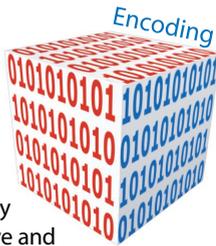


The fastest,  
most powerful  
and flexible  
**digital cinema  
mastering system**  
in the world!

**QUBE**  
MASTER *Pro*

Qube Cinema is a company that has proven expertise in managing complex technology transformations in traditional workflows; a company with a passion for cinema and a thorough understanding of film, video, audio and computer technology as well as the production, post-production and exhibition industries. Qube Cinema has an entire suite of products required for a practical, commercially viable, end-to-end implementation of Digital Cinema.

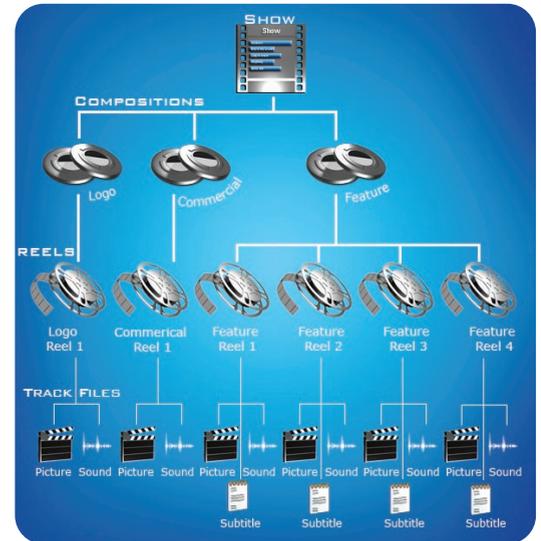


**QubeMaster Pro** is a uniquely flexible and powerful Digital Cinema encoding and packaging solution designed to integrate fully into the modern post environment. It is a database-driven software solution for the Microsoft Windows™ platform with an intuitive and familiar user interface that is simple to understand, yet provides virtually unlimited power and flexibility for digital cinema content creation. For power users, the software provides fast keyboard-based control over nearly all operations.

## QubeMaster Pro's DCI Object Model

The architecture of QubeMaster Pro closely mirrors the *Digital Cinema Initiatives (DCI) Object Model* with a hierarchy of *Shows, Compositions, Reels* and *Track Files*. It is this design that makes QubeMaster Pro unarguably the best choice for every digital cinema mastering application.

While QubeMaster Pro has been designed from the ground up to conform to the DCI Specification and is the ideal product to go from a *Digital Cinema Distribution Master (DCDM)* to a *Digital Cinema Package (DCP)*, it has also been designed to operate in the real world where workflows don't always represent the ideal.



QubeMaster Pro's DCI Object Model

## The Virtual DCDM

QubeMaster Pro has powerful pre-processing capabilities that allow it to crop, scale and add borders to the image, and to combine multiple audio files with flexible channel assignments. QubeMaster Pro can perform Log to Linear conversions, handle 1 D and 3 D Lookup Tables as well as convert between XYZ, RGB and YCbCr color spaces with user defined R, G, B and White Point colour coordinates. For more advanced pre-processing, QubeMaster Pro includes *Color Transform Language (CTL) Script Processing*. The software handles all pre-processing calculations with the highest internal precision to preserve every bit of image quality.

Together, these pre-processing capabilities allow QubeMaster Pro to work directly on the Digital Intermediate data where there is insufficient time or budget to create a DCDM – a concept that we refer to as the Virtual DCDM! And since the DCDM is the ideal archival format for a film, QubeMaster Pro can also generate a standards-compliant DCDM even as it encodes, thus saving considerable time and money.

## More Pre-processing

There are many more pre-processing capabilities built right into QubeMaster Pro so that you can manage most situations without export/import or the use of third-party software. This includes the capability to burn-in captions, both in 2D and 3D with Z positioning; perform audio pull-ups and pull-downs, video and audio frame rate conversions and much, much more.

