

basic recording

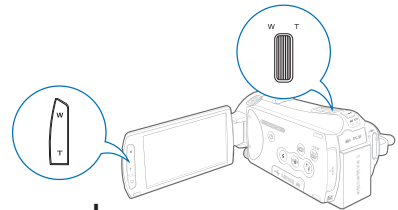
ZOOMING

Use the zoom function for close-up or wide-angle recording. This camcorder allows you to record using 15x optical power zoom, 18x Intelli-zoom and digital zoom.

PRECHECK!

Select the record (📹/📷) mode by pressing the **MODE** button.

→page ??



To zoom in

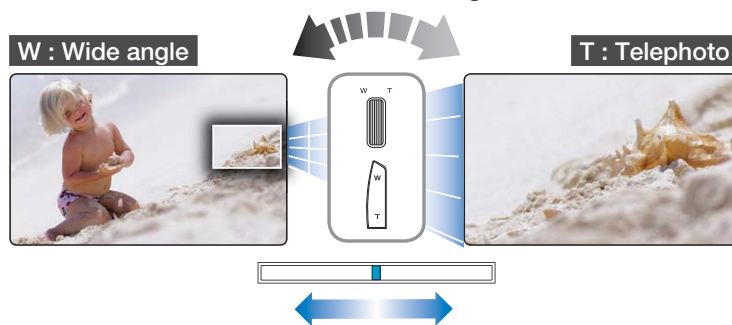
Press the **T** (zoom) button on the LCD panel or slide the zoom lever towards **T** (telephoto).

- The distant subject is gradually magnified and can be recorded.
- The most magnified zoom ratio is 18x zoom in the normal zoom-in.

To zoom out

Press the **W** (zoom) button on the LCD panel or slide the zoom lever towards **W** (wide angle).

- The subject moves further away.
- The smallest zoom ratio is the subject's original size in the zoom-out.



Zoom speed

When using the zoom function, its speed can be decreased by slowly moving the Zoom (W/T) lever. A fast moving increases the zoom speed. However, the Zoom (W/T) button on the LCD panel cannot adjust the zoom speed.



- Using the optical zoom does not degrade the image quality and clarity.
- Use the digital zoom when you want to zoom more than the optical zoom range (Video recording mode only). →page ??
- Focusing may become unstable when recording with a fast zoom or zooming into a subject standing too far away. In this case, use the manual focus function. →page ??
- The minimum possible distance between camcorder and subject while maintaining sharp focus is about 1cm (about 0.4 inches) for wide angle and about 50cm (about 19.7 inches) for telephoto. If you want to shoot the object close to the lens at a wide angle, use the Tele Macro function. →page ??
- When using the zoom function while holding the camcorder with your hand, use Anti-shake (OIS) for stable recording. →page ??
- Frequent use of the zoom function consumes more power.
- Zooming sound by using the **Zoom** lever or **Zoom** button can be recorded.

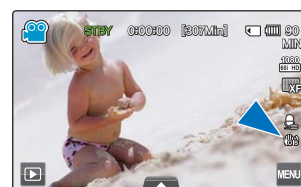
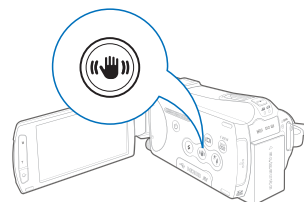
SETTING THE ANTI-SHAKE (OIS: OPTICAL IMAGE STABILIZER)

Use the Anti-shake (OIS: Optical Image Stabilizer) function to compensate for unstable images caused by shaking movements when holding the camcorder.

PRECHECK!

Select the record ( / ) mode by pressing the **MODE** button. →page ??

Press the **Anti-shake (OIS)** () button to toggle the Anti-shake (OIS) mode between On and Off.



Use the Anti-Shake function in the following cases

- When recording while walking or when recording in a moving car.
- When recording with the zoom function.
- When recording subjects of a small size.



- The Smart Auto mode automatically sets the Anti-shake (OIS) to On.
- Gross camcorder shake may not be entirely corrected even if the Anti-shake is set to On. Firmly hold the camcorder with both hands.
- When this function is set to On, the actual movement of the subject and the movement displayed on the screen may be slightly different.
- When recording in dark lighting at high magnification while this function is set to On, after-images may stand out. In this case, we recommend using a tripod (not supplied) and turning the Anti-shake to Off.

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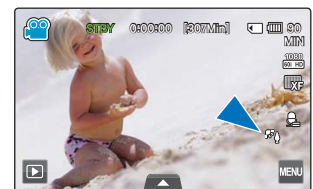
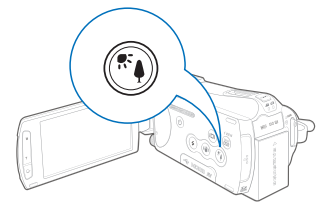
USING BACK LIGHT COMPENSATION MODE

When a subject is lit from behind, this function will compensate for lighting so that the subject is not too dark.

