lapse Shot]

Playing back/saving images stored on the camera, or uploading them on social media sites

- 1 Connect to a smartphone. (P152)
- 2 Operate the smartphone.

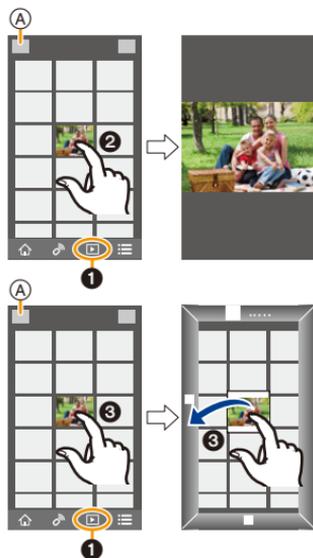
- 1 Select [▶].
 - You can switch the images to be displayed by selecting the icon (A) on the top left of the screen. To display images stored in the camera, select [LUMIX].

(To play back the image)

- 2 Touch the image to enlarge it.

(To save the image or upload it on a social media site or other web service)

- 3 Touch and hold an image, and drag it.

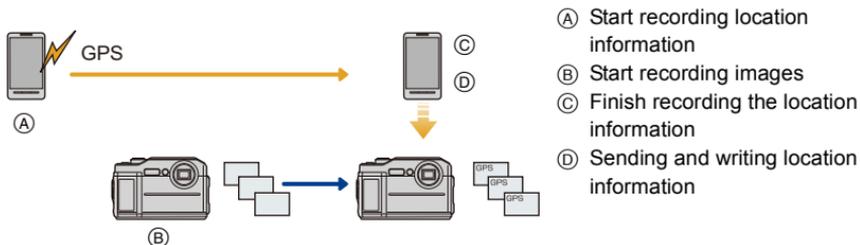


- When you play a motion picture, the camera transmits it to the “Image App” at a reduced data size. As a result, its image quality differs from that of the actual recorded motion picture. In addition, depending on the smartphone or conditions of use, the image quality may deteriorate or the sound may skip during motion picture or picture playback.
- You cannot save the following types of images:
 - When the MP4 motion picture size is set to [4K] in [Rec Quality]
 - 4K burst files
 - Images recorded with [Post Focus]

Adding location information to images stored in the camera from a smartphone

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.**

- Once the location information is sent to the camera, you can also write it on images by performing [Location Logging] (P141) in the [Playback] menu.



- 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.

■ Recording location information and images

1 Start recording location information with the smartphone.

- 1 Start "Image App". (P151)
- 2 Select [].
- 3 Select [Geotagging].
- 4 Select [] to start recording location information.



2 Record images with the camera.

3 Stop recording the location information with the smartphone.

Select [] to stop recording the location information.

■ Writing the location information to the images

(Preparation on the camera)

Connect to a smartphone. (P152)

Operate the smartphone.

- 1 Start "Image App". (P151)
- 2 Select [].
- 3 Select [Geotagging].
- 4 Select [] to send and write the location information.
 - Follow the on-screen messages to operate the smartphone.
 - Images with location information are indicated with [GPS].



• 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.

- The smartphone battery drains faster while location information is being recorded. When recording of location information is not necessary, stop it.
- 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.



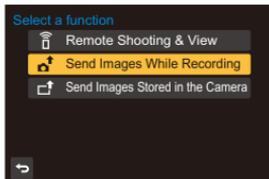
Not available in these cases:

- This function is not available in the following cases:
 - Images recorded after location information was sent to the camera
 - Images with location information already written to them

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 | MP4 ^{*1, 2} | 4K Burst File Pictures recorded in [Post Focus] |
|---------------------|------|----------------------|--|
| [Smartphone] (P161) | ○ | ○ | — |
| [PC] (P163) | ○ | ○ | — |

*1 Sending by [Send Images While Recording] is not available.

*2 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 for more information on how to playback pictures.

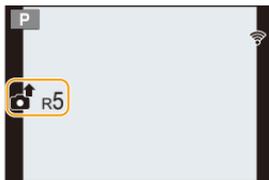
■ Send Images While Recording

A picture can be automatically sent to a specified device every time you take it.

- While sending a file, [R5] is displayed on the recording screen.
- To terminate the connection, follow the steps below:

MENU → [Setup] → [Wi-Fi] → [Wi-Fi Function] → [Yes]

- You cannot change the sending settings while sending pictures.



- Since the camera gives priority to recording, sending may take longer during the recording.
- If you cancel the transmission before its completion by, for example, terminating the Wi-Fi connection, unsent files will not be resent.
- Some menus may not be available while sending is in progress.
- You cannot perform recording with the 4K Photo or Post Focus function or of 4K motion pictures during Wi-Fi connection.