## Flexible Source File Formats

The software supports multiple methods of bringing in picture and sound elements including file import and image sequence import. Numerous picture formats are supported including TIFF, DPX, Cineon, TGA and BMP image sequences apart from MXF, Quicktime, QT Reference and AVI based sources. Since QubeMaster Pro works with any existing local or shared storage, its flexible support of multiple file formats will quickly become a boon in a post facility without the need to copy or convert.

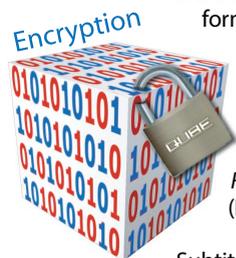
## Simple, Intuitive Workflow

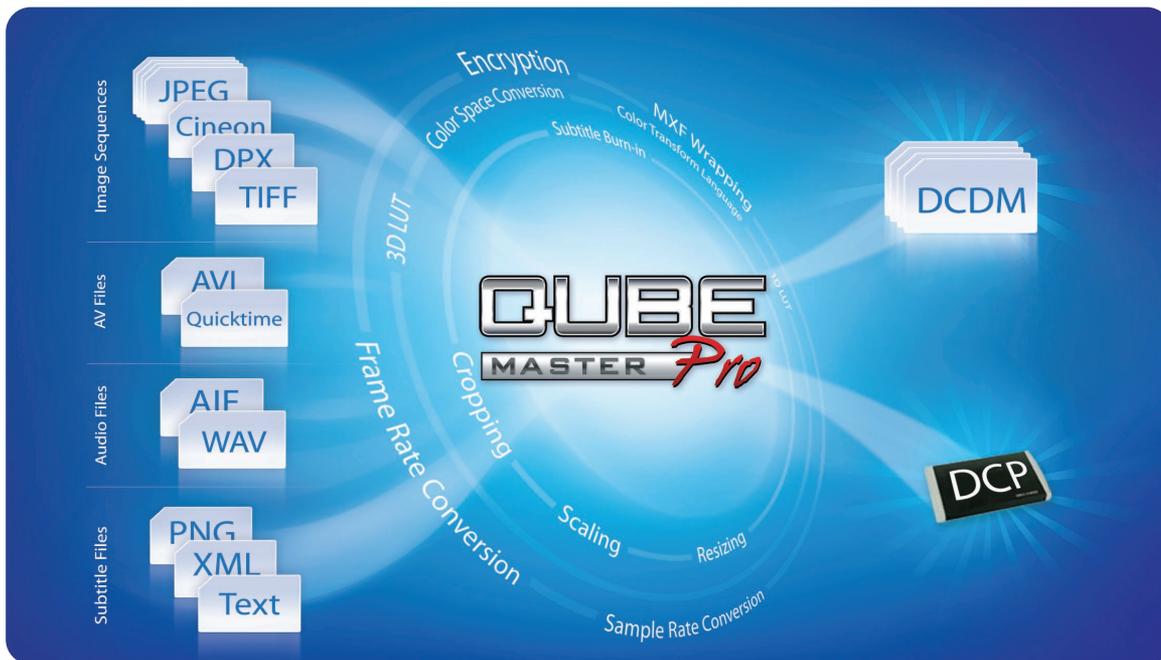
QubeMaster Pro provides a very powerful mastering interface which allows picture, sound and subtitle *Track Files* to be added to the database by a simple drag-and-drop operation. These files are then synced accurately using a Sync Point such as the 2-Pop to form *Reels*. Sync Points are marked for each Track File using the *Clip Editor* as are In and Out Points representing the *First Frame of Action (FFOA)* and the *Last Frame of Action (LFOA)* of each Reel.

Subtitles are xml or MXF files in the CineCanvas™ format and can be created by the QubeMaster Pro application from plain text files in multiple popular formats or the system can directly use standards compliant xml files created in other applications.

Multiple Reels are ordered and chained together to form a *Composition* along with additional metadata that is entered by the user. The Composition is the basic unit of distribution in the digital cinema world and QubeMaster Pro produces standards compliant SMPTE and MXF Interop *Digital Cinema Packages (DCPs)* and *Key Delivery Messages (KDMs)* for distribution to digital screens.

