Lumix S1H

Full-Frame Mirrorless Camera and Lens System

Panasonic

Cinematic Performance, Boundless Creativity.

The full-frame camera unlocking creative possibilities for cinematographers.

The LUMIX S1H is a full-frame mirrorless camera for film production,
scaled to a hand-held design without compromising professional-level standards.
It offers extensive recording modes and cinematic image quality to meet the high demands of today's creators.
With superior functionality that slots effortlessly into the professional workflow,
the S1H is also designed for active filming in the field when attached to a gimbal or drone.

The LUMIX S1H combines cinema industry performance, refined by Panasonic,
with the high mobility and functionality of LUMIX mirrorless cameras.

LUMIX S1H

I've always loved full-frame imagery, and now I have the ability to do that in a video format that also shoots 4K 4:2:2 10-bit. It's just a game changer for me. Having a camera that has dual native ISO built in, 640 ISO native and 4,000 native, it allows us to, in any circumstance, wherever we're shooting – capture the images we want. It's been an incredible tool for us.

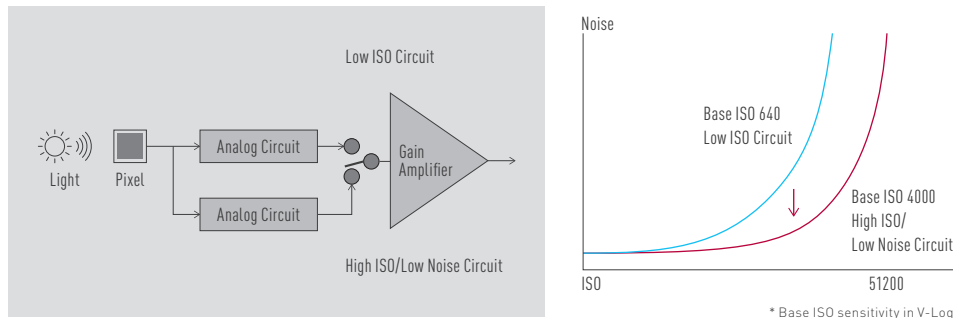Jacob Schwarz

CINEMATOGRAPHY ESSENTIALS

Best Combination of 24.2MP CMOS Sensor and Venus Engine

The LUMIX S1H gives you breathtaking image quality without compromise. By delivering ample light condensation per pixel, the 24.2-megapixel CMOS sensor offers a wide dynamic range and sharp, natural expression even at high sensitivity settings. Together with the low-pass filter, the sensor delivers high resolution with minimal moire. Leveraging the power of the Venus Engine, the camera offers an impressive maximum sensitivity of ISO51200.
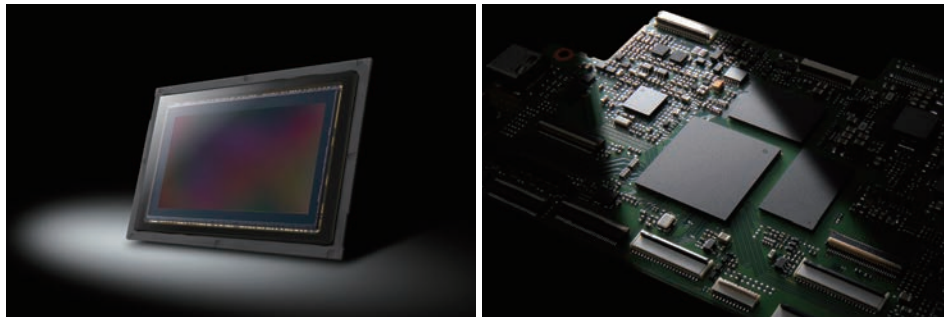
Newly-developed Dual Native ISO

The S1H is equipped with Dual Native ISO sensitivity, a revolutionary technology that first featured on Panasonic's professional video cameras, notably the flagship VariCam. Through a process that reads the sensor more efficiently, Dual Native ISO offers the advantages of very high sensitivity for low-light shoots while suppressing noise levels. As such, the camera can switch from a standard sensitivity to this higher sensitivity with almost no discernible noise degradation. With 640 and 4000 base ISOs in V-Log, the S1H allows today's cinematographers phenomenal flexibility on set when they wish to capture more extreme lighting scenarios.

Low ISO Circuit

Light — Pixel — Analog Circuit / Analog Circuit — Gain Amplifier

High ISO/Low Noise Circuit

Noise

Base ISO 640
Low ISO Circuit

Base ISO 4000
High ISO/
Low Noise Circuit

ISO — 51200

* Base ISO sensitivity in V-Log

Two dedicated circuits are provided for each pixel. Sensitivity is set prior to the gain amplifier. ⟶ High sensitivity noise is reduced.

Multiple Formats and Aspect Ratios with Full Range of Video Recording Modes

Notably, these include full-area 3:2 6K24p, C4K (4,096 x 2,160) and anamorphic modes. The 35 mm full-frame CMOS sensor built into the S1H offers 6,024 x 4,016 effective pixels at stunning 6K resolution across its entire area. This is therefore a full-frame digital camera that, for the first time in the world, achieves video recording at 6K/24p and 5.9K/30p (3:2 or 16:9 aspect ratios respectively).* Even when down-sampling images to C4K (or less) the S1H delivers superior quality resolution. The various formats above can be encoded with superior HEVC compression or the rich tones of 4:2:2 10-bit. High quality data up to 4:2:2 10-bit can also be output via HDMI onto an external video recorder when set to 10-bit recording mode. The HDMI output is enabled simultaneously with the internal recording. The S1H covers every recording mode and option to fully satisfy professional requirements. And as the filtering menu has been streamlined, it is now much easier and faster to find and select the precise mode you want. For quick recall, use the 'My List' feature to register those you use most frequently.

* For a full-frame digital interchangeable lens system camera, as of August 27th, 2019. Panasonic research.

Full-frame   Super35mm

3:2   6K / 5.4K   4:3   4K-A

17:9, 16:9   5.9K / C4K / 4K/FHD   17:9, 16:9   C4K / 4K/FHD

Super35mm Image Circle

Full-frame Image Circle



Filtering Menu   'My List'

V-Log / V-Gamut

The S1H features V-Log / V-Gamut with a wider 14+ stops of dynamic range. This is compatible with the Cinema VariCam Look and precisely captures everything from shadows to highlights, as well as faithfully reproducing the color and texture subtleties of human skin. Designed also for color management consistency, S1H-recorded footage is compatible with V-Log footage recorded on VariCam/AU-EVA1 or S series cameras as well as V-Log L footage shot on the LUMIX GH5/GH5S. The V-Log View Assist enables you to view a simulation of the final look (hue, saturation and brightness) of your video image in camera using the Look Up Table (LUT) while you are shooting. With Look Up Table (LUT) installed on the camera, the video you record with V-Log can be modified to match the characteristics of your monitor display. The VariCam IDT for ACES can also be applied to footage shot on the S1H. 35 conversion LUTs and artistic looks for VariCam® cinema cameras and the AU-EVA1 can be downloaded from Panasonic's official web site.

https://pro-av.panasonic.net/en/cinema_camera_varicam_eva/support/lut/index.html
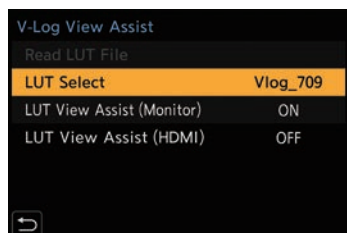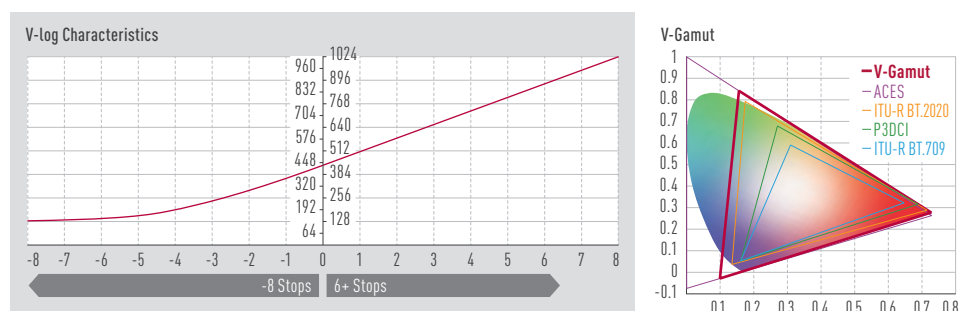
V-Log View Assist
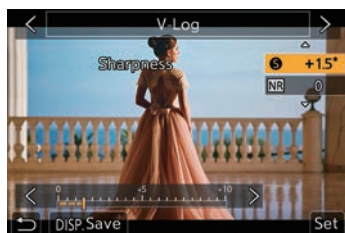
Robust Video Expression Features (VFR, HFR)

From basic functionality to advanced technology, the S1H is designed to offer outstanding, multifaceted video performance. VFR (Variable Frame Rate) functionality supports both overcranking and undercranking. Users have access to 2.5x slow (24p/60 fps) in C4K/4K and 7.5x super-slow (24p/180 fps) in FHD.* HFR (High Frame Rate) videography now includes autofocus and audio recording, allowing users to create slow-motion video in post-production thanks to 48p/47.95p recording in Cinema4K/4K and 120p/100p in FHD.

* The degree of effect varies depending on the recording format and frequency, and the angle of view narrows if a frame rate over
  150 fps is selected.

HDR Video & HLG View Assist

HDR (High Dynamic Range) video recording is available, processing both the brighter and darker parts of an image together, just as the human eye naturally perceives them. The camera also records video with a designated gamma curve compatible with ITU-R BT.2100, as well as offering the option of Hybrid Log Gamma (HLG) in Like2100.
The HLG View Assist output mode allows you to visually confirm the gradation and exposure of video shot in HLG mode, depending on the monitor or viewfinder installed in the camera. It can also be used for stills shot in HLG (HLG Photo mode).

Standard Dynamic Range (SDR)

High Dynamic Range (HDR)

Image Stabilization

The S1H features powerful camera-shake suppression in the body thanks to an algorithm developed by Panasonic that precisely calculates shake information from not only the camera's gyrosensor but also from the image sensor and acceleration sensor. The 5-axis Body I.S. enables an accurate level of correction, even making it possible to use a 6.0-stop slower shutter speed.* Shake suppression is also highly effective even when a cine lens, anamorphic lens, or older lens is attached. Furthermore, 6.5-stop slower shutter speed** can be used thanks to 5-axis Dual I.S.2 stabilization when the Body I.S. is combined with the Optical I.S. of the LUMIX S series lenses. This compensates for even larger movements that were conventionally uncontrollable.