Not available in these cases:

- You cannot connect to Wi-Fi networks in the following cases:
 - When recording with [4K Pre-Burst] ([4K Pre-Burst]) of the 4K Photo function
 - When using [Time Lapse Shot]

■ Send Images Stored in the Camera

Images can be selected and sent after recording.

[Single Select] setting

- 1 Press ◀/▶ to select the picture.
- 2 Press [MENU/SET].



[Multi Select] setting

- 1 Press ▲/▼/◀/▶ to select the picture and then press [MENU/SET] (repeat).
 - The setting is canceled when [MENU/SET] is pressed again.
- 2 Press ◀ to select [OK], and then press [MENU/SET].
 - The number of pictures that can be sent by [Multi Select] is limited.



- To terminate the connection, press ▲/▼ to select [Exit], and then press [MENU/SET].



Not available in these cases:

- Images recorded with a device other than the camera and images modified or edited on a PC may not 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.

| | |
|---------------|---|
| <p>[Size]</p> | <p>Resize the image to send. [Original]/[Change] • You can select the image size for [Change] from [M], [S] or [VGA]. The aspect ratio does not change.</p> |
|---------------|---|

Sending images to a smartphone/tablet

Preparations:

- Install the “Image App” in advance. (P151)

1 Select the menu.

MENU →  [Setup] → [Wi-Fi] → [Wi-Fi Function] → [New Connection] → [Send Images While Recording] or [Send Images Stored in the Camera] → [Smartphone] → [Direct]

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

| | |
|----------------------------|--|
| <p>[WPS Connection]</p> | <p>[WPS (Push-Button)]</p> <ol style="list-style-type: none"> 1 On the camera screen, press ▲/▼ to select [WPS (Push-Button)], and then press [MENU/SET]. 2 Set the smartphone to the WPS mode. <ul style="list-style-type: none"> • You can wait longer for a connection by pressing [DISP.] on the camera. 3 On the smartphone, start “Image App”. (P151) <hr/> <p>[WPS (PIN code)]</p> <ol style="list-style-type: none"> 1 On the camera screen, press ▲/▼ to select [WPS (PIN code)], and then press [MENU/SET]. 2 Enter the PIN code of the smartphone into the camera. 3 On the smartphone, start “Image App”. (P151) |
| <p>[Manual Connection]</p> | <p>Operate the smartphone.</p> <ol style="list-style-type: none"> 1 Turn on the Wi-Fi function. 2 Select the SSID (A) that matches the one displayed on the screen of this unit. 3 Start “Image App”. (P151) <div data-bbox="735 866 1004 1077" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Select [Wi-Fi] of [Settings] from smartphone. Please connect to the following.</p>  </div> |

- 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.

3 Press ▲/▼ to select the smartphone you want to connect to, and then press [MENU/SET].

4 Check the send setting, and then press [MENU/SET].

- To change the send setting, press [DISP.]. (P160)

5 When [Send Images While Recording] has been selected

Take pictures. (P159)

When [Send Images Stored in the Camera] has been selected

Select the picture. (P160)



MENU



When sending images to PC

Preparations:

- Turn the computer on.
- Prepare folders for receiving images on the PC. (P163)
- If the workgroup of the destination PC has been changed from the standard setting, change the setting of this unit in [PC Connection]. (P169)

■ 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.

(For Windows)

Supported OS: Windows 7/Windows 8/Windows 8.1/Windows 10

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 v10.11, macOS 10.12

Example: OS X v10.8

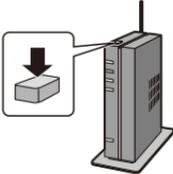
- 1 Select a folder you intend to use for receiving, then click on the items in the following order.**
[File] → [Get Info]
- 2 Enable sharing of the folder.**
 - For details, refer to the operating instructions of your PC or Help on the OS.

■ Sending images to the PC

1 Select the menu.

MENU → ⚙ [Setup] → [Wi-Fi] → [Wi-Fi Function] → [New Connection] → [Send Images While Recording] or [Send Images Stored in the Camera] → [PC] → [Via Network]

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

| | |
|---------------------|--|
| [WPS (Push-Button)] | <p>Press the WPS button on the wireless access point to set up a connection.</p> <p>Press the wireless access point e.g.: WPS button until it switches to WPS mode.</p>  |
| [WPS (PIN code)] | <p>Enter a PIN code into the wireless access point to set up a connection.</p> <ol style="list-style-type: none"> ① On the camera screen, press ▲/▼ to select the wireless access point you are connecting to, and then press [MENU/SET]. ② Enter the PIN code displayed on the camera screen into the wireless access point. ③ Press [MENU/SET] of the camera. |
| [From List] | <p>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. (P166)</p> |

- WPS refers to a function that allows you to easily configure the settings related to the connection and security of wireless LAN devices.
 For details about the compatibility and operation of the function, refer to the operating instructions for the wireless access point.

