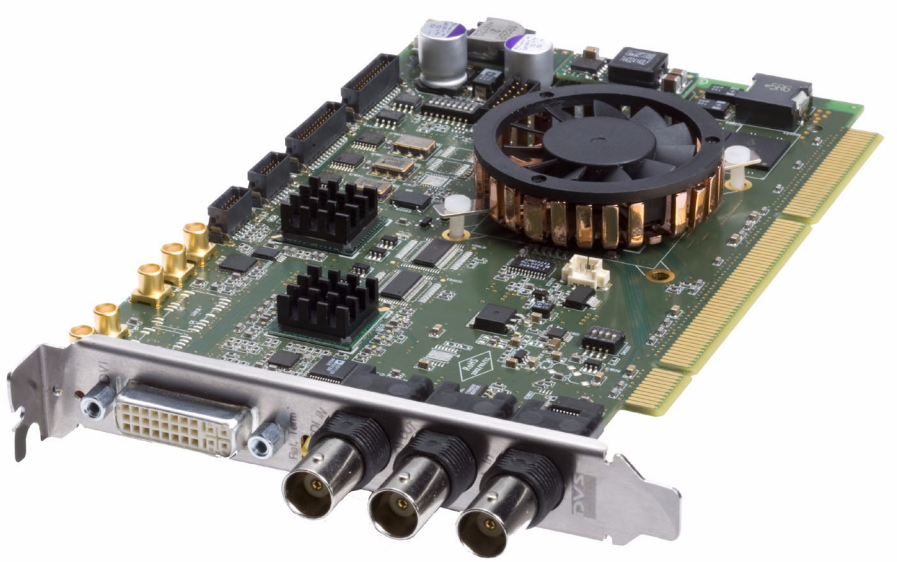
PCI Video Board

Centaurus II



Installation Guide

Centaurus II Installation Guide

Installation Guide Version 1.1 for Centaurus II

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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 II

Serial No.: _____

Remarks: _____

_____

Computer

Brand: _____ Type: _____

Operating System: _____ Version: _____

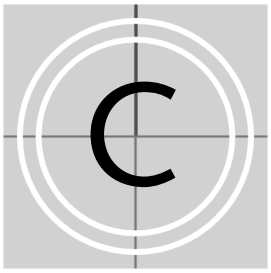
Connected devices
(Brand and type of edit controller, VTR, color grading system, etc.)

_____

_____

_____

Contents



Introduction

This documentation describes Centaurus II, the next generation of OEM products manufactured by DVS. It is the successor of the former OEM product Centaurus, offering you full compatibility with its previous version combined with new technology. Software applications already developed for Centaurus will work with Centaurus II as reliable as you are used to.

Centaurus II is centered around the Centaurus II board, a half-length PCI-X/PCIe bus single board for the real-time input and output of uncompressed video and audio signals. All major video and film formats are supported from SD video up to 4K film via SDI I/O, dual-link DVI and analog outputs, supplemented by eight (optionally 16) channels audio either over AES/EBU or embedded in the video stream. With the help of the DVS software development kit (SDK) you can build your own powerful video and film solutions, for example, for editing, compositing, virtual studio, or titling.

Coming with a concise licensing Centaurus II can be adapted to your or your customers needs easily making future hardware upgrades or replacements in most cases unnecessary.

Key Features

- SD-/HD-SDI input and output in YUV 8/10/12 bit
- Separate connectors for SD- and HD-SDI
- Dual-link SD-/HD-SDI input and output for RGB 8/10/12 bit
- Key channel for SD/HD YUVA and RGBA
- SDI either usable as dual-link or independent I/O channels
- Up to 16 channels of AES/EBU and embedded audio (48 kHz 20/24 bit) with audio embedder/de-embedder
- Real-time hardware mixer with split-screen operation
- Dynamic 1D LUT for input and output, dynamic 3D LUT for output
- HD-to-SD down-converter
- 3:2 and 2:3 pulldown insertion/removal
- Zooming and panning for high-resolution rasters
- Analog reference genlock (bilevel, trilevel) input
- Cross-sync: SD or HD sync for HD rasters

- Dual-link DVI output with analog RGBS/YUV/CVBS via breakout cable
- On-board color space conversion and low-pass 4:4:4 ↔ 4:2:2 filtering
- RS-422 remote in and out, software switchable
- Watchdog with hardware relay for a bypass between SDI input and SDI output (automatic switching to the live signal, reacts also on loss of power)
- LTC I/O, VITC I/O with generator and reader
- SMPTE 201 film, production TC & keycode (3-line VITC)
- Vertical ancillary data (VANC) I/O including closed captioning
- GPI I/O (optionally with optocoupler technology) and wordclock output
- SDK and drivers available for 32 and 64 bit operating systems
- Support for DirectShow under Windows
- Modular breakout boxes for easy plugging and handling
- Libraries to encode/decode MPEG 1 and 2

1.1 Overview

This guide informs you about the installation of Centaurus II 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 maintenance work that you may perform on your own.

In detail the chapters contain the following information:

Chapter 1	Begins with a short introduction to Centaurus II, 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 II, it provides safety instructions that you must adhere to and some important notes that you should read.
Chapter 2	Gives an overview of Centaurus II as an OEM product and describes shortly its individual components. Furthermore, the items, switches and connectors of the Centaurus II board and its additional panels are detailed in this chapter.
Chapter 3	Describes the installation of Centaurus II. First the hardware installation is explained, followed by some hardware related settings and upgrades to be effected with the software.
Chapter 4	Details service and maintenance work in case of a PCI interface upgrade failure.
Appendix	Provides technical details and general information about Centaurus II. This chapter also contains a short reference to the items available on the Centaurus II board.
Index	This chapter facilitates the search for specific terms.

1.2 Target Group

To use this manual you should have experience installing hardware components in a computer system and be familiar with the hardware structure and interior of such a system. Additionally, you should have knowledge in the field of digital video in general and be used to operate with computer software.

1.3 Conventions Used in this User Guide

The following typographical conventions will be used in this documentation:

- Texts preceded by this symbol describe activities that you must perform in the order indicated.

– Texts preceded by this symbol are parts of a list.

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
BUTTON	Text in small caps and bold indicates push buttons
Menu	Text in italic and bold indicates either a menu name or options in a menu list
Item	Text in bold only stands for other labeled items of a user interface
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 a command in **bold**, it stands for optional parameters
[Key]	A key on a keyboard

1.4 Safety Instructions

To use Centaurus II correctly please heed the following:

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

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

General

Centaurus II 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 II the manuals and guides delivered with Centaurus II must be read and observed.

- Use Centaurus II only in apparent good technical order.
- The system you are trying to install Centaurus II 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 II whenever possible.
- Computer hardware contains components that are sensitive to changing voltages. Connecting or disconnecting Centaurus II 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 II 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 II whatsoever.