PRECHECK!

Select the record (📹/📷) mode by pressing the **MODE** button. ↪ page ??

Press the **Back light** (☀️) button to toggle the back light mode between On and Off.



🔍 Back lighting exists when the subject is darker than the background

- The subject is in front of a window.
- The person to be recorded is wearing white or shiny clothes and is placed against a bright background; the person's face is too dark to distinguish his/her features.
- The subject is outdoors and the background is overcast.
- The light sources are too bright.
- The subject is against a snowy background.

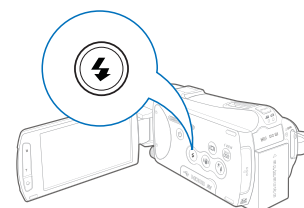


USING THE FLASH

Using the flash, you can capture clear and bright photos even under shadows, at night or indoors which need more light.

PRECHECK!

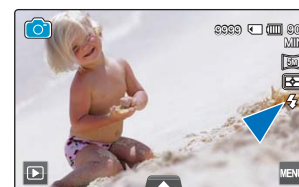
Select the Photo record (📷) mode by pressing the **MODE** button. →page ??



Press the **Flash** (⚡) button to select the flash mode you want.

- The selected flash mode is displayed.

Display	Meaning
	Disables the flash.
	Flash works automatically when the subject or background is dark.
	Flash works automatically when the subject or background is dark, and it reduces red eyes of persons looking straight at flash.
	Flash always works regardless of brightness.
	Flash works as the shutter speed is slow. It is suitable for use around sundown or in dark places. It is recommended to use the tripod (purchase separately) to prevent camcorder shake.



- Do not use the flash with a hand covered on it.
- Do not use a flash too close to eyes of a person.



- Use a flash within a distance of 1~2 meters.
- Frequent use of a flash may decrease battery time faster.
- You cannot use a flash in the following conditions.
 - when the continuous shooting is set
 - when capturing photos during video recording

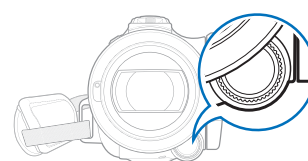
basic recording

USING THE MANUAL DIAL

With the manual dial, you can simply set the frequently used functions (Focus, Aperture, Shutter, Exposure Value) during recording. It is convenient to set functions easily without using the menu.

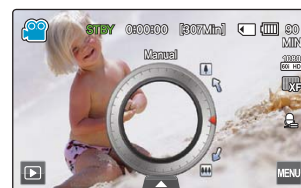
PRECHECK!

- Select the record (📹/📷) mode by pressing the **MODE** button. ↪page ??
- Set the manual dial to the frequently used function (Focus, Aperture, Shutter, Exposure Value). ↪page ??



Ex) The manual dial set to Focus

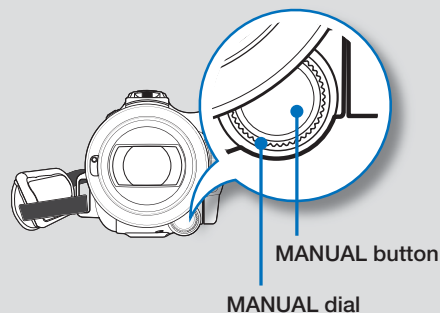
1. Press the **MANUAL** button.
 - Press the **MANUAL** button to toggle focus between Auto and Manual.
2. Adjust the focus turning the **MANUAL** dial.
 - You can adjust aperture, shutter, exposure value in a same way to set focus. (when one function is assigned to the manual dial. ↪page ??)



🔍 Menus to be assigned to the manual dial

The following menus can be assigned to the manual dial. Refer to the following pages for the details of each function.

- Focus ↪page ??
- Aperture ↪page ??
- Shutter ↪page ??
- EV ↪page ??



- Only one function can be assigned to the manual dial. ↪page ??
- Even if one of functions unavailable at the same time in the menu is assigned to the manual dial, you can set the function with the manual dial, however, not in the menu.
For example) When Aperture is assigned to the manual dial
Aperture cannot be used if Shutter is set to Manual in the menu, however, when using the manual dial, the Shutter is automatically set to Auto in the menu, you can adjust the aperture.

basic playback

CHANGING THE PLAYBACK MODE

- You can switch the record mode into the play mode by touching the Play (▶) tab on the LCD screen.
- Recorded images are displayed in the thumbnail display and the most recently recorded file is highlighted.
- According to the last recorded video or photo, the corresponding thumbnail display is switched.
- You can choose the thumbnail view display options by touching the HD (HD), SD (SD), or photo (Photo) tab on the LCD screen.



Understanding how to change the operation modes

You can simply change the operation modes by touching the LCD screen or using the buttons as shown in the following figures:



To change thumbnail display type

You can choose the thumbnail display type variously as follows.

