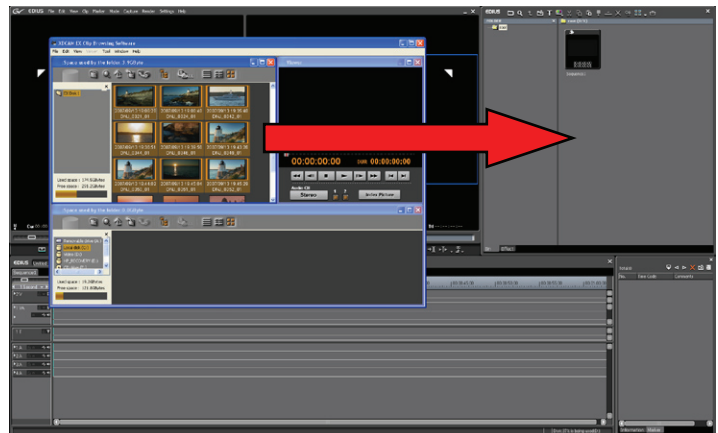


Using Sony XDCAM Footage with EDIUS NLE Software

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1. Introduction

This document explains how to edit native Sony XDCAM, XDCAM HD and XDCAM EX content with version 4.6 of Thomson Grass Valley EDIUS Broadcast NLE software. Given the degree of flexibility offered with XDCAM devices, it should be noted that the workflows offered here are just a few examples of how to work with XDCAM, and that XDCAM workflows can vary in many ways. Specifically, this document only covers ingest and export via file-based methods. It does not cover the XDCAM workflows that involve VTR emulation or AVC device control.

About XDCAM and XDCAM HD

XDCAM and XDCAM HD are Sony's solution to tape-free video recording and acquisition. As with other tapeless solutions offered by other video equipment manufacturers, the Sony XDCAM workflow makes use of IT-immersed concepts, utilizing technology and workflows familiar to the realm of personal computers, and allowing you to browse, ingest and export content as computer-read files. What makes XDCAM different is that it is based on optical media (the Sony Professional Disc system), rather than incorporated hard disk drive electronics for storage. Additionally, XDCAM cameras and decks can also operate as VTR replacement units; essentially imitating the linear based workflows that have long since been established within news production environments.

XDCAM records DVCAM (as DV25) and/or MPEG IMX (as MPEG-2), and XDCAM HD records MPEG-2 Long-GOP only. Both XDCAM and XDCAM HD content use the Material eXchange Format container, otherwise known as MXF. Both classes of device can record a low-resolution MPEG-4 video stream for proxy-based video editing. This low-res proxy data is written simultaneously with the high-resolution data during recording.

About XDCAM EX

The Sony XDCAM EX range of solutions offer an additional means of footage acquisition and storage for high definition (HD) video. XDCAM EX is not intended to be a replacement for XDCAM HD, but rather a cost-effective addition to the XDCAM HD family. The primary difference with XDCAM EX is the recording medium used by the cameras. Rather than using the Sony Professional Disc system for recording video, XDCAM EX uses solid state SxS removable media. This media is based of the new PCMCIA ExpressCard technology, which in turn is the successor to the old PCMCIA CardBus PC card technology. The advantage of this type of recording media over Sony Professional Disc is that it is much faster for data acquisition and ingest, while still providing adequate storage capacity for the MPEG-2 Long-GOP recording format that XDCAM EX employs. SxS solid-state media can also be read by any PC with an ExpressCard reader slot or device, avoiding the requirement for a professional XDCAM HD deck. This makes XDCAM EX ideal for field-based ENG.

As mentioned above, XDCAM EX records MPEG-2 Long-GOP in HD only, within an MP4 file container. XDCAM EX devices are only capable of being access via file-based methods. They do not support VTR emulation.

Further information on XDCAM solutions can be found at the Sony Broadcast and Business Solutions Company Web site (<http://bssc.sel.sony.com/BroadcastandBusiness>)

Before You Begin

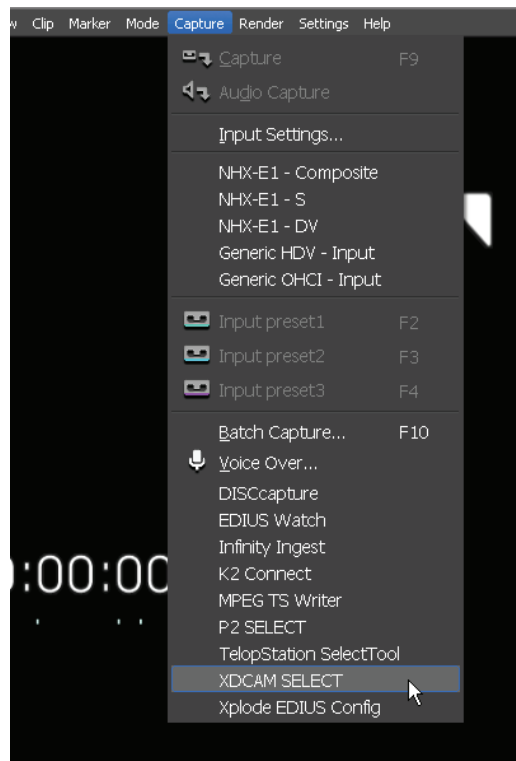
Ensure that you have installed all relevant vendor-provided software for your XDCAM equipment. In some cases, the presence of this software and its respective hardware device drivers are required to allow interoperability with the EDIUS Broadcast NLE software. This software is provided with the Sony XDCAM device.

You should also plan ahead as to how you want to connect to your XDCAM devices, and understand the required settings and configuration (for Ethernet/FTP connectivity vs FireWire). For example, XDCAM and XDCAM HD units use FireWire in two distinct modes; FAM and iLink. When the FireWire connection is set to FAM, the XDCAM unit is seen as an external storage device by the PC, and you can perform data transfer as like any computer file. When using the iLink mode, the XDCAM unit will be recognized as a standard DVCAM or HDV VTR. Please refer to the manual of your XDCAM deck or camcorder to learn how to switch between FireWire modes.

