



THE ULTIMATE HOME THEATRE EXPERIENCE

SIGMA DESIGNS®

User's Guide

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FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit that is not connected to the receiver.
- Consult the dealer or an experienced radio/TV technician.

Notice

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Shielded cables and I/O cords must be used for this equipment to comply with the relevant FCC regulations.

Changes or modifications not expressly approved in writing by Sigma Designs, Inc., may void the user's authority to operate this equipment.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulation of the Canadian Department of Communication.

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Chapter 1: Product Description

Congratulations on your purchase of the Sigma Designs REALmagic Xcard! With it, whole new vistas of home theatre multimedia experiences await your command with our provided remote control:

- Watch your favorite movie clips in a variety of formats (DVD-video discs, MPEG-4 clips, DivX™ Video, VCDs, and SVCDs) on either your TV or VGA monitor. View high-quality conversions for any or all of these formats on a TV or HDTV -- the REALmagic Xcard processes all visual signals and supported codecs to the selected output.
- Connect your home audio system to the REALmagic Xcard for the ultimate home theatre and MP3 playback experience.
- And do it all with ease and style, using our new Xmedia player software.

The REALmagic Xcard comes with high quality progressive VGA and HDTV outputs, as well as RGB and Composite SCART support (SCART cable not provided) for European users. It provides high quality video output to either a VGA monitor or TV.

The REALmagic Xcard delivers higher video quality because it does not use an analog overlay. Unconstrained by VGA resolution, the board generates an optimum graphics mode for all processed signals.

Kick back. Relax. Experience your movies, music, and media through the new REALmagic Xcard.

Features and Specifications

Refer to the Glossary section of this User's Guide for definitions of any terms used in this document.

System requirements

- Intel® or AMD-based PC with 200MHz or higher CPU
- PCI 2.1 compliant
- Plug and Play BIOS support
- 64MB RAM and 10MB free hard disk space
- SVGA graphics card
- DVD-ROM drive (for DVD playback)
- Microsoft® Windows® 98SE, Me, 2000 or XP
- Bus mastering IDE controller recommended
- Amplified stereo speakers (Dolby Digital or Dolby ProLogic, or DTS receiver and speakers required for surround sound)

Supported video formats

The REALmagic Xcard displays the following formats to either a VGA monitor or a television.

- MPEG-4, MPEG-2, and MPEG-1 streams
- DVD-Video, SVCD, and VideoCD 1.0 and 2.0 movies
- Supports DivX™ Video versions 3.x, 4.x, and 5.x (without 1/4 pixel motion compensation). DivX 3.x requires Xmedia player version 2.0 or later.
- Karaoke CD format

Video features

- Composite, S-Video and Component YPrPb (PAL/NTSC) TV outputs
- Composite and Component RGB (PAL/NTSC) SCART TV outputs
- Component YPrPb (480p, 576p, 720p, 1080i) progressive and interlaced HDTV outputs
- High-quality VGA progressive output
- Frame rate conversion of NTSC titles on PAL TVs, and vice-versa
- Progressive output and frame rate up-conversion of PAL/NTSC titles
- Brightness, contrast, and color saturation controls for VGA and TV displays
- Multiple viewing aspect ratios
 - Full frame (4:3 video for 4:3 display)
 - Letterbox for DVD playback only (16:9 video for 4:3 display)
 - Pan and Scan for DVD playback only (16:9 video for 4:3 display)
 - Widescreen (16:9 video for 16:9 display)

Supported audio formats

- Dolby Digital via S/PDIF
- Dolby ProLogic 2-channel downmix via Stereo output
- DTS Surround Sound via S/PDIF (compressed audio output)
- MPEG Layers I, II and III (MP3)
- PCM and AAC audio

Additional features

- Interactive menus and sub-picture controls
- Multiple camera angles and language selection
- Macrovision analog copy protection
- Support for regional copy protection
- Parental lockout

Connectors

External

- Mini-jack (stereo audio output)
- S/PDIF Out for Dolby Digital, DTS and PCM
- DIN for TV/HDTV out
- DB15 for VGA out
- VGA In from VGA card

Internal

- SCART header for A/V output using optional cable
- MPC3 compliant S/PDIF input from sound card
- MPC3 compliant S/PDIF output
- MPC3 compliant LINE output header
- Digital Video output header (future feature)

Chapter 2: Hardware Description

Physical Dimensions

- Height 3.570 inches
- Length 4.725 inches

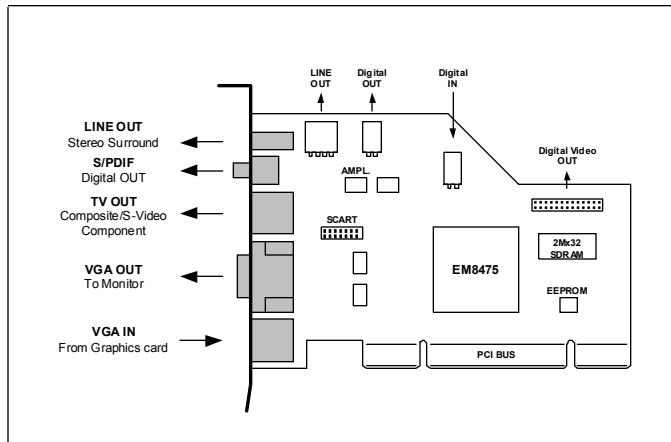


Figure 1. REALmagic Xcard connections.

Board Connectors

Bracket connectors

- Line out (mini-jack)
- Digital out (female RCA)
- TV out (7-pin DIN compatible with standard S-Video cables)
- VGA out (DB-15)
- VGA in (9-pin DIN)

Internal connectors

- SCART expansion bracket interface
- 4-pin analog audio line output
- 2-pin digital S/PDIF output
- 2-pin digital S/PDIF input
- 26-pin digital video output interface

Output cables

Provided cables

- Mini-DIN to RCA(x3) cable (component adapter cable)
 - For Component video output, connect the Y/Pb/Pr cables to the appropriate RCA connectors of the component adapter cable.
 - For S-Video output, connect the monitor/TV directly to the 7-pin DIN of the REALmagic Xcard.
 - For Composite video output, connect the monitor/TV to the yellow RCA cable of the composite adapter cable.

Optional cables

An optional accessory kit for European customers may be purchased from our online store. The kit contains a one-foot ribbon cable that connects a bracket to the card, and a six-foot SCART cable (P/N 22-100020-01) that connects the bracket to a SCART TV. The Sigma Designs online store is located at www.buyrealmagic.com.

Macrovision Copyright Notice

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only, unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

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Chapter 3: Hardware Installation

Preparations and Precautions

Static electricity can damage your equipment!! Do not remove the board from its protective anti-static bag until you are ready to install it.

- Before opening the protective anti-static bag, touch the bag to one of the metal expansion slot covers on the back of your computer to drain residual static electricity from the package and from your body. Anyone else handling the board should follow this procedure.
- Do not touch, or allow anyone else to touch, any exposed printed circuitry on the REALmagic Xcard board.
- Limit your movement. Movement builds up static electricity.

Hardware Installation

1. Turn off the power to the computer and to the VGA monitor. Unplug (disconnect) the power cord from the computer.
2. Disconnect the VGA monitor cable from your PC.
3. Remove the cover from the computer. (Refer to your PC user's manual for specific instructions.)
4. Locate an available PCI expansion slot.¹ (REALmagic Xcard is not ISA compatible.)
5. Remove and set aside the slot cover screw and slot cover, if applicable.
6. Open the protective sleeve containing REALmagic Xcard, grasp the circuit board by the edge of its mounting bracket, and remove it from the protective sleeve.
7. Insert REALmagic Xcard into the PCI expansion slot. Press down gently on the top edges of the board to ensure that all connecting points are seated securely. Anchor the board's mounting bracket using the screw removed in Step 5.²
8. Replace the cover of your PC and reconnect the power cord.

1. REALmagic Xcard requires a bus-mastered PCI slot. Most PCI slots support PCI bus mastering, but if you experience difficulties with your REALmagic Xcard, try installing the card in a different PCI slot.
2. If you install a DVD-ROM drive at the same time as the REALmagic Xcard, remember to attach the CD-Audio cable from the DVD-ROM drive to your sound card. Otherwise, CD-Audio titles will not be audible when played in the DVD-ROM drive. DVD-Video titles will be audible whether or not the CD-Audio cable is attached.