Choose the thumbnail display type you want by touching the 3x3 (3x3) tab, date (Date) tab on the LCD screen and using the **Zoom** (W/T) lever.



basic playback

PLAYING BACK VIDEOS

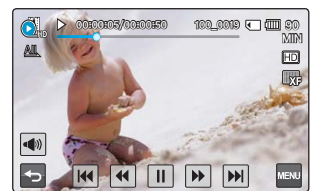
You can preview recorded videos in a thumbnail index view. Find your desired video quickly, and playback directly.

PRECHECK!

- Insert a memory card. ↪page ??
- Set the appropriate storage media. (HMX-S15/S16 only) ↪page ??
- Touch the Play (▶) tab on the LCD screen to select the play mode. ↪page ??

To play back videos

1. Touch the HD (HD) or SD (SD) tab.
 - Video thumbnails corresponding to the selected video resolution appear on the screen.
 - To change the current thumbnail page, touch the left (◀) or right (▶) tab.
 - To change the thumbnail display type, touch the 3x3 (3x3) tab, date (📅) tab on the LCD screen or use the **Zoom** (W/T) lever.
 - If you select the thumbnail display by the date (📅), you can sort videos by specific dates. ↪page ??
2. Touch the desired video clip.
 - The selected video is played and playback control tabs appear briefly. They reappear when touching anywhere on the screen.
 - You can set playback settings using the **“Play Option”** menu. ↪page ??
 - To stop playback and return to the thumbnails, touch the Return (⏪) tab.



Using the Touch Screen

Drag to left or right on the LCD screen like turning pages.

- You can select previous or next file.



Touch the point or drag the pointer to left or right in the playback progress bar on the LCD screen.

- You can move directly to the position you want.





Do not power off or eject the memory card during photo playback. Doing so may damage the recorded data.



- It may take some time to start playback, depending on the size and quality of the selected video.
- The camcorder may not play the following video files:
 - A video edited by using the different software that was not built-in your camcorder, or whose file name is changed on a PC
 - A video recorded on other devices
 - A video whose file format is not supported on the camcorder
- You can use various play options during the video playback. ↪page ??
- The recorded videos can be played on a TV or PC. ↪pages ??, ??
- If you touch the Menu (MENU) tab during playback, play is paused and the menu screen appears.

To adjust the volume during video playback

You can hear the sound through the built-in speaker of the camcorder while the video is playing back on the LCD screen.

1. Touch the Volume (🔊) tab on the LCD screen.
2. Adjust the volume by dragging the volume control dial toward the desired direction on the LCD screen.



The sound level is adjusted between “0~19.” When the level is at “0,” you cannot hear sound.

basic playback

Various playback operations

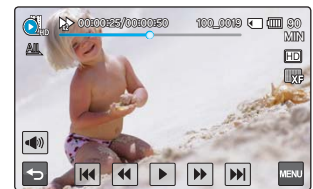
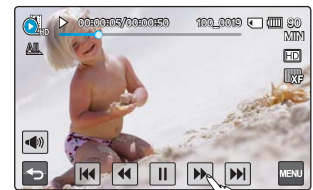
Playback / Pause / Stop

- Playback and pause alternates when touching the Play (▶) / Pause (⏸) tab during playback.
- Touch the Return (⏮) tab to stop playback and return to the thumbnail.

Search playback

During playback, each touch of the Reverse search (◀◀) / Forward search (▶▶) tab increases the play speed:

- RPS (Reverse Playback Search) rate:
x2 → x4 → x8 → x16 → x32 → x2
- FPS (Forward Playback Search) rate:
x2 → x4 → x8 → x16 → x32 → x2



Skip playback

Touch the Reverse skip (◀◀) / Forward skip (▶▶) tab during playback.

- Touching the Forward skip (▶▶) tab plays the next video.
- Touching the Reverse skip (◀◀) plays the beginning of the scene.
If reverse skip (◀◀) is touched within 3 seconds from the start of the file, the previous video is played.
- Place and hold your finger on the Reverse skip (◀◀) / Forward skip (▶▶) tab to search the desired video number quickly. When you lift off your finger, the selected video is played.

Slow playback

During a pause, touching the Reverse slow (◀◀) / Forward slow (▶▶) tab reduces the playback speed:

- Reverse/forward playback slow rate: x1/2 → x1/4 → x1/8 → x1/2

Frame by frame playback

- During pause, touch the Reverse frame advance (◀) / Forward frame advance (▶) tab makes play go reverse or forward one frame at a time.



- Various playback operations are available with same buttons on the remote control.
- Touch the Play (▶) tab to play back in normal speed.
- You can hear the sound only when the playback is in normal speed.

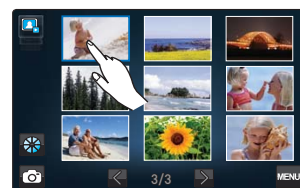
VIEWING PHOTOS

You can view recorded photos by using various playback functions.

