VideoSystem

**CAMEO** *Convert*

Digital & Analog Video Converter

English Manual

Version: 08.11.02

CE Declaration

We:

TerraTec Electronic GmbH, Herrenpfad 38, D-41334 Nettetal, Germany

hereby declare that the product:

Cameo Convert

to which this declaration refers is in compliance with the following standards or standardizing documents:

1. EN 55022 Class B

2. EN 55024

3. EN 61558

The following are the stipulated operating and environmental conditions for said compliance:

residential, business and commercial environments and small-company environments.

This declaration is based on:

Test report(s) of the EMC testing laboratory

## *Contents*

# *Preface*

Thank you for choosing a TerraTec product. We would like to congratulate you on your decision to buy this sophisticated piece of state-of-the-art technology. Cameo Convert is a professional product that forms a bridge between the worlds of analog and digital video. We're convinced that the Cameo Convert will be both very useful and a lot of fun for you for a long time to come.

The following is a brief overview of the features of your new Cameo Convert.

# *Scope of delivery*

- CAMEO CONVERT
- S-video cable
- Composite cable
- Stereo audio cable
- Power supply unit
- DV (IEEE-1394) cable (4-pin to 6-pin)
- DV (IEEE-1394) cable (6-pin to 6-pin)
- Adapter Scart/Composite
- Ulead MediaStudio VE 6.5
- This manual
- Registration card with the serial number

Please return the registration card to us at the earliest possible opportunity or register online at **http://www.terratec.net/register.htm**. This is important for support and hotline services.

# Product description

### CAMEO CONVERT is a bridge between worlds...

...no matter whether your video is an analog or digital recording, the external converter transfers recordings from one medium to another in the best possible quality. Connect your VCR, TV, analog camcorder or DVD player to your desktop or notebook PC, Mac or DV camcorder in a few simple steps.

### From analog to digital (and back), please...

Would you like to digitize your analog videos, edit them on your PC or Mac and store them on DVD or (S)VCD with the click of a mouse? Transfer digital videos to your VCR or TV? Or simply set up a connection between your DVD player, VCR, camcorder, TV or computer to view, copy and convert video material? It's all no problem with CAMEO CONVERT. It features suitable connections for any purpose—from the lightning-fast FireWire™ port to analog video-in and video-out (S video, composite) to audio inputs and outputs. It's everything you need to go from analog to digital—and back, if necessary. Just what you need, whenever you need it.

### It's all there: a complete accessories package.

CAMEO CONVERT comes with a complete accessory package to cover all of your video transfer needs. It includes suitable connector cables (two DV cables, S video cable, A/V cable, Scart-composite adapter) and a powerful PC software package, including Ulead MediaStudio VE 6.5 for professional video editing and archival on (S)VCD or DVD.

## Connections

### The front panel
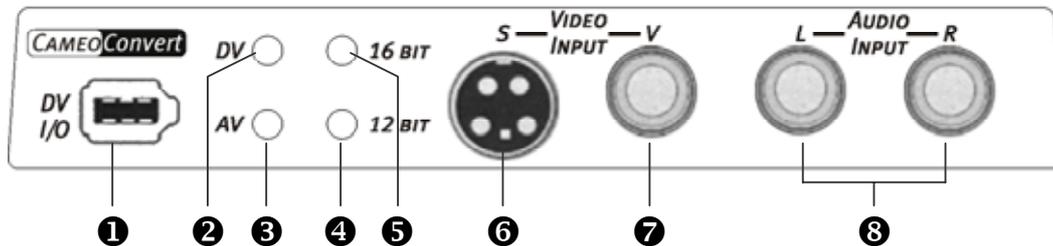


❶    6-pin DV (FireWire™, IEEE1394) interface for DV In/Out

❷    This LED is lit when the selected video source is DV *.

❸    This LED is lit when the selected video source is AV *

❹    This LED is lit when 12-bit encoding is used for the sound *

❺    This LED is lit when 16-bit encoding is used for the sound *

❻    S video (Y/C) input

❼    Composite video input (cinch)

❽    Stereo audio inputs (cinch)

### The rear panel
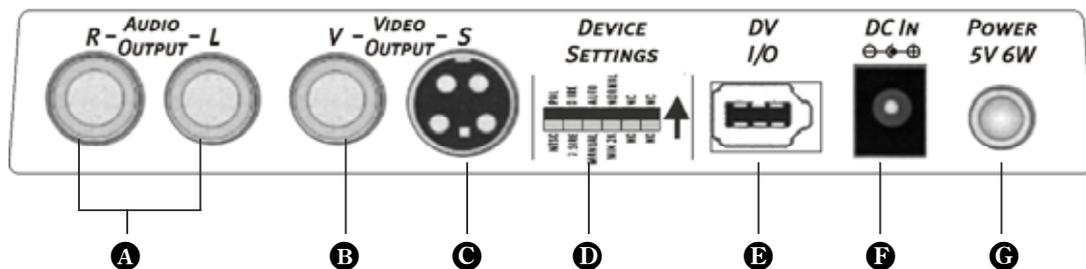


Ⓐ    Stereo audio outputs (cinch)

Ⓑ    Composite video output (cinch)

Ⓒ    S video (Y/C) output

Ⓓ    Device settings (DIP switch) *

Ⓔ    6-pin DV (FireWire™, IEEE1394) interface for DV In/Out

Ⓕ    DC input (+5 VDC / 6 Watt)

Ⓖ    Power switch (on/off)

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* These settings must be configured manually. This topic will be covered later under Settings.