Chapter 4: Software Installation

Software Installation for Windows 98SE/Me/2000/XP

1. After installing REALmagic Xcard and making all appropriate hardware connections, turn on the power to your computer.
2. When the **New Hardware Found** message appears, *Driver from disk provided by hardware manufacturer* and then click **OK**.
3. The **Install From Disk** dialog appears. Insert the REALmagic Xcard CD into your CD- or DVD-ROM drive.
4. Make sure the dialog specifies the correct disk drive letter (for example, D:\) and location (use the Browse dialog), and click **OK** to install the appropriate drivers and software for the REALmagic Xcard to your hard disk. For example, installing to Windows 98SE will use the driver location D:\Win9x_Me.
5. After installation is complete, the Windows desktop appears.
6. Run the **REALmagic Xcard Setup** program under D:\Win9x_Me\Apps\Disk1\ (where D: is the CD-ROM drive letter). The **Welcome** dialog box appears. Click the **Next** button.
7. Click on the *Install the REALmagic applications* radio button (default) for the **REALmagic Xcard Setup** dialog and then click **OK**. The **Remote Control Serial Port Selection** dialog appears.
8. Click on the **COM2** radio button (or **COM1**, **COM3**, or **COM4**, depending on the computer-remote control connection) and then click **Next**. The **Choose Destination Location** dialog appears.
9. Click **Next** unless you wish to specify an alternative destination folder in which to install files. To specify an alternative destination, click **Browse**, and navigate to the desired folder and then click **Next**.
10. REALmagic Setup installs the program files, which includes both the original and revised Xmedia player skins. When installation is completed, the **Setup Complete** dialog appears. Click **Finish**.

Setting and Changing the DVD Region Code

Use the setup program to change the DVD region code of the board if you relocate to a different region and want to play DVDs from the new region. **The region code may only be changed five times.**

(REALmagic Xcard does not require region code set up when using a DVD-ROM drive carrying the region code (RPC2 drive).)

To set and change the DVD region code:

1. Run **REALmagic Xcard Setup**. The **Welcome** dialog box appears.
2. After exiting all other programs, click the **Next** button. The **REALmagic Xcard Setup** dialog appears.
3. Click on the *Change the DVD Region Code* button and click **OK**.
4. Select the DVD region code to the region of the DVD to be viewed. Follow the on-screen instructions to complete region code set-up.

Chapter 5: Xmedia player Software

Overview

Xmedia player provides a completely new interface for Sigma Designs DVD, DivX™ Video, Video CD, CD and computer audio/media file playback under Windows. Xmedia player plays full-length feature films recorded on DVD (drive must be DVD-compliant), DivX™ Video, Video CD, and data CDs (MPEG files), as well as audio CDs. Xmedia player can automatically detect, identify, and play audio/video information from discs in your CD or DVD drives, or from a specified location on your hard drive.



Figure 2. Xmedia player interface (in playlist mode).

Xmedia player automatically detects the volume type loaded. Possible volume types include:

- DVD
- VCD/VCD 2.0
- SVCD
- Audio CD
- Computer-based file directories
- DivX movies

Dynamic Information Panels

Xmedia player provides detailed status information on played media, and hides and displays panels for a Playlist Manager, DVD Navigation, and a VCD Keypad.

Status Information

The new Xmedia player software provides a wide range of status information.

- Disc/file type - format of the file being played (DVD, DivX™ Video, VCD/VCD 2.0, Audio CD, AVI, MPG, etc.)
- Volume/file name - the actual name of the file being played
- Time progress - a counter showing time elapsed since the current file/track began playing
- Play state - current operating status of the file (playing, paused, stopped)
- Loop indicator - current loop option activated (none, track repeat, playlist repeat)

Playlist Manager

Xmedia player's playlist manager includes drag-and-drop capability, as well as standard open file dialog directory browsing. With the playlist manager, you can:

- Add files to the playlist (DivX™ Video clips, MPEG-1, MPEG-2, MPEG-4, MP3 audio). Xmedia player displays the name and duration of each file in the playlist.
- Remove one, some or all files from a playlist.
- Save playlists for future enjoyment.
- Load playlists from the hard drive. Xmedia player recalls and restores its last state each time it runs.
- Associate, play and synchronize external subtitle files with corresponding video clips.

DVD Navigation

In addition to standard DVD operations, the DVD Navigation panel includes controls that access DVD menus, titles, subtitles, audio tracks and camera angle selections.

VCD Keypad

The VCD keypad also works in DVD mode, allowing the user to navigate to specific tracks by number.

Supported Operating Systems

Xmedia player operates under the Windows 98SE, Me, 2000, and XP operating systems.

FiltersControl

The installation folder (default path is Program Files\REALmagic) contains the application FiltersControl.exe. This application allows you to control the use of REALmagic DirectShow filters in applications other than the Xmedia player. It also allows you to reverse the Xmedia player's modification of the quartz.dll reference in the Windows registry.

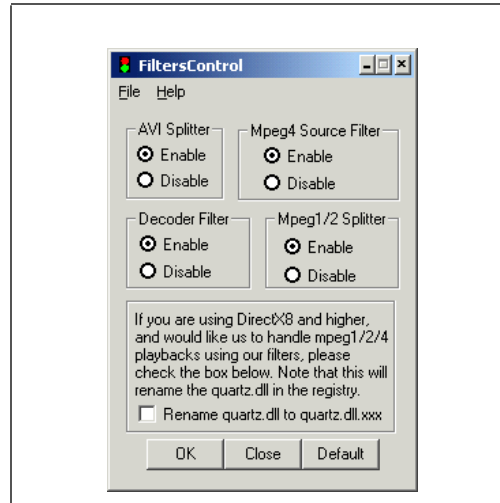


Figure 3. Filters control dialog.

To rename quartz.dll to quartz.dll.xxx in the Windows registry, check the bottom radio box in the dialog. Leaving this box unchecked preserves the quartz.dll filename in the Windows registry, which allows the REALmagic Xcard filters to handle MPEG playback. Changing this setting only affects the Windows registry; it does not modify the actual filename of the quartz.dll file. Do NOT change or relocate the quartz.dll file.

If you have any other applications which use software decoding, you may want to disable all filters (select the Disable radio button for all the filters). Whether the filters are enabled or disabled has no effect on the Xmedia player, which always uses the filters.

- Be sure to click the *OK* button to implement any setting changes.
- Click the *Close* button to cancel any changes and close the dialog.
- Click the *Default* button to reset all options back to factory defaults.

AVI Check

The program AVI Check in the REALmagic group analyzes DivX™ files for their compatibility with the REALmagic Xcard.

- AVI check recognizes the following audio streams -- MP3, Dolby Digital (AC3), PCM, MPEG-1, and WMA. (WMA requires Microsoft DirectX version 9.) For unrecognized audio streams, it issues the message "Audio format isn't MP3!"
- It issues messages for the GMC and QPEL features of the DivX 5.

The initial appearance of the AVI Check dialog is shown in Figure 19.

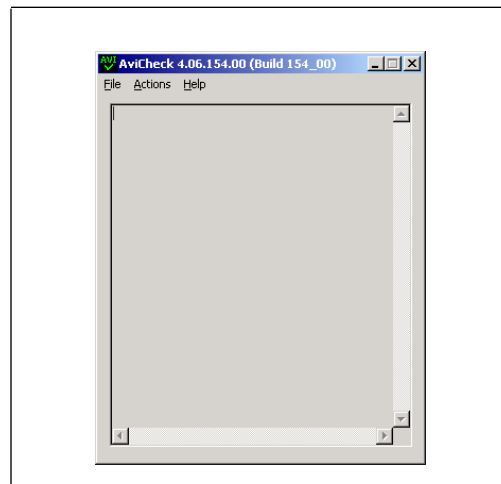


Figure 4. AVI Check main dialog.

The menu options under “File” are

- Open - opens a user-specified media file for analysis.
- New Index File - saves a new index file in a user-specified location. Media files normally have their own internal index. The New Index File option generates an additional external index for the media file. This external index has the same name as the media clip, but the file extension is .idx. The time required to generate a new index depends on both the file size and the storage medium.

