JVC

HD/SD Memory Card Camcorder

GY-HM650

ProHD

SDHC CLASS 10 SDHC CLASS 6 SDHC CLASS 4 SDXC AVCHD MOV QuickTime™ MP4 MXF ftp GPS

Innovation without Compromise

Shown with optional microphone.

Shooting

Newly-developed 23x Fujinon Lens and Full HD 1/3-inch CMOS Sensors

The Fujinon wide angle 23x zoom lens provides superb sharpness and excellent low-light performance in tandem with three CMOS sensors with extremely high sensitivity of F11 (60Hz) /F12 (50Hz) at 2000 lux. Minimum illumination is an incredible 0.15 lux (typical.)

Dual Codec

Dual Codec for Simultaneous Full HD/SD and web-ready recording

The revolutionary new dual codec makes it possible to record in two resolutions—one in full HD and one as a smaller web-friendly file—to separate memory cards at the same time.

Wireless Connectivity for a New Level of Functionality

Introducing the GY-HM650, a ProHD handheld news camera equipped with dual codecs, built-in FTP and Wi-Fi connectivity for shooting and delivering news footage faster than ever.

Wide Media Format Compatibility and Support for Data-rich MXF Files

The GY-HM650 records HD or SD footage to SDHC /SDXC cards in a range of file formats, including MP4 file format (XDCAM EX™ workflow-compatible), MOV (Final Cut Pro™ compatible), and AVCHD. The camera now also supports MXF files with rich descriptive metadata, which can be sent to the camera via Wi-Fi.

Wi-Fi Ready with Network Connectivity and FTP Functions

Featuring and network functionality, remote viewing is possible, and video and audio data can be delivered to the studio.

Wi-Fi Remote Control of Camcoder (iOS and Android OS)

Shown with optional microphone.

Innovative Features without Compromise

ND Filters

Equipped with a built-in 4-position ND filter for greater flexibility through a range of lighting situations.

3.5-inch 920K pixel LCD Monitor

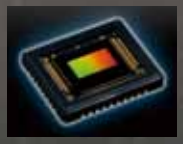
The top-mounted position of the high-resolution 3.5-inch LCD monitor is ideal for shooting at various angles in handheld camera applications.

Fujinon 23x Optical Zoom Lens

Newly-developed Fujinon wide angle 23x zoom lens delivers superior low-light performance and the highest magnification in the industry.

Full HD 1/3-inch CMOS Sensors

Three CMOS sensors offer an excellent sensitivity of F11 (60Hz) /F12 (50Hz) and a remarkable signal-to-noise ratio for superior precision and vivid color reproduction.



Optical Image Stabilizer

Helping to correct lateral and vertical movement of the camera, the built-in OIS ensures that pristine HD images remain sharp and stable.

Focus Assist

JVC's patented focus assist system highlights the edges of objects in the image to help the operator keep the action in focus.

0.45-inch 1.22M pixel Color Viewfinder

Stunning new high-resolution LCOS viewfinder with a crisp and detailed 16:9 aspect ratio image.

FALCONBRID™

JVC's high-speed processor for advanced video applications achieves stunning image quality with superior processing power on a single chip.

SDXC/SDHC Memory Card Recording

Dual SDHC/SDXC card slots allow footage to be recorded either to both cards simultaneously, or from one card to the other in relay.

Shown with optional microphone.

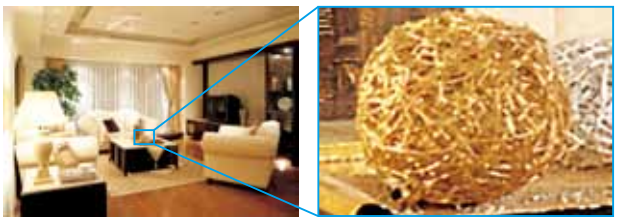
Expanding the Possibilities with Advanced Features in a High Definition Camcorder

Superior HD Imaging

Newly-developed 23x Fujinon Auto Focus Zoom Lens with Manual Functions

23x Zoom Lens

The GY-HM650 is equipped with the newly-developed Fujinon wide angle 23x zoom lens, giving the highest magnification in the industry. Delivering superior low-light performance and ensuring brightness at the tele end, the lens offers F1.6-3.0, a focal range of 29mm-667mm (35mm equivalent) and includes servo zoom, manual focus, and iris rings, along with a four-position (clear, 1/4, 1/16 and 1/64) ND filter. Other features include an optical image stabilizer, chromatic aberration correction.