## *Getting started*

Please use the included power supply (14). Simply switch the Cameo Convert on (15). It's now ready to use.

## *Options*

Two buttons are located on the top of the unit.



### Input signal

Press the **"SOURCE"** button to choose whether you would like to convert AV to DV (LED ❸ must be lit) or DV to AV (LED ❷ must be lit).

 **Caution:** Please wait five seconds after pressing the SOURCE button before changing the operating mode again.

### Audio settings

Press **"AUDIO"** and choose whether the converter will use 12-bit or 16-bit encoding for the sound. The LED ❹ must be lit for 12-bit encoding, LED ❺ for 16-bit.

**Advanced settings**

It's not necessary to change these settings in the everyday use of the Cameo Convert. Nevertheless, we would like to give you an overview of the functions of the individual DIP switches. To access the DIP switches, carefully remove the cover ❶.

*The DIP switches in detail*

| • S1 | ON | -› | PAL |
| | OFF | -› | NTCS system |
| • S2 | ON | -› | 7.5 IRE (NTSC standard, except Japan) |
| | OFF | -› | 0 IRE (NTSC standard, Japan) |
| • S3 | ON | -› | Automatic recognition of the video source |
| | OFF | -› | manual recognition of the video source |
| • S4 & S5 | These two switches let you adapt the Cameo Convert perfectly to suit your purposes. They are not important in most cases, however, as the device's performance is very good with the default settings. | | |

| S5 | | S4 | ON | -› | Default setting |
|---|---|---|---|---|---|
| | ON | | OFF | -› | Windows 2000 |
| | OFF | S4 | ON | -› | Windows ME / XP |
| | | | OFF | -› | Windows 2000, if many DV devices are connected |

*Caution:*
*you must restart the Cameo Convert after every change.*

## *Application examples*

Cameo Convert is compatible with DV (iLink, FireWire™ or IEEE-1394), Digital 8, Video 8, Hi8, VHS, S-VHS, VHS-C and S-VHS-C formats. This results in a broad range of potential uses.

### Bridge between analog video device and PC

An especially interesting application for the Cameo Convert is as a bridge between analog video devices and PCs, permitting existing analog video material to be digitized, edited and stored on (S)VCD, DVD or videotape.

Simply connect your analog video device to the video input ❻ or ❼ and the audio inputs ❽. Please use the appropriate cables (included) for this connection. Next, connect the DV input/output ❶ to the FireWire™ port of your PC: Please also use the included DV cable (IEEE1394 6-pin to 6-pin) for this connection. Switch the Cameo Convert on. Your PC will automatically recognize the Cameo Convert as a DV camcorder. The Cameo Convert will be listed in your PC's Device Manager under "Imaging devices" as an "MS DV camera and video recorder".

To open the Device Manager, press and hold the Windows key (with the Windows logo) and press the Pause key. This will open the System Properties window. In Windows 98SE or ME, click the "Device Manager" tab; in Windows 2000 or XP, click the "Hardware" tab and the "Device Manager" button.

Press the SOURCE button of the Cameo Convert once to select AV as the video source. The LED ❸ must light up.

Launch your software. For more information on ULEAD MediaStudio PRO 6.5, please see "The applications at a glance" also in this manual. To copy the edited video material from the software back to analog video tape, simply press the SOURCE button to select DV as your source. The LED ❷ must light up.

### Bridge between AV and DV camcorders

Naturally, a computer is not necessary when using the Cameo Convert. It can also be used as a bridge between digital and analog video equipment.

Your DV camcorder will have a socket labeled as "DV IN", "DV IN / OUT" or "iLink™". Connect the smaller plug of the DV cable (IEEE1394 6-pin to 4-pin) to the socket on your DV camcorder and the larger one to the Cameo Convert, ❶ or Ⓔ. The connection of the analog video device will naturally depend on its purpose. If you would like to copy from DV to AV, connect the analog video device to the rear panel, or for the opposite direction to the front panel. Set the direction by simply pressing the SOURCE button. The LED ❷ or ❸ will indicate the selected direction. Finally, press Record or Play on the connected devices.

## Installing the software

Inserting the installation CD will automatically launch the installation routine. If this is not the case, please execute **AUTORUN.EXE** in the root folder of the CD manually.

While the installation program will take care of a lot of the work, we were unfortunately not able to automate everything for you. A number of points must be observed to ensure trouble-free installation.

### Installing DirectX 8.1

Frequently we realize that things don't always go as planned. With the introduction of DirectX 8.1, Microsoft offers many improvements and bug fixes that are essential for digital video editing.

Please install these updates first!

### Installing MediaStudio Pro 6.5 VE

Once you have installed DirectX 8.1, please install MediaStudio Pro 6.5 VE. Follow the instructions which will then be displayed. Oh, and by the way, the DVD plug-in is installed automatically.

## The applications at a glance

The following descriptions of the software are not intended to replace the manuals. Please refer to the installation CD for detailed documentation of the individual applications.