Environmental Conditions

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

- Do not expose Centaurus II to sources of heat, such as direct sunlight or a radiator.
- The chassis of the computer system where the Centaurus II 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 II to strong electric or magnetic fields.
- Avoid areas where Centaurus II 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 1-5.
- 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

RoHS 2002/95/EC

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-14.

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.

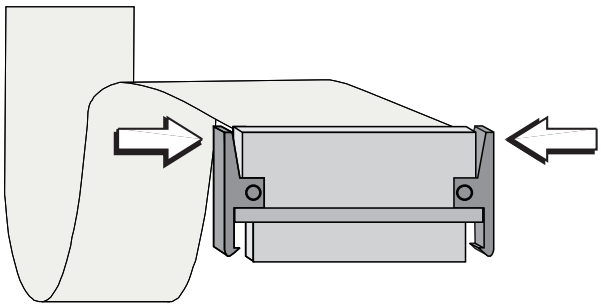


Figure 1-1: Unplugging flat cables

Then you can easily remove the connector.

Breakout Box

A modular breakout box is optionally available for Centaurus II 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 most of the additional slot panels described in this manual (see section "Overview of the Panels" on page 2-12).

For more information about the different types of breakout boxes available for Centaurus II please refer to the "Breakout Box II" installation guide which can be found on the DVS OEM web site (http://private.dvs.de/oem), 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 II.

- Pentium 4 or similar with at least 1.8 GHz
- Mainboard with 64-bit, 66-/100-/133-MHz PCI-X bus
  or
  Mainboard with 64-bit, PCIe x8 bus

  The factory setting of the PCI-X variant of the board is 133 MHz (autodetection).
- 1 free slot in a bus-master capable PCI segment that supports PCI-X or PCIe respectively
- 512 MB RAM

Supported Operating Systems

Centaurus II can be used with the following operating systems:

- Windows 2000, XP or Vista
- Linux (Red Hat and Fedora)

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 II needs the DVS video board 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 site (http://private.dvs.de/oem).

Overview

This chapter shows an overview of Centaurus II thereby detailing all items, switches and connectors of the Centaurus II 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 II board is provided. The chapter will be concluded with a detailed overview of the delivered slot panels.

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

2.1 Overview of the OEM Product

Centaurus II 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 the delivery of Centaurus II:

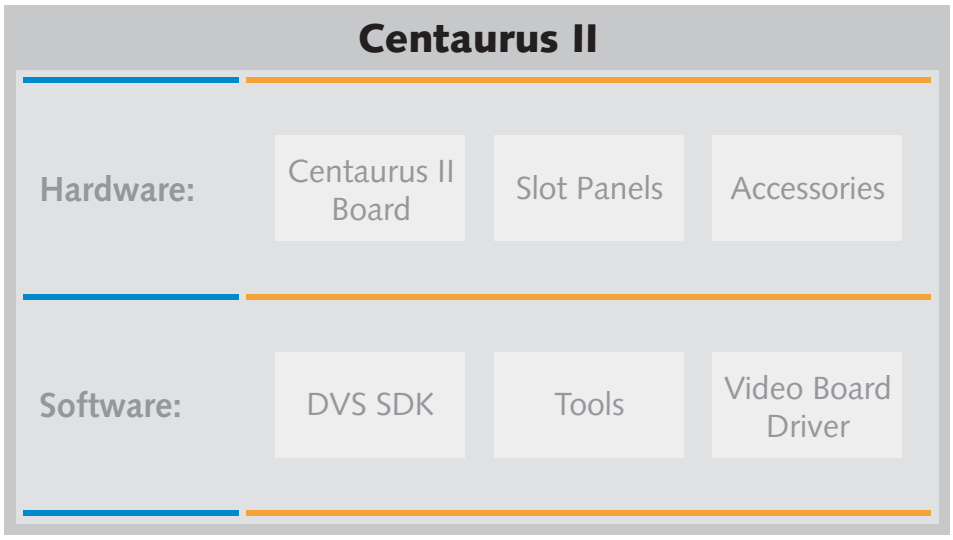


Figure 2-1: Centaurus II overview

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

To the hardware components belong the items described in this installation guide. Centaurus II is centered around the Centaurus II board, a half-length PCI-X/PCIe bus single board for a real-time input and output of video and audio signals. All major video and film formats are supported from SD video up to 4K film via SDI I/O, dual-link DVI and analog outputs, supplemented by up to 16 channels audio either over AES/EBU or embedded in the video stream. To use all the features of Centaurus II several slot panels may have been included in your delivery 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 DVS software development kit (DVS SDK) which can be used to build editing and storage solutions with Centaurus II. The DVS SDK is compatible among the OEM products by DVS 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 II which can be done with the tools for the hardware setup. The video board driver controls the Centaurus II board and thus the in- and output of signals. The DVS 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 II is a complex piece of technology. Depending on your ordered variant it will be delivered either with a PCI-X or PCIe interface.

This section provides an overview of the Centaurus II board. First the different variants of the board are explained followed by a detailed description of the items, switches and connectors present on the PCI video board.

2.2.1 The Different Variants of the Board

The Centaurus II board can be delivered in two variants: It can be delivered with a PCI-X or PCIe interface.

