

# Panasonic

# GH4U

SYSTEM PROPOSAL

This model is not available in some areas.



Lens is optional.



# LUMIX G



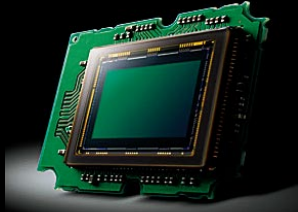
# AG-GH4U Features

## The world's first\* single-lens mirrorless camera with 4K video capability and professional interfaces.

\* As of June 2014, according to a Panasonic survey.

### Recording 4K videos onto an SD memory card

The AG-GH4U can record super-high-definition 4K videos with four times the resolution of Full-HD, such as C4K (Cinema 4K): 4096 x 2160, 24.00p and 4K (QFHD): 3840 x 2160, 23.98p/24.00p/25.00p/29.97p onto an SD memory card (U3-compatible SDXC/SDHC Memory Card) in MOV/MP4 file format.



Newly developed Live MOS sensor

### Recording Video Formats and Recording Times

(Examples)

| Recording Video Format                 | 32GB SDHC Memory Card  | 64GB SDXC Memory Card  |
|--|------------------------|------------------------|
| MP4/MOV C4K (Cinema 4K) 24.00p 100Mbps | approx. 40 min.        | approx. 1 hrs. 25 min. |
| MP4/MOV 4K (QFHD) 29.97p 100Mbps       |                        |                        |
| MP4/MOV FHD 59.94p 200Mbps             | approx. 18 min.        | approx. 40 min.        |
| MP4/MOV FHD 59.94p 100Mbps             | approx. 40 min.        | approx. 1 hrs. 20 min. |
| MP4/MOV FHD 59.94p 50Mbps              | approx. 1 hrs. 20 min. | approx. 2 hrs. 45 min. |
| AVCHD Progressive FHD 59.94p 28Mbps    | approx. 2 hrs. 30 min. | approx. 5 hrs.         |
| AVCHD FHD 59.94i 17Mbps                | approx. 4 hrs. 5 min.  | approx. 8 hrs. 15 min. |

### Extracting 4K photos from video

Thanks to the super-high resolution of 4K, a still image with approximately 8 million pixels can be extracted from a video frame. This lets you obtain pictures of critical moments that cannot be easily captured by a conventional still camera.

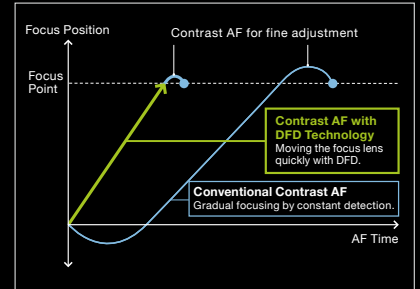


### Full-HD video recorded at a high 200 Mbps bit rate

Even for Full-HD (1920 x 1080, 23.98p/24.00p/25.00p/29.97p/50.00p/59.94p) video recording, the AG-GH4U offers a high bit rate of 200 Mbps maximum by using the MOV/MP4 file format and All-Intra compression system. When the IPB compression system is used, the AG-GH4U can record at 100 Mbps maximum (4K/FHD recording). Recorded images provide the high quality required for full-fledged video production. The AG-GH4U also supports AVCHD Progressive (28 Mbps max.) and AVCHD file format recording.

### Newly developed DFD AF for high-speed, high-precision focusing

The original Depth From Defocus (DFD) technology instantly calculates the distance to the subject from among all of the subjects in the frame, and proceeds to instantaneously drive the lens to the focus area. Then, the high-precision Contrast AF makes fine adjustment. The AG-GH4U has achieved an auto-focus speed of approximately 0.07 seconds.



\* The space recognition AF is not supported by lenses manufactured by other companies.

### VFR (Variable Frame Rate) of 2 to 96 fps

The AG-GH4U supports a VFR recording function to enable slow-motion or quick-motion recording. It allows overcranking of 96 fps maximum for slow-motion videos, or undercranking of 2 fps maximum for quick-motion videos.

### Expansion interface unit compatible with SDI output and XLR input

The expansion interface unit provided with the camera enables the use of AG-GH4U for professional applications. The output of a 4:2:2/10-bit\* SDI video signal via Quad Link 4K (SDI x 4, Square Division) allows connection to a professional 4K recorder or 4K monitor. The expansion interface unit also features XLR audio input (LINE/MIC/+48V selectable, 2 channels), audio manual dial and level meter. It enables recording of sound from an external mic or line, and comes with a time code input (BNC x 1).



\* Motion pictures cannot be recorded onto the memory card in the camera when 4:2:2/10-bit output is selected

### Motion picture functions meet full-fledged video production needs

- Display of peaking, zebra pattern and center marker.
- Nine gamma curve types, including Cinelike D and Cinelike V.
- Auto white balance and master pedestal.
- Variable shutter speed, with synchro scan function.
- Motion picture control panel designed with video camera users in mind.
- Outputs color bars and a 1-kHz test tone.

