PCI Video Board

Centaurus

Installation Guide

Centaurus Installation Guide

Installation Guide Version 2.0 for Centaurus

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Registration Form

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Dear customer,

this product was developed and tested thoroughly. Unfortunately, the possibility of problems and errors can never be ruled out. To support us in helping you as fast as possible if such a case occurs, please fill in this registration form and send or fax it to the address on the right.

You may also use our online registration form which can be accessed from the following internet page: http://www.dvs.de/english/support/support.html

Customer

Name: _____

Company: _____

Contact: _____

Address: _____

_____

_____

Phone: _____

Fax: _____

Vendor: _____

Centaurus

Serial No.: _____

Remarks: _____

_____

Computer

Brand: _____ Type: _____

Operating System: _____ Version: _____

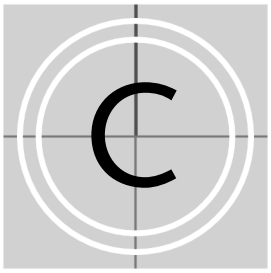
Connected devices
(Brand and type of edit controller, VTR, color grading system, etc.)

_____

_____

_____

Contents



Introduction

This documentation describes Centaurus, the ultimate DVS product for OEM customers. It is centered around the Centaurus board, a half-length PCI-X bus single board for the real-time input and output of uncompressed HDTV, SDTV and AES/EBU audio signals. Combining proven technologies from former OEM boards, Centaurus offers developers even more flexibility, power and reliability. Based on the PCI-X bus architecture, Centaurus supports all video formats from standard definition in PAL as well as NTSC through high definition up to full 2K film resolution. Using the software development kit (SDK), which is compatible to DVS' former OEM products, you can build powerful HDTV and SDTV solutions, for example, for editing, compositing, virtual studio or titling with Centaurus.

1.1 Overview

This guide informs you about the installation of Centaurus as well as all connection possibilities. Furthermore, it provides information about the setting of license keys, the upgrade of the PCI interface, the testing of the installation and of servicing Centaurus, for example, in case you want to upgrade the HDTV single-link to its dual-link version (expansion of Centaurus).

In detail the chapters contain the following information:

Chapter 1	Begins with a short introduction to Centaurus, followed by a note regarding the audience this manual is written for and an explanation of the conventions used in this manual. Beside the system requirements necessary to run Centaurus, it provides safety instructions that you must adhere to and some important notes that you should read.
Chapter 2	Gives an overview of Centaurus as an OEM product and describes shortly its individual components. Furthermore, all connectors and interfaces of the Centaurus board and its additional panels will be detailed in this chapter.
Chapter 3	Describes the installation of Centaurus. First the hardware installation is explained, followed by a description of the software installation.
Chapter 4	Details service and maintenance work, for example, in case of a PCI upgrade failure or when upgrading the HDTV single-link Centaurus to its dual-link version.
Appendix	Provides technical details and general information about Centaurus.
Index	This chapter facilitates the search for specific terms.

1.2 Target Group

To use this manual you should have experience in computer software handling and be familiar with the hardware structure and interior of a computer system.

1.3 Conventions Used in this User Guide

The following typographical conventions will be used in this documentation:

– Texts preceded by this symbol are parts of a list.
• Texts preceded by this symbol describe activities that you must perform in the order indicated.

Texts preceded by this symbol are general notes intended to facilitate work and help avoid errors.

You must pay particular attention to text that follows this symbol to avoid errors and possible resulting damages thereof.

Texts following this symbol you must pay particular attention to to avoid dangers and personal injuries.

" " Texts enclosed by quotation marks are references to other manuals, guides, chapters, or sections.

'Window'	Text in bold with single quotation marks indicates a window name
Menu	Text in italic and bold indicates either a menu name or options in a menu list
BUTTON	Text in small caps and bold indicates push buttons
File	Directory structure or file
Command	Command, for example, at a prompt; a bold typeface indicates that this has to be typed in exactly as written
Command	In the standard text flow a regular typeface of a command indicates commands, variables, or parameters; it may also indicate a file syntax or contents of a file; when used in conjunction with the command in **bold**, it stands for optional parameters

1.4 Safety Instructions

To use Centaurus correctly please heed the following:

Please read the following safety instructions very carefully before attempting any installation and/or performing any work on Centaurus.

If Centaurus is not used in compliance with the safety instructions, the warranty and all resulting liability claims will be void.

General

Centaurus has been built according to the applying safety regulations. To minimize the possibility of a faulty operation of the device all manuals and guides must be available at all times at the operation site. Before installing and/or using Centaurus the manuals and guides delivered with Centaurus must be read and observed.

- Use Centaurus only in apparent good technical order.
- The system you are trying to install Centaurus in usually works with voltages that can be hazardous to your health. Never work on the system or access its interior with the power cable(s) being plugged in. Make sure the power supply is disconnected from the components you intend to work on.
- Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed. Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the video system. Avoid touching the components of the computer system and Centaurus whenever possible.
- Computer hardware contains components that are sensitive to changing voltages. Connecting or disconnecting Centaurus to or from peripheral hardware while any of them is switched on may damage the hardware. Switch off all peripheral hardware before connecting or disconnecting anything.
- Use the board only in compliance with the technical data laid out in section “Technical Data” on page A-1.
- Centaurus may not be misused, abused, physically damaged, neglected, exposed to fire, water or excessive changes in the climate or temperature, or operated outside maximum rating.
- Do not perform any changes or extensions to Centaurus whatsoever.

Environmental Conditions

For error-free working and a long service life, Centaurus needs some basic environmental conditions:

- Never operate Centaurus without the cooling plate installed.
- Do not expose Centaurus to sources of heat, such as direct sunlight or a radiator.
- The chassis of the computer system where the Centaurus board is installed must be equipped with a sufficient ventilation for cooling reasons.
- Avoid areas with high humidity or dust. Best operating conditions are given in an air-conditioned site.
- Do not expose Centaurus to strong electric or magnetic fields.
- Avoid areas where Centaurus will be subject to vibrations or shocks.

1.5 Important Notes

The following provides information about warranty and the conformity of the product. Furthermore, it includes an important note if you want to unplug cables and some information about optionally available breakout boxes.

Warranty Information

This product is warranted to be free of defects in materials and workmanship for a period of one year from the date of purchase. DVS extends this Limited Warranty to the original purchaser.

In the event of a defect or failure to confirm to this Limited Warranty, DVS will repair or replace the product without charge. In order to make a claim under this Limited Warranty, the purchaser must notify DVS or their representative in writing of the product failure. In this Limited Warranty the customer must upon DVS' request return the product to the place of purchase or send the defective device to a given address for the necessary repairs to be performed. If the customer is not satisfied with the repair, DVS will have the option to either attempt a further repair, exchange the product or refund the purchase price.

This warranty does not cover:

- Products not developed by DVS Digital Video Systems GmbH.
- Products not used in compliance with the safety instructions detailed in section "Safety Instructions" on page 1-4.
- Products on which warranty stickers or product serial numbers have been removed, altered or rendered illegible.
- The costs of installations, removals, transportations, or reinstallations.
- Costs for transportation damages.
- Damages caused to any other item.
- Any special, indirect, or consequential damages, and damages resulting from loss of use, data, or profits, or business interruption.

Declaration of Conformity

This product has been tested according to the applying national and international directives and regulations. Further information about this can be found in section "Conformity Declarations" on page A-10.

Unplugging Cables

If you want to unplug one of the flat cables after its installation on the board, please observe the following:

Flat cable connectors are equipped with a locking mechanism to prevent them from becoming disconnected after they were plugged in.

Don't use any force to disconnect flat cable plugs, otherwise the socket on the board may be damaged or even break off.

To unplug the connector use your index finger and thumb to press the locking wings together.

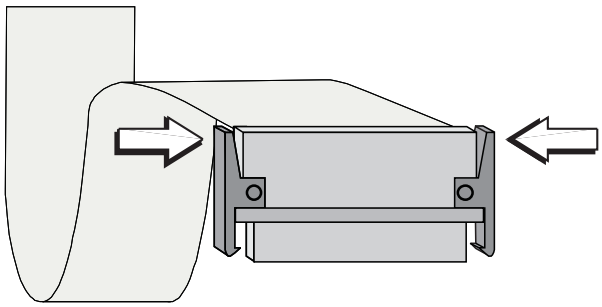


Figure 1-1: Unplugging flat cables

Then you can easily remove the connector.

Breakout Box

A modular breakout box is optionally available for Centaurus to replace the breakout cables and reduce the amount of panels. Due to its modular design – each module provides connectors on a half-19" front panel – you can adapt the overall configuration to your personal needs. To connect to the breakout box a different slot panel will be included in its delivery which will replace all additional slot panels described in this manual (see section "Overview of Panels" on page 2-11).

For more information about the different types of breakout boxes available for Centaurus please refer to the "Breakout Box II" installation guide which can be found on the DVS OEM web pages, or contact your local vendor or DVS directly.

1.6 System Requirements

Required Hardware

These are the minimum hardware requirements that the computer system has to meet if you want to use Centaurus.

– Pentium 4 or similar with at least 1.8 GHz
– Mainboard with 64-bit, 66-/100-/133-MHz PCI-X bus

Ex factory the board is set to operate with 66 MHz.

With its default firmware the Centaurus board will not work when plugged in a PCI-X bus set to 133 MHz. However, it can be plugged in a 133 MHz capable bus if this is set to operate, for example, with 100 MHz. In such a case the PCI-X bus has to be set to 100 MHz in the BIOS of the computer system and the respective DIP switch on the Centaurus board to the correct clock frequency.

– 1 free slot in a bus-master capable PCI segment that supports PCI-X
– 512 MB RAM

Supported Operating Systems

Centaurus can be used with the following operating systems:

– Windows 2000 and XP
– Linux (Red Hat and Fedora)
– IRIX

Be sure that you have installed the newest Service Packs for your system, otherwise you may encounter soft- and/or hardware problems.

Required Software

Centaurus needs the DVS driver. Furthermore, to be programmed for applications the SDK by DVS is necessary. Both software items should be included in your delivery. They are also available online on the DVS OEM web pages.

Overview

This chapter shows an overview of Centaurus thereby detailing all connectors and interfaces of the Centaurus board and its additional panels. First the components of the DVS OEM product as it is delivered to you are described shortly. Afterwards an overview of the Centaurus board is provided, followed by an overview of the optional module necessary for some of the additional features available for Centaurus. The chapter will be concluded with a detailed overview of the delivered slot panels.

Please note that some of the panels as well as the optional module may not be included in your Centaurus configuration. They belong to optional features of Centaurus and are only necessary if you ordered the respective feature.

2.1 Overview of the OEM Product

Centaurus as an OEM product consists of various individual components that combined will give you the opportunity to develop your own real-time video and film solutions. The following diagram shows the different components included in your delivery of Centaurus in detail:

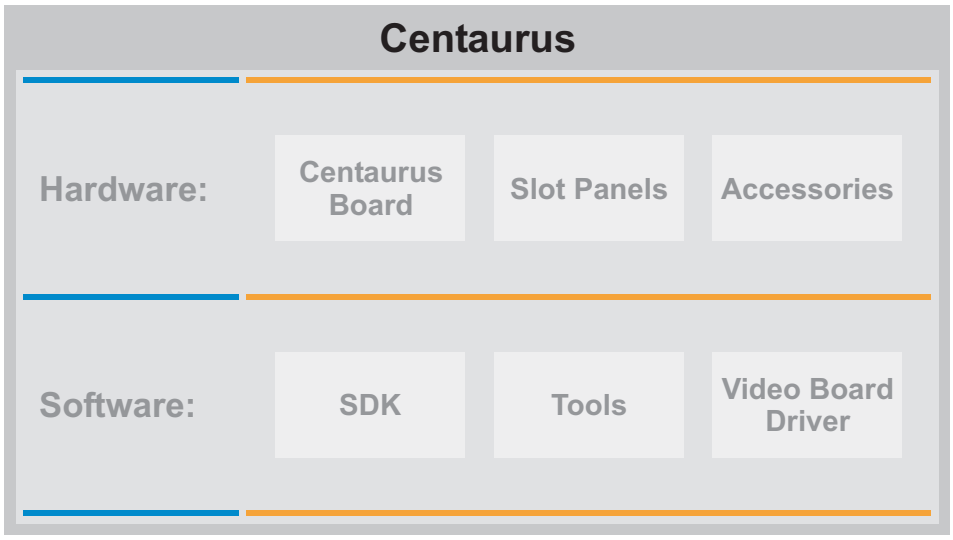


Figure 2-1: Centaurus overview

The components of Centaurus can be divided into hardware and software components:

To the hardware components belong the items described in this installation guide. Centaurus is centered around the Centaurus board, a half-length PCI-X bus single board for real-time input and output of uncompressed HDTV, SDTV and AES/EBU audio signals. Based on PCI-X bus architecture, Centaurus supports all video formats from standard definition in PAL as well as NTSC through high definition up to full 2K film resolution. To use all the features of Centaurus several slot panels may have been delivered to you as well as other accessories such as breakout cables. All these items and their installation will be described in this manual.

Among the software components you can find the software development kit (SDK) that can be used to build editing and storage solutions with Centaurus. The SDK is compatible among the DVS OEM products meaning your code can be used with other DVS OEM boards as well. Several tools for basic hardware setup and diagnostics such as the DVSConf program complement the SDK. To run properly the video board driver has to be loaded prior to using Centaurus which can be done with the tools for the hardware setup. The video board driver controls the Centaurus board and thus the in- and output of video signals. The SDK as well as all other software components are described in the separate SDK documentation.