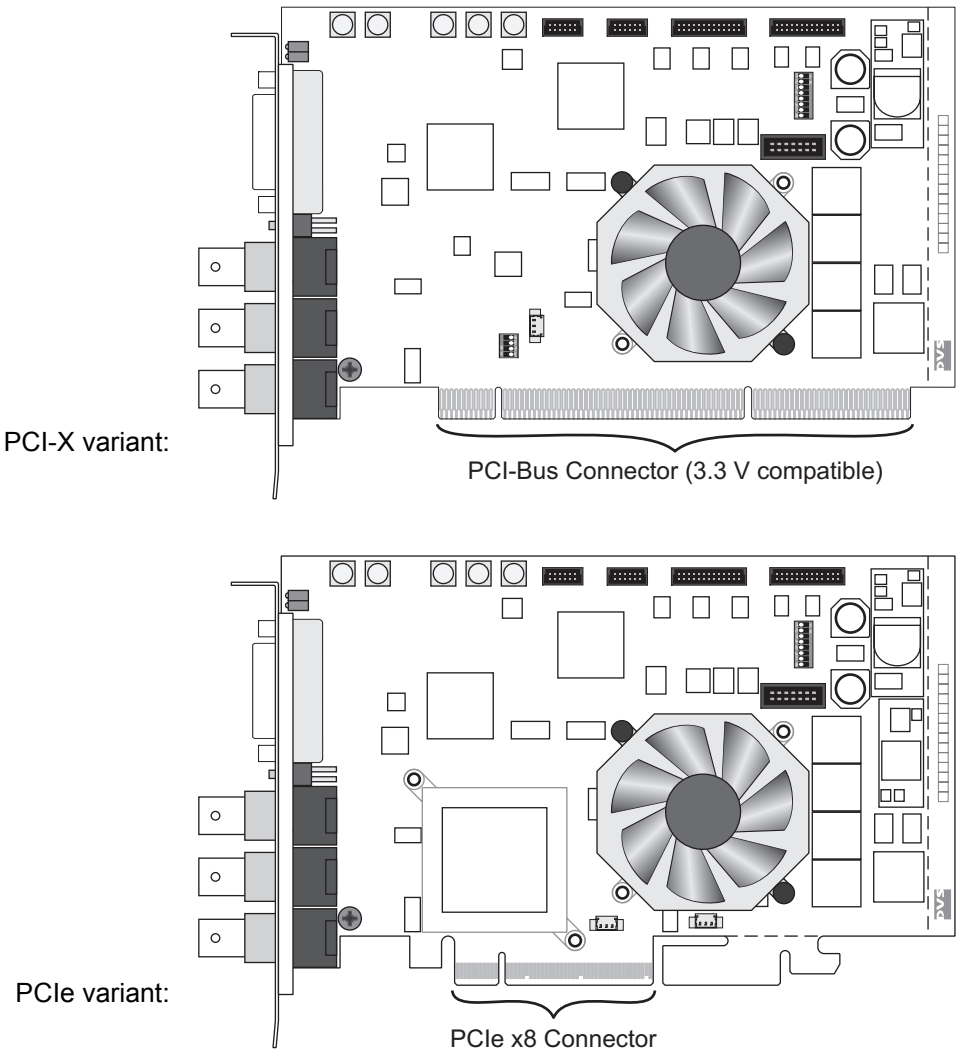


Figure 2-2: Variants of Centaurus II

As you can see the main difference between the two board variants lies within their interfaces and some items mounted on the printed circuit board. Because there is only one item necessary for an operation present on the PCI-X variant which is not available on the PCIe variant, the overview section of the Centaurus II board shows the PCI-X variant only and mentions this item explicitly.

2.2.2 Centaurus II Board Layout

The following provides an overview of the Centaurus II board in its PCI-X variant, describing all items, switches and connectors. Because the two variants of the PCI video board (PCI-X/PCIe) differ only in one item necessary for an operation (available on PCI-X, not on PCIe) this section shows the PCI-X variant only. The difference will be mentioned in the table explicitly.

The connectors and switches on the Centaurus II board which are not described in the following are used during the manufacturing process only and without function in normal operation mode.

For a concise overview of the PCI video board see section “Short Reference: Centaurus II Board” on page A-16.

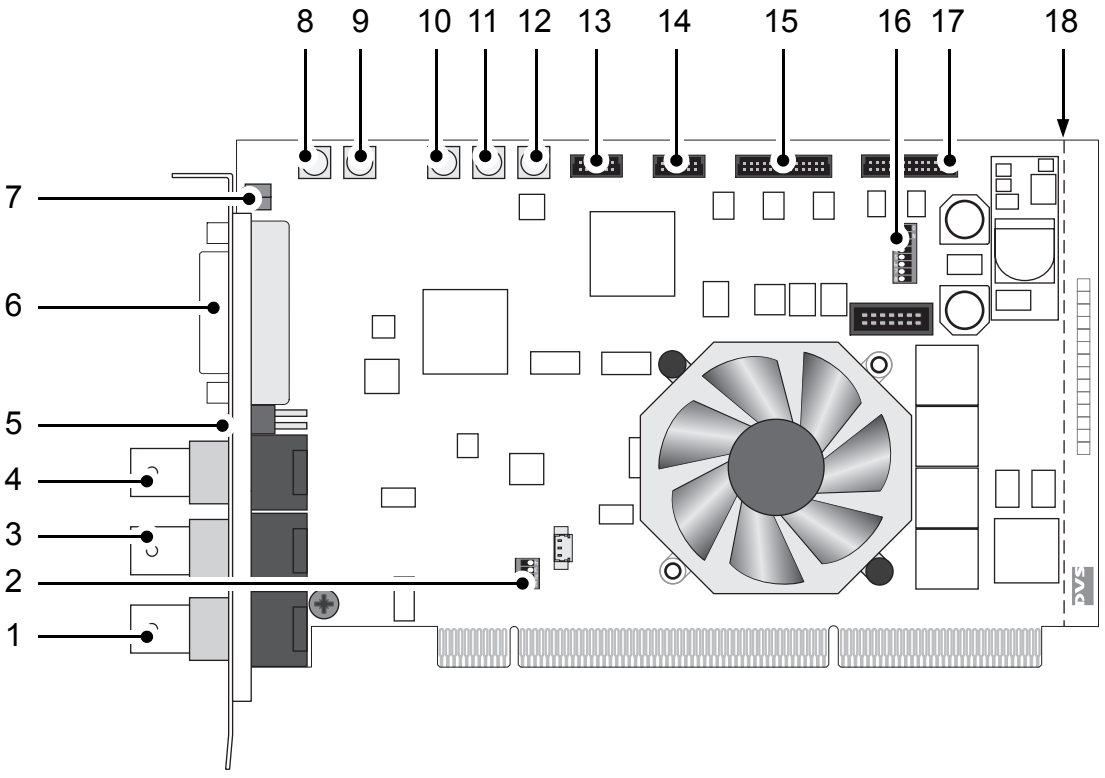
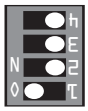


Figure 2-3: Overview of the items and connectors on the Centaurus II board

No.	Item	Explanation
1	Ref. In	BNC connector for the reference input
2	DIP Switch for PCI	*PCI-X variant only:* DIP switch to set up the PCI video board interface, i.e. its clock frequency; please observe the orientation of the switch on the board
		 Autodetection (PCI-X 66/ 100/133 MHz, factory setting)
		 PCI-X 66 MHz
3	(HD) SDI OUT A	BNC connector for a video output at port A (serial digital interface); usually used for an output of the first video channel in single-link (YUV) or the first stream of YUVA or RGB[A] in dual-link mode
4	(HD) SDI IN A	BNC connector for a video input at port A (serial digital interface); usually used for an input of the first video channel in single-link (YUV) or the first stream of YUVA or RGB[A] in dual-link mode
5	Ref. Term	Termination switch for the reference input; switches off the termination of the genlock signal manually, e.g. if the Centaurus II board is not the last link in a genlock connection chain
6	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-7
7	LEDs	Two status LEDs indicating the presence of correct video and sync signals (see section “LEDs” on page 2-11)
8	SD SDI IN[1]	MCX connector for an input of digital SD video signals (serial digital interface)