### Remote operation from smartphone/wired remote controller

- The built-in Wi-Fi® (IEEE 802.11 b/g/n) function enables remote operation from a smartphone or tablet which application software "Panasonic Image App" is installed.
- Also supports the use of a wired remote controller (other manufacturer's product) for remote operation (Zoom, Rec).



Panasonic Image App Camera Control



## System Application 1 – Aerial Shooting, On-Vehicle Shooting



**Compact, lightweight body allows new shooting styles such as aerial shooting or on-vehicle shooting.**

- The camera body weighs approximately 560 g (19.75 oz). Even with the lens mounted, it weighs about 825 g (29.10 oz). It is light enough to mount on a drone for aerial shooting of super-high-resolution 4K video.
- Thanks to its light camera body, an HD live transmission unit or external recorder can be mounted together on a drone.
- The interchangeable lens system allows the use of various lenses according to shooting needs.
- The small body and wide-angle interchangeable lens enables wide-angle shooting even in a limited space such as a car.



## System Application 2 — TV Series, Movie Production



### 10-Bit 4K video recording for high-quality video production

- Outputs 4:2:2/10-bit 4K images via Quad Link (SDI x 4). When combined with the AJA Ki Pro Quad external recorder, high-quality 4:2:2/10-bit 4K recording (Apple ProRes) is possible.
- Cinelike gamma and VFR (Variable Frame Rate) enables the use of the AG-GH4U as a sub-camera in movie production using Varicam, etc.
- Using professional 4K monitor BT-4LH310, image quality can be managed accurately.
- SDI (coaxial cable, BNC connector) ensures reliable connection and allows the extension of cable to up to 100 m (328 ft).
- Equipped with HDMI output, an external backup recorder or a viewfinder can be connected.



## System Application 3 – Weddings, Events



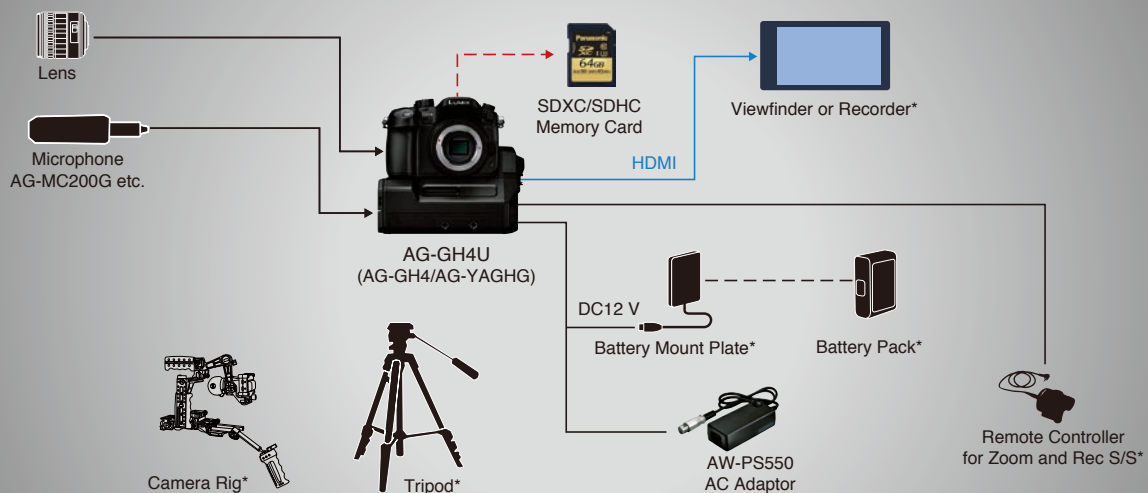
### Capturing special moments in high-quality 4K videos and 4K still images

#### PHOTO

- 4K photos equivalent of 8 million pixels can be extracted from a 4K video. The extraction operation can be performed with the camera, so there is no need for separate processing using a PC or other device.
- 4K photos gives continuous shooting of 30fps in 4K. The AG-GH4U lets you capture critical scenes without missing shooting opportunities, and continuous pictures can be used for producing albums.

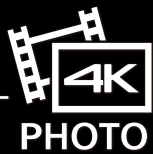
\* Increasing the shutter speed to 60 fps or faster for the sake of 4K photos results in unnatural, flickering movement. Therefore, post processing, such as motion blur processing, will be required.

- A wide range of available interchangeable lenses and the large-size sensor achieve a beautiful defocusing effect, while the Cinelike gamma expresses soft tones. They help create images with rich texture similar to those of movies and video clips.
- The connected external HD recorder can be used for backup recording while the camera records 4K images. An existing HD editing system can also be used.
- The AG-GH4U can be provided with an external XLR mic. This enables the recording of high-quality sounds as well as interviews using a handheld mic.