2.2 Overview of the Board

The PCI video board delivered with Centaurus is a complex piece of technology. Depending on the overall configuration it may be equipped with connectors on two circuit board levels, the base circuit board (the Centaurus board) and the IM (Iris module) circuit board. In its standard version with HDTV single-link capability only the base circuit board will be delivered to you. In its extended version the PCI video board will be additionally equipped with the IM circuit board. It will already be mounted on the Centaurus board to provide for some of the optionally available features of Centaurus, such as HDTV dual link and key channel.

However, in both versions of Centaurus the PCI video board is covered by a cooling plate to enable a sufficient cooling for the temperature sensitive parts (chips) on the board.

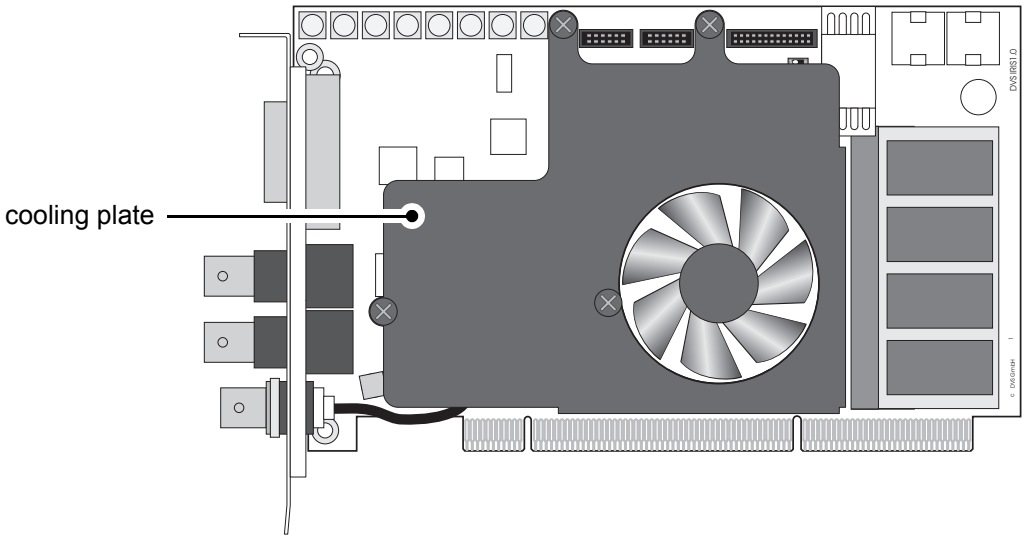


Figure 2-2: The cooling plate

If necessary, most items of the PCI video board can be reached easily without removing the cooling plate, for example, the DIP switches can be set with the help of a thin object such as a small flat blade screw driver. Only when upgrading the single-link version of Centaurus to its dual-link version by installing the IM circuit board, you may have to remove the plate.

The upgrade procedure will only be necessary when you have acquired Centaurus in its single-link version first and you want to expand it at a later time, for example, to its dual-link version. A description of how to upgrade Centaurus can be found in section “Expansion of Centaurus” on page 4-4.

This section provides an overview of the PCI video board of Centaurus. First, an overview of the connectors and switches on the base circuit

board will be given, followed by an overview of the connectors implemented on the second level circuit board, the IM circuit board.

The items available on the Centaurus board which are not described in the following sections are used during the manufacturing process only and without function in normal operation mode.

2.2.1 Centaurus Board Layout

The following provides an overview of the base circuit board of Centaurus, the Centaurus board. You can find descriptions of all items necessary for an operation of the board here.

In all versions the Centaurus board is covered by a cooling plate that provides sufficient cooling for the temperature sensitive parts (chips) of the board. However, for documentational reasons the following figure shows the PCI video board without the cooling plate installed:

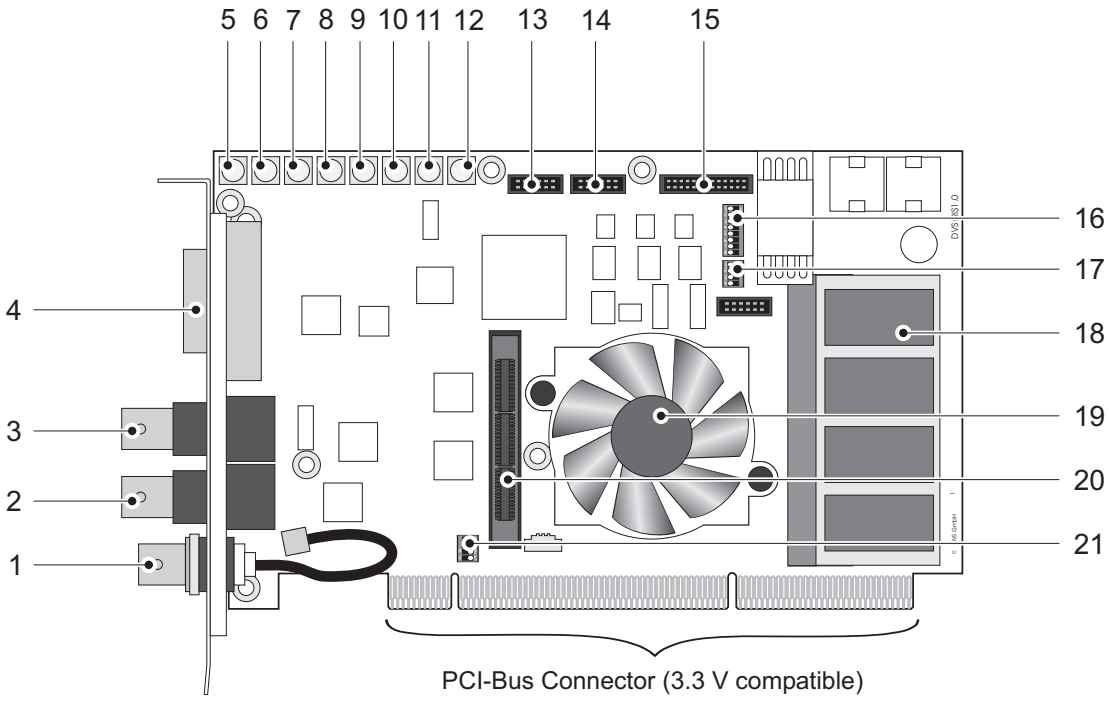
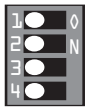
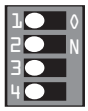
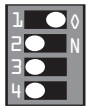


Figure 2-3: Overview of the items and connectors on the Centaurus board

No.	Item	Explanation
1	REF IN	BNC connector for the reference input
2	(HD) SDI OUT A	BNC connector for an output of port A (serial digital interface); either output of YUV in single-link or first stream of YUVA/RGB[A] in dual-link mode
3	(HD) SDI IN A	BNC connector for an input of port A (serial digital interface); either input of YUV in single-link or first stream of YUVA/RGB[A] in dual-link mode
4	DVI OUT	DVI connector for an output of analog and digital video signals; a pin-out of this connector can be found in section "Signal In- and Outputs" on page A-5
5	H Sync OUT	MCX connector for an output of a video synchronization signal (horizontal sync)
6	V Sync OUT	MCX connector for an output of a video synchronization signal (vertical sync)
7	CVBS OUT	MCX connector for a composite video burst signal, either analog output of SD video or used for synchronization purposes
8	R OUT	MCX connector for an analog video signal output of red
9	G OUT	MCX connector for an analog video signal output of green
10	B OUT	MCX connector for an analog video signal output of blue
11	SD IN	MCX connector for an input of digital SD video signals
12	SD OUT	MCX connector for an output of digital SD video signals
13	GPI	Flat cable connector for the general purpose interface
14	RS-422	Flat cable connector for an in- and output of RS-422 signals
15	AUDIO/LTC	Flat cable connector for the audio and LTC interface

No.	Item	Explanation
16	DIP Switch for Manufacturing	This switch is used during the manufacturing process only; do not alter its setting
		 Default setting of the manufacturing DIP switch; please observe the orientation of the switch on the board
17	DIP Switch for Flash Controller	This switch controls the operation of the on-board Flash controller; it defines the version set of the map file that will be loaded at startup
		 Default setting of the DIP switch for the Flash controller; please observe the orientation of the switch on the board
18	Memory	256 MB RAM memory module
19	Fan	The fan together with the cooling plate cools the temperature sensitive parts of the Centaurus board
20	Expansion slot	Mictor connector to connect the IM circuit board to the Centaurus board
21	DIP Switch for PCI	DIP switch to set up the PCI board interface, for example, the clock frequency; please observe the orientation of the switch on the board
		 PCI-X 100/133 MHz
		 PCI-X 66 MHz (factory setting)
	 With its default firmware the Centaurus board needs a PCI-X interface that works with either 66 or 100 MHz. However, there is also a firmware version available that allows to operate the Centaurus board at 133 MHz.	

2.2.2 Overview of the IM Circuit Board

This section provides an overview of the connectors present on the second level circuit board of the Centaurus board, i.e. on the IM (Iris module) circuit board. The IM circuit board is necessary for some of the optionally available features of Centaurus, such as HDTV dual link and key channel. It will already be mounted on the Centaurus board when you have ordered these features.

An upgrade (expansion) from Centaurus equipped with single-link HDTV only to a dual-link version is possible without exchanging the hardware. You will then be provided with the IM circuit board which has to be mounted on the Centaurus board. For details about this see section "Expansion of Centaurus" on page 4-4.

In all versions of Centaurus the PCI video board is covered by a cooling plate that provides sufficient cooling for the temperature sensitive parts (chips) of the board. However, for documentational reasons the following figure shows the IM circuit board mounted on the Centaurus board without the cooling plate installed:

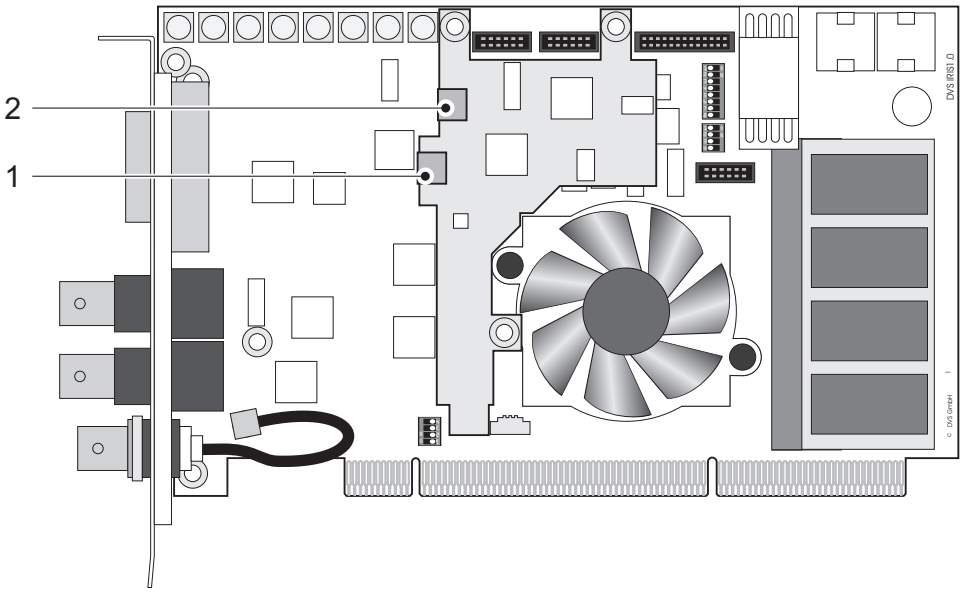


Figure 2-4: Overview of the connectors on the IM circuit board

No.	Item	Explanation
1	(HD) SDI OUT B	BNC connector for an output of port B (serial digital interface); output of the second stream of YUVA or RGB[A] in dual-link mode
2	(HD) SDI IN B	MCX connector for an input of port B (serial digital interface); input of the second stream of YUVA or RGB[A] in dual-link mode

2.2.3 Item on the Rear

This section shows the only operational item located at the rear of the PCI video board. It is detailed to inform you about its default settings:

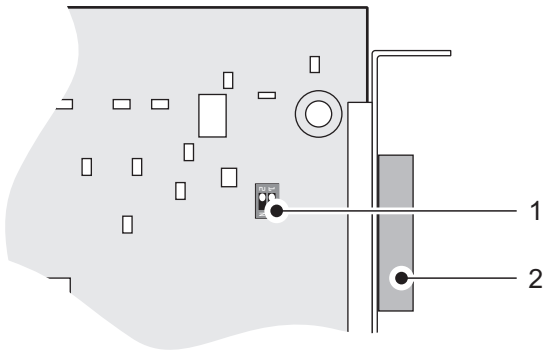


Figure 2-5: Item of the Centaurus board's rear

No.	Item	Explanation
1	DIP Switch DVI Out	This switch configures the DVI Out connector; it is available for manufacturing reasons
		 Default setting of the DIP switch DVI Out; please observe the orientation of the switch on the board
2	DVI Out	See section "Centaurus Board Layout" on page 2-4

2.2.4 Digital Video I/Os of the Centaurus Board

DVS named the external connectors for the in- and output of the digital video signals alphabetically. For YUV you will usually use one channel (connectors labeled 'A', single link). For YUVA you will need two channels ('A' for YUV and 'B' for the key signal). With RGB you will always need two channels ('A' and 'B', dual link). The same applies to transmitting rasters of a higher resolution such as 2K.