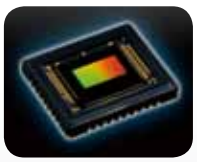


Wide end Tele end

High Performance Full HD 1/3-inch CMOS Sensors

F11/F12 (60Hz) (50Hz) Sensitivity

At the heart of the GY-HM650 are three, 1/3-inch CMOS sensors, each capable of capturing full HD 1920 x 1080 resolution images. Offering an excellent sensitivity of F11 (60Hz) /F12 (50Hz) and a remarkable signal-to-noise ratio, the devices provide superior precision and color reproduction with minimal aberration. For improved CMOS sensor performance, flash-band compensation is also supported.



Conventional 1/3" device New Full HD CMOS

Advanced Processing Engine

Revolutionary FALCONBRID™ Image Processing Engine

FALCONBRID™

FALCONBRID™ is JVC's high-speed processor for advanced video applications. Delivering tremendous processing power on a single chip, the on-board FALCONBRID™ engine processes large amounts of video data at exceptional speeds. Together with this technology, superior image quality has been realized with 2D DNR processing and compensation circuitry and wide dynamic range.

MPEG-2/AVCHD Recording and Dual Codec

MPEG-2 AVCHD

The GY-HM650 supports both the popular MPEG-2 Long GOP 35/25/19Mbps format, widely used by television broadcasters, and the highly efficient AVCHD 24/17Mbps mode, which provides compatibility with a wide range of affordable editing systems. This means that professionals have unprecedented flexibility to meet production standards through a wide range of workflows. With the revolutionary dual codec, the GY-HM650 now also supports simultaneous HD/SD or HD/proxy recording, producing full HD files on one memory card while creating smaller, Web-friendly files on the other. Also supported is the MPEG-4/AVC H.264 8Mbps SD format.

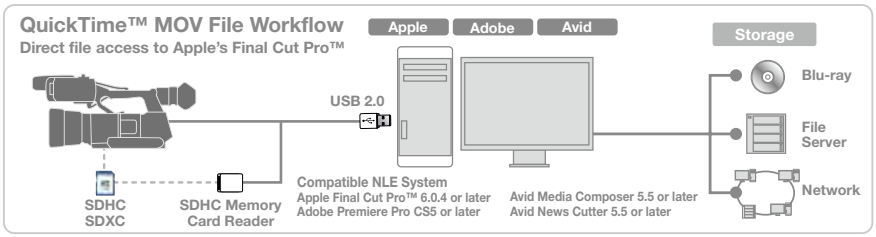
		MPEG-2			AVCHD	
		HQ mode (35Mbps)	SP mode (25Mbps)	SP mode (19Mbps)	HQ mode (24Mbps)	SP mode (17Mbps)
		MOV/MP4/MXF	MOV/MP4/MXF	MOV/MP4/MXF	MTS	MTS
HD	1920 x 1080	60i/50i 30p/25p/24p			60i/50i	60i/50i
HD	1440 x 1080	60i/50i	60i/50i			
HD	1280 x 720	60p/50p 30p/25p/24p		60p/50p		
SD	720 x 576					
SD	720 x 480					
Proxy	480 x 270					

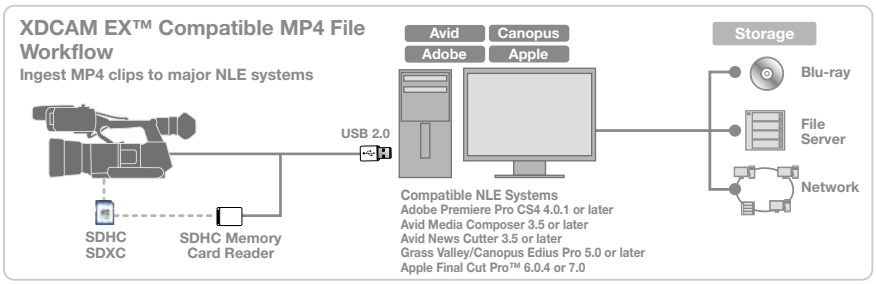
		MPEG-4/AVC H.264		
		UHQ mode (35Mbps)	SD mode (8Mbps)	Web mode (1Mbps)
		MOV	MOV	MOV
HD	1920 x 1080	60i/50i/24p		
HD	1440 x 1080			
HD	1280 x 720			
SD	720 x 576		50i (GY-HM650E)	
SD	720 x 480		60i (GY-HM650U)	
Proxy	480 x 270			30p/25p/24p

Flexible File-based Workflow

Multiple File Formats for Native Workflows
Record HD or SD footage directly in ready-to-edit QuickTime™ MOV files, the native file format of Apple's Final Cut Pro™. JVC has eliminated one of the main obstacles to achieving a smoother, more streamlined production workflow. Native file recording ensures your footage is ready to edit the moment it's shot, resulting in a more efficient workflow and no loss of image quality. Additionally, with the MPEG-2 mode for Windows editing environments, it is possible to record in MP4 format (XDCAM EX™ workflow-compatible) for direct editing in other major NLE systems, including Avid Media Composer, Adobe Premiere and Grass Valley Edius Pro.

