



VIDEO WORKFLOW

OVERVIEW



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Introduction

DAVID Systems has expanded their product portfolio with new modules for integrating video. The basis of the new video products and special video and multimedia solutions is the successful *DigaSystem*, the result of more than 15 years of development and continuous improvements.

Our video products provide powerful solutions for the areas of ingest, browsing, production, transcoding and distribution. The combination of a desktop application and supporting software modules is guaranteed to make your work both efficient and professional. The modular structure of the video software guarantees that integration into existing *DigaSystem* environments is very simple. To make integration even easier, new category and system functions have been added to the *Database Manager*. A video file is simply dragged to an icon in the tool bar in order to play, edit or send it or to open the file with the corresponding application. The video tab provides a preview function and shows video specific fields and metadata.

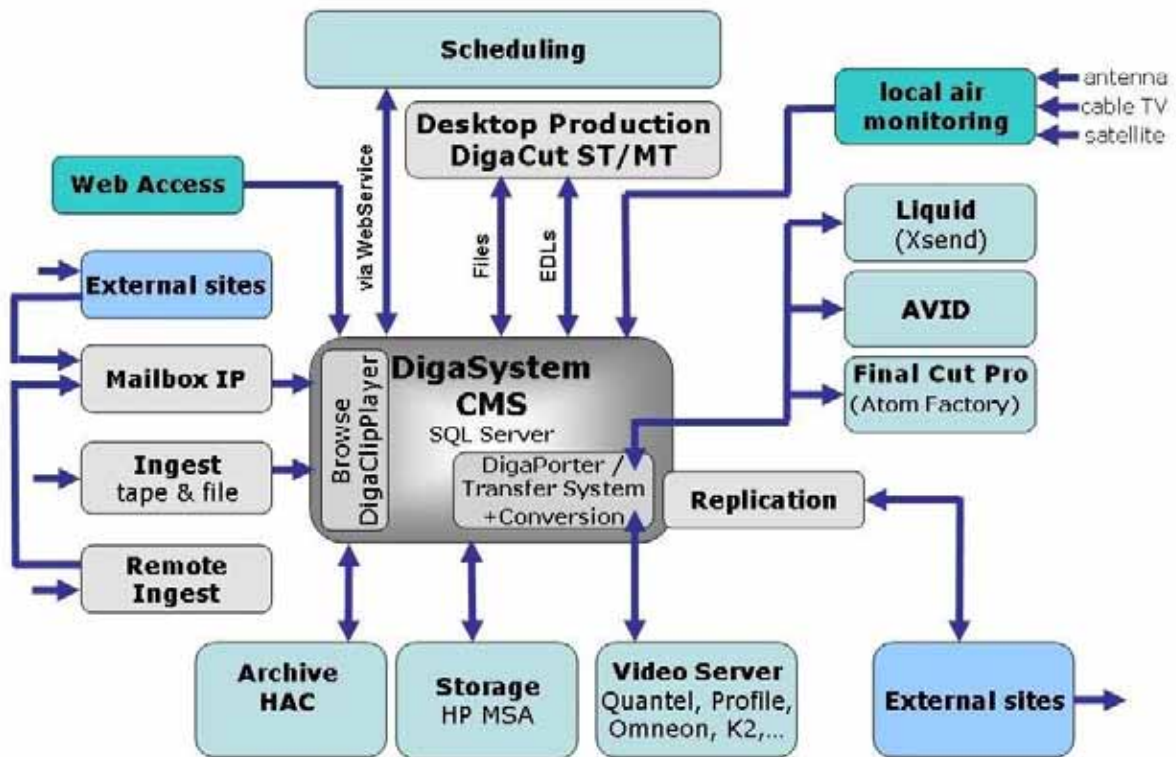
All video products can work with high resolution (HiRes) and low resolution (LoRes) video material. Different concepts can be realized depending on the workflow. Integration partners have ActiveX Controls available to them for integrating video modules in third-party system environments (OEM option).

Features

The focus is on the following functional areas and applications:

- Synchronization of the work processes for HiRes and LoRes video material
- Parallel browsing and editing of the same material by several users within a single network (multi-user functionality)
- Browsing, selection, multi-format editing, consolidation (LoRes - HiRes)
- Integration in existing system environments (*DigaSystem* or third-party systems such as Automation, Newsroom or Archive)
- Interfaces to playback systems such as GVG Profile, Quantum or Omneon video servers
- File transfer (replication) with multi-directional broadcasting of video files in different formats and metadata to different receivers, incl. format conversion
- Network compliant access to metadata and/or essences via the *Database Manager*
- SQL integration
- Indexing of video material

Workflow Overview



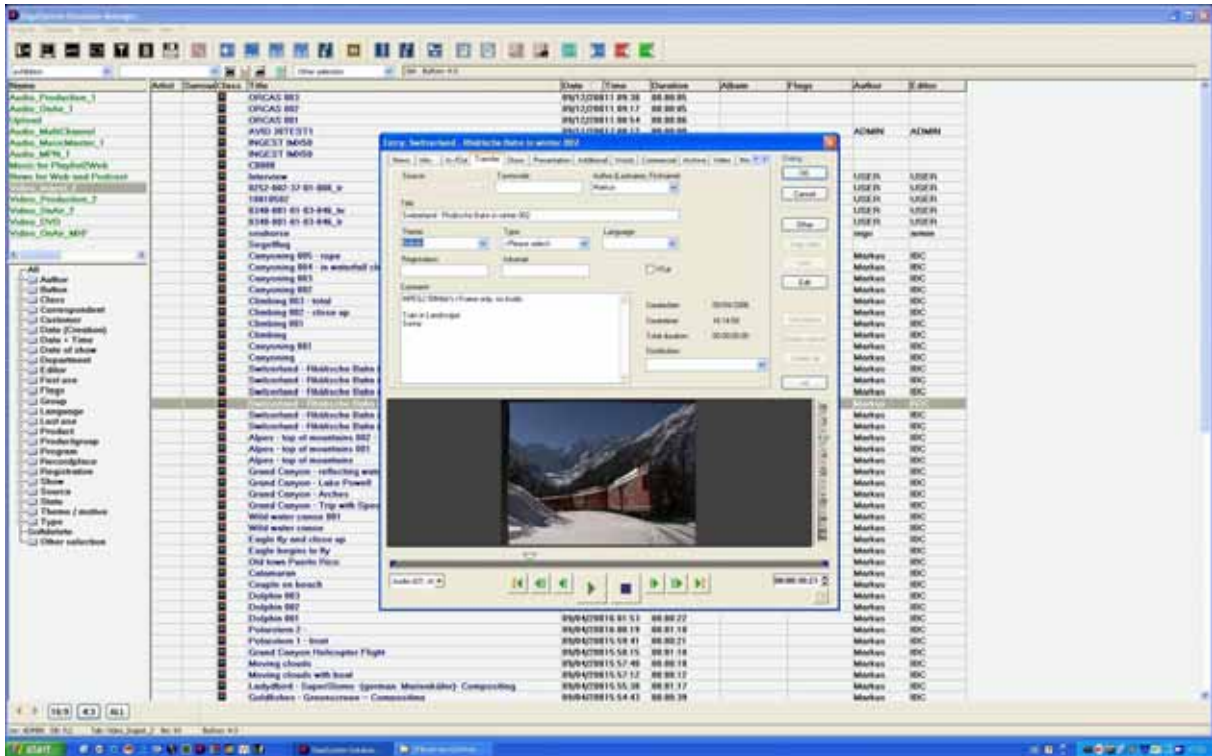
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Content Management

Database Manager

The Database Manager is the central database backend for management of multi-media content (audio, video, pictures, text etc.) with integrated audio player, recorder, audio format conversion, MediaPlayer for video, viewer for pictures, text editor, multi-table search and archive read.