* Based on the CIPA standard [Yaw/Pitch direction: focusing distance f=50mm, when S-X50 is used.]
** Based on the CIPA standard [Yaw/Pitch direction: focusing distance f=105mm when S-R24105 is used or focusing distance
   f=200mm when S-R70200 is used]. Firmware must be updated to the latest version.
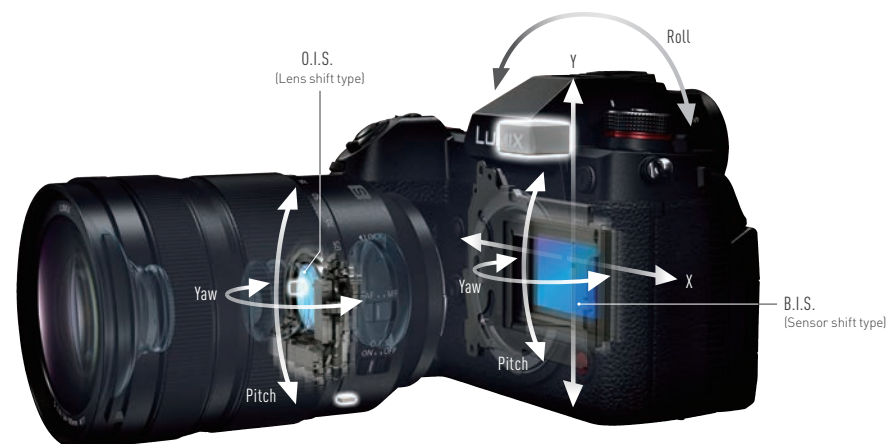
Anamorphic Desqueeze Display

If you are shooting with an anamorphic lens that compresses the image width to an almost unrecognizable extreme, the S1H camera allows you to view a simulation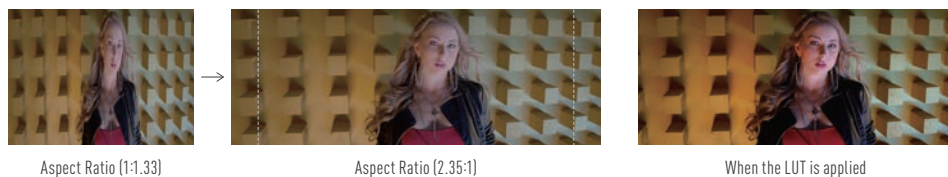 of the final 'desqueezed' CinemaScope format (2.39:1 or 2.35:1), in one of five magnification options, 1.3x, 1.33x, 1.5x, 1.8x or 2.0x, stretched out on the camera monitor. This lets you decide the composition you want, and better visualize the impact of the final project.

Aspect Ratio (1:1.33)   Aspect Ratio (2.35:1)   When the LUT is applied

Time Lapse Video with 4K 60p/50p

The S1H supports interval capture to create time lapse video in the camera body itself and is also capable of 4K 60p/50p, with smooth exposure transitions across the whole video sequence that eliminate abrupt brightness changes. Still photos can also be shot with LIKE709 to save time making color corrections later, and also shot with V-Log for greater workflow flexibility.

SS/ISO, Angle/ISO, SS/dB Display

The shooting information to be displayed can be changed from shutter speed to shutter angle instead, or from ISO to Gain. Panel contents and layout have been designed by carefully considering how professional photographers, filmmakers, and video creators instinctively work from years of experience.

For Still Photographer   For Filmmaker   For Video Creator
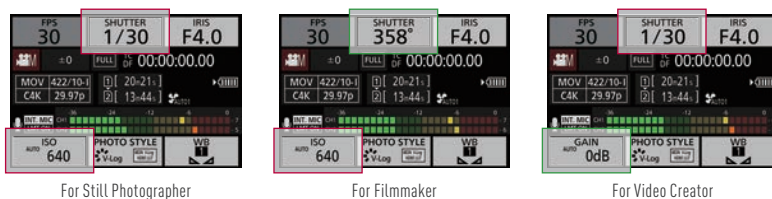
Luminance Level Adjustment

Select the luminance range from 3 settings to match video editing and playback, and control both super whites and super blacks. When recording in 8-bit, set the range to 16-235 (video levels 0 to 100% on IRE scale) or preserve the super whites with 16-255 (video levels 0 to 109% on IRE scale). The third option, 0-255, covers both, also known as Data Levels. These selections make it easy to match luminance levels in projects that combine both photos and video. For 10-bit recording you can select between 0-1023, 64-940 or 64-1023.

- When the recording format is set to AVCHD, the options are 16-235 and 16-255.
- When the recording format is set to MOV or MP4, options are 0-255, 16-235 and 16-255.
- When Photo Style is set to 'Hybrid Log Gamma', the setting is fixed at 64-940.
- When Photo Style is set to 'V-Log', the setting is fixed at 0-255 in 8-bit or at 0-1023 in 10-bit.
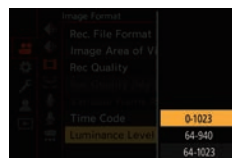
Waveform Monitor Display / Vector Scope

Use these features to easily check the brightness, luminance, hue and saturation (color component and chrominance) while you are shooting. The built-in Waveform Monitor (WFM) quantifies and displays the signals being recorded as visual wave data. This is especially useful for determining correct exposure in situations where relying on the eye alone is not possible, or when needing to comply with a precise broadcast specification. Vector Scope allows you to view and measure waveforms as vectors and check the color phase and saturation on the recording screen. You can instantly judge if you have the right colors or not, and adjust the white balance accordingly. Vector Scope is also useful when you want to match the saturation of multiple pieces of footage.

Waveform Monitor   Vector Scope
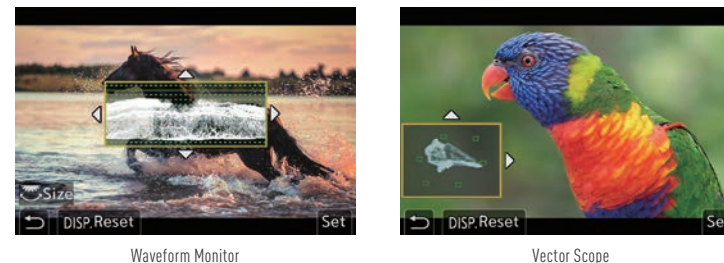
Various Assist Function

The assist functions on the S1H provide powerful support for on-site video shooting, such as adjusting super black or super white, etc.

Luminance Spot Meter: This is useful for checking 18% gray in V-Log recording. The brightness can be displayed numerically.

Zebra Pattern: Image areas brighter than the benchmark value are indicated with stripes. You can also set the benchmark value and range width so that the stripes are only shown within the brightness range you specify. Brightness areas can be set individually with ZEBRA1 and ZEBRA2, and displayed simultaneously.

Video Frame Marker: A frame delineating your selected aspect ratio is displayed on the camera screen. This means that, while recording, you can see the same angle of view that will be achieved when the image is cropped in post-processing.

Segmented File Recording: Longer video takes can be recorded as a series of 1-minute data segments, saved as a single group. Dividing the recording up using this option safeguards against losing data, for example, if the battery were to be accidentally disconnected.

Luminance Spot Meter   Zebra Pattern

I love the color science to this camera. You actually have 14+ stops in 10-bit 4:2:2 which is very correctable. It's very gradeable. Whatever the engineers did is awesome. On top of that, one of the features I really like about the S1H is that it is weather sealed. The camera helped me reach places that I couldn't reach before.
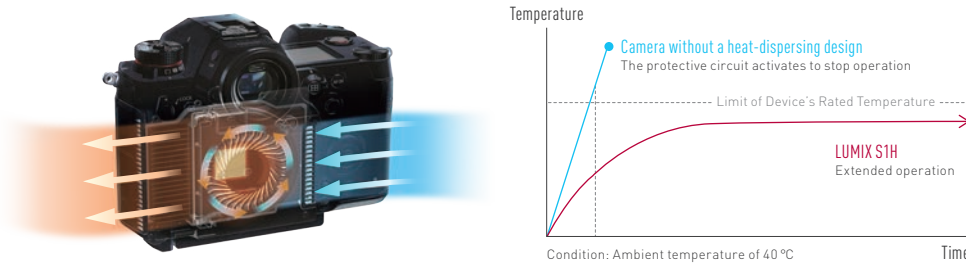
Nick Dabas

SUPERB RELIABILITY

Non-stop Recording Supported by Heat Dispersing Fan

The S1H has unlimited video recording capability for all recording modes within the recommended operating temperatures, (-10°C to 40°C). To dissipate the heat generated by recording non-stop, a highly-effective and independently operating fan is now included within the body — an industry first.* The filmmaker can now concentrate on capturing every minute of the scene without the worry that recording may stop suddenly. The fan is designed for minimal vibration and low noise, operating in four modes to suit the type of shoot and shooting environment and, as with the S1H body overall, is dust- and splash-resistant.**

* For a full-frame digital interchangeable lens system camera, as of August 27th, 2019.
** Dust and splash resistance does not guarantee that damage will not occur if this camera is subjected to direct contact with dust and water.

Temperature

Camera without a heat-dispersing design
The protective circuit activates to stop operation

Limit of Device's Rated Temperature

LUMIX S1H
Extended operation

Condition: Ambient temperature of 40 ℃   Time

Dust / Splash / Freeze Resistant*

The magnesium alloy full die-cast frame is highly durable, while sealing helps protect every seam, dial, and button. The overall system is dust- and splash-resistant.* designed furthermore to operate at temperatures as low as -10°C.

* Dust and splash resistance does not guarantee that damage will not occur if this camera is subjected to direct contact with dust and water.

Double Memory Card Slot

The double memory card slot is compatible with SD Memory Cards (UHS-II / V90). Allocation Record mode allows you to specify the card slot to be used for recording different image formats. The extra card slot is also convenient for recording long videos or as a backup. Relay Recording mode relays recording to the other card slot after the first card runs out of free space during recording. Backup Recording mode* records the same data to the two cards.

* Cannot be used with AVCHD format.

USB Power Supply / Power Charging

This feature allows you to supply power to the camera while charging the battery.* The S1H has been designed with safety considerations and with regard to battery life, charging time and method. The 7.4-V 3,050 mAh high-capacity battery can be quickly charged via USB PD (USB Power Delivery) using the bundled USB 3.1 Type-C** cable. A fully charged battery lasts for about 2 hours, depending on the demands of the shoot. A USB 3.1 Type-C** adaptor is included that is compatible with the USB PD standard. It also realizes high-speed data transfer.