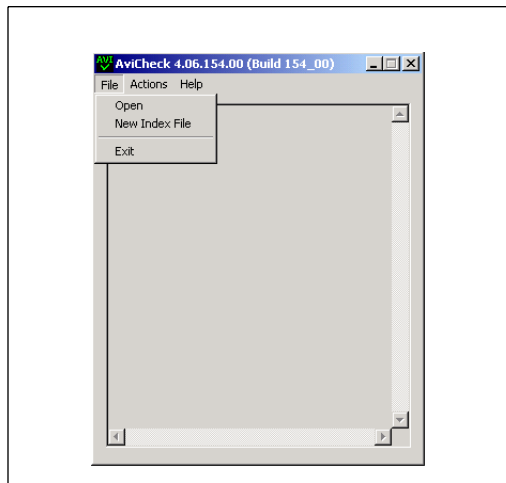


Figure 5. File menu options.

Under the Actions menu item, the Check AVI File Properties option verifies the contents of the media file against its internal index.

The Options submenu contains a number of selections that can be toggled (checked) on or off:

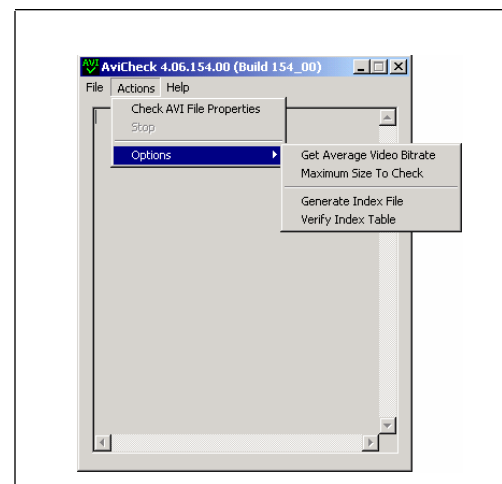


Figure 6. Actions menu options.

- Get Average Video Bitrate - gets the average bitrate of the entire media clip.
- Maximum Size to Check - When selecting this function, an additional dialog appears (Figure 7, page 16). This dialog allows the user to choose whether the entire file is verified, and if not, exactly how much of it to verify.
- Generate Index File - creates an external file containing index information for the selected media clip. This index file enables seek operations using the progress bar. The file is created only once per clip, and its location is stored and recalled automatically if it exists for a clip being played. There may be a seek lag of up to a few minutes while the index is first created.
- Verify Index Table - determines the accuracy of the media clip's index table (within the file).

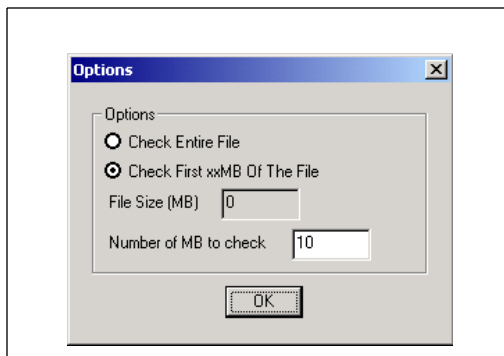


Figure 7. Max size to check dialog.

The AVICheck file properties dialog (Figure 8 and Figure 9) contains the following information:

- File - displays the name of the file being analyzed.
- Total Streams - specifies the number of media streams in the file, usually 2 (one audio and one video stream) or 3 (one video and two audio streams).
- Running Time - specifies total running time in hours, minutes, and seconds.
- Index Chunk - indicates whether the media file contains an internal index.
- Index Errors - indicates the number of discrepancies found between the media file's internal index and the content of the media file.
- Interleaved - indicates whether audio and video information is interleaved.
- AUDIO - specifies the type of audio in the file. A separate entry is displayed for each audio stream.
 - Average Bitrate Per Sec - specifies average audio bitrate per second.
 - Sample Rate - specifies the sample rate in hertz.
 - Channels - specifies the number of audio channels in the file.
- VIDEO - specifies the type of video in the file.
 - B-VOP - indicates whether the video information contains B frames.
 - S(GMC)-VOP - indicates whether the video information contains GMC.
 - Quarter Pixel - indicates whether the video information contains QPEL.
 - Frame Size - specifies the video stream's frame size in pixels.
 - Average Bitrate Per Sec - specifies average video bitrate per second.
 - Frame Rate - specifies the video stream's frame rate in frames/second.
 - Color Depth - specifies the color bit depth of the video stream.
 - Total Frames - specifies the total number of frames in the video stream.
- Elapsed time - specifies the total time AVI Check has been running.

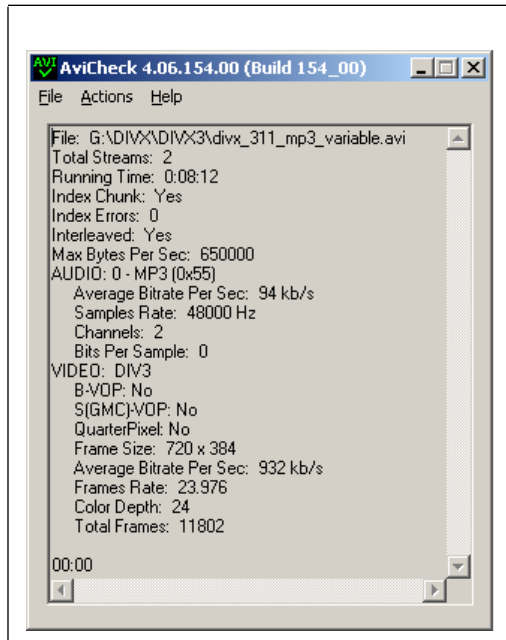


Figure 8. AVI Check file properties dialog for file with a single audio stream (example).

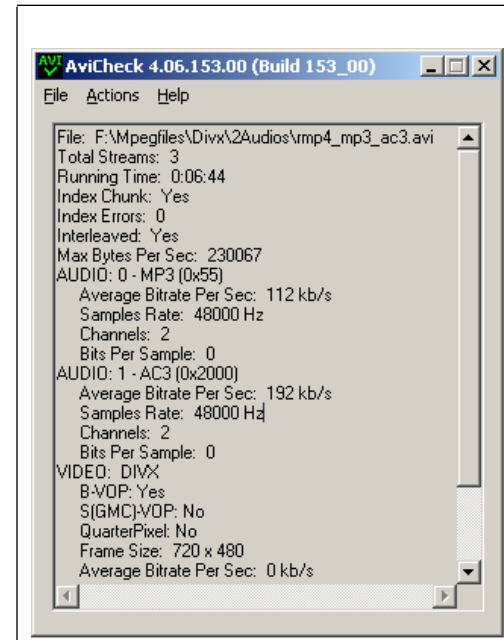


Figure 9. AVI Check file properties dialog for file with two audio streams (example).

Chapter 6: Using Xmedia player

Starting Xmedia player

1. Start Windows and click on the Xmedia player v2.0 (illustrated throughout this manual) on your desktop. Xmedia player v1.2 is available via the REALmagic program group in the Start menu.
2. Place a DVD disc, a Video CD, or a CD-ROM containing MPEG files in your DVD drive. The Xmedia player (Figure 10) will appear on the screen. Xmedia player looks best if Windows is set to High Color (16-bit) or better.
3. Xmedia player automatically plays discs inserted into the DVD-ROM drive if Autoplay is enabled. To access the Autoplay toggle, left-click on the *Configuration* button and select the *General* tab.

When viewing video on a TV(default viewing option), the VGA screen displays the Xmedia player interface and operating system desktop.

When viewing video on a VGA display, the Xmedia player interface disappears after the Play button is pressed allowing the video to occupy the entire screen. Press the ESC key or doubleclick the mouse to restore the Windows desktop and redirect video output to the TV, if present.

The entire interface of Xmedia player may be completely user-defined (skinnable). Future software development kits will provide information on developing customizable interfaces/skins.

Main Panel

The Main Panel (Figure 12) provides specific information about the current video or audio track, such as its track number, and play time. A **Progress Bar**, positioned directly above the file/volume title, indicates the progression of the clip as it plays. Click anywhere along the **Progress Bar** to jump to a particular part of the track being played. Depending on the type of disc playing, additional information may appear.



Click the *Keypad Panel* button to toggle between the interfaces containing either a floating 10-key keypad panel or a joystick navigator to interact with menu selections and options of DVD/VCD movies in a variety of ways.



Figure 10. Xmedia player interface with joystick navigator.



Figure 11. Xmedia player interface with numeric keypad.

The playlist window only appears when *Playlist* is selected from the *Source* button options. See page 20.