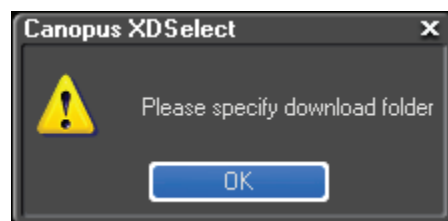
2. Importing XDCAM and XDCAM HD Content with the XDSelect Utility

XDSelect is a tool included with EDIUS Broadcast that provides connection via FireWire or Ethernet to any XDCAM or XDCAM HD unit, to retrieve proxy and essence (or high-res) files. Unlike the Sony PDZ-1 software, XDSelect is not designed for rough editing but instead provides easy clip logging and transfer of MXF files into the EDIUS software for editing. XDSelect also features synchronization of an XDCAM unit with a specified folder on your hard drive, so that any file on the XDCAM disc which is not already present in that folder will be transferred automatically.

XDSelect can be accessed directly through the EDIUS interface by selecting **Capture > XDCAM SELECT**, or through the **Windows Start menu** (via the **Canopus > EDIUS** folder).

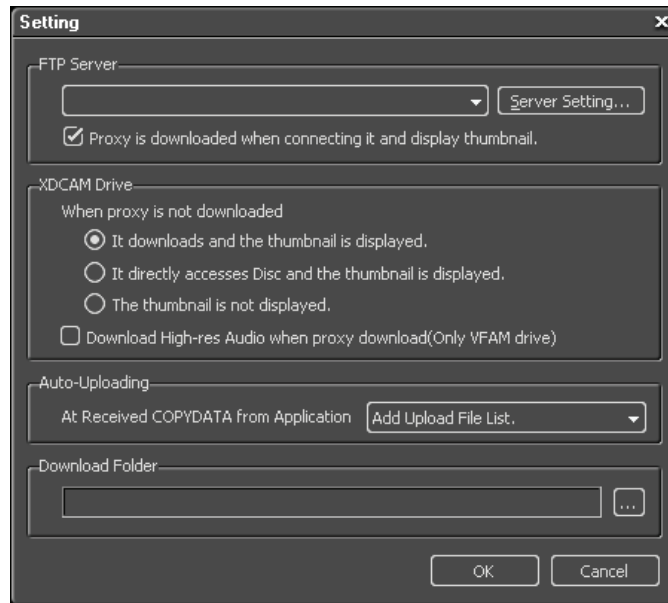


Upon the first time launching XDSelect, you will be prompted to provide a location to transfer clip data and content to from the XDCAM device.



Click **OK**.

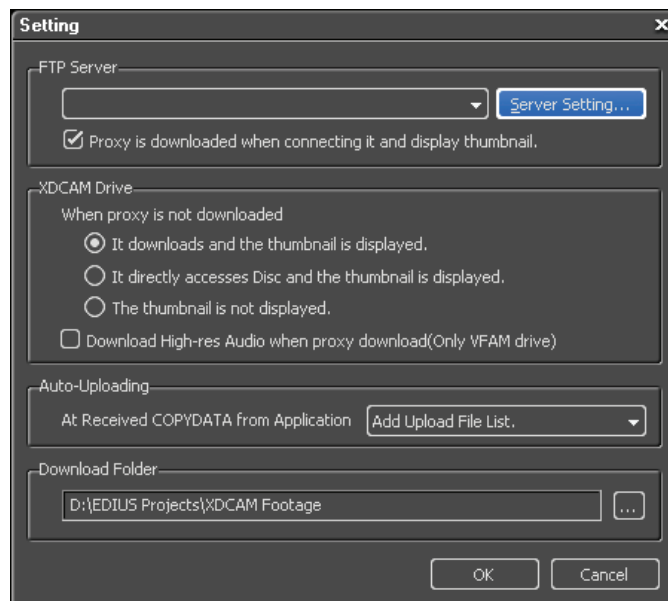
You will then be taken to the XDSelect **Setting** window. This window allows you to control the behavior of XDSelect when used with a connected XDCAM or XDCAM HD device.



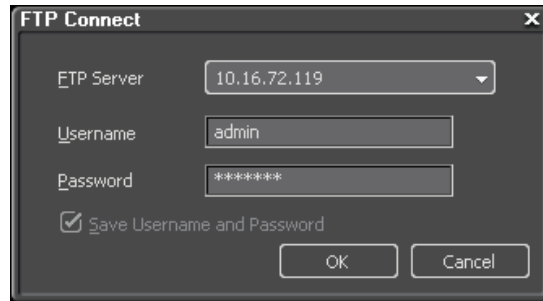
To specify a folder, choose the ... button from the lower-right corner.

Typically, you will want to choose a folder located on a local hard disk, unless you have a high-speed, robust network storage solution in place.

Once you have chosen a folder location, you will be returned to the previous window.

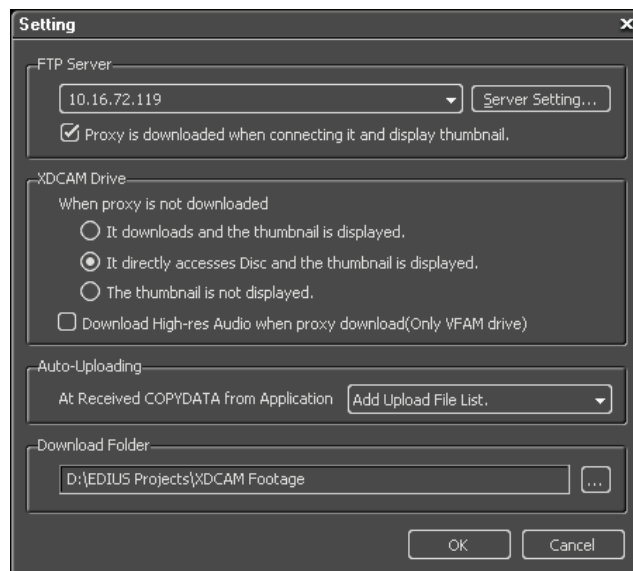


With XDCAM devices, you can connect to them over a network via an inbuilt FTP server. To add an FTP server-based XDCAM device, choose **Server Setting...**



Within the **FTP Connect** window, enter the XDCAM device's IP address, the username (usually 'admin'), and the password (usually the device's model number, such as 'pdw-f70'). Once you have entered the details, click **OK**. You can add as many additional FTP servers to your list as needed, via this method.

Other options within the Setting window cover the download and behavior. For example, you may want to prevent XDSelect from automatically downloading proxy content once it connects to an XDCAM device, in order to allow you to edit directly off the device itself.