### MediaStudio Pro 6.5 VE—Overview

MediaStudio Pro 6.5 VE is a program suite consisting of the following applications that will all be installed on your hard drive:

- Audio Editor 6.5
  (manipulation of audio files—fade in/fade out/louder/softer etc.)
- Video Capture 6.5 (recording of video sequences)
- Video Editor 6.5 (cutting, editing and output of video sequences)

### Ulead DVD Plug-in

The Ulead DVD plug-in lets you create VideoCDs, Super VideoCDs or DVDs of your video material. No prior knowledge is required. The Ulead DVD plug-in will walk you through all of the steps.

# First steps

> Very important! – Experience has shown that PC systems are rarely absolutely stable. As crashes can easily spoil your enjoyment of your work, we recommend saving your work often, especially after making major changes. Please make a habit of saving to keep data losses to a minimum in the event of a crash.

## DV recording with Video Capture 6.5.

We would like to provide a brief introduction to video capture in this chapter.

1. Connect the Cameo Convert to the FireWire™ port of your PC and the analog video source.

2. Switch on the Cameo Convert and set it to "AV-in" mode. Your system will now automatically recognize that the Cameo Convert has been connected to your computer.

3. Launch "Video Capture 6.5" located in the "Ulead MediaStudio Pro 6.5 VE" program group.

4. Select "Preview" from the "View" menu. Your analog video source does not support remote control. You must start the playback on your analog device and cue it as required. Once you have started the playback on the analog device, the analog video source will be displayed in "Video Capture".
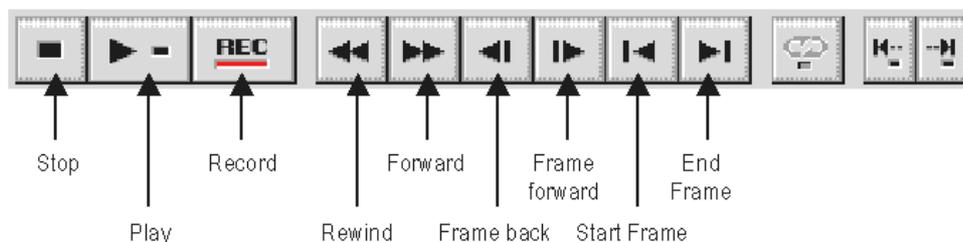


*The Video Capture toolbar.*

5. Cue the videotape to place where you would like to start recording and click the "REC" button in the video capture toolbar.

6. The "Cut video" window will now appear. Enter the filename for the video clip under "File". Use the "Browse" button to select the path under which the file will be stored. Please ensure that enough free hard disk space is available, as one second of DV video requires around 3.5 MB of storage space. To start the actual recording, click "OK".

7. The video data will now be transferred from your camcorder to the hard drive of your computer. Please do not be alarmed by a halting display of the video on your monitor. This is only the case in preview mode and it has no effect on the final result.

*Note: there is no sound in the preview.*

8. End the recording after a few seconds by pressing the "ESC" key. You have now stored your first video clip on your hard drive, ready for editing.

Repeat the steps described above a second time for another video clip so that you have enough suitable material for the instructions in the next chapter. Please be sure to use a different name for your second video clip so that you do not overwrite the first one.

We generally recommend using descriptive names for your video captures as this simplifies finding and sorting the clips at a later date.

## DV editing with the Video Editor.

Close Video Capture and open the Video Editor. You can cut your video clips and add titles and effects to them here.