Using the client application Database Manager, all items are managed within DigaSystem database tables. Metadata are assigned to video items, which can be previewed within the database mask video player.



Typical video related workflows with DBM are:

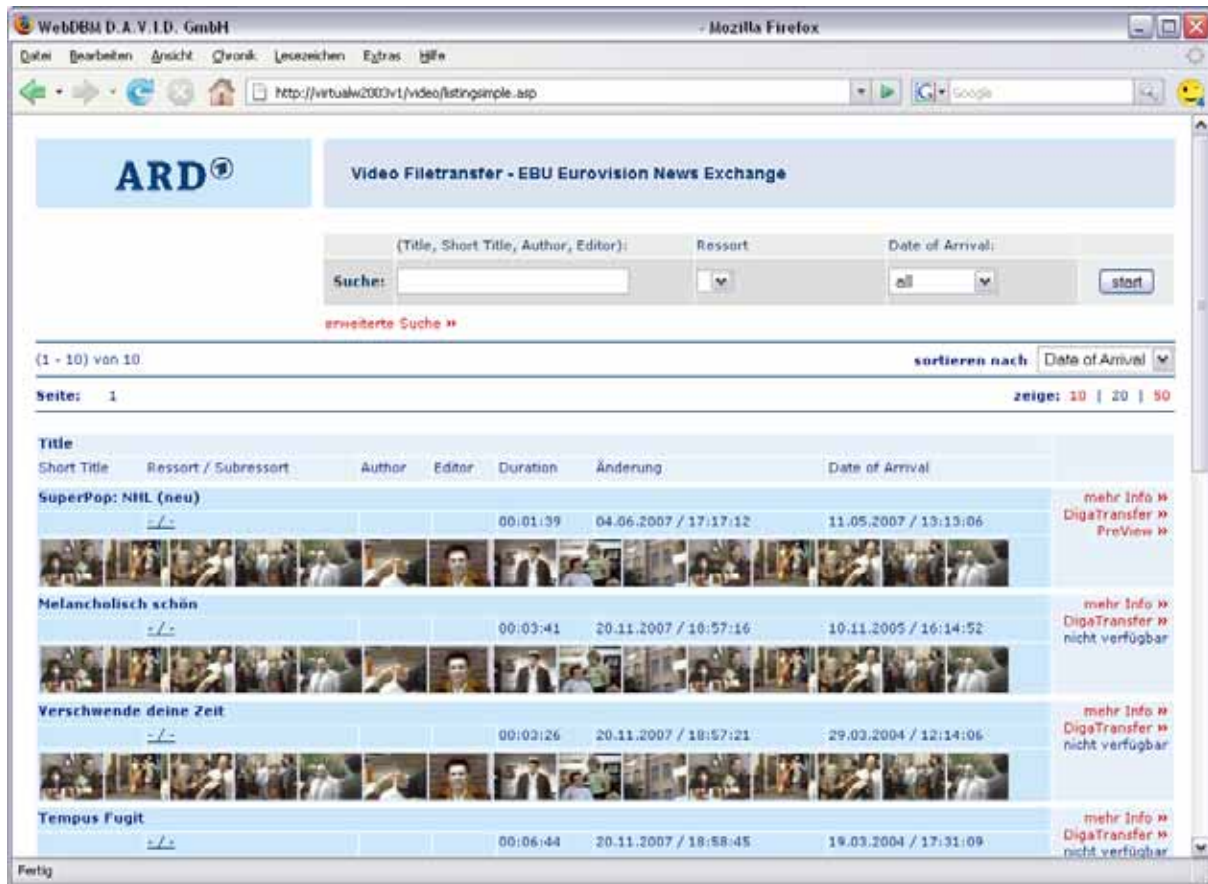
- Previewing and entry video files
- Editing database entries
- Adding metadata (see picture)
- Setting flags
- Setting markers in the video preview



WebDBM

This browser-based application allows very basic access to DigaSystem databases, in case no further rights shall be available or if no DigaSystem is accessible directly. Via Web DBM the user gets a accurately specified read-only access with an individual screen layout to defined tables. Project specific flags can be pre-defined and set by users or automatically by the system.

WebDBM can also be used for transferring video contents to or from a TV station. To trigger the transfer video items must be selected and marked with the appropriate flag. Users see the state of the transferred items via remote access.