- 3 Press ▲/▼ to select the PC you want to connect to, and then press [MENU/SET].**
 - 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 Press ▲/▼ to select the destinations folder of the PC, and then press [MENU/SET].**
- 5 Check the send setting, and then press [MENU/SET].**
 - To change the send setting, press [DISP.]. (P160)
- 6 When [Send Images While Recording] has been selected**
Take pictures. (P159)
- When [Send Images Stored in the Camera] has been selected**
Select the picture. (P160)

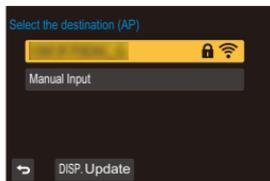
- Folders sorted by the sent date are created in the specified folder, and pictures are saved in those folders.
- If the screen for a user account and password entry appears, enter the one you set on your PC.
- When the computer name (NetBIOS name for Apple Mac computers) contains a space (blank character), 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.
- When the firewall of the OS, security software, etc. is enabled, connecting to the PC may not be possible.

If you are not sure about the WPS compatibility (connecting by [From List])

- Confirm encryption key of the selected wireless access point if the network authentication is encrypted.

1 Press ▲/▼ to select the wireless access point you are connecting to, and press [MENU/SET].

- Pressing [DISP.] will search for a wireless access point again.
- If no wireless access point is found, refer to “When connecting with [Manual Input]” on P166.

**2 (If network authentication is encrypted) Enter the encryption key.**

- For information on how to enter characters, refer to P44.
- Except for the first-time connection, a connection will be made automatically using the previously-used encryption key.

■ When connecting with [Manual Input]

- When connecting by [Manual Input], confirm SSID, authentication type, encryption type, encryption key of the wireless access point you are using.

- 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] by pressing ▲/▼, then press [MENU/SET].
- 2 Enter the SSID of the wireless access point you are connecting to, then select [Set].
 - For information on how to enter characters, refer to P44.
- 3 Press ▲/▼ to select the network authentication type, and press [MENU/SET].

| | |
|-----------------|--|
| [WPA2-PSK] | Supported encryption type: [TKIP], [AES] |
| [WPA2/WPA-PSK] | |
| [No Encryption] | — |

- 4 (When an option other than [No Encryption] is selected) Enter the encryption key and select [Set].

- 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” (P181) and “Troubleshooting” (P183) for details.

- Depending on your environment, transmission speed between the camera and wireless access point may decrease. In addition, the wireless access point may not be available for use.

Connecting quickly with the same settings as the previous ones

When the Wi-Fi function is used, a record is saved in the history. You can register records as favorites. Using the history or favorites list, you can easily connect with the same settings as used previously.

- If the settings of the device to connect to have been changed, it may not be possible to connect to the device.

1 Select the menu.

MENU → ⌘ [Setup] → [Wi-Fi] → [Wi-Fi Function]

| | |
|--------------------------------------|---|
| [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. |

2 Select the desired connection setting with ▲/▼, and then press [MENU/SET].

- You can display details of the connection by pressing [DISP].

■ Registering records as favorites

1 Select the menu.

MENU → ⌘ [Setup] → [Wi-Fi] → [Wi-Fi Function] → [Select a destination from History]

2 Press ▲/▼ to select the history record you want to register, and then press ►.

3 Enter a registration name.

- For information on how to enter characters, refer to [P44](#).
- A maximum of 30 characters can be entered. A two-byte character is treated as two characters.

■ Editing the history registered to favorites

1 Select the menu.

MENU → ⚙ [Setup] → [Wi-Fi] → [Wi-Fi Function] → [Select a destination from Favorite]

2 Press ▲/▼ to select the history record in the favorites list you want to edit, and press ►.

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

| | |
|--------------------------------|---|
| [Remove from Favorite] | — |
| [Change the Order in Favorite] | Specify the destination location of the desired item to change the display order. |
| [Change the Registered Name] | Enter text to change the registered name. |

- Because the number of records that can be saved is limited, register frequently-used connection settings as favorites.
- Performing [Reset Wi-Fi Settings] clears the history and the contents saved in [Select a destination from Favorite].
- If the device you want to connect to (smartphone, etc.) is connected to a wireless access point other than the camera, you cannot connect the device to the camera using [Direct]. Change the Wi-Fi settings of the device you want to connect to so that the access point to be used is set to the camera.
You can also select [New Connection] and reconnect the devices. (P152)
- A connection may not be established easily when you try to connect to a network to which many PCs are connected.
If a connection attempt fails, reconnect by using [New Connection].

[Wi-Fi Setup] Menu

Configure the settings required for the Wi-Fi function.
The settings cannot be changed when connected to Wi-Fi.

