

codex

USER GUIDE

RECORDING AND PROCESSING ARRIRAW WITH ALEXA XT

REVISION 12.12.2013

ARRI 



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Safety Warnings

Please observe any warnings and follow all instructions.

- Do not use this equipment near water and clean only with a dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other equipment (including amplifiers) that produce heat.
- Do not expose to excessive vibration, or drop this product.
- Do not defeat the safety purpose of the polarised or grounding-type plug. A polarised plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade, or the third prong, is provided for your safety.
- If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched, particularly at plug ends, convenience receptacles, and the point where they exit from the equipment.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the equipment.
- Unplug this equipment during lightning storms or when not in operation for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the equipment has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the equipment, has been exposed to rain or moisture, does not operate normally, or has been dropped.
- To reduce the risk of fire or electric shock, do not expose equipment to rain or moisture.
- To avoid electrical shock, do not attempt to open this equipment. Refer servicing to qualified personnel only.

Caution: Capture Drive media may become hot during normal use.

Disclaimer

Codex products are continually developed to remain at the forefront of the industry, and as such the information in this guide is subject to change without notice. Whilst Codex endeavour to ensure that all documentation provided is correct at the time of writing, this document is not guaranteed to be error-free.

Codex does not assume responsibility for issues or losses due to misinterpretation of the information in this document, errors in this document, or incorrect configuration or installation of the equipment described herein.

Please report any errors found in this document to support@codexdigital.com

Support and Servicing

For assistance with your Codex product please contact support@codexdigital.com

1. Introduction

This document describes how to record ARRIRAW images from an ALEXA XT to a Codex Capture Drive, and then process this material using a Codex Capture Drive Dock.

The ALEXA XT can record to a Capture Drive either Open Gate images up to 75 frames per second, 4:3 aspect images up to 90 frames per second (fps), or 16:9 aspect images up to 120fps.

There is a Codex **Pocket Guide for ALEXA XT** available from www.codexdigital.com/support/recorders

ARRI documentation is available from http://www.arri.com/camera/digital_cameras/downloads

At the start of a project it is recommended to do a factory reset on the camera using MENU ► USER SETUPS ► Factory reset.

2. Hardware and Software

We assume the following hardware/software versions:

ARRI ALEXA XT - SUP9.0

To check the ALEXA firmware version press the "INFO" button on the side of the camera, then the "VERSION" button.

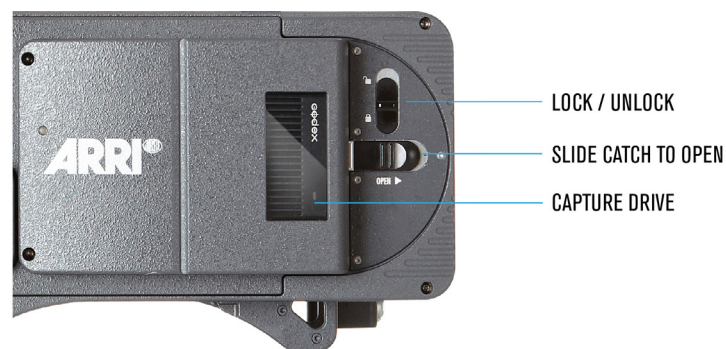
Codex XR Capture Drive (CDX-3730 with yellow ring) media for recording

Codex Capture Drive Dock and Codex Server version 2013.r1.2509 with licence for Enhanced Functionality

To view the Codex software version on a Mac open the Codex UI and go to the SETUP tab. Click the **i** to open the About box which displays the Codex Server version that is running.

If the software needs to be updated, installation packages and instructions can be found at <http://www.codexdigital.com/software>

3. Loading and Unloading a Capture Drive



Loading

1. Slide door catch towards rear of camera to release the door
2. Insert Capture Drive and push firmly to mate the connector
3. Push the door closed so that the catch returns to the original position
4. LED will flash blue on Capture Drive whilst loading. LED is green when loaded.
5. Slide locking catch to prevent accidental door release

Unloading

1. Check that drive LED light is green. (If LED is red do not open door.)
2. Undo locking catch to allow door release
3. Slide door catch towards rear of camera to release the door
4. LED on Capture Drive will flash blue, and become solid blue when it is unloaded
5. Hold Capture Drive firmly and pull towards rear of camera to remove

4. Formatting a Capture Drive

A Capture Drive must be formatted before it can be used for recording. It is formatted with a Reel number that can be set in the camera.

Enter the MENU ► PROJECT screen and set the 'Next reel count value'. At the start of a project this would normally be 001.

The camera will increment this number each time a Capture Drive is formatted to ensure the same Reel number does not get applied to more than one Capture Drive. This is very important to prevent issues in postproduction, so it is not normally necessary to alter this setting.

Enter the MENU ► RECORDING ► INTERNAL screen and use the 'Quick format Capture Drive' option. This will prepare the loaded Capture Drive for recording.

IMPORTANT: If a Capture Drive contains material, only format if you are sure the data is securely backed up or not required. There is no 'undo' option after the Capture Drive has been formatted.

5. Project Settings

In the ALEXA's MENU ► PROJECT screen enter the correct information for your project.

In this menu there is also the option to set the Project Rate. Ensure this is correct for your project, as this setting determines the playback speed of clips from the camera.

6. Sensor Mode

The sensor of the ALEXA XT can operate in Open Gate mode (3424x2202 resolution), 4:3 mode (2880x2160 resolution) or 16:9 mode (2880x1620 resolution).

To change the sensor mode enter the MENU ► SYSTEM ► Sensor screen. Select the Sensor mode and press the jog wheel, then press the two buttons under the screen to switch to the other sensor mode.

7. Recording Settings

Setting up the ALEXA XT to record ARRIRAW is very simple. Enter the MENU ► RECORDING ► Internal screen and set the Mode as ARRIRAW.

Then from the HOME screen enter the FPS menu and set the sensor to the correct frame rate for recording.

8. Highspeed Recording

To record ARRIRAW above 48fps (4:3) or 60fps (16:9) the ALEXA XT must be switched to highspeed mode. To do this from the HOME screen enter the FPS screen. Press HIGHPEED and then press the two buttons under the screen to switch the camera into Highspeed mode. This takes around 40 seconds.

Available frame rates will now be 48-90fps (16:9) or 60-120fps (16:9). From the HOME screen enter the FPS HS screen to choose from the standard frame rates, or to ADD a custom frame rate.

To switch out of highspeed mode go into the FPS HS screen and press the EXIT HS button.

9. ARRIRAW Record times to Capture Drive (480GB)

This table shows the record times available to a Capture Drive at standard frame rates for Open Gate, 4:3 and 16:9 modes:

Fps	Open Gate mode	4:3 mode	16:9 mode
23.98 / 24	29	35	47
25	27	33	45
29.94 / 30	23	27	37
48	14	17	23
50	13	16	22
59.94 / 60	11	13	18
72	9	11	16
75	9	11	15
90	Not applicable	9	12
96	Not applicable	Not applicable	11
100	Not applicable	Not applicable	11
120	Not applicable	Not applicable	9


10. HOME screen

The HOME screen contains an overview of information about the current settings and status of the camera, as detailed here:

FPS

24.000

AUDIO



SHUTTER

172.8

TC EXT 00: 04: 21 @24
16:9 ● STBY

REEL A 001
ARRIRAW

BAT1 14.8V CLIP C 003
Drive

BAT2 50%
DUR 0:01:23
⌚ 00: 16: 53

800

EI

INT: RAW

REC: REC 709

COLOR

3200⁰

WB

KEY

STBY = Current status

16:9 = Sensor mode

ARRIRAW = Recording format

Drive = Media type (Capture Drive)

00:16:53 = Record time remaining

24.00 = Sensor fps

TC EXT = Timecode source (External LTC, or Internal)

00:04:21@24 = Current timecode (at Project Rate)

11. Clip Naming

ARRIRAW clips recorded on the ALEXA XT will use the established ALEXA naming convention:

<Reel><Clip>_<Date>_<Camera Id>
 e.g. A001C001_130215_RZ08

12. Recording and Playback

Press the camera's REC button to start and stop recording. The LED next to the REC button and the LED on the Capture Drive (visible through the door window) will be lit red during recording.

It is recommended to perform a 'gate check' playback after each recording, to confirm the recording is as intended. Press PLAY and then press the jogwheel to playback the previous recording. In the PLAY screen press CLIPLIST to select a different clip to play back.

13. Errors and Warnings

If an error occurs the ALEXA XT should be rebooted. The following indications are given if there is an error:

- **ERR** flashes on the HOME screen
- **ERR** flashes on the MON OUT image
- INFO screen shows an error code

Keep a note of the error code. Then reboot the camera.