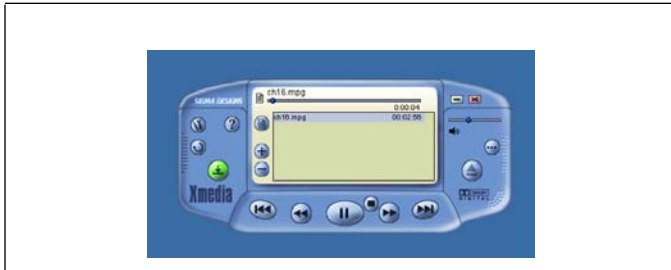


Figure 12. Xmedia player interface with playlist window.

Standard buttons



Click the Help button to open the Xmedia player help file.



Click the Configuration button to access advanced options through a tabbed dialog window. See Configuration Window, page 27, for more information.



Left-click the *Repeat Mode (Repeat)* button when playing a DVD to toggle between normal play, repeating the current chapter, and repeating the entire DVD. When playing a file from a play list, this button toggles between normal play, repeating the current file, and repeating the entire play list. *Right-click this button to bring up a menu of available repeat modes. For DVDs, available modes are Off, Repeat Chapter, and Repeat Title. For files, available modes are Off, Repeat List, Repeat File.*



Click the *Select Media Source* button to choose between optical drives or playlists. Xmedia player recognizes sources using the nomenclature established by Microsoft Windows. Xmedia

player plays discs from a variety of sources, including DVDs, VCDs, and hard drives.



Figure 13. Source button options menu.

Xmedia player has controls similar to those of a VCR (Figure 12). They are described below, in the order they appear -- from left to right -- on the main panel.



Click the *Previous Track* button to skip to the previous track.



Left-click the *Rewind* button to play the current DVD track backwards at 2x normal speed. Subsequent clicks cycle through 4x, 8x, and then back to normal speed. For VCDs and media files on the hard drive, each left-click implements a 10-second

jump backwards. *Right-click this button to bring up a menu of available rewind speeds.*



Figure 14. Rewind button options menu.



Left-click the *Play/Pause* button to begin playing the file list, to pause play, or to resume play after pausing. *Right-clicking this button brings up slow motion play options.*

Slow motion play options include half speed (SLOW 2x), quarter speed (SLOW 4x), and eighth speed (SLOW 8x). While playback is paused, the *Step* option (Ctrl+g) advances the video frame by frame. Select *Slow*

Off to resume normal play speed. Audio is muted in slow modes. This button functions in DVD mode only.



Figure 15. (Slow) Play options menu.



Click the *Stop* button to stop playback and reset the track pointer to the beginning of the file list.



Left-click the *Fast Forward* button to fast forward the current DVD at 2x normal speed. Subsequent clicks cycle through 4x, 8x, and then back to normal speed. For VCDs and media files on the hard drive, each left-click implements a 10-second jump forward for AVI clips. *Right-click this button to bring up a menu of available fast forward speeds.*



Click the *Next Track* button to skip to the next track.



Click the *Eject* button to eject or close the CD/DVD drive mechanism (if supported by your CD or DVD-ROM drive).

Volume control

Adjust the Volume Control (Figure 16) by dragging the knob left (to lower volume) and right (to increase volume). Click the speaker icon to toggle audio on/off. Absent sound wave lines indicate that mute is active.

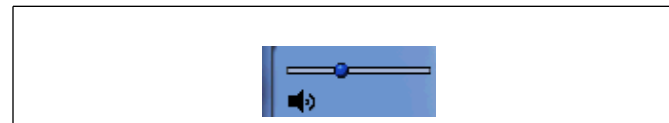


Figure 16. Volume control.



Click the *More Commands* button to access advanced functions, which include screen capture, bookmark, segment assignment/playback, and subtitle offset (files only).



Figure 17. More Commands options.

Choose *Capture* to save a BMP image of a movie frame to disk. Due to copyright restrictions, this feature may not work with all DVD titles.

Choose *Bookmark* to mark positions within a file or track. The Bookmark Browser dialog contains a number of options:



Figure 18. Bookmark Browser dialog.

- Add -- Adds a bookmark pointing to the current position in the DVD or file
- Go To -- Highlight/click on a bookmark, and then click on this button to navigate to that position in the DVD or file.
- Rename -- Highlight/click on a bookmark, and then click on this button to rename the bookmark.
- Remove -- Highlight/click on a bookmark, and then click on this button to delete the bookmark.
- Remove All -- Click this button to delete all the bookmarks.

The status bar at the bottom of the Bookmark Browser dialog indicates the precise starting position of a highlighted bookmark.

Xmedia player preserves bookmark lists even when a DVD is removed from the player or a file is closed. When the DVD or file is reloaded, any pre-existing bookmarks will reappear in the Bookmark Browser.

Choose *Segment Play* options to create custom movie loops. Select *Segment Play A* to set the starting point of the segment, and then choose *Segment Play B* to set the ending point. Markers will appear on the progress bar to indicate the segment start and end points. The movie then loops between the two points until *Rem Segment Play* is selected.

Choose *Subtitle Offset* to properly synchronize subtitle display with video display (file mode only). The subtitle menu defaults to Subtitles Off when opening media files, and reverts to Subtitles Off when switching from one media file to another. Click the right-arrow next to the drop-down menu to Add or Remove files from the subtitle drop-down menu.

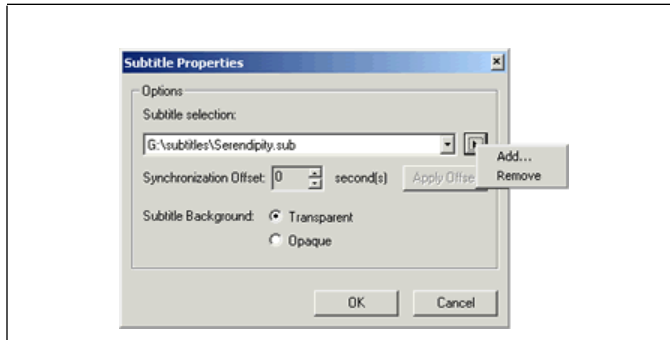


Figure 19. Subtitle Offset dialog.

Click *Add* to open a file access dialog and select the proper subtitle file(s) for your media file. Activate a desired subtitle file from the drop-down menu. Then choose the proper offset to time the appearance of subtitles with the video they correspond to. The range of the offset is plus or minus five minutes in seconds (300 seconds).

Subtitles may have either a transparent (invisible) background, or an opaque background. Select the appropriate radio button for your needs.

Navigation Panel

The DVD Navigation panel appears automatically if a DVD is in the DVD-ROM drive and Autoplay is enabled. This panel includes eight DVD navigation buttons and a joystick controller.



Figure 20. DVD Navigation panel.



Click the *Title Selector (Title Menu)* button while a DVD is playing to activate the Title menu of a DVD, if available. Use the on-screen joystick (see Joystick Controller, Figure 22) to choose a title. Click *Select* or *Play* to play the title.



Click the *Menu Selector (Root Menu)* button while a DVD is playing to activate the DVD-based menu structure, if available. For example, some discs allow you to access multiple language soundtracks, multiple camera angles, and subtitle options using the DVD menu.



Left-click the *Audio Soundtrack Selector (Language)* button to choose from available soundtracks on a DVD movie disc. Select the desired language while a movie is playing. The selected language briefly appears in the upper-right corner of the movie screen. *Right-click this button to bring up a menu of available audio soundtrack options.*



Left-click the *Camera Angle Selector (Angle)* button and move the mouse up or down to choose from available camera angles on a DVD movie disc while the movie is playing. Left-click on the angle you wish to view. The camera angle ID number briefly appears in the upper-right corner of the movie screen. *Right-click this button to bring up a menu of available camera angle options.*



Left-click the *Subtitle Selector (Subtitle)* button to choose from available subtitles/closed caption options on a DVD movie disc. Select the desired language while a movie is playing. The selected language briefly appears in the upper-right corner of the movie screen. *Right-click this button to bring up a menu of available subtitle options.*

If the selector is divided (the languages appear more than once), the first selection provides normal subtitles for the selected language. The second language selection identifies subtitles with extra functions.



Figure 21. Subtitle selection menu.

Use the *Joystick Controller* to navigate through possible choices offered in DVD menus. Once a menu is visible, click on the *up, down, left, or*

right arrows to highlight the option you wish to select, and then click on the *ENT* button in the center of the joystick to select the highlighted item.

