

High definition video camera HDC-HS 100P/PC and HD Writer 2.6E High Definition Image Management/Easy Editing Software

from Panasonic Corporation

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1. INTRODUCTION. Currently, video is a growing component in corpus creation in language documentation, as it has become more accessible in terms of cost, storage and delivery (Ashmore 2008:77). Arguably, video recordings serve as an excellent community resource in language documentation and revitalization programs, and provide researchers with multi-dimensional, situational records of language use in communities. Video has even been promoted as “the ideal recording device” for documenting languages (Himmelmann 2002:12). However, rapidly developing video technology presents a challenge for many language documenters in terms of selecting recording equipment and software. This paper discusses the features and functions of the high-definition video camera HDC-HS 100P/PC and the accompanying HD Writer 2.6E High Definition Image Management/Easy Editing software (HD Writer). Drawing on fieldwork in the summer of 2009 in Peru, the authors evaluate the strengths and drawbacks of the equipment and software under consideration and describe how to make a DVD using HD Writer for the purpose of language documentation.



FIGURE 1. High definition camera HDC-HS 100P/PC with the external microphone ECM-MS908C, mounted on the Bogen-Manfrotto Modo 785B tripod

2. HDC-HS 100P/PC FEATURES. The HDC-HS 100P/PC was tested by EM in the summer of 2009 during fieldwork in eastern Peru. While this camera is a mid-range product (\$580), it contains certain features typically found on higher-end models. First, it is a high-definition video camera, providing superb video image quality, a desired objective for language documentation video. Next, the hybrid HDC-HS100 records to both an SD/SDHC memory card (optional) and its internal hard drive. The spacious 60GB internal hard drive (HDD), when combined with the 16 GB SDHC memory card (\$36), provides a reliable temporary storage base for a language documenter. The camera's large storage capacity as well as its good-size LCD screen, another of its premium features, gives a documenter the opportunity to present a sample of recorded video to members of a language community. In addition, the camera has a built-in mount for an external electret condenser microphone, a necessary accessory in language documentation to ensure a high quality audio component. EM used the ECM-MS908C microphone from Sony (\$90), supplemented by a windscreen, yet another important tool for capturing sound. In addition, the camera has a tripod receptacle, which is convenient for lengthy recording sessions. The Bogen-Manfrotto Modo 785B tripod (\$66), used extensively by EM, is a compact and lightweight accessory, easy to pack and carry around. Another attractive feature of this camera is the length of its supplied lithium-ion battery operation time, which is approximately 1hr 50 min of continuous recording time. Its charging time is quite short: just 2 hrs 35 min when the battery has no capacity left. The replacement battery can also be purchased at an additional cost (\$50) and used when the supplied battery is projected to wear out during prolonged recording. Finally, the camera is lightweight (only 482 g or 1.06 lbs.), user-friendly (it includes Intelligent Auto mode, an intuitive set of technologies that automatically activate, making video shooting an easy process), and durable. Its robustness was proven in the hot and humid climate of the Peruvian jungle where temperatures often soared to over 100F.

Nevertheless, there are a number of drawbacks to this product. For example, to start recording, the user has to simultaneously rotate the mode dial and press the lock release button, which is an awkward operation. Some of the protection covers (e.g., over accessory shoes and the external microphone terminal) are so flush with the body of the camera that it takes considerable effort to open them. The HDMI, USB, and DC power ports are poorly placed, all hidden behind the battery. Disadvantages associated with the supporting software for this camera are addressed below.

3. HDC 2.6E SOFTWARE AND SYSTEM REQUIREMENTS FOR ITS INSTALLATION.

Panasonic's HD Writer 2.6E is a limited Windows-only editing application (MS Windows XP, MS Windows 2000, and MS Windows Vista). Mac users can edit the HS100's AVCHD video with iMovie '08. To install HD Writer: a computer built around a 2.16-GHz Intel Core Duo or better processor is required; 1024 MB or more of RAM are recommended; and desktop resolution of 1024 x 768 pixels or more (1280 x 1024 pixels or more), as well as a graphics card complying with DirectX 10 for Windows Vista and a graphics card com-

plying with DirectX 9.0c for Windows XP/2000 are recommended. The software¹ should be compatible with Panasonic HDC (SD1, SD3, SD5, SD9, SD100, SX) and could work with other HDC (Sony, Canon, etc.), though the authors have not tested this claim.