*H.264 UHQ/SD/Web MOV files can be edited by Grass Valley Edius Pro.





MPEG-4/AVC H.264 Ultra High-Quality (UHQ) 35Mbps Recording Mode and Proxy Recording
The GY-HM650 further provides the H.264 high-quality 35Mbps (MOV) recording mode used in HD SLRs, meaning higher bit rates for even better image quality. The 35Mbps bit rate is high enough to support full 1920 x 1080 encoding, resulting in stunningly detailed, broadcast standard HD images. In addition, the onboard H.264 video format Web mode (0.8Mbps) allows for quick on-location data transfers, allowing footage to be delivered faster than ever.

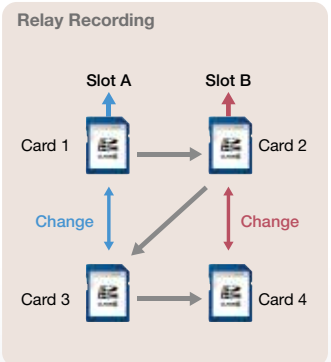
UHQ Ultra-High Quality

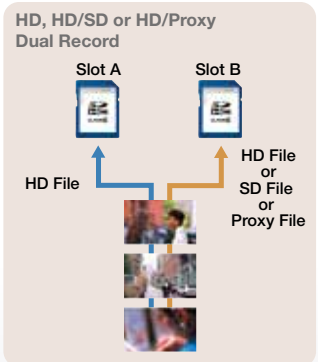
Dual SDHC/SDXC Card Slots for Maximum Versatility
Dual SDHC/SDXC card slots make the GY-HM650 a truly versatile camcorder, offering such benefits as simultaneous recording and relay recording with reliable and cost-effective media.

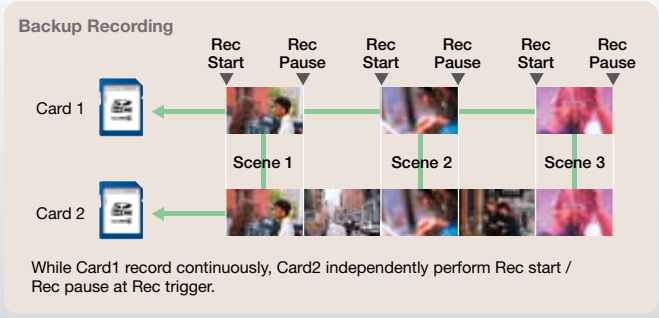
In relay recording mode, you can shoot continuously and seamlessly over multiple cards. When one card is full, the camcorder switches seamlessly and automatically to the other card. And because cards are hot swappable, there is in effect no limit to the continuous shooting time in any mode, even with lower capacity cards.
It is possible to start editing footage from one card while still shooting to the other. With simultaneous recording, you can easily create backup or duplicate files as you shoot without the need for any external equipment—either for a client copy or simply for peace of mind. Additionally, while the Rec trigger is used to pause and unpause recording on one card, the other card can act as a continuous backup that overrides the pause function.With the new dual codec, it is now possible to record full HD files on one memory card while simultaneously creating smaller SD or proxy files on the other, providing the flexibility for a range of workflow possibilities.

SDHC/SDXC media offers the best combination of price, availability, capacity, reliability and transfer speed. With no moving parts and no pins or other extrusions, SDHC/SDXC cards are both durable and reliable, and compare favorably with tape on a cost-per-minute basis.

* During simultaneous backup recording in HD mode, the duplicate file records in the same file format and bit rate as the original.







** Backup Recording is not compatible with AVCHD mode.

A Powerhouse of Performance and Flexibility

High-Performance Features

Superb Portability and Compact Design

With a stylish body that fits boldly within the distinctive range of ProHD camcorders, the compact dimensions and superb portability of the GY-HM650 allow it to be used anywhere. Lightweight (2.45kg/5.4lbs operating condition), versatile and extremely easy to use, it is the perfect camcorder for next generation acquisition.

Shooter-Friendly Controls and Layouts

Ergonomics has played a major role in the design of the GY-HM650. The camcorder's handgrip makes it very comfortable to hold, even on long shoots. And despite its extremely compact dimensions, all the camcorder's main functions are accessible directly from controls and switches on the camera body, right where you would expect them to be.