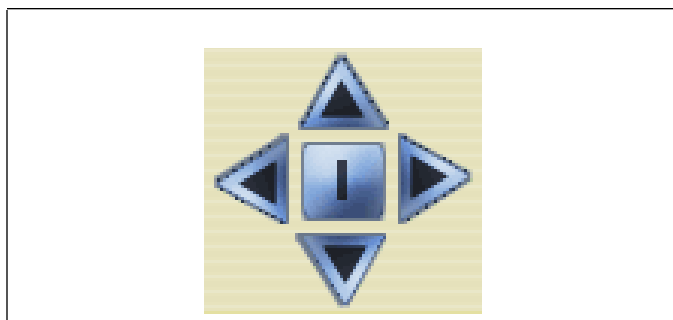






Figure 22. Joystick controller.

Keypad Panel

The Keypad panel appears if a VCD 2.0 is in the DVD/VCD-ROM drive. You can force the Keypad panel to appear by pressing the keypad button on the Advanced panel (page 25). The Keypad panel includes a full 10-digit keypad, title/chapter display, and four control buttons.



Figure 23. Keypad panel.

-  Click the *Execute* button to activate a chosen option.
-  Click the *Previous Menu* button to return to the previous menu.
-  Click the *Backspace* button to make input corrections.
-  Click the *Select* button to toggle between title and chapter field entry using the keypad.

Playlist Panel

The playlist window only appears when *Playlist* is selected from the *Source* button options. See page 20.

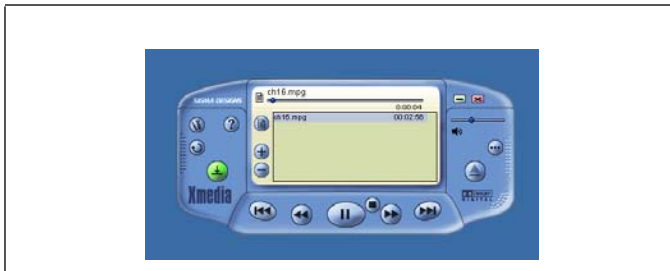


Figure 24. Xmedia player interface with playlist window.



Left click on the *List* button for two options:

Save Playlist saves the current files as a playlist. *Load Playlist* loads a previously saved playlist file.



Click the *Add File* button to access MPEG files on the hard disk, DVD-ROM, or CD-ROM drive. A standard Windows **Open Video File** dialog window will appear.



Highlight a file or files (by clicking on titles while holding Shift or Ctrl keys) from the playlist. Then click this button to remove the files from the playlist. *Right-click this button to remove all the files in the playlist.*

Right-clicking in the playlist window displays Sorting options. Items may be sorted in ascending or descending order by either name or clip length.

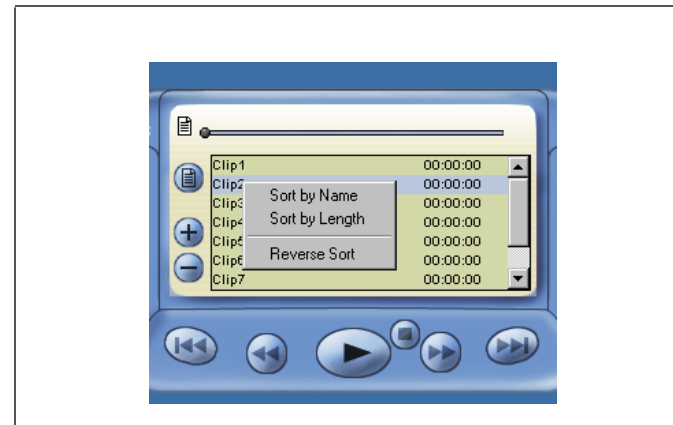


Figure 25. Playlist sorting options.

Configuration Window

DVD options

Click on the DVD tab to display Xmedia player's DVD settings. *Any changes made to these settings will take effect only after restarting Xmedia player.*

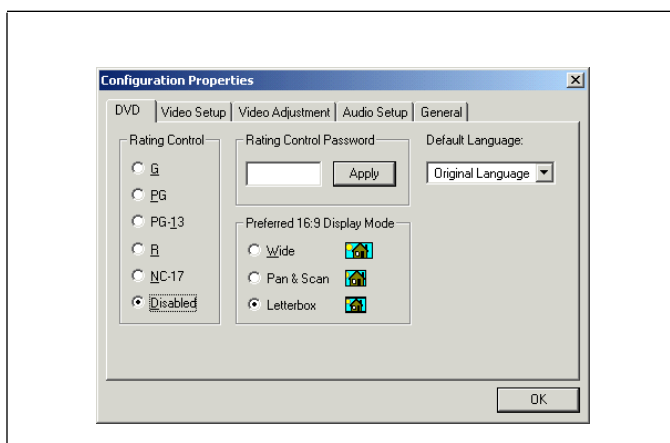


Figure 26. DVD configuration dialog.

Rating Control

The DVD format supports a voluntary movie rating system. With a rated title, this feature allows you to play an edited version of the movie, with

objectionable scenes removed. For example, a title may come with R, PG-13, and PG-rated versions of the same movie.

To change the rating level:

1. Click in the password box, type in a password, and then Click the **Apply** button. Note that passwords are case sensitive.
2. Click on the rating level that the Xmedia player should not exceed and Click **OK**.

This Rating Control feature only works for DVD titles that support rating control. Some DVD movie titles may not use this voluntary rating system. You cannot rely upon this feature to prevent your children from viewing objectionable titles. The only way to prevent children from playing such movies is to physically keep those movies away from children.

Preferred 16:9 Display Modes

Enable any of the following display modes by clicking on the appropriate radio button.

- Wide -- Enables 16:9 widescreen format display. *Always choose this option if you have a widescreen TV.*
- Pan and Scan -- Enables 16:9 source to be displayed in 4:3, with the picture trimmed on the left and right sides. Some image loss will occur. You may choose this option if you have a standard (4:3) TV.
- Letterbox -- Enables 16:9 source to be displayed in 4:3, with black bars placed above and below the picture. No data loss occurs. You may choose this option if you have a standard (4:3) TV.

Video setup

Click on the Video Setup tab to display Xmedia player's video settings.

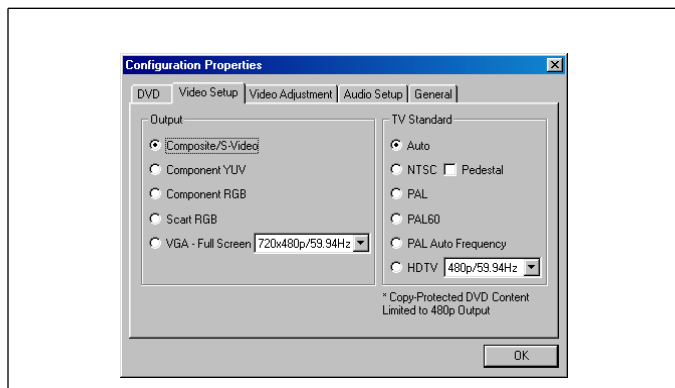


Figure 27. Video configuration setup.

Video Standards

Provides options for Auto (Multisystem), NTSC, PAL, PAL 60Hz, and PAL Auto Frequency output to TV.

- Auto setting preserves the source format when sending a signal to the TV.
- NTSC with the Pedestal option unchecked sends an NTSC signal to the TV, regardless of the original source format. This is the American version of NTSC. It produces a “cooler” image, with more intense black colors.

- NTSC with the Pedestal option checked sends an NTSC signal to the TV, regardless of the original source format. This version of NTSC, also referred to as NTSC-J, is used in Japan. It produces a “warmer” image, with more intense white colors.
- PAL sends a PAL 50 signal to the TV, regardless of the original source format.
- PAL 60 sends a PAL 60 signal to the TV, regardless of the original source format.
- PAL Auto Frequency is to be used only with a PAL system TV. It automatically selects the PAL or PAL60 format output depending on the source signal. (NTSC signals are converted to PAL 60 mode).

Video Outputs

Provides options for composite/S-Video, component YUV, component RGB, SCART RGB, and VGA fullscreen settings. Choose the appropriate setting for your TV or VGA monitor.

If VGA fullscreen is selected, the Xmedia player and Windows desktop disappear as video is sent to the VGA monitor in fullscreen mode. To return to the Windows desktop, doubleclick the mouse or press the ESC key on your keyboard.