"A deceptively simple user interface that hides the fact that QubeMaster Pro has an answer to every digital cinema packaging problem one can think of!"





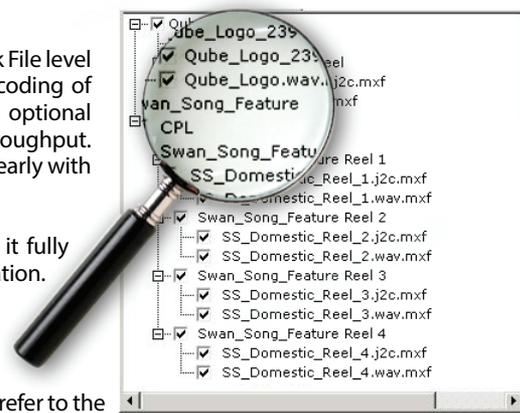
## Encoding, Encryption and MXF Wrapping

In order to retain maximum flexibility, QubeMaster Pro allows MXF wrapping and encryption at the Track File level while one-step encoding, encryption and MXF wrapping is performed at the Composition level. Encoding of Compositions into JPEG2000 can be performed in software and, where speed is of the essence, optional distributed processing capability is available to achieve performance limited only by source file throughput. QubeMaster Pro fully utilizes every CPU in a multi-core system and processing throughput increases linearly with the number and speed of the processors.

While QubeMaster Pro has the capability to encode into all supported image compression formats, it fully supports MXF wrapping and/or 128-bit AES encryption of already encoded material to the DCI specification. This allows post-houses to take advantage of their custom encoding solutions.

## Control Over Every Asset in the DCP

One of QubeMaster Pro's most powerful features is its versioning capability. Not only can multiple Reels refer to the same Track File and multiple compositions refer to the same Reel, but making copies of Reels and Compositions is also quick and easy. The software also has very powerful Packaging features including the ability to merge multiple items into a single DCP and to include or exclude every element of one or more Compositions in a DCP.



The Packager's Asset Map



The Clip Editor

## The Clip Editor

Another powerful tool in the application is the Clip Editor. This is used throughout the QubeMaster Pro application to mark Sync Points and In & Out Points, and to check Reels and Compositions for Sync and Transitions. The Clip Editor uses familiar icons and keyboard commands that will make the user instantly comfortable with the system.

## Real-time Playback of JPEG2000 with 3D LUT and Subtitles

Thanks to its high efficiency JPEG2000 codec, the QubeMaster Pro system can also play DCI compliant files in real-time within the Clip Editor or the Preview Window. Best of all, both the Clip Editor and the Preview Window also support industry standard 3D LUTs for viewing XYZ and Log material with accurate color rendition on computer monitors. And when a Reel includes Subtitles, the system will render these on-screen with accurate fonts, positions and colors to provide you with as high quality a viewing experience as is possible on a non-DCI display device. For stereoscopic material, previews can also be output in side-by-side, over-under and dual-monitor formats.

## Speed, Speed and more Speed

QubeMaster Pro was designed and engineered for speed. Harnessing every iota of power in today's powerful workstations, it can manage significantly faster than real-time 2K encoding from a DSM even while performing cropping, scaling, applying a 3D LUT, JPEG2000 encoding, encryption and MXF wrapping, all in a single step! And of course, the system is even faster when working from a 2K DCDM and performing just JPEG2000 encoding, encryption and MXF wrapping! Best of all, QubeMaster Pro's performance is designed to scale nearly linearly with the number of CPU cores and their processing speed so you can fully expect it to do more and more each year, thanks to Moore's Law.

## Powerful Localization Capability

QubeMaster Pro also allows for Compositions to be edited for censorship or localization requirements of different territories. Existing Compositions may be loaded into the system along with a valid KDM and then modified with total control of all parameters.

## Keys, Security and Audit Logs

While QubeMaster Pro is a mastering system, it does include efficient Key management capabilities. KDMs can be issued for a single target Device Certificate or optionally, in bulk for a folder full of target Device Certificates. And for large post-production organizations, QubeMaster Pro also allows KDMs to be restricted to just a specified list of target Device Certificates such as those in internal screening rooms and dedicated Key Management solutions such as Qube KeySmith. And that's not all, QubeMaster Pro logs every encode performed on the system so an audit log will be available to the System Administrator.