- **White balance** —Selectable between preset and two user settings
- **Gain** — (L,M,H) -6, -3, 0, 3, 6, 9, 12, 15,18, 21, 24 dB & Lolux, AGC can be assigned to the "L/M/H" gain switch
- **Full Auto**— (on/off)
- **ND Filter**— (Clear, 1/4, 1/16, 1/64)
- **Auto/Manual Focus, One Push Auto**
- **Shutter**—Speed selectable by cross keys
- **Focus Assist/User 1**— (on/off)
- **OIS/User 2**— (on/off)
- **LoLux/User 3**— a JVC exclusive feature that permits shooting in adverse lighting conditions
- **AE LOCK/User 4**— (on/off)
- **Zebra/User 5**— (on/off)
- **Marker/User 6**— (on/off)

Among the controls are seven user-definable buttons that can be assigned a range of functions for instant setting instead of the preset settings.

High-Resolution 920K pixels 3.5" LCD Monitor

The high-resolution 920K pixels 3.5" 16:9 aspect ratio LCD monitor provides a wide array of monitoring and setup indications. For maximum flexibility, the monitor is mounted at the top of the camera, ideal for shooting at various angles in handheld camera applications.

1.22 Megapixel LCOS Viewfinder

The GY-HM650 features a stunning new high-resolution (852 x 480 x 3) LCOS (Liquid Crystal on Silicon) 0.45" viewfinder. The 16:9 image is crisper and more detailed than conventional LCD viewfinders, with higher vertical resolution and superior RGB color separation

Focus Assist Function

Helping the camera operator stay focused on the action is a focus assist system that highlights the edges of objects in the image. When Focus Assist switched on, the image in the viewfinder or LCD monitor switches to monochrome and all objects that are in focus appear with colored edges (selectable from red, green or blue). Keeping the important elements in the picture in focus while shooting is greatly simplified.

Focus Assist OFF

Focus Assist ON

GUI

The GY-HM650 takes ProHD's highly regarded GUI navigation to the next level. Not only are menu items immediately accessible, but settings can also be easily checked right from the settings window. With an improved graphical interface, it's easier than ever to customize the settings to match individual preferences or the demands of the moment.

Shown with optional microphone.

User Friendly Functions

Pre Rec Mode
How many times have you missed a crucial moment because you didn't hit the record button in time? With Pre Rec enabled, the camcorder continuously buffers up to 15 seconds of video, so that when recording is started the cached video is included in the recorded file, giving you an up to 15 second head start.

Interval Rec
This feature allows you to record single frames at set intervals, which can be used to shoot slow-moving scenes, such as sunsets or construction, or to capture time-lapse recordings, such as the growing of plants.

Variable Frame Rate Recording (Over Crank, Under Crank)
When recording in the 720p 35Mbps mode, the camera can be set to record at a frame rate different than the playback rate. This capability makes it possible to record slow or fast motion when the recording is played back at 24p, 25p or 30p. The GY-HM650 can also under-crank in the 1080p 35Mbps mode.

Cutting-Edge Connectivity
Equipped with leading edge connections, the GY-HM650 offers versatility while meeting the needs of professional applications. For easy monitoring of footage, you can monitor from the digital SDI and HDMI outputs simultaneously, easily switching between output in HD or SD.

- **SDI** (HD/SD) out
- **HDMI** (HD/SD) out
- **TC Sync** in/out
- **AV** out
- **USB**
- **Mic/Line** x 2 with phantom power
- **Aux In** for Wireless Receiver
- ø2.5mm **Remote Control**
- ø3.5mm Stereo **Headphone** out

TC Sync
With TC Sync functionality, two GY-HM650 units can be synchronized with time code using an RCA cable. Since the terminal can be used for both in/out functions, either unit can be the master, providing for an ideal multi-camera operation setup.

Wired Remote Control
The GY-HM650 comes with a wired remote interface (Ø2.5mm connector) for operating the camcorder remotely when using a tripod, jib, crane or boom.

Audio Recording and Monitoring Flexibility
The GY-HM650 provides a number of essential audio features. Its built-in stereo microphone is ideal for capturing natural sound on location, but the camera also includes two mic/line selectable XLR inputs with phantom power.
The side panel is equipped with screws to attach a holder for an optional wireless receiver, for which there are dedicated mic and headphone jacks. Also equipped with an audio equalizer, sound can be adjusted to your liking from the GUI.

High-Capacity Battery Systems
Capture more footage and clock more recording time with the newly developed high-capacity (4900mAh) battery. In addition, it is also possible to charge the battery when the camera is switched off and plugged in using the AC adapter.