Use the remote control to adjust the brightness, contrast, and saturation while in VGA fullscreen mode:

1. Press OSD on the remote control. An on-screen menu overlays the fullscreen video. Four options are available (brightness, contrast, saturation, and file info).
2. Use the *Up* and *Down Arrow* buttons on the remote to navigate to a desired option and press *Select* to choose it. The onscreen menu disappears and an adjustment bar appears along the bottom of the screen. Note: *File Info* is a special on/off toggle for a continuous display of the title and time of the currently playing media. This information is positioned at the bottom of the screen, overlaid on the fullscreen video.
3. Use the Left and Right Arrow buttons to adjust the selected option. File info cannot be adjusted. It can only be toggled on/off.

Video adjustment

Click the Video Adjustment tab to adjust the brightness, contrast, and color saturation of the movie.

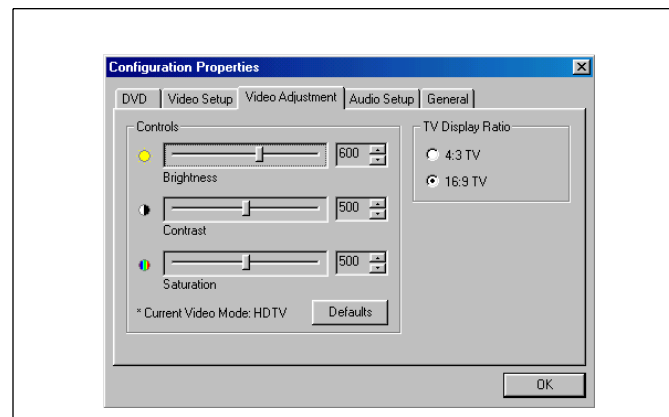


Figure 28. Video configuration adjustment dialog.

Reducing saturation to zero results in black and white TV output. All adjustments made from this dialog affect the TV only. Use the remote control to adjust VGA graphics on your computer monitor.

The TV Display Ratio can be set to either 4:3 or 16:9. If you have a 16:9 TV connected to the Xcard, always choose 16:9 for the best viewing experience. These settings do not affect DVD playback.

Audio Output

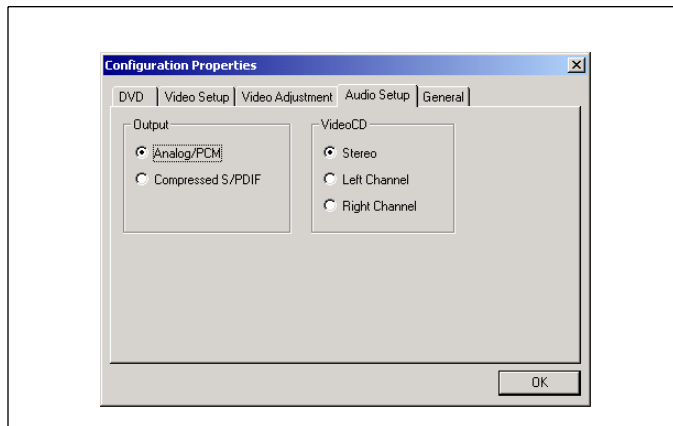


Figure 29. Audio setup window.

Analog/PCM

Enables Dolby Pro Logic Surround Sound output through the Line Out port. Choose this option to have the REALmagic Xcard decode audio signals.

Compressed S/PDIF

Enables Dolby Digital Surround Sound or Digital Theater System sound through the S/PDIF port. Choose this option when an external device performs audio decoding. DTS streams are always delivered through the S/PDIF output.

VCD channel output

Use these controls for Karaoke, or audio channel manipulation. Selecting *Left* outputs the left audio channel only to both left and right speakers. Selecting *Right* outputs the right audio channel only to both left and right speakers. Selecting *Stereo* results in normal stereo audio output.

General Settings

Click on the General tab to toggle general Xmedia player settings.

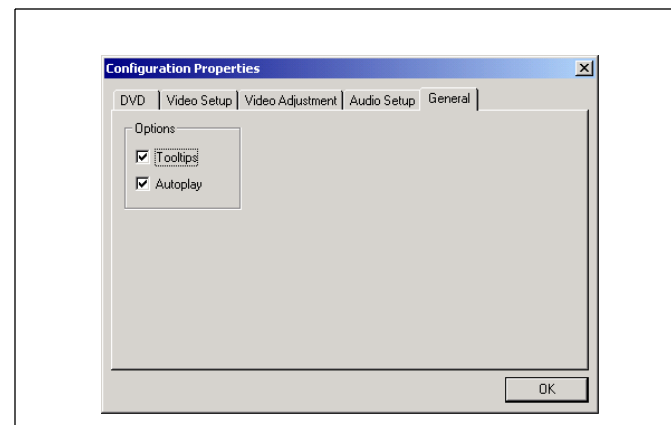


Figure 30. General configuration dialog.

Options

Tooltips: Enables pop-up Tooltips that explain the function of each Xmedia player button.

AutoPlay: Toggles between enabling/disabling AutoPlay. When Autoplay is active, the system automatically detects and plays discs inserted into the player.

Shortcut Keys

Key	Description
Alt-F4	Quit
Ctrl+a	Select audio track (cycles through audio tracks; only in file mode, and only for files with multiple audio tracks)
Ctrl+c	Select subtitle (cycles through available subtitles for DVD media and AVI files)
Ctrl+e	Eject disk (open/close disk tray)
Ctrl+f	Fast-forward (cycles through 2x, 4x, 8x, normal)
Ctrl+g	Step/frame advance (only when playback is paused)
Ctrl+m	Root menu
Ctrl+n	Next track or chapter
Ctrl+p	Play/pause toggle
Ctrl+r	Rewind (cycles through 2x, 4x, 8x, normal)
Ctrl+s	Stop
Ctrl+t	Title menu (DVD/VCD menus only) Display file info (files only)
Ctrl+u	Mute volume (toggle)

Key	Description
Ctrl+v	Previous track or chapter
Ctrl+w	Slow motion playback (cycles through 2x, 4x, 8x, normal)
Ctrl+z	Select zoom setting (cycles through zoom modes 1, 2, 3, and off).
ESC	Return to Windows desktop from fullscreen VGA display
F1	Open Help file
Ctrl+↑	Increase volume
Ctrl+↓	Decrease volume
↑	Navigate up (DVD/VCD menus only) Adjust aspect ratio (files only)
↓	Navigate down (DVD/VCD menus only) Adjust aspect ratio (files only)
←	Navigate left (DVD/VCD menus only)
→	Navigate right (DVD/VCD menus only)
<Enter>	Activate selection (DVD/VCD menus only) Adjust aspect ratio -- reset to 1:1 (files only)

Chapter 7: DirectShow Applications

DirectShow version 8 and later impose high priorities for the software MPEG 1 decoder filter and the Windows splitter filter. They also affect the playback of some MPEG2 files by connecting the software audio decoder filter to the MPEG1 audio stream of these MPEG2 files. In such cases, the REALmagic Xcard is not used for decoding.

For this reason, the Setup application renames the string quartz.dll to quartz.dll.xxx in the two following entries:

```
[HKEY_CLASSES_ROOT\CLSID\{4A2286E0-7BEF-11CE-9BD9-0000E202599C}
```

```
\InprocServer32]@="C:\\WINDOWS\\SYSTEM\\QUARTZ.DLL.xxx"
```

```
[HKEY_CLASSES_ROOT\CLSID\{FEB50740-7BEF-11CE-9BD9-0000E202599C}
```

```
\InprocServer32]@="C:\\WINDOWS\\SYSTEM\\QUARTZ.DLL.xxx"
```

Or "C:\\WINDOWS\\SYSTEM32\\QUARTZ.DLL.xxx" for Win XP.

This does not affect the use of quartz.dll for the playback of other multimedia files (e.g. WAV files).

When using an application in which you build your own graph by forcing filters and not auto rendering, you can rename these two entries with their original names.