* Battery must be installed in camera and retain some charge for feature to work.
** USB Type-C (TM) and USB-C (TM) are trademarks of USB Implementers Forum.

Durable Shutter & Fast Flash Synchro

The high-precision shutter is designed with increased rigidity and is durable to around 400,000 cycles. It also boasts an external flash sync speed of 1/320 seconds maximum.*

* Guide number decreases at 1/320. Only when set to M mode or S mode.

I'm usually looking can I put the camera low? Can I put it high? Can I put it on a small jib arm? Can I get the camera in interesting and strange places, to maximize its small form factor? The S1H so far has really proven itself to be a really capable shooter. I'm almost thinking of it as the VariCam 'Micro.'

David C. Smith

PERFECT OPERABILITY & AGILITY

New Tilting 3.2-inch Free-angle Rear Monitor

This rear-mounted monitor is a touch-sensitive LCD with a superbly bright 2.33-million-dot high resolution that is still clearly visible in sunny outdoor conditions. The combination of a tilting and swivel mechanism makes unusual compositions and creative angle shots easy to frame. This also avoids the monitor becoming entangled in any connected HDMI or USB cables.

Status LCD

The 1.8-inch high-resolution Status LCD is designed for low power consumption yet high visibility outdoors. The large sub-liquid crystal display offers 303 x 230 dots resolution and instant access to information on the most relevant settings, stills or video, with a black/white switchable background. Backlighting allows you to monitor settings in the dark and even view key data when power is off thanks to the LCD's low-power 'Memory in Pixel'.

5.76-million-dot Resolution Real View Finder

This Real View Finder boasts 5.76-million-dot resolution, the highest level among DSLMs. Clarity and sharpness is so vivid that you may feel you are directly viewing the subject with your own eye. This greatly aids concentration. With a lens designed for minimum distortion from center to the corners and high magnification of 0.78x, the Real View Finder supports both perfect framing and high-precision focusing. The high-speed, high-precision OLED (Organic Light-Emitting Diode) for the LVF achieves a smooth display at 60 fps/120 fps (switchable). A high-speed response with minimum time lag of approximately 0.005 sec, as well as 10,000:1 high contrast, allow exceptional visibility. In addition, the 0.78x magnification ratio can be switched to 0.7x or 0.74x according to the shooting situation.

Convenient Controls, Intuitively Positioned

Fn Buttons: Most of the hard buttons can be assigned to other modes from various options so that you can customize the camera as you wish. Different functions can be set for both recording and for playback.

Sub REC Button: The Sub REC button on the lower camera front, almost opposite the top-located Main Rec button, is positioned for easy left-hand access when your other hand is busy handling a shoulder rig, or gimbal, and can't reach the Main Rec button.

Preview Mode Button: Depress the Preview Mode button to make last moment fine adjustments to the bokeh effect or brightness just before you shoot.

Lock Lever: By flipping the operation lock lever, you can prevent unintentional operation of specific controls, including the cursor (menu/set/control dial), joystick, touch screen and dials (front and rear), etc.

Joystick: The joystick moves freely in eight directions, allowing you to intuitively select the focus area with just your thumb. You can concentrate on your subject more easily and quickly get the shot you want.

Button Illumination: The buttons are illuminated to enable accurate operation in the dark.

Lock Lever   View Finder   Joystick   Fn1 Button

Preview / Fn2 Button   Sub REC Button

There is not one thing that makes a great film. It is the relationship of the parts. Whether it be the script, actors, art direction or equipment – the individual elements complement each other to make something special. I think that is what is exciting about the S1H; here is a small form factor camera with extraordinary ability. The S1H complemented our process with no compromise in quality.

Peter Hamblin

EXPANDABILITY

HDMI Type A & Cable Holder

The S1H includes a versatile and durable HDMI Type A terminal. This comes with a bundled HDMI cable holder which prevents any disconnection mishaps during busy shoots. Conveniently, the camera's rear monitor is a flip-type so the cable and the holder never get in the way of monitor operations.

Time Code IN/OUT

The S1H is fitted with a TC IN/OUT terminal. By setting up TC synchronization – through the flash synchro socket and bundled BNC conversion cable with optional BNC cable – it is easy to carry out non-linear timeline editing of footage shot with multiple cameras. Indeed, TC can be synchronized amongst an external master, S1Hs and other external devices.

Flash synchro socket   BNC conversion cable   BNC cable   External devices
                            (for TC IN/OUT)   (commercially available)
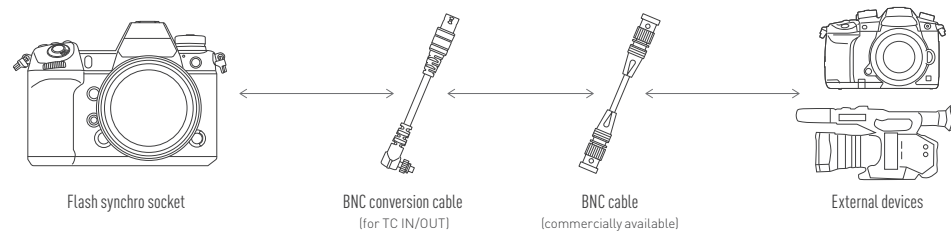
Versatile Sound Setting Functions and Φ3.5mm MIC Jack

Mute Sound Input: This new feature allows the sound input to be muted.

Sound Rec Gain Level: When set to LOW, the sound input can be suppressed for recording in environments where the volume is especially loud, (-12 dB).

Sound Rec Level Adjustment: The input level is adjustable across 32 levels. (-18 dB to +12 dB or mute).

Sound Rec Level Limiter: The S1H automatically adjusts sound input levels, and minimizes any crackling distortion at higher volumes. In addition, when using built-in microphone or external stereo microphone, the Dynamic Range Enhancer, an advanced signal processing algorithm, achieves both low distortion and high sound quality. You can now record far greater presence and reverberation for a more real audio experience. They can be mainly achieved by two processing, one for expanding the audio dynamic range* and the other for dividing the frequency band which suppresses the signal only in the necessary frequency band and leaves the other bands unchanged.

* Approximately twice that of the previous DC-S1 model.

3.5 mm MIC LINE Input: For greater flexibility on video shoots this input makes it possible to record sounds from an external audio device. They are allowed to input MIC or LINE levels by selecting from the mic socket options.

Special Mic: You can set the sound pickup range of the Stereo Shotgun Microphone DMW-MS2. (sold separately)

XLR Mic Adaptor

This accessory allows you to connect an XLR microphone and achieve high-quality stereo sound including high-res sound recording in 96kHz/24 bit. In addition to recording lip-synched vocals, this accessory lets you control volume, gain, low cut, automatic level, and other audio functions useful in professional videography. This accessory also supports the use of plug-in power.

01 LINE/MIC/+48V switch	05 CH 1/2 switch
02 Gain switch	06 ALC switch
03 LOW CUT switch	07 XLR terminal (INPUT 2)
04 AUDIO LEVEL dial	08 XLR terminal (INPUT 1)

Wi-Fi / Bluetooth

Faster 5GHz* and conventional 2.4GHz Wi-Fi® are both supported. Having both bands ensures you always have a stable connection, even in an unstable network environment caused by radio or similar interference. Bluetooth® 4.2 (Bluetooth Low Energy) is supported so you can easily pair with a smartphone or tablet – and with energy saving enabled too. When operating remotely using the installed Panasonic Image App, you stay connected even when on standby to launch your device and always with minimal battery consumption.

* 5GHz Wi-Fi® is not available in some countries.

LUMIX Sync

With Panasonic's dedicated LUMIX Sync app (Android / iOS), you can remotely control the REC button of the S1H and access a wide range of settings from your smartphone or tablet. The software also enables transfer of photos to a smartphone or laptop by just pressing the Q button on the camera rear. Connection by Bluetooth or Wif-Fi is easy. The Wi-Fi 5GHz (IEEE802.11ac) transfers your data at high-speed.* You can even use LUMIX Sync to copy settings from one camera to another,** which is useful when managing multiple cameras in a shoot.

* Direct connection is 2.4 GHz. An access point is needed to connect to smartphone with 5GHz.
** Only between same model cameras.

LUMIX Tether

The LUMIX S Series allows tethered shooting via USB with "LUMIX Tether" PC software. It enables camera control and shooting while checking the image on a large PC screen. Naturally, it supports both video and 6K PHOTO / 4K PHOTO. This greatly assists professional workflows in commercial photoshoots at studios.

The S1H is the first digital mirrorless camera that I feel finally bridges the gap between both individual photographers and filmmakers and the production world. Having a camera that I can just as easily carry in my backpack whilst travelling for photography, or rig up into a full production video shooting set up, is invaluable. The full-frame sensor of the LUMIX S1H with 14-bit RAW photo delivers amazing colour and stunning resolution even in low light scenarios. The freedom to shoot this camera in the way that I want and in the situations I choose, rather than in the way the camera demands allows me to produce work I've never been able to before.

Jacob James

SUPERIOR IMAGE QUALITY EVEN FOR STILL IMAGES

14-bit RAW Photos for Rich Grading

Color depth when recording RAW files corresponds to super-detailed 14-bit. This equates to capturing about 4 times the tonal information possible with 12-bit, (16,384 gradations compared to 4,096). As well as taking beautiful stills with a rich dynamic range of delicate tones and colors, you can prevent gradation jump (tone jump) and overexposures that can occur when correcting an image.
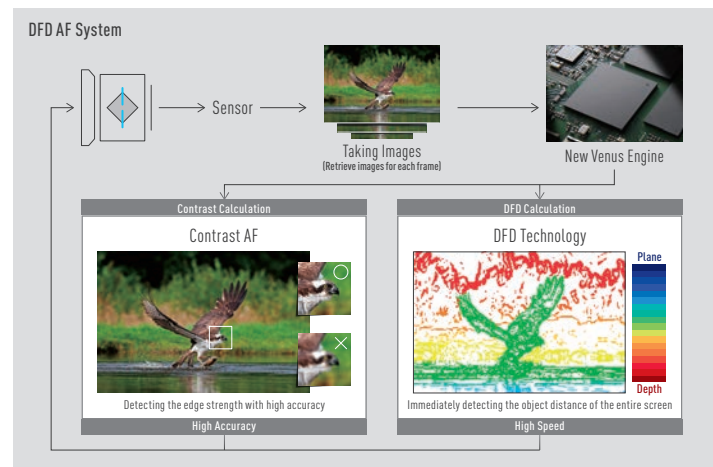
High Resolution Mode

This mode enables ultra-high precision photo shooting. Eight consecutive images are automatically shot while shifting the sensor using the Body I.S. mechanism. These are then synthesized into a 96-megapixel equivalent RAW image. This mode is ideal for taking natural landscapes or works of fine art with delicate details. However, by switching the sub mode, it can also be used in situations where moving subjects are part of the scene.

