

## the viewer Digital Multimedia Center

the viewer Digital Multimedia Center (DMC) is the fully featured software platform designed for powering multimedia set-top boxes.

The DMC fundamental goal is to enable an intuitive, unified and consistent access to all range of entertainment services available on the user's TV set.

At the same time, by supporting encrypted services, proprietary services, and third-party applications, DMC allows different revenue models.

### Hardware

DMC layered architecture provides scalability, portability and an easy integration over a broad range of hardware configurations:

- x86-based core hardware platforms;
- DVB-S with CI support (dual tuner supported);
- MPEG 2/4 HW/SW decoder;
- HD Drive;
- DVD/CD Drive;
- Photo memory card reader;
- Sound Card;
- Return channel (Internet access: Ethernet and modems);
- Remote control / keyboard;
- Front panel display;
- VGA, DVI, S-Video TV output;
- SPDIF support.

### User Interface

The DMC user interface concept targets the television viewers and therefore is TV optimized.

DMC enables user-friendly and intuitive operation via on-screen menus and/or remote control functional keys.

The Box user interface supports Multilanguage and is optimized for TV sets and Plasma displays.

Following resolutions are supported:

- Analogue: 720x576, 800x600, 848x480, 1024x768, 1280x768, 1280, 1280x1024, 1360x768;
- Digital: 640x480, 720x576, 800x600, 848x480, 1024x768, 1280x768, 1280x1024, 1360x768;
- Supported TV aspect ratios: 4:3, 14:9, 16:9.

### Services provided

DMC provides a broad range of built-in services, extending the user digital TV experience with various media players, internet-on-TV or gaming.

- Digital TV/radio (DVB), including videotext, EPG, direct/scheduled recording, time-shift, access to pay-TV channels;
- Video Player
- DVD Player
- Audio CD Player
- MP3 Player
- Photo Viewer
- CD/DVD Writer, including DVD and Audio CD authoring
- Internet browser
- E-mail client
- Games
- Media manager

### DMC TV/Radio Player

DMC provides access to DVB TV/radio services:

- Play free-to-air and pay TV/radio channels.
- Display EPG SI information for the present and following events on the running channel
- Videotext
- Surfing channels
- Channel lists
- Direct recording
- Time-shift
- Sound capabilities: mpeg audio (mono, stereo) and Dolby digital (maximum 5 channels decoded internally or 5.1 decoded outside the box via SPDIF connection);
- Multilanguage support: the user can choose between multiple audio PIDs where available;
- Zoom function: the TV picture can be zoomed from 100% to 200% from the original size;
- Picture-in-Picture (PiP)

DMC can scan for DVB TV/Radio channels either in automatic mode, or in manual mode. In manual mode, the user has to provide the physicals parameters: polarization, frequency, and symbol rate.

The user can chose either to replace all channels or to scan only for new channels. DMC supports also DiSEqC 1.1, up to 4 satellites.

## Electronic Program Guide (EPG)

DMC implements Standard EPG, relaying on the SI information delivered over the DVB network EPG features fast tuning, guide scrolling, search, and multiple ways to find programs: by channel, title, category, or day and time.

For a selected event, the user is allowed to:

- Display full EPG information
- Mark the event for single or series recording. Allows the user to schedule series recordings or to record all events with a given name
- Mark the event for remainder. DMC notifies the user when the marked event is about to start. The list of events marked for remainder could be displayed on the user request.

## Private Video Recorder (PVR)

In addition to current TV channel direct recording, the user is allowed to schedule recordings:

- Either from EPG, by marking the event to be recorded
- Or by explicitly creating a PVR job, indicating the channel, the start time and the end time for recording.
- The recording can be made either on free-to-air and pay channels. To play a recording made on a pay-TV channel you do not need a CAM and smart card.

Regardless the modality of scheduling, DMC performs a time validation, in order to prevent conflicts with other scheduled recordings. The available space is continuously monitored. The user is warned when the space reaches a certain amount. The recordings or other HDD related services will be disabled when the space reaches the minimum amount.

Once created, a PVR job can be subsequently edited or removed. The user can see the running recordings, the future scheduled events (single or series) or the failed jobs.

The recordings are added to the video database. The user is allowed to play a video from the database, even during its recording.

If the hardware architecture has two DVB tuners the PVR will be run on the secondary tuner. This way the first tuner will only be used for zapping. The user will be able to perform in the same moment a schedule recording as well as a timeshift or direct recording. Both DVB cards support CIs for watching and recording pay TV channels.