The user interface consists of the following areas:
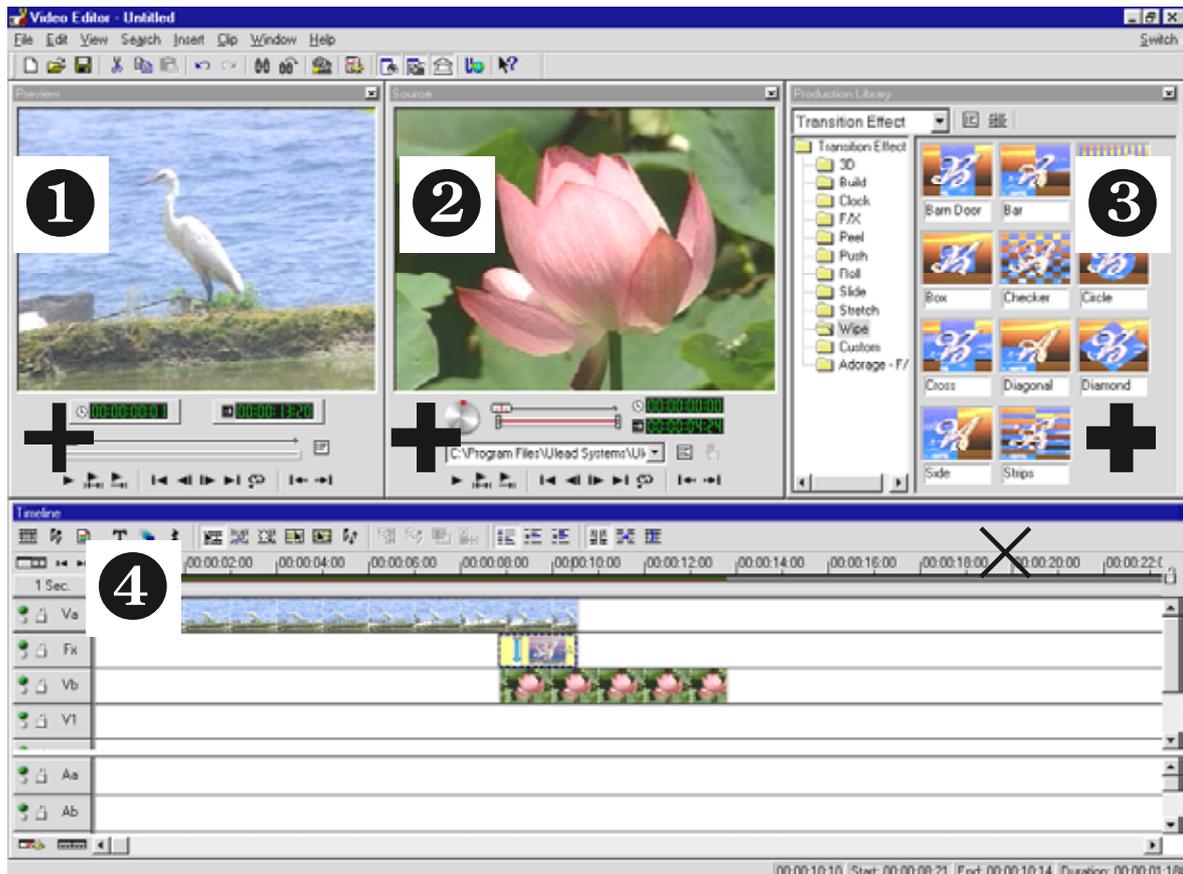


1. Preview window (Here you can preview your project with reduced quality.)

2. Source window (Cut your video or audio clips here before inserting them.)

3. Production archive (This contains all of the tools you will need for your work: video effects, filters, audio effects, and an archive for your video and audio material.)

4. Time axis (The time axis provides a complete overview of your project. Old video clips, effects, audio tracks etc. are displayed here in sequence from left to right.)

*And here we go:*

- When you launch Video Editor 6.5, you will first be prompted for your project settings. Select DV (PAL, Audio 48 kHz).
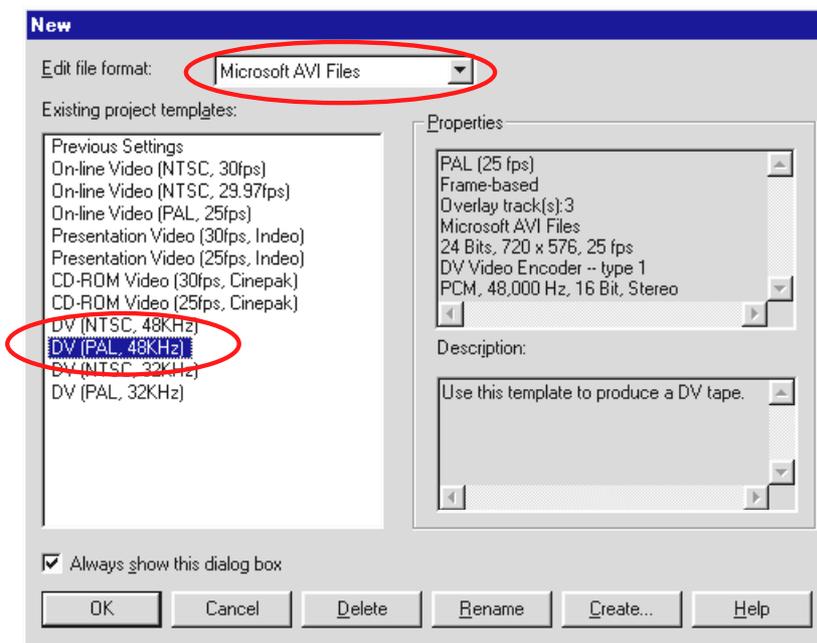


- Next, double-click the video track **Va** located in the time axis.

- A file selector window will appear from which you can select your first video clip.

- As you can see, the clip has now been positioned on the time axis.
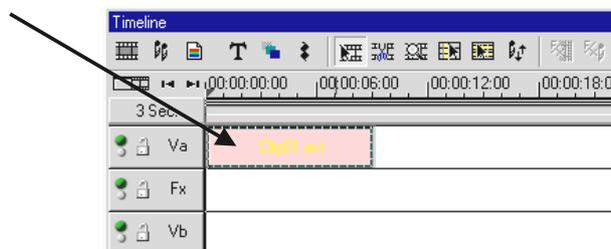


*You can view the video clip by clicking the playback button in the preview window.*

- Double-click the video track **Vb** and insert your second video clip.