MENU →  **[Setup]** → **[Wi-Fi]** → **[Wi-Fi Setup]**

[Wi-Fi Password]

You can improve security by enabling password entry for a direct connection to a smartphone.

| | |
|--------------|---|
| [ON] | Connects the camera and a smartphone using an SSID and password. (P153) |
| [OFF] | Connects the camera and a smartphone using an SSID. (P152) |

- When [ON] is selected, you can also set up a connection by scanning a QR code.

[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. • For information on how to enter characters, refer to P44. |
| [Restore to Default] | Restores the default state. |

- If you are using the PC with standard settings, you do not need to change the workgroup.

[Device Name]

You can change the name (SSID) of this unit.

- 1 Press [DISP.].
- 2 Enter the desired device name.
 - For information on how to enter characters, refer to P44.
 - A maximum of 32 characters can be entered.

[Wi-Fi Function Lock]

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. • For information on how to enter characters, refer to P44 . |
| [Cancel] | — |

• 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.

[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.

12. Connecting to other equipment

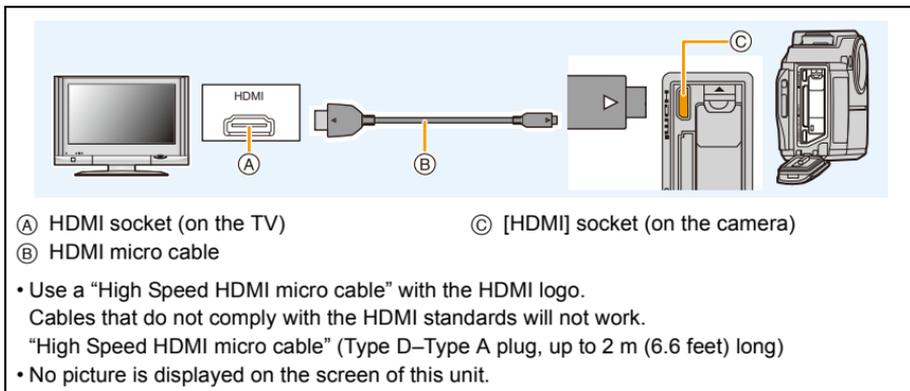
Playing Back Pictures on a TV Screen

Preparations: Turn the camera and the TV off.

1 Connect the camera and the TV with an HDMI micro cable.

- 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.



2 Turn on the TV and select the input to match the connector in use.

3 Turn the camera on and then press [▶].

- 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.
- HDMI output will be canceled if a USB connection cable (supplied) is connected simultaneously.
- No image will be displayed on the monitor/viewfinder of the camera. In addition, no audio will be output from the speaker of the camera.
- 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.
- In some cases, panorama pictures cannot be played back. Also, auto-scroll playback of panorama pictures may not work.
- For cards compatible with playback, refer to the operating instructions of the TV.

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.

■ PC that can be used

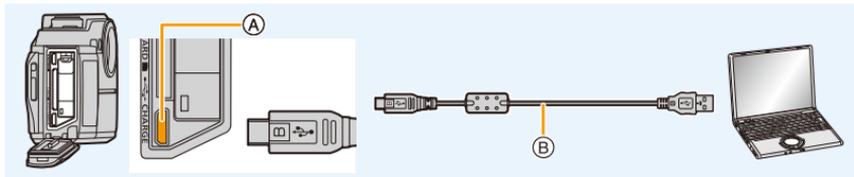
The unit can be connected to any PC capable of recognizing a mass storage device.

- Windows support: Windows 7/Windows 8/Windows 8.1/Windows 10
- Mac support: OS X v10.5 to v10.11, macOS 10.12

Transferring images to a PC

1 Connect the computer and camera with the USB connection cable (supplied).

- Please turn this unit on and your PC before connecting.
- 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.
- A message about charging may be displayed. In this case, press any button to clear the display.



- (A) [USB/CHARGE] socket
- (B) USB connection cable (supplied)

2 Press ▲/▼ to select [PC], and then press [MENU/SET].

- For Windows: A drive ([LUMIX]) is displayed in [Computer]
- For Mac: A drive ([LUMIX]) is displayed on the desktop

3 Drag and drop files and folders in the camera to the PC.

- When the image transfer is complete, disconnect the USB connection cable safely.

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.

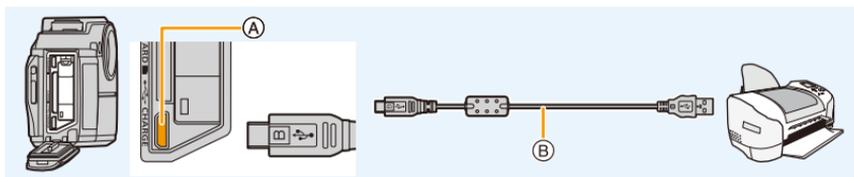
Preparations:

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).

