

■ Streaming and FTP via JVC's GY-HM650

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■ Need an OB van you can fit in a bag?

JVC's GY-HM650 is one of the most exciting cameras we've seen recently. Not only is it approved by the EBU and extremely well-equipped for its price point, but the inclusion of WiFi connectivity (and by extension FTP and streaming functionality) opens up some intriguing opportunities for anyone working in ENG or events.

The GY-HM650 allows you to move ENG or other live reporting to the cloud, essentially allowing a single camera operator to do what used to take an OB van. You can now shoot footage on location and stream it straight back to the studio for editing, or even stream it directly to the web – all armed with little more than your camera, a WiFi dongle and your smartphone.

Not content with that, JVC have made the camera a real contender even if you don't plan to stream footage. That connection also enables remote control from a range of devices (including metadata management) and recording options include dual encoding and simultaneous recording of different resolutions to different cards. The GY-HM650's low light performance is particularly impressive, and being capable to capture 2000 lumens at F12 means it actually exceeds BBC broadcast requirements.

There are other nice touches too, like the ability to shoot at the sweet spot in low light if you enable extended mode; pixel to pixel viewing so you can check focus in incredible detail; the inclusion of wide dynamic range and the fact that the 4:2:2 capable sensor captures all the colour information it can, despite the camera being capped at 4:2:0, so you can pull a true 4:2:2 image off an external recorder.

In order to demystify the JVC GY-HM650 a little, we've decided to put together a rough guide to how its FTP and streaming options work, so that you can work out whether it'll meet your requirements and plan for any extra peripherals you might need.

If you have any questions about the GY-HM650, its workflow or accessories, you can always get in touch with the team on **03332 400 888** or at **broadcast@Jigsaw24.com**



■ Connecting your GY-HM650 to a network

What hardware/infrastructure do you need?

First and foremost you'll need a 3G, 4G or WiFi dongle to plug into the Host USB port at the back of the camera – this port is there purely to enable network setup, and can't be used for data transfer like a standard USB port. Alternatively, you can use a USB adaptor to connect to a wired network over Ethernet.

You're free to choose your own network – the camera isn't programmed to deal with any in particular – but to achieve the best speeds we recommend setting up a local WiFi network using a solution like AirPort Extreme, then connecting your camera to it via a dongle, rather than trying to have your camera as an integral part of your network. Connecting your camera to the network via a wired connection will always give you the best speeds.

Choosing a dongle

The host USB port is compatible with a limited number of USB sticks, and will not be able to connect to a 3G, 4G or WiFi network if your dongle is not on a compatible device. For seamless connectivity, both the network provider you choose and the chipset in your dongle must be qualified; problems have arisen in testing when manufacturers have used different chipsets in different iterations of the same dongle, meaning some iterations will work and others won't.

The most comprehensive list of what works and what doesn't can be found on the JVC website here: [\[JAMES MAY HAVE A LINK\]](#), but as a general rule dongles with Huawei chipsets work best.

Setting up your dongle for the GY-HM650

Most WiFi and 3G dongles are password protected, but if the dongle is attached to the Host USB port, you'll be unable to enter your credentials using the camera's controls.

Before using the dongle, plug it into a more traditional device, like a desktop or laptop computer. Activate the dongle, connect to the network, then remove any options like passcodes which require you to manually input data in order to connect to the network. The dongle is then ready to be used on-camera.

Setting up your camera for a network connection

Turn off HDMI or SDI on your camera – you can't have both on when connected to a network, as your camera requires the processing power usually dedicated to these in order to access the network and transfer footage. You can do this by going to Main Menu > System > Network in the camera menu and selecting HDMI Off or SDI Off.

Configuring your network connection.

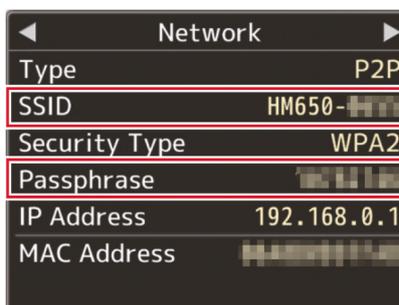
To enable your network connection, go to Main Menu > System > Network > Settings > Connection Setup and press the Set button. A setup wizard will appear (it will appear differently for each adaptor or dongle you connect to the Host port). Follow the instructions on screen to connect via Wireless LAN, Wired LAN or 3G.



Connecting the GY-HM650 to public hotspots

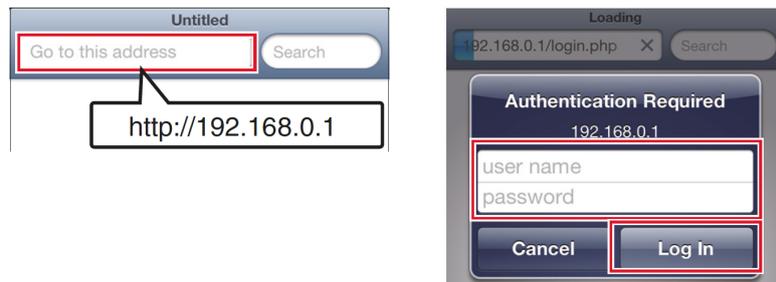
As many public hotspots require a password or other user authentication, you cannot access them directly from the camera. However, you can connect to the WiFi hotspot using an alternative device, such as a laptop or tablet, then access the camera's controls through that device's browser.