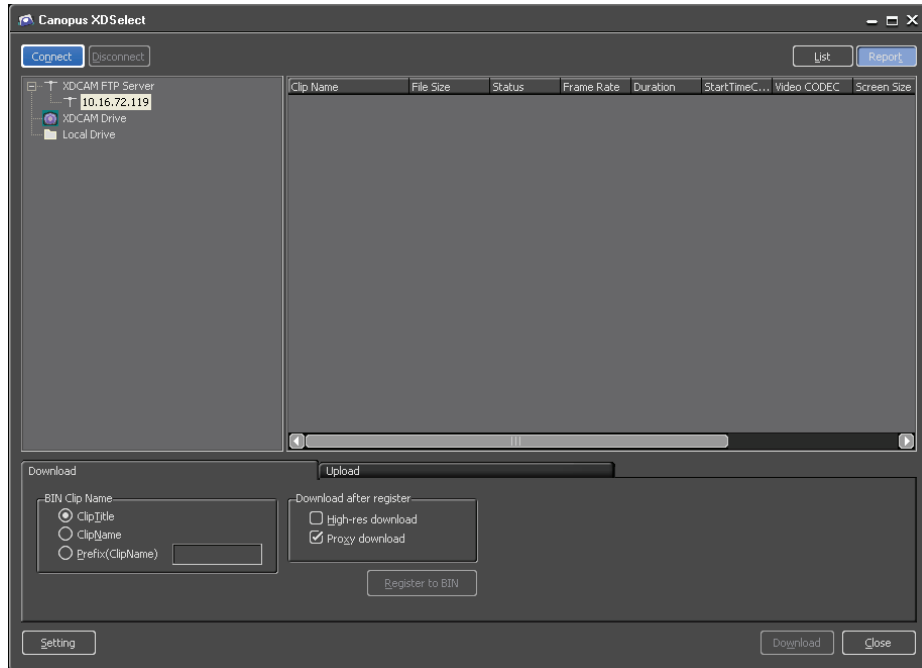


The **Download High-res Audio when proxy download(Only VFAM drive)** option refers to the new Virtual File Access Mode functionality found with XDCAM SAM (Simple Access Mode) devices. This feature allows you to work with the high-quality source audio while editing with the low-res proxy video content, since the audio datastream is far less resource/bandwidth taxing than the video datastream. EDIUS is the first NLE to fully support XDCAM SAM.

The **Auto-Uploading** option lets you choose whether to have XDSelect queue up all export jobs received from the main EDIUS application for a single, one-time upload operation, or upload any completed timeline export job to the XDCAM device immediately. You can also choose to have XDSelect not do anything, allowing you to manually create your own Upload job queues when you are ready.

Click **OK** to be taken to the main XDSelect interface.

Note: You can return to these options at any time just by clicking the **Setting** button in the lower left corner of the main XDSelect application.



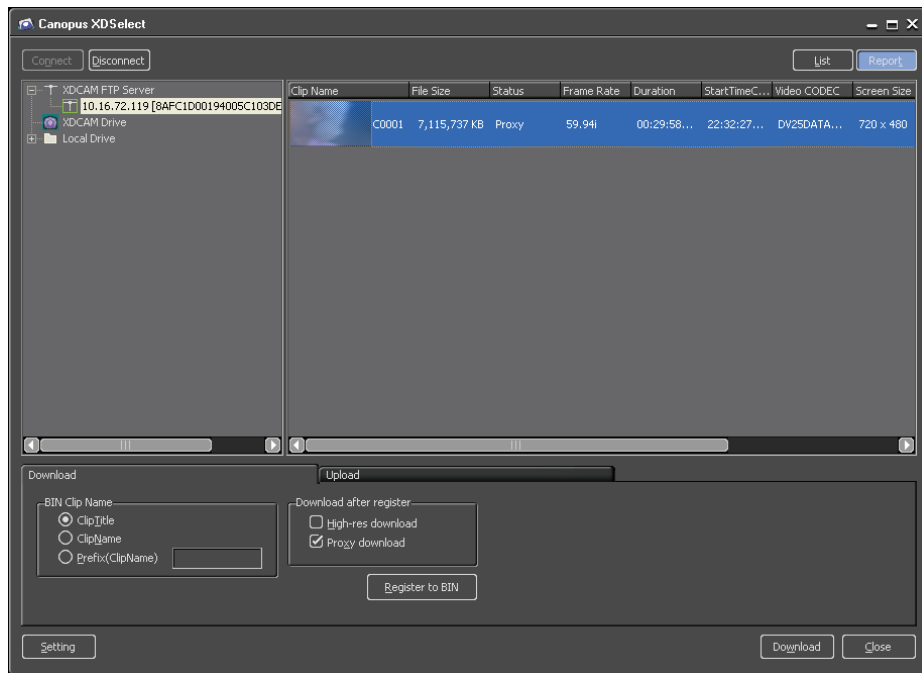
If you've added any XDCAM FTP servers, you'll see them listed in the left-hand pane. To connect to an FTP-based XDCAM device, first choose the server's address, and then choose **Connect**.

Depending on how your system is configured, you may receive the following security warning from the built-in Windows Firewall software.

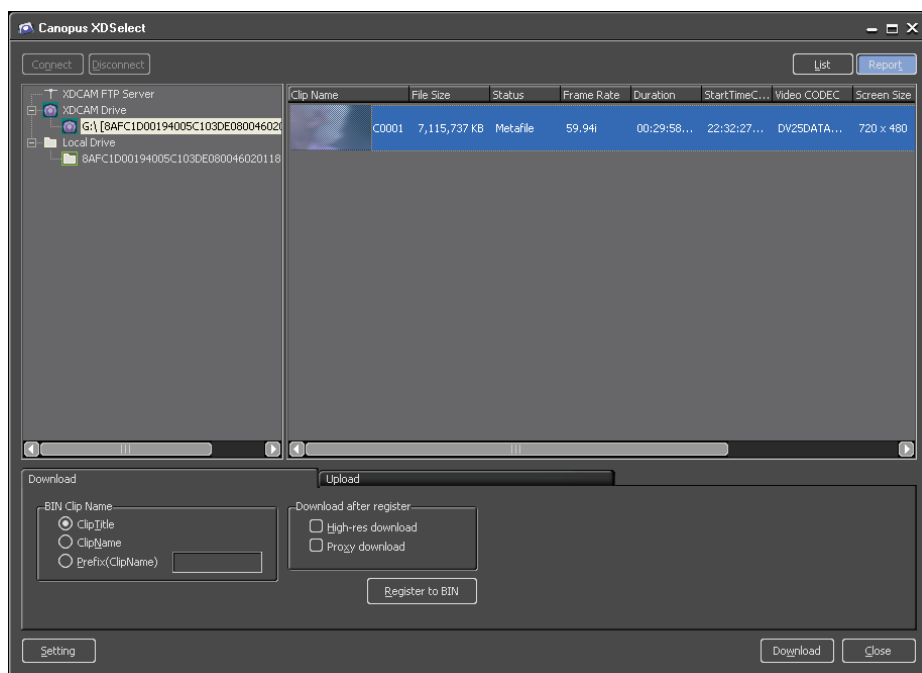


If this happens, simply choose **Unblock** to allow the connection to the XDCAM device to go through.