- 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.
- A message about charging may be displayed. In this case, press any button to clear the display.



- (A) [USB/CHARGE] socket
- (B) USB connection cable (supplied)

2 Press ▲/▼ to select [PictBridge(PTP)], and then press [MENU/SET].

3 Press ◀/▶ to select the picture and then press [MENU/SET].

4 Make print settings.

| | |
|-------------------|--|
| [Print with Date] | Sets date printing. |
| [Num.of prints] | Sets the number of pictures to be printed (up to 10 pictures). |
| [Paper Size] | Sets the paper size. |
| [Page Layout] | Sets whether or not to add borders and how many pictures to be printed on each sheet of paper. |

- 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.)
- 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.

5 Press **▲** to select [Print start] and then press [MENU/SET].

- Disconnect the USB connection cable after printing.
- Use a battery with sufficient battery power. If the remaining battery power becomes low while the camera and the printer are connected, 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 inserting or removing a card, turn the camera off, and disconnect the USB connection cable.

Not available in these cases:

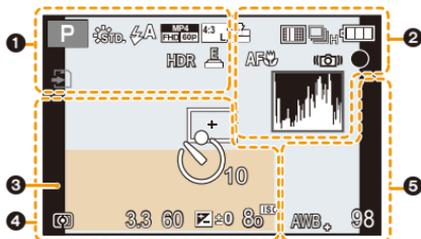
- Motion pictures, 4K burst files, and pictures recorded with [Post Focus] cannot be printed.

13. Others

Monitor Display/Viewfinder Display

• The descriptions in this section use the monitor screen as examples.

In recording



1

| | |
|--|--|
| | Recording Mode (P36) |
| | Photo Style (P122) |
| | Flash Mode (P102) |
| | LED light (P135) |
| | Recording quality (P107) |
| | Picture size/Aspect Ratio (P124) |
| | Picture size (Panorama Shot Mode) (P63) |
| | Image effect (filter) adjustment display (P54) |
| | Image effect (filter) setting (P63) |
| | Card (displayed only during recording) (P27) |
| | Elapsed recording time ^{*1} (P105) |
| | Simultaneous recording indicator (P109) |
| | HDR (P126)/iHDR (P48) |
| | Electronic shutter (P127) |
| | Overheat indicator |

2

| | |
|--|--|
| | Quality (P125) |
| | AF Mode (P65) |
| | Post Focus (P83) |
| | Burst (P87) |
| | 4K Photo (P76) |
| | Auto Bracket (P89) |
| | Self-timer (P91) |
| | Battery indication (P24) |
| | Macro recording (P69) |
| | High Speed Video (P110) |
| | Image Stabilizer (P96) |
| | Jitter alert (P96) |
| | Recording state (Flashes red./Focus (Lights green.)) (P35) |
| | Focus (Under low illumination) (P66) |
| | Connected to Wi-Fi |
| | Histogram (P130) |

③

Current date and time/Travel destination setting⁺²:  (P133)

Exposure meter

Zoom (P98)

④

 AF area (P68)

+ Spot metering target (P125)

   Self-timer (P91)   Metering Mode (P125)

3.3 Aperture value (P35)

60 Shutter speed (P35)

 ±0 Exposure compensation value (P70)

Manual Exposure Assistance (P51)

80 ^{ISO} ISO sensitivity (P71)

⑤

AWB ⁺ White Balance Fine Adjustment (P75)      White Balance (P73)

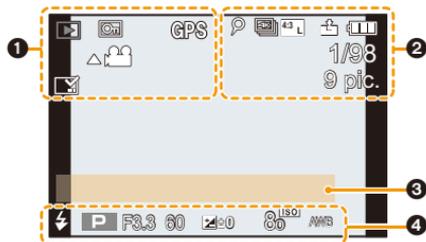
98 Number of recordable pictures (P29)

R8m30s Available recording time⁺¹ (P29)

*1 m: minute, s: second

*2 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.

In playback



1

| | |
|------------|--|
| | Playback Mode (P140) |
| | Protected picture (P147) |
| GPS | Location Information display (P141) |
| | Cable disconnect prohibit icon (P176) |
| | Motion picture playback (P117) |
| | Play panorama (P64) |
| | Save pictures from the 4K burst file (P80) |
| | Save a picture from pictures recorded using [Post Focus] (P85) |
| | Continuous group picture playback (P120) |
| | Stamped with text indication (P143) |
| 8m30s | Elapsed playback time* (P117) |

2

| | |
|--------|--|
| | Icon indicating the presence of a marker (P81) |
| | 4K Photo (4K burst file) (P76) |
| | Post Focus (P83) |
| | Picture size/Aspect Ratio (P124) |
| | Recording quality (P107) |
| | Quality (P125) |
| 120fps | High Speed Video (P110) |
| | Battery indication (P24) |
| 1/98 | Picture number/Total pictures |
| | Connected to Wi-Fi |
| 9 pic. | Number of group pictures |
| 8m30s | Motion picture recording time* (P117) |