- Use the mouse to drag the second video clip to the right until the beginning of the second video clip only just overlaps the end of the first.
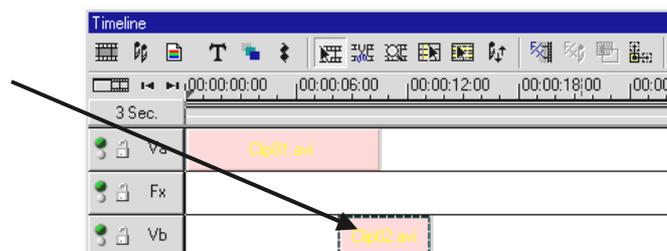


Have another look at the preview. Starting at the position at which the video clip on **Vb** overlaps the video clip on **Va,** only **Vb** will be visible and **Va** will be cut off. This is your first straight cut.

The preview window of the Video Editor will remain blank if you have connected the Cameo Convert to the FireWire™ card. The preview will then be output directly via the Cameo Convert. From there you can send the preview directly to your TV. If this is not the case, set your Cameo Convert to "DV-in" with the Source button.

To display a video in the preview window of Ulead MediaStudio, simply disconnect the Cameo Convert from your PC or switch the Cameo Convert off.

## *DV output to your analog video device.*

Once you have completed your first project, you can transfer to back to your analog video device. (The Cameo Convert must be set to "DV-in" for this.)

1.  Connect the Cameo Convert to the FireWire™ port of your PC and the analog video device.

2.  Switch on the Cameo Convert and set it to "DV-in" mode. Your system will now automatically recognize that the Cameo Convert has been connected to your computer.

3.  Launch "Video Editor 6.5" located in the "Ulead MediaStudio Pro 6.5 VE" program group.

4.  Load the video project that you would like to transfer to your analog video device.

5.  In the Video Editor, click "File", followed by "Select device control".

6.  Ensure that "MS 1394 device control" is selected.

7.  Click "File" again, followed by "Transmit to tape" and select "Time axis".

8.  Select "Whole project", click "Options", select "Device control" and confirm your selection with "OK". Output to your camcorder should start automatically.

> If your PC does not have an AMD Athlon / Intel® Pentium® III 500 or faster processor, you may experience problems with audio recording when using the "Transmit to tape" feature for DV camcorders. We recommend converting the entire project to a single DV video clip and sending it to the camcorder. Once you have recorded one video from a TV camcorder, you may have to reprocess the audio section.

## Using the DVD plug-in.

Films that you would like to store on VCD, SVCD or DVD must be available in MPEG format and a specific resolution. The following table will help you prepare your videos correctly.

| Medium | Resolution | Frame rate | Video data rate | Audio data rate |
|--------|-----------|-----------|-----------------|-----------------|
| DVD | 720 x 576 | 25 fps | MPEG-2<br><br>4~8 Mbps constant or variable bit rate | Stereo, 48 kHz and 192~384 kbps MPEG audio |
| SVCD | 480 x 576 | 25 fps | MPEG-2<br><br>Variable bit rate up to 2600 kbps* | 32~384 kbps* MPEG-1 layer 2 |
| VCD | 352 x 288 | 25 fps | MPEG-1<br><br>Constant bit rate 1152 kbps | Stereo, 44.1kHz and 224 kbps MPEG-1 layer 2 |

*\* Caution: the maximum overall data rate (audio and video) must not exceed 2750 kbps.*

To save your video project in the appropriate format, open the Video Editor.

1. Load the video project that you would like to store on a VCD, SVCD or DVD.

2. Open the "File" menu, select "Create" and "Video file".

3. In the next window, enter a name for the file to be created and under "File type", select "MPEG files (*.mpg)".

4. Click "Options".

5. Select the proper MPEG format under "Media type". Be sure to set the video standard of your project (PAL/NTSC) here as well.

6. The Video Editor will now create the specified file.

7. Next, click "File" once more, then "Export", followed by "DVD plug-in". You may have time for a cup of coffee or two during the export of longer films.

8. Select the file you have just created. The DVD plug-in will automatically recognize the format (VCD/SVCD/DVD) and will walk you through the creation of your VCD, SVCD or DVD step-by-step.


Enjoy!

# Appendix

## FAQ—frequently-asked questions and their answers.

### ‹I can't play back video data from MediaStudio Pro 6.5 VE in Windows 98 SE as described in the "DV output to your camcorder" chapter.

1. It's very likely that you have not installed DirectX 8.X. You can find it on the included installation CD.

2. To ensure that all of your DirectX 8.X files are current, download the "Video Capture Update" for DirectX from the Microsoft website:
   **`http://www.microsoft.com/directx`**

### I've heard about problems related to the file sizes of films. What's the story?"

It's true, restrictions do exist with regard to file sizes. In part, this is due to restrictions in the AVI format itself. Older, VfW-based software only supports AVI format to a maximum file size of 2 GB. Current programs based on DirectShow support AVI files of up to 4 GB. The format has been developed further, however, because even this would only allow a maximum film length of around 18 minutes for DV. The current OpenDML format for AVI files is only subject to the restrictions of the file system itself.

- FAT (Windows 98 SE, ME, 2000)
  The maximum file size here is 2 GB (approx. 9 minutes of DV video)

- FAT 32 (Windows 98 SE, ME, 2000)
  The maximum file size here is 4 GB (approx. 18 minutes of DV video)

- NTFS (Windows 2000, XP)
  The maximum file size in NTFS is equal to the partition size.

If you need to edit long videos, we therefore recommend using Windows 2000 or XP. OpenDML is naturally supported by MediaStudio Pro 6.5 VE.