DigaTransferSystem

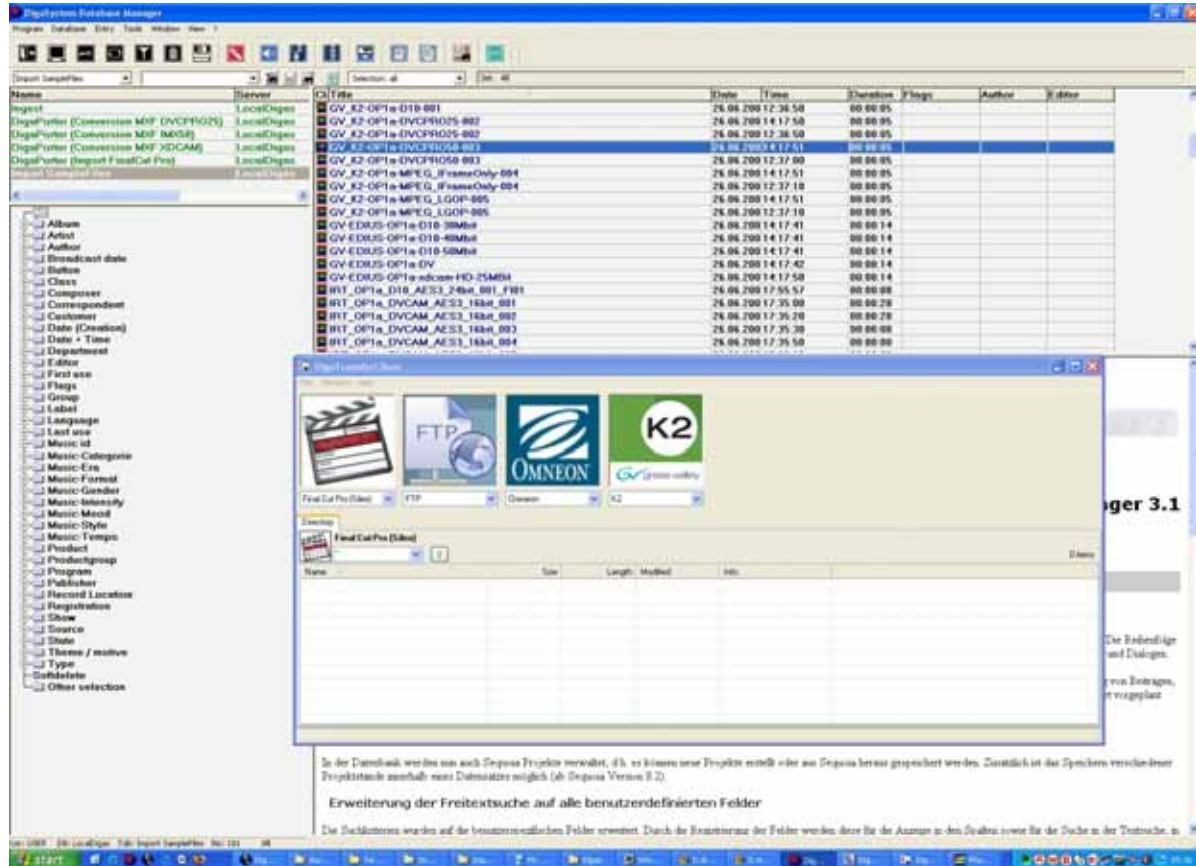
DigaTransferSystem is a service that allows doing automated copy and transcoding jobs in the background. Tables can be defined with a specific video format. Actions are triggered by the user or 3rd party applications. DigaTransferSystem comes with a management functionality to control jobs. File exchange between different tables, DigaTransferSystem checks if the format is correct and does a transcoding if necessary. The workstation is not blocked during the copy job.

DigaTransferClient allows the opportunity to receive essences out of the DigaSystem environment. DigaTransferClient offers an user interface to connect to several other instances, for example video servers, to other locations via FTP or into a windows file system.

DigaTransferSystem is highly modular. It consists of one Broker module and a free defined number of Worker and Client modules (at least one). The Broker manages incoming jobs and is doing some load balancing on the available number of Workers.

DigaSystem VideoConversionLibrary (DigaAVCvtLib)

Transcoding will be processed by the VideoConversionLibrary, a sub module which has to be installed on the same workstation the Worker module is running on.

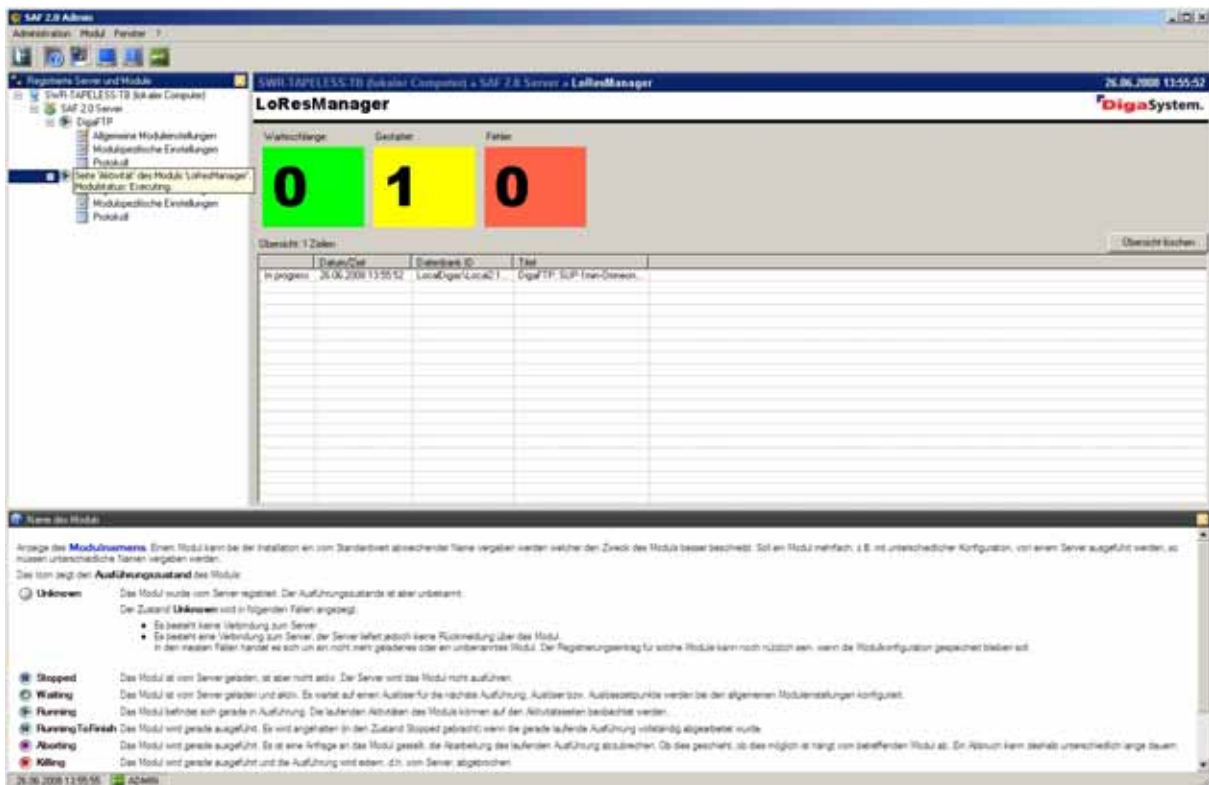


LoRes Manager

LoRes Manager controls the automatic generation of low-res copies while the transcoding itself is done by the DigaTransfer System. This task sharing results in a highly scalable system because all that is required when the system load is nearing capacity is to simply increase the number of TransferWorkers. The most important features are:

- Switch low-res generation on and off within a database table.
- A configurable table is monitored. If a low-res copy is missing or corrupt, LoRes Manager automatically generates it and completes the database entry with the respective metadata.
- Storage location for low-res files is freely configurable.
- Configurable low-res format (The chosen format must be available in the conversion library.)
- Video parameter: codec, data rate, image size, and de-interlacing
- Audio parameter: codec, data rate, quantization, and sample rate
- The copy is marked as „low-res“ in the media list of the contribution.

- Availability of a low-res copy is shown in the Database Manager.
- Errors during low-res generation are reported in Database Manager.
- Database alignment based on the media list during overnights – checks if all registered low-res copies are available
- If the check results find inconsistent data for the database and file server, LoRes Manager sends a command to the TransferBroker to generate the missing low-res file.