Chapter 8: Remote Control

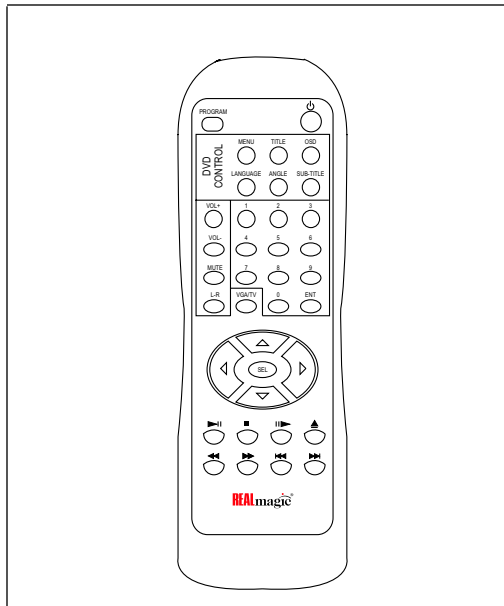


Figure 31. REALmagic Xcard remote control.

Management Functions

Launch XMP

Press this button to launch Xmedia player. Press the button while Xmedia player is running to close Xmedia player.

PROGRAM **Program**

The program button currently has no function.

OSD **OSD**

Press this button to reveal the Sigma Designs OSD. If the OSD is visible, pressing the button hides it.

VGA/TV **VGA/TV**

Press this button to toggle the REALmagic Xcard's output signal between VGA and TV.

Playback Functions

Stop

Press this button to stop playback.

Play/pause

Press this button to toggle between playback and pause modes. If Xmedia player is playing a file in fast-forward, slow, or reverse modes, pressing this button resumes normal playback (1x speed).

⏪ Slow

Press this button to cycle between 1/2x, 1/4x, 1/8x, and 1x playback speeds.

⏩ Fast Forward

Press this button to cycle between 1x, 2x, 4x, and 8x playback speeds.

⏮ Rewind

Press this button to cycle between 1x, 2x, 4x, and 8x playback speeds, in reverse.

⏮ Previous Track

Press this button to jump to the track prior to the current track.

⏩ | Next Track

Press this button to jump to the beginning of the track following the current track.

▲ | Eject

Press this button to eject the CD/VCD/DVD in Xmedia player.

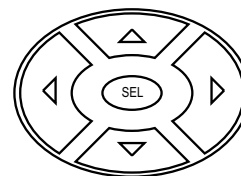
1 Numeric keypad

Press numbers 1-9 on the numeric keypad to select specific tracks/chapters on the CD/VCD/DVD in Xmedia player.

ENT ENT

Press this button to implement the selection made on the numeric keypad.

DVD Functions



Menu navigation

Navigate up, down, left, and right through menus by pressing the appropriate direction key. Press SEL (select) to implement a highlighted menu option.

Pressing the up and down arrow buttons (for files only) adjusts the video's aspect ratio.

MENU Menu

Press this button to jump to the DVD menu at any time.

TITLE Title

Press this button to jump to the title menu of the DVD. *In file mode, this button displays the filename and elapsed time in the video window.*

LANGUAGE Language

Press this button to cycle through the different audio language options available on the DVD (DVD mode only).

ANGLE Angle

Press this button to cycle through the different camera angle options available on the DVD. If no alternatives are available, an "X" will appear on the screen.

SUB-TITLE **Sub-title**

Press this button to cycle through the different sub-title options available on the DVD (DVD mode only). *In file mode, this button displays subtitles contained in the subtitle file linked to the video file.* If multiple subtitle files are linked to the video file, pressing this button repeatedly cycles through them.

Audio Functions

VOL+ **Volume up**

Press this button to increase the volume.

VOL- **Volume down**

Press this button to decrease the volume.

MUTE **Mute**

Press this button to mute the volume.

L-R **L-R**

Press this button to cycle between left-only, right-only, and left-right channel output for karaoke and music/vocal VCD functions.

Chapter 9: Troubleshooting

My S-Video cable has only 4 pins! How do I hook it up?

Problem: The S-Video connector on the REALmagic Xcard is a 7-hole socket and your S-Video cable has a 4-pin jack.

Solution: The 4-pin cable is fully compatible with the 7-pin socket. Just plug it in.

Which media do I use to install REALmagic software?

Problem: You received a CD-ROM with your REALmagic Xcard and a floppy disk with your remote control.

Solution: Do NOT use the floppy disk provided with the remote control to install software. Use only the REALmagic Xcard CD-ROM.

Oops. I've already installed the software from the floppy disk. How do I install the correct drivers?

Problem: You installed the software from the floppy disk that came with your remote control.

Solution: Use the Windows Control Panel to uninstall the floppy software and then install the correct software from the REALmagic Xcard CD-ROM.

I can't play DVDs on my DVD drive. What's wrong?

Problem: You have a third generation DVD-ROM drive (RPC2 specs that require a region code on the drive) and you cannot play movies.

Solution: Set the DVD drive's region code to your country code.

How do I set DVD region codes for RPC2 DVD-ROM drives?

Under Windows 98, the program "DVD Drive Region" in the REALmagic Group sets the region code of the RPC2 DVD-ROM drives. The region code on the REALmagic Xcard is irrelevant for this purpose.

Under Windows 2000 or XP, the Device Manager for the DVD drive (located in the hardware specifications dialog) includes a utility for setting the region code.

If you don't have an RPC2 drive (i.e. you are using an RPC1 drive), then the region code of the movie is compared against the region code of REALmagic Xcard. To set this region code, run SETUP from Win98_Me\Apps\Disk1 (under Windows 98) or Win2K\Apps\Disk1 (under Windows 2000) and select "Set the region code" from the menu.

How do I quickly toggle between playlist and DVD/CD-ROM drive?

Left-click on the Source button to choose between Playlist mode and DVD/CD-ROM drives.

My TV's brightness settings seem to fluctuate. I have some yellow horizontal line noise on the video image. What's happening?

Problem: When watching video on a TV, the picture gets dimmer and brighter at short intervals and some movies have yellow horizontal lines appearing on the TV screen.

Solution: The TV set is connected to the PC system via a VCR or similar device. This device initiates the movie's Macrovision protection. Connect the TV directly to the REALmagic Xcard.

When I'm watching a movie, there's no sound. How do I fix this?

Problem: While watching a movie, video is visible, but audio is absent.

Solution: First make sure that your speakers are connected to the REALmagic Xcard.

Second, check the audio jumper cable from the output of the REALmagic Xcard to the input of the sound card. Verify that the Line IN to the volume mixer is NOT muted or set at a low level.

Lastly, when using a Dolby Digital Receiver, make sure it accepts Dolby Digital streams if the Xmedia player is set to output Compressed S/PDIF. Otherwise, the receiver must decode PCM signals and the Xmedia player output must be set to Analog/PCM.

When I have two monitors hooked up, one shows a blank screen and the other shows video. Where's the desktop?

Problem: If the driver was installed with the pass thru cable installed and the cable is later removed, the Xmedia player sends video output thru the Progressive VGA connection. When using two CRT devices, one shows a green screen and the other shows the video.

Solution: Enable and then disable the Xmedia player driver. The desktop reappears on the monitor with the blank screen, and video will continue to be present on the second screen.

What is the pinout of the VGA signals on the pass-thru cable?

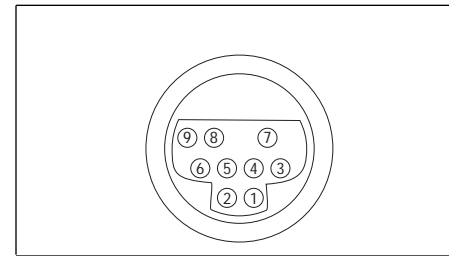


Figure 32. Pinout for 9-pin socket of pass-thru cable.

Pin	Description
1	Blue IN
2	GND
3	Green IN
4	GND
5	Vsync IN
6	Hsync IN
7	Red IN
8	SDA (from pin 12 of DB15) - PnP monitors
9	SCL (from pin 15 of DB15) - PnP monitors

Appendix: Remote Control Codes

Set the serial port to the following parameters to obtain data from the IR receiver.

Parameter	Value
Baud Rate	1200 bps
Parity Bit	none
Data Bit	8
Stop Bit	1
RTS	enable

After these parameters are properly set, the application begins receiving remote control key messages from the serial port. Each message contains three bytes of information in the following format:

Header Byte + Data Code + Data Code

The following table shows the three-byte messages sent from the IR receiver to the serial port for each key.