If your FTP login credentials are correct, the XDCAM device is connected and configured for Network-based connection (check your XDCAM device's operation manual), and has a disc loaded with footage present, XDSelect will immediately begin populating a list of clips within the main section of the interface.

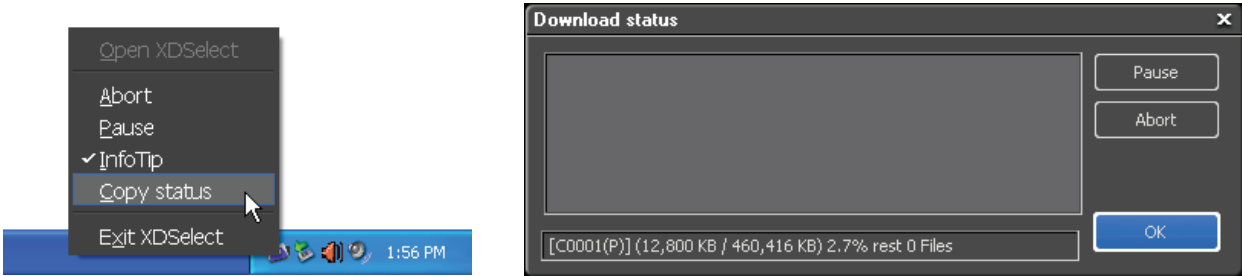


If you are connecting a device locally via FireWire, you will want to choose the appropriate **XDCAM Drive** device listed in the left-hand pane. As above, XDSelect will automatically begin listing any clips it finds on the XDCAM media.



In both cases, you will see that a mirrored list will be created within the **Local Drive** folder on the left-hand side. This local mirror initially contains clip metadata and thumbnail imagery (if you've permitted thumbnail download), and then eventually proxy data and full resolution data.

As mentioned earlier, the process of downloading proxy content when browsing XDCAM media can be set to happen automatically. If this is the case, you can always bring up the download progress window, simply by right-clicking on the XDSelect notification tray icon and choosing **Copy status**.

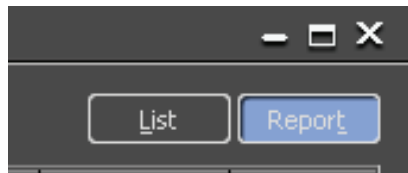


This same **Download status** window will report download queues for high-res content as well.

In addition to browsing XDCAM footage stored on XDCAM media, you can also browse content that has already been copied to a specific location, either on the PC's local storage, or across a network. To add an additional folder containing clips, right-click the **Local Folder** in the left-hand window pane, and choose **New reference...**

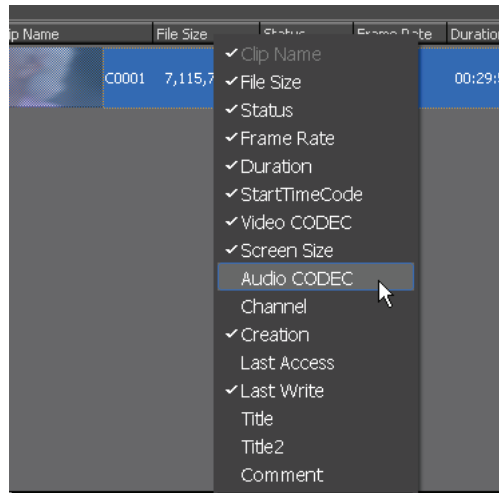
Note: Importing additional folders requires that the target folder has preserved all relevant file and folder structures for XDCAM media. If any files are missing or renamed, XDSelect will not be able to browse and import the content.

XDSelect offers a few display options for you to use, to better help locate particular clips more easily. In the top right-hand corner of the utility, you can choose between a **List** view, which shows only the clip thumbnails (or thumbnail placeholder image), or the default **Report** view, which displays clip details within separate columns.



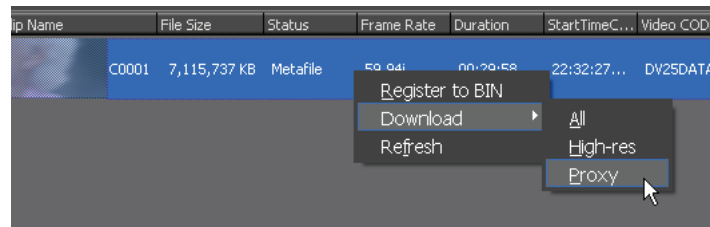
When using the Report view, you can sort clips in ascending or descending order by any of the column criteria, just by clicking on the column heading. As with most Windows applications, you can also resize and rearrange the ordering of the column by clicking and dragging the mouse in the appropriate locations.

If you want to add or remove columns, right-click anywhere on the column heading area to bring up the column selection menu. From here, you can enable and disable columns as desired.



At this point, you may be ready to begin registering content into the EDIUS Bin window, but first you will need to decide if you want to download the proxy data to a local drive (if it has not already done so automatically), or edit directly from the source media.

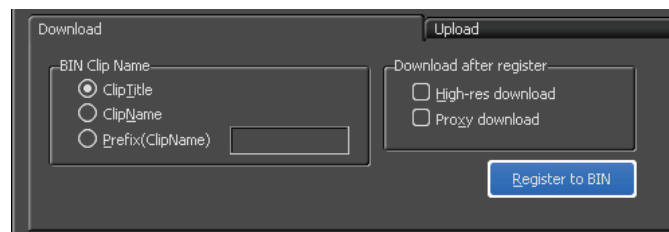
If you want to download proxy content for a clip, simply right-click on that clip, and choose **Download > Proxy**.



You will notice that there is also a **Register to BIN** option in the previous image. If you want to import the clip directly into the EDIUS Bin, you can choose this option. However, you might want to adjust the clip name handling first, or register multiple clips in one operation.

This is where the options at the bottom of the XDSelect interface come in. The **BIN Clip Name** options let you choose how to name clips, as they appear in the Bin, while the **Download after register** options on the right instruct EDIUS on what to do once the clips have been registered.