Single-Link Centaurus Board

In its single-link version the Centaurus board offers two ports for either an input or an output of video signals. For example, for an output the Centaurus board provides the connectors (HD) SDI OUT A and SD OUT (see the overview in section "Centaurus Board Layout" on

page 2-4). Via the delivered software by DVS you can configure these ports freely:

– In its HDTV single-link version the A ports are used for single-link YUV for HD as well as SD, or the first part of the RGB SD signal in dual link.
– The B ports (SD IN/SD OUT) provide for SDTV either the key channel, a mirrored output of port A or the second part of RGB.
– Additionally, for an input of SDTV in YUV you can switch between an input of port A or port B.

The table below shows the signal distribution over the I/O ports for the different video rasters (color modes):

Table 2-1: I/O signal distribution for HD single-link Centaurus board

Raster	Video Mode	(HD) SDI		SD	
		IN A	OUT A	IN	OUT
SD	YC_bC_r 4:2:2	Y, C_b, C_r[1]	Y, C_b, C_r	Y, C_b, C_r[1]	Y, C_b, C_r
	YC_bC_rA 4:2:2:4	Y, C_b, C_r	Y, C_b, C_r	A	A
	RGB 4:4:4	G, ½ R, ½ B	G, ½ R, ½ B	½ R, ½ B	½ R, ½ B
	RGBA 4:4:4:4	G, ½ R, ½ B	G, ½ R, ½ B	½ R, ½ B, A	½ R, ½ B, A
HD	YC_bC_r 4:2:2	Y, C_b, C_r (HD)	Y, C_b, C_r (HD)	–	Y, C_b, C_r (SD)
	YC_bC_rA 4:2:2:4	–	–	–	–
	RGB 4:4:4	–	–	–	–
	RGBA 4:4:4:4	–	–	–	–

1) With this raster and color mode the input ports can be exclusively switched via the software.

Dual-Link Centaurus Board

In its dual-link version the Centaurus board offers a total of three ports for either an input or an output of video signals. For example, for an output the Centaurus board provides the connectors (HD) SDI OUT A, (HD) SDI OUT B and SD OUT (see the overviews in section "Centaurus Board Layout" on page 2-4 and section "Overview of the IM Circuit Board" on page 2-7). Via the delivered software by DVS you can configure these ports freely:

– In its HDTV dual-link version the A ports are usually used for single-link YUV or the first part of the RGB signal in dual link. Ports B are usually used for key in YUVA mode or the other part of the RGB signal as well as the key signal in dual-link mode.
– However, you also have the possibility at hand to get a mirrored output of the signal.

The table below shows the signal distribution over the I/O ports for the different video rasters (color modes):

Table 2-2: I/O signal distribution for HD dual-link Centaurus board

Raster	Video Mode	(HD) SDI		(HD) SDI		SD	
		IN A	OUT A	IN B	OUT B	IN	OUT
SD	YC_bC_r 4:2:2	Y, C_b, C_r	Y, C_b, C_r	–	Y, C_b, C_r (mirror)	–	–
		Y, C_b, C_r	Y, C_b, C_r	–	–	–	Y, C_b, C_r (mirror)
		–	Y, C_b, C_r (mirror)	–	–	Y, C_b, C_r	Y, C_b, C_r
		–	–	–	Y, C_b, C_r (mirror)	Y, C_b, C_r	Y, C_b, C_r
	YC_bC_rA 4:2:2:4	Y, C_b, C_r	Y, C_b, C_r	A	A	–	–
		Y, C_b, C_r	Y, C_b, C_r	–	–	A	A
	RGB 4:4:4	G, ½ R, ½ B	G, ½ R, ½ B	½ R, ½ B	½ R, ½ B	–	–
		G, ½ R, ½ B	G, ½ R, ½ B	–	–	½ R, ½ B	½ R, ½ B
	RGBA 4:4:4:4	G, ½ R, ½ B	G, ½ R, ½ B	½ R, ½ B, A	½ R, ½ B, A	–	–
		G, ½ R, ½ B	G, ½ R, ½ B	–	–	½ R, ½ B, A	½ R, ½ B, A
HD	YC_bC_r 4:2:2	Y, C_b, C_r (HD)	Y, C_b, C_r (HD)	–	Y, C_b, C_r (HD, mirror)	–	Y, C_b, C_r (SD)
	YC_bC_rA 4:2:2:4	Y, C_b, C_r (HD)	Y, C_b, C_r (HD)	A	A	–	Y, C_b, C_r (SD)
	RGB 4:4:4:	G, ½ R, ½ B (HD)	G, ½ R, ½ B (HD)	½ R, ½ B (HD)	½ R, ½ B (HD)	–	Y, C_b, C_r (SD)
	RGBA 4:4:4:4	G, ½ R, ½ B (HD)	G, ½ R, ½ B (HD)	½ R, ½ B, A (HD)	½ R, ½ B, A (HD)	–	Y, C_b, C_r (SD)

2.3 Overview of Panels

To provide all the connection possibilities for the various features of Centaurus at a computer casing, several panels are delivered with the individual board. This section provides an overview of the different panels.

Please note that some of the panels may not be included in your Centaurus configuration. They belong to optional features of Centaurus and are only necessary if you ordered the respective feature.

A modular breakout box is optionally available for Centaurus which will replace all additional slot panels described in this section. Further information about the breakout box can be found in section “Breakout Box” on page 1-7.

2.3.1 SDI and RS-422 Panel

The SDI and RS-422 panel is included in the standard configuration of Centaurus. It provides the connectors for the second link of the dual-link connections. Additionally, a CVBS output is installed on this panel that provides a composite video signal.

The RS-422 connector available on the panel is a DB-15 (HD) connector. It can be equipped with a breakout cable that will then provide two female DB-9 connectors for a standard RS-422 connection (see figure 2-7 on page 2-13). The breakout cable is included in the delivery of Centaurus. The two ports can be switched between master and slave mode. Pin-outs of the DB-15 (HD) connector on the slot panel and the DB-9 connectors available via the breakout cable can be found in section “Signal In- and Outputs” on page A-5.

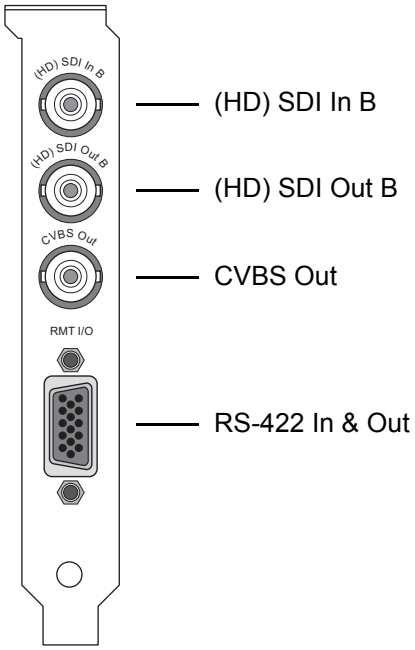
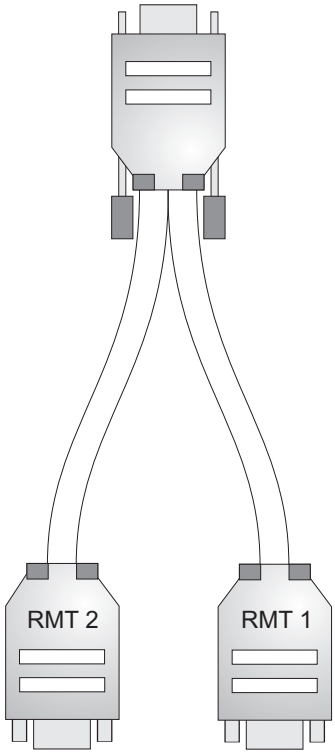


Figure 2-6: Panel with SDI and remote control connections

Item	Explanation
(HD) SDI In B	BNC connector for an input of port B (serial digital interface); input of the second stream of YUVA or RGB[A] in dual-link mode
(HD) SDI Out B	BNC connector for an output of port B (serial digital interface); output of the second stream of YUVA or RGB[A] in dual-link mode

Item	Explanation
CVBS Out	BNC connector for a composite video burst signal, either analog output of SD video or used for synchronization purposes
RS-422 In & Out	DB-15 (HD) connector (male), serial RS-422 interface for master/slave control, a breakout cable to two DB-9 connectors is included in the delivery:  *Figure 2-7: RS-422 breakout cable*

2.3.2 Audio Panel

The audio panel is available as an optional feature. An analog stereo headphone output and a DB-25 connector for digital audio (AES/EBU) and LTC signals are provided on this slot panel.

To the DB-25 connector you can either connect a breakout cable providing eight XLR connectors to interface directly with audio devices, or a half-19" audio breakout box which is optionally available. The latter will then provide the necessary connections in one place. Further information about the breakout box can be found in section “Breakout Box” on page 1-7. A pin-out of the DB-25 connector can be found in section “Signal In- and Outputs” on page A-5.

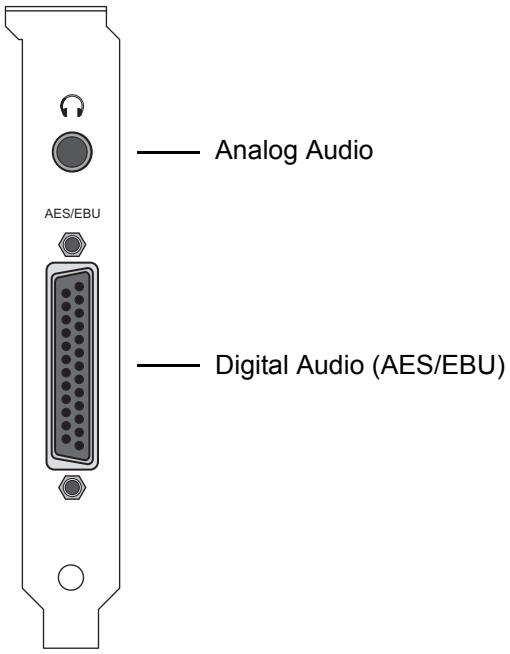


Figure 2-8: Panel for analog and digital audio

Item	Explanation
Analog Audio	3.5 mm unbalanced stereo headphone jack to monitor the audio output
Digital Audio (AES/EBU)	DB-25 connector (female) for audio signal in- and output of channels 1 to 8

Prior to the installation of the audio panel you have to set the jumpers on the printed board to their desired settings: you can choose between four digital stereo channels or three digital stereo channels and one LTC in- and output. This is described in detail in section “Jumper Settings of the Audio Panel” on page 3-3.

2.3.3 GPI and Wordclock Panel

The GPI and audio wordclock panel is optionally available and provides the general purpose interface and the audio wordclock output.

The GPI port could be used for all kinds of triggers that have to be send to your audio/video system. The provided plug is a DB-9 male connector. A pin-out of this connector can be found in section “Signal In- and Outputs” on page A-5.

A clock frequency according to the currently adjusted audio mode will be supplied by the wordclock output to synchronize to external audio equipment.

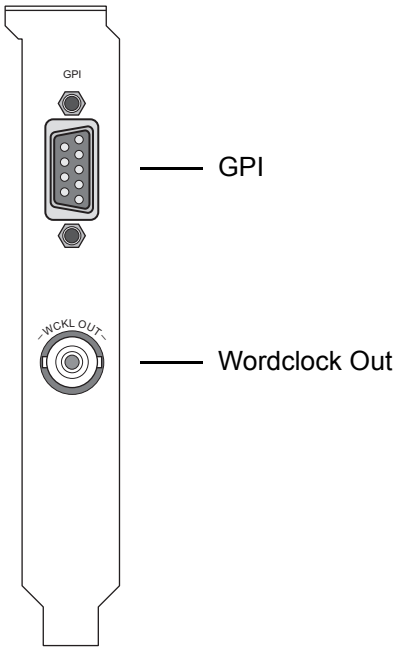


Figure 2-9: Panel for GPI and wordclock

Item	Explanation
GPI	DB-9 connector (male), general purpose interface
Wordclock Out	BNC connector providing a wordclock signal for the synchronization of external audio equipment

Prior to the installation of the GPI and audio wordclock panel you have to check the jumpers on the printed board of the GPI for their correct settings. This is described in detail in section “Jumper Settings of the GPI and Wordclock Panel” on page 3-4.

Installation

This chapter details all the information necessary to install Centaurus in a computer system.

First, the installation of the board itself is described. After that follows a description on how to activate the ordered features. Centaurus offers a lot of features to the user. Some of these are included in the standard version of Centaurus, some belong to optional packages and have to be ordered explicitly if you want to use them. Via a license key the whole feature set that you have ordered with Centaurus can be activated.

For some installations it may be necessary to upgrade the PCI interface (firmware) of Centaurus. This is described in this chapter as well.

Once everything is set, you may test your installation and system configuration if everything is working properly.

When switching on the computer system where the Centaurus board is installed, the fans of the board will turn off after approximately two seconds. This is a normal behavior and does not indicate a fault. The fans will work correctly as soon as the driver is loaded.

The DVS driver to control the board is part of the SDK software package. For information on how to install the DVS driver please refer to the separate SDK documentation.

3.1 Hardware Installation

How to install Centaurus in a computer system is described in this section. The installation has to be performed in four steps: First, you have to prepare the computer system and the panels as well as set up the clock frequency that the board shall use. After that the board itself must be installed. This is followed by the installation of the different panels. As the fourth and last step the hardware installation has to be finished.