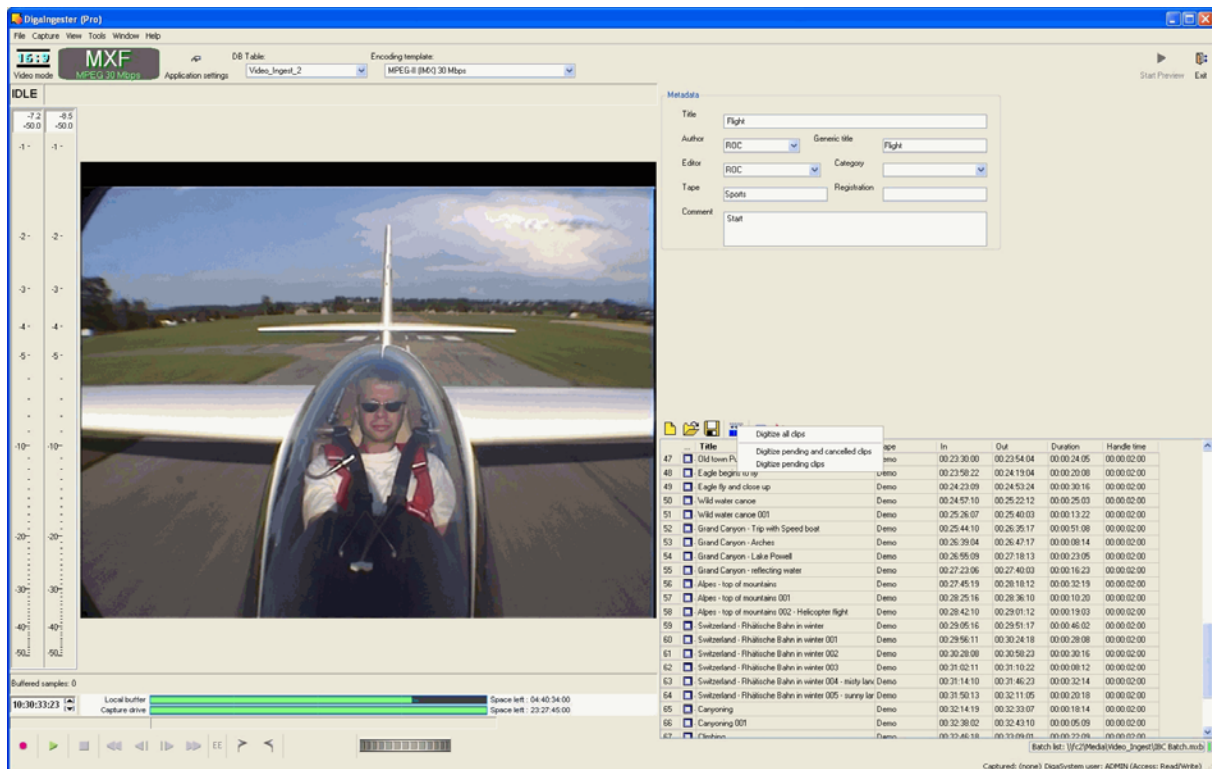
LoRes Manager

Content Production

DigaIngester

DigaIngester is used to log and capture video material either directly (online) as “crash recording” or on the basis of a batch list according to the workflow below:

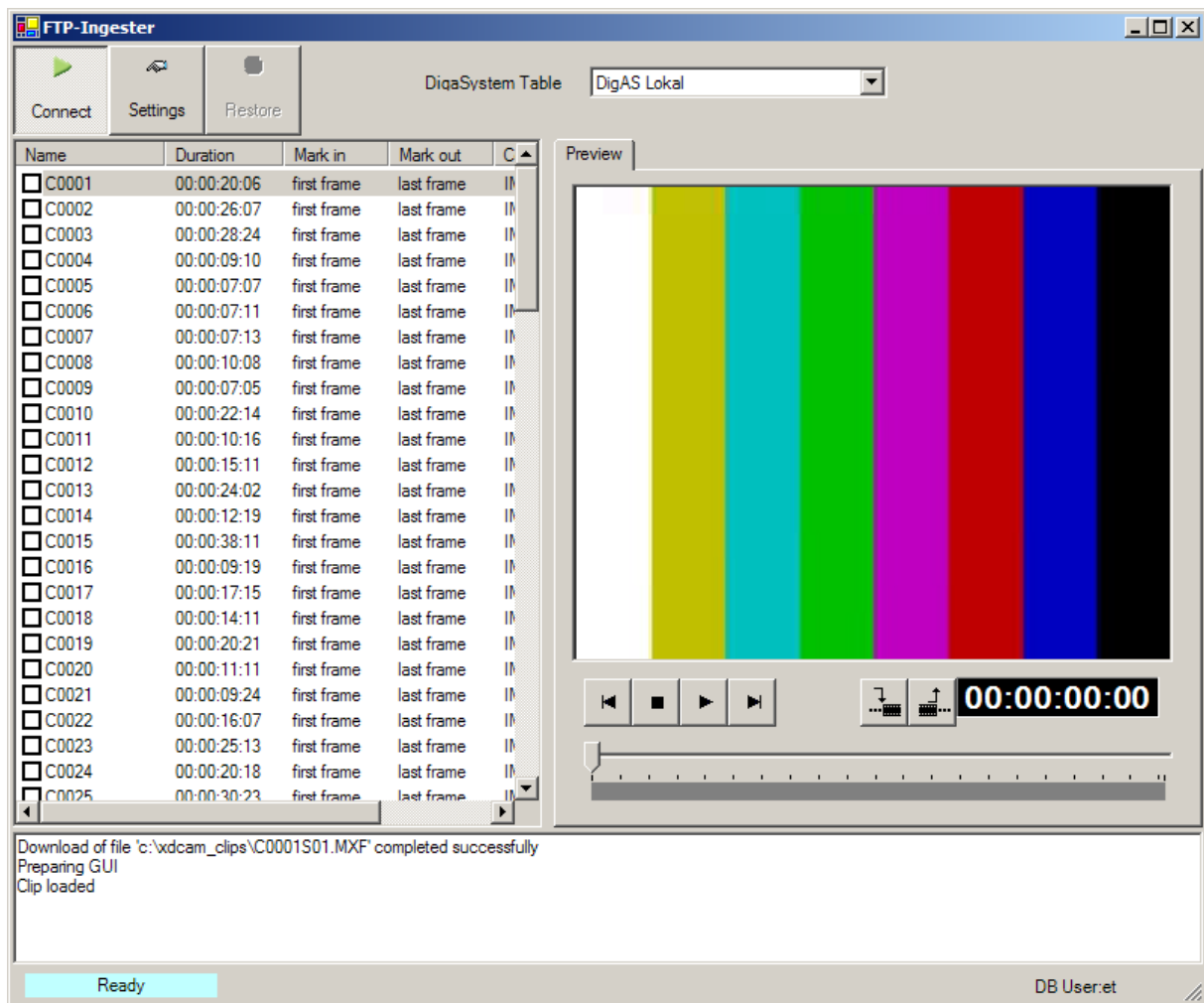
- Scenes are defined and stored in a list using Mark-In/Mark-Out points (based on timecode information)
- Once the material has been viewed and all desired scenes have been marked, they are recorded off air. DigaIngester processes the generated batch list and captures all scenes automatically in order.