No.	Item	Explanation
9	(HD) SDI IN B	MCX connector for a video input at port B (serial digital interface); usually used for an input of the second video channel in single-link (YUV) or the second stream of YUVA or RGB[A] in dual-link mode
10	(HD) SDI OUT B	MCX connector for a video output at port B (serial digital interface); usually used for an output of the second video channel in single-link (YUV) or the second stream of YUVA or RGB[A] in dual-link mode
11	SD SDI OUT[1]	MCX connector for an output of digital SD video signals (serial digital interface)
12	CVBS OUT	MCX connector for a composite video burst signal, either analog output of SD video or used for synchronization purposes
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 1-8/LTC	Flat cable connector for the digital audio channels 1 to 8 and LTC
16	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
17	AUDIO 9-16	Flat cable connector for the digital audio channels 9 to 16

No.	Item	Explanation
18	breaking line	The printed circuit board provides at its bottom (PCIe variant only) and right side extensions void of any electrical parts; these may serve to stabilize the installation of the board in a computer system; when not needed or interfering, you can break them off the circuit board at the breaking line(s); see also dotted lines in figure 2-2 on page 2-3

1) These connectors may be falsely labeled (HD SDI IN/OUT C) on the layout version 4 of the PCI video board.

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 setting:

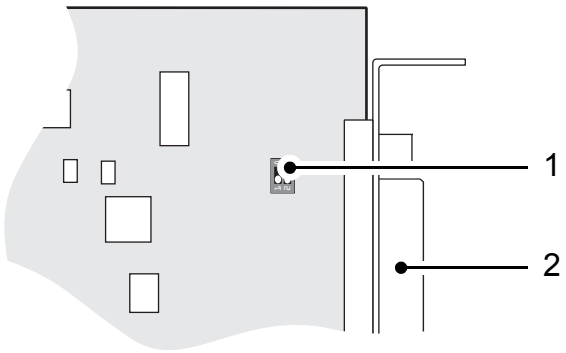


Figure 2-4: Item of the Centaurus II board's rear

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 II Board Layout" on page 2-4

2.2.4 Digital Video I/Os of the Centaurus II Board

DVS usually names the external connectors for the in- and output of the digital video signals alphabetically. For YUV you will normally use one channel (connectors named '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.

SD Dual-Link and HD Single-Link Centaurus II Board

DVS offers a licensing for Centaurus II that turns the Centaurus II board to an SDTV dual-link and HDTV single-link board. With this feature two ports for an input and an output are available on the board: the standard A ports and the SD SDI ports.

By effecting the second link for SDTV via the SD SDI ports Centaurus II is a true one-to-one replacement for its predecessor Centaurus.

Via the delivered software by DVS you can configure the digital video I/Os of the Centaurus II board freely:

- The A ports are used in single link for YUV in SD as well as HD, or in SD dual link for the first part of RGB.
- The B ports (SD SDI IN/SD SDI 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 SD SDI IN.

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

Table 2-1: I/O signal distribution for the SD dual-link and HD single-link board

Raster	Video Mode	(HD) SDI		SD SDI	
		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/color mode the input ports can be exclusively switched via the software.

Instead of linking and connecting to the SD SDI ports you may as well connect to the (HD) SDI B ports which will then provide in YUV for an input the same as the input port A and for an output you can get a mirrored output signal.

HD Dual-Link Centaurus II Board

A licensing also makes an HD dual-link version of the board available. With this feature all three serial digital interfaces are available to you, for example, for an output the connectors (HD) SDI OUT A, (HD) SDI OUT B and SD SDI OUT (see section "Centaurus II Board Layout" on page 2-4). Via the delivered software by DVS the ports can be configured 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. The 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.
- In SD single-link rasters you can switch the A ports for an in- or output between the SD SDI ports and the standard A ports, while in SD dual-link the B ports can be switched between the SD SDI ports and the labeled B ports.
- In multi-channel mode the in- and output pipelines can be used independently (different raster and color mode).
- Additionally, you have the possibility at hand to get a mirrored output of the signal.

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

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

Raster	Video Mode	(HD) SDI		(HD) SDI		SD SDI	
		IN A	OUT A	IN B	OUT B	IN	OUT
SD	YC_bC_r 4:2:2 (mirroring)	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_r 4:2:2 (multi-channel)	Y, C_b, C_r (video 1)	Y, C_b, C_r (video 1)	Y, C_b, C_r (video 2)	Y, C_b, C_r (video 2)	–	–
		Y, C_b, C_r (video 1)	Y, C_b, C_r (video 1)	Y, C_b, C_r (video 2)	–	–	Y, C_b, C_r (video 2)
		Y, C_b, C_r (video 1)	Y, C_b, C_r (video 1)	–	Y, C_b, C_r (video 2)	Y, C_b, C_r (video 2)	–
		Y, C_b, C_r (video 1)	Y, C_b, C_r (video 1)	–	–	Y, C_b, C_r (video 2)	Y, C_b, C_r (video 2)
				Y, C_b, C_r (video 1)	Y, C_b, C_r (video 1)	Y, C_b, C_r (video 2)	Y, C_b, C_r (video 2)
	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 (mirroring)	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_r 4:2:2 (multi-channel)	Y, C_b, C_r (video 1)	Y, C_b, C_r (video 1)	Y, C_b, C_r (video 2)	Y, C_b, C_r (video 2)	–	–
	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)

2.2.5 LEDs

The Centaurus II board panel holds two status LEDs that signal whether correct video and sync signals are available at the respective digital inputs. In detail they indicate the following:

LED	Function	Modus	Meaning
green	Signals the status of the sync input	on	A correct sync signal is detected, i.e.: – Sync mode 'internal' is set. – Sync mode 'external' is set and a correct signal is connected. – sync mode 'analog' is set and an analog genlock signal is connected. – Sync mode 'digital' is set and a correct signal is connected.
		off	A wrong input signal is detected, i.e.: – Sync mode 'external' is set and no SDI input signal. – Sync mode 'analog' is set and no genlock signal connected. – Sync mode 'digital' is set and no SDI input signal.
red	Signals the status of the video raster detection feature	blinking slowly	No input signal is available.
		blinking fast	A wrong input signal is detected (e.g. Centaurus II is set to NTSC video mode, but a PAL signal is connected to the active input).
		off	A correct input signal is detected.

2.3 Overview of the Panels

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

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

A modular breakout box is optionally available for Centaurus II which will replace most additional slot panels described in this section. Further information about the breakout box can be found in section “Breakout Box” on page 1-8.

2.3.1 SDI and RS-422 Panel

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

The RS-422 connector available on the panel is a DB-15 (HD) connector. It can be used to connect a breakout cable that will then provide two female DB-9 connectors for a standard RS-422 connection (see figure 2-6 on page 2-14). The breakout cable is included in the delivery of Centaurus II. 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-7.