If you want to disconnect the flat cables from the board once they are plugged in, please read section “Unplugging Cables” on page 1-7.

3.1.1 Preparations

Before installing the Centaurus board the computer system and some of the panels have to be prepared for the installation. Furthermore, the desired clock frequency for the board has to be selected. All these preparations will be described in the following.

Preparing the Computer System

To prepare the computer system where Centaurus has to be installed perform the following:

- Disconnect all cables (especially the power cords) from the computer system where Centaurus is to be installed.

The computer system you are trying to install Centaurus in usually works with voltages that can be hazardous to your health.

Never work on the system or access its interior with the power cable(s) being plugged in. Make sure the power supply is disconnected from the components you intend to work on.

- Open the computer casing.

For details on how to do this, please refer to the respective manufacturer’s manual.

Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed.

Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the video system. Avoid touching the components of the computer and the Centaurus board whenever possible.

The computer system is now ready for the installation of the Centaurus board and you have to proceed with the checking of the panels, i.e. checking the audio and the GPI and wordclock panel for their correct jumper settings.

Jumper Settings of the Audio Panel

Up to four stereo channels of AES/EBU or three stereo channels of AES/EBU and one LTC in- and output can be transmitted over the DB-25 connector that is available on the audio panel. This signal configuration has to be configured via jumper settings on the printed board mounted to the audio slot panel.

- Before installing the audio panel, please check whether the jumpers on the printed board are set to your desired configuration:

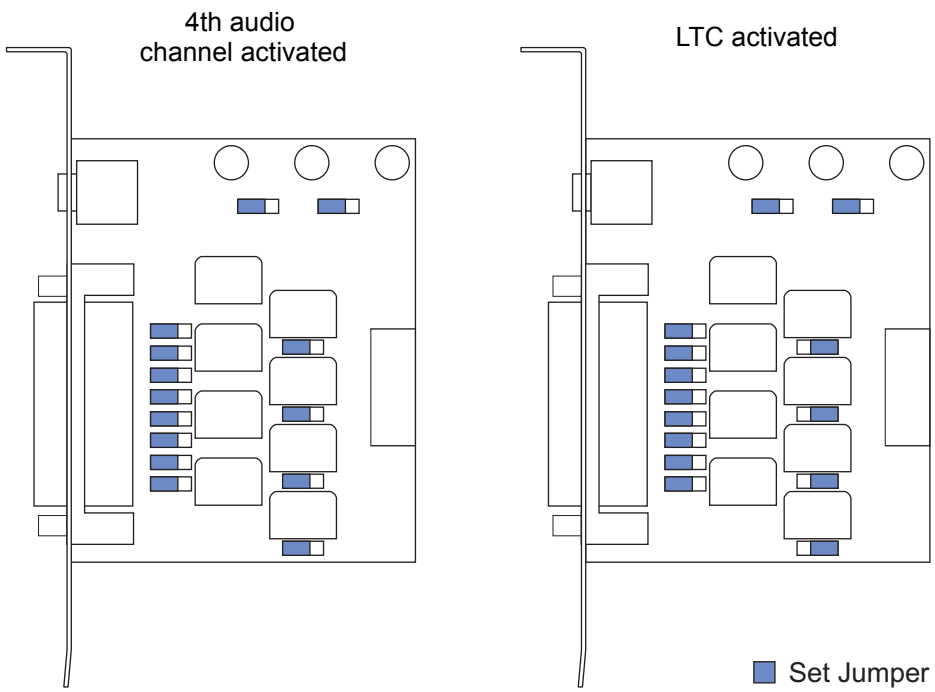


Figure 3-1: Jumper settings for audio circuit board

After checking and, if appropriate, adjusting the jumpers of the audio panel for their correct settings you have to check the settings of the GPI and wordclock panel.

Jumper Settings of the GPI and Wordclock Panel

Prior to the installation of the GPI and wordclock panel, you have to check the jumpers on the printed board of the GPI for their correct settings. If they are not set correctly, using this interface may result in an unexpected behavior of Centaurus.

- Please check whether the jumpers are set as shown in the figure below:

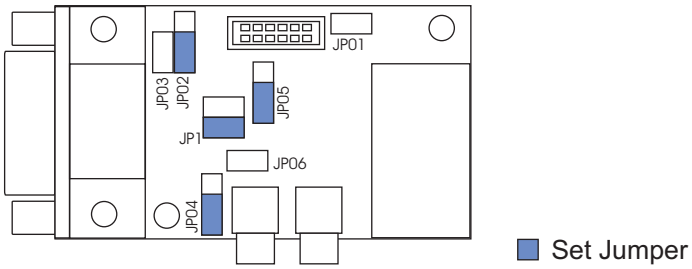


Figure 3-2: Jumper settings for GPI and wordclock panel

After checking and, if appropriate, adjusting the jumpers on the printed board for the GPI you have to set up the clock frequency of the PCI-X bus and the Centaurus board.

Setting up the Clock Frequency

When to be run with its default firmware, the Centaurus board has to be plugged in a PCI-X bus that operates with 66 or 100 MHz. It will not work when plugged in a PCI-X bus set to 133 MHz. Nevertheless, there is also a firmware version available that allows to operate the Centaurus board at 133 MHz. Ex factory the board is set to operate with 66 MHz.

If you are not sure about the appropriate clock frequency for your Centaurus setup, it is recommended to install the Centaurus board with 100 MHz in a PCI-X slot capable of 100 as well as 133 MHz. Then you can decide later about the appropriate clock frequency. Further information about the features supported by different firmwares and clock frequencies of the Centaurus board can be found on the DVS OEM web pages.

If you want to use the Centaurus board with a clock frequency different from the factory setting, you have to change the DIP switch for PCI on the Centaurus board to the appropriate setting. Furthermore, in case you want to run the board at 100 MHz, you have to set the PCI-X bus

in the BIOS of the computer system to the this clock frequency later in the installation procedure.

If Centaurus is installed with the 66 MHz setting, two HDTV or 2K data streams at the same time will not be possible.

In all setups it is recommended for an optimum performance of Centaurus to have no other data transfers running in the same PCI bus.

- Select and identify the PCI-X bus where Centaurus shall be installed.
- In case the Centaurus board should run with 100 MHz, memorize the identification number of the PCI-X bus or write it down. During the finishing of the installation you have to adjust the frequency of the selected PCI-X bus in the BIOS settings of the computer system.
- Set the DIP switch for PCI on the Centaurus board to the setting of your liking, i.e. either to 66, 100 or 133 MHz, as indicated in section "Centaurus Board Layout" on page 2-4.

  With the cooling plate in place you can reach the DIP switch on the Centaurus board with a thin object such as a small flat blade screw driver.

After setting up the board for the desired clock frequency the preparations are finished and you can go on with the next step and install the board into the computer system.

3.1.2 Installation of the Board

With the second step the Centaurus board will be installed in the prepared computer system. For this perform the following:

Before installing the board you have to set up the board to a specific clock frequency. Otherwise Centaurus may not work. Further information about this can be found in section "Setting up the Clock Frequency" on page 3-4.

- In the computer system remove the slot bracket from the selected PCI-X slot where the Centaurus board should be installed.

  For the next step please observe not to break off any parts of the PCI video board. Apply pressure to the slot panel and/or the printed circuit board only, not to any of its attached parts.
- Insert the Centaurus board into the PCI-X slot without using excessive force or bending it.

- Afterwards fasten the board with the screw from the slot bracket.

The chassis of the computer system where the Centaurus board is installed must be equipped with a sufficient ventilation for cooling reasons.

Never operate the Centaurus board without the cooling plate installed.

After this the Centaurus board is installed in the computer system and you can move on to the next step, i.e. the installation of the panels.

When switching on the computer system where the Centaurus board is installed, the fans of the board will turn off after approximately two seconds. This is a normal behavior and does not indicate a fault. The fans will work as soon as the driver is loaded correctly.

The DVS driver to control the board is part of the SDK software package. For information on how to install the DVS driver, please refer to the separate SDK documentation.

3.1.3 Installation of the Panels

As the third step you have to connect the delivered panels internally to the Centaurus board and install them in your computer system. For this perform the following:

- Remove as many slot brackets as you need for the additional panels.

The number of additional panels depends on the optional features ordered with Centaurus.

- Now install the panels: Insert the panels of Centaurus into the empty slots and fasten each with a screw from the slot brackets.
- Connect the cables to the appropriate Centaurus board interfaces as detailed in the following:

Connecting the SDI and RS-422 Panel

In a board setup without the IM circuit board (single-link HDTV) the (HD) SDI connectors of the SDI and RS-422 panel are linked to the second link of the SD stream. The respective connections can be found at the top of the Centaurus board. With them connected Centaurus will be able to follow the SMPTE259 specification for SDTV signals.

With the dual-link HDTV version of Centaurus the HD SDI will be connected to the connectors of the IM circuit board (see dotted line in figure below). In this case the SDI links provide a multi-rate connection in accordance with the specifications SMPTE259, SMPTE292 and SMPTE372.

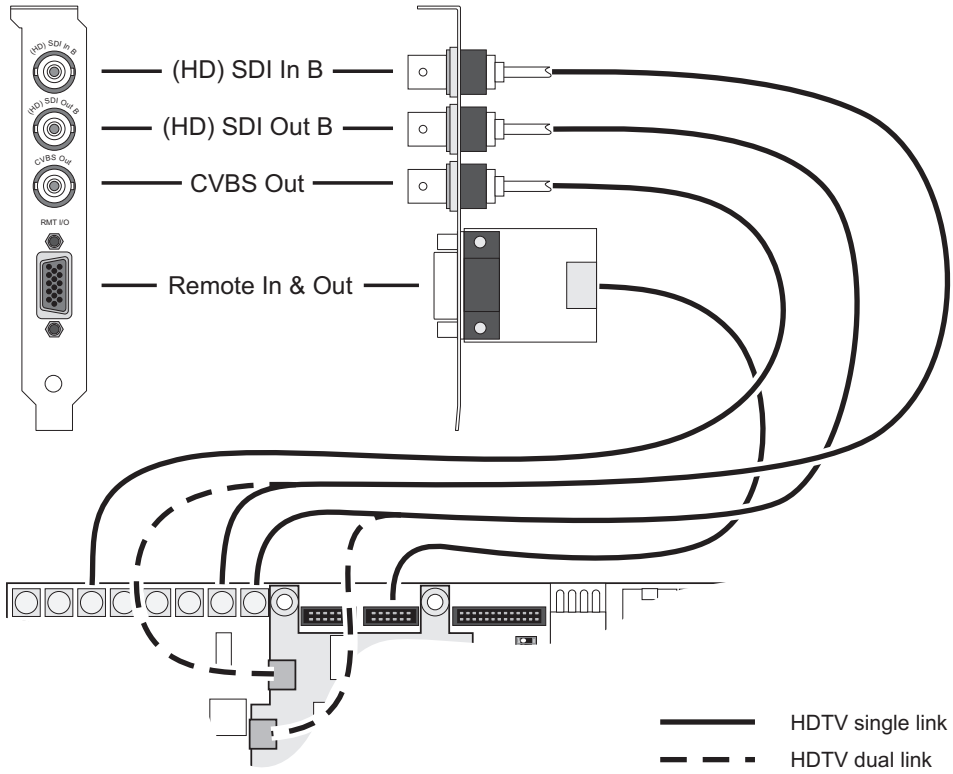


Figure 3-3: Internal connection of SDI and RS-422 panel

Connecting the Audio Panel

The audio slot panel is connected via a 26-pin flat cable to the Centaurus board. To perform the internal connections connect the panel to the board as shown in the following figure:

Prior to the installation of the audio panel you have to set the jumpers on the printed board to their desired settings: you can choose between four digital stereo channels or three digital stereo channels and one LTC in- and output. This is described in detail in section “Jumper Settings of the Audio Panel” on page 3-3.

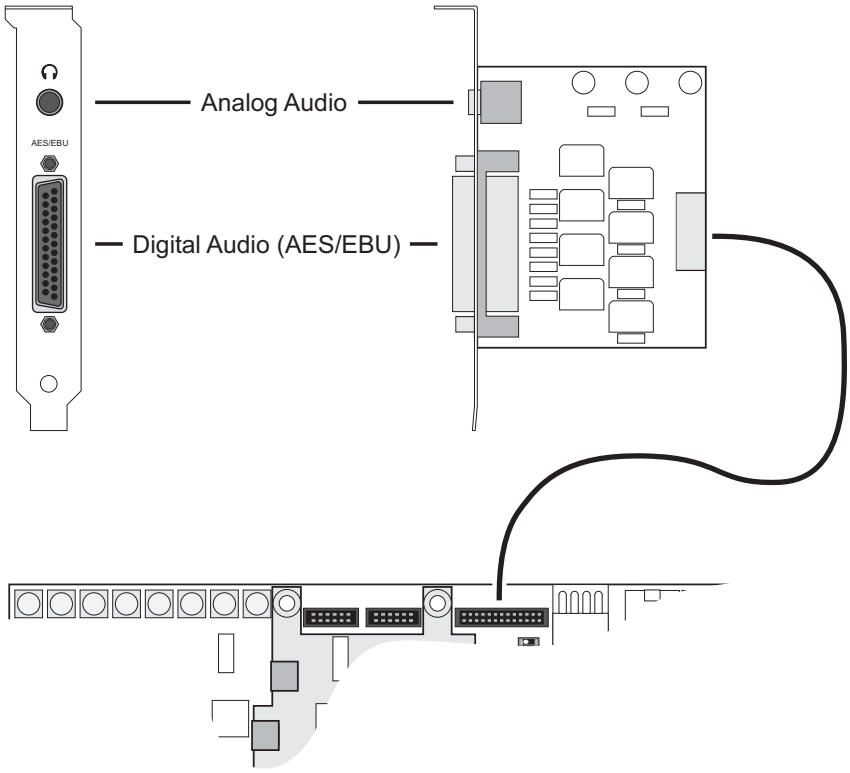


Figure 3-4: Internal connection of audio panel

Connecting the GPI and Wordclock Panel

The printed board behind the GPI connector plugs via a 12-pin flat cable to the top of the Centaurus board. To perform the internal connections connect the panel to the board as shown in the following figure:

Prior to the installation of the GPI and audio wordclock panel you have to check the jumpers on the printed board of the GPI for their correct settings. This is described in detail in section “Jumper Settings of the GPI and Wordclock Panel” on page 3-4.