To connect to a device, set your camera to Camera Mode, press Status and scroll through the screens until you reach the Network screen. Your camera's IP address will be displayed; note this down.



Fire up the browser on the device you wish to connect to, and enter http:// followed by your camera's IP address where the URL would normally go.

You'll be asked to enter your camera's user name and password. Out of the box, this is prohd and 0000.



Changing your camera's user name and password

To change your camera's user name and password, go to Main Menu > System > Network > Settings > Web > Change password and enter your new credentials.

■ Streaming from your GY-HM650

Getting set up for streaming

Once your camera is connected to the network, all you need to do to begin streaming is go to Main Menu > Settings > Network Settings and enter the IP of your destination device, for example a Teradek Cube or on-set display. You will then be able to stream a 3Mbps to 5Mbps MPEG-H264TS stream to the device from the camera.

If you are streaming to an online content distribution system, be aware that the GY-HM650 currently only supports streaming using fixed bitrate UDP, and many commercial streaming services currently only support RTNP streams.

JVC plan to add RTNP support to the GY-HM650 but have not announced a timescale for this yet. In the meantime, Livestream and VideoLAN's VLC both support UDP. If you plan on working with VLC, contact our team first, as the workflow requirements are extremely specific and we recommend having someone walk you through your initial setup.

On-set streaming

The fastest way to stream is to attach an Ethernet adaptor to your camera's host USB port back USB port, then connect via Ethernet to a router. From the router, you can stream wirelessly to receivers such as the Teradek Cube, and these can in turn stream wirelessly to DIT stations, monitors and other devices. This wired system gives you the shortest possible delay between shooting your footage and it appearing on screen – around 3.5 seconds.

Devices that have tested particularly well include the Teradek Slice and Cube, Haivision's Makito family and VideoLAN's VLC – again, we would recommend contacting us directly before attempting to stream to VLC.

■ FTP with your GY-HM650

How does the GY-HM650's on-board FTP work?

The camera's FTP function uses a point-to-point push service to send content to a specified IP address.

Can I record during FTP?

You can record to one of your GY-HM650's memory cards while performing FTP on content from the other – just start recording and the camera will automatically default to the card that is not already engaged in FTP.

Connecting via a 3G adaptor for FTP

To perform FTP via 3G, attach a 3G adaptor to your camera's host USB port. Disable HDMI or SDI, then go to Main Menu > System > Network > Settings > Connection Setup > Wizard and press the Set button. This will open your connection setup Wizard.

'Cellular' should appear in the Wizard screen. If it doesn't, the camera doesn't recognise your dongle and you will need to try a different model. Scroll through the options presented by the Wizard to confirm your 3G carrier, the access point you wish to connect to, the connection phone number and the user name associated with it.



Bear in mind that your data costs will soon go up if you are paying for your 3G on an as-used basis, and make sure you remove the adaptor entirely when not using your 3G network as if it is left in your camera may stay connected and continue to transmit data, incurring further costs.

Setting up a Clip Server for FTP

Connect the camera to a device with a keyboard using the same process as described in 'Using your camera with public hotspots'. Once you have remote control of the camera, you can set up a clip server.

To set up a clip server, go to Go to Main Menu > System > Network > Settings > Clip Server and enter the following details:

Alias – the name you want this configuration to be referred to by in menus and option lists. Must be less than 31 characters.

Server – the address of your FTP server; must be less than 127 characters and only contain letters, numbers, hyphens and dots.

Port – enter the server port number (by default this is 21).

Dir. Path – the path for the directory you want your files to be uploaded to.

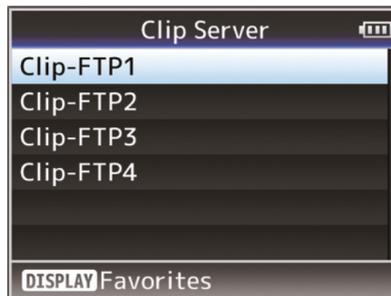
User name and password – the credentials required to log into your FTP server. Both should be fewer than 31 characters.

You can have up to four clip servers registered on your GY-HM560 at any one time.

Uploading a recorded video clip

First, ensure that the specified FTP port is open and you are permitted access. The network indicator light on the camera should be white, and not blink.

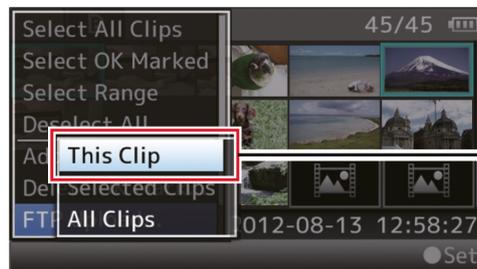
Go to Main Menu > System > Network > Settings > Clip Server and select a server from your list of registered Clip Servers.



Press and hold the Mode selection button to put the camera into Media mode. A thumbnail list of all the available clips is shown. Use the arrow keys to move the cursor to the clip you want to upload.



Press the LOLUX/3 button to display the action selection screen. Select FTP Upload > This Clip > the server you wish to upload to, and then press the set button.



Your upload should begin. The Mode selection button will now be disabled until your upload is complete. To stop an upload at any time, press the Set button, select 'Yes' in the confirmation box and press the Set button again to return to the thumbnail screen.