14. Processing Overview

The next sections of this guide are written to describe using the Capture Drive Dock in a workflow with the ALEXA XT for ARRIRAW. After an ALEXA XT has been used to record ARRIRAW, the Capture Drive media is loaded into the Capture Drive Dock, which (when licensed for enhanced functionality) can be used to:

- Check and correct shot metadata
- Produce PDF reports for the production
- Produce ALE files for editorial
- Clone the data to RAID protected internal storage (with Mac Pro)
- Process the data to RAW image files (.ari) for archiving and finishing
- Process the data to proxy files (.mov/.mxf) with LUT/Burn-In for editorial and dailies
- Create secure, verified archives of the data to disk or LTFS tape

This guide will show these steps as an example of a workflow that could be used.

15. Capture Drive Dock Software

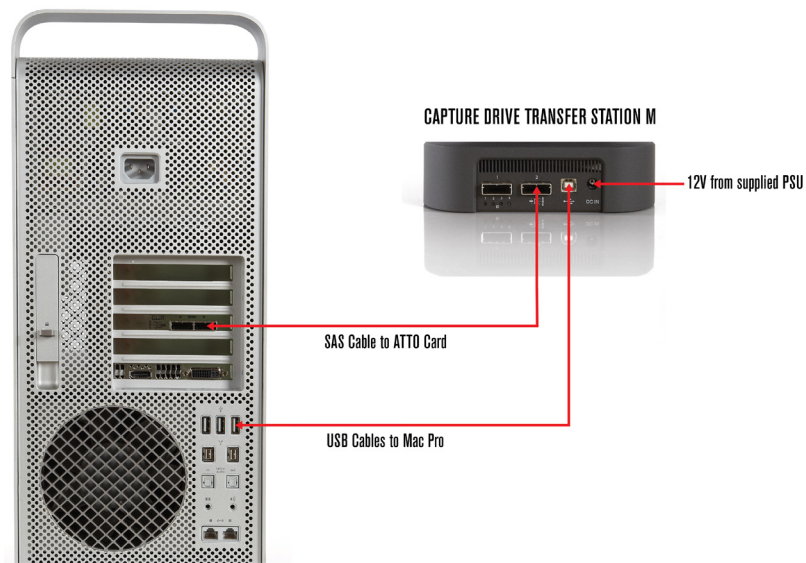
Go to www.codexdigital.com/software to register and download software. There are installation instructions available from this webpage.

The software webpage is divided into sections. It is recommended to download the latest Capture Drive Dock Software Pack when first installing a system. The Capture Drive Dock Software Pack contains the following software components that must be installed:

Required software	Example filename
Codex Server	codexserver-osx-2013.r1.2509.dmg
Codex UI	codexui-osx-2013.r1.2509.dmg
FTDI USB driver	FTDI USB Serial driver v2.2.16
ATTO H680 / H6F0 driver	ATTO ExpressSAS H680 drivers v2.03
OSXFUSE	OSXFUSE-2.6.1

16. Cabling Setup

The diagram below shows the correct cabling set up for the Capture Drive Dock (SAS). Please refer to the Codex MacPro Configuration Guide for further details.



17. Loading and Unloading a Capture Drive

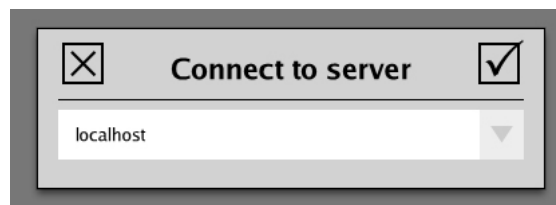
Fully insert the Capture Drive into one of the ports on the Dock. The LED on the Capture Drive will flash blue whilst loading, and green when it has loaded. To unload press the eject button on the front of the Capture Drive. The LED will flash blue whilst it is unloading and change to constant blue when it is safe to remove the Capture Drive.

WARNING: The LED on a Capture Drive flashes green when it is being read or written. Do not unload storage when it is being read or written, as this can compromise the data integrity.

18. Codex Software Overview

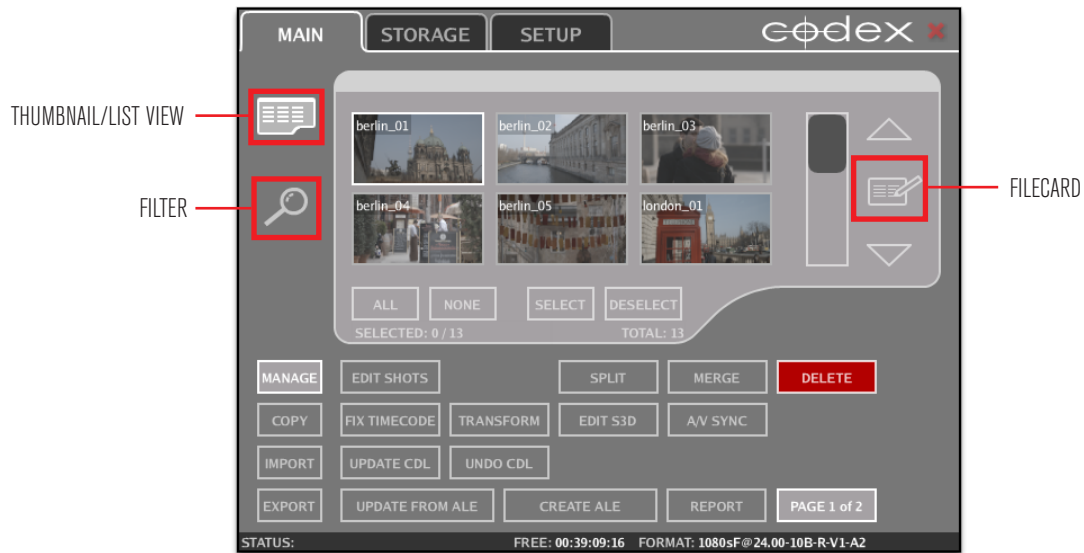
When the Codex UI software is opened the 'Connect To Server' box will be shown.

- Leave 'localhost' in the box, this is correct
- Click the checkbox icon to connect the Codex UI to the Codex Server.



The Codex UI is divided into the **MAIN**, **STORAGE**, and **SETUP** tabs:

- **MAIN** tab is primarily used for editing shot metadata and creating reports.
- **STORAGE** tab is used for operations such as creating and deleting the Roll on the media. It also shows the number of shots and the total duration of shots on the Roll.
- **SETUP** tab is used for configuring the Codex software to provide deliverable files. It also contains project settings such as the recording format and Shot/Roll naming rules.

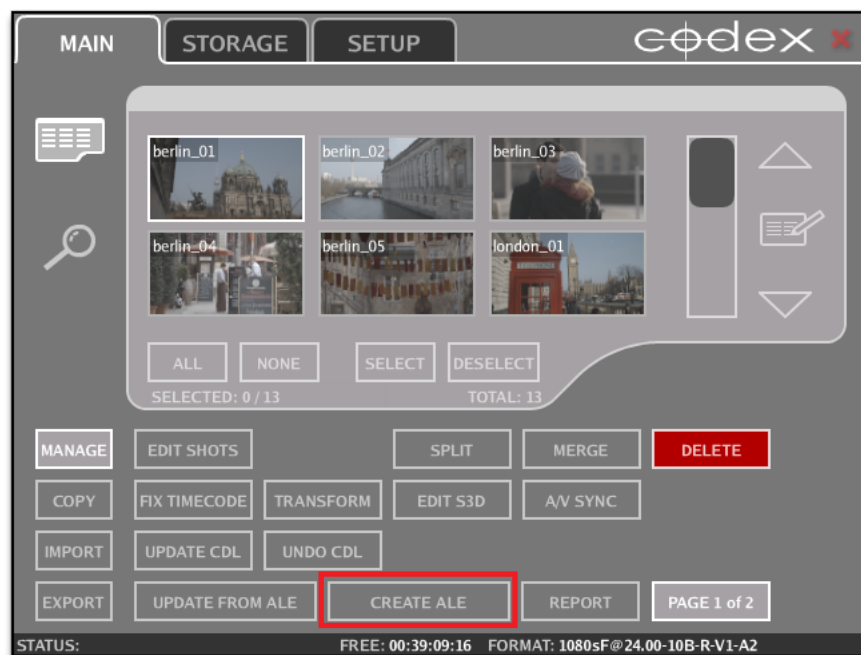


- **Filecard** – to view and edit shot metadata
- **Thumbnail/List View** – to toggle between a thumbnail (as shown) or list view of shots
- **Filter** – to limit the shots that are displayed, based on media location, and/or metadata

19. Creating a first ALE

An ALE (Avid Log Exchange) is a text file that contains metadata information for your shots. In the file there is a column for each metadata item that is stored for the shots.