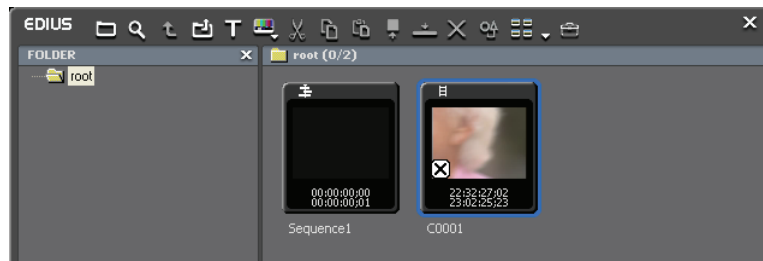
Once you have adjusted these options as required, and have selected (highlighted) the clips to bring into EDIUS, choose **Register to BIN**.



You will be returned to the main EDIUS interface, with the clips that you chose to register now accessible from within the Bin window.

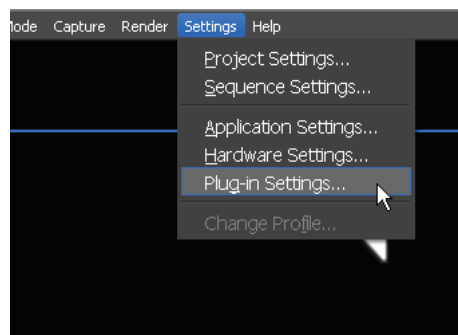
3. Handling XDCAM and XDCAM HD Content within EDIUS Projects

Depending on how you configured XDSelect's default import behavior, you may see a small icon in the bottom left corner of an XDCAM clip's thumbnail. This icon will also appear on the clip placed on the timeline.

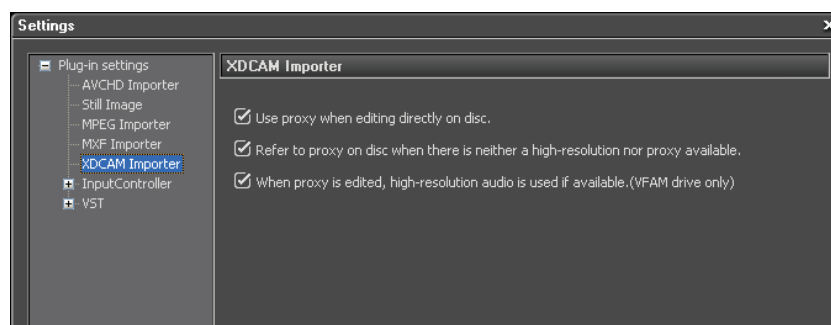


An 'X' icon denotes that this clip has only had its metadata copied to the local disk, and is accessing the actual content from the source (i.e. the connected XDCAM deck). A 'P' icon denotes that the clip has had its proxy data downloaded to a local disk, and will be referencing that data when being used in a project.

By default, clips that haven't had either proxy or high-res content downloaded ('X' clips) will only reference the proxy data from the source. If you want to edit with the high-res data, you will need to download it to a local disk first. To change this behavior, choose **Settings** from the main EDIUS menu, and then **Plug-in Settings**.



Choose **XDCAM Importer** from the left-hand pane.



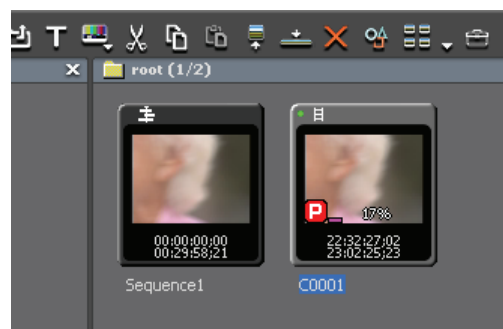
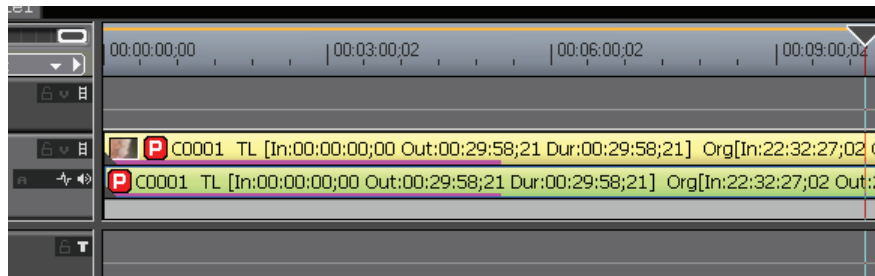
Here you can choose to enable/disable additional options for handling proxy and high-res XDCAM content, when editing in EDIUS. All three options are enabled by default. Its recommended that you leave the first two options enabled, as editing with the high-res content coming directly from the source media is typically too slow to be considered a productive workflow. There are, of course, situations where you may want to temporarily reference the high-res content. For example, you may want to use high-res data when performing a color correction, chrominance effect or a chroma key.

Editing XDCAM footage within an EDIUS project is no different to any other form of video that the software supports, and you can use all the various effects, filters, layout settings and keyers available to you.

An excellent feature of XDSelect's background downloading capability is that you can continue to edit content while proxy and high-res data is being downloaded. The data simply snaps into place once it has been downloaded, with no additional placement required from you.

As an example, if you start a project with just the metadata of the clip (you're editing off the source XDCAM disc), and you find you would like to download and use a local copy of the proxy data, simply reopen XDSelect and then right-click the clip in question, choosing **Download > Proxy** (or **High-res** if you wish).

Switch back to EDIUS and resume editing. You'll see that the clip's 'X' icon will have switched to a red 'P' icon, and progress indicators will be display both on the timeline and on the corresponding clip in the Bin window.