\* Other manufacturer's product

# System Application 4 – News Gathering



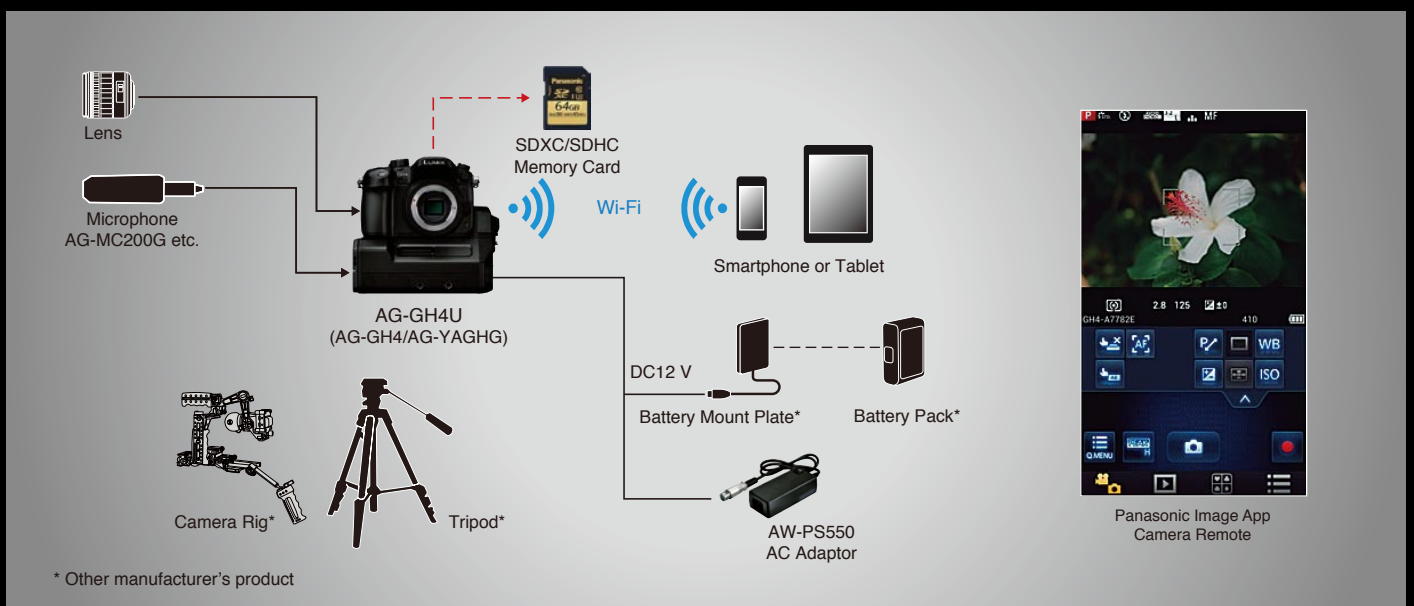
## New workflow – shooting 4K video and use 4K photos extracted from video

- 4K photos equivalent of 8 million pixels can be extracted from 4K video. Both video and still images can be obtained by using a single camera operated by one person.\*<sup>1</sup>
- 4K photos gives continuous shooting of 30fps in 4K. The AG-GH4U lets you capture critical scenes without missing shooting opportunities.

\*1: Increasing the shutter speed to 60 fps or faster for the sake of 4K photos results in unnatural, flickering movement. Therefore, post processing, such as motion blur processing, will be required.