PRECHECK!

- Insert a memory card. ↪page ??
- Set the appropriate storage media. (HMX-S15/S16 only) ↪page ??
- Touch the Play (▶) tab on the LCD screen to select the play mode. ↪page ??

1. Touch the Photo (📷) tab.
 - The thumbnail view appears.
 - To change the current thumbnail page, touch the left (◀) or right (▶) tab.
 - To change the thumbnail display type, touch the 3x3 (3x3) tab, date (📅) tab on the LCD screen or use the **Zoom** (W/T) lever.
 - If you select the thumbnail display by the date (📅), you can sort photos by specific dates. ↪page ??



2. Touch your desired photo to play back.
 - The selected photo is displayed in full screen and playback control tabs appear briefly. They reappear when touching anywhere on the screen.
 - Touch previous image (◀) / next image (▶) tab to view the previous and next photo.
 - Place and hold your finger on the previous image (◀) / next image (▶) tab to search the desired photo number quickly. When you lift off your finger, the selected photo is displayed.



3. To return to the thumbnails, touch the Return (↶) tab.

Using the Touch Screen

Drag to left or right on the LCD screen like turning pages.

- You can select previous or next file.



Do not power off or eject the memory card during photo playback. Doing so may damage the recorded data.



- **Your camcorder may not playback the following photo files normally:**
 - A photo with its file name changed on a PC.
 - A photo recorded on other devices.
 - A photo with a file format not supported on this camcorder (does not conform to DCF standards).
- Loading time may vary depending on the size and quality of the selected photo.

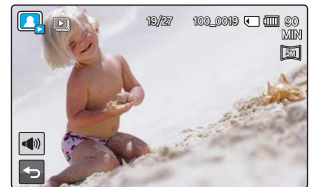
basic playback

VIEWING A SLIDE SHOW

You can view a photo slide show with background music.

Touch the Slide Show (🎞️) tab during photo playback.

- The (🎞️) indicator is displayed. The slide show starts from the current selected photo.
- All photos are played back continuously in the set slide show option (“Music, Interval, Effect.”) → page ??
- If you select the thumbnail display by the date (📅), photos only taken on the corresponding date play back in a slide show.
- You can adjust the background music’s volume level using the Volume (🔊) tab while playing back the slide show with music.
- To stop the slide show, touch the Return (⏪) tab.



A slide show is available also in the menu. → page ??

ZOOMING DURING PHOTO PLAYBACK

You can magnify a playback image.

Touch the up (▲)/down (▼)/left (◀)/right (▶) to select the desired area to magnify.

1. Touch the desired photo.
 - The selected photo is displayed on the full screen.
2. Adjust the magnification with the **Zoom** (W/T) button or **Zoom** (W/T) lever.
 - Magnification starts from the center of the photo.
 - You can zoom in from x1.1 to x8.0.
 - While the playback zoom is in use, other images cannot be selected.
3. Touch the up (▲)/down (▼)/left (◀)/right (▶) tab to view the area you want on the magnified photo.
4. To cancel, touch the Return (⏪) tab.



Photos recorded on other devices or those edited on a PC cannot be magnified.

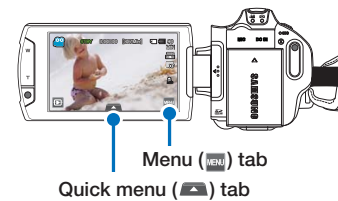
using the menu items

HANDLING MENUS AND QUICK MENUS

The instructions below are examples of how to access and use menu items using the Menu (MENU) tab and the Quick menu (QUICK) tab. When you access and use other menu items, use these examples as guides.

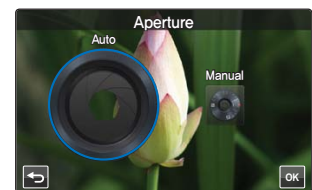
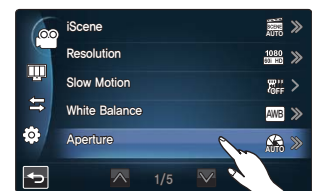
PRECHECK!

- Open the LCD screen to turn on the camcorder.
Your camcorder turns on automatically when you open the LCD screen.
- Select the record (CAMERA) mode by pressing the **MODE** button. →page ??



Using the Menu (MENU) tab

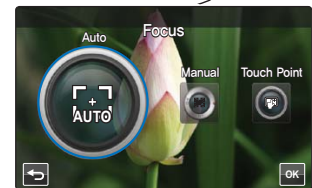
1. Touch the Menu (MENU) tab on the touch panel.
 - The menu screen appears.
 - To change the current page, touch the up (▲)/down (▼) tab.
2. Touch “Aperture.” (The Aperture function is used here as an example.)
3. Touch the desired option.
 - Set the values according to the selected item.
 - Drag toward the direction indicated on the LCD screen or touch the desired setting value.
 - Touch the (OK) tab to complete the setting. If you touch the Return (↩) tab not the (OK) tab, the setting values are not applied and returns to the previous values.
4. To exit the menu, touch the Return (↩) tab.