It can be useful to create an ALE when media first arrives at the Transfer Station. This ALE file gives a record of all shot metadata before any changes are made, and this can be useful for reference. To create the ALE click the **CREATE ALE** button on the MAIN tab:



The initial settings for creating the ALE are shown here:

The folder icon on the right of the Filename box can be used to open a browser to set the destination for the ALE, or if you know the path you can type it. You must type the name for the ALE at the end of the path, and the correct extension (.ale), as shown here:

Next choose the Source shots for the ALE. This is normally done per Roll, so open the drop down list to set **Source shots** to **Specified roll** and then choose the **Roll** from the list:

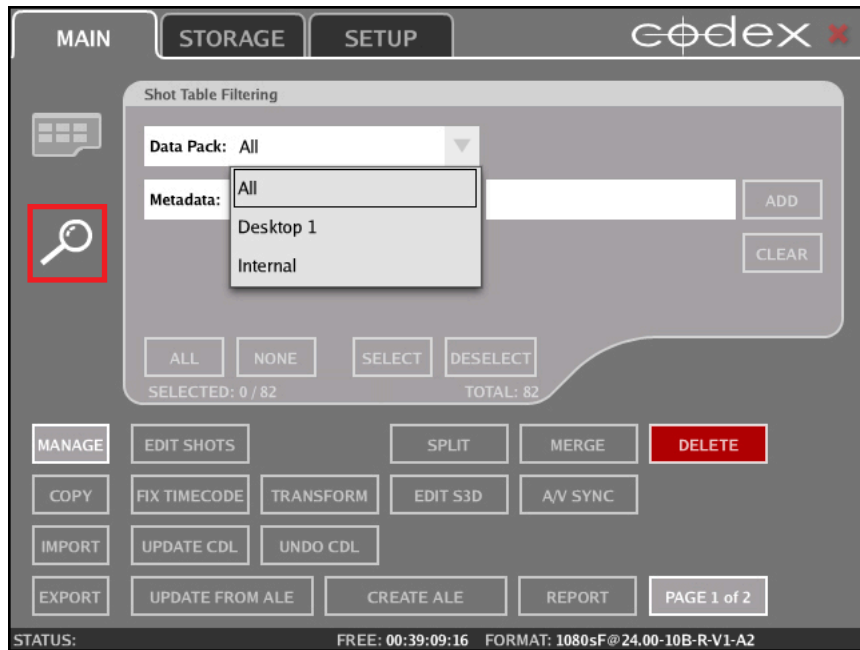
Then click **DO IT** to create the ALE file.

Now you have a record of all the original metadata for reference.

20. Filtering the Shot Table

It is possible to have more than one Codex storage media loaded at the same time (e.g. a Capture Drive and the Internal Storage disks). In this case it can be useful to filter the Shot Table, so you can only see shots on a chosen media location.

Click the **Filter icon** (spyglass) on the left of the MAIN tab, and then open the Datapack drop down list to make a selection:



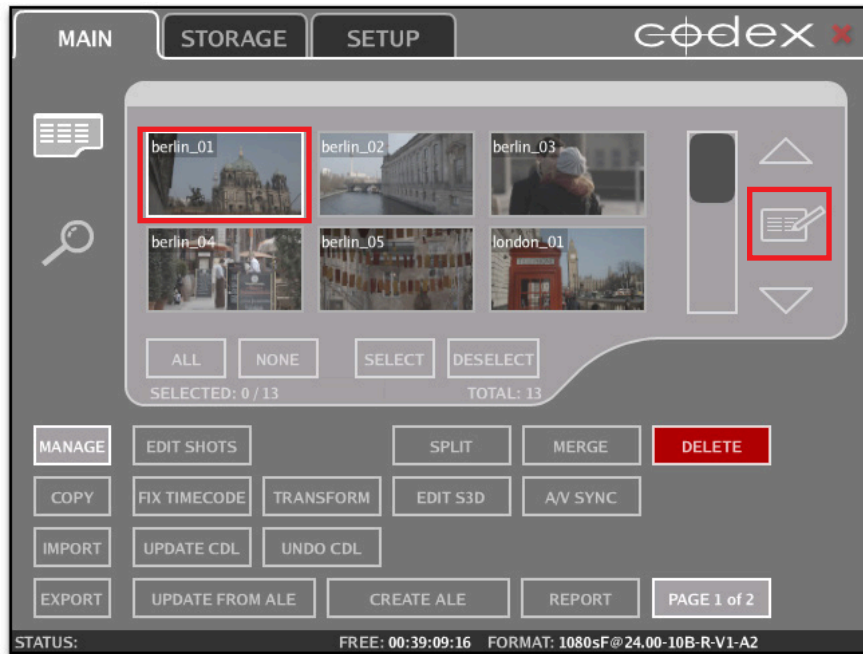
The physical location for these settings is shown below:



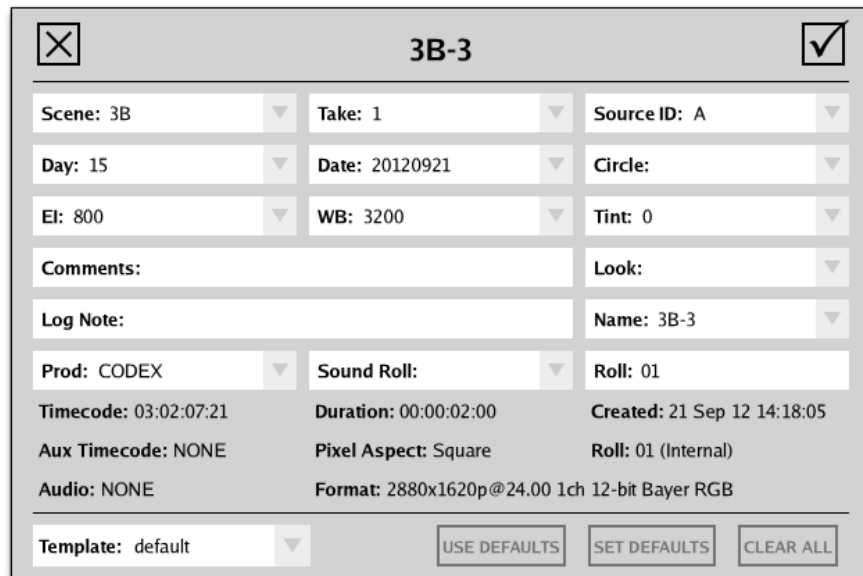
21. Metadata checking

It is advised to check the metadata for shots when they are first loaded. This is a valuable opportunity to correct any mistakes or identify any issues that may have happened on set. This will minimise the chance of any problems later in post-production.

Click on the thumbnail/shotname to highlight the first shot on the Roll. Then click the 'Filecard' icon, or press F on your keyboard as a shortcut, to open the Filecard where you can view and edit metadata:



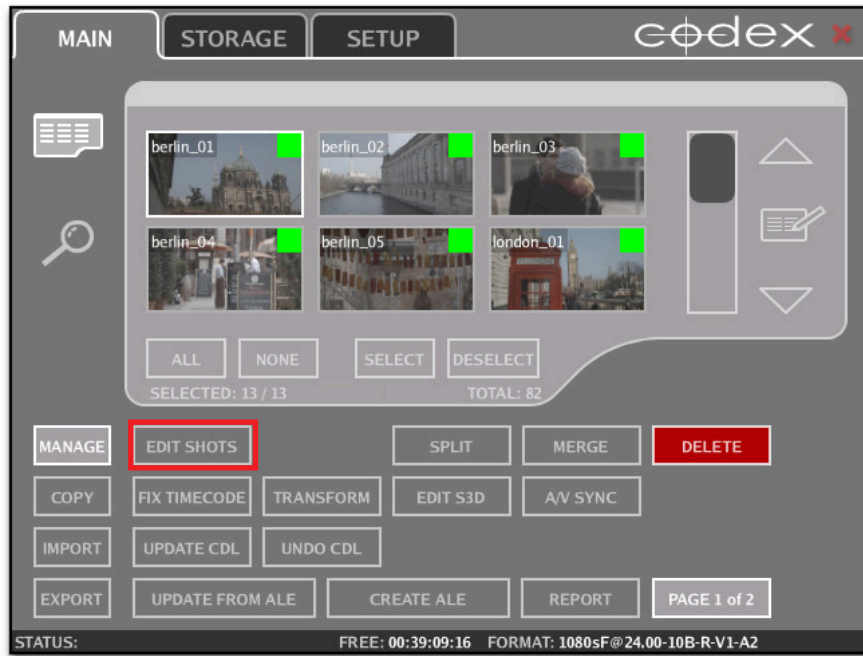
With the Filecard open you can press the down arrow (cursor key) on your keyboard to view metadata for the next shot. It is advisable to first check that all existing metadata looks correct and sensible, and also to check for anything in the Log Note box:



In the event of a problem during recording the ALEXA XT can store error codes as a metadata Log Note automatically. If there is an error code in the Log Note box a problem may have occurred on set, and this should be cross checked with camera sheets to confirm if it was recognised at the time of recording.

You can click in any of the white boxes to edit or add metadata to an individual shot, and then click the check icon to save.