The files are saved and continuously managed in DigaSystem tables. Additionally, the Digalngester modules can be laid out redundantly and metadata can be entered into the database mask either before, during or after the ingest process. Besides other features, the format of the video screen is adjustable between 4:3 or 16:9 simply via the user interface. MXF format is generated directly.

Digalngester has options for different sources: "DV" for DV devices connected via FireWire interface and "Professional" for video feeds via professional interfaces (SDI). Device control in the DV option is provided by the FireWire protocol; the Professional option uses RS422 device control. Digalngester is able to process DV formats (DV, DVCam, DVCPro), all video and audio MPEG formats as the target format and MXF. All encoding is strictly software encoding. The data is stored locally on the workstation PC or on a network storage, e.g. on a centralized storage system.

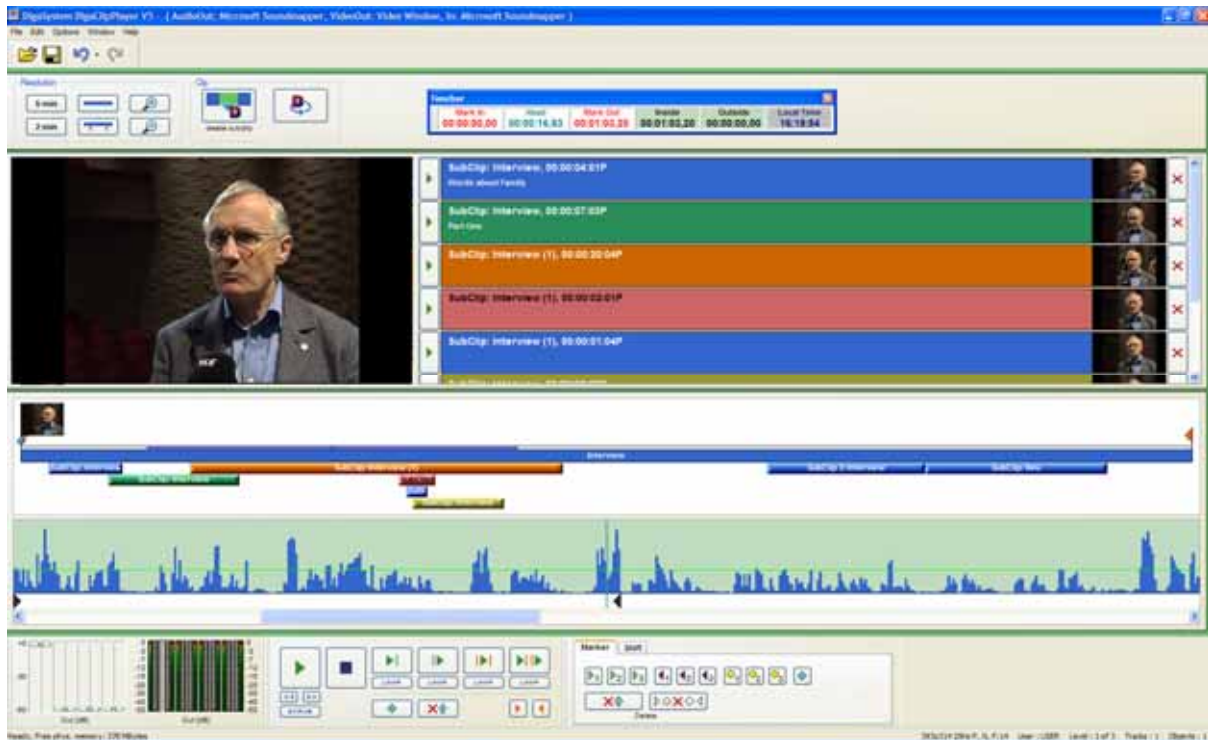
For XDCAM ingest DAVID provides a special ingester version, the XDCAM Ingest:



DigaClipPlayer

The successor of our Browse-Tool DigaPlayerAV features enhanced functionality. DigaClipPlayer is an application for browsing, viewing and simple pre-selecting of audio and video files. It works with proxy as well as with high-resolution video data. The easily and intuitively operated application is designed for the use in editorial areas, especially for journalists.

Besides the play-back of media data (audio, video, grafics) in different formats and resolutions, scenes can be selected by in- and out-marks. These scenes are generated and administrated as separate sub-clips, which can be exported as ALEs.