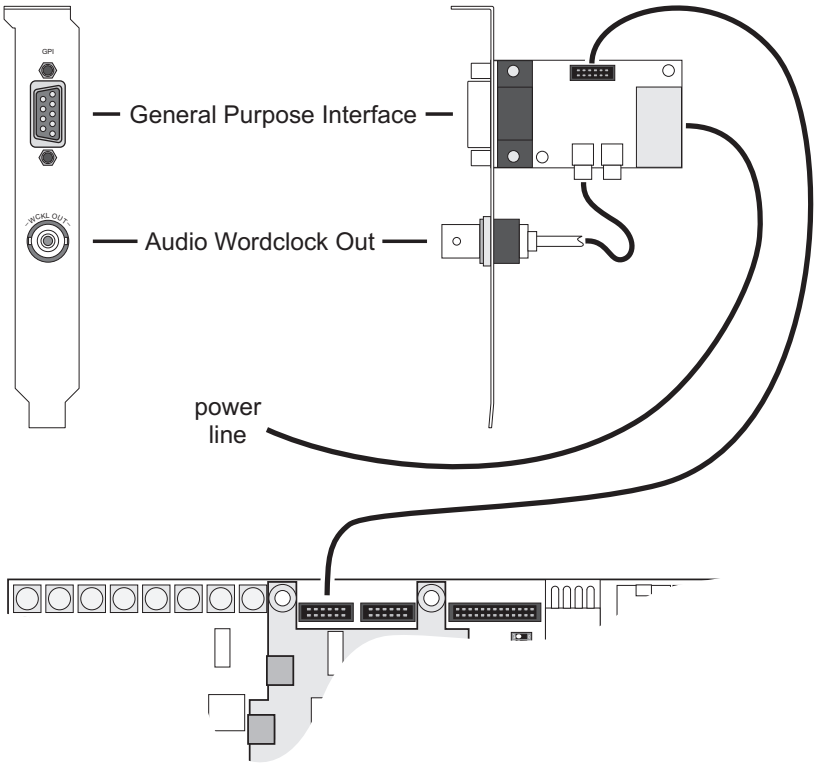


Figure 3-5: Internal connection of GPI and wordclock panel

The power line to be connected to the printed circuit board of the GPI has to be a standard power distribution line of your computer system. It should be of the same type as, for example, used to power your CD-ROM, with the following specifications:

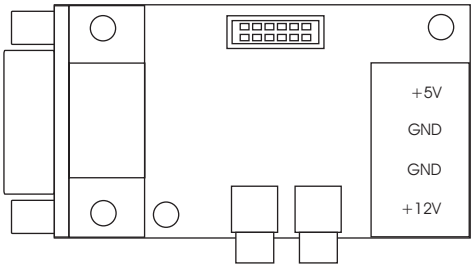


Figure 3-6: Power line specification

The connected extra power line of the GPI makes the GPI signal stronger and clearer. However, if you do not have a power line available, the GPI will still be functional.

When the internal connections are all set up, Centaurus is properly connected to your computer system. As a last step you must now finish the installation.

3.1.4 Finishing the Installation

This step of installing the Centaurus board is the last step to be performed. To finish the installation do the following:

- Close the computer casing.
- Connect all cables to the computer system again.
- Connect your audio and video equipment to the Centaurus connectors.
- After this start the computer system.

The next steps have to be made only if you want to run the Centaurus board with 100 MHz. When operating with either 66 or 133 MHz you do not have to perform the following.

- In case you want to run the Centaurus board with 100 MHz activate the BIOS configuration program.
- In the BIOS of the computer system search for the settings of the selected PCI-X bus where the Centaurus board is installed (the memorized or written down bus, see section “Setting up the Clock Frequency” on page 3-4).
- Configure the bus to 100 MHz.
- Next, reboot your computer system.

Once the computer system has finished the loading of the operating system, the installation of Centaurus as a hardware is complete. To use the board and activate its features you have to install the DVS software as well (see section “Software Installation” on page 3-11).

3.2 Software Installation

Beside the files for software development, the SDK software package also contains the Centaurus board driver and tools for a basic hardware setup and diagnostics. Therefore, for descriptions of the software and driver installation, please refer to the separate SDK documentation.

Once the software installation is completed, you have to activate the feature set available for Centaurus with the delivered license key.

3.3 Setting the License Key

This section explains how to set the license key on the computer system equipped with Centaurus. The license key activates the individual features that you have ordered for your DVS product. After the SDK and the driver are installed, you have to set the license key for Centaurus to be able to use the full feature set.

Centaurus is capable of holding three license keys. The first key (key 1) is usually used for licensing the features that were ordered with Centaurus. Keys 2 and 3 are usually used for temporary licenses that you may have received for evaluation purposes. Each license key enables one or more (optional) features of Centaurus until date of expiration (if applicable). Each time Centaurus starts all keys are checked and their features are combined.

Because DVS supports several operating system platforms, this section is divided into the different setup procedures for the respective operating system (i.e. 'Windows' and 'All Operating Systems').

3.3.1 Setting of License Key (Windows Only)

Once the SDK and the driver are properly installed, you have to set the license key for Centaurus to be able to use all ordered features.

To set the license key Windows offers you with the DVSConf program the possibility to use a standard graphical user interface.

You may also use the procedure described in section “Setting of License Key (All Operating Systems)” on page 3-13.

The following assumes that the DVSConf program is already running and that the driver is correctly loaded.

In case the driver is not already loaded, load the driver with the 'Driver' tab of the DVSConf program.

Further information on how to operate the DVSConf program can be found in the separate SDK documentation.

To set the license key with the help of the DVSConf program perform the following:

- Change to the 'Card0' tab.

For each installed Centaurus board there is a 'Card' tab available. If you have more than one Centaurus board installed in your computer system, you have to repeat the following steps with 'Card1', 'Card2', etc.

- Click on the button **SETUP** and select from the opening menu the option ***Set Licence***:

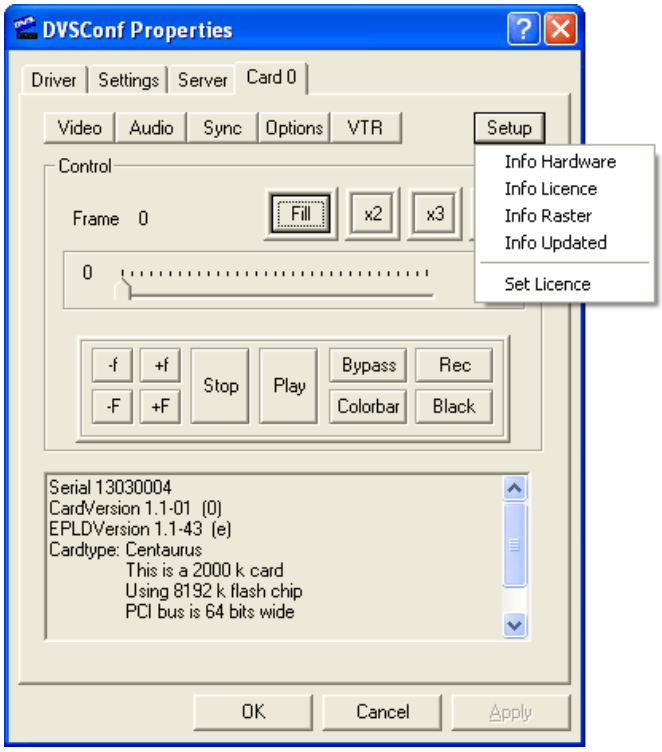


Figure 3-7: 'Card0' tab

The following dialog window opens:

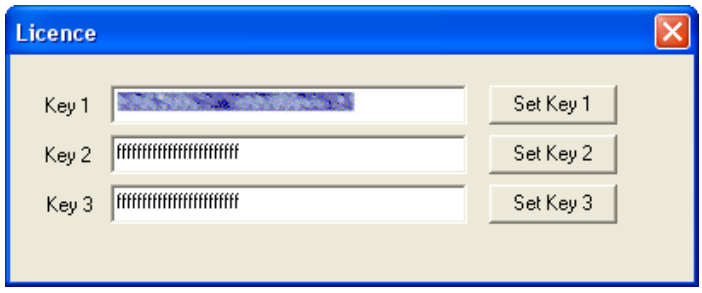


Figure 3-8: 'Licence' dialog window

- In the field 'Key 1' enter the license key that you have received with Centaurus and click the **SET KEY 1** button.

The **'Licence'** dialog window closes. The new license key is now set and will be stored non-volatile in Centaurus.

The features activated with this licence key can be displayed by clicking the button **SETUP** and selecting from the menu the option ***Info Licence***.

- Repeat the described steps above to activate the features for keys 2 and 3, if appropriate.
- If you have more than one Centaurus board installed in your computer system, change to their respective card tabs and repeat the steps to activate their features.
- Reboot the computer system.

Once the system has started, all licensed features will be available to Centaurus.

Depending on the SDK version, you may need to upgrade the PCI interface (firmware) of the Centaurus board. More information about this can be found in section "Upgrading the PCI Interface" on page 3-15.

To be sure your Centaurus board works properly, you may also test your installation. Details on how to perform a testing of your installation can be found in section "Testing the Installation" on page 3-18.

3.3.2 Setting of License Key (All Operating Systems)

Once the SDK and the driver are properly installed, you have to set the license key for Centaurus to be able to use all ordered features.

The following procedure uses the command line (shell, or in case of Windows MS DOS prompt). This is the common way for most operating systems to perform such a procedure.

To set the license key with the command line (shell), you have to open the shell first. After that perform the following:

In case the driver is not already loaded, load the driver. Further information about this can be found in the separate SDK documentation.

In case you have several Centaurus boards installed, use the environment variable `SCSIVIDEO_CMD` and set it to `PCI,card:<x>` (with `<x>` as the number of the board) to access a particular board. Please refer to the SDK documentation for details about setting the variable `SCSIVIDEO_CMD`.

- Enter the command **`svram licence key1`** `<key value>`. For `<key value>` insert the license key that you received with Centaurus.

The new license key is set now and will be stored non-volatile in Centaurus.

The features activated with this licence key can be checked with the command **`svram licence show`**.

- Repeat the described steps to activate the features for keys 2 and 3, if appropriate, by altering the command respectively.
- If you have more than one Centaurus board installed in your computer system, use the environment variable `SCSIVIDEO_CMD` to access the respective board and repeat the steps to activate its features.
- Reboot the computer system.

Once the system has started, all licensed features will be available to Centaurus.

Depending on the SDK version, you may need to upgrade the PCI interface (firmware) of the Centaurus board. More information about this can be found in section “Upgrading the PCI Interface” on page 3-15.

To be sure your Centaurus board works properly, you may also test your installation. Details on how to perform a testing of your installation can be found in section “Testing the Installation” on page 3-18.

3.4 Upgrading the PCI Interface

Depending on the SDK version you may need to upgrade the PCI interface (firmware) of the Centaurus board. This is done with a program named *irisup###*. This section explains how to determine whether you need and how to perform a PCI interface upgrade.

An upgrade should be performed by qualified personnel only. Before you upgrade the PCI interface you have to close all other applications.

Be aware of a power failure. If this happens, you have to use the fallback PCI version of the Centaurus board as detailed in section "PCI Upgrade Failure" on page 4-11.

For the newest version of the firmware (*irisup###*) check the DVS OEM web page (http://private.dvs.de/oem). There you can find information about the features supported by different firmwares and clock frequencies as well.

If you want to run the Centaurus board with 133 MHz, you have to update the firmware with the appropriate one from the DVS OEM web pages as described in section "Upgrading the PCI Interface" on page 3-16.

3.4.1 Determining the PCI Interface Version

Before upgrading the PCI interface you have to determine whether a PCI upgrade is necessary. For this you need to know the PCI interface version that is required at least to work properly with the SDK installed. You can find this information on the DVS OEM web pages (http://private.dvs.de/oem, see the respective page of your installed SDK). Look for the line that says 'Required firmware version: Version 2.1.**48i-33**' or similar. The numbers (bold in our example) tell you the PCI interface version.

Next you have to check the PCI interface version of your Centaurus board:

The following procedure uses the command line (shell, or in case of Windows MS DOS prompt).

- Open a command line (shell).

If the driver is not already loaded, load the driver. Further information about this can be found in the separate SDK documentation.

In case you have several Centaurus boards installed, use the environment variable `SCSIVIDEO_CMD` and set it to `PCI,card:<x>` (with `<x>` as the number of the board) to access a particular board. Please refer to the SDK documentation for details about setting the variable `SCSIVIDEO_CMD`.