Using the Quick menu (QUICK) tab

Quick menu enables you to quickly access your favorite functions. You can easily select the desired menu with one-touch.

1. Touch the **Quick menu** tab on the LCD screen to see the available menu options.
 - The quick menu screen appears.
2. Touch “Focus (FOCUS).” (The Focus function is used here as an example.)
3. Touch the desired option.
 - Adjust the setting values accordingly.
 - Touch the (OK) tab to complete the setting.



- When using the Menu or Quick menu items, some menu items can not be used at the same time, or may be grayed out.
- For more information, see the Troubleshooting page ??.
- For the purpose of easy understanding, all the menu setting examples from this page are explained based on the simplest methods. The menu setting methods can be different depending on the user's chosen menu options.

using the menu items

MENU ITEMS

- Accessible items in menu vary depending on the operating mode.
- For operation details, see the corresponding page.

Video/photo record menu items

● : available, X : not available

Items	Operation mode	Video	Photo	Default value	Page
iSCENE		●	●	Auto	??
Resolution		●	●	1080/60i (XF) [5M] 2960x1664 (16:9)	??
Slow Motion		●	X	Off	??
White Balance		●	●	Auto	??
ISO		X	●	Auto	??
Aperture		●	●	Auto	??
Shutter		●	●	Auto	??
EV		●	●	0	??
Super C.Nite		●	X	Normal	??
Focus		●	●	Auto	??
Face Detection		●	●	Off	??
Magic Touch		X	●	Off	??
Metering		X	●	Multi	??
xvYCC		●	X	Off	??
Digital Effect		●	●	Off	??
Fader		●	X	Off	??
Tele Macro		●	●	Off	??
Wind Cut		●	X	Off	??
Zoom MIC		●	X	Off	??
Voice Reduction		●	X	Off	??
MIC Level		●	X	Medium	??
Digital Zoom		●	X	Off	??
Cont. Shot		X	●	Off	??
Self Timer		●	●	Off	??
Time Lapse REC		●	X	Off	??

Video/photo playback menu items

● : available, X : not available

Items	Operation mode	Video		Photo		Default value	Page
		Thumbnail	Single	Thumbnail	Single		
Play Option		●	●	X	X	Play All	??
Highlight		●	●	X	X	-	??
Story-Board Print		●	●	X	X	-	??
Delete		●	●	●	●	-	??
Protect		●	●	●	●	Off (Single)	??
Copy *		●	●	●	●	-	??
Edit	Partial Delete	●	●	X	X	-	??
	Divide	●	●	X	X	-	??
	Combine	●	X	X	X	-	??
Slide Show Start		X	X	●	●	-	??
Slide Show Option		X	X	●	●	Random	??
File Info **		●	●	●	●	-	??



- Items marked with * are available only with HMX-S15/S16 models.
- Items marked with ** are not displayed when the recording thumbnail display is set to the date (📅).

Display setting menu items

Items	Default value	Page
LCD Brightnes	5	??
LCD Enhancer	Off	??
Guideline	Off	??
Date/Time Display	Off	??
TV Type	16:9	??
TV Display	On	??
HDMI TV Out	Auto	??
Auto LCD Off	On	??

using the menu items

Connectivity setting menu items

Items	Default value	Page
Remote	On	??
PC Software	On	??
USB Connect	Mass Storage	??
TV Connect Guide	-	??
Anynet+ (HDMI-CEC)	On	??

Other setting menu items

Items	Default value	Page
Storage Type *	Internal Memory	??
Storage Info	-	??
Format	-	??
File No.	Series	??
Time Zone	Home	??
Date/Time Set	JAN/01/2010 12:00AM (Summer Time: Off)	??
Date Type	JAN/01/2010	??
Time Type	12 Hr	??
Beep Sound	On	??
Shutter Sound	On	??
Auto Power Off	5Min	??
Quick On STBY	5Min	??
Custom Dial	Focus	??
REC Lamp	On	??
Default Set	-	??
Language	English	??
Demo	On	??



- Menu options and default values may be changed without prior notice.
- Some grey colored menu options cannot be selected. → page ??
- Items marked with * are available only with HMX-S15/S16 models.
- The date and time format may change depending on the selected language.

QUICK MENU ITEMS

- Quick menu is available only in the video and photo record mode.
- Available menu items may depend on the selected operation mode.
- For operation details, see the corresponding page.