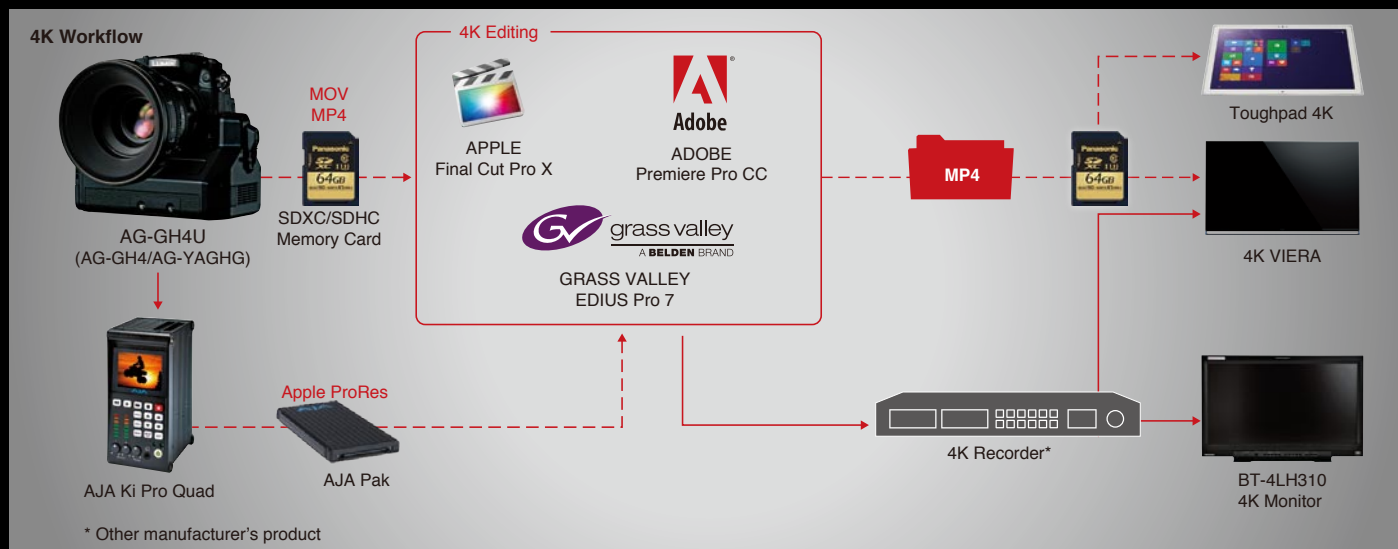
- The compact, lightweight single-lens mirrorless camera brings greater mobility to news gathering.
- The Wi-Fi function allows remote operation from a smartphone or tablet. Operations and functions such as the shutter, zoom, aperture, shutter speed, ISO and white balance can be controlled remotely.\*<sup>2</sup>
- An external XLR mic can be connected for use in interviews.

\*2: The dedicated application, Panasonic Image App, must be installed in the smartphone or tablet.



\* Other manufacturer's product

# AG-GH4U System Equipment



## AC Adaptor



**AW-PS550**  
Power Source: AC 100V—240V,  
1.3 A, 50 Hz / 60 Hz  
Output: DC 12 V / 3.5 A, 42W

## Microphone



**AG-MC200G**  
XLR Microphone

## 4K Monitor



**BT-4LH310**  
787.4mm (31 inches) LCD Monitor  
DCI 4K IPS LCD panel,  
DCI 4K/QFHD/2K/HD/SD Display  
Input: 3G SDI x4, HDMI 1.4 x 2,  
Display Port x2, AC/DC

## AG-YAGHG Interface Unit



## Other Manufacturer's Products

### 10 bit 4K Recorder



**AJA Ki Pro Quad**  
Input: SDI x 4 (4K Quad Link)  
Codec: Apple ProRes, 4444, 422  
(HQ), 422/422 (LT),  
422 (Proxy)  
Media: AJA Pak SSD

### Camera Rig



**ZACUTO**  
DSLR Recoil Rig, Half Cage,  
Zacuto EVF\*, and etc.  
\*EVF is not available 4K video via  
HDMI input.

### Remote Controller



**LIBEC ZC-3DV**  
Control: Zoom\*, Rec S/S,  
\*Panasonic zoom lens only

### Battery



**IDX**  
Battery mount plate and battery  
charger are required.



**Anton Bauer**  
Battery mount plate and battery  
charger are required.

## AG-YAGHG Interface Unit Specifications

| GENERAL               |   |
|-----------------------|---|
| Power source          | DC 12 V (11 V - 17 V), 1.4 A (DC 12 V)<br>*including digital camera   |
| Operating Temperature | 0°C to 40°C (32°F to 104°F)   |
| Operating Humidity    | 10% to 80% (non condensing)   |
| Weight                | Approx. 750 g (1.65 lbs.)   |
| Dimensions            | 160 mm (W) x 64 mm (H) x 91 mm (D),<br>(6-19/64 inches x 2-33/64 inches x 3-37/64 inches)<br>*excluding protrusion and HDMI connection terminal   |
| DIGITAL VIDEO         |   |
| Resolution            | Cinema4K: 4096 x 2160 [24p]<br>4K (QFHD): 3840 x 2160 [29.97p]<br>3840 x 2160 [25p]<br>3840 x 2160 [24p]<br>3840 x 2160 [23.98p]<br>FHD: 1920 x 1080 [59.94p] (3G-SDI Level-A/B)<br>1920 x 1080 [50p] (3G-SDI Level-A/B)<br>1920 x 1080 [59.94i]<br>1920 x 1080 [50i]<br>1920 x 1080 [24PsF]<br>1920 x 1080 [23.98PsF]<br>HD: 1280 x 720 [59.94p]<br>1280 x 720 [50p] |
| Sampling              | Y: Cb: Cr = 4: 2: 2   |
| Bit depth             | 8 bit / 10 bit  |
| DIGITAL AUDIO         |   |
| Sampling frequency    | 48 kHz (video sync)   |
| Quantization          | 16 bit  |
| Headroom              | 12 dB   |
| INPUT / OUTPUT        |   |
| TC IN                 | BNC x 1, 1.0 V [p-p] to 4.0 V [p-p], 10 kΩ  |
| AUDIO IN              | XLR (3 pin) x 2, high impedance,<br>LINE/MIC/+48 V (switchable)<br>LINE: 0 dBu<br>MIC: -50 dBu<br>+48 V: +48 V phantom supported, -50 dBu   |
| SDI OUT               | BNC x 4, 0.8 V [p-p], 75Ω<br>Audio output: SDI OUT 1<br>Embedded audio: 2 channel<br>Timecode output: SDI OUT 1<br>Embedded LTC   |
| HDMI                  | HDMI TypeA (VIERA Link not supported),<br>2 channel audio (linear PCM)  |