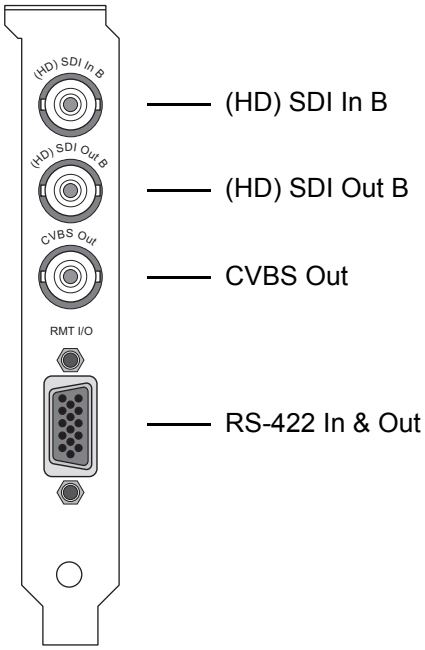
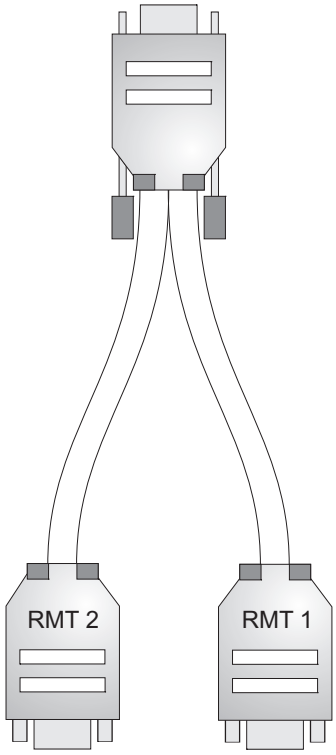


Figure 2-5: Panel with SDI and remote control connections

Item	Explanation
(HD) SDI In B	BNC connector for a video input at port B (serial digital interface); usually used for an input of the second video channel in single-link (YUV) or the second stream of YUVA or RGB[A] in dual-link mode

Item	Explanation
(HD) SDI Out B	BNC connector for a video output at port B (serial digital interface); usually used for an output of the second video channel in single-link (YUV) or the second stream of YUVA or RGB[A] in dual-link mode
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 (female), serial RS-422 interface for master/slave control, a breakout cable to two DB-9 connectors is included in the delivery:  *Figure 2-6: RS-422 breakout cable*

2.3.2 Audio Panels

The audio panels are available as optional features. In a setup with 16 channels digital audio two audio panels are required, each providing a DB-25 connector for digital audio (AES/EBU) and/or LTC signals.

The analog stereo headphone outputs currently available on these panels provide no function. They are only available for compatibility reasons with its predecessor Centaurus.

To the DB-25 connectors 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 1-8. Pin-outs of the DB-25 connectors can be found in section “Signal In- and Outputs” on page A-7.

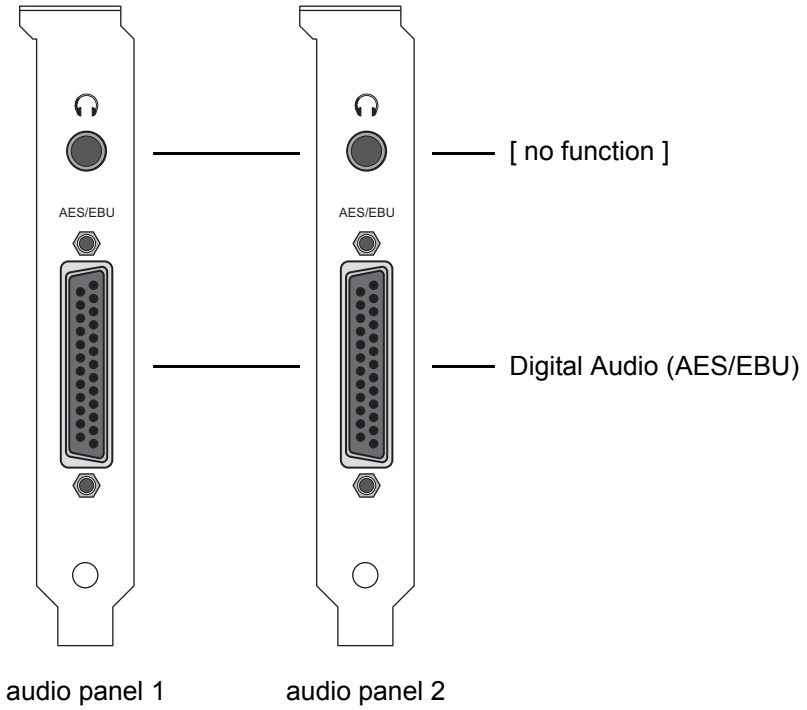


Figure 2-7: Panels for digital audio

Audio Panel	Item	Explanation
1	Digital Audio (AES/EBU)	DB-25 connector (female) for audio signal and/or LTC in- and output; provides either four stereo channels digital audio (channels 1 to 8) or three channels audio plus LTC
	In conjunction with the optocoupler GPI you can receive for Centaurus II with this panel four stereo channels plus LTC (see section "GPI (Optocoupler Based) and LTC Panel" on page 2-19).	
2	Digital Audio (AES/EBU)	DB-25 connector (female) for audio signal in- and output; provides the digital audio channels 9 to 16

Prior to the installation of the audio panels you have to set/check the jumpers on their printed circuit boards to the appropriate settings for your setup (see section "Jumper Settings of the Audio Panels" 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.

Instead of this panel you may have received the optocoupler based GPI (see section “GPI (Optocoupler Based) and LTC Panel” on page 2-19).

The GPI port could be used for all kinds of triggers that have to be sent 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-7.

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

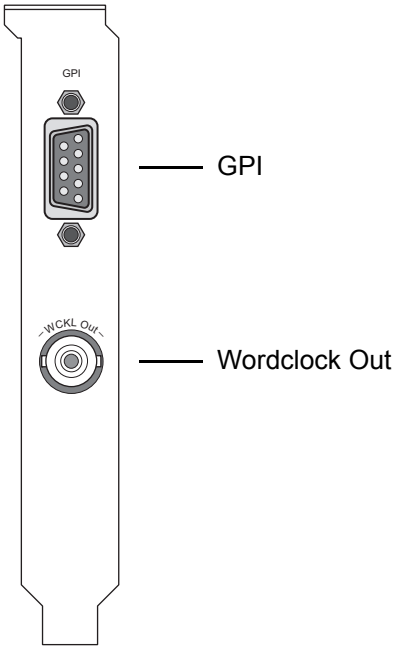


Figure 2-8: Panel for GPI and wordclock

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 circuit board of the GPI for their correct settings. This is described in detail in section “Jumper Settings of the GPI Panel(s)” on page 3-4.