### My recorded video sequences are choppy or skip.

It's very likely that your hard drive is too slow and cannot process the required data quickly enough. You should defragment your hard drive regularly. If you are using an Ultra DMA hard drive, be sure that Ultra DMA mode is also enabled in the Device Manager. We recommend using a separate hard drive which is reserved for your video material. The temporary folders for MediaStudio Pro 6.5 VE should also be located on this hard drive.

Please also read the next item.

*How fast does my hard drive have to be to prevent dropouts during recording or playback?*

The reliable transfer of video data calls for a hard drive with a minimum data throughput of 3.5 MBps. We urgently recommend using a SCSI hard drive or an IDE hard drive that supports Ultra DMA mode. When using an Ultra DMA hard drive, ensure that this mode is also activated in the Device Manager and that you are using the current Ultra DMA drivers for your system.

*In "VideoCapture" I get the message that the capture driver could not be accessed. Recording is not possible.*

Check whether Cameo Convert is entered in the Win98 SE/ME, 2000 or XP Device Manager. This is done automatically by the operating system. If this is not the case, click "Refresh".

*I've exported a completely rendered clip, but all of the edited scenes have been destroyed, showing mosaic-like patterns, or the camcorder returned the message "Incorrect format".*

Win 98 SE requires two DV updates, (`2427up.exe, 243174up.exe`). You can install these updates directly from the installation CD.

## *The perfect PC*

Sorry, it hasn't been built yet. Every PC has its advantages and disadvantages and should therefore be designed for its primary purpose. In the following, we've compiled a little list to help you in your selection:

### *The CPU*

The speed of the CPU tends to be of secondary importance when working with DV video. It does become relevant, however, when working with video effects and complex cross-fades. A fast CPU will speed processing of effects and reduce waiting times. We recommend Intel Pentium III or AMD Athlon CPUs for video editing.

### *Main memory*

Video editing involves the manipulation of video material. The capacity to keep large volumes of data in memory without continually writing to and reading from the hard drive will provide noticeable performance benefits. Although 64 MB RAM is adequate, we recommend a main memory of 128 MB. If you are using Windows 98 SE, there is unfortunately little point in having more memory.

### *The hard drive*

No other component plays such an important role for digital video editing as the hard drive. As a rule, any current hard drive should be able to read and write the required volume of data quickly enough. If you're using IDE hard drive please be sure that the hard drive is in DMA mode. In addition, we recommend using a second hard drive which is reserved exclusively for video data.

**Internet links for digital video editing**

`http://www.dvfilmmaker.com` (English-language site dedicated to the topic of DV film)

`http://www.mainconcept.com` (manufacturer of video editing and compositing programs, as well as other useful software)

`http://www.videox.net` (website in German)

`http://www.slashcam.de` (website in German)

## Service at TerraTec.

"Rien ne va plus—Nothing's working" can happen to the best systems. In such a case, the TerraTec Team is always ready to provide service and support.

### Hotline, Mailbox, Internet.

In case of a serious problem—where you can neither solve the problem on your own nor with the guided help found in this manual, nor with the help of your dealer—please contact us directly.

The first way should be the Internet: under **http://www.terratec.net** you will always find current answers to frequently asked questions (FAQ) and the latest drivers. All of that is also accessible via our mailbox system. To call us: +49-(0)2157-8179-24 (analog) and +49-(0)2157-8179-42 (ISDN).

If these options do not provide the necessary help, please contact our phone hotline. You can also reach us online. To do so, visit us under **http://www.terratec.net/support.htm**. In both cases, please have the following information handy:

- your registration number,
- this documentation,
- a printout of your configuration files,
- the manual of your motherboard, and
- a screen shot of your BIOS configuration.

In addition, it would be helpful to our technicians if you are at your computer during the phone call to directly carry out tips and tricks. Please do not forget to write down the name of the respective support technician if you contact our Support Team.

You will need this name if a defect is present and your card needs to be mailed to us.

## *Broken?!*

Before you send the device back, be sure to contact us! Make a note of the name of your support contact and follow these simple instructions:

- Please fill out the service request form provided with your Cameo Convert clearly and completely. The more clearly and detailed you describe the problem, the faster we will be able to help. Cards sent in without a description of the problem cannot be processed and will be returned to you at your expense.

- Be sure to include a copy of your purchase receipt (not the original) with the package. If we do not receive a copy of a receipt, we will assume that the warranty for the product has expired and will bill you for the repair.

- Please use a sufficiently strong and padded mailing package. We recommend using the original package. Remember that the card is a sensitive electronic component.

- Be sure to include enough postage—we will cover for the postage for the return to you.


;-)

**General terms and conditions of service**

1.  General
    You accept our general terms and conditions of service by purchase and receipt of the goods.

2.  Proof of guarantee
    You will require a copy of the purchase receipt or delivery slip as proof of warranty. If you do not supply the proof of warranty, we will charge for repairing the goods.

3.  Description of problem
    Shipments that do not include a description of the fault or an insufficient description ('defective' or 'for repair' is insufficient) will be returned for a processing fee, because this makes repair more difficult and could have been avoided.