Fast and Accurate AF at 0.08sec* & Built-in AI Technology

Advanced LUMIX technology provides unified control of the sensor, engine, and lens to deliver high-speed, high-precision focus at every angle. Super-fast sensor-lens communication at a maximum 480 fps and DFD (Depth From Defocus) technology helps achieve high-precision autofocus of approximately 0.08 seconds.* It also incorporates Advanced AI Technology that detects specific subjects – humans and fast-moving animals, including birds, wild dogs and felines. The S1H keeps tracking these subjects even when they turn their back to the camera.

* 11EV, at wide-end with S-R24105 (CIPA) in LVF120 fps setting.

DFD AF System

Sensor → Taking Images (Retrieve images for each frame) → New Venus Engine

Contrast Calculation | DFD Calculation

Contrast AF | DFD Technology

Plane / Depth

Detecting the edge strength with high accuracy | Immediately detecting the object distance of the entire screen

High Accuracy | High Speed

9fps (AFS) / 6fps AFC Burst Shooting

The S1H boasts high speed burst shooting at 9 fps (AFS) / 6 fps (AFC). Together with the camera's high AF tracking performance, you can capture target subjects with almost absolute certainty.

6K PHOTO* / 4K PHOTO

Shoot an extended burst, then choose and extract the specific frames you wish to keep. Using 6K PHOTO* mode at 30 fps you can capture perfect moments at stunningly high resolutions to approx. 18 megapixels.** The ultra-high-speed 4K PHOTO mode at 60 fps freezes even faster motion, a feat utterly impossible in conventional cameras.*** In 6K PHOTO /4K PHOTO, you can choose from three exclusive modes depending on the subject and the predictability of its motion, etc. These are 6K Burst/4K Burst, 6K Burst (Start/Stop)/4K Burst (Start/Stop) and 6K Pre-burst/4K Pre-burst. Select the most suitable of these options, or the regular consecutive shooting mode in full resolution, accordingly.

* 6K PHOTO is a high speed burst shooting function that cuts a still image out from 4:3 or 3:2 video footage with approx.18-megapixel (approx. 6000 x 3000 equivalent effective pixel count).
** Maximum recording time of 10 minutes in 6K PHOTO.
*** Maximum recording time of 15 minutes in 4K PHOTO.

HLG Photo*

HLG Photo mode* supports a new style of photographic enjoyment on the screen of HLG-compliant devices — one in which the rendering of bright light is especially impressive. HSP files,** which compress a high degree of brightness, are displayed as images with breathtaking reproduction of dynamic range and extremely fine gradations of light and dark.

* "HLG (Hybrid Log Gamma)" is an international standard (ITU-R BT.2100) HDR format.
** "HSP" is an HDR picture format using HLG format video technology.
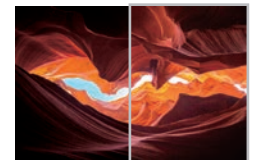
Conventional   HLG Photo

Highlight Weighted Light Metering Mode

The Highlight Weighted Light Metering mode meters light with a priority on highlighted parts to prevent it from washing out.

I.S. Status Scope

The user can consciously remove the cause of shake by checking a pointer that indicates the camera's shaking condition.

S SERIES LENSES DESIGNED FOR ALL CREATORS ⓛ MOUNT

LUMIX S PRO Certified by LEICA
50mm F1.4

The core of the LUMIX S Series of lenses with large aperture

The LUMIX S PRO 50mm F1.4 is a large-aperture fixed focal length lens with all the core elements of the LUMIX S Series. With its versatile 50mm focal length, the wide F1.4 aperture achieves high resolution across the entire image while the lens construction delivers supreme optical performance surpassing even stringent LEICA standards. Delightfully smooth defocus gradation from the focus peak to neighboring image areas achieves beautiful bokeh effects, while suppressed focus breathing assures a rock-solid frame when rack-focusing a video scene. Fast too, the double focus system's combined linear and stepping motor achieves sensor drive speeds up to 480 fps. With a refined design and superb operability this lens is built for high mobility – splash/dust-resistant* and able to withstand harsh conditions down to -10°C.

Product Number	S-X50
Lens Construction	13 elements in 11 groups
Aperture Value	F1.4-F16
Closest Focusing Distance	0.44m / 1.44ft
Maximum Magnification	Approx. 0.15x
Filter Size	Φ77mm
Max. Diameter	Φ90mm / 3.54inch
Overall Length	Approx. 130mm / 5.12inch
Weight	Approx. 955g / 33.69oz

ASPH ED

LUMIX S PRO Certified by LEICA
24-70mm F2.8

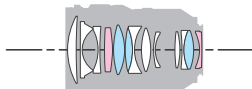### F2.8 aperture and outstanding expression throughout the zoom range and a beautiful bokeh effect

The LUMIX S PRO 24-70mm F2.8 is a large-aperture standard zoom lens delivering highly lifelike images and striking depth. It produces high resolution and high contrast across the entire focal range for landscapes, snapshots, portraits, and more. Indeed, optical performance exceeds even LEICA's professional standards and the lens construction effectively suppresses any chromatic aberration. Adoption of a focus clutch mechanism enables instant AF and MF switching to allow fine adjustments – simply slide the focus ring forward or backward. Soft and beautiful bokeh effects are achieved by smooth defocus gradation throughout the image, while suppressed focus breathing ensures smoother operation when shooting video. The AF sensor speed is fast too, at 480 fps, thanks to a double focus system.
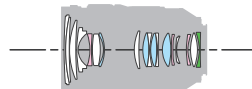
Product Number	S-E2470
Lens Construction	18 elements in 16 groups
Aperture Value	F2.8-F22
Closest Focusing Distance	0.37m / 1.21ft
Maximum Magnification	Approx. 0.25x
Filter Size	Φ82mm
Max. Diameter	Φ90.9mm / 3.58inch
Overall Length	Approx. 140mm / 5.51inch
Weight	Approx. 935g / 32.98oz

ASPH ED UHR

LUMIX S
24-105mm F4 MACRO O.I.S.

Covering the wide-angle to medium telephoto range with macro shot capability

The LUMIX S 24-105mm F4 MACRO O.I.S. is a standard zoom covering wide-angle to medium-telephoto with high performance throughout. In addition, it has a 0.5x macro capability to 0.3m focusing distance (min.). The lens works effectively with Panasonic's 5-axis Dual I.S.2 technology, a stabilization system being used for the first time with a full-frame mirrorless camera system. The Optical Image Stabilizer (O.I.S.) in the lens effectively compensates against camera-shake so you can shoot in low light, or without a tripod, even in telephoto. The high-precision linear motor achieves sensor drive speeds up to 480 fps for super-fast AF, while suppressed focus breathing will be especially appreciated by video creators.
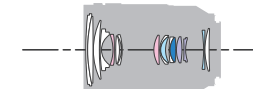
Product Number	S-R24105
Lens Construction	16 elements in 13 groups
Aperture Value	F4.0-F22
Closest Focusing Distance	0.30m / 0.98ft
Maximum Magnification	Approx. 0.5x
Filter Size	Φ77mm
Max. Diameter	Φ84mm / 3.31inch
Overall Length	Approx. 118mm / 4.65inch
Weight	Approx. 680g / 23.99oz

ASPH ED ASPH ED UED

LUMIX S PRO Certified by LEICA

70-200mm F4 O.I.S.

A telephoto zoom lens with high resolution with stunning clarity across the entire zoom range

This LUMIX S PRO 70-200mm F4 O.I.S. telephoto zoom lens provides high-resolution, high-contrast images across the entire zoom range, from portraits to sports. It is compatible with Panasonic's 5-axis Dual I.S.2 stabilization system, now being used with a full-frame mirrorless camera system for the first time. The lens features an Optical Image Stabilizer (O.I.S.) to compensate against camera-shake. This means you can shoot in low light or without a tripod, even at 200mm focal length. Designed for optimum lens alignment, bokeh effects are beautiful with minimal vignetting. The high-precision linear motor achieves sensor drive speeds up to 480 fps and suppressed focus breathing assures stable focus-racking for videos compared to lenses only designed for still photography.
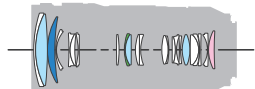
Product Number	S-R70200
Lens Construction	23 elements in 17 groups
Aperture Value	F4.0-F22
Closest Focusing Distance	0.92m / 3.02ft
Maximum Magnification	Approx. 0.25x
Filter Size	Φ77mm
Max. Diameter	Φ84.4mm / 3.32inch
Overall Length	Approx. 179mm / 7.05inch
Weight	Approx. 985g / 34.74oz

ASPH ED UED UHR

TELECONVERTER

Compatible with LUMIX S PRO 70-200mm F4 O.I.S.

DMW-STC14

Product Number	DMW-STC14
Lens Construction	7 elements in 4 groups
Focal Length	1.4x that of the attached lens
Dust and Splash Resistant	Yes*
Max. Diameter	Φ65.3mm / 2.57inch
Overall Length	Approx. 27.6mm / 1.09inch
Weight	Approx. 180g / 6.35oz

DMW-STC20

Product Number	DMW-STC20
Lens Construction	8 elements in 4 groups
Focal Length	2x that of the attached lens
Dust and Splash Resistant	Yes*
Max. Diameter	Φ65.3mm / 2.57inch
Overall Length	Approx. 41.6mm / 1.64inch
Weight	Approx. 230g / 8.11oz

* Dust and splash resistance does not guarantee that damage will not occur if this lens is subjected to direct contact with dust and water.

L MOUNT

UNLIMITED

Expansion of L-Mount Lenses

Over 100 lenses to be available by March 2021, including alliance cine lenses and at least 46 L-Mount lenses.

LUMIX	Leica	SIGMA
11 or more lenses	18 lenses / 37 Cinema lenses*	17 lenses / 13 Cinema lenses*
	*A mount adapter is required.	*A mount adapter is required.