Supporting Software

JVC ProHD Clip Manager
The ProHD Clip Manager for both Mac and Windows makes it easy to manage MP4 clips on the GY-HM650's memory cards from your computer. With a few clicks of the mouse you can copy, move or delete clips, preview clip content, as well as view and edit clip metadata. A thumbnail view of all the clips in the current folder shows the content of each clip at a glance. Use the viewer to watch the whole clip, or change the clip's index frame used for the thumbnail. You can also manage folders to keep your clips organized, and check the remaining free space on a card. The latest version of ProHD Clip Manager offers an even greater level of NLE compatibility by enabling MP4 files to be converted to m2t, widely supported by NLEs.

ProHD Log and Transfer Plug-in
The ProHD Log and Transfer Plug-in is a plug-in for Apple's Final Cut Pro™ that lets you drop MP4 files recorded on the GY-HM650 into the clip bin. With the plug-in installed, you can view thumbnails of the MP4 files on a memory card from the Log and Transfer screen of Final Cut Pro™. Simply drag and drop the thumbnails into the bin to automatically convert the clips to QuickTime™, ready for use.

Discover the Next Stage with Wi-Fi

Professional Display

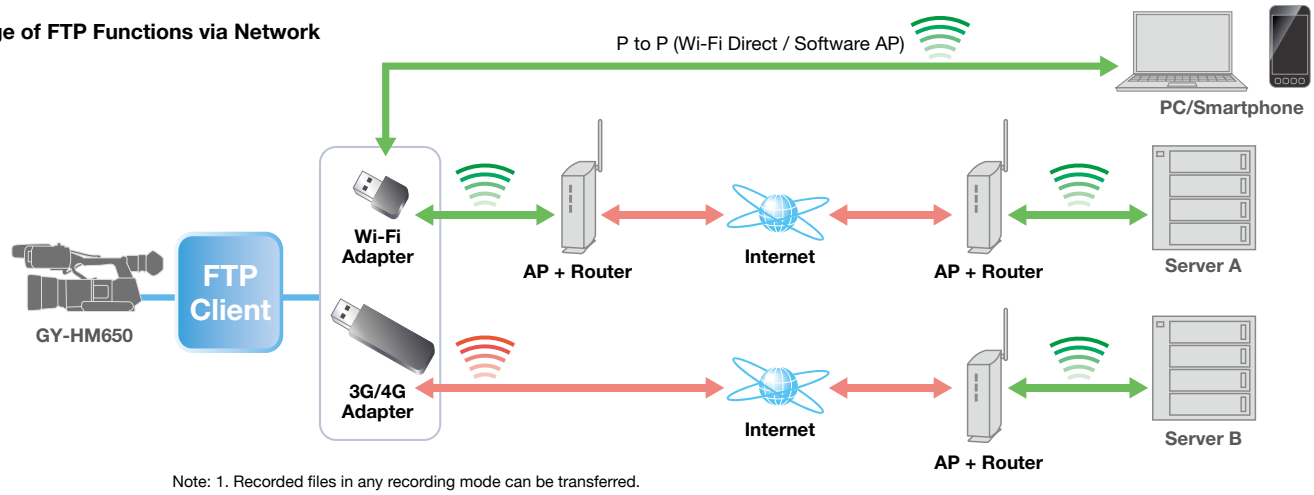
Network Connectivity for Next-Level Functionality

The GY-HM650 is equipped with a USB 2.0 host function so that you can connect the main unit directly to a network adapter for Wi-Fi or 3G/4G functionality. This allows remote viewing of camera images, wireless remote control, and transfer of recorded images with a PC or portable device—such as a tablet or smartphone—using Wi-Fi direct or via an access point.

Wi-Fi Adapter

Smartphone, Tablet

Range of FTP Functions via Network

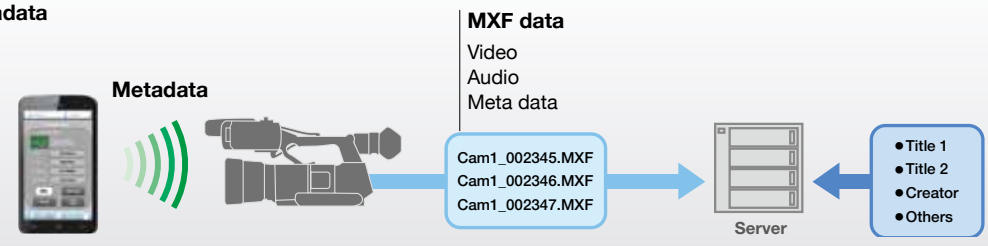


Note: 1. Recorded files in any recording mode can be transferred.
2. File transfer is only possible in Media mode. (It is not possible in camera mode. It means file transfer is not possible during shooting.)
3. It is not connectable with "Hot Spot" Wi-Fi access points with security authentification required.
4. Every Wi-Fi adapters are not compatible. Only recommended and verified adapters can be used. Compatible adapters will be informed in JVC website.
5. 3G/4G dongles connection are required with major carrier partners.