4. FUNCTIONS. Along with its primary function of capturing video images, based on the MPEG-4 AVC/H.264 codec for compressing images, the camera can: (1) copy recorded images to PC, (2) write the stored MPEG-4 data to DVD discs and SD cards, (3) convert the stored MPEG-4 data to MPEG-2, and (4) create a DVD video disc. To perform these functions, the installation of HD Writer 2.6E is required and the media have to be connected to the camera via its USB port.

5. CREATING A DVD VIDEO. Creating a DVD video with the help of HD Writer consists of three steps: copying recorded data to a PC, editing, and writing a DVD video. Each step is described in detail below.

6. COPYING DATA TO PC. Copying to a PC is simple. The interface is clear and does not involve a steep learning curve. First, the camera should be on and plugged into an electrical outlet. The supplied USB connection cable can then be used to connect the camera to a PC. When the SELECT USB FUNCTION screen appears, the “Select PC” option should be chosen. After the connection is established, HD Writer will launch, and the main functions will appear on the START MENU screen, among them “Copy to PC.” This function enables selection of videos listed in the “Select image” display and copy destinations from the “Enter Import destination” display. The source HDD data are displayed as thumbnails in the source list. The videos have an attached checkbox symbol that must be checked for the file to be selected and the selection is confirmed by clicking twice on the thumbnail. The copied data can then be stored in an HD Writer save folder, which will hold up to 200 videos and 3950 scenes. After the copying is finished, the message “Continue editing?” will appear. If “yes” is selected, the user will be directed to the next screen called EASY EDITING.

7. EDITING. Editing is a user-friendly process that includes splitting a scene, deleting a selected scene, and merging a scene with a preceding one. A scene is selected for editing by clicking on the thumbnail in the video/picture window and will then appear in the scene display area.

¹ The software download (\$15) is available from <<http://its-catastrophe.net/download/buy-cheap-panasonic-hd-writer-26e>>. A free download of the updated HD Writer 2.6E software for Windows 7 is available from <http://panasonic.jp/support/global/cs/soft/download/hdw26ee_w7.html>.



FIGURE 2. The EASY EDITING screen

The “Split scenes” button on the right is clicked to display the scene in the preview area. When the playback is paused, the “Split scenes” button is clicked again to divide the scene in two at the current playback point. The “Merge scenes” button is clicked to combine a selected scene with a preceding one in the image display area. The “Delete scenes” button is clicked to discard a selected scene. It should be noted that video data should be copied to some other media before editing since, once the editing process begins, the original data cannot be restored. For language documentation, which emphasizes the meticulous preservation of raw data, editing may not be required. In this case, the user would go directly to the recording step by clicking on the “Select videos to copy to media” button, which then allows users to drag scenes from the image display area to the image recording area. When selected videos are in the image recording area, clicking the “Confirm the selected scenes” button will direct the user to the new top production window. This EDIT TOP MENU window is used to record selected images to a DVD video disc.

8. RECORDING TO A DVD VIDEO DISC. The recording process includes selecting the recording destination, recording format, menu page background, font, font size, font style and font color for the disc and image pages, and DVD playback settings. The EDIT TOP MENU screen displays the image files as thumbnails in the top menu window. When the user clicks on a thumbnail, the videos are displayed page-by-page and can be given titles. The clickable “Bg/layout” function allows the background for the menu page and layout of the pages to be selected. To change the sequence of image files, the user must click on “Close” to return to the previous screen. The “Font/Title” function is used to select the font and font size, color, and style for the disc title and the video titles.



FIGURE 3. The EDIT TOP MENU screen

The clickable “Title entry” button allows the user to insert a page title and image titles in the column that appears on the right. The user must also choose the recording destination and the recording format by clicking on options in the drop-down boxes on the page. As figure 3 shows, there are three options for the latter: AVCHD, DVD-video (high quality), and DVD-video (standard quality). The DVD-video (standard quality) option is typically the optimal format, as it is most frequently supported by DVD players found in indigenous communities. A considerable drawback to the HD Writer recording process is that it may take several hours to produce a DVD disc in DVD-video format, since the images need to be converted from MPEG-4 to MPEG-2 format. If the PC has a CPU of low performance, converting and recording may take significantly longer.