LUMIX S Series Lens Roadmap
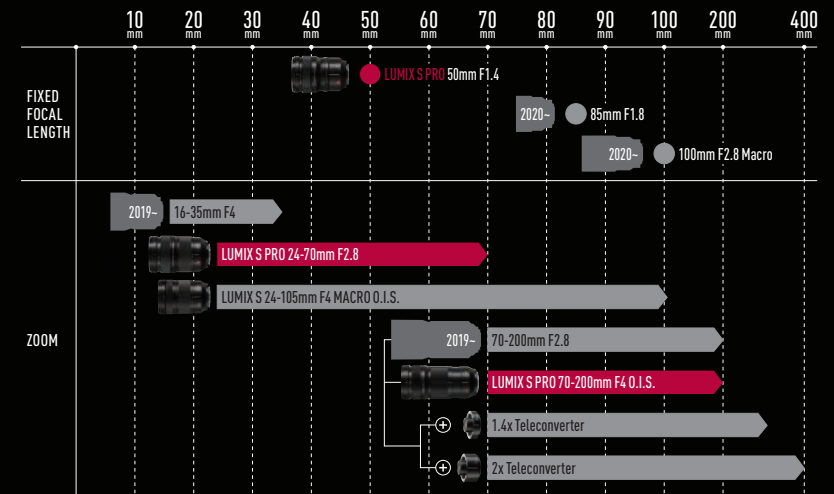
* As of Aug 2019.

An Alliance by Leica SIGMA Panasonic

Discover the possibilities at www.l-mount.com

• LEICA is a registered trademark of Leica Microsystems IR GmbH.
• L Mount is a trademark or registered trademark of Leica Camera AG.

A NEW GENERATION OF VISUAL STORYTELLERS ✕ S1H

Nick Dabas

Nick Dabas is a director of photography based in New York City. Nick's passion for still image photography brought him to filmmaking where the creative process and different techniques of cinematic production piqued his interest. Nick's polished style, and clean visuals have allowed him to make a living in fashion, advertising and music video production. Nick's success has allowed him to establish Paper Bag Media LLC and blessed him with opportunities to make a living doing something he loves.

Carissa Dorson

Carissa Dorson is a cinematographer originally from Silver Spring, Maryland, USA. She learned her craft at Florida State University's College of Motion Picture Arts, and now resides in Los Angeles. She began her career shooting videos for CollegeHumor and Funny or Die, and has since expanded to features, short films, commercials, and music videos. As a cinematographer, her work has appeared at festivals such as Tribeca and Cinequest, and on networks such as Adult Swim and Showtime.

Peter Hamblin

Raised in Durban, South Africa producer/director Peter Hamblin has travelled world-wide and lived in LA, London and Cape Town. He began his career in advertising but was soon drawn to long form film-making. So, in 2009 he started Hamblin Imagery, a UK production company. Peter's career highlights to date include his award-winning sports-action short film "Wright side of Wrong". More recently he wrote, directed and produced "Let's Be Frank" an Emmy award-winning surf movie that brings a fresh style to the genre and exemplifies innovative film-making at its best. Now Peter is working on a short fiction film called "In Hope Of Nothing" about the challenges of film-making.

Alicia Robbins

LA-based director of photography Alicia Robbins received her MFA in Cinematography in 2003. She has shot for TV shows including episodes of Shonda Rhimes' "For the People" (Season 2) and "Grey's Anatomy". In film, she has recently received an Emerging Cinematographer Award for her short "Internet Gangsters" and performed past work on the award-winning romcom, "The Wedding Invitation", "Creed II", "Tag", The Post" and others. She also has credits on two features due for release this year, "Babysplitters" (a Best Narrative winner) and "Forever Not Maybe". In addition to cinematography work, Alicia has been the lead DP at Driving Plates, a company making background footage.

Jacob Schwarz

Jacob Schwarz is an American-based film director and cinematographer. As a visual storyteller, he always "strives to be comfortable with being uncomfortable". He has never been afraid to experiment with new technologies and techniques that help tell stories able to inspire the human spirit. Jacob is fluent in Russian and lived in Siberia for several years. Over the past 5 years he has spent most of his time traveling around the world directing and shooting commercial content.

David C. Smith

David C. Smith is a cinematographer, cinema technologist, CEO and creator of DrivingPlates.com LLC, the world leader in 360 motion environments for driving scenes used in television and films. Recent projects include "Bohemian Rhapsody", "The Post", "The Irishman", "Narcos", "This is Us", and hundreds more. Throughout his career, David has always been a forward-looking technologist and inventor. In service of a creative vision, he has continually innovated the techniques and tools for bringing a story to the screen. With an eye toward the needs of the next generation of content, Smith is pursuing multiple endeavors that promise to impact narrative production for decades to come.

To see their works, please visit;
https://www.panasonic.com/global/consumer/lumix/s/s1h.html
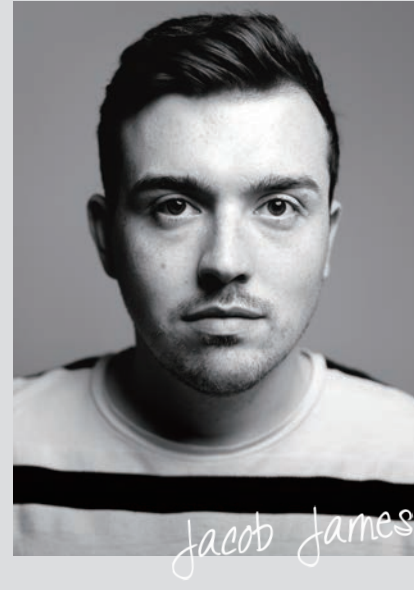
Jacob James

Travel and cultural documentary photographer Jacob James, an ambassador for Panasonic UK, has a passion for immersing himself in new cultures and experiences. His work, he explains, revolves around capturing the human side of life for people across the globe, "Whether the nuances in different cultures that make us all unique, or the simple, instinctual emotions that deep down we all have in common." Aiding Jacob in his work – through which he aims to inspire people "to see the world as a much smaller and more exciting place" – is Panasonic's LUMIX camera range. "I've been amazed at the flexibility and enjoyment I've rediscovered in using LUMIX camera systems," he says.

LUMIX AMBASSADOR

LUMIX
PRO

Panasonic launches LUMIX PRO program, a hub for its LUMIX Professional Services that is designed to satisfy the needs of creative professional and to ensure that they can continue to work, through a range of service and repair benefits, and consistent global support.

For more information about the support registration and qualified products, please visit;
https://lumixpro.panasonic.com/

PARTS & CONTROLS

01 Shoulder strap eyelet
02 Self-timer light/AF assist light
03 Fn button
04 Grip
05 Preview button/Fn button
06 Lens release button
07 Front tally lamp
08 Flash synchro socket / TC IN/OUT
09 Lens fitting mark
10 Lens lock pin
11 Sensor
12 Contact points
13 Mount

14 Screw hole for function expansion
15 Sub video rec. button
16 [REMOTE] socket
17 [MIC] socket
18 Headphone socket
19 USB port
20 [HDMI] socket
21 Fan outlet
22 Stereo microphone
23 Recording distance reference mark
24 Mode dial
25 Mode dial lock button
26 Drive mode dial

27 Hot shoe
28 [LVF] button
29 Speaker
30 [V.MODE] button
31 Camera on/off switch /
   Status LCD backlight button
32 Front dial
33 Shutter button
34 White balance button
35 ISO sensitivity button
36 Exposure compensation button
37 Video rec. button
38 Status LCD

39 Rear dial
40 Battery door
41 Battery door release lever
42 DC Coupler cover
43 Battery grip connector
   (cover for the battery grip connector)
44 Tripod mount/
   Pinhole for video tripod mount
45 Monitor lock lever
46 Operation lock lever
47 Playback button
48 Dioptre adjustment dial
49 Eye sensor

50 Viewfinder
51 Eye cup
52 Eye cup lock lever
53 Rear tally lamp
54 AF mode button
55 Focus mode lever
56 [AF ON] button
57 Joystick/Fn buttons
58 Quick menu button
59 Cursor buttons/Fn buttons
60 Card door lock lever
61 Control dial
62 [MENU/SET] button

63 Card door
64 Card access light
65 Delete button
66 Cancel button
67 [DISP.] button
68 Monitor/Touch screen
69 Card slot 1
70 Card slot 2
71 Fan inlet

L MOUNT

DC-S1H

Standard Accessories

LUMIX S PRO 24-70mm F2.8 S-E2470
LUMIX S PRO 50mm F1.4 S-X50
LUMIX S PRO 70-200mm F4 O.I.S. S-R70200
LUMIX S 24-105mm F4 MACRO O.I.S. S-R24105
Leica / SIGMA Lenses
L-Mount Alliance : www.l-mount.com

1.4x Teleconverter DMW-STC14 Attachable to the S-R70200
2x Teleconverter DMW-STC20 Attachable to the S-R70200

Bundled Software (Download)
LUMIX Tether
PHOTOfunSTUDIO 10.1 PE
SILKYPIX® Developer Studio SE
LoiLoScope Trial Version

Eyecup
Shoulder Strap
BNC Conversion Cable

Battery Grip DMW-BGS1
Battery Pack DMW-BLJ31
Battery Charger DMW-BTC14
AC Adaptor DMW-AC10*1
DC Coupler DMW-DCC16*1

Battery Pack
Cable Holder
Battery Charger AC Adaptor AC Mains Lead
USB Connection Cable (C-C)
USB Connection Cable (A-C)

SD / SDHC / SDXC Memory Card*2

External Flash DMW-FL580L
External Flash DMW-FL360L
External Flash DMW-FL200L
XLR Microphone Adaptor DMW-XLR1
LED Video Light VW-LED1
Stereo Shotgun Microphone DMW-MS2
Stereo Microphone VW-VMS10
Shutter Remote Control DMW-RS2
Eyecup DMW-EC6
Shoulder Strap DMW-SSTG9
Soft Bag DMW-BAG2
HDMI Cable (HDMI TypeA)*3
4KTV / HDTV
Blu-ray Disc™ Player
Personal Computer

*1 The AC Adaptor DMW-AC10 requires the DC coupler DMW-DCC16. The DC coupler DMW-DCC16 requires the AC Adaptor DMW-AC10. *2 "SDXC/SDHC Memory Card compatible with UHS Speed Class 3 (U3)" must be used when recording 6K video (S1H), C4K video (S1H), 4K video, 6K PHOTO, 4K PHOTO and High Speed Video in camera. Use this SD Memory Card for S1H All-Intra 400Mbps mode requiring Video Speed Class V60 or V90. *3 For 6K video (S1H), C4K video (S1H) and 4K video output, use an HDMI cable that has the HDMI logo on it, and that is described as "4K compatible". •The L-Mount Logo mark is a trademark or registered trademark of Leica Camera AG. •The SDXC/SDHC Memory Card can be used only if their logos are indicated on the equipment or in the operation manual. It cannot be used with equipment that supports only the SD Memory Card. •USB Type-C™ and USB-C™ are trademarks of USB Implementers Forum. •Confirm the operation information of compatible lenses at Customer Support http://panasonic.jp/support/global/cs/dsc (English). •Batteries made by other companies which have been certified by Panasonic may be used with these units, but we offer no guarantee as to the quality, performance or safety of such batteries. •Exercise care when purchasing batteries. Many fake or imitation batteries have been found among those sold at unusually low prices and those which customers cannot check for themselves before purchasing. •Please confirm the latest information about batteries on the following website. http://panasonic.jp/support/global/cs/info/battery.html (English).