\* There are some products not available in some areas.

|                              |  |   |   |
|------------------------------|--|---|---|
| IMAGE SENSOR                 | Type   | Digital Single Lens Mirrorless camera   |   |
|                              | Recording media                                | SD Memory Card, SDHC Memory Card, SDXC Memory Card (Compatible with UHS-I UHS Speed Class 3 standard SDHC / SDXC Memory Cards)  |   |
|                              | Lens mount                                     | Micro Four Thirds mount   |   |
|                              | Type   | 4/3 type Live MOS Sensor  |   |
|                              | Total pixels                                   | 17.20 Megapixels (Effective pixels: 16.05 Megapixels)   |   |
| RECORDING SYSTEM             | Aspect ratio                                   | 4:3   |   |
|                              | Color filter                                   | Primary color filter  |   |
|                              | Dust reduction system                          | Supersonic wave filter  |   |
|                              | Recording file format                          | Still Image: JPEG (DCF, Exif 2.3), RAW, MPO (When attaching 3D lens)<br>Motion picture: MP4/MOV/AVCHD Progressive/AVCHD   |   |
|                              | Audio format                                   | MP4: LPCM 2ch/AAC 2ch<br>MOV: LPCM 2ch, AVCHD: Dolby Digital 2ch  |   |
|                              | System frequency                               | 59.94Hz, 50.00Hz, 24.00Hz   |   |
|                              | Aspect ratio                                   | 4:3, 3:2, 16:9, 1:1   |   |
|                              | Still Image                                    | [4:3] 4608 × 3456 (L), 3264 × 2448 (M), 2336 × 1752 (S), 1824 × 1368 (with 3D lens)<br>[3:2] 4608 × 3072 (L), 3264 × 2176 (M), 2336 × 1560 (S), 1824 × 1216 (with 3D lens)<br>[16:9] 4608 × 2592 (L), 3840 × 2160 (M), 1920 × 1080 (S), 1824 × 1024 (with 3D lens)<br>[1:1] 3456 × 3456 (L), 2448 × 2448 (M), 1744 × 1744 (S), 1712 × 1712 (with 3D lens) |   |
|                              | Color space                                    | sRGB / Adobe RGB  |   |
|                              | Image quality                                  | Fine Standard, RAW, RAW+Fine, RAW+Standard, MPO+Fine / MPO+Standard (with 3D lens)  |   |
| MICROPHONE / SPEAKER         | Motion picture                                 | MOV   | 59.94 Hz<br>• 3840 × 2160: 29.97p, 100Mbps (IPB), LPCM<br>• 3840 × 2160: 23.98p, 100Mbps (IPB), LPCM<br>• 1920 × 1080: 59.94p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM<br>• 1920 × 1080: 29.97p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM<br>• 1920 × 1080: 23.98p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM       |
|                              |  |   | 50.00 Hz<br>• 3840 × 2160: 25.00p, 100Mbps (IPB), LPCM<br>• 1920 × 1080: 50.00p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM<br>• 1920 × 1080: 25.00p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM  |
|                              |  |   | 24.00 Hz<br>• 4096 × 2160: 24.00p, 100Mbps (IPB), LPCM<br>• 3840 × 2160: 24.00p, 100Mbps (IPB), LPCM<br>• 1920 × 1080: 24.00p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM   |
|                              |  | MP4*  | 59.94 Hz<br>• 3840 × 2160: 29.97p, 100Mbps (IPB), LPCM / AAC<br>• 3840 × 2160: 23.98p, 100Mbps (IPB), LPCM<br>• 1920 × 1080: 59.94p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM<br>• 1920 × 1080: 29.97p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM<br>• 1920 × 1080: 23.98p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM |
|                              |  | 50.00 Hz<br>• 3840 × 2160: 25.00p, 100Mbps (IPB) / 100Mbps (IPB), LPCM / AAC<br>• 1920 × 1080: 50.00p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), AAC<br>• 1920 × 1080: 25.00p, 20Mbps (IPB), AAC<br>• 1280 × 720: 29.97p, 10Mbps (IPB), AAC<br>• 640 × 480: 29.97p, 4Mbps (IPB), AAC  |   |
|                              |  | 24.00 Hz<br>• 4096 × 2160: 24.00p, 100Mbps (IPB), LPCM<br>• 3840 × 2160: 24.00p, 100Mbps (IPB), LPCM<br>• 1920 × 1080: 24.00p, 200Mbps (ALL-Intra) / 100Mbps (IPB) / 50Mbps (IPB), LPCM   |   |
|                              |  | 59.94 Hz<br>• 1920 × 1080: 59.94p, 28Mbps (IPB), Dolby Digital<br>• 1920 × 1080: 59.94i, 24Mbps (IPB), Dolby Digital (Sensor output is 29.97fps)<br>• 1920 × 1080: 59.94i, 17Mbps (IPB), Dolby Digital (Sensor output is 59.94fps)<br>• 1920 × 1080: 23.98p, 24Mbps (IPB), Dolby Digital  |   |