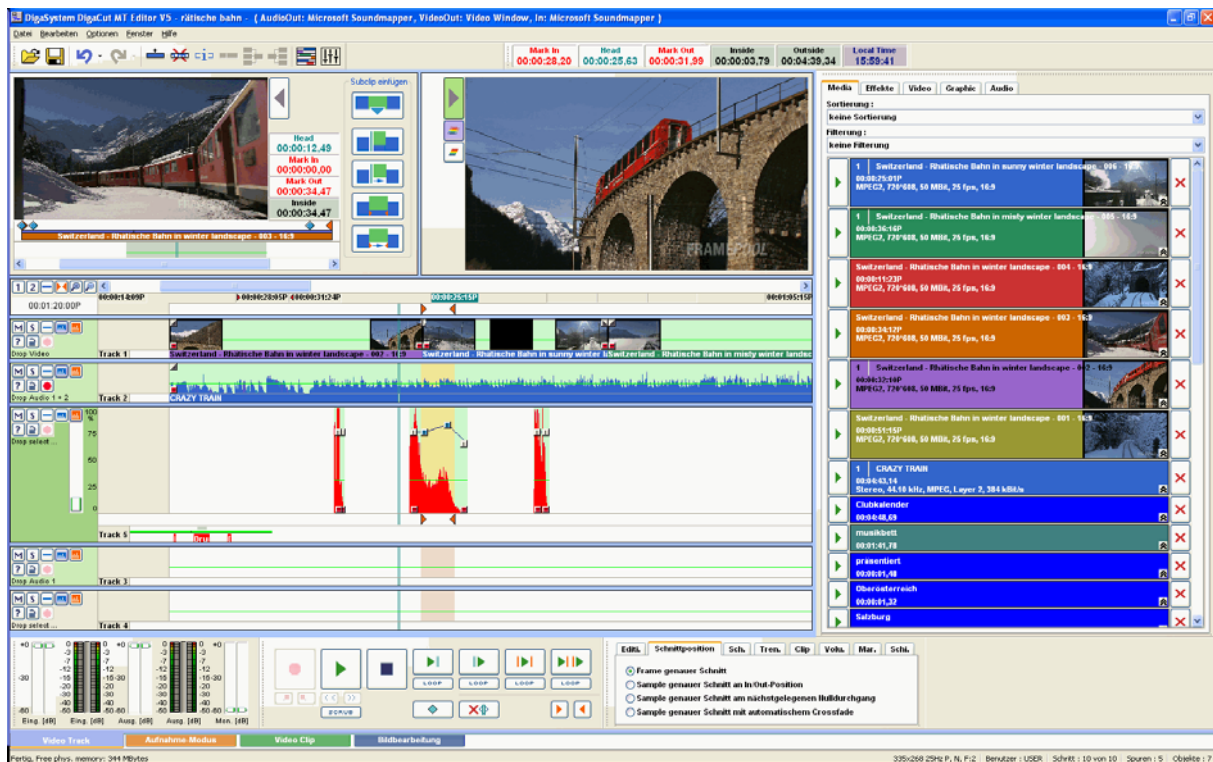


Main Features

- Video and audio file playback
- Automatic and manual keyframe generation
- Set markers
- Define subclips
- Scene Detection
- Fast navigation in media file
- Audio envelope curve display
- Adjustable modulation range display

DigaCut MT

DigaCut MT is our next generation video editor. In addition to the full spectrum of features for audio editing it is equipped with a multitrack video timeline, cross-fades and different editing modes. That way it can be used for the most demanding editing tasks in the newsroom. Users can work selectively in low and high resolution modes with multiple file formats. Voice-overs can be added with punch-in/punch-out. Project data is stored in XML format. MXF formats are supported for import, editing and export. DigaCut MT supports alpha graphics, EDL export and Web formats. In addition to the standard video formats all broadcast audio formats including linear and multi-channel audio (RF 64) are supported as well. For radio editors already used to work with a DigaSystem audio editor the training period will shorten to a minimum.



General Features

- Multi-track timeline with separate audio and video tracks
- Free selection of video and audio tracks
- Video preview in separate source and timeline viewer
- External video preview using a SDI I/O-card
- Scene selection by setting Mark-in/Mark-out points
- Edit Mode, Overwrite Mode, Insert Mode
- Processing of LoRes and HiRes files
- Video formats: MPEG-2-based; MPEG-1; DV-based; DVCPRO25 and 50; IMX-D10; Quicktime; Windows Media; MPG; m2v; AVI; DV; DIF; MOV; MXF
- Audio formats: linear audio; MPEG Layer 2; MPEG Layer 3; RealAudio; MS Audio; Rawfile; Wavefile; BWF; Musifile; AIFF; RF64
- Supported standard image formats: tif; tga; bmp; jpg
- Direct interface to the database and DBM
- Automatic audio extraction during import of multiplexed files
- PAL and NTSC support (25fps, 30 fps, 29,97 fps)

Timeline Features

- Clipboard with customizable working directories
- Unlimited number of video/audio tracks with separate audio and video editing
- DVEs: dissolve and horizontal wipe
- Audio cross-fades, audio rubber-banding, audio auto-duck, panning
- Track and Master Mixer
- Handle-controlled fade-in/out, fade from/to black

- Audio and video stretch feature
- Audio envelope curve display
- Intelligent field swapping
- Customizable timecode display
- Glue clips (joins all clips on the timeline and closes gaps)
- Voice-over with punch-in/punch-out

Import/Export Features

- Project export to the file system and to the database (Database Manager)
- Export of project data in XML and EDL formats
- Export/rendering of video files to other target formats (HiRes and LoRes) in file system and database
- Export of stills
- Creation of a LoRes copy of files in HiRes target formats
- Edit in LoRes, completion in HiRes
- Group import from Database Manager
- Graphics import (incl. alpha channel images)
- Import of standard video files (HiRes/LoRes)
- EDL import

Audio Features

- Support for all broadcast audio formats incl. linear audio support and RF64
- Audio input and output routing
- Integrated audio mixer, track mixer and master mixer

DigaCut ST

DigaCut ST comes with single track video functionality and is designed for small corrections, rough cuts and conducting simple editing tasks in the newsroom environment. It also supports low and high resolution editing with multiple file formats, even in mixed mode.



The general features as well as audio and Import/Export features are comparable with those of DigaCut MT.

Timeline Features

- Clipboard with customizable working directories
- One video track (for video only or video and audio), 8 audio tracks (mono or stereo)
- Separate audio and video editing
- Hard cuts only
- Audio cross-fades, audio rubber-banding, audio auto-duck
- Track and Master Mixer
- Audio envelope curve display
- Intelligent field swapping
- Customizable time code display (df, ndf)
- Voice-over with punch-in/punch-out

Moves Media – File Transfer and Distribution

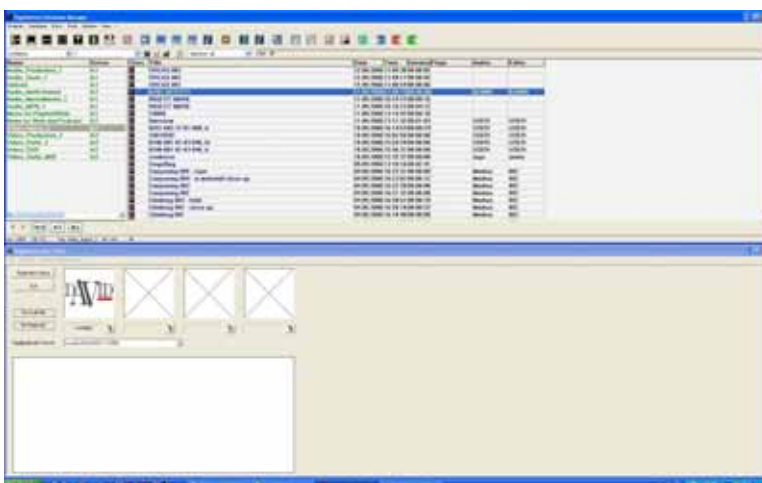
DigaReplicator AV

DigaReplicator V transfers media data (video, audio, graphics), metadata and project data (regional or inter-regional). Due to the large volumes of data to be handled during video file transfer, DigaReplicator V has been designed as a multi-stage transfer process. The push-and-pull principle favored by DAVID SYSTEMS transfers all database media files and metadata information (addressing, keywords, program, etc.).

On the basis of this data, a piece can be planned from start to finish before or during transfer in HiRes format (MPEG-2, IMX, DV, DVCPPro). Sequence and volume of the data to be replicated is freely selectable in a configuration menu.

There are different types of transfers available:

- AutoReplication
Certain database tables are intended for exchanging with other addressees. Adding a new piece to this table automatically triggers transfer as a background operation. This makes its use simple and intuitive.
- Transfer via DigaReplicator Client
Replicator Client is launched. Once a piece has been selected in DigaSystem Database Manager, it is dragged onto the picture icon in the client for the appropriate receiver. This process triggers transfer to a single addressee or to a group.