3

Title (P142)

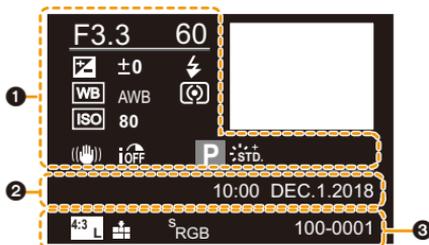
4

Recording information

* m: minute, s: second

In playback

Detailed information display



1

Recording information

| | |
|-------------------|--|
| iOFF | Intelligent Dynamic Range Control (P126) |
| HDR _{ON} | HDR (P126)/iHDR (P48) |

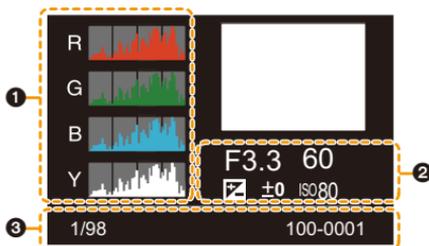
2

Recorded date and time/World Time (P133)

3

| | |
|------------|----------------------------------|
| 4:3 L | Picture size/Aspect Ratio (P124) |
| MPEG | Recording quality (P107) |
| 120fps | High Speed Video (P110) |
| Quality | Quality (P125) |
| S_RGB | Color space |
| 4K | 4K Photo (4K burst file) (P76) |
| Post Focus | Post Focus (P83) |
| 100-0001 | Folder/File number (P174) |

Histogram display



1

Histogram (P38)

2

Recording information

3

| | |
|----------|-------------------------------|
| 1/98 | Picture number/Total pictures |
| 100-0001 | Folder/File number (P174) |

Message Display

Confirmation messages or error messages will be displayed on the screen in some cases. The major messages are described below as examples.

[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 (P28) on this unit after saving necessary data on a PC, etc.

[Cannot be set on this picture]

- Pictures that do not comply with the DCF standard cannot be edited on the camera.

[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. (P28)

[Insert SD card again]/[Try another card]

- An error has occurred accessing the card.
 - Insert the card again.
- Insert a different card.

[Insert SD card again]/[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.

[Recording was cancelled due to the limitation of the writing speed of the card]

- Depending on the [Rec Quality] of a motion picture, the speed class rating required for the card differs. 4K photo recording requires a card that meets a particular speed class rating. Use a card that meets the rating. (P27)
- 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 (P28).
 - Depending on the type of the card, recording may stop in the middle.

[To prevent water leakage, ensure that the door is locked properly.]

- Refer to "About the water leakage warning message" on [P21](#) for details.

[Failed to connect wireless access point]/[Connection failed]/[No wireless access point found]

- The wireless access point information set on this unit is wrong.
Check the authentication type, encryption type, and encryption key. ([P166](#))
- 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.

[Connection error]/[Connection failed]

- Radio waves from the wireless access point are getting weak.
Perform the connection closer to the wireless access point.
- Depending on the wireless access point, connection may be automatically disconnected after specific time has passed.
Reconnect the connection again.

[Connection failed]

- Change the access point to connect to in the smartphone Wi-Fi settings to this camera.



Troubleshooting

First, try out the following procedures (P183 to P191).

If the problem is not resolved, it may be improved by selecting [Reset] (P137) 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. (P22)

This unit is turned off automatically.

- [Economy] is enabled. (P135)

The battery becomes flat too quickly.

- When [] ([4K Pre-Burst]) is set, the battery drains faster.
 - Select [] ([4K Pre-Burst]) only when recording.
- 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. (P135)

Recording

Cannot perform recording with the 4K Photo or Post Focus function.

- The 4K Photo and Post Focus functions are not available during Wi-Fi connection.

4K photo recording stops before finishing.

- When the ambient temperature is high or continuous 4K photo recording is performed, after [] is displayed, recording may stop to protect the camera. Wait until the camera cools down.

The recorded picture is whitish.

- Picture might look whitish when lens gets dirty with fingerprints or similar.
 - When it is dirty, lightly wipe the surface of the lens with soft and dry cloth.

The recorded picture is too bright or dark.

- Check that the exposure is correctly compensated. (P70)

Multiple pictures are taken at one time.

- Is the drive mode set to a mode other than [Single]? (P86)

The subject is not focused properly.

- The subject is beyond the focus range of the camera. (P35)

**The recorded picture is blurred.
The Image Stabilizer is not effective.**

- The shutter speed will become slower and the Image Stabilizer function may not work properly when taking pictures especially in dark places.
→ We recommend using a tripod and the self-timer (P91) when taking pictures with a slow shutter speed.