|                              |  | 50.00 Hz<br>• 1920 × 1080: 50.00p, 28Mbps (IPB), Dolby Digital<br>• 1920 × 1080: 50.00i, 24Mbps (IPB), Dolby Digital (Sensor output is 25.00fps)<br>• 1920 × 1080: 50.00i, 17Mbps (IPB), Dolby Digital (Sensor output is 50.00fps)  |   |
|                              |  | AVCHD Progressive<br>59.94 Hz<br>• 1920 × 1080: 59.94p, 28Mbps (IPB), Dolby Digital<br>• 1920 × 1080: 59.94i, 24Mbps (IPB), Dolby Digital (Sensor output is 29.97fps)<br>• 1920 × 1080: 59.94i, 17Mbps (IPB), Dolby Digital (Sensor output is 59.94fps)<br>• 1920 × 1080: 23.98p, 24Mbps (IPB), Dolby Digital   |   |
|                              |  | 50.00 Hz<br>• 1920 × 1080: 50.00p, 28Mbps (IPB), Dolby Digital<br>• 1920 × 1080: 50.00i, 24Mbps (IPB), Dolby Digital (Sensor output is 25.00fps)<br>• 1920 × 1080: 50.00i, 17Mbps (IPB), Dolby Digital (Sensor output is 50.00fps)  |   |
|                              | VIEWFINDER                                     | Type  | Aspect ratio 4:3 / OLED Live View Finder (Approx. 2,359K dots)  |
|                              |  | Field of view / Magnification   | Approx. 100% / Approx. 1.34x / 0.67x (35 mm camera equivalent) with 50 mm lens at infinity; -1.0 m <sup>-1</sup>  |
| Eye point/Diopter adjustment |  | Approx. 21 mm from eyepiece lens / -4.0 to +4.0 [dpt]   |   |
| FOCUS                        | Type   | Contrast AF system  |   |
|                              | Focus mode                                     | AFS [Single] / AFF [Flexible] / AFC [Continuous] / MF   |   |
|                              | AF detectable range                            | EV -4 to 18 (ISO 100 equivalent)  |   |
| EXPOSURE CONTROL             | Light metering system                          | 1,728-zone multi-pattern sensing system   |   |
|                              | Light metering mode                            | Multiple / Center Weighted / Spot   |   |
|                              | Metering range                                 | EV0 to 18 (F2.0 lens, ISO 100 equivalent)   |   |
|                              | Exposure mode                                  | Program AE, Aperture Priority AE / Shutter Priority AE / Manual exposure (M)  |   |
|                              | ISO sensitivity [Standard Output Sensitivity]  | Auto / Intelligent ISO / 100 (Extended) / 200 / 400 / 800 / 1600 / 3200 / 6400 / 12800 / 25600 (Changeable to 1/3 EV step) (Up to ISO 6400 in motion picture recording) (ISO Auto in M mode), Creative Control  |   |
| WHITE BALANCE                | Exposure compensation                          | 1/3 EV Step ±3EV (±3 EV for motion image)   |   |
|                              | AE bracket                                     | 3, 5, 7 frames in 1/3, 2/3 or 1 EV Step, Max. ±3 EV, single/burst   |   |
| SHUTTER                      | White balance                                  | Auto White Balance / Daylight/Cloudy / Shade/Incandescent lights / Flash / White set1 / White set2 / White set3 / White set4 / White Balance K set  |   |
|                              | Type   | Focal-plane shutter   |   |
|                              | Shutter speed                                  | Still image: Bulb (Max. 60 minutes), 1/8,000 to 60<br>Motion picture: 59.94Hz: 1/16,000 to 1/30, 50.00Hz: 1/16,000 to 1/25, 23.98Hz: 1/16,000 to 1/24 (When using Synchro Scan)   |   |
|                              | Shutter life                                   | Approx. 200,000 images  |   |
| BURST SHOOTING               | Self timer / Remote control                    | 2 sec or 10 sec, 3 images / 2 sec / 10 sec, DMW-RS1 (Optional)  |   |
|                              | Burst speed (In case SDHC Memory Card is used) | Mechanical shutter: 12 frames/sec (with AFS) / 7 frames/sec (with AFC)<br>Electronic shutter: 40 frames/sec   |   |
|                              | Number of recordable images                    | Approx. 100 images (when there are no RAW files)<br>Approx. 40 images (when there are RAW files with the particular speed)<br>Approx. 120 images (when using electronic shutter) (depending on memory card size, battery power, picture size, and compression)  |   |
| MINIMUM ILLUMINATION         |  | Approx. 6 lx (when i-Low light is used, the shutter speed is 1/30th of a second (When [System Frequency] is set to [59.94 Hz (NTSC)]) or 1/25th (When [System Frequency] is set to [50.00 Hz (PAL)]))<br>[When the interchangeable lens (H-HS12035) is used]  |   |