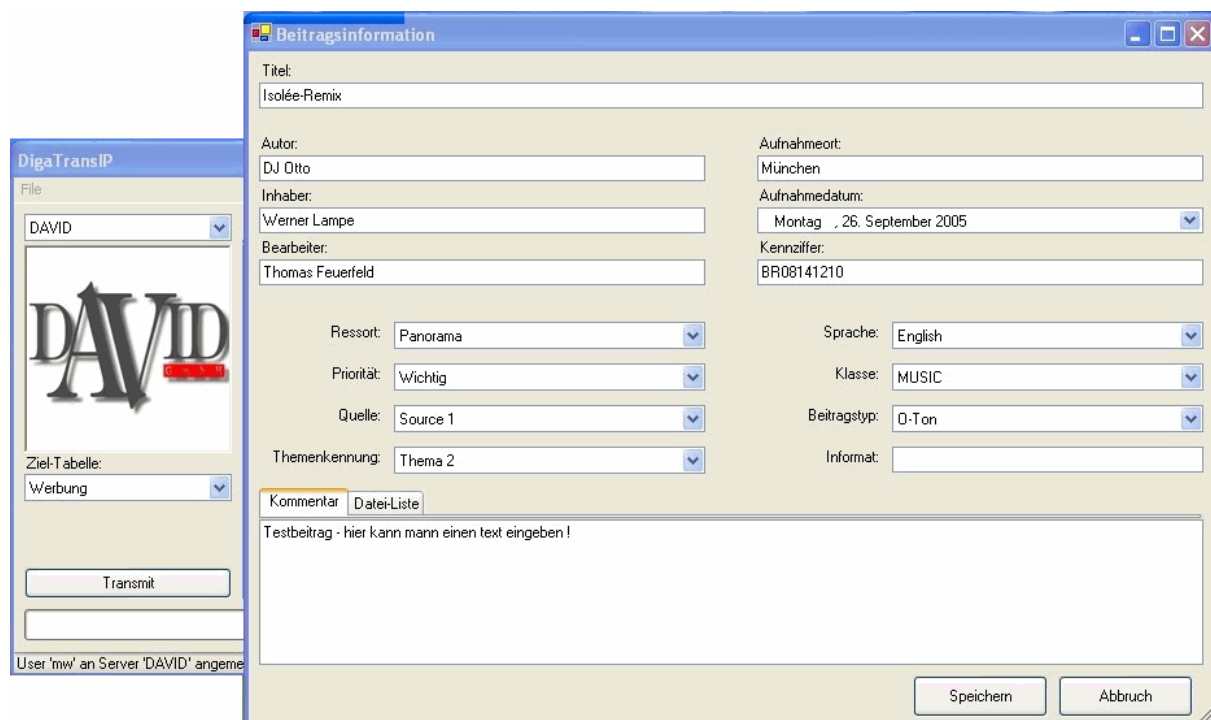


- Manual Selection of an Addressee from a Distributor Field

- Selection of an addressee can also be done manually from a list in the so-called distributor field in a database mask. Saving of a piece in the database triggers transfer to the selected receivers entered in the distributor field.
- FTP
- Matching or transfer of data via FTP protocol.

DigaMailbox IP

The DigaMailbox IP system enables the secure transmission of multimedia content via Internet/IP to simplify communication between broadcast centers and external offices, regional studios, individual correspondents, or production houses. At the same time, the system addresses our customers' specific security concerns with integrated support for existing firewalls. DigaMailbox IP provides all the necessary transfer modules for users who wish to expand their network to enable the exchange of audio, video, and other files.



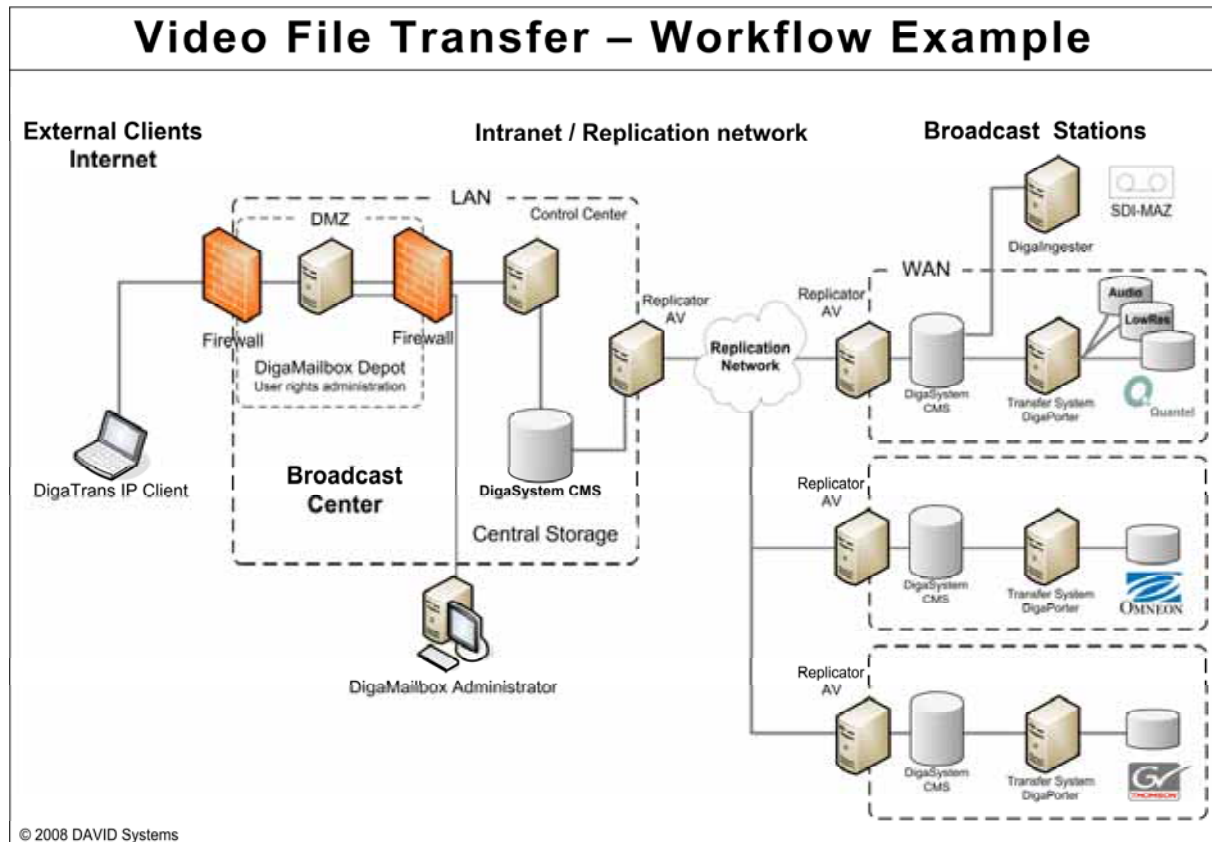
DigaMailbox IP was developed for users – typically correspondents, production houses etc. – who need an easy-to-use solution for sending audio, image and video files plus associated descriptive information to their broadcaster. Media data is transferred from a client (DigaTransIP) via a temporary storage location (DigaMailbox Depot) to its actual destination, the broadcasting house (DigaMailbox Import).