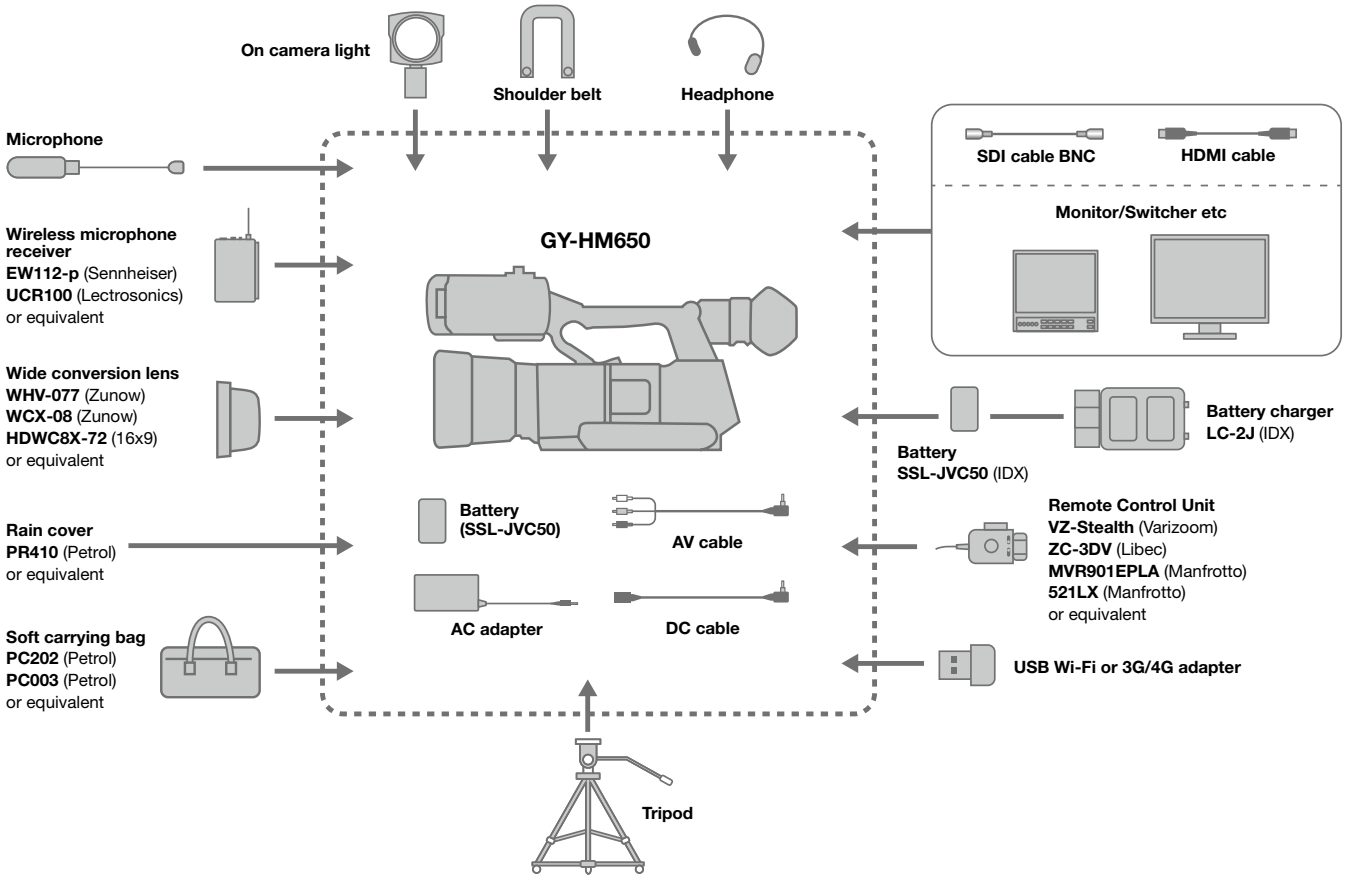
The GY-HM650 allows you to record full HD files on one SDHC/SDXC memory card while simultaneously creating smaller proxy files (H.264/MOV files at 1Mbps:480 x 270 30p/25p/24p) on the other. With the built-in FTP client function, you can transfer captured audio and video directly from the field via an optional Wi-Fi adapter or 3G/4G network adapter. From high-quality HD video to light, Web-friendly proxy video data, delivering footage back to the studio has never been faster or easier.