|                              |   |   |
|------------------------------|---|---|
| MONITOR                      | Typ / Field of view                         | 3.0 inches OLED Monitor (3:2) (Approx. 1,040,000 dots) (field of view ratio about 100%) Touch screen  |
| FLASH                        | Built-in flash type                         | TTL Built-in-Flash, GN12 equivalent (ISO100 • m) / GN17 equivalent (ISO200 • m), Built-in Pop-up (Reference) Lighting angle: 24mm (35mm camera equivalent)  |
|                              | 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, iA+ only.  |
|                              | Flash output adjustment                     | 1/3EV Step ±3EV   |
|                              | Synchronization speed                       | Less than 1/250 second  |
| DIGITAL ZOOM                 |   | 2x, 4x  |
| EXTRA TELE CONVERSION        | Still image                                 | Max. 2x (Aspect ratio sets at 4:3. Not effective with L size recording. Magnification ratio depends on the recording pixels and aspect ratio.)  |
|                              | Motion picture                              | 2.4x (FHD), 3.6x (HD), 4.8x (VGA)   |
| DIRECTION DETECTION FUNCTION |   | Yes   |
| CREATIVE                     | Exposure Mode                               | Program AE / Aperture-Priority / Shutter-Priority / Manual Exposure   |
| VIDEO MODE                   | Variable frame rate                         | 59.94 Hz<br>MOV / FHD / 100Mbps / 29.97p, MP4(LPCM) / FHD / 100Mbps / 29.97p: 2 / 15 / 26 / 28 / 30 / 32 / 34 / 45 / 60 / 75 / 90 / 96 fps<br>MOV / FHD / 100Mbps / 23.98p, MP4(LPCM) / FHD / 100Mbps / 23.98p: 2 / 12 / 20 / 22 / 24 / 26 / 28 / 30 / 36 / 48 / 60 / 72 / 84 / 96 fps<br>AVCHD / FHD / 24Mbps / 29.97p: 2 / 15 / 26 / 28 / 30 / 32 / 34 / 45 / 60fps<br>AVCHD / FHD / 24Mbps / 23.98p: 2 / 12 / 20 / 22 / 24 / 26 / 28 / 36 / 48 / 60fps |
|                              |   | 50.00 Hz<br>MOV / FHD / 100Mbps / 25.00p, MP4(LPCM) / FHD / 100Mbps / 25.00p: 2 / 12 / 21 / 23 / 25 / 27 / 30 / 37 / 50 / 62 / 75 / 96fps<br>AVCHD / FHD / 24Mbps / 25.00p: 2 / 12 / 21 / 23 / 25 / 27 / 30 / 37 / 50fps  |
|                              | 24.00Hz                                     | MOV / FHD / 100Mbps / 24.00p, MP4(LPCM) / FHD / 100Mbps / 24.00p: 2 / 12 / 20 / 22 / 24 / 26 / 28 / 36 / 48 / 60 / 72 / 84 / 96fps  |
|                              |   | PHOTO STYLE   |
| MICROPHONE / SPEAKER         |   | Yes (stereo) / Yes (monaural)   |
| LANGUAGE                     |   | English, German, French, Italian, Spanish, Polish, Czech, Hungarian, Russian, Chinese (Traditional), Chinese (Simplified), Dutch, Thai, Korean, Turkish, Portuguese, Arabic, Persian, Japanese, Swedish, Danish, Finnish, Greek, Vietnamese *Check the website of Panasonic sales company in your country / region or ask customer support for details of the OSD language available on the products sold in your country / region.                       |
| INTERFACE                    | USB   | USB 2.0 High Speed Multi  |
|                              | HDMI**                                      | micro HDMI TypeD  |
|                              | AV output                                   | NTSC/PAL Composite (Switched by [System Frequency])<br>Audio line output (monaural)   |
|                              | Remote input                                | φ2.5 mm for remote, DMW-RS1 (option)  |
|                              | External microphone input                   | φ3.5 mm for external microphone   |
| Headphone output             | φ3.5 mm for headphone                       |   |
| Wi-Fi/NFC                    |   | Yes (IEEE 802.11b/g/n) / Yes (ISO/IEC 18092, NFC-F (Passive Mode))  |
| POWER                        | Battery                                     | Li-ion Battery Pack (7.2 V, 1860mAh) (Included), Battery Charger  |
|                              | Battery life [CIPA standard]                | Approx. 530 images with H-HS12035, Approx. 530 images with H-FS14140  |
|                              | Continuous recordable time (Motion picture) | 4K: Approx. 180 min with H-FS14140  |
|                              | Actual recordable time (Motion picture)     | 4K: Approx. 90 min with H-FS14140   |
| DIMENSIONS / WEIGHT          | Dimensions (W × H × D)                      | 132.9 mmx 93.4 mmx 83.9 mm / 5.23 inchesx 3.68 inches x 3.30 inches (excluding protrusions)   |
|                              | Weight                                      | Approx. 560g / 19.75 oz (SD card, Battery, Body)<br>Approx. 480g / 16.93 oz (Body only)<br>Approx. 825g / 29.10 oz (SD card, Battery, H-FS14140 lens included)  |
| OPERATING ENVIRONMENT        | Operating temperature                       | 0°C to 40°C (32°F to 104°F)   |
|                              | Operating humidity                          | 10% to 80%  |
| STANDARD ACCESSORIES         | Software                                    | PHOTOfunSTUDIO 9.5 PE (Windows XP / Vista / 7 / 8), SILKYPIX® Developer Studio 4.1 SE (Windows XP / Vista / 7 / 8, Mac OS X v10.5 / v10.6 / v10.7 / v10.8), LoLoScope (trial version) (Windows XP / Vista / 7 / 8)  |
|                              | Standard accessories                        | Battery Charger (AC Cable included), Battery Pack, Body Cap, Hot Shoe Cover, USB Connection Cable, Shoulder Strap, DVD  |