2.3.4 GPI (Optocoupler Based) and LTC Panel

The GPI and LTC panel is optionally available and provides a galvanically isolated GPI based on the opto-isolator technique. Because the interface harbors LTC as well, with it you can even receive four stereo audio channels plus LTC for Centaurus II. This is made possible because the source signals coming from the Centaurus II board are looped-through to identical plugs on the connected printed circuit board which are then used to reroute the signals.

Instead of this panel you may have received the GPI and wordclock panel (see section “GPI and Wordclock Panel” on page 2-17).

This panel is also available in a low profile version, i.e. with a height of about two-third of the full-size panel.

To interface with other systems easily a breakout cable (15-pin-D-Sub to 2 × XLR and 1 × 25-pin-D-Sub) is included in the delivery that conducts the different signals to standard connectors. Pin-outs of the DB-15 connector on the slot panel and the DB-25 connector available via the breakout cable can be found in section “Signal In- and Outputs” on page A-7.

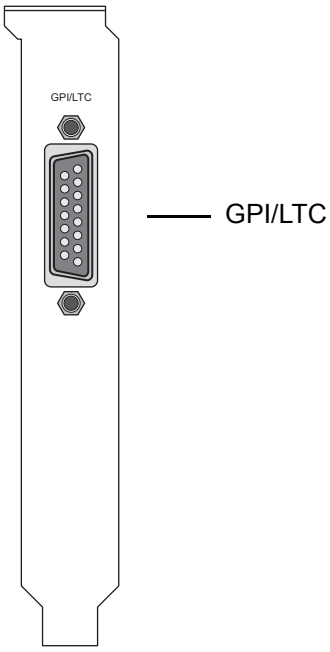
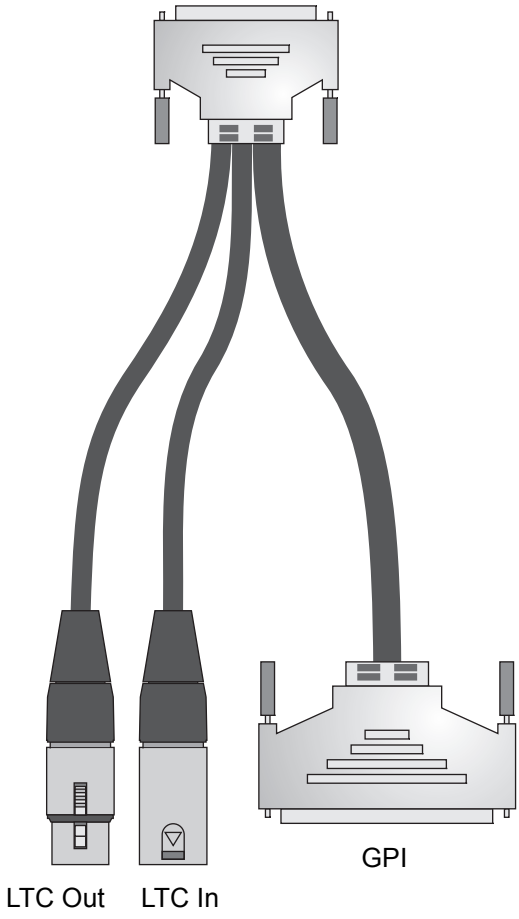


Figure 2-9: Panel with GPI and LTC connection

Item	Explanation
GPI/LTC	DB-15 connector (male) providing the general purpose interface as well as LTC in- and output, a breakout cable to two XLR and one DB-25 is included in the delivery:  *Figure 2-10: GPI/LTC breakout cable*

Prior to the installation of the GPI and LTC panel you have to check the jumper on the printed circuit board for its correct setting. This is described in detail in section “Jumper Settings of the GPI Panel(s)” on page 3-4.

Installation

This chapter details all the information necessary to install Centaurus II 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 II offers a lot of features to the user. Some of these are included in the standard version of Centaurus II, 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 II can be activated.

For some installations it may be necessary to upgrade the PCI interface (firmware) of Centaurus II. 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.

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 II in a computer system is described in this section. The installation has to be performed in several steps: First, you have to prepare the computer system and the panels for the installation, and additionally, if provided with the PCI-X variant of the board, you may have to set up the clock frequency that the board should use. After that the board itself must be installed. This is followed by the installation of the different panels. As the last step the hardware installation has to be finished.

If you want to disconnect flat cables from the board once they are plugged in, please read section “Unplugging Cables” on page 1-8.

3.1.1 Preparations

Before installing the Centaurus II 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 (PCI-X variant only). The necessary preparations will be described in the following.

Preparing the Computer System

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

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

The computer system you are trying to install Centaurus II 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 Centaurus II whenever possible.

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

Jumper Settings of the Audio Panels

On the audio panel that should be installed as the audio panel no. 1 (see section "Audio Panels" on page 2-15 and section "Connecting the Audio Panels" on page 3-8) 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. This signal configuration has to be configured via jumper settings on the printed circuit board mounted to the audio slot panel.

- Before installing the audio panel 1 please check whether the jumpers on the printed circuit board are set to your desired configuration and, if appropriate, adjust them:

To receive four audio channels plus LTC when provided with the GPI and LTC panel (see section "GPI (Optocoupler Based) and LTC Panel" on page 2-19), configure the jumper settings of the audio panel 1 to four channels of audio (i.e. to '4th audio channel activated').

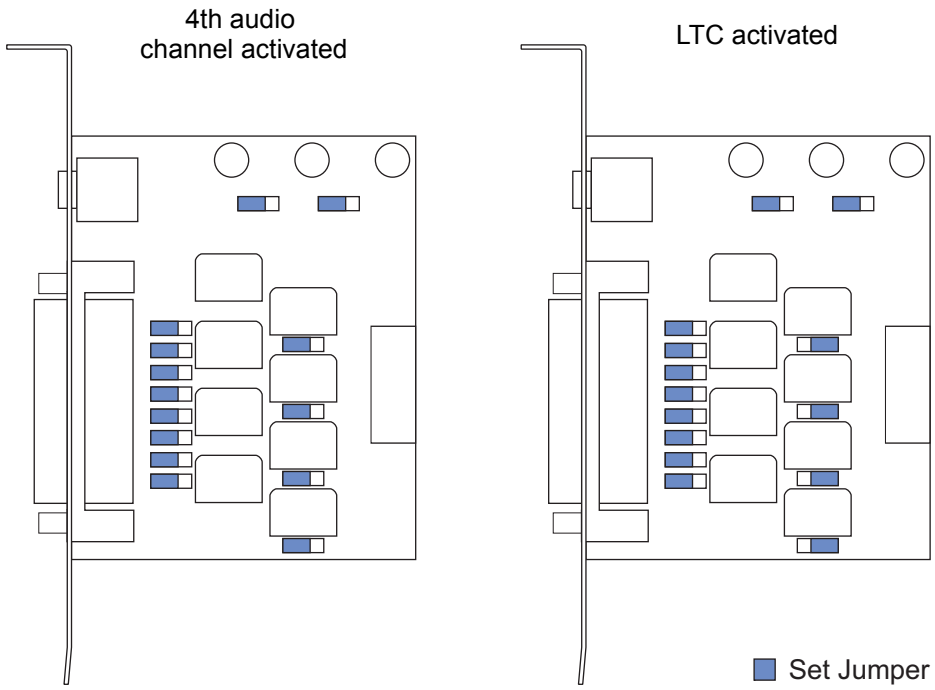


Figure 3-1: Jumper settings for audio circuit board

- Next check the jumper settings of the audio panel that should be installed as the audio panel 2. They should be set as the indicated in the left drawing (figure above, 4th audio channel activated).