Support for MXF Files with Rich Metadata

The GY-HM650 supports the MXF file format, which allows rich metadata, such as capture information sent via the FTP function, to be embedded into the file. This descriptive metadata is essential to efficient operation of asset management systems for recorded data.

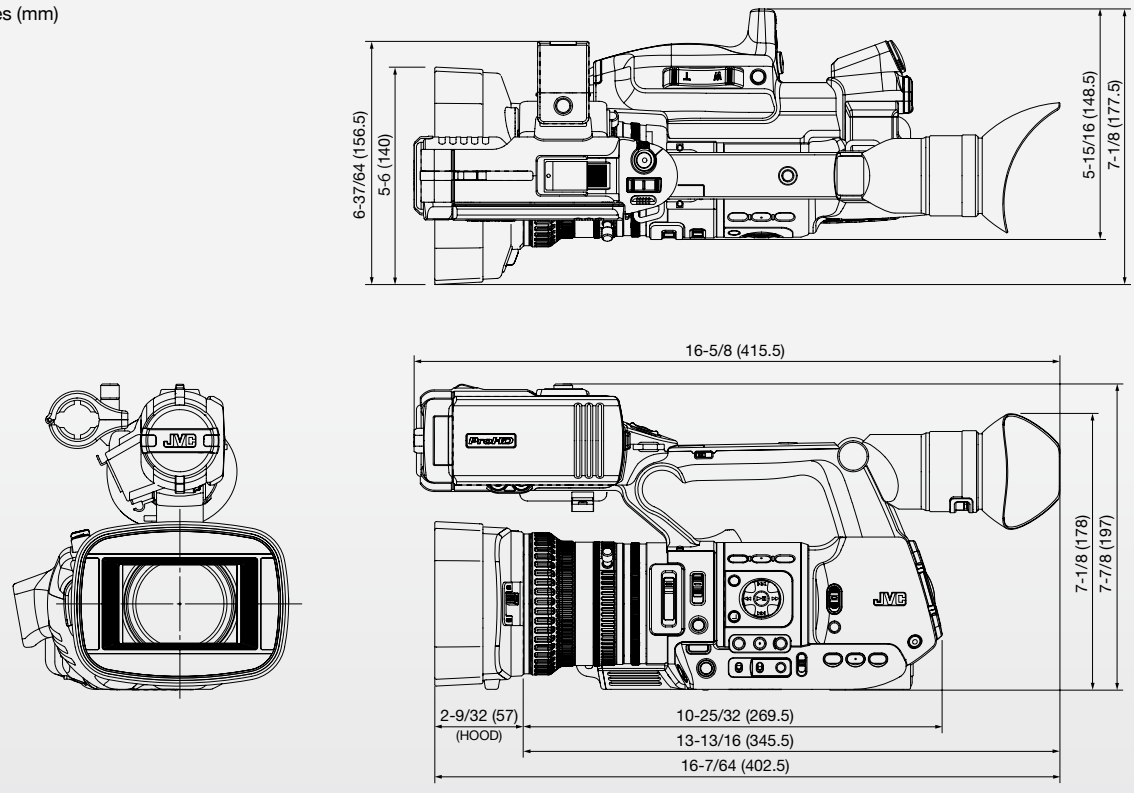


System Configuration



Dimensions

Unit: inches (mm)



Specification

GY-HM650

[GENERAL]
Power: DC 12V (AC adaptor), DC 7.2V (Battery)
Power consumption: Approx. 13W(with VF in single REC mode and default setting)
Dimensions (W x H x D): 178 x 198 x 416mm (7" x 7-13/16" x 16-3/8")
Mass: Appro.2.45kg (5.4lbs) (including battery)
Operating temperature: 0℃ to 40℃ (32℃ to 104℃)
Storage temperature: -20℃ to 50℃ (14℃ to 122℃)
Operating humidity: 30% to 80% RH
Storage humidity: Under 85%

[CAMERA]
Image sensor: 1/3" 2.2M pixels progressive scan 3CMOS
Synchronizing system: internal synchronization
Stabilizer: Optical image stabilizer
Lens: Fujinon F1.6-3.0, 23x, f=4.1-94.3mm (35mm conversion: 29 to 667mm)
Sensitivity: F11 (60Hz) /F12 (50Hz), 2000lx (typical)
Minimum illumination: 0.15lx (typical) (1920 x 1080 mode, F.1.6, Lolux mode with 1/30 or 1/25 shutter)
Filter diameter: 72mm
Shutter speed: 1/4 to 1/10000
Gain: -6, -3, 0, 3, 6, 9, 12, 15, 18, 21, 24 dB, Lolux, ALC
ND filter: Clear, 1/4, 1/16, 1/64
LCD display: 3.5" 920K pixels, 16:9
Viewfinder: 0.45" 1.22M pixels, 16:9