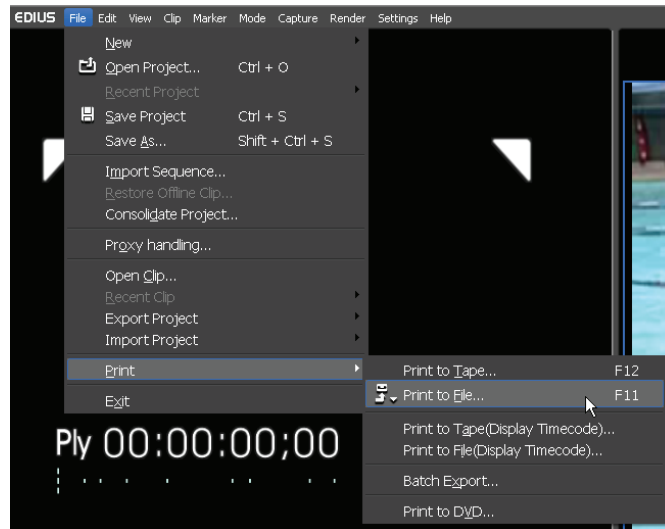


4. Exporting XDCAM and XDCAM HD

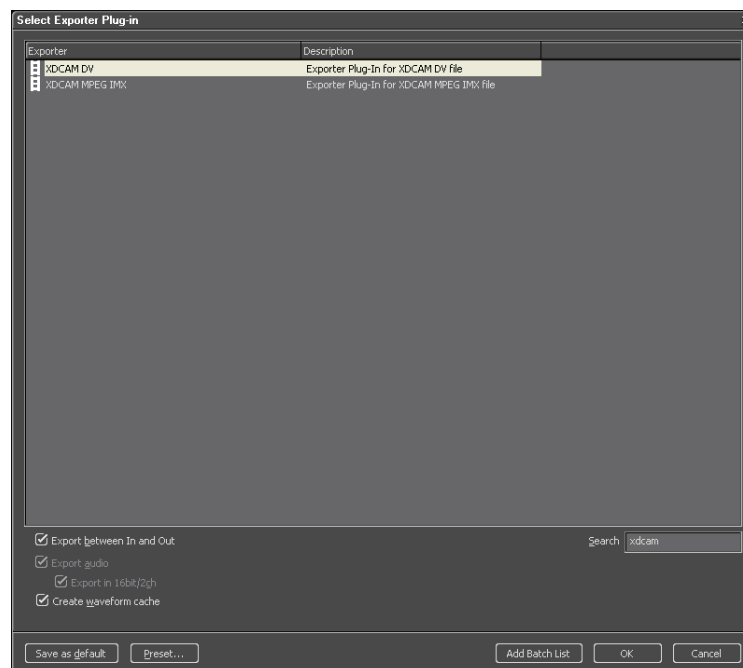
Whether you edit footage that originated from an XDCAM device or from somewhere else, EDIUS fully supports the exporting and uploading of XDCAM and XDCAM HD content to any connected device. For the purposes of this guide, the source content is standard definition XDCAM DVCAM proxy data.

To export a completed timeline, choose **File > Print > Print to File...** from the main EDIUS menu.

Note: As mentioned in the introduction, some XDCAM and XDCAM HD devices can also support VTR emulation. If your device has been configured this way, you will need to choose the **Print to Tape** option instead, to export your timeline as you would for a DV or HDV device.



This opens the exporter selection window. To make things easier, simply enter 'xdcam' into the search filter box in the lower right-hand side. This will remove all exporters save for the relevant XDCAM exporters needed.

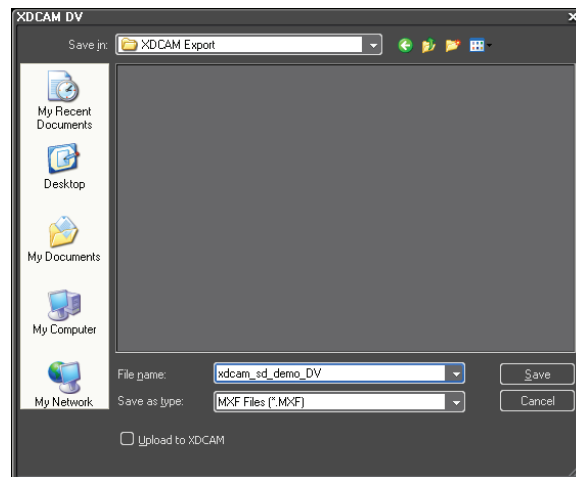


When exporting an SD project, you will see two choices as shown (**XDCAM DV** and **XDCAM MPEG IMX**). When exporting an HD project, only one option will be displayed (**XDCAM HD**). It should be noted that these exporters will only appear if the current EDIUS project's settings match a frame size and resolution that is compatible with current XDCAM specifications. If this is not the case, the timeline will need to be exported to an intermediate format and then reimported as a single clip within a compatible project preset.

Adjust any of the other options below the exporter list as necessary, remembering that EDIUS also has a Batch Export feature, which allows you to prepare multiple export tasks before commencing the actual export itself. This is very useful if your project needs to go out to multiple target formats, or if you are exporting sections of your timeline as separate XDCAM clips.

Click **OK** to continue, when ready.

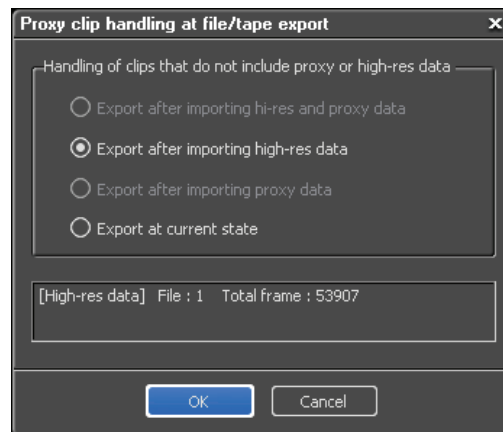
You will be prompted to choose a folder path and file name for the exported MXF data file. This window also provides an option for uploading to an XDCAM device. This option will work in conjunction with the auto-uploader setting in the XDSelect utility, covered earlier in this document.