It can be useful to add the Day and Date information if this was not entered on the ALEXA XT on set, and this can be added to multiple clips using the **EDIT SHOTS** feature. Click the **ALL** button so that all the shots on the media are marked with a green square:



Then click the **EDIT SHOTS** button to view/edit metadata for all the selected shots:

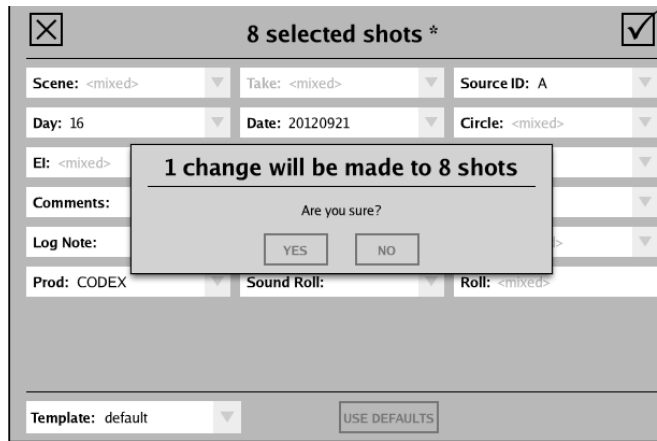
✕
8 selected shots
☑

Scene: <mixed>	Take: <mixed>	Source ID: A
Day: 15	Date: 20120921	Circle: <mixed>
El: <mixed>	WB: <mixed>	Tint: 0
Comments:		Look:
Log Note:		Name: <mixed>
Prod: CODEX	Sound Roll:	Roll: <mixed>

Template: default
USE DEFAULTS

The Date information should be in the format YYYYMMDD to be applied correctly to PDF reports (which will be discussed later in this guide).

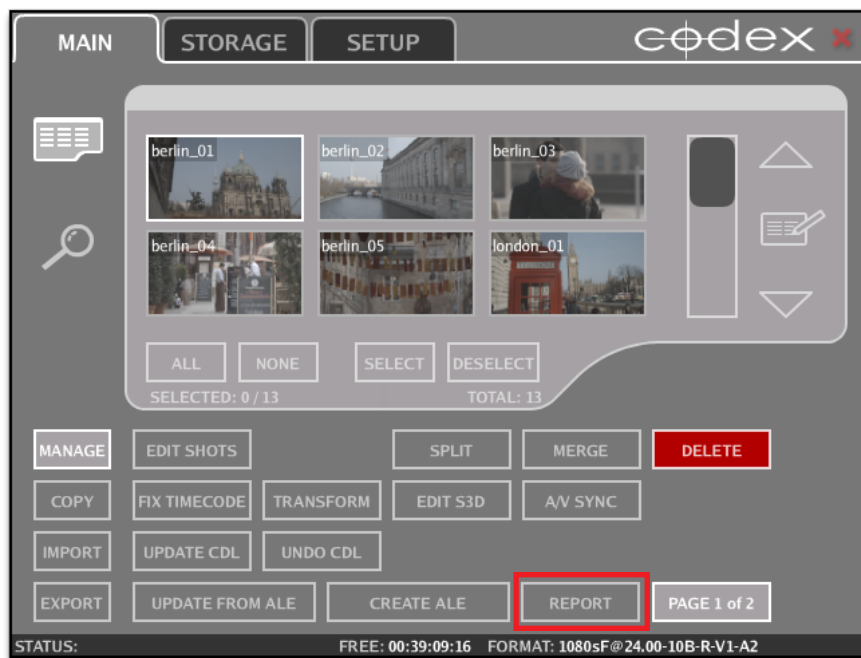
After entering any changes click the check box and you can choose to apply the new metadata to all the shots:



22. Creating a PDF Shot Report

A PDF Shot Report can be created giving an overview of the media, which can be very useful for a production.

Click the REPORT button to open the options for creating a report:



Like when creating the ALE, the initial settings need to be completed. Set the destination Filename including the correct extension (.pdf). Set **Source shots** as **Specified Roll** and choose the correct Roll from the list. You can also enter a name for the **Author** of the Shot Report, and set the **Timecode frame rate** to be correct for the project:

Create Report

Filename: /Users/codex/Desktop/A001.pdf

Source shots: Specified roll Roll: A001

Author: Codex

Timecode frame rate: 24

DO IT CANCEL

Then click **DO IT** to create your PDF Shot Report.

23. Creating a final ALE

If the project is being edited in Avid then providing an ALE with editing files is useful for two reasons:

1. The ALE can be imported with the editing files, allowing the editor to view all the original metadata for the shots in the Avid software.
2. The ALE shows the number of original shots meaning the editor can confirm that the correct number of editing files have been delivered to them.

To create the final ALE to send to the editor, follow the same steps as when creating the first ALE, but this time it is important to set the **Timecode frame rate** to be correct for the project:

Create Report

Filename: /Users/codex/Desktop/A001.ale

Source shots: Specified roll Roll: A001

Author: Codex

Timecode frame rate: 24

DO IT CANCEL

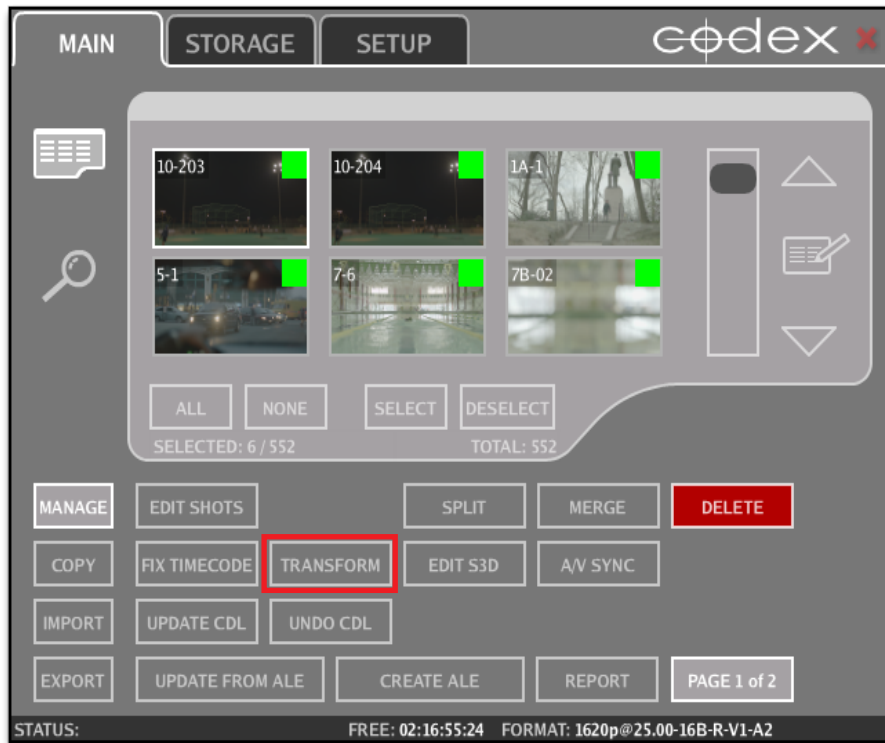
Then click **DO IT** to save the ALE.

24. Setting the Aspect when using Anamorphic lenses

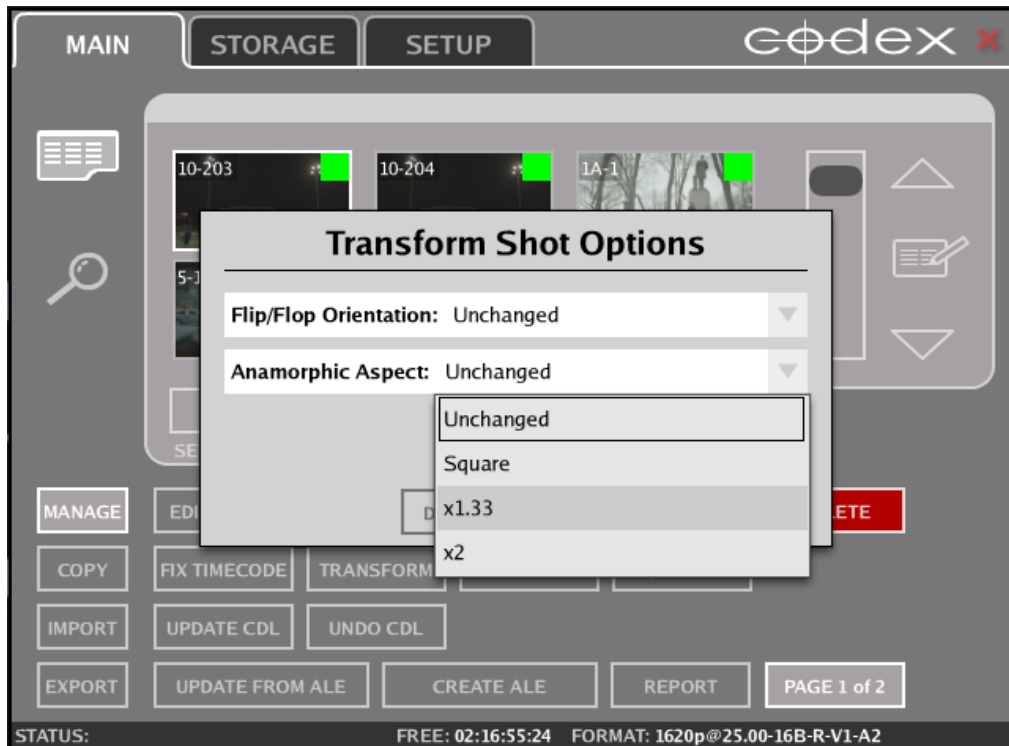
When shooting with an Anamorphic lens the Codex UI software can be used to mark the shots with the correct Pixel Aspect information.