4.  Invalid returns
    In the event of an unfounded complaint (no fault could be detected, probable operating error), we will return the goods and a processing fee will be charged.

5.  Package
    If possible, please use the original packaging for return shipment. Any warranty claim will be jeopardized by improper packaging. The warranty will not apply to damage caused by improper packaging.

6.  Foreign manufactured products
    Devices that are not manufactured or distributed by TerraTec Electronic GmbH will be returned and a processing fee will be charged.

7.  Repairs liable to your expense
    Repairs out of the warranty period are liable to your expense.

8.  Transportation costs
    The despatcher pays all costs associated with shipping and insurance for the goods for repair to TerraTec Electronic GmbH. If the goods are covered by warranty, TerraTec Electronic GmbH will pay the shipping costs for returning repaired goods. COD shipments will not be accepted for organizational reasons.

9.  Final regulation
    TerraTec Electronic GmbH reserves the right to change or supplement the general terms and conditions of service at any time.


Otherwise the General Terms and Conditions of Business of TerraTec Electronic GmbH are considered to be accepted.

## *Glossary*

**AVI** – A **Windows** video format.

**Bit rate** – The bit rate indicates the volume of the data stream per second. A higher bit rate results in higher quality. A distinction is made between constant bit rates (for ·› VCD, for example) and variable bit rates, e.g. for ·› SVCD and ·› DVD. Unlike constant bit rates, variable bit rates adjust the data stream to suit the video material.

**Blue screen** – A variation of ·› Chroma keying

**Capture** – Recording.

**Chroma keying** – Chroma keying uses a surface with a single color in front of which an actor, for example, is filmed. This color area is then made transparent during subsequent editing and can be replaced by a different background, for example.

**Chrominance** – Chrominance refers to the color signal in ·› YUV, which consists of two color components: U, the balance between red and cyan, and V, the balance between yellow and blue.

**Clip** – A short piece of video material.

**Composite video** – Composite video is a transmission method common in the consumer sector that is generally realized using cinch connectors and which is frequently found on TVs. In this process, all signals (chrominance and luminance) share a single cable. The quality of composition video is lower than that of ·› S video, for example, in which chrominance and luminance are transmitted separately.

**CPU** – Central processing unit. The part of your computer (the processor, i.e. Pentium or Athlon) that does the actual computing.

**D8** – Digital 8 is the successor to the Hi8 and VHS-C camcorder formats. Hi8 or D8 cassettes are still used, but the video data is recorded digitally in DV format.

**Data throughput** – see Data transfer rate

**Data transfer rate** – The data transfer rate describes the speed at which a hard drive can read or write data over a sustained period. The data transfer rate is usually measured in seconds, e.g. 7 Mbps.

**Device control** – In the DV terms, this refers to the ability to control your camcorder from your PC.

**DirectDraw** – DirectDraw is a graphics standard initiated by Microsoft. Its features include the capability to write graphics data directly to the memory of the graphics board for the fluid display of video material.

**Dropped frames** – These are missing individual images in the video data stream that are mainly the result of using a slow hard drive.

**DV** – DV stands for Digital Video. The DV standard uses a compression rate of 5:1. This corresponds to a data rate of 3.125 Mbps, which can be handled by virtually any modern hard drive. The quality of the DV standard is very high; it is therefore frequently used in professional productions. A number of different cassette types exist in the DV sector which vary in size and maximum playing time, but which are compatible with one another in terms of video data. MiniDV is designed for consumer sector and supports playing times of up to one hour. The DV format used in the professional sector supports playing times of up to three hours.

**DV-In** – As a rule, the DV socket of a camcorder can transport video data in both directions—to or from the camcorder. Many camcorders in Europe do not feature DV-In, however. Also see -› Enabling.

**Enabling** – Due to European import duties, imported digital video recorders are more expensive than imported digital video playback devices. For this reason, manufacturers of camcorders have begun to modify their products for the European market by disabling the digital input -› DV-In. Needless to say, clever developers found a way around this restriction very quickly. This is known as "enabling". Enabling the DV camcorder is a precondition for sending video material back to the camcorder. Enablers are available for almost all camcorders and can be purchased freely.

**Fade** – see Fading

**Fading** – Fades are soft transitions, often involving special effects, from one clip to the next.

**Fields** – Rather than displaying 25 frames per second (as per the PAL standard), 50 frames are displayed per second to reduce TV display flicker. These fields consist of either the odd-numbered rows (these are sent first) or the even rows of the image to be displayed.

**FireWire™** – Apple's name for -› IEEE 1394

**Frame rate** – The number of frames within a given period of time. The frame rate is frequently stated in frames per second (FPS).

**Hi8** – Analog video recording system that separates color and brightness information, thus offering better quality than VHS-C, for example.

**Hosiden connector** – A small connector with four conductors used for -› S video signals.

**IEEE 1394** – This is a universal bus system originally developed by Apple for digital data communications. The devices are connected by cables with a maximum length of 4.5 m. The system supports transfer rates of up to 400 Mbps. However, a standard has not been established for video data due to the lack of specifications for the format of video data using this bus. Sony got down to brass tacks and closed this gap by installing FireWire™ sockets in its digital camcorders and developing its own protocol. Thanks to FireWire™ and the Sony protocol, the dream of loss-free video editing has finally come true.