RECORDING MODES

MOV

FULL						HLG	VFR	59.94Hz	50.00Hz	24.00Hz
6K (3:2)	5952 x 3968	4:2:0 10-bit	LongGOP	HEVC	200Mbps	Yes	-	23.98p	-	24.00p
5.4K (3:2)	5376 x 3584	4:2:0 10-bit	LongGOP	HEVC	200Mbps	Yes	-	29.97p	25.00p	-
5.9K (16:9)	5888 x 3312	4:2:0 10-bit	LongGOP	HEVC	200Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
C4K	4096 x 2160	4:2:2 10-bit	All-Intra	H.264	400Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:2 10-bit	LongGOP	H.264	150Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	-	29.97p / 23.98p	25.00p	24.00p
4K	3840 x 2160	4:2:2 10-bit	All-Intra	H.264	400Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:2 10-bit	LongGOP	H.264	150Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	-	29.97p / 23.98p	25.00p	24.00p
FHD	1920 x 1080	4:2:2 10-bit	All-Intra	H.264	200Mbps	Yes	-	59.94p / 29.97p / 23.98p	50.00p / 25.00p	24.00p
		4:2:0 10-bit	LongGOP	HEVC	150Mbps	Yes	-	119.88p (HFR)	100.00p (HFR)	-
		4:2:2 10-bit	All-Intra	H.264	100Mbps	Yes	-	59.94i	50.00i	-
		4:2:2 10-bit	LongGOP	H.264	100Mbps	Yes	-	59.94p / 29.97p / 23.98p	50.00p / 25.00p	24.00p
		4:2:0 10-bit	LongGOP	HEVC	100Mbps	Yes	-	47.95p (HFR)	-	48.00p (HFR)
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	Yes	59.94p / 29.97p / 23.98p	50.00p / 25.00p	24.00p
		4:2:0 10-bit	LongGOP	H.264	50Mbps	-	-	59.94i	50.00i	-

Super 35mm PIXEL/PIXEL										
C4K	4096 x 2160	4:2:2 10-bit	All-Intra	H.264	400Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:0 10-bit	LongGOP	HEVC	200Mbps	Yes	-	59.94p / 47.95p (HFR)	50.00p	48.00p (HFR)
		4:2:2 10-bit	LongGOP	H.264	150Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:0 8-bit	LongGOP	H.264	150Mbps	-	-	59.94p	50.00p	-
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	Yes	29.97p / 23.98p	25.00p	24.00p
4K	3840 x 2160	4:2:2 10-bit	All-Intra	H.264	400Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:0 10-bit	LongGOP	HEVC	200Mbps	Yes	-	59.94p / 47.95p (HFR)	50.00p	48.00p (HFR)
		4:2:2 10-bit	LongGOP	H.264	150Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:0 8-bit	LongGOP	H.264	150Mbps	-	-	59.94p	50.00p	-
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	Yes	29.97p / 23.98p	25.00p	24.00p
Anamorphic 4K(4:3)	3328 x 2496	4:2:2 10-bit	All-Intra	H.264	400Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:0 10-bit	LongGOP	HEVC	200Mbps	Yes	-	47.95p (HFR)	50.00p	48.00p (HFR)
		4:2:2 10-bit	LongGOP	H.264	150Mbps	Yes	-	29.97p / 23.98p	25.00p	24.00p
		4:2:0 8-bit	LongGOP	H.264	150Mbps	-	-	-	50.00p	-
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	Yes	29.97p / 23.98p	25.00p	24.00p
FHD	1920 x 1080	4:2:2 10-bit	All-Intra	H.264	200Mbps	Yes	-	59.94p / 29.97p / 23.98p	50.00p / 25.00p	24.00p
		4:2:0 10-bit	LongGOP	HEVC	150Mbps	Yes	-	119.88p* (HFR)	100.00p* (HFR)	-
		4:2:2 10-bit	All-Intra	H.264	100Mbps	Yes	-	59.94i	50.00i	-
		4:2:2 10-bit	LongGOP	H.264	100Mbps	Yes	-	59.94p / 29.97p / 23.98p	50.00p / 25.00p	24.00p
		4:2:0 10-bit	LongGOP	HEVC	100Mbps	Yes	-	47.95p (HFR)	-	48.00p (HFR)
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	Yes**	59.94p / 29.97p / 23.98p	50.00p / 25.00p	24.00p
		4:2:2 10-bit	LongGOP	H.264	50Mbps	Yes	-	59.94i	50.00i	-

* Only when Super 35mm is selected.   ** Only when Super 35mm is selected at 59.94/50.00p.

MP4

FULL						HLG	VFR	59.94Hz	50.00Hz
4K	3840 x 2160	4:2:0 10-bit	LongGOP	HEVC	72Mbps	Yes	-	29.97p / 23.98p	25.00p
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	-	29.97p / 23.98p	25.00p
FHD	1920 x 1080	4:2:0 8-bit	LongGOP	H.264	28Mbps	-	-	59.94p	50.00p
		4:2:0 8-bit	LongGOP	H.264	20Mbps	-	-	29.97p	25.00p
		4:2:0 8-bit	LongGOP	H.264	24Mbps	-	-	23.98p	-
Super 35mm PIXEL/PIXEL									
4K	3840 x 2160	4:2:0 10-bit	LongGOP	HEVC	100Mbps	Yes	-	59.94p	50.00p
		4:2:0 10-bit	LongGOP	HEVC	72Mbps	Yes	-	29.97p / 23.98p	25.00p
		4:2:0 8-bit	LongGOP	H.264	100Mbps	-	-	29.97p / 23.98p	25.00p
FHD	1920 x 1080	4:2:0 8-bit	LongGOP	H.264	28Mbps	-	-	59.94p	50.00p
		4:2:0 8-bit	LongGOP	H.264	20Mbps	-	-	29.97p	25.00p
		4:2:0 8-bit	LongGOP	H.264	24Mbps	-	-	23.98p	-

AVCHD / AVCHD Progressive

FULL / Super 35mm PIXEL/PIXEL						HLG	VFR	59.94Hz	50.00Hz
FHD	1920 x 1080	4:2:0 8-bit	LongGOP	AVCHD / AVCHD Progressive	28Mbps	-	-	59.94p (59.94fps)	50.00p (50.00fps)
		4:2:0 8-bit	LongGOP		17Mbps	-	-	59.94i (59.94fps)	50.00i (50.00fps)
		4:2:0 8-bit	LongGOP		24Mbps	-	Yes	59.94i (29.97fps) / 23.98p (23.98fps)	50.00i (25.00fps)