After checking and, if appropriate, adjusting the jumpers of the audio panels to their correct settings you have to check the settings of the GPI panel(s).

Jumper Settings of the GPI Panel(s)

Prior to the installation of one of the GPI panels (see section “GPI and Wordclock Panel” on page 2-17 and section “GPI (Optocoupler Based) and LTC Panel” on page 2-19), you have to check the jumpers on the printed circuit 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 II.

- Please check whether the jumpers are set as shown in the figure below. It shows the printed circuit boards of the available GPI panels:

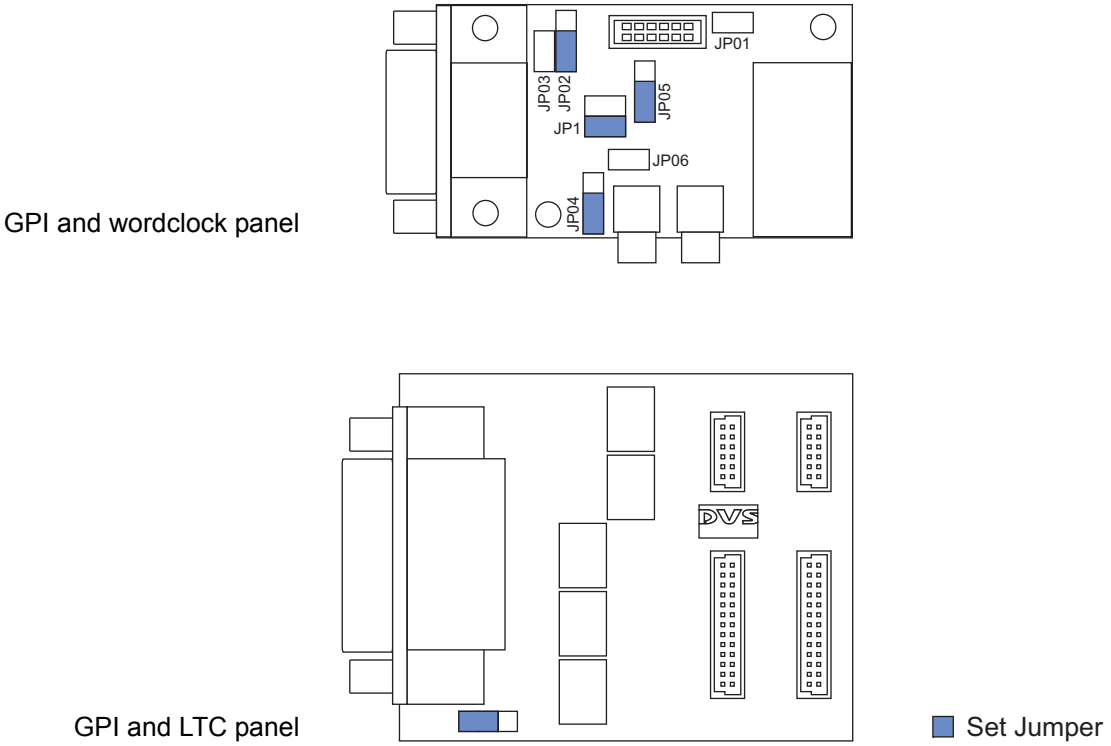


Figure 3-2: Jumper settings on GPI’s printed circuit boards

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

Setting up the Clock Frequency (PCI-X Variant only)

In case you are using the PCI-X variant of the Centaurus II board (see section “The Different Variants of the Board” on page 2-3), you may

want to use it with a clock frequency different from the factory setting (133 MHz, autodetection). Then you have to change the DIP switch for PCI on the Centaurus II board to the appropriate setting.

To run the PCI video board with a different clock frequency you may have to adjust the frequency of the respective PCI-X bus in the BIOS settings of the computer system as well.

If Centaurus II is installed with 66 MHz, 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 II to have no other data transfers running in the same PCI bus.

- Set the DIP switch for PCI on the Centaurus II board to the setting of your liking, i.e. either to 66 MHz or autodetection, as indicated in section "Centaurus II Board Layout" on page 2-4.

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 II board will be installed in the prepared computer system. For this perform the following:

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

During 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.

For an optimum performance of Centaurus II it is recommended to have no other data transfers running in the same PCI bus.

- Insert the Centaurus II board into the PCI 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 II board is installed must be equipped with a sufficient ventilation for cooling reasons.

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

3.1.3 Installation of the Panels

As the third step you have to connect the delivered panels internally to the Centaurus II 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 II. If Centaurus II serves as a replacement for its previous version there may also be some panels already available that you may connect to Centaurus II if needed.

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

Connecting the SDI and RS-422 Panel

If provided with the SDTV dual-link and HDTV single-link version of the Centaurus II board, the (HD) SDI connectors of the SDI and RS-422 panel should be linked to the second link of the SD stream (i.e the SD SDI connectors). With them connected Centaurus II will be able to follow the SMPTE 259 specification for SDTV signals.

With the dual-link HDTV version of Centaurus II the HD SDI connectors have to be linked to the explicitly labeled B ports on the PCI video board (see dotted line in figure below). In this case the SDI links provide a multi-rate connection in accordance with the specifications SMPTE 259, SMPTE 292 and SMPTE 372.

The latter connections can also be used with the SDTV dual-link and HDTV single-link version of the board which will then provide in YUV for an input the same as the input port A and for an output you can get a mirrored output signal.

All connections can be found at the top of the Centaurus II board.