9. CONVERSION TO MPEG-2 FILES. As previously mentioned, HD Writer software is capable of outputting data in MPEG-2 format, which allows videos to be archived as stand-alone video files capable of being opened by other linguistic and consumer applications. MPEG-2 conversion is also useful for transporting files to linguistic annotation software, such as ELAN. The HDC audio is recorded with Dolby Digital 5.1 Creator, which produces surround 5.1-channel sound tailored to consumer applications. Soundtracks with 5.1-channels encoded with Dolby Digital 5.1 Creator can take up less than a quarter of the space required for stereo digital audio on recording media. Nevertheless, for language documentation, the converted MPEG-2 files with the surround 5.1-channel sound have a limited usefulness. These are not stand-alone files. The HD Writer MPEG-2 files can be opened with HD Writer and with VLC2, a highly portable **multimedia player** and **multi-**

² VLC is a free software application, found at <<http://www.videolan.org/vlc/>>.

media framework capable of reading most audio and video formats and various **streaming** protocols.

To resolve the evident problem with the surround sound, the camera's microphone setup can be changed from the default "surround" setting to "focus mic" to ensure reduced (2-channel) sound. When the system is in recording mode, the user can go to MENU > RECORD SETUP > MIC SETUP > FOCUS MIC. HD Writer also provides the option to save the converted files as 2-channel sound files. To convert the original MPEG-4 file, the user clicks the "Save as MPEG2" button on the EASY EDITING screen. When the "settings" window opens, the user must select the number of sound channels. When the image with 5.1-channel sound is output in MPEG-2 format by "Save as the original image," the sound will be 5.1-channel, not 2-channel. If the original image was recorded with the "focused" 2-channel microphone sound, the user is able to activate the "Save as 2ch" button. The 2-channel option is important to ensure compatibility of converted MPEG-2 video files with other applications commonly used in language documentation.

However, the camera's microphone setup cannot be changed if an external microphone is used. The default "surround" sound function is the only option available. HD Writer is unable to convert MPEG-4 files with surround audio signal to MPEG-2 with 2-channel audio signal. HD Writer blocks the "Save as 2ch" button on the settings screen. Considering the purposes of linguistic documentation, the limited use of HD Writer MPEG-2 conversion function is disappointing.

10. COMPATIBILITY WITH ELAN. As mentioned above, video files created during the export phase of the HD Writer video editing process are, in their native MPEG-2 format, unreadable by ELAN. At the time of writing, ELAN stands as the most widely used linguistic annotation software. Therefore, those hoping to use this linguistics program in conjunction with the HDC-HS 100P/PC and the supplied HD Writer software may benefit from being aware of a few interesting, yet manageable, challenges.

While ELAN does offer the ability to open .mpg files, one should note that it prefers an .mpg of the MPEG-4 variety (the .mpg format commonly associated with online videos). However, upon export, HD Writer creates an MPEG-2 file wherein the normally distinct signals of audio and video are "muxed" into essentially one signal.³ As a result, these MPEG-2 files may be read only by HD Writer and VLC, and as such remain unusable by ELAN in this native format.

Note that in addition to the .mpg compatibility issue, both the display resolution and aspect ratio of the native MPEG-2 files created by HD Writer present persistent problems during the importation phase of the ELAN video annotation process. With a native resolution of 854 x 480 pixels, the physical frame size of these MPEG-2 files may be too large for ELAN. Furthermore, ELAN appears unable to scale a 16:9 High Definition aspect ratio (such as 854 x 480 pixels) into a 4:3 Standard Definition aspect ratio.

³ See more information on muxed files at <<http://en.wikipedia.org/wiki/Multiplexer>>.

Nevertheless, the compatibility problem is solvable with the help of the video converter MPEG-Streamclip by Squared 5 software.⁴ In addition to downloading and installing MPEG-Streamclip, users seeking to incorporate this video conversion software for use with ELAN will also need to download and install the free software application QuickTime Alternative 1.81. It is found at <<http://www.squared5.com/svideo/mpeg-streamclip-win.html>>. Note that later versions of this software are not compatible with MPEG-Streamclip and may not be installed alongside Apple QuickTime.

To make HD Writer MPEG-2 files ELAN-ready, the following steps should be taken. To use MPEG-Streamclip, go to “File” on the menu bar and select “Open files.” Navigate to and select the MPEG-2 video file to be used with ELAN. When the video file is opened, it should be viewable in the MPEG-Streamclip player. To create a video file for use with ELAN, go to “File” on the menu bar and select “Export to MPEG-4.” The MPEG-4 Exporter dialog box should appear. In the dialog box, ensure that “Compression” remains set to H.264. In the “Sound” area, keep all default settings with the exception of 256 kbps. Click the drop-down box next to this setting and select 128 kbps. Next, under the “Frame size” area, select “Other” and make sure the setting reads 320 x 240. Finally, in the “Zoom” area, change the X/Y setting from 1 to 1.333 to add a letterbox to the video to prevent scaling. When finished, click “Make MP4.” After being exported, the resultant video file should be compatible with ELAN.