SPECIFICATIONS

TYPE	Type			Digital Single Lens Mirrorless camera
	Recording media			SD Memory Card / SDHC Memory Card* / SDXC Memory Card* *Compatible with UHS-I/UHS-II UHS Speed Class 3 standard SDHC/SDXC Memory Cards and UHS-II Video Speed Class 90 standard SDXC Memory Cards.
	Lens mount			L-Mount
IMAGE SENSOR	Type			35mm full-frame (35.6mm x 23.8mm) CMOS sensor
	Camera effective pixels / Total pixels			24.20 megapixels / 25.28 megapixels
	Aspect ratio / Color filter			3:2 / Primary color filter
	Dust reduction system			Supersonic wave filter
LATITUDE				14+ stops (V-Log)
STILL IMAGE	Recording file format	Still image		JPEG (DCF, Exif 2.31), RAW, HLG Photo (CTA-2072)
		6K PHOTO*** / 4K PHOTO***		6K PHOTO: MP4 (H.265/HEVC, Audio format: AAC (2ch)) 4K PHOTO: MP4 (H.264/MPEG-4 AVC, Audio format: AAC (2ch)) Extracted still images: JPEG (DCF, Exif 2.31)
	Aspect ratio			4:3 / 3:2 / 16:9 / 1:1 / 65:24 / 2:1
	File size (Pixels)	When using full-frame lenses	3:2	6000x4000(L) / 4272x2848(M) / 3024x2016(S) / 12000x8000(XL)* *High Resolution Mode. RAW file. 5184x3456(6K PHOTO) / 3504x2336(4K PHOTO) / 5984x4000(HLG PHOTO, Full-Res.) / 3232x2160(HLG PHOTO, 4K-Res.)
			4:3	5328x4000(L) / 3792x2848(M) / 2688x2016(S) / 10656x8000(XL)* *High Resolution Mode. RAW file. 4992x3744(6K PHOTO) / 3328x2496(4K PHOTO) / 5312x3984(HLG PHOTO, Full-Res.) / 2880x2160(HLG PHOTO, 4K-Res.)
			16:9	6000x3368(L) / 4272x2400(M) / 3024x1704(S) / 12000x6736(XL)* *High Resolution Mode. RAW file. 3840x2160(4K PHOTO) / 5888x3312(HLG PHOTO, Full-Res.) / 3840x2160(HLG PHOTO, 4K-Res.)
			1:1	4000x4000(L) / 2848x2848(M) / 2016x2016(S) / 8000x8000(XL)* *High Resolution Mode. RAW file. 2880x2880(4K PHOTO) / 4000x4000(HLG PHOTO, Full-Res.) / 2144x2144(HLG PHOTO, 4K-Res.)
			65:24	6000x2208(L)
			2:1	6000x3000(L)
		When using Super 35mm (APS-C) lenses	3:2	3888x2592(L) / 2784x1856(M) / 1968x1312(S) / 3504x2336(4K PHOTO)
			4:3	3536x2656(L) / 2560x1920(M) / 1840x1376(S) / 3328x2496(4K PHOTO)
			16:9	4064x2288(L) / 2816x1584(M) / 1920x1080(S) / 3840x2160(4K PHOTO)
			1:1	2656x2656(L) / 1920x1920(M) / 1376x1376(S) / 2880x2880(4K PHOTO)
	Image quality			RAW / RAW+Fine / RAW+Standard / Fine / Standard
	Color space			sRGB, AdobeRGB
MOTION PICTURE	Recording file format			MOV: H.264/MPEG-4 AVC, H.265/HEVC (Audio format: LPCM (2ch 48kHz/16-bit, 48kHz/24-bit*, 96kHz/24-bit*)) *When attaching DMW-XLR1 (sold separately). MP4: H.264/MPEG-4 AVC, H.265/HEVC (Audio format: AAC (2ch)) AVCHD Progressive, AVCHD (Audio format: Dolby Audio (2ch))
	System frequency			59.94Hz / 50.00Hz / 24.00Hz
	Continuous recordable time (Motion picture)***			AVCHD [FHD/60p]: Approx. 160 min (Full-frame), 140 min (Super 35mm), 150 min (Pixel by Pixel) MP4 [4K/60p]: Approx. 120 min (Super 35mm, Pixel by Pixel) MOV [C4K/24p/4:2:2 10-bit/ALL-Intra]: Approx. 130 min (Full-frame, Super 35mm, Pixel by Pixel) *When using S-R24105. When the battery is fully charged.
	Actual recordable time (Motion picture)***			AVCHD [FHD/60p]: Approx. 80 min (Full-frame), 70 min (Super 35mm), 75 min (Pixel by Pixel) MP4 [4K/60p]: Approx. 60 min (Super 35mm, Pixel by Pixel) MOV [C4K/24p/4:2:2 10-bit/ALL-Intra]: Approx. 65 min (Full-frame, Super 35mm, Pixel by Pixel) *When using S-R24105. When the battery is fully charged.
VIEWFINDER	Type			OLED Live View Finder
	Pixels			Approx. 5.76 million dots
	Field of view / Magnification			Approx. 100% / Approx. 0.78x with 50 mm lens at infinity; -1.0 m⁻¹, when the aspect ratio is set to 3:2
	Eye point / Diopter adjustment			Approx. 21 mm at infinity; -1.0 m⁻¹ / -4.0 - +2.0 (dpt)
	Eye sensor			Yes
	Display speed			120 fps / 60 fps
	Display time lag			Approx. 0.005 sec
REAR MONITOR	Type			TFT LCD monitor with static touch control
	Monitor size			Tilt free-angle, 3.2-inch (8.0cm), 3:2 aspect
	Pixels			Approx. 2.33 million dots
	Field of view			Approx. 100%
STATUS LCD				1.8-inch, 303 x 230 dots (effective pixels 287 x 214 dots), Monochrome LCD monitor
FOCUS	Type			Contrast AF system
	DFD technology			Yes
	Focus mode			AFS (Single) / AFC (Continuous) / MF
	AF mode			Auto Detection (Face, Eye, Body, Animal) / Tracking / 225-Area / Zone (Vertical/Horizontal) / Zone (Square) / Zone (Oval) / 1-Area+ / 1-Area / Pinpoint / Custom 1, 2, 3 (Full area touch is available) (Scalable AF frame size and flexible AF position)
	AF detective range			EV -6 - 20 (F1.4, ISO100 equivalent, AFS)
	AF custom setting			AF Sensitivity, AF Area Switching Sensitivity, Moving Object Prediction
	AF assist lamp			Yes
	AF lock			Set the Fn button in custom menu to AF lock

	Post Focus / Focus Stacking			Yes / Yes
	Others			AF-ON, Shutter AF, Half Press Release, Focus/Shutter Priority, Quick AF, Continuous AF (during motion picture recording), Eye Sensor AF, AF-Point Scope Setting, AF+MF, MF Guide, MF Assist, Touch MF Assist, Focus Peaking, Touch AF/AE Function, Touch Pad AF, Touch Shutter, Focus Switching for Vert./Hor., Focus Ring Lock, Show/Hide AF Mode, 1-Area AF Moving Speed, Loop Movement Focus Frame, AFC Start Point (225-Area), Lens Focus Resume, Focus Ring Control
EXPOSURE CONTROL	Light metering system			1,728-zone multi-pattern sensing system
	Light metering mode			Multiple / Center Weighted / Spot / Highlight Weighted
	Metering range			EV0-18 (F2.0 lens, ISO100 equivalent)
	Exposure mode			Program AE / Aperture Priority AE / Shutter Priority AE / Manual Exposure
	ISO sensitivity (Standard output sensitivity)			Auto / 50* / 100 / 200 / 400 / 800 / 1600 / 3200 / 6400 / 12800 / 25600 / 51200 / 102400* / 204800* (Changeable to 1/3 EV step) *Extended ISO
	Dual Native ISO	Normal		Native ISO: 100, 640 Auto: Auto / 50* / 100-51200 / 102400* / 204800* Low: Auto / 50* / 100-800 High: Auto / 320* / 640-51200 / 102400* / 204800* *Extended ISO
		V-Log		Native ISO: 640, 4000 Auto: Auto / 320* / 640-51200 Low: Auto / 320* / 640-5000 High: Auto / 2000* / 4000-51200 *Extended ISO
		HLG		Native ISO: 400, 2500 Auto: Auto / 400-51200 / 102400* / 204800* Low: Auto / 400-3200 High: Auto / 2500-51200 / 102400* / 204800* *Extended ISO
		Cinelike D2 / Cinelike V2		Native ISO: 200, 1250 Auto: Auto / 100* / 200-51200 / 102400* / 204800* Low: Auto /100* / 200-1600 High: Auto / 640* / 1250-51200 / 102400* / 204800* *Extended ISO
	Exposure compensation			1/3 EV step ±5EV (±3EV for motion picture)
	AE lock			Set the Fn button in custom menu to AE lock
IMAGE STABILIZATION SYSTEM				Image sensor shift type (5-axis / 6.0-stop*) *Based on the CIPA standard (Yaw/Pitch direction: focusing distance f=50mm when S-X50 is used.) Dual I.S. (6.5-stop*) Dual I.S. 2 compatible) *Based on the CIPA standard (Yaw/Pitch direction: focusing distance f=105mm when S-R24105** is used. focusing distance f=200mm when S-R70200** is used.) **Firmware must be updated to the latest version.
WHITE BALANCE	White balance			AWB / AWBc / AWBw / Daylight / Cloudy / Shade / Incandescent / Flash / White Set 1, 2, 3, 4 / Color temperature setting 1, 2, 3, 4
	White balance adjustment			Blue/Amber bias, Magenta/Green bias
	Color temperature setting			2500-10000K in 100K
SHUTTER	Type			Focal-plane shutter
	Shutter speed			Still image: Bulb (Max. 30 minutes), 1/8,000 - 60 Electronic front curtain shutter: Bulb (Max. 30 minutes), 1/2,000 - 60 Electronic shutter: Bulb (Max. 60 sec), 1/8,000 - 60 Motion picture: 1/16,000 - 1/25 Creative Video M mode / MF mode: 1/16,000 - 1/2
	Shutter life			Approx. 400,000 images
	Self timer			10 sec, 3 images / 2 sec / 10 sec
	Remote control			Remote control by DMW-RS2 (sold separately)
	Silent mode / Shutter type			Yes / Yes (Auto / Mechanical / Electronic front curtain / Electronic / Electronic+NR)
BRACKET	AE bracket			3, 5, 7 images in 1/3, 2/3 or 1 EV step, max. ±3 EV, single/burst
	Aperture bracket			3, 5 or all positions in 1 EV step
	Focus bracket			1 to 999 images, focus steps can be set in 10 levels
	White balance bracket			3 images in blue/amber axis or in magenta/green axis, color temperature setting
BURST SHOOTING	Burst speed	Mechanical shutter / Electronic front curtain shutter		AFS/MF: H: 9 frames/sec, M: 5 frames/sec (with Live View), L: 2 frames/sec (with Live View) AFC: H: 6 frames/sec (with Live View), M: 5 frames/sec (with Live View), L: 2 frames/sec (with Live View)
		Electronic shutter		AFS/MF: H: 9 frames/sec, M: 5 frames/sec (with Live View), L: 2 frames/sec (with Live View) AFC: H: 5 frames/sec (with Live View), M: 5 frames/sec (with Live View), L: 2 frames/sec (with Live View)
	Number of recordable images			RAW / RAW+JPEG: More than 60 images JPEG: More than 999 images (When using a card with SD Speed Class with "UHS-II UHS Speed Class 3 (U3)".) * Until the burst shooting speed slows. When recording is performed under the test conditions specified by Panasonic.
6K PHOTO*** / 4K PHOTO***	Burst speed			6K PHOTO: 30 frames/sec 4K PHOTO: 60 frames/sec, 30 frames/sec
	Exif information			Yes (Each JPEG image cropped out of the 6K/4K burst file complies with EXIF.)
FLASH	Flash type			TTL External Flash (sold separately)
	Flash mode			Auto* / Auto/Red-eye Reduction* / Forced On / Forced On/Red-eye Reduction / Slow Sync. / Slow Sync./Red-eye Reduction / Forced Off *For iA only.
	Flash synchronization			1st Curtain Sync, 2nd Curtain Sync.
	Flash output adjustment			1/3EV step ±3EV
	Synchronization speed			Less than 1/320 second *The guide number decreases at 1/320 second. Only when set to M mode or S mode.
	Wireless control			Yes (When using DMW-FL200L / FL360L / FL580L (sold separately)), Wireless Channel: 1ch/2ch/3ch/4ch
	Flash sync socket			Yes