QubeMaster Pro was built for the real world and addresses nearly every real-world challenge. Whatever your digital cinema mastering application, QubeMaster Pro is one system that has the power and flexibility to support it!

### System Requirements:

Microsoft Windows 7 x64 based Workstation, Intel Core i5 Processor 2.3 GHz or faster CPU (20-core Workstation with dual Intel Xeon Processor E7s preferred), 4 GB RAM minimum (16 GB preferred), 250 GB available Storage (SSD preferred), separate Media Storage and an ATI Radeon HD Series Graphics Adapter capable of a screen-resolution of 1280x1024 or higher (1920x1080 or 2048x1536 preferred).

QubeMaster Pro is part of an entire suite of products for an end-to-end implementation of digital cinema.

The DCI Certified **Qube XP-I Storage Server** with **Qube Xi Integrated Media Block** and the **Qube XP-D Digital Cinema Server** are the core offerings for cinemas. While the Qube XP D has quad HDSDI outputs at 2K resolution and can work with content at DCI specified data rates, the Qube Xi IMB can work at 2K and 4K resolutions and goes well beyond the DCI specification to handle High Frame Rates at 48 fps and 60 fps 3D or 120 fps 2D at 500 Mbps. The system also includes the unique ability to link multiple projectors with their Qube Xi IMBs to play a single DCP encoded at 1000 Mbps at 120 fps per eye in 3D!

**Qube KeySmith** is a powerful and comprehensive web-based digital cinema key management and reporting system that was developed to meet real-world requirements across different environments. While retaining a high level of flexibility and ease-of-use, Qube KeySmith has comprehensive reporting capabilities, maintains all audit-trails and can enforce multi-point authorizations for all key requests.

		QubeMaster Pro	QubeMaster Packager	QubeMaster Preview	QubeMaster Xpress	QubeMaster Xport
	Operating System	Microsoft Windows™	Microsoft Windows™	Microsoft Windows™	Microsoft Windows™	Mac OS X
ENCODING	2K	✓	✗	✗	✓	✓
	4K	✓	✗	✗	✓	✓
	High Frame Rate	✓	✗	✗	✗	✗
	High Bit Rate	✓	✗	✗	✗	✗
SOURCE FILE FORMATS	DPX, Cineon, TIFF Sequences	✓	✗	✗	✗	✓
	Quicktime, AVI Files	✓	✗	✗	✓	✓
	MXF Files	✓	✗	✗	✗	✗
	Separate WAV, AIF Audio	✓	✗	✗	✗	✓
	Still Images	✗	✗	✗	✓	✗
SUBTITLES	CineCanvas XML	✓	✓	✗	✗	✗
	Subtitle Text Files	✓	✓	✗	✗	✗
	Encryption	✓	✓	✗	✗	✗
	Composition Editing, Versioning	✓	✓	✗	✗	✗
PACKAGING	Single Composition DCPs	✓	✓	✗	✓	✓
	Multi Composition DCPs	✓	✓	✗	✗	✗
	Partial DCPs	✓	✓	✗	✗	✗
KEY MANAGEMENT	Single KDM Generation	✓	✓	✗	✗	✗
	Bulk KDM Generation	✓	✓	✗	✗	✗
	KDM Target Restrictions	✓	✓	✗	✗	✗
	Audit Logging	✓	✗	✗	✗	✗
	DCP Ingest	✓	✓	✓	✗	✗
	Realtime Playback in 2D & 3D	✓	✓	✓	✗	✗



USA  
601 S Glenoaks Blvd Ste 102, Burbank, CA 91502, USA  
Tel: +1 (818) 392-8155 | Fax: +1 (818) 301-0401 | info@qubecinema.com  
www.qubecinema.com

Europe  
Nigel Dennis  
Tel: +44 (208) 144-5661 | Mobile: +44 7878717548  
nigel@qubecinema.com