**The recorded picture looks rough.
Noise appears on the picture.**

- Try the following:
 - Decrease the ISO sensitivity. (P71)
 - Increase the setting for [Noise Reduction] in [Photo Style] or lower the setting for each of the items other than [Noise Reduction]. (P123)

The subject appears distorted on the picture.

- If you record a moving subject when using the electronic shutter or recording motion picture or a 4K photo, the subject may appear distorted on the picture. This is characteristic of MOS sensors which serve as the camera's pickup sensors. This is not a malfunction.

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.
- When using the electronic shutter (P127), lowering the shutter speed may reduce the effect of the horizontal stripes.



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.

Motion pictures**Recording motion pictures is not possible.**

- You may not be able to record for a short while after turning this unit on when using a large capacity card.
- 4K motion pictures cannot be recorded during Wi-Fi connection.

Motion picture recording stops in the middle.

- When the ambient temperature is high or motion picture is recorded continuously, the camera may display [>] and stop the recording to protect itself. Wait until the camera cools down.
- Depending on the [Rec Quality] of a motion picture, the speed class rating required for the card differs. Use a card that meets the rating. (P27)

Sometimes it is difficult to focus with Auto Focus when recording 4K motion pictures.

- This phenomenon occurs when the camera is trying to record with highly accurate focus at a reduced Auto Focus speed, and is not a malfunction.

In motion pictures, abnormal clicking and buzzing sounds are recorded. The recorded sound is very quiet.

- When recording in a quiet environment, the sound of aperture, focus or zoom operation may be recorded in motion pictures.
Focus operation can be set to [OFF] in [Continuous AF] (P108).
- 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.

Flash

The flash is not activated.

- Is the flash setting set to [☺]?
→ Change the flash setting. (P102)
- When the electronic shutter is used, the flash is not activated.
→ Set [Shutter Type] to [MSHTR]. (P127)

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] (P135) is activated, and the Monitor/Viewfinder turns off.

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.

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.

Playback

The picture is not played back. There are no recorded pictures.

- Is the card inserted?
- Is this a folder or picture which was processed in the PC?
If it is, it cannot be played back by this unit.
- Has [Playback Mode] been set for playback?
→ Change to [Normal Play]. (P140)

Red part of the recorded image has changed color to black.

- When Red-Eye Removal ([☑] or [☑☑]) is performed, red parts may be corrected to black.
→ It is recommended to take a picture with the Flash Mode set to [A], [A], [A], or [A], or [Red-Eye Removal] on the [Rec] menu set to [OFF]. (P128)

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.
- 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.
- Check the radio wave condition of the wireless access point.
 - Move this unit closer to the wireless access point.
 - Change the location and orientation of the wireless access point.
- It may not display even if the radio waves exist depending on the setting of the wireless access point.
 - Turn off and on 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 (P166) or enable the SSID broadcast of the wireless access point.

This unit is not displayed in the Wi-Fi setting screen of the smartphone.

- From the Wi-Fi setting menu on the smartphone, turn off and then on the Wi-Fi function.

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.

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. (P169)
- 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.

Transmission of the image fails midway. Some images cannot be transmitted.

- Is the size of the image too large?
→ Reduce the image size at [Size] (P160), and then send.
→ Transmit after dividing the motion picture with [Video Divide] (P144).
- It may take longer time to transmit when distance to the wireless access point is far.
→ Transmit closer to the wireless access point.

I have forgotten the password for the Wi-Fi.

- Execute the [Reset Wi-Fi Settings] in the [Setup] menu. (P137)
However, all the information you have set on the [Wi-Fi Setup] menu will be reset.

TV, PC and printer

The picture does not appear on the TV.

- Is the camera connected to the TV correctly? (P171)
→ Set the TV's input to the HDMI input.

Cannot communicate with the PC.

- Is the camera recognized by the PC correctly?
→ Select [PC] when connecting. (P173)
→ Turn this unit off and on.

The card is not recognized by the PC. (SDXC memory card is used.)

- Check if your PC is compatible with SDXC memory cards.
- 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.
- Select [PictBridge(PTP)] when connecting. (P175)

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

[Precautions] is displayed repeatedly whenever this unit is turned on.

- Press [MENU/SET] after viewing the last screen (12/12). For details, refer to [P13](#).

A rattling or similar sound is heard from the camera.

- This is the sound of the lens moving and not a malfunction in the following cases:
 - A rattling sound is heard when you shake the camera while the camera is turned off or in Playback Mode.
 - A rattling or similar sound is heard when you turn on or off the camera or switch between Recording Mode and Playback Mode.

The sound from the speaker is weak. Difficult to hear the recorded sound.

- Water is left in the speaker or microphone hole. Drain the water. ([P17](#))

Zooming stops instantaneously.