This will determine if any de-squeeze is applied to the images when they are processed for editing (i.e. to Quicktime or MXF deliverables), and also this information is contained in the ARRIRAW file header so that viewing software (e.g. Da Vinci Resolve) can apply the appropriate desqueeze.

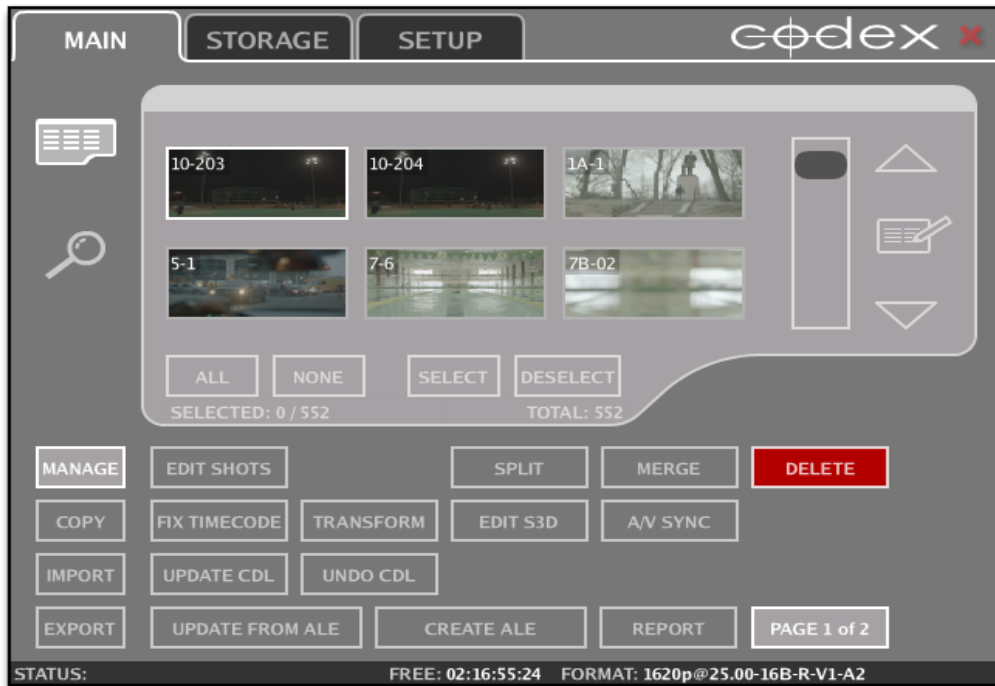
To change the aspect setting first select the shots you want to change:



Then click the TRANSFORM button to set the correct aspect:



Choose the correct aspect and click DO IT. The shots will be marked with this new aspect setting and the displayed thumbnails will reflect this.



This setting does not affect the RAW image data that is stored. It only affects how it is processed.

25. Cloning from a Capture Drive to the Internal Storage

With the correct licence installed the Codex software can use disks fitted to the Internal Drive bays of the Mac Pro.

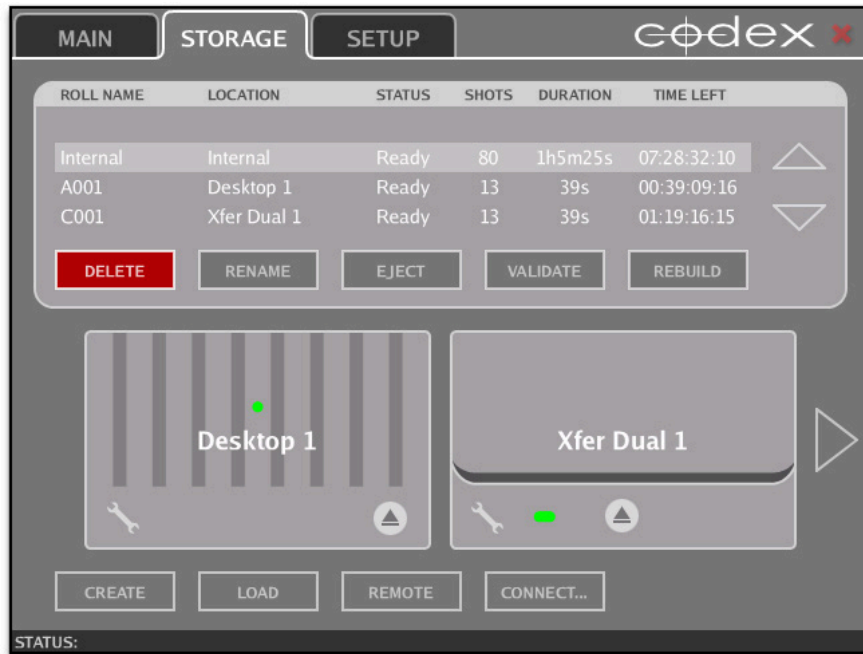
Contact support@codexdigital.com if you require a licence for this feature. Skip to the section 'Getting RAW image files' if this licence is not installed, or if you do not need to clone the data to the Codex formatted internal disks.

This feature allows data to be cloned in the original recorded format, before it is processed as either RAW image or editorial files for post-production. A full guide to configuring a MacPro with internal disks is available here: <http://www.codexdigital.com/?action=asset&id=413>

IMPORTANT NOTE: After cloning shots to the Internal storage always go to the STORAGE tab and eject the Internal storage block. This will prevent there being multiple copies of your shots loaded when you copy RAW or proxy files from the Codex VFS to another hard drive.

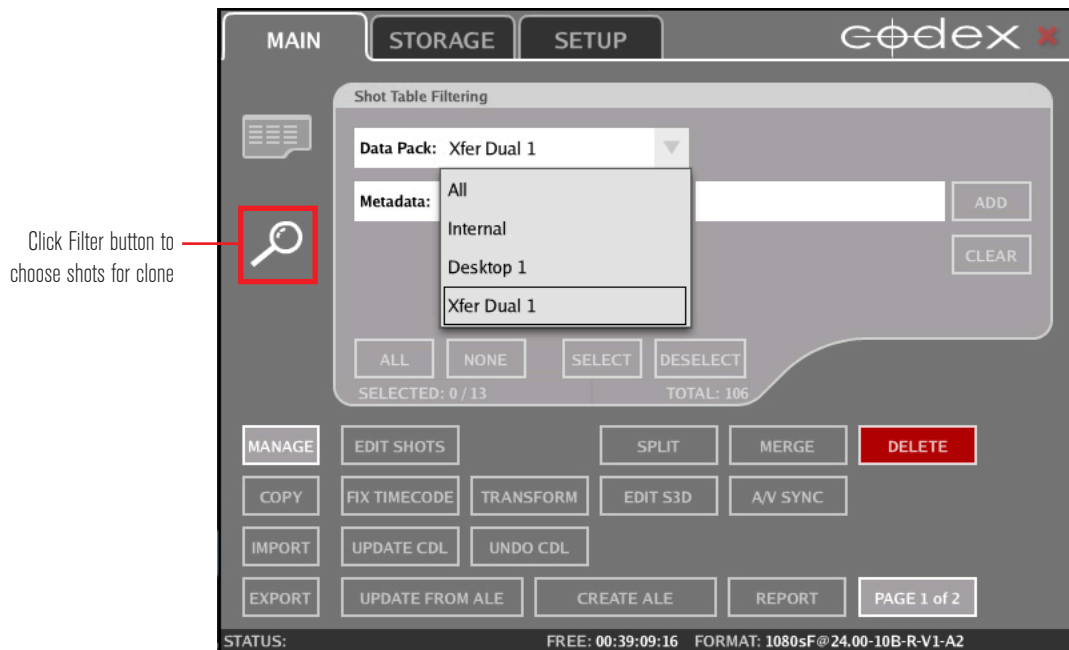
Follow these steps to clone data to the Internal Storage:

1. With a Dock attached and a Capture Drive loaded in addition to the Internal Storage the STORAGE tab appears like this:



The bottom half of the STORAGE tab represents the physical locations for the media.