Video/photo recording menu items

● : available, X : not available

Items	Video	Photo	Default value	Page
iSCENE	●	●	Auto	??
Resolution	●	●	[HD]1080/60i (XF) [5M] 2960x1664 (16:9)	??
White Balance	●	●	Auto	??
Aperture	●	●	Auto	??
Shutter	●	●	Auto	??
EV	●	●	0	??
Focus	●	●	Auto	??
Digital Effect	●	●	Off	??

advanced recording

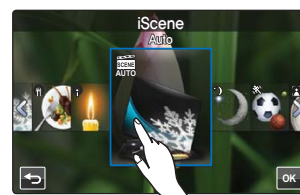
iSCENE

This camcorder automatically sets the shutter speed and aperture according to the subject and brightness for optimal recording.

PRECHECK!

Select the record (📹/📷) mode by pressing the **MODE** button. ↪page ??

1. Touch the Menu (MENU) tab → “iSCENE” → touch the desired submenu item.
 - You can move to the desired item by touching the </> tab.
2. Touch the (OK) tab or selected submenu item again to complete the setting.
3. To exit the menu, touch the Return (↵) tab.



Submenu items

- **Auto**: Under normal conditions, recording naturally.
- **Night** (🌙): Recording in a dark place or at night.
- **Sports** (🏆): Recording people or objects in motion.
- **Portrait** (👤): Recording skin color naturally.
- **Spotlight** (☀️): When strong light strikes the object.
- **Beach/Show** (🌊): Where reflection of light is intense such as a snowfield or beach.
- **Food** (🍴): To make food more colorful.
- **Candle Light** (🕯️): Recording in the soft glow of candlelight.



When you specify “Aperture:Manual” or “Shutter:Manual,” the iSCENE mode is cancelled.
(Manual Aperture/Manual Shutter priority)

Resolution

You can select the resolution of video to be recorded on storage media.

PRECHECK!

Select the record (📹/📷) mode by pressing the **MODE** button. ➡page ??

1. Touch the Menu (MENU) tab → “Resolution” → touch the desired submenu item.
 - You can move to the desired item by touching the </> tab.
2. Touch the (OK) tab or selected submenu item again to complete the setting.
3. To exit the menu, touch the Return (↩) tab.



<Setting video resolution>



<Setting photo resolution>

Submenu items

- **1080/60i (XF)** (📹/📷): Records in the HD (1920x1080/60i) format and at the extreme fine image quality.
- **1080/60i(SF)** (📹/📷): Records in the HD (1920x1080/60i) format and at the super fine image quality.
- **1080/60i(F)** (📹/📷): Records in the HD (1920x1080/60i) format and at the fine image quality.
- **1080/30p** (📹/📷): Records in the HD (1920x1080/30p) format and at the super fine image quality.
- **720/60p** (📹/📷): Records in the HD (1280x820/60p) format and at the super fine image quality.
- **480/60p** (📹/📷): Records in the SD (720x480/60p) format and at the super fine image quality.
- **[10M] 4224x2376 (16:9)** (📷): Records in 16:9 aspect ratio and the 4224x2376 resolution.
- **[5M] 2960x1664 (16:9)** (📷): Records in 16:9 aspect ratio and the 2960x1664 resolution.
- **[3M] 2224x1664 (4:3)** (📷): Records in 4:3 aspect ratio and the 2224x1664 resolution.
- **[2M] 1920x1080 (16:9)** (📷): Records in 16:9 aspect ratio and the 1920x1080 resolution.
- **[VGA] 640x480 (VGA)** (📷): Records in the VGA 640x480 format.



- “60i” indicates the camcorder will record in interlaced scan mode at 60 fields per second.
- “30/60p” indicates the camcorder will record in progressive scan mode at 30/60 frames per second.
- Recorded files are encoded with Variable Bit Rate (VBR). VBR is an encoding system that automatically adjusts the bit rate according to the recording image.
- The recordable time for video and the recordable number of photos depend on the selected resolution. ➡page ??
- Photos that are recorded on your camcorder may not playback properly on other digital devices that do not support these resolution.

advanced recording

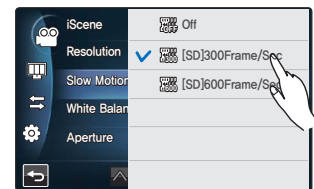
Slow Motion

You can record a video in slow motion. It is useful to record a fast moving subject such as a bird flying in the sky or golf swing and so on to analyze the detailed movement.

PRECHECK!

Select the Video record (📹) mode by pressing the **MODE** button. →page ??

1. Touch the Menu (MENU) tab → “**Slow Motion**” → touch the desired submenu item.
2. To exit the menu, touch the Return (⏪) tab.



Submenu items

- **Off**: Disables the function.
- **[SD] 300Frames/Sec** (📹): Records 300 frames per seconds in the 368x208 resolution.
- **[SD] 600Frames/Sec** (📹): Records 600 frames per seconds in the 192x112 resolution.

Comparison of normal speed video and slow motion video

The number of frames needed to record video is as follows.
When Slow Motion is not set to On: 60 frames per second are recorded.