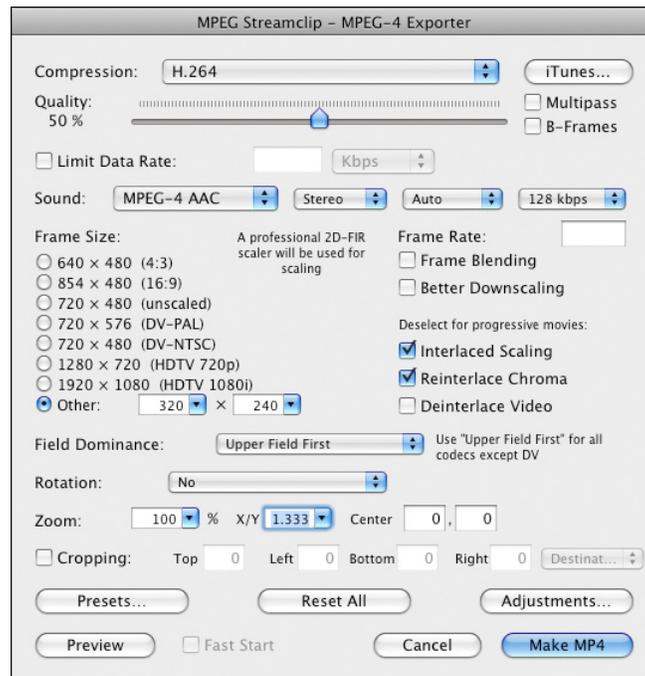


FIGURE 4. The MPEG-4 Exporter screen

⁴ See <<http://www.squared5.com/>>.

11. ADVANTAGES AND DRAWBACKS. The HDC HC-100P/PC is a good quality, user-friendly product that has tested well in linguistic fieldwork conditions. Its software is simple and does not involve a steep learning curve. To mobilize video data, an HD Writer standard quality stand-alone video object can be quickly disseminated with the help of DVD players and TVs commonly found in indigenous language communities. Based on EM's fieldwork experience, indigenous language speakers in the Peruvian jungle have limited access to the Internet and computers, but are familiar with TV sets and DVD players and have shown a clear preference for such stand-alone video objects. Considering that the aim of language documentation is to create a multi-media product that includes video, audio, transcription, and annotations, the software is ill-suited for this purpose since HD Writer lacks the inherent capacity to link the subtitles or other annotations to the final video product. Nonetheless, it is possible to create HD Writer MPEG-2 files that are more compatible with the objectives of language documentation. Such software applications as MPEG-Streamclip and QuickTime Alternative 1.81 can make the HD Writer files ready for dissemination and annotation by converting them to .mov or .mpg files. The final note on the software's weaknesses is that the HD Writer standard quality video making process requires many hours to produce a DVD Video disc. Overall, the HDC-HS 100P/PC camera and HD Writer 2.6E software are useful tools for a language documenter who is willing to take extra time and effort to make them work.

Primary function:	To capture video images and create DVDs
Pros:	The camera is easy to use, lightweight, very reliable in fieldwork conditions; the software associated with it is also user-friendly and tailored for consumer use aimed at the production of stand-alone high and standard quality DVD videos.
Cons:	The HD Writer 5.1 channel sound makes it impossible to use the HD Writer MPEG2 files for the purposes of language documentation; the HD Writer software lacks the capacity to link the subtitles or other annotations to the final video product.
Platforms:	PC: MS Windows XP, MS Windows 2000, MS Windows Vista Mac: Not available Unix: Not available (Minimum requirements: CPU Intel Core 2Duo 2.16GHz or higher, Intel Pentium D 3.2 GHz or higher, or AMD Athlon 64 X2 Dual-Core 5200+ or higher; RAM 1042 MB or better)
Proprietary format:	Available from Panasonic Corporation at < http://www2.panasonic.com/consumer-electronics/support/Cameras-Camcorders/Camcorders/Hi-Def-Camcorders/model.HDC-HS100 >
Viewed:	High definition video camera HDC-HS 100P/PC and HD Writer 2.6E High Definition Image Management/Easy Editing Software
Application size:	300 MB

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