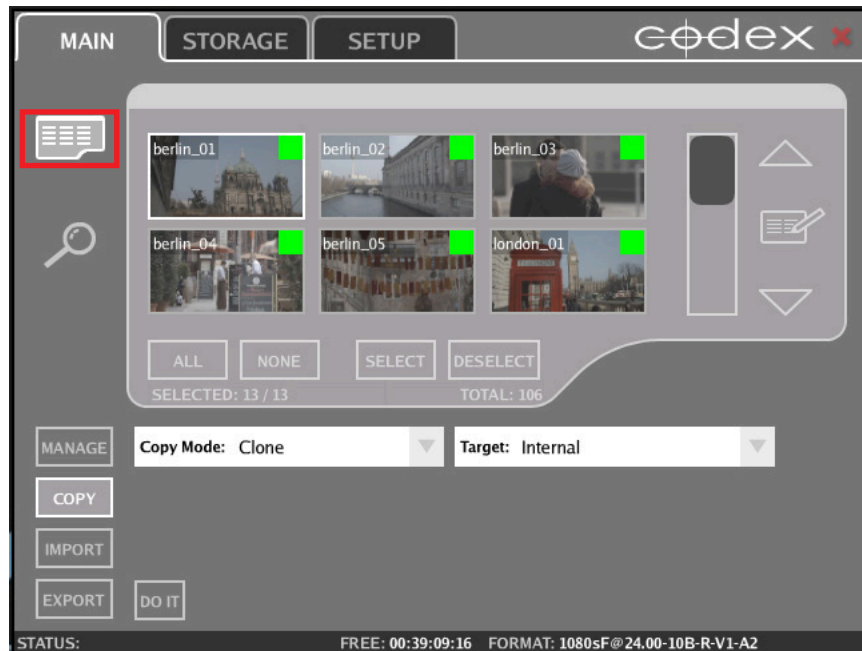
- To clone data to the Internal Storage go to the MAIN tab. Select the Filter button on the left of the screen (spyglass icon) and open the Datapack drop down list to select the location to copy from:



- Click the Shots View button (above the Filter button) to view the shots on the media you have chosen. From the bottom left of the screen click **COPY** and set the **Copy Mode** as **Clone**. Open the **Target** drop down list to choose **Internal** as the target for your copy:



4. Then below the shot thumbnails/list click the **ALL** button so that all shots to copy are marked with a green square:



5. To begin the copy click **DO IT**. The copy progress will be shown:



6. When the copy has finished a COPY SUCCEEDED message will be shown at the bottom of the Codex UI:

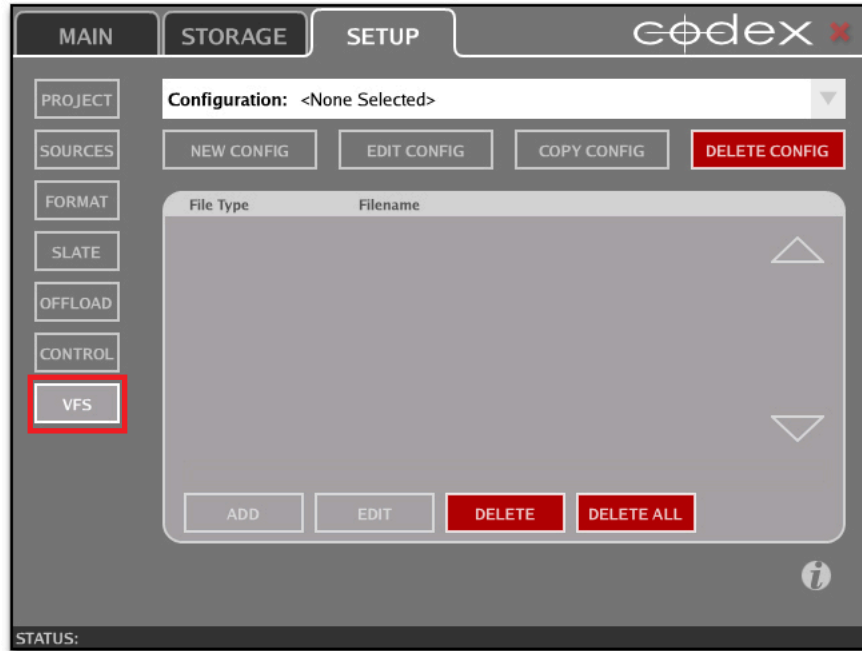


26. Getting RAW image files

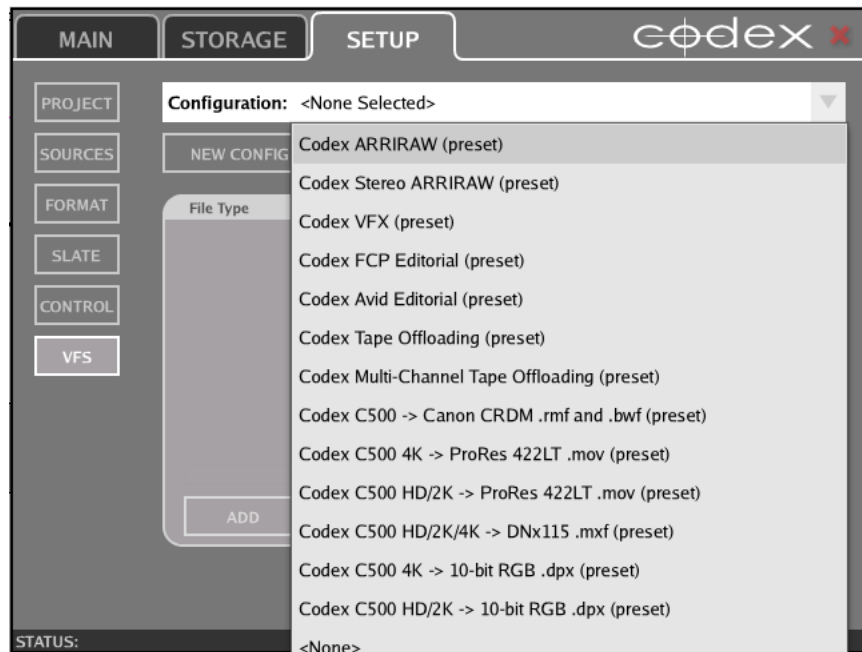
To maintain maximum quality the Codex software can package the ARRIRAW data recorded from the ALEXA XT into .ari files. These contain the original camera sensor data along with a range of useful metadata, and there is a file per frame.

IMPORTANT NOTE: Before copying files from the Codex VFS always check there is only one copy of the shots loaded. There could be more than one copy, for example, if you have cloned shots to the Internal storage. Performing this check will prevent duplicate RAW or proxy files being copied from the Codex VFS.

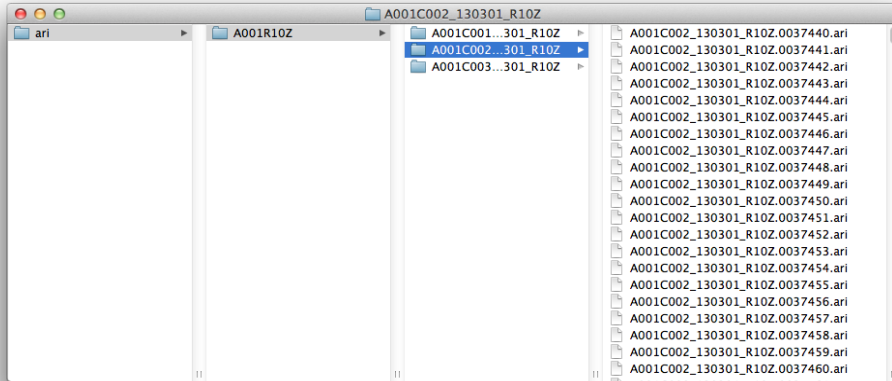
Go to the SETUP tab, and then click on the VFS button.



The first time the software is used, Configuration is set to <None Selected>. Click the arrow to open the Configuration drop down list and choose **Codex ARRIRAW (preset)**:



Then go to the Codex VFS drive to access the files:



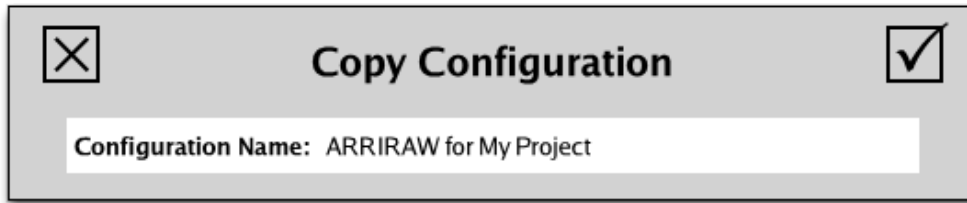
The 'Codex VFS' drive should normally be visible with Finder and on the Desktop. If not then make sure that Finder Preferences is set to show Hard disks on the Desktop:



Files can be copied from the 'Codex VFS' drive using any copy tool.