- When using the Extended Optical Zoom, the zooming action will stop temporarily. This is not a malfunction.

An unreadable language was selected by mistake.

- Press [MENU/SET], select the [Setup] menu icon [] and then select the [] icon to set the desired language. ([P136](#))

A white lamp sometimes turns on when the shutter button is pressed halfway.

- AF Assist Lamp will turn on white in the dark place to assist the focusing.

The camera becomes warm.

- The surface of the camera may become warm during use. This does not affect the performance or quality of the camera.

The side door will not close.

- Have foreign objects become trapped?
→ Remove the foreign objects. (P14)
- When closing, do not set the [LOCK] switch to the locked side. Doing so may cause damage or leaks.
→ Release the lock. (P20)

Cannot move some parts of the camera, such as the buttons, dial, and side door.

- When using the camera in cold places such as ski resorts or places at high altitude, do not leave the camera with snow or water droplets sticking to it. Some parts of the camera may become hard to move with snow or water droplets freezing in narrow spaces, such as the gaps of the buttons, dial, and side door. This is not a malfunction. When the camera returns to normal temperature it will function as normal.
- When using the camera in places with large amounts of sand or dust, some parts of the camera may become hard to move with foreign objects getting in narrow spaces, such as the gaps of the diopter adjustment dial, shutter button, and camera [ON/OFF] button. Wipe off with a dry, lint-free cloth or rinse with fresh water.

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. (P31)

Cautions for Use

About the waterproof/dustproof and anti-shock performance of the camera

- For more detail, refer to “(Important) About the Waterproof/Dustproof and Anti-shock Performance of the Camera” (P12).

When using in a cold climate or at low temperatures

- **It may cause injury to the skin if you directly touch the metal parts of the unit in places where temperature is very low (environments under 0 °C (32 °F), such as ski resorts or places at high altitude) for a long period of time. Use gloves or similar when using it for long periods.**
- The performance of the battery (number of recordable pictures/operating time) may decrease temporarily when using in a temperature between -10 °C and 0 °C (14 °F and 32 °F) (cold places such as ski resorts or places at high altitude). (Charge the battery sufficiently before use)
- The battery cannot be recharged in a temperature less than 0 °C (32 °F). (The charging lamp blinks when the battery cannot be recharged.) Charge it sufficiently in a location where the ambient temperature is between 10 °C and 30 °C (50 °F and 86 °F).
- If the camera gets very cold in cold places such as ski resorts or places at high altitude, performance of the monitor may temporarily drop immediately after turning this unit on, e.g. the picture on the monitor being slightly darker than usual or ghost images appearing.
- In cold places, keep the camera and spare batteries warm by placing them in a warm place such as inside your cold protection gear or clothes. The performance will resume as normal when the internal temperature rises.
- When using the camera in cold places such as ski resorts or places at high altitude, do not leave the camera with snow or water droplets sticking to it. Some parts of the camera may become hard to move or the sound may become dim with snow or water droplets freezing in narrow spaces, such as the gaps of the buttons, dial, side door, speaker, and microphone. This is not a malfunction.

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. 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

Refer to P16 for information about maintenance after underwater use.

Before cleaning the camera, remove the battery. 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.
- 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 the Monitor/Viewfinder

- Do not press the monitor with excessive force. Doing so may cause malfunction.
- If the camera gets very cold in cold places such as ski resorts or places at high altitude, performance of the monitor may temporarily drop immediately after turning this unit on, e.g. the picture on the monitor being slightly darker than usual or ghost images appearing. Keep the camera warm when using in a cold environment. The performance will resume as normal when the internal temperature rises.

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, the microphone, and the speaker

- 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.
- If there is water or dirt on the lens, wipe it off with dry soft cloth before taking a picture.
- If water is left in the microphone or speaker hole, weak or distorted audio may be recorded and played back. Drain the water, and use the camera only after letting it dry for a while. (P17)
- Do not poke the holes of microphone and speaker with sharp points. (It may damage the waterproof sheet inside, which may damage the waterproof performance.)

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 recordable time will become shorter in cold places such as ski resorts or places at high altitude.
- When you travel, do not forget to bring the AC adaptor (supplied) and USB connection 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.

AC adaptor (supplied)

- If you use the AC adaptor (supplied) near a radio, the radio reception may be disturbed. Keep the AC adaptor (supplied) 1 m (3.3 feet) or further away from radios.
- The AC adaptor (supplied) 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.)

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

We recommend that you enable [Wi-Fi Password] and [Wi-Fi Function Lock] to protect personal information. (P169, 170)

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] (P137).
- Reset the settings to protect the personal information. (P137)
- 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”.
 (P196)

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.
- Read the operating instructions for the tripod or unipod carefully.

Wi-Fi 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.

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