**About motion picture recording**

• Motion picture can be recorded up to 29 min 59 sec depending on the recording format and the camera's sales area. • Use a card with SD Speed Class with "UHS-I Speed Class 3 (U3)" when recording motion pictures in [4K/100Mbps] [C4K/100Mbps] [FHD/100Mbps] or [FHD/200Mbps]. • Use a card with SD Speed Class with "UHS-I Speed Class 1 (U1)" or higher when recording motion pictures in [FHD/50Mbps]. • Use a card with SD Speed Class with "Class 4" or higher when recording motion pictures in [FHD/28Mbps], [SD speed class is the speed standard regarding continuous writing]. • The actual recordable time refers to the time that is recorded when repeatedly starting/stopping recording, turning the unit on/off, moving the zoom lever etc. The continuous recordable time refers to the recordable time when recording without pause, powering on/off etc. (They change according to environment and conditions.)

\*\* For [4K] or [C4K] video output, use an HDMI cable that has the HDMI logo on it, and that is described as "4K compatible".

**About the performance of Face Recognition function**

Recognition performance varies greatly depending on shooting conditions, i.e., according to factors such as angles, facial expression and lighting, so operation under all conditions cannot be guaranteed. Because the camera searches for faces that are similar to registered faces, there are cases where the faces are not correctly recognized when the registered image and the shooting image varies much. When facial characteristics are similar, particularly between parents and their children or brothers and sisters, the camera may not distinguish the faces.

"AVCHD Progressive", "AVCHD", the "AVCHD Progressive" Logo and the "AVCHD" Logo are trademarks of Panasonic Corporation and Sony Corporation. • When a lens that does not support the contrast AF function is mounted, operation will automatically switch to manual focus. Confirm the operation information of compatible lenses at Customer support. <http://panasonic.jp/support/global/cs/dsc> (English) • Dolby and the double-D symbol are trademarks of Dolby Laboratories. • HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC. • Four Thirds™ and Micro Four Thirds™, and Four Thirds and Micro Four Thirds Logo marks are trademarks or registered trademarks of Olympus Imaging Corporation, in Japan, the United States, the European Union and other countries. • Other names of systems and products mentioned in this brochure are generally the registered trademarks or trademarks of the manufacturers who developed the system or product concerned. • Some accessories are not available in some countries. • Weight and dimensions shown are approximate. • Some functions may not work when lenses other than the included lens are used. Please refer to Panasonic's website, etc., for the latest information. • Available of OSD languages may vary depending on the sales area. • Some sample images are simulated. • The use of recorded or printed materials that are protected by copyright for any purpose other than personal enjoyment is prohibited, as it would infringe upon the rights of the copyright holder. • The Wi-Fi CERTIFIED Logo is a certification mark of the Wi-Fi Alliance.



**Panasonic Corporation**  
**AVC Networks Company**  
 2-15 Matsuba-cho, Kadoma, Osaka 571-8503 Japan  
<http://pro-av.panasonic.net/>