When Slow Motion is not set to [SD] 300Frame/Sec: 300 frames per second are recorded.



← Video recording time (Per second) →

You can record video of maximum 600 frames per second compared to the normal speed video.



- You can record a video in slow motion for maximum one minute. When recording in slow motion, the recording stops after 1 minute but when you playback the same recording it play back for the following time.
 - 300 Frame/Sec: 5 minutes
 - 600 Frame/Sec: 10 minutes
- Recording does not stop for 10 seconds even if the **Recording start/stop** button is pressed to stop.
- Sound cannot be recorded while recording in slow motion.
- Photos cannot be taken when Slow Motion is in use.
- Menu or Quick Menu are not available while recording in slow motion.
- The image quality of slow motion video may be lower than the normal speed video's.

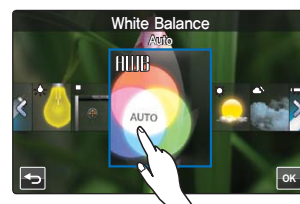
White Balance

The color of your image depends on the type and quality of the light source. If you want the color of your image to be realistic, select an appropriate lighting condition to calibrate the white balance.

PRECHECK!

Select the record (📹/📷) mode by pressing the **MODE** button. →page ??

1. Touch the Menu (MENU) tab → “**White Balance**” → touch the desired submenu item.
 - You can move to the desired item by touching the </> tab.
2. Touch the (OK) tab or selected submenu item again to complete the setting.
3. To exit the menu, touch the Return (↩) tab.



Submenu items

- **Auto**: Controls the white balance automatically depending on the recording conditions.
- **Daylight** (☀️): Controls the white balance according to the outdoor lighting.
- **Cloudy** (☁️): When recording in the shade or cloudy weather.
- **Fluorescent** (💡): When recording under white fluorescent lights.
- **Tungsten** (💡): When recording under halogen lamps and incandescent lights.
- **Custom WB** (🎛️): You can manually adjust the white balance to match the light source or situation.

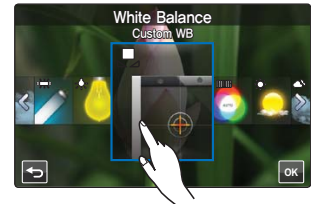
🔍 Understanding White Balance

White balance (WB) is the process of removing unrealistic color casts, so that objects which appear white are rendered white in your image. Proper white balance has to take into account the “color temperature” of a light source, which refers to the relative warmth or coolness of white light.

advanced recording

To set the white balance manually

1. Touch the Menu (MENU) tab → “White Balance” → “Custom WB.”
 - The “(WB) Set White Balance” indicator is displayed.
2. Fill the screen with a white object, and touch the (OK) tab.
 - The white balance setting is stored.
3. To exit the menu, touch the Return (↩) tab.
 - The stored white balance setting will be applied the next time you record.



- When setting the white balance manually, the subject must be white, otherwise, your camcorder may not detect an appropriate setting value.
- The adjusted setting remains until you set the white balance again.
- During normal outdoor recording, setting to “Auto” may provide better results.
- Cancel the digital zoom function for clear and precise setting. →page ??
- Reset the white balance if light conditions change.

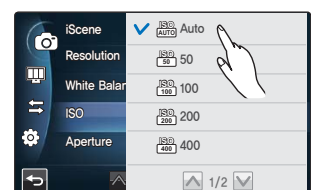
ISO

ISO sensitivity function sets the light sensitivity of the camcorder’s image sensor. A higher ISO setting allows the camcorder to select a higher shutter speed, thus reducing the image-shaking when recording without flash under dimmer conditions since it increases the light sensitivity of the image sensor.

PRECHECK!

Select the Photo record (📷) mode by pressing the **MODE** button. →page ??

1. Touch the Menu (MENU) tab → “ISO” → touch the desired submenu item.
2. To exit the menu, touch the Return (↩) tab.



Submenu items

- **Auto**: Sets Aperture to Auto.
- **50**($\frac{ISO}{50}$): Records in a bright place as a low sensitivity.
- **100**($\frac{ISO}{100}$): Records in a normal situation as a normal sensitivity.
- **200**($\frac{ISO}{200}$): Increases the shutter speed and minimizes noises of the images to record in a dark place.
- **400**($\frac{ISO}{400}$)/**800**($\frac{ISO}{800}$)/**1600**($\frac{ISO}{1600}$)/**2400**($\frac{ISO}{2400}$): Records in a dark place as a high sensitivity. The recorded images may be with noise.



The high sensitivity of ISO values may give images with noise.

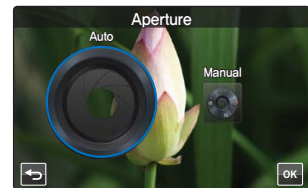
Aperture

The camcorder adjusts the aperture automatically depending on the subject and recording conditions. You can also manually adjust the Aperture to your preference.

PRECHECK!