EXTRA TELE CONVERSION			2.0x (EX S) (When using full-frame lenses), 1.9x (EX S) (When using Super 35mm (APS-C) lenses), 1.4x (EX M) *Only for still image recording.
PHOTO STYLE	Photo Style		Standard / Vivid / Natural / Flat / Landscape / Portrait / Monochrome / L. Monochrome / L. Monochrome D / Cinelike D2 / Cinelike V2 / Like709 / V-Log / Standard (HLG) / Monochrome (HLG) / Like2100 / My Photo Style 1-10
	Picture adjustment		Contrast / Highlight / Shadow / Saturation / Color Tone / Hue / Filter Effect / Grain Effect / Sharpness / Noise Reduction / Dual Native ISO Setting / ISO / WB *Adjustable settings vary depending on the Photo Style mode.
FILTER			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* *For photos only.
MOTION PICTURE FUNCTION	Master pedestal level		31 steps
	Luminance level		8-bit: 0-255 / 16-235 / 16-255 10-bit: 0-1023 / 64-940 / 64-1023
	Wave form monitor / Vectorscope		Selectable
	LUT display		LUT View Assist (Monitor) / LUT View Assist (HDMI)
	Synchro scan		Yes
	Time code		Count Up: Rec Run/Free Run selectable, Time Code Mode: Drop frame/Non-drop frame selectable (When system frequency [59.94Hz] is selected.)
	SS/Gain operation		Shutter Duration/ISO / Angle/ISO / Shutter Duration/dB
	Color bars / 1kHz test tone		Yes (SMPTE / EBU / ARIB) / Yes
	Knee control		Yes (in Like709 mode)
FUNCTION BUTTON	REC		Exposure Comp. / Dual Native ISO Setting / Sensitivity / White Balance / Photo Style / Metering Mode / Aspect Ratio / Picture Quality / Picture Size / HLG Photo / High Resolution Mode / 1 Shot Spot Metering / Long Exposure NR / Min. Shutter Speed / 1 Shot RAW+JPG / i.Dynamic Range / Filter Effect / One Push AE / Touch AE / Exposure Mode / Synchro Scan / AF Mode / AF Custom Setting(Photo) / AF Custom Setting(Video) / Focus Peaking / Focus Peaking Sensitivity / 1-Area AF Moving Speed / Focus Ring Lock / AE LOCK / AF LOCK / AF/AE LOCK / AF-ON / AF-ON: Near Shift / AF-ON: Far Shift / AF-Point Scope / Focus Area Set / Flash Mode / Flash Adjust. / Wireless Flash Setup / Drive Mode / 1 Shot "6K/4K PHOTO" / Bracketing / Silent Mode / Image Stabilizer / Shutter Type / Ex. Tele Conv. / Flicker Decrease (Photo) / Post-Focus / Motion Pic. Rec Format / Motion Pic. Rec Quality / Rec Quality (My List) / Variable Frame Rate / Time Code Display / Sound Rec Level Disp. / Mute Sound Input / Sound Rec Level Adj. / Sound Rec Level Limiter / XLR Mic Adaptor Setting / Mic. Directivity Adjust / Image Stabilizer / E-Stabilization (Video) / Boost I.S. (Video) / Image Area of Video / Focus Transition / Live Cropping / Q.MENU / Rec / Playback Switch / Video Record / LVF/Monitor Switch / LVF Magnification / Dial Operation Switch / Preview / Constant Preview / Level Gauge / Histogram / Luminance Spot Meter / Video Frame Marker / Photo Grid Line / Live View Boost / Monochrome Live View / Night Mode / LVF/Monitor Disp. Style / Video-Priority Display / Status-LCD Display (Video) / Zebra Pattern / LUT View Assist (Monitor) / LUT View Assist (HDMI) / LUT Select / HLG View Assist(Monitor) / HLG View Assist (HDMI) / Sheer Overlay / I.S. Status Scope / WFM/Vector Scope / Anamorphic Desqueeze Display / Color Bars / Focus Ring Control/ Zoom Control / Destination Card Slot / Wi-Fi / Fan Mode / No Setting / Restore to Default
	PLAY		Magnify from AF Point / LUT View Assist (Monitor) / HLG View Assist (Monitor) / Anamorphic Desqueeze Display / RAW Processing / 6K/4K PHOTO Bulk Saving / Delete Single / Protect / Rating 1, 2, 3, 4, 5 / Copy / Rec/ Playback Switch / LVF/Monitor Switch / Video Record / Night Mode / Card Slot Change / Wi-Fi / Fan Mode / Send Image (Smartphone) / LUT View Assist (HDMI) / HLG View Assist (HDMI) / 6K/4K Photo Play / No Setting / Restore to Default
LEVEL GAUGE			Yes
PRINT			PictBridge compatible
INTERFACE	USB		SuperSpeed USB 3.1 Gen1 Type-C
	HDMI****	Monitor-through	4:2:2 10bit (When [Rec Quality] is set to [4:2:2 10bit] or [4:2:0 10bit].) 4:2:2 8bit (When [Rec Quality] is set to [4:2:0 8bit].) Info Display: ON / OFF (selectable) Down Convert: Auto / 4K/30p/25p / 1080p / 1080i / OFF HLG View Assist (HDMI): AUTO / MODE1 / MODE2 / OFF (selectable)
		Playback	HDMI TypeA / VIERA Link, Audio: Stereo 59.94Hz: Auto / C4K/60p / C4K/30p / 4K/60p / 4K/30p / 1080p / 1080i / 720p / 480p 50.00Hz: Auto / C4K/50p / C4K/25p / 4K/50p / 4K/25p / 1080p / 1080i / 720p / 576p 24.00Hz: Auto / C4K/24p / 4K/24p / 1080p
	Remote input		Φ2.5mm
	External microphone / external audio device input		Φ3.5mm for external microphone / external audio device MIC (Plug-in Power) / MIC / LINE is selectable. Stereo/Lens Auto/Shotgun/Super Shotgun/Manual is selectable when attaching DMW-MS2 (sold separately).
	Headphone output		Φ3.5mm
	Microphone		Stereo, Wind Noise Canceller: OFF / Low* / Standard / High *When attaching DMW-MS2 (sold separately).
	XLR microphone		Yes with DMW-XLR1 (sold separately)
	Speaker		Monaural
	High-res audio recording		Yes with DMW-XLR1 (sold separately)
	SD card slot		Slot 1, Slot 2
	TC IN/OUT		Yes with BNC Converter Cable (bundled)
	Fan		Auto1 / Auto2 / Normal / Slow
	Tally lamp		Yes (front/rear)

WIRELESS	Wi-Fi		2.4GHz (STA/AP) (IEEE802.11b/g/n) 5GHz (STA) (IEEE 802.11a/n/ac) *5GHz Wi-Fi is not available in some countries.
	Bluetooth		Bluetooth® v4.2 (Bluetooth Low Energy (BLE))
DUST AND SPLASH RESISTANT*			Yes. *Dust and Splash Resistant does not guarantee that damage will not occur if this camera is subjected to direct contact with dust and water.
POWER	Battery		Li-ion Battery Pack (7.4V, 3050mAh, 23Wh) (bundled) USB power supply, USB power charging
	Battery life (CIPA standard)		Approx. 400 images (rear monitor), 380 images (LVF), 1,150 images (Power Save LVF mode*) with S-R24105 *Under the test conditions specified by Panasonic based on CIPA standard. When the time to get in the sleep mode is set to 1 sec.
	Battery grip		DMW-BGS1 (sold separately)
DIMENSIONS / WEIGHT	Dimensions (W x H x D)		Approx. 151.0 x 114.2 x 110.4 mm / 5.94 x 4.50 x 4.35 inch (excluding protrusions)
	Weight		Approx. 1,164g / 2.57 lb (SD Memory Card x 1, Battery, Body) Approx. 1,052g / 2.32 lb (Body only)
OPERATING ENVIRONMENT	Operating temperature*****		-10°C to 40°C (14°F to 104°F)
	Operating humidity		10%RH to 80%RH
STANDARD ACCESSORIES	Software	Recording	LUMIX Tether • This software is used to control a Panasonic digital camera from a PC. It allows you to change various settings of the camera, perform remote recording, and save remotely recorded images to the PC. Check the site below to download and install the software. http://panasonic.jp/support/global/cs/soft/download/d_lumixtether.html (For Windows / Mac)
		Playback / Editing	• The software to edit and playback images on computer is not bundled with this camera. To do this, PHOTOfunSTUDIO 10.1PE is available for download at Panasonic website using computer connected to the Internet. https://panasonic.jp/support/global/cs/soft/download/d_pfs1001pe.html(For Windows) • The software to process RAW file on computer is not bundled with this camera. To do this, SILKYPIX Developer Studio is available for download at Ichikawa Soft Laboratory's website using computer connected to the Internet. http://www.isl.co.jp/SILKYPIX/english/p/ (For Windows / Mac)
	Standard accessories		Body Cap, Hot Shoe Cover, Eye Cup, Flash Synchro Socket Cap, Cover for the Battery Grip Connector, Shoulder Strap, Battery Pack, Battery Charger, AC Adaptor, AC Mains Lead, USB Connection Cable (C-C), USB Connection Cable (A-C), BNC Converter Cable, Cable Holder • The DC-S1H Operating Instructions for advanced features is available for downloaded at Panasonic LUMIX Customer Support Site using PC, smartphone or tablet connected to the Internet.

*** About motion picture recording / 6K PHOTO/4K PHOTO recording;
- 6K PHOTO is a high speed burst shooting function that cuts a still image out of a 4:3 or 3:2 video footage with approx. 18-megapixel (approx. 6000 x 3000 equivalent effective pixel count) that the 6K image manages.
- Use a card with SD Speed Class with "Class 4" or higher when recording motion pictures in [AVCHD] or [MP4(under 28Mbps)].
- Use a card with SD Speed Class with "UHS-I / UHS-II UHS Speed Class 3 (U3)" when recording motion pictures with [MP4] in [4K], [MOV], [VFR], [6K PHOTO] or [4K PHOTO]. (SD speed class is the speed standard regarding continuous writing.)
- Video Speed Class 60 or higher is required for ALL-Intra 400Mbps recording. Use of SD Memory Card with Video Speed Class 60 or higher is recommended for C4K/4K ALL-Intra video recording.
- MP4 motion pictures with [MP4] in [4K]: When using an SDHC memory card: You can continue recording without interruption even if the file size exceeds 4 GB, but the motion picture file will be divided and recorded/played back separately. / When using an SDXC memory card: You can continue recording without interruption even if the file size exceeds 96 GB or 3 hours 4 minutes in length, but the motion picture file will be divided and recorded/played back separately.
- MP4 motion pictures with [MP4] in [FHD]: You can continue recording without interruption even if the file size exceeds 4 GB or 30 minutes in length, but the motion picture file will be divided and recorded/played back separately.
- 4:2:2 10-bit recording is a recording mode for film production and the video needs to be processed on PC. The original video cannot be played on standard TV, Blu-ray Disc™ recorder and Blu-ray Disc™ player. It may cause problems such as freezing when played on these devices.
- When the ambient temperature is high or continuous recording is performed, the camera may stop the recording to protect itself. Wait until the camera cools down.
**** For [6K] [5.9K] [5.4K] [C4K/60p] [C4K/50p] [4K/60p] [4K/50p] video output, use an HDMI2.0 cable that has the HDMI logo on it, and that is described as"4K compatible".
***** The camera may stop recording when used in lower or higher than recommended operating temperature: -10 to 40 degrees.
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- Some sample images are simulated.
- Some accessories are not available in some countries.
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