**iLink** – Sony's name for ·› IEEE 1394

**Interlacing** – see Fields

**Linear editing** – The origins of linear video editing date back to analog video. The original video data is generally present in the same sequence as the edited video clips. A simple type of linear editing would be, for example, transferring video material from an analog video camera to a video recorder while discarding a number of clips. If you then insert a new clip in the middle, however, all of the following clips will also require editing.

**Luma keying** – Unlike chroma keying, the transparency of the video is determined on the basis of brightness in luma keying.

**Luminance** – Luminance refers to brightness in ·› YUV. (Y)

**Main memory** – see RAM

**MiniDV** – The consumer version of the DV format. Also see –› DV.

**MiniDVD** – This is a process in which ·› DVD data, including the DVD directory structure and navigation menu, is burned onto a blank conventional CD. Many of the currently-available DVD players can play MiniDVDs. Due to their lower capacity, MiniDVDs can only store around 18 minutes of video data. If you do not own a DVD burner, we recommend recording video material on ·› SVCD.

**MJPEG** – Motion JPEG is a compression process in which every single frame in the video data stream is compressed individually.

**MPEG** – The Motion Picture Experts Group is a consortium of leading manufacturers and developers of video technology that agrees on new standards such as MPEG-1 or MPEG-2.

**Nonlinear editing** – Unlike ·› linear editing, individual clips can be edited here without affecting the following clips. For example, with nonlinear editing, you can shorten or remove a clip at the beginning of a video project without having to edit the following clips as a result.

**NTSC** – NTSC is the video standard used in the USA and Japan. NTSC has a higher frame rate than PAL (30 frames or 60 ‑› fields per second), but a lower resolution (525 rows, with 480 visible). Color depiction in NTSC is realized in ‑› YIQ.

**PAL** – This is the most common video standard in Europe. PAL displays 25 frames (or 50 ‑› fields) per second and has a resolution of 625 rows, of which 576 are visible. Color depiction in PAL is realized in ‑› YUV.

**Preview** –The preview offers you a quick overview of your work. The final quality is normally considerably higher than that of the preview.

**RAM** – Random Access Memory is the main memory of your PC. Since video editing with effects is very memory-intensive, the old rule applies: you can never have enough RAM!

**Rendering** – this refers to the processing of video or audio clips after an editing operation has been completed, for example after the application of an effect or filter.

**RGB color space** – In the RGB color space, each visible pixel is made up of the three components R(ed), G(reen) and B(lue). To achieve the natural display of colors on a computer, each of these components must have at least 256 values. This corresponds to exactly one byte for each color component. A single complete video image would thus require 768 pixels x 576 pixels x 3 bytes = 1,327,104 bytes. This corresponds to around 1.2 MB per frame! One second of video in the RGB color space would therefore require around 31.6 MB of storage space. Using this process, a 2 GB hard drive would have a video capacity of around one minute. No current hard drive can deliver this volume of data in real time, but a number of options are available to reduce the data volume of the video signal substantially through transformation to a different color space (usually YUV) and compression (usually MJPEG).

**S video** – Unlike ‑› composite video, chrominance and luminance are transmitted separately in S video, resulting in higher quality.

**Saturation** – Describes the share of color in the picture.

**SECAM** – The English drive on the left, the French use SECAM. SECAM is the third video standard after PAL and NTSC. Today it is only in use in France and a number of Eastern countries. East Germany, for example, also once used the SECAM standard.

**Storyboard** – Unlike the ‑› timeline, the storyboard offers a thematic overview of your video project. Individual scenes can be identified easily, but it does not deliver a sense of the actual length of the project.

**SVCD** – Abbreviation for Super Video CD. SVCDs are similar to ‑› VCDs, but they have a great advantage in that their data is in MPEG-2 format with a ‑› variable bit rate. In addition, the resolution of 480 X 576 pixels is higher than that of the VCD. An SVCD generally can contain

45-50 minutes of video material. The bit rate (audio and video) of an SVCD may not exceed 2.6 Mbps. SVCDs can be viewed using many standalone DVD players.

**Timeline** – The timeline is the time axis upon which you position and edit your video clips.

**Transition** – see Fading

**Trimming** – This refers to adjusting the length of a video clip at the beginning and/or end.

**VCD** – Abbreviation for Video CD. The Video CD has a PAL resolution of 352 X 288 pixels and stores audio and video data in MPEG-1 format. VCDs use a constant ·› bit rate of 1.15 Mbps for video and 224 kbps for audio data. VCDs can be viewed in virtually any DVD player.

**Video filter** – Video filters let you influence your video material in a wide range of ways. For example, you can manipulate the colors of your video film or use complex filters to degrade your new, top-quality film to look like an old, silent movie.

**Video for Windows** – This is an old, but still commonly used, video concept for Windows.

**YIQ** – YIQ is a color space related to ·› YUV. It is also characterized by a brightness component ·› luminance (Y), but also by different color components, I (cyan-orange balance) and Q (magenta-green balance). YIQ is used for ·› NTSC, for example.

**YUV** – YUV is the designation for a color space characterized by a brightness component ·› luminance (Y) and two color components ·› chrominance (U, V).