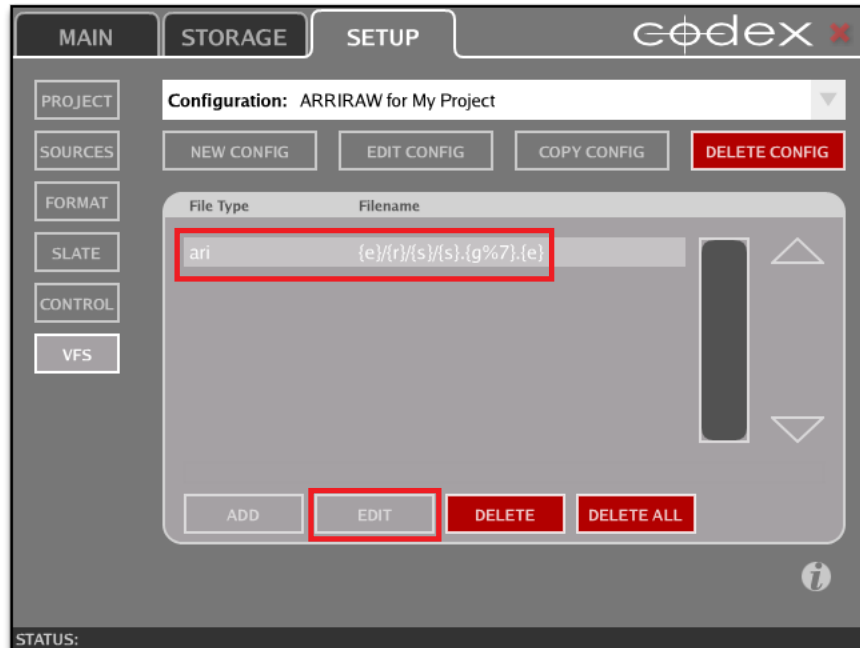
The Codex software offers the Disk and Tape Offloader feature for making verified copies of files from the 'Codex VFS' drive to disk or LTFS tape. This will be discussed later in this guide in the section "Using the Disk and Tape Offloader".

This preset configuration can be customised for your project, for example if you want to change the file naming from its default setting. To make the configuration editable for your project select **COPY CONFIG** to create a copy of this configuration, and rename it for your project:



Note: any renamed configuration cannot have the first word 'Codex'

Once the configuration has been renamed for your project, to change settings for the ari File Type click **EDIT**.



This opens up more options for that File Type that are fully covered in the VFS Guide.

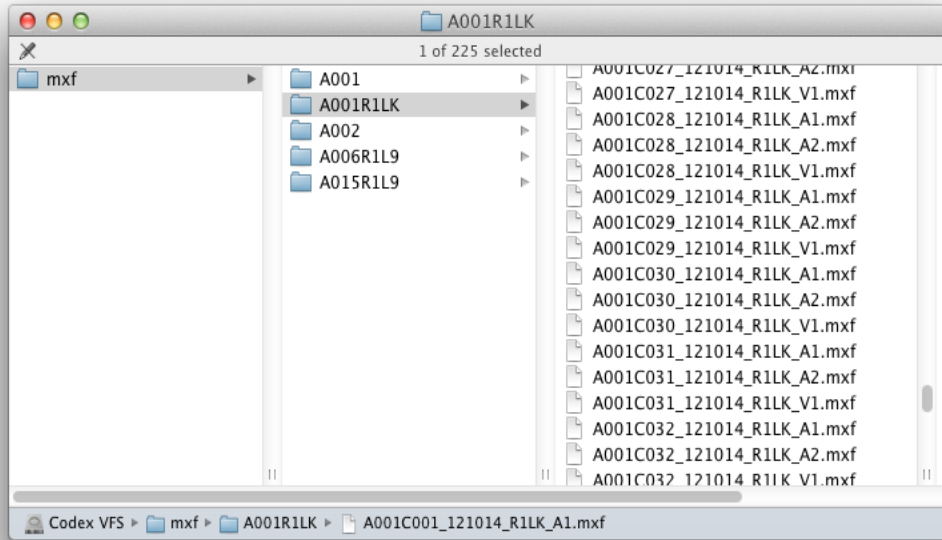
27. Getting Proxy files for editing

IMPORTANT NOTE: Before copying files from the Codex VFS always check there is only one copy of the shots loaded. There could be more than one copy, for example, if you have cloned shots to the Internal storage. Performing this check will prevent duplicate RAW or proxy files being copied from the Codex VFS.

There are two Configuration preset examples for creating proxy files for editing:

1. **Codex FCP Editorial (preset)** - this will create ProRes 422LT files. There is no Scaling, LUT or Burn-In applied by default. This preset can be edited to use for your project.
2. **Codex Avid Editorial (preset)** - this will create DNxHD 422 115/120 files. There is no LUT or Burn-In applied by default. This preset can be edited to use for your project.

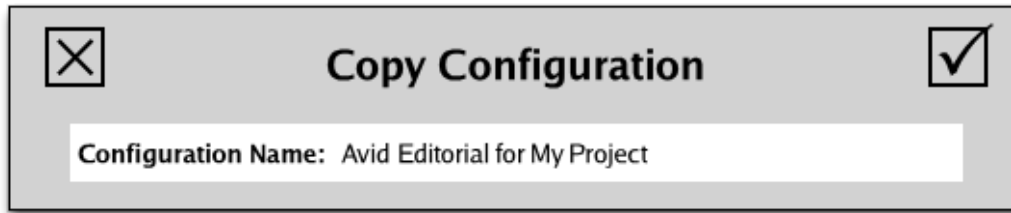
Choose the correct Configuration for your project, then copy the files from the Codex VFS drive:



If you need to change any settings for the files edit the configuration using these steps:



The preset configurations can be customised for your project. To make the configuration suitable for your project select **COPY CONFIG** to create a copy of this configuration, and rename it for your project:



Note: any renamed configuration cannot have the first word 'Codex'.

Once the configuration has been renamed for your project, for each file type click to select it and then click **EDIT**. This opens up more options for that File Type.

DNxHD files will always be scaled to 1920x1080. If setting up ProRes files (starting with FCP Editorial preset) it is also generally recommended to set **Scaling** as **Fixed**, **Height** to 1920, and **Width** to 1080. Applying LUTs and Burn-Ins is detailed in the VFS Guide.

Now you have set the type of files that the Codex software will process, and the frame rate for them.

28. Using the Disk and Tape Offloader

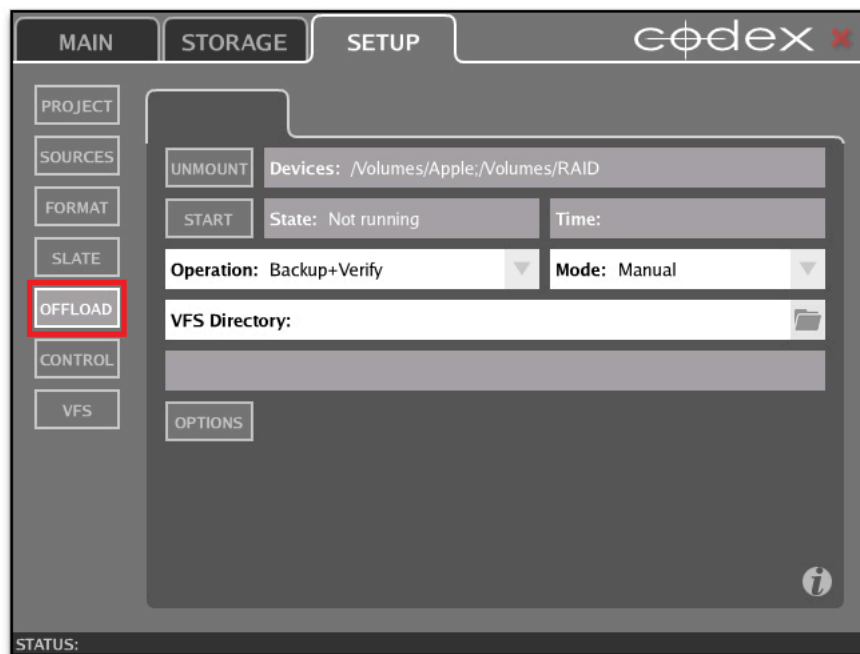
With the correct licence installed the Codex software provides the Disk and Tape Offloader feature.

This feature can perform a byte-for-byte (or md5) verified backup to 2 disk and 2 LTFS tape targets simultaneously (or combinations thereof).

LTFS stands for Linear Tape File System and is an open standard way of formatting tapes, that can be read on any system with the appropriate drivers installed.