- Enter at the command line **`svram version info`**.
- In the output look for the line that says 'Firmware Version: 2.1.**49j_35**' or similar.
- The numbers of the PCI interface version (bold here) have to be as high as the numbers stated on the DVS OEM web pages at least.

Compare the numbers separately: if one of them is lower than its counterpart on the web pages, you have to perform an upgrade.

In our example chosen here the Centaurus board does not need a PCI interface upgrade.

If the version numbers of the installed PCI interface are lower than the version required for the DVS software, the PCI interface has to be upgraded.

3.4.2 Upgrading the PCI Interface

In case you determined that a PCI interface upgrade is necessary, perform the following:

- Download the required firmware version from the DVS OEM web pages.
- Open a command line (shell).
- Run the update program *`irisup###`*:

`###` is the PCI interface version that *`irisup###`* upgrades the Centaurus board to (e.g. *`irisup_2.1.49j_35`* would upgrade the PCI interface to version 2.1.49j-35. Make sure that an *`irisup###`* of a high enough version is available.

The program *`irisup###`* upgrades all Centaurus boards installed in the computer system.

  - First you have to wait while the program is inspecting the system.
  - After this you will be asked if you really want to upgrade the firmware. To confirm type in `Y` and press [Enter].

  – Then wait until the program terminates itself which may take several minutes.

- When *irisup###* has finished the upgrade procedure, shut down the computer and wait at least one minute before rebooting it.

This will safely erase the old PCI interface from the Centaurus board.

- Start the computer and, after the operating system has loaded, check the PCI interface version as described in section "Determining the PCI Interface Version" on page 3-15.

If the interface version is upgraded, the procedure is finished. If it is not upgraded, perform the procedure again and give the board more time to erase the old information.

3.5 Testing the Installation

After having installed and set up everything, you should test if the Centaurus installation has been successful. The tools delivered with the SDK software package offer you the possibility to generate and display test pictures to check the Centaurus hardware.

Because DVS supports several operating system platforms, this section is divided into the different procedures for the respective operating system (i.e. 'Windows Only' and 'All Operating Systems').

3.5.1 Testing the Installation (Windows Only)

To test the installation Windows offers you with the DVSConf program the possibility to use a standard graphical user interface. Perform the following:

You may also use the procedure described in section "Testing the Installation (All Operating Systems)" on page 3-20.

- Connect a video monitor to the analog or digital video output connectors of Centaurus (see chapter "Overview" on page 2-1).
- Open the DVSConf program.

In case the driver is not already loaded, load the driver with the 'Driver' tab of the DVSConf program.

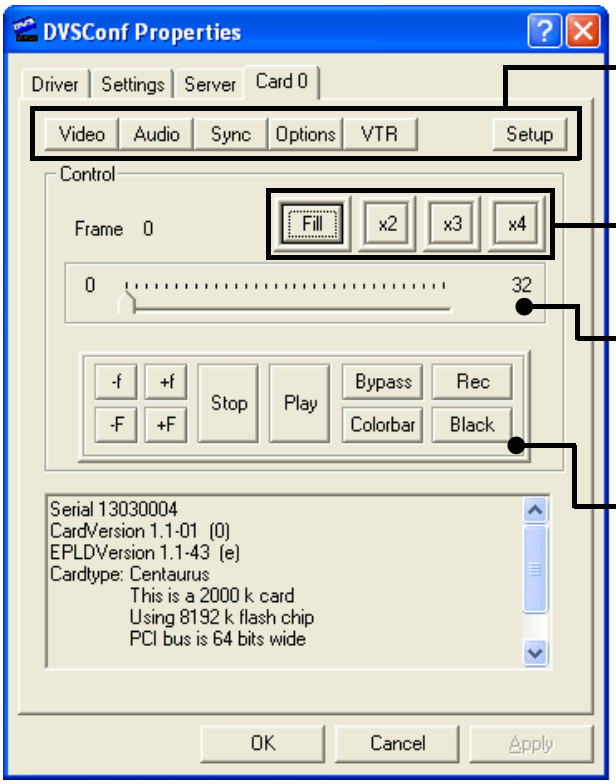
Further information on how to operate the DVSConf program can be found in the separate SDK documentation.

- Optionally you may change the settings on the 'Settings' and 'Server' tabs if desired.

Now the computer system is ready to generate test frames:

- Change to the 'Card0' tab.

For each installed Centaurus board there is a 'Card' tab available. If you have more than one Centaurus board installed in your computer system, you have to repeat the following steps with 'Card1', 'Card2', etc.



These buttons influence the video and audio settings of the video board.

These control buttons fill the whole video board buffer with a test picture. Using the **X** buttons you can superimpose the frame's timecode in different sizes over the test images.

The slider shows a timeline of the video material loaded into the video board buffer (depends on board buffer size and currently set video raster).

These buttons perform basic display operations on the video outputs:

-f/+f: Moves one field backward/forward.

-F/+F: Moves one frame backward/forward.

STOP: Stops a play-out.

PLAY: Starts a play-out.

BYPASS: Displays the digital video input signal at the outputs.

REC: Captures the digital video input to the video board buffer.

COLORBAR: Displays a color bar at the video outputs.

BLACK: Displays a black frame.

Figure 3-9: 'Card' tab overview of DVSConf program

- Use the buttons at the top of the 'Card' tab to select the desired video and audio settings.
- Use the **FILL**, **x2**, **x3**, or **x4** buttons to fill the Centaurus board buffer with a test pattern.
- Perform the display operations with the lower buttons.

If this works, you have successfully completed the Centaurus installation. Together with the SDK some sample programs are delivered that can also be used for testing.

The DVSConf program only affects the buffer and the I/O functions of the Centaurus board. For testing optionally installed video hard disks you will have to use your own test routines.

3.5.2 Testing the Installation (All Operating Systems)

To test the installation perform the following:

The following procedure uses the command line (shell, or in case of Windows MS DOS prompt). This is the common way for most operating systems to perform such a procedure.

- Connect a video monitor to the analog or digital video output connectors of Centaurus (see chapter "Overview" on page 2-1).
- Open a command line (shell).

If the driver is not already loaded, load the driver. Further information about this can be found in the separate SDK documentation.

Now the computer system is ready to display test frames:

In case you have several Centaurus boards installed, use the environment variable `SCSIVIDEO_CMD` and set it to `PCI,card:<x>` (with `<x>` as the number of the board) to access a particular board. Please refer to the SDK documentation for details about setting the variable `SCSIVIDEO_CMD`.

- Use `svram mode`, `svram sync`, `svram analog`, etc. to select the desired video and audio settings (further information about the commands can be found in the SDK documentation).
- Enter **`svram colorbar`** to display a color bar at the output.

If this works, you have successfully completed the Centaurus installation. Together with the SDK some sample programs are delivered that can also be used for testing.

The svram program only affects the buffer and the I/O functions of the Centaurus board. For testing optionally installed video hard disks you will have to use your own test routines.

Servicing

This chapter explains service and maintenance work that you may perform on your own, i.e. this chapter deals with the following tasks:

– How to remove an already installed Centaurus board from the computer system and how to reinstall it afterwards:
  Some tasks described in this chapter require a deinstallation of an already installed Centaurus board from the computer system where it is installed and a reinstallation of the board afterwards once the intended work is finished.
– How to expand a HDTV single-link Centaurus to its dual-link version:
  If you have acquired Centaurus in its single-link version first and you want to expand it at a later time, for example, to its dual-link version, an upgrade is possible without exchanging the hardware. When receiving the upgrade kit, you will be provided with the IM circuit board which will offer these features. It has to be mounted on the Centaurus board.
– How to act in case of a PCI upgrade failure:
  When an environmental extreme happens during a PCI upgrade and the programming of the PCI video board gets lost, you can easily activate a fallback map to restore the programming and perform the PCI upgrade again.

All these procedures are explained in this chapter.

4.1 Handling of the PCI Video Board

Some tasks described in this chapter require a deinstallation of an already installed Centaurus board from the computer system where it is installed and a reinstallation of the board afterwards once the intended work is finished. Both tasks will be explained in this section.

4.1.1 Deinstallation of the PCI Video Board

To deinstall and remove the PCI video board from the computer system where it is installed perform the following:

- Disconnect all cables (especially the power cords) from the computer system where the PCI video board is installed.

The computer system you are working on usually works with voltages that can be hazardous to your health.

Never work on the system or access its interior with the power cable(s) being plugged in. Make sure the power supply is disconnected from the components you intend to work on.

- Open the computer casing.

For details on how to do this, please refer to the respective manufacturer's documentation.

As soon as the computer casing is open, the system will be ready for the removal of the PCI video board. To remove it perform the following:

Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed.

Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the video system. Avoid touching the components of the computer, the PCI video board and the IM circuit board whenever possible.

- In the computer system remove the screw that holds the PCI video board in its place.
- Then disconnect all connection cables from the Centaurus slot panels that are connected to the board.
- After that remove the PCI video board from the computer system by pulling it out of its PCI slot.

Do not use excessive force when pulling out the PCI video board. Apply pressure to the slot panel and/or the printed circuit board of the PCI video board only, not to any of its attached parts.

Once this is finished, the PCI video board has been successfully removed from the computer system and you can now proceed with your intended task.

4.1.2 Reinstallation of the PCI Video Board

After finishing your task at hand (e.g. the expansion of Centaurus) you have to install the PCI video board into the computer system again. For this perform the following:

Please observe not to break off any parts of the PCI video board. Apply pressure to the slot panel and/or the printed circuit board only, not to any of its attached parts.

- Insert the PCI video board in its former PCI slot again without using excessive force or bending it.
- Fasten it with the appropriate screw.
- Reconnect the connection cables from the Centaurus slot panels that were previously connected to the board (cf. section “Installation of the Panels” on page 3-6).

After this the PCI video board is installed in the computer system and you can now finish the installation:

- Close the computer casing.
- Connect all cables to the computer system again.
- Connect your audio and video equipment to the Centaurus connectors.

After that the reinstallation of the PCI video board is finished and you can now use Centaurus again.

4.2 Expansion of Centaurus

This section describes the installation of the Iris module circuit board (IM circuit board) which will expand the single-link HDTV version of Centaurus to its dual-link version. The IM circuit board is necessary for some of the optionally available features of Centaurus, such as key channel. It has to be mounted directly on the PCI video board.

The upgrade procedure is necessary only when you have acquired Centaurus in its single-link version first and you want to expand it at a later time, for example, to its dual-link version.

This section details first the items provided in the delivery of the expansion kit. After that follow the three installation steps necessary for the installation, each described in a section of its own:

1. What to do to prepare for the expansion (see section “Step 1: Installation Preparations” on page 4-5),
2. how to perform the installation of the IM circuit board (see section “Step 2: Installation of the IM Circuit Board” on page 4-8), and
3. how to finish the expansion (see section “Step 3: Finishing the Installation” on page 4-10).

To expand Centaurus successfully you have to carry out the descriptions provided in each section in the order indicated.

The computer system you are working on usually operates with voltages that can be hazardous to your health.

Never work on the system or access its interior with the power cable(s) being plugged in. Make sure the power supply is disconnected from the components you intend to work on.

Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed.

Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the video system. Avoid touching the components of the computer and the printed circuit boards of Centaurus whenever possible.

4.2.1 Scope of Delivery

The following lists the items that are needed for an installation of the IM circuit board and provided by the expansion kit:

- 1 × IM circuit board (mezzanine card)
- 1 × thermal conductive pad
- 3 × spacer nuts (8 mm)
- 3 × spacers (3 mm)
- 3 × screws (6 mm)
- 3 × countersunk screws (10 mm)

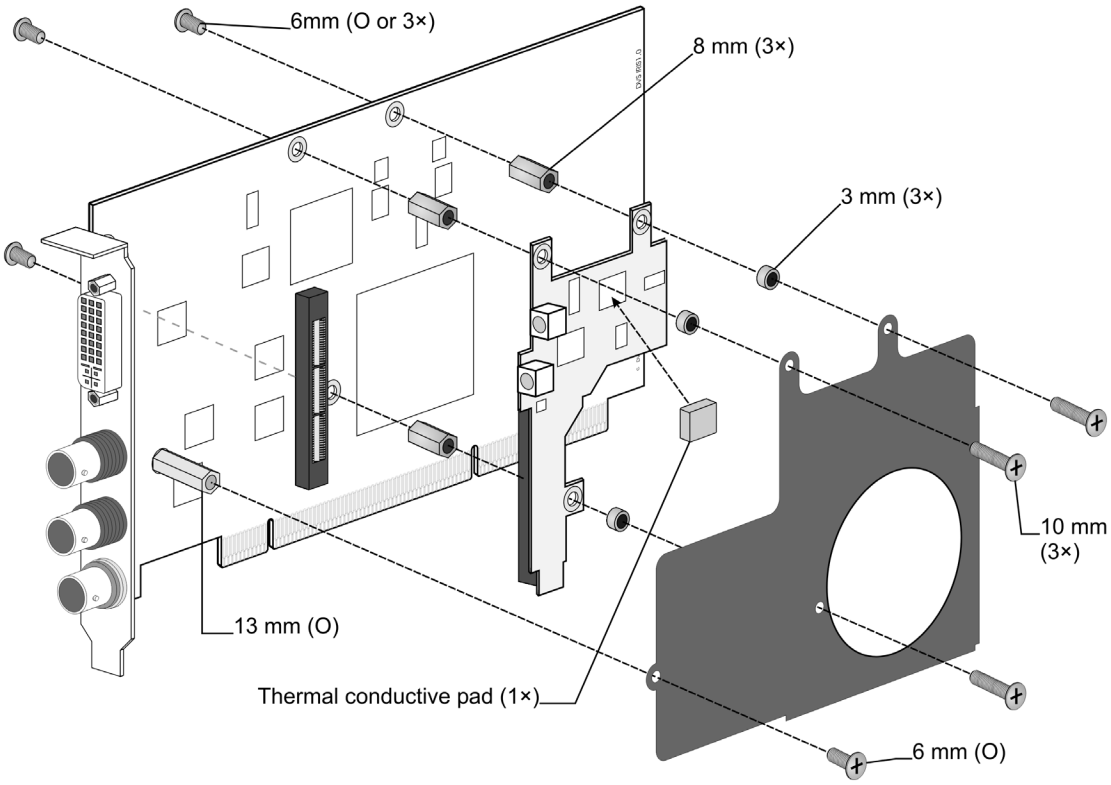
If any of these items are missing or damaged, contact your distributor or vendor immediately.