## Video Player

The video player allows for playing video files either from the video database or from discs. The video player can play not only PVR recordings, but also DivX and other video formats.

The video player can be started either from the on-screen menu or by inserting a data disc containing video files into the drive.

DMC allows for video database management: edit PVR recording name and description, delete videos. Also the user can easily recognize an incomplete recording among the complete ones (an incomplete recording appears due to time conflicts between single and series recordings or power network problems). The player supports both mpeg2 and Dolby digital audio formats for the played streams and navigation with multiple speeds.

## DVD Player

The DVD player can be started either automatically, by inserting a DVD in the drive, or from the on-screen menu.

The DVD player implements the following features:

- DVD menu
- Navigation: pause/resume, fast forward/backward, next/previous chapter.
- Select language, among available soundtracks.
- Select camera angle
- Subtitling.

The player also supports VCD and SVCD video disc formats. The player supports both mpeg2 and Dolby digital audio formats for the played streams.

## Audio CD Player

The Audio CD player can be started either automatically, by inserting an audio CD in the drive, or from the on-screen menu.

The Audio CD player implements the following features:

- Navigation in the list of audio tracks: next/previous track, select track by track index
- Navigation in the audio track: pause/resume, fast forward/backward.
- CD recognition
- Retrieving the CD information (album, artist, track titles) from the CDDB database.

## MP3 Player

The MP3 player allows for playing MP3 tracks from local HDD, from optical disks or from USB external devices (flash cards, HDDs etc). The MP3 player can be started either from the on-screen menu or by inserting a data disc containing MP3 tracks in the drive.

The MP3 player is able to play the files directly from folders or from playlists.

The MP3 player allows for:

- Navigation in local/external folders
- Navigation in the playlist: next/previous track, select track by track index
- Navigation in the MP3 track: pause/resume, fast forward/backward.

DMC provides tools for audio database/files management:

For playlists – audio manager:

- Playlist management: create, sort, rename and delete playlists;
- Organize tracks in playlists: add track to a playlist, sort a playlist, and delete tracks from a playlist;

For folders and files – media manager:

- Organize folders and files (copy, move, create, rename);
- Import audio to the box from different locations;
- Burn audio/music data disks.

## Photo Viewer

The photo player allows for viewing photo files from local HDD, from optical disks or from USB external devices (flash cards, HDDs etc).

The player can be started either from the on-screen menu or by inserting a data disc containing photo files.

The photo player is able to play the files directly from folders or from playlists. The photo player allows for:

- Navigation in local/external folders
- Navigation in the playlist: next/previous image
- Sorting the photos by date, name, size.

DMC provides tools for photo database/files management: the photo manager and the media manager.

For playlists – photo manager:

- Playlist management: create, sort, rename and delete playlists;
- Organize files in playlists: add files to a playlist, sort a playlist, and delete files from a playlist.

## Media Manager

Media Manager is the key application for managing media content on the box. It allows the user to:

- Manage folders and files: create, delete, rename, copy, move;
- Import data from optical disks (copy, rip), from LAN, from USB external devices;
- Export data to other USB devices, LAN, author DVD, author audio CD.

## Internet Browser

The TV user can now enjoy surfing the Internet via the TV set. The main problem a TV Internet browser has to face is to ensure the user visual comfort on viewing Web pages at TV resolution. DMC implements a mechanism that displays only a limited area of the Web page, and allows the user to pan this view over the entire page. Also zooming in and out the fonts is possible. The browser supports automatically completing Web addresses, back/forward navigation, favorites list.

## E-mail Client

The DMC e-mail client provides the following functionality: Compose mail, Replay mail, Forward mail, Support for attachments (MP3 tracks, photos), Mails management: add to archive, delete from archive, Address book. The e-mail client supports multiple users.

## System Settings

The user can control the following functionalities:

- Organize the favorite TV/Radio channels in lists. Maximum 4 favorite lists are possible each with maximum 2000 channels. Channel preview is available;
- Select the graphical interface language. German, English and Polish are available;
- Select the display type and resolution (PLASMA, TFT, analogue TVs are supported);
- Select the number of allowed audio channels. Dolby digital channels can be decoded internally or using an external audio amplifier connected via SPDIF;
- Set the system time;
- Connect the box into a network (using DSL, LAN-DHCP or ISDN);
- Register the box to provider's server. This way the user will automatically receive software updates.