A web service is used for communication with the DigaMailbox Depot; data is transferred via HTTP – or FTP, if applicable. The most notable feature of the DigaMailbox IP system is the extremely easy-to-use transmission client. Once it is installed, no further IP maintenance is required.

The DigaMailbox IP Depot ensures a high level of security. Only the DigaMailbox IP Depot (DMZ server) is visible on the Internet, while the computers at the broadcast center remain inaccessible. An HTTP or proxy server, possibly in combination with FTP (to increase transfer speed) is then used as the port. All that is needed is access from within the broadcast center to the Depot, similar to a workstation with Web and FTP access.

Then the DigaMailbox IP Import Server installed at the broadcasting house retrieves the media from the DigaMailbox IP Depot. The transferred files are downloaded immediately upon receipt and imported into the DigaSystem at the recipient site.

DigaMailbox IP supports all data and metadata formats and can be used in combination with the Database Manager or Windows Explorer. The system also includes an input screen for adding or editing metadata. To enable media transfer outside a DigaSystem target environment, the received material can be saved to any target directory via DigaMailbox IP import.

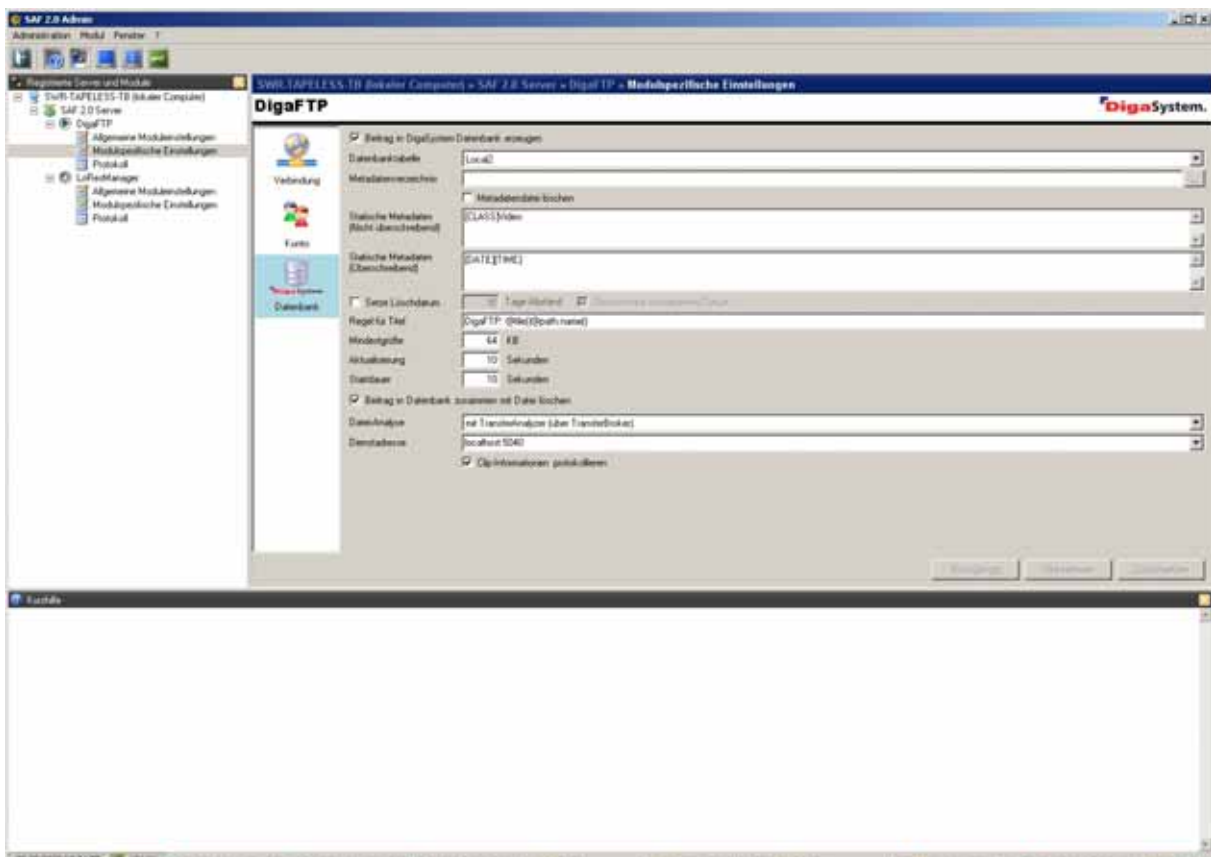


DigaFTP

A brand new Moves Media product is DigaFTP, a service for the transfer of files into DigaSystem CMS. The application allows control of simple FTP server functions by third-party systems, enables direct docking to such systems without polling.

DigaFTP uses a standard FTP interface. It extracts metadata out of file names - through FTP site commands or file analysis - and creates a DBM database entry during the transfer process. Growing files are supported as well.

DigaFTP is fully integrated into the Station Automation Framework (SAF) and allows parallel operation of multiple functions. One instance is always assigned to one database table, independent of the number of transfers in process.



Third-Party Interfaces

Final Cut Pro Integration with AtomFactory

Import to FCP

Atom Factory is an extended FTP daemon, which is able to extract an external QuickTime Reference File and WAV-files out of the MXF-file provided by the DigaTransferSystem or another source. While the file is still growing FCP can open and use the incoming file (RWW). In the current system the module is installed locally on the MAC computer and provides the incoming files within a predefined local folder. The FCP editor has to know the "Incoming" directory to find the files.

Export

AtomFactory is a plug-in for FCP. It takes the referenced time line (has to be IMX), fuses and wraps it into MXF. The destination can be local or in the network.

AtomFactory stores the rendered file in a local directory on the MAC, which is accessible through FTP.

AtomFactory is capable to write back into DigaSystem using DigaTransferSystem for Atom Factory. A SOAP interface triggers the transfer process, so that DigaTransfer System receives the new file and transfers it into DigaSystem where a new database entry will be created.

DigaPorter

The DigaPorter is a service which is able to monitor folders and import essences into the DigaSystem database. Fundament of the DigaPorter is the so called StationApplicationFramework (SAF), a framework, in which additional modules with different functionality will be plugged in. DigaPorter also uses the Video Conversion Library for conversion of incoming files.

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