Select the record (📹/📷) mode by pressing the **MODE** button. →page ??

1. Touch the Menu (MENU) tab → “Aperture” → touch the desired submenu item.
2. Touch the (OK) tab to complete the setting.
3. To exit the menu, touch the Return (↩) tab.



Submenu items

- **Auto:** Sets the aperture value automatically.
- **Manual:** Drag the aperture dial toward the desired direction on the LCD screen to adjust the setting values.
The setting values are as follows:
F1.8, F2, F2.8, F4, F5.6, F8, F11, F16, F22

Understanding Aperture

The aperture value can be adjusted to control the amount of light reaching the image sensor. The aperture value needs to be adjusted in the following cases:

- When shooting against the light or when the background is too bright.
- When shooting on a reflective natural background such as at the beach or when skiing.
- When the background is overly dark (for example, night scenery).



When you specify “Aperture: Manual,” the iSCENE mode is cancelled and “Shutter” is set to “Auto” automatically. (Manual Aperture priority)




advanced recording

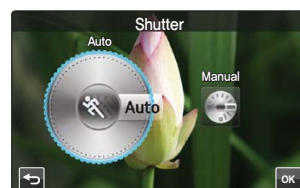
Shutter

The camcorder automatically sets the shutter speed depending on the scene's brightness. You can capture the moment of the fast moving objects or record dynamically the slow moving objects.

PRECHECK!

Select the record ( / ) mode by pressing the **MODE** button. ↪ page ??

1. Touch the Menu () tab → “**Shutter**” → touch the desired submenu item.
2. Touch the () tab to complete the setting.
3. To exit the menu, touch the Return () tab.



Submenu items

- **Auto:** The camcorder automatically sets the appropriate shutter speed value.
- **Manual:** Drag the shutter dial toward the desired direction on the LCD screen to adjust the setting values.
The setting values are as follows:
 - Video: 1/30, 1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1 /10000
 - Photo: 1/4, 1/8, 1/15, 1/30, 1/60, 1/100, 1/250, 1 /500, 1 /1000



- The image may not seem smooth when a high shutter speed is set.
- When recording with a shutter speed of 1/1000 or higher, make sure the sun is not directly shining into the lens.
- When you specify “**Shutter: Manual,**” the iSCENE mode is cancelled and “**Aperture**” is set to “**Auto**” automatically. (Manual Shutter priority)

EV

Depending on the intensity of the ambient light, your videos and photos may be too bright or dark. In these cases, you can adjust the exposure to get a better videos and photos.

PRECHECK!

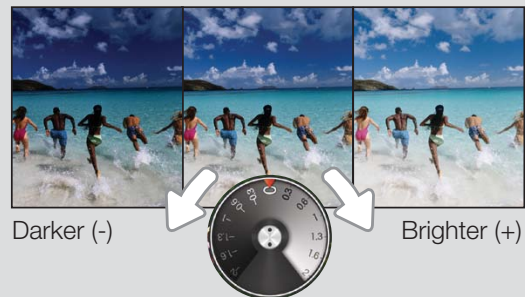
Select the record (📹/📷) mode by pressing the **MODE** button. →page ??

1. Touch the Menu (MENU) tab → “EV.”
2. Drag the exposure value dial toward the desired direction on the LCD screen to adjust the setting values.
 - The setting values are as follows: -2.0 ~ +2.0
3. Touch the (OK) tab to complete the setting.
4. To exit the menu, touch the Return (↩) tab.



Q Understanding EV (Exposure Value)

Exposure value is the total amount of light allowed to fall on the photographic medium (Image sensor) during the process of taking photos or videos as well.



advanced recording

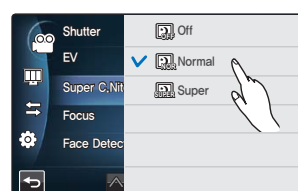
Super C.Nite

The camcorder adjusts the shutter speed to get bright images without losing color when recording a slowly moving subject or in a dark place.

PRECHECK!

Select the Video record (📹) mode by pressing the **MODE** button. ↪page ??

1. Touch the Menu (☰) tab → **“Super C.Nite”** → touch the desired submenu item.
2. To exit the menu, touch the Return (↩) tab.



Submenu items

- **Off:** Disables the function.
- **Normal** (☰): Records to get a brighter image in a dark place by using the shutter speed of 1/30 second.
- **Super** (☰): Records to get a brighter image in a dark place by using the shutter speed of 1/15 second.



You can set the video resolution to 30p only when the Super C.Nite is set to **“Super.”**

For example, if the Super C.Nite is set to **“Super”** with 1080/60i of the resolution, the resolution will be automatically changed to 1080/30p.

- 1080/60i (XF), 1080/60i (SF), 1080/60i (F): Unavailable
- 1080/30p: Available
- 720/60p: Automatically set to 720/30p
- 480/60p: Automatically set to 480/30p