4.2.2 Step 1: Installation Preparations

Before installing the IM circuit board onto the Centaurus board the board has to be prepared for the installation, i.e. it must be removed from the computer system where it is installed. Afterwards the cooling plate must be taken off. For both procedures do the following:

- Remove the Centaurus board from the computer system where it is installed. This is in detail described in section “Deinstallation of the PCI Video Board” on page 4-2. Once you are finished, return to this section and continue the installation.

To familiarize yourself with the installation of the IM circuit board take a look at the following figure. It shows the assembly of the IM circuit board in an exploded view:



In brackets: #× Amount of parts from expansion kit
O Original part from board

Figure 4-1: Assembly of IM circuit board

You may use this figure as a reference during the installation procedure described in this and the upcoming sections.

After the Centaurus board is deinstalled from the computer system you have to continue the preparations by removing the cooling plate from the PCI video board:

- Unscrew the screws that hold the cooling plate in place:

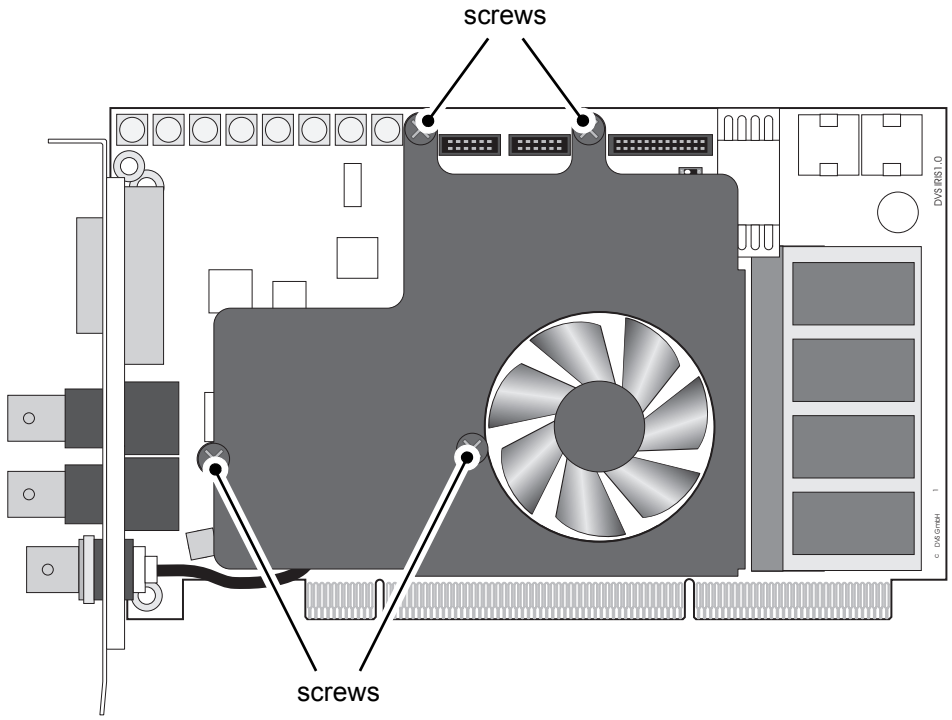


Figure 4-2: Screws of the cooling plate

- Next, lift up the cooling plate carefully.

If during the unscrewing of the cooling plate the very left spacer nut near the BNC connectors was loosened, tighten it again with its respective screw at the rear of the Centaurus board. The others can be disregarded because in one of the following steps they will be replaced anyway.

The cooling plate is now removed and you can access the parts below it to install the IM circuit board. For this continue the installation with the section “Step 2: Installation of the IM Circuit Board” on page 4-8.

4.2.3 Step 2: Installation of the IM Circuit Board

Once the installation preparations are completed, you will be able to install the IM circuit board. With the cooling plate removed you can see the items that are necessary for its installation:

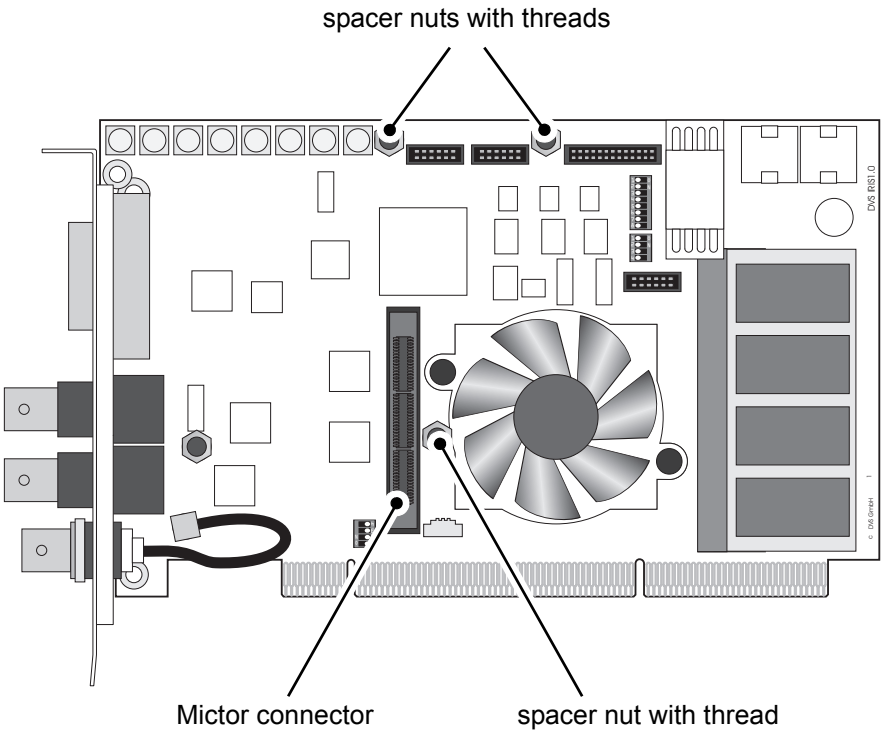


Figure 4-3: Installation items on Centaurus board

To install the IM circuit board perform the following:

- Replace the three spacer nuts indicated in the figure above (13 mm) with the ones enclosed in the delivery of the IM circuit board (8 mm). To fasten them you may either use the original screws or the screws (6 mm) enclosed in the delivery.
- Now take the IM circuit board and install it on the PCI video board so that the connector present on the IM circuit board is plugged into the expansion slot (Mictor connector):

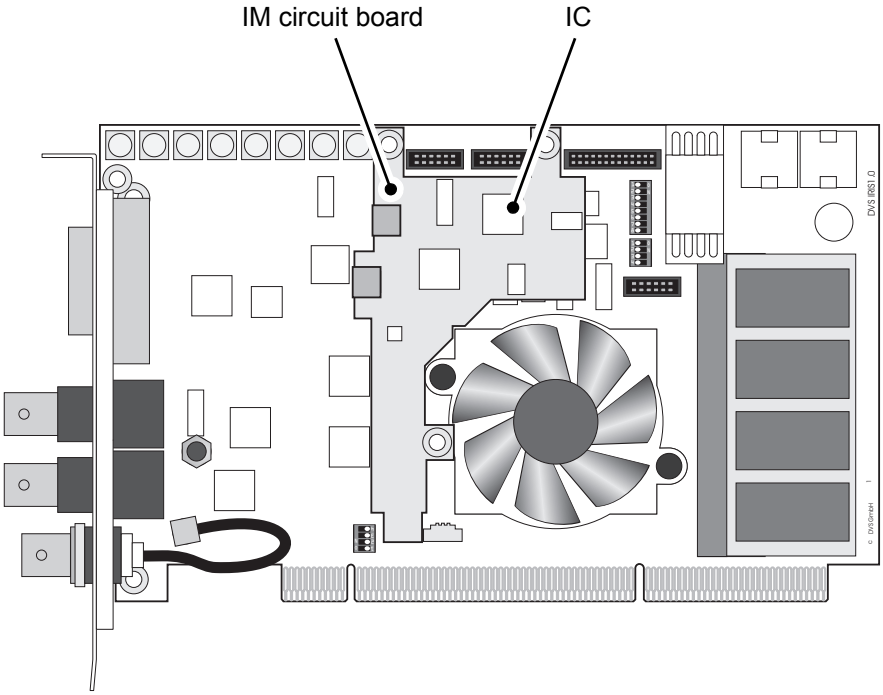


Figure 4-4: IM circuit board installed on PCI video board

- Afterwards take the thermal conductive pad and place it on the IC indicated in figure 4-4 on page 4-9 so that the electronic component is completely covered by the pad.

The thermal conductive pad will be squeezed firmly onto the IC when the cooling plate is installed again. Thus it will be held in place and take off some heat from this electronic component to ensure its functioning.

- Place the delivered three spacers on the mounting holes of the IM circuit board.
- After this install the cooling plate again with the new countersunk screws enclosed in the delivery of the expansion kit (see section "Scope of Delivery" on page 4-5). For the very left spacer nut (13 mm) take one of the screws that were originally used to fasten the cooling plate.

Never operate the board without the cooling plate installed, otherwise you may damage the PCI video board.

Once the assembly described above is finished, the IM circuit board is successfully installed and you can now go on and reinstall the PCI video board into the computer system again (see section "Step 3: Finishing the Installation" on page 4-10).

4.2.4 Step 3: Finishing the Installation

After completing the assembly of the IM circuit board on the PCI video board you have to install the board into the computer system again to finish the installation. For this perform the following:

- Reinstall the Centaurus board into the computer system as described in section “Reinstallation of the PCI Video Board” on page 4-3.

  When installing the connection cables from the Centaurus slot panels, you have to connect the formerly connected second link of the SD stream to the connectors provided by the IM circuit board. Then you will be able to use the new features of Centaurus, such as dual-link HDTV and/or key. This connection is described in section “Installation of the Panels” on page 3-6.

After that the installation of IM circuit board is finished and you can now begin to use the new features of Centaurus.

If you received a new license key with the IM circuit board, you have to set it after the hardware installation is finished. The procedure of how to set a new license key is described in section “Setting the License Key” on page 3-11.

4.3 PCI Upgrade Failure

An upgrade of the PCI interface (see section "Upgrading the PCI Interface" on page 3-15) is a delicate procedure comparable to a BIOS upgrade of a computer motherboard. If, for example, an environmental extreme like a power failure occurs while the upgrade program is running, the PCI video board may loose all its programming.

Prior to performing the procedure for a PCI upgrade failure contact the DVS service department to make sure that this procedure is really necessary.

When an environmental extreme happens during a PCI upgrade and the programming of the PCI video board is lost, act as described in the following to restore it:

The computer system you are working on usually works with voltages that can be hazardous to your health.

Never work on the system or access its interior with the power cable(s) being plugged in. Make sure the power supply is disconnected from the components you intend to work on.

Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures they can be destroyed.

Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the video system. Avoid touching the components of the computer and the printed circuit boards of Centaurus.

- If appropriate, turn off the computer system where Centaurus is installed and disconnect its power cable(s).
- Open the casing of the computer system.

  For details on how to do this, please refer to the respective manufacturer's manual.
- Set the DIP switch for the Flash controller on the PCI video board (cf. section "Centaurus Board Layout" on page 2-4) to the setting indicated in the following figure:

  With the cooling plate in place you can reach the DIP switch on the Centaurus board with a thin object such as a small flat blade screw driver.