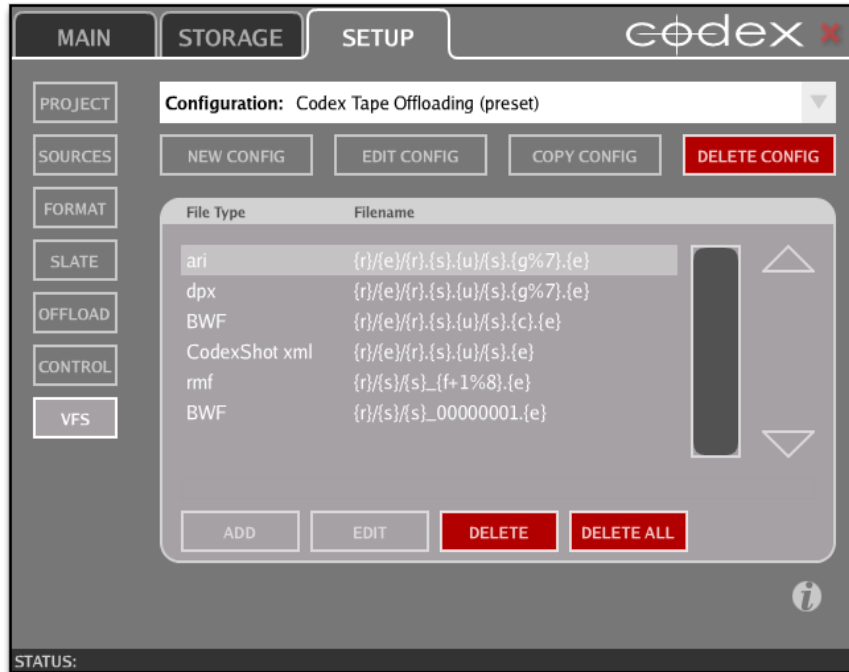
Contact support@codexdigital.com if you require a licence for this feature.

When this feature is activated there is an OFFLOAD option on the SETUP tab:



To use the Disk and Tape Offloader there is a recommended VFS Configuration called 'Codex Tape Offloading (preset)'. If this configuration is used as the basis for your offload it means that the files can be imported back to Codex storage (Internal storage or a Capture Drive) later and

will be exactly the same as they were originally:



Alternatively you can use the same configuration that you set up for creating RAW files if there is no requirement to import the files back to Codex storage later.

Go to the **OFFLOAD** screen and set the **Mode** to **Manual**:



Then click to open the **OPTIONS**:

Offload Options

Num LTFS offloads: 0

Num Disk offloads: 0

These are set at zero (0) by default. Set these to how many LTFS tape and Disk offloads you required:

Offload Options

Num LTFS offloads: 2

Num Disk offloads: 2

Disk offload 1: 0

Disk offload 2: 2

Then click the File Browser icon to choose the destination for the disk offloads:

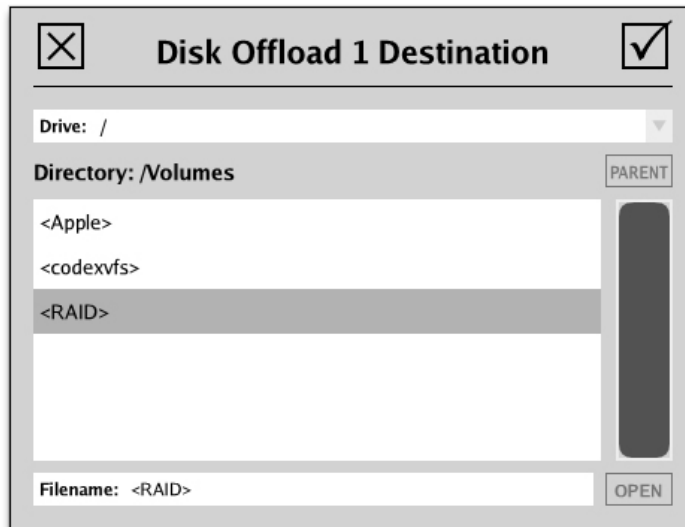
Offload Options

Num LTFS offloads: 2

Num Disk offloads: 2

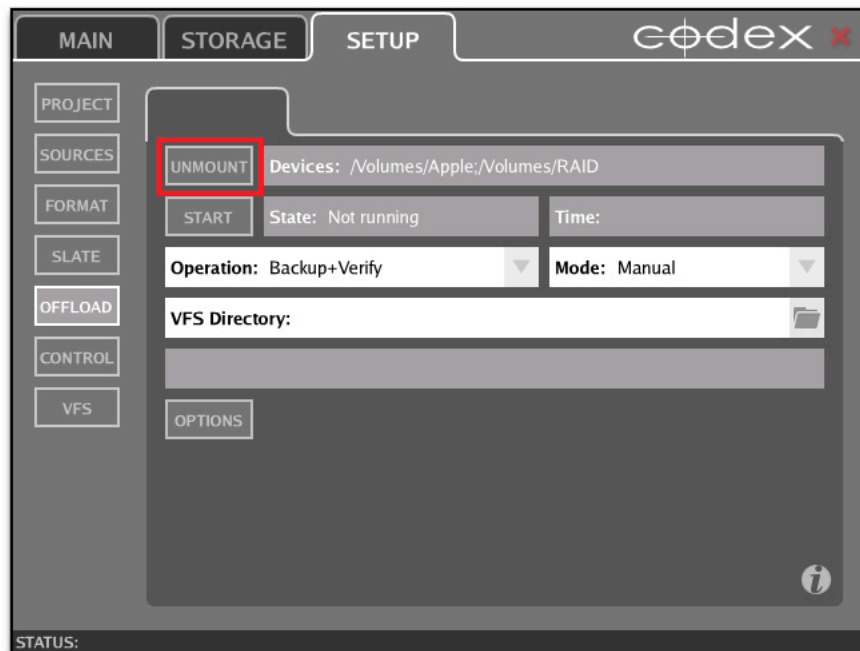
Disk offload 1:

Disk offload 2:



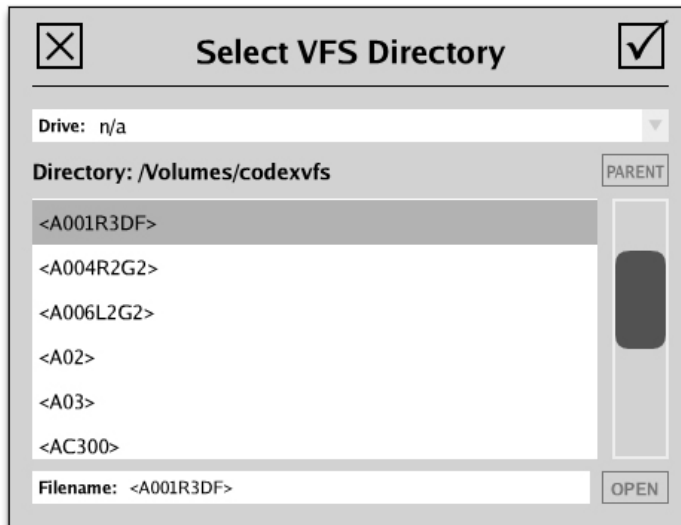
Confirm that **Operation** is set to **Backup+Verify**.

Then click the **MOUNT** button and the target(s) for the offload should be shown next to **Devices**:



At this point it is advised to view the contents of the Codex VFS drive, to confirm it contains the files you want to offload.

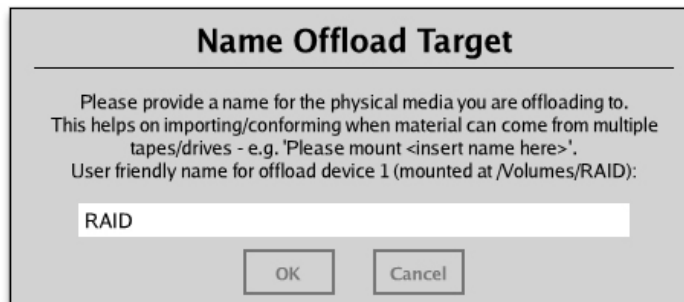
If required you can choose a VFS Directory – for example you may want to offload just one Roll from all those that are loaded:



Then click **START**. After scanning the VFS the software will ask you to enter a user friendly name for the offload. The default is 'unnamed', so this could be changed to the Roll name for example:



Then you will be asked to enter the name(s) of the media being used, for logging purposes:



The software will then proceed with the offload, showing the names of the files as they are copied, and the estimated time remaining to completion:



When the offload has completed successfully the software will show how many files have been backed up and verified:



29. Deleting the media to return to the set

To delete the media go to the STORAGE tab of the Codex UI.

Here you can select the Roll in the top half of the screen, and then click the **DELETE** button. The software will ask if you are sure you want to delete. If you are sure that your data is backed up then click OK and the Roll will be deleted:



There is no 'Undo' button or recovery option, so you should be certain before deleting the media.