Key	Message	Key	Message
COMPUTER	83 8D 8D	LAST CHAPTER	83 A0 A0
PLAYER	83 8E 8E	NEXT CHAPTER	83 A1 A1
UP CURSOR	83 8F 8F	VOL +	83 A2 A2
DOWN CURSOR	83 93 93	VOL -	83 A6 A6
LEFT CURSOR	83 91 91	MUTE	83 AB AB
RIGHT CURSOR	83 BE BE	L-R	83 25 25
SEL	83 92 92	1	83 A3 A3
MENU	83 94 94	2	83 A4 A4
TITLE	83 95 95	3	83 AC AC
OSD	83 96 96	4	83 A7 A7
LANGUAGE	83 97 97	5	83 A8 A8
ANGLE	83 98 98	6	83 41 41
SUB-TITLE	83 99 99	7	83 0D 0D
PLAY/ PAUSE	83 9A 9A	8	83 11 11

Key	Message	Key	Message
STOP	83 9B 9B	9	83 A9 A9
SLOW MOTION	83 9C 9C	0	83 19 19
EJECT	83 9D 9D	VGA/TV	83 15 15
FAST REWIND	83 9E 9E	ENT	83 21 21
FAST FORWARD	83 9F 9F		

Glossary

AAC: Advanced Audio Coding, a compression format defined by the MPEG-2 standard; aka MPEG-2 NBC (Not Backward Compatible with MPEG-1).

Aspect ratio: Ratio of image width to image height on a display.

AVI: Audio Video Interleave, a Microsoft-developed Windows-native audio and video data file format with the extension .AVI.

BMP: Standard Windows bitmap graphics file format with the extension .BMP.

DivX: Digital video compression technology based on MPEG-4 and developed by DivXNetworks, Inc.; do not confuse with DIVX (digital video express).

Dolby Digital: High quality digital multichannel surround sound audio standard enabling the transmission and storage of up to five full-range audio channels plus a low-frequency effects channel (LFE), in less space than is required for just one linear PCM-coded channel on a compact disc. Additional features include the transmission of metadata that can control playback parameters such as dialogue-keyed playback level, and the ability of two-channel decoders to downmix multichannel soundtracks.

Dolby Pro Logic: This technology that decodes program material encoded in Dolby Surround; it is built into virtually every home theatre

audio system. Like the professional decoder units used in cinemas, Dolby Surround Pro Logic reconstructs the original four channels-left, center, right, and surround-that were encoded onto the program material's stereo soundtracks.

DTS Surround Sound: 5:1 channel, less than 75% efficient encoding scheme with a lossy compression algorithm and a bitrate of up to 1.5Mbps.

DVD-Video: Digital Versatile Disc specification supporting disks carrying MPEG-2 video with capacities of 4.7-17GB and access rates of 0.6-1.3 MBps; DVD players are backwards compatible with CD-ROMs, which includes CD-I disks, videoCDs, DVD-ROMs and (potentially) CD-Rs.

Full frame (aspect ratio): Common analog NTSC video aspect ratio; 4:3 video for 4:3 display.

GIF: Graphics Interchange Format, a bitmapped graphics format with the extension .GIF and commonly used in websites; supports varied colors and resolutions, as well as data compression.

JPEG (also JPG): A highly compressible, but lossy bitmap graphics format, created by and named after the Joint Photographic Experts Group; uses the extension .JPG.

Karaoke CD: A CD containing both audio and video information in a Karaoke-specific Bridge Disc format.

Letterbox (aspect ratio): common ratio-preserving conversion of a widescreen image to full frame; 16:9 video for 4:3 display.

MPEG (MPEG-1, MPEG-2, MPEG-4): Moving Pictures Experts Group format, provides perceptibly lossless audio/video compression technologies for general consumers.

The most common implementations of the MPEG-1 standard provide a video resolution of 352-by-240 at 30 fps. This produces video quality slightly below the quality of conventional VCR videos.

MPEG-2 offers resolutions of 720x480 and 1280x720 at 60 fps, with full CD-quality audio. This is sufficient for all the major TV standards, including NTSC, and even HDTV. MPEG-2 is used by DVD-ROMs. MPEG-2 can compress a 2 hour video into a few gigabytes. While decompressing an MPEG-2 data stream requires only modest computing power, encoding video in MPEG-2 format requires significantly more processing power.

MPEG-4 is a graphics and video compression algorithm standard that is based on MPEG-1 and MPEG-2 and Apple QuickTime technology. Wavelet-based MPEG-4 files are smaller than JPEG or QuickTime files, so they are designed to transmit video and images over a narrower bandwidth and can mix video with text, graphics and 2-D and 3-D animation layers. MPEG-4 was standardized in October 1998 in the ISO/IEC document 14496.

MP3 (MPEG audio layer 3): An audio-only compression technology that reduces file sizes by up to 70% without sacrificing sound quality. It eliminates redundant and irrelevant portions of sound signals and adds a modified discrete cosine transform to implement a filter bank that increases frequency resolution; also the extension for a file in this format.

Pan and Scan (aspect ratio): Common image-lossy conversion of a widescreen image to full frame; 16:9 video for 4:3 display. Images are often user-transparently cropped on the left and right, retaining optical focus on the items of interest within the image.

PCM: PCM, or pulse code modulation, digitizes analog audio signals by sampling the signal 8000 times a second; each sample is represented by 8 bits for a total of 64 Kbps. Mu-Law (North America) and A-Law (other countries) are two standards for coding the sample level.

Super Video-CD (also SVCD): A super video-CD is similar to a video-CD (See video-CD below), except that video is stored in the higher resolution MPEG-2 variable bit rate format. An SVCD contains 35-80 minutes of video per CD.

VCD (also Video-CD): A VCD contains 74-80 minutes of audio/video information in MPEG-1 format on a standard size CD. VCD quality compares favorably with VHS recordings, and plays on nearly all DVD players, as well as computers equipped with proper software-based decoders and DVD/CD-ROM drives.

Widescreen (aspect ratio): Image displayed with a wider aspect ratio (16:9) than full frame. All digital HDTV and some SDTV are widescreen; 16:9 video for 16:9 display.

Limited Warranty

What the warranty covers

Sigma Designs warrants its products to be free from defects in material and workmanship during the warranty period. If a product proves to be defective in material or workmanship during the warranty period, Sigma Designs will at its sole option repair or replace the product with a like product. Replacement product or parts may include remanufactured or refurbished parts or components.

How long the warranty is effective

The Sigma Designs REALmagic Xcard is warranted for one (1) year for all parts and labor from the date of the original purchase.

Who the warranty protects

This warranty is valid only for the original purchaser.

What the warranty does not cover

1. Any product on which the serial number has been defaced, modified, or removed.
2. Damage, deterioration or malfunction resulting from:
 - Accident, misuse, neglect, fire, water, lightning, or other acts of nature, unauthorized product modification, or failure to follow instructions supplied with the product.
 - Repair or attempted repair by anyone not authorized by Sigma Designs.
 - Any damage of the product due to shipment.
 - Removal or installation of the product.
 - Causes external to the product, such as electric power fluctuations or failure.
 - Use of supplies or parts not meeting Sigma Designs' specifications.
 - Normal wear and tear.
 - Any other cause which does not relate to a product defect.
3. Removal, installation, and set-up service charges.

How to get service

1. For information about receiving service under warranty, contact Sigma Designs Customer Support.
2. To obtain service under warranty, you will be required to provide a) the original dated sales slip, b) your name, c) your address, d) description of the problem, and e) serial number of the product.
3. Take or ship the product prepaid in the original container to your Sigma Designs dealer, any Sigma Designs service center, or Sigma Designs.
4. For additional information or the name of the nearest Sigma Designs service center, contact your Sigma Designs dealer or Sigma Designs.

Limitation of implied warranties

There are no warranties, express or implied, which extend beyond the description contained herein including the implied warranty of merchantability and fitness for a particular purpose.

Exclusion of damages

Sigma Designs' liability is limited to the cost of repair or replacement of the product. Sigma Designs shall not be liable for:

1. Damage to other property caused by any defects in the product, damages based upon inconvenience, loss of use of the product, loss of time, loss of profits, loss of business opportunity, loss of goodwill, interference with business relationships, or other commercial loss, even if advised of the possibility of such damages.
2. Any other damages, whether incidental, consequential, or otherwise.
3. Any claim against the customer by any other party.

Effect of state law

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on implied warranties and/or do not allow the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

Sales outside the USA

For Sigma Designs products sold outside the USA, contact your Sigma Designs dealer for warranty information and service.



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