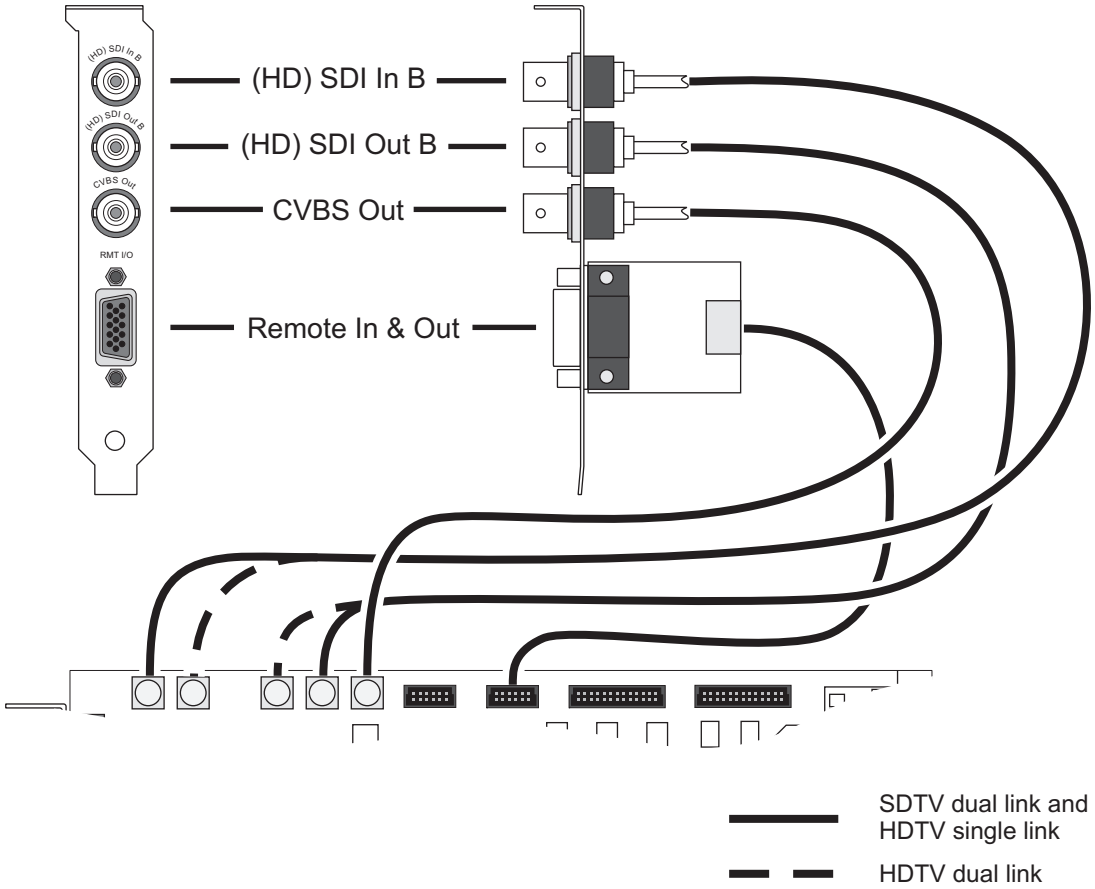


Figure 3-3: Internal connections of SDI and RS-422 panel

Connecting the Audio Panels

The audio slot panels are connected via 26-pin flat cables to the Centaurus II board. To perform the internal connections connect the two audio panels to the board as shown in the following figure:

Prior to the installation of the audio panels you have to set the jumpers on their printed circuit boards to the desired settings. This is described in detail in section "Jumper Settings of the Audio Panels" on page 3-3.

If you are provided with the GPI and LTC panel (see section "GPI (Optocoupler Based) and LTC Panel" on page 2-19), connect the audio panel 1 to the printed circuit board of the GPI and LTC panel instead of connecting to the Centaurus II board directly as detailed below (see section "Connecting the GPI and LTC Panel" on page 3-11).

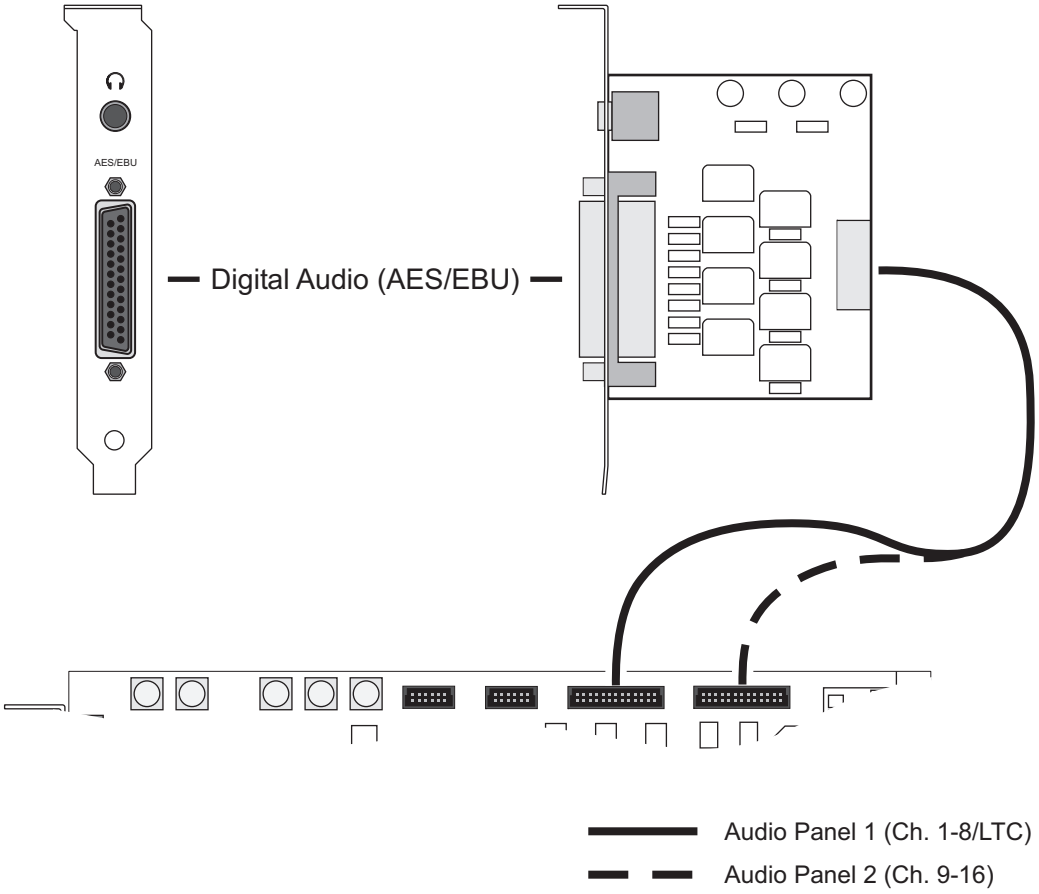


Figure 3-4: Internal connections of audio panels

Connecting the GPI and Wordclock Panel

The printed circuit board behind the GPI connector plugs via a 12-pin flat cable to the top of the Centaurus II 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 circuit board of the GPI for their correct settings. This is described in detail in section "Jumper Settings of the GPI Panel(s)" on page 3-4.