MPEG Export

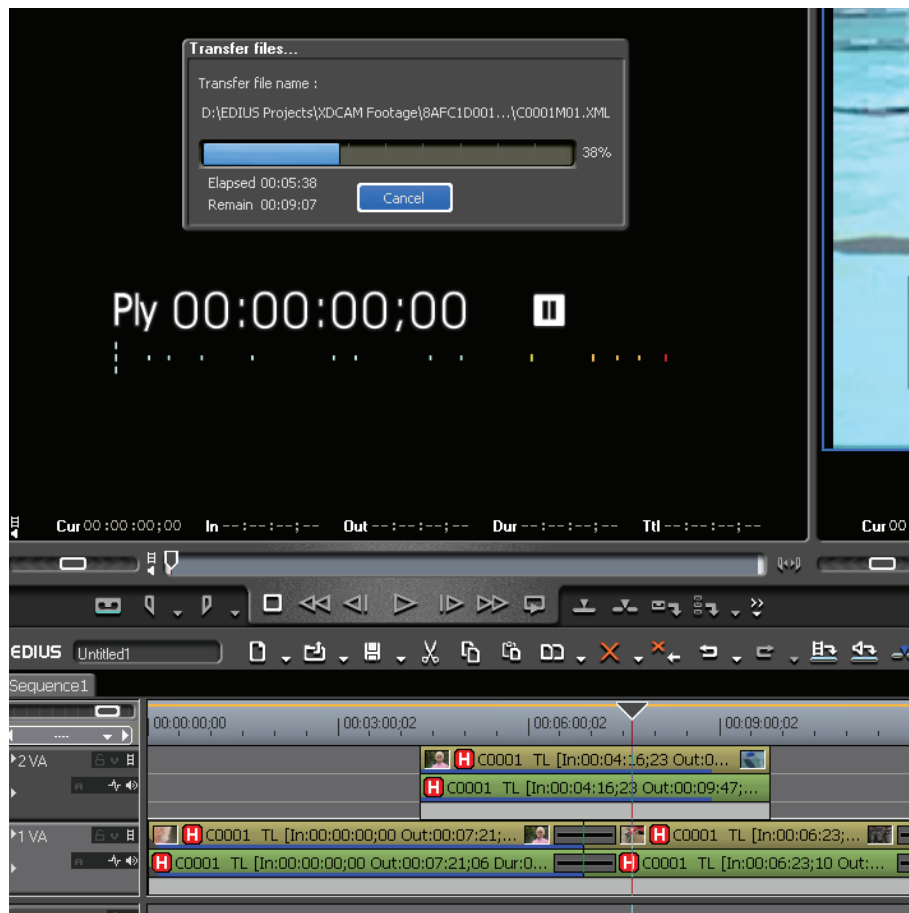
If your export target is MPEG-based XDCAM, you will also see additional MPEG encoding options, such as bitrate, which are not shown here. In addition, XDCAM HD export offers you the **Segment Encode** (smart rendering) option, which is extremely useful as it reduces the overall export time by only encoding content that differs from the target MPEG settings. This means that if your HD project predominantly uses XDCAM HD content, which aside from simple cuts remains unaltered, that footage will not need reencoding if the target MPEG settings match the source exactly.

If your timeline contains clips from an XDCAM source, you will see the following window displayed.



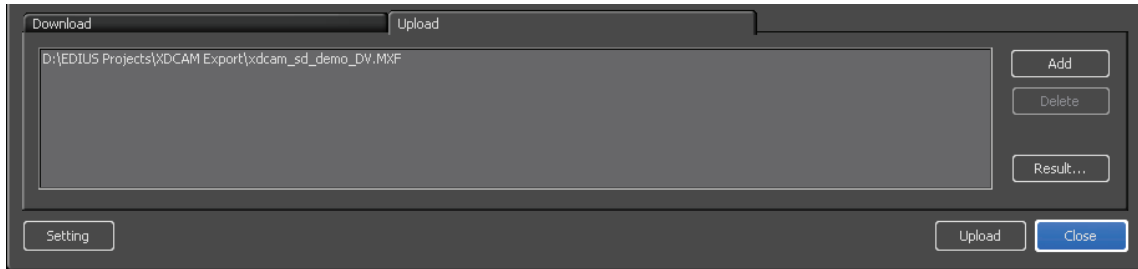
Here you can choose how EDIUS will treat XDCAM clips that may not have high-res (or even proxy) content downloaded prior to export. The default option – **Export after importing high-res data** – will ensure that any content not already fully downloaded, will be before the output stream is encoded. Click **OK** to start the export.

The image below shows the export progress that also includes downloading of high-res content. As with proxy downloads within EDIUS, you will see a visual indication of progress both on the timeline, and in the Bin window. The 'P' icon will temporarily be replaced with a red 'H' icon.



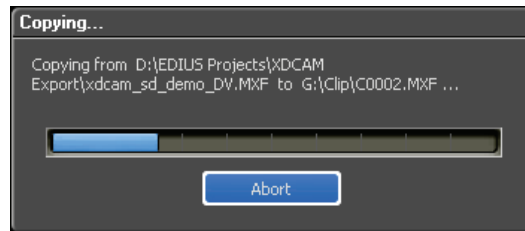
Once the transfer (if any) and export are done, you can switch back to XDSelect to begin the upload.

Select the XDCAM device from the left-hand window pane and then choose the Upload tab below the main listing area.



Depending on how you have configured XDSelect's auto-upload settings, you will see your exported project queued and ready. If it does not appear, or you want to add MXF content manually, click the Add button on the right and browse to where the MXF file is located.

To begin uploading, ensure that the XDCAM device is ready with media present, and then choose **Upload**.



The time taken to upload will depend on the length of the clip(s). Keep in mind that uploading clips is essentially a disc burn operation to optical media.

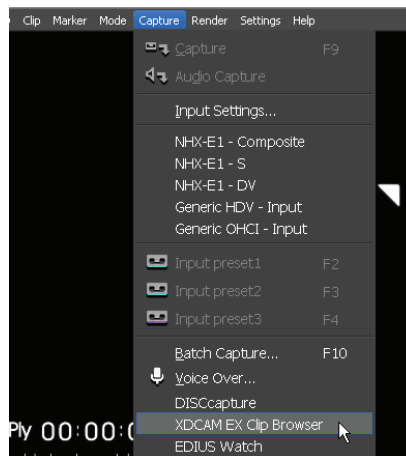
5. The XDCAM EX Workflow

Like the recording media itself, the workflow for using XDCAM EX content with EDIUS NLE software is significantly different to that of XDCAM and XDCAM HD. Since XDCAM EX does not record proxy data, you will always be editing with the full resolution content. It is still possible for you to edit directly off the media, and this is a perfectly acceptable practice given that the disk access speed and device connection bandwidth are superior.

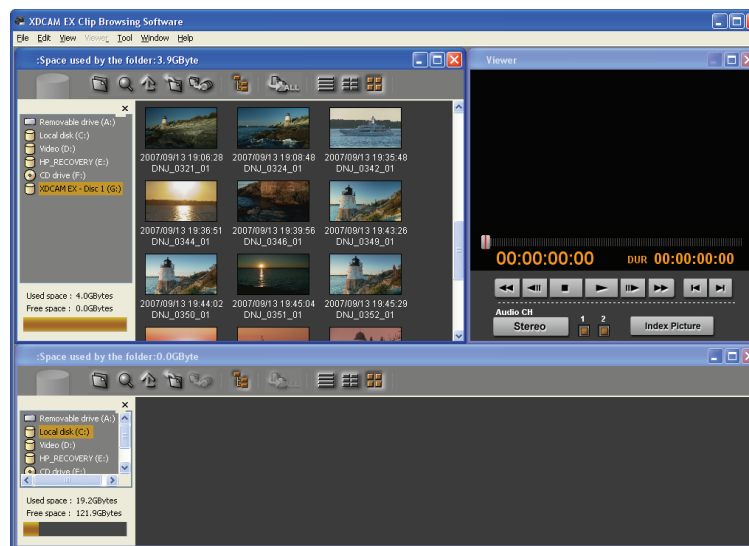
Import

Rather than using a special EDIUS utility, XDCAM EX requires the use of the vendor-supplied Sony XDCAM EX Clip Browsing Software, so it is important that this software be installed prior to importing footage.