[VIDEO/AUDIO RECORDING]
Recording media: 2x SDHC/SDXC memory card Class 4/6/10 (Class4 for AVCHD and H.264 SD or Proxy only)
Video recording:
Video codec: MPEG2 Long GOP (HD), MPEG-4/AVC H.264 (HD/SD/Web)
File format: MOV (HD/SD: H.264), MP4 (XDCAM EX), MTS (AVCHD), MXF
Recording mode:
MPEG-2 Long GOP
NTSC setting:
HQ mode: 1920 x 1080/59.94i, 29.97p, 23.98p, 1440 x 1080/59.94i, 1280 x 720/59.94p, 29.97p, 23.98p
SP mode: 1440 x 1080/59.94i (25Mbps), 1280 x 720/59.94p (19Mbps)
PAL setting:
HQ mode: 1920 x 1080/50i, 25p, 1440 x 1080/50i, 1280 x 720/50p, 25p
SP mode: 1440 x 1080/50i (25Mbps), 1280 x 720/50p (19Mbps)
MPEG-4/AVC H.264 (UHQ)
NTSC setting: 1920 x 1080/59.94i, 23.98p
PAL setting: 1920 x 1080/50i
AVCHD
NTSC setting:
HQ mode: 1920 x 1080/59.94i, SP mode: 1920 x 1080/59.94i
PAL setting:
HQ mode: 1920 x 1080/50i, SP mode: 1920 x 1080/50i
SD (MPEG-4/AVC H.264)
NTSC setting: 720 x 480/59.94i (GY-HM650U only)
PAL setting: 720 x 576/50i (GY-HM650E only)
Proxy (MPEG-4/AVC H.264)
NTSC setting:
Web mode: 480 x 270/29.97p, 23.98p
PAL setting:
Web mode: 480 x 270/25p
Audio recording LPCM 2ch, 48kHz/16-bit (MPEG-2 Long GOP/H.264), Dolby Digital 2ch, 48kHz/16-bit, 256kbps (AVCHD), μ-law (Web)

[INTERFACE]
Video output: AV output, SDI output (BNC x1), HDMI output x 1
Audio input: XLR x2 (MIC,+48V/LINE), ø3.5mm mini jack x 1
Audio output: AV output
Headphone: ø3.5mm mini jack x 1
Time code link input/output: RCA x 1
Remote: ø2.5mm mini jack x 1
USB: Mini-USB2.0, Type-B/USB host A
* Only recommended network adapters should be connected to the USB host terminal.

[PROVIDED ACCESSORIES]
Battery pack (SSL-JVC50) x 1, AC adapter x 1, AV cable x 1

Optional Accessories

SSL-JVC50
Battery (IDX)

LC-2J
Battery Charger (IDX)

■ **SDHC Class 4/6/10, SDXC recording time (approx.)**
Class 4 only correspondence with AVCHD/H.264 mode.

	MOV/MP4			MOV	MTS		MOV	MOV
	MPEG-2/HD			H.264/HD	AVCHD		H.264/SD	H.264/Proxy
	SP		HQ	HQ	SP	HQ	SD	Proxy
	720p	1080i	720p/1080i	1080i	1080i	1080i	480i/576i	270p
4GB	22 min.	17 min.	12 min.	12 min.	25 min.	19 min.	47 min.	6 hr. 20 min.
8GB	45 min.	35 min.	25 min.	25 min.	50 min.	39 min.	1 hr. 35 min.	13 hr.
16GB	1 hr. 30 min.	1 hr. 10 min.	50 min.	50 min.	1 hr. 40 min.	1 hr. 18 min.	3 hr. 10 min.	26 hr.
32GB	3 hr.	2 hr. 20 min.	1 hr. 40 min.	1 hr. 40 min.	3 hr. 20 min.	2 hr. 36 min.	6 hr. 20 min.	52 hr.
64GB (SDXC)	6 hr.	4 hr. 40 min.	3 hr. 20 min.	3 hr. 20 min.	6 hr. 40 min.	5 hr. 12 min.	12 hr. 40 min.	104 hr.
128GB (SDXC)	12 hr.	9 hr. 20 min.	6 hr. 40 min.	6 hr. 40 min.	13 hr. 20 min.	10 hr. 24 min.	25 hr.	208 hr.

Recommended SDHC/SDXC cards brands: *Sandisk, Toshiba, Panasonic.

Simulated pictures.
The values for weight and dimensions are approximate.
E.&O.E. Design and specifications subject to change without notice.

DISTRIBUTED BY

Printed in Japan
KCS-8432 CEHM650GNK1209