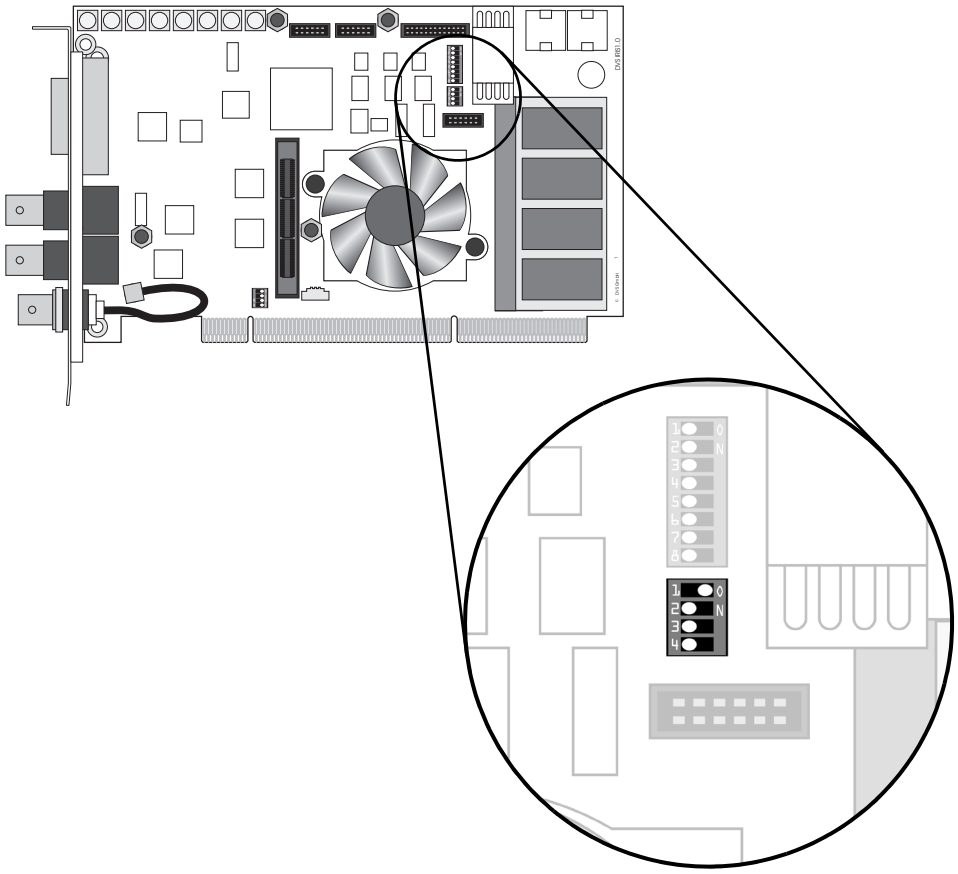


Figure 4-5: Setting of Flash controller DIP switch

This setting will load a safe mode programming (fallback map) when the PCI video board is initialized during start-up. Now use this fallback map to perform the PCI upgrade once again:

- Close the casing of the computer system and plug in its power cables.
- Turn on the computer system.
- After the start-up of the computer and the loading of the operating system run the PCI upgrade program (`irisup###`) once again:

The PCI upgrade program upgrades all installed DVS PCI video boards in your system.

  - First you have to wait while the program is inspecting the system.
  - After this you will be asked to confirm the upgrade of the firmware. For this type in `Y` and press [Enter].
  - Then wait until the program terminates itself which may take several minutes.

- When the update program has finished the procedure, shut down the computer.

You must now set the DIP switch for the Flash controller back to its default position. For this perform the following:

- Disconnect the power cable(s) of the computer system.
- Open the casing of the computer system.
- Then set the DIP switch for the Flash controller back to its default setting as shown in the respective figure on page 2-6.
- Close the casing and plug in the power cable(s).
- Now start the computer.
- After the operating system has loaded check the PCI interface version as described in section “Upgrading the PCI Interface” on page 3-15.

If the interface version is upgraded, the procedure is finished.

Appendix

This chapter provides technical data and general information about Centaurus.

A.1 Technical Data

The following shows the technical data of the Centaurus board.

The chassis of the computer system where the Centaurus board is installed must be equipped with a sufficient ventilation for cooling reasons.

PCI bus requirements	PCI-X at either 66, 100 MHz or 133 MHz
Board size	Half-length, single-slot
Electrical type	3.3 volt
Conformity	PCI-X Specification 1.0
Operating environmental conditions	5°C (41°F) to 40°C (104°F) 20% to 80% relative humidity, non-condensing
Storage environmental conditions	-17°C (0°F) to 70°C (158°F) 10% to 80% relative humidity, non-condensing

A.2 Hardware Specifications

The following table shows the hardware specifications of Centaurus.

Table A-1: Centaurus specifications

Video	Input	Output
Analog		3 BNC RGB/YUV or CVBS and Y/C
DVI (analog and digital)		1 DVI-I
HD Serial Digital 4:2:2 8/10 bit HD Serial Digital 4:4:4 8/10 bit (Dual Link)	1 BNC 2 BNC	1 BNC 2 BNC
Serial Digital 4:2:2 8/10 bit Serial Digital 4:4:4 8/10 bit (Dual Link)	1 BNC 2 BNC	1 BNC 2 BNC
Key	**Input**	**Output**
HD Serial Digital 4:0:0 8/10 bit for 4:2:2:4 and 4:4:4:4 Mode	1 BNC	1 BNC
Serial Digital 4:0:0 8/10 bit for 4:2:2:4 and 4:4:4:4 Mode	1 BNC	1 BNC
Reference	**Input**	**Output**
Analog Reference Genlock	1 BNC	1 BNC for S/H 1 BNC for V
Wordclock		1 BNC
Audio	**Input**	**Output**
Embedded Audio, 8 Digital Stereo Channels	1 BNC (via Video In)	1 BNC (via Video Out)
AES/EBU, 4 Digital Stereo Channels	4 XLR female or 4 BNC via breakout box	4 XLR male or 4 BNC via breakout box
Analog Audio		1 stereo headphone jack
Timecode	**Input**	**Output**
Longitudinal (LTC)	1 XLR female	1 XLR male
Vertical (VITC)	1 BNC (via Video In)	1 BNC (via Video Out)
Data and Control Interfaces	**Input**	**Output**
Serial RS-422	1 DB-9 female (software switchable)	1 DB-9 female (software switchable)
GPI (1 DB-9)	2 TTL	2 TTL

Table A-1: Centaurus specifications (cont.)

Data Formats	
Color Modes	YC_bC_r 4:2:2 YC_bC_rA 4:2:2:4 RGB 4:4:4 RGBA 4:4:4:4
Storage Format	Uncompressed YUV(A) 4:2:2(:4) / RGB(A) 4:4:4(:4) 8/10 bit, user selectable
Internal Processing	Color space conversion User definable LUT Frame repetition Real-time mixer Input raster detection
Audio Formats	48 kHz, 20/24 bit

A.3 Baud Rate of RS-422 Ports

The baud rate (data transfer speed) of the RS-422 ports of Centaurus can be set up via the DVS software.

For more information about how to set the baud rate of the RS-422 ports please refer to the SDK documentation.

The following settings are possible:

- 9600 baud
- 19200 baud
- 38400 baud
- 57600 baud

The maximum baud rate is 57600 baud.

A.4 Video Rasters

The following table shows the supported video rasters. All frequencies indicate the frame rate.

Table A-2: Supported video rasters

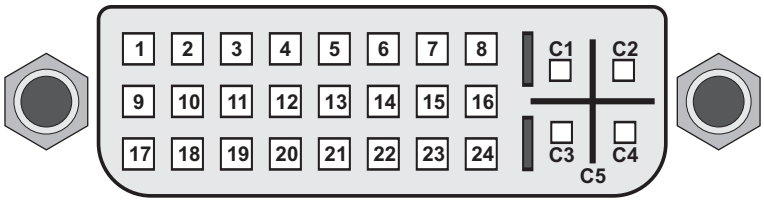
Raster	Total lines per frame	x size	y size	Aspect ratio
525i /29.97 (NTSC)	525	720	486	4:3
625i /25 (PAL)	625	720	576	4:3
525i /29.97 (NTSC HR)	525	960	486	16:9
625i /25 (PAL HR)	625	960	576	16:9
720p /23.976/24/25/29.97/30 /50/59.94/60	750	1280	720	16:9
1035i /29.97/30	1125	1920	1035	16:9
1080i /23.976/24/25/29.97/30	1250	1920	1080	16:9
1080p /23.976/24/25/29.97/30	1125	1920	1080	16:9
1080psF /23.976/24/25/29.97 /30	1125	1920	1080	16:9
2048p /23.976/24	1025	2048	1080	16:9
2048p /24	1600	2048	1556	4:3
2048psF /14.985/15/19.98/20 /24/30	1980	2048	1556	4:3
2048psF /24	1600	2048	1536	4:3
4096p /5	3125	4096	3112	4:3
4096psF /5	3125	4096	3112	4:3

You can find information about the internal data representation of video, audio and timecode in the SDK documentation.

A.5 Signal In- and Outputs

This section provides pin-out information about some of the connectors provided by Centaurus.

Digital Video Interface (DVI-I Connector)

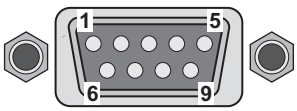


(external view;
female on interface, male on cable)

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	/TX_2	9	/TX_1	17	/TX_0
2	TX_2	10	TX_1	18	TX_0
3	GND	11	DVI_CLK_B	19	/DVI_CLK_B
4	/TX_4	12	/TX_3	20	/TX_5
5	TX_4	13	TX_3	21	TX_5
6	DDC_CLK	14	+5V	22	GND
7	DDC_DAT	15	GND	23	TX_CLK
8	ANALOG_VSYNC	16	HP_DETECT	24	/TX_CLK

C1	ANALOG_RED	C3	ANALOG_BLUE	C5	GND
C2	ANALOG_GREEN	C4	ANALOG_HSYNC		

GPI (9-Pin D-Sub Connector)

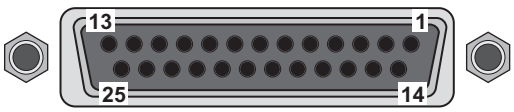


(external view;
male on interface, female on cable)

Pin No.	Signal
1	–
2	GND
3	GPI_OUT0 (GPI output 0)
4	GPI_IN0 (GPI input 0)
5	–
6	–
7	GPI_OUT1 (GPI output 1)
8	GPI_IN1 (GPI input 1)
9	GND

The GPI inputs are voltage sensing inputs with TTL trigger levels (> 2V = high, < 0,8V = low). Without any input they are set to 'high'. Thus, with a connected switch the user will be able to connect the voltage level to ground (GND) and no extra power supply has to be set for the GPI inputs.

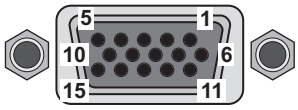
Digital Audio (25-Pin D-Sub Connector)



(external view;
female on interface, male on cable)

Pin No.	Signal	Pin No.	Signal
1	Audio OUT CH 7/8	14	/Audio OUT CH 7/8
2	GND	15	Audio OUT CH 5/6
3	/Audio OUT CH 5/6	16	GND
4	Audio OUT CH 3/4	17	/Audio OUT CH 3/4
5	GND	18	Audio OUT CH 1/2
6	/Audio OUT CH 1/2	19	GND
7	Audio IN CH 7/8	20	/Audio IN CH 7/8
8	GND	21	Audio IN CH 5/6
9	/Audio IN CH 5/6	22	GND
10	Audio IN CH 3/4	23	/Audio IN CH 3/4
11	GND	24	Audio IN CH 1/2
12	/Audio IN CH 1/2	25	GND
13	–		

Remote In- and Output (15-Pin D-Sub HD Connector)

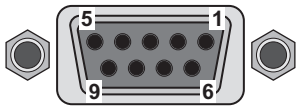


(external view;
female on interface, male on cable)

Pin No.	Signal	Pin No.	Signal
1	/RX_A_CON	9	GND
2	–	10	TX_B_CON
3	/TX_A_CON	11	GND
4	RX_B_CON	12	RX_A_CON
5	GND	13	/TX_B_CON
6	TX_A_CON	14	–
7	GND	15	/RX_B_CON
8	–		

RMT 1 and RMT 2 (9-Pin D-Sub Connectors Breakout Cable)

The RS-422 connector available on the slot panel of Centaurus is a DB-15 (HD) connector. It can be equipped with a breakout cable that will then provide two female DB-9 connectors for a standard RS-422 connection (see figure 2-7 on page 2-13). The two ports can be switched between master and slave mode, i.e. between RMT OUT and RMT IN.



(external view;
female on breakout cable, male on cable)

RMT IN	
Pin No.	**Signal**
1	–
2	/TX_B_CON
3	RX_B_CON
4	GND
5	–
6	GND
7	TX_B_CON
8	/RX_B_CON
9	–

RMT OUT	
Pin No.	**Signal**
1	–
2	/RX_A_CON
3	TX_A_CON
4	GND
5	–
6	GND
7	RX_A_CON
8	/TX_A_CON
9	–

A.6 Conformity Declarations

Centaurus has been tested according to the applying national and international directives and regulations. The following states further information about the compliances and conformities.

A.6.1 RoHS Compliance

The EU directive 2002/95/EC 'Restriction of Hazardous Substances (RoHS)' prohibits the use of certain substances in electrical and electronic equipment. All DVS products are manufactured in compliance with this directive.

A.6.2 EC Declaration of Conformity (CE Marking)

DVS Digital Video Systems GmbH herewith declares that the following product(s) according to the provisions of the mentioned EC Directives – including their relevant revisions at the time of this declaration – is (are) in conformity with the detailed standards or other normative documents:

Centaurus	EC Directives: – EMC Directive 89/336/EEC – Low-Voltage Directive 73/23/EEC
	Applied Harmonized Standards: – EN50081-1 – EN50082-2 – EN55022 – EN55024 – EN61000-3-2 – EN61000-3-3 – EN61000-4-2 – EN61000-4-3 – EN61000-4-4 – EN61000-4-5 – EN61000-4-6 – EN61000-4-11

A.6.3 FCC Compliance Statement

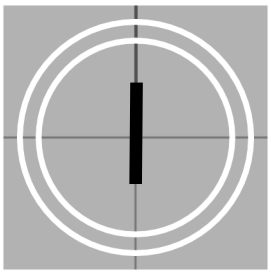
DVS Digital Video Systems GmbH herewith declares that the following equipment has been tested according to the applying valid FCC regulations:

– Centaurus

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: Connecting this device to peripheral devices that do not comply with Class A requirements or using an unshielded peripheral data cable could also result in harmful interference to radio or television reception. The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.



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