Once this software has been installed, you can open it from within EDIUS by choosing **Capture > XDCAM EX Clip Browser** from the main EDIUS menu.

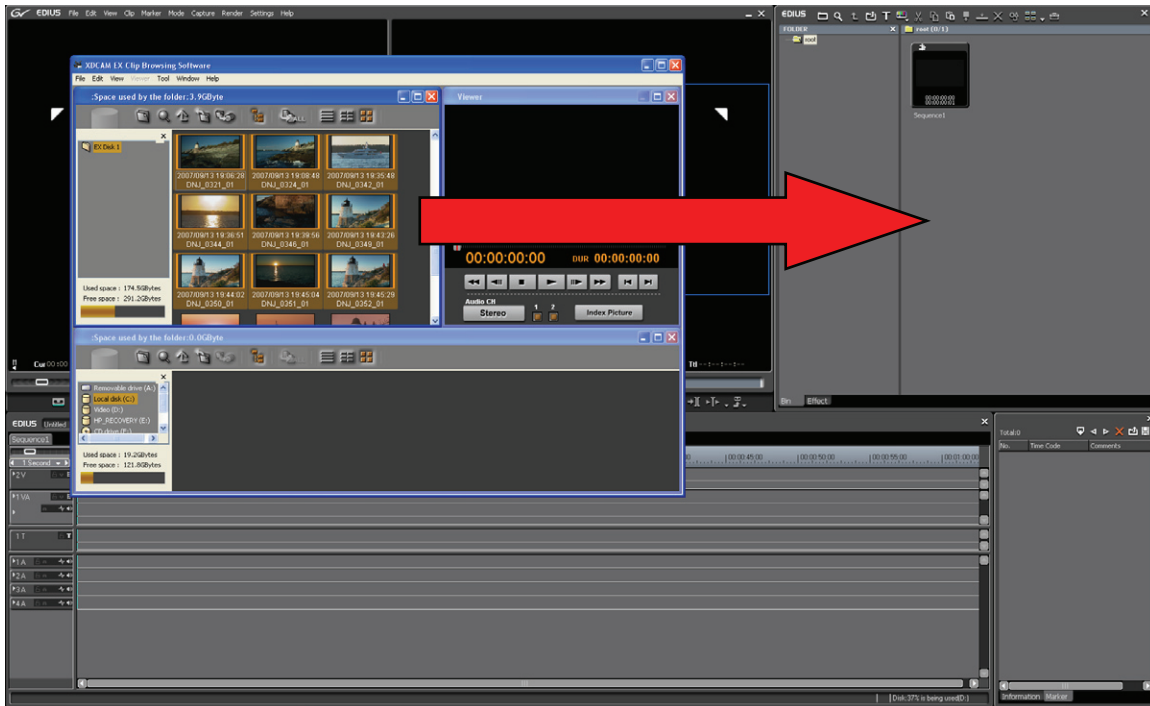


The **XDCAM EX Clip Browsing Software** will open up and immediately search for any connected SxS media connected via an ExpressCard reader. If one is found, clips will automatically be imported in to the viewer's bin. Otherwise, you can browse to a specific drive and folder to locate clips.

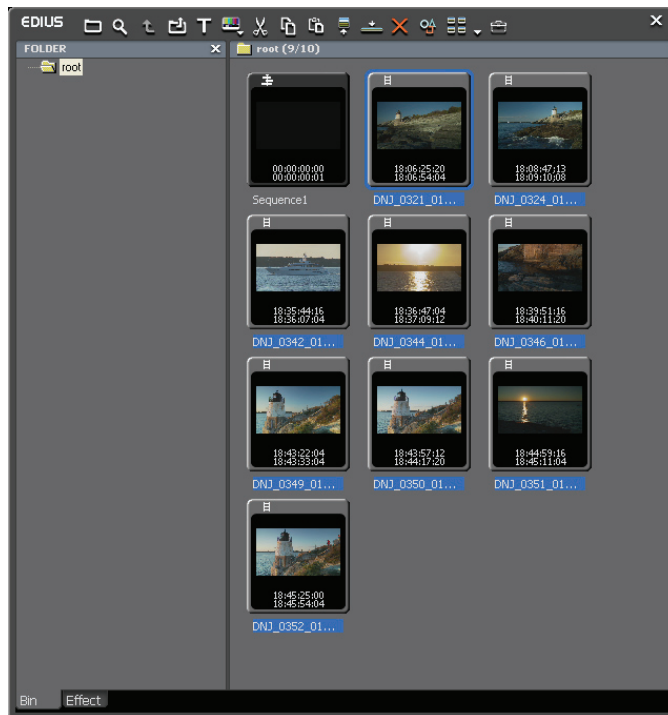


For more information on how to use this software, including how to copy clips to a local drive, consult the supplied documentation from Sony.

To register the clips you want to use in EDIUS, simply highlight the clip or clips and then click and drag them over to the EDIUS Bin window. This will work for any clip that the XDCAM EX clip browser can open.



Clips now appear in the Bin window, ready for use in your project.



Editing

XDCAM EX clips can be used the same way any supported clip format is used in EDIUS. With the superior native MPEG-2 Long-GOP editing capability offered by EDIUS, no additional preconversion or rewrapping required.

With that said, the required system specifications for realtime editing of high definition Long-GOP MPEG-2 data will be higher than systems that are over 18-24 months old. In those situations, you can convert XDCAM EX clips to the Canopus HQ codec, which matches the quality of your source footage, but eases the strain on the PC configuration for realtime editing.

Export

At the time of writing, there is currently no method for exporting a timeline back out to the XDCAM EX MP4 container format. Certainly, it is Sony's expectation that finished content will either be authored as a high definition Blu-ray Disc, or uploaded to an XDCAM HD Professional Disc.

EDIUS supports export of full frame 1920 x 1080 Long-GOP MPEG-2 streams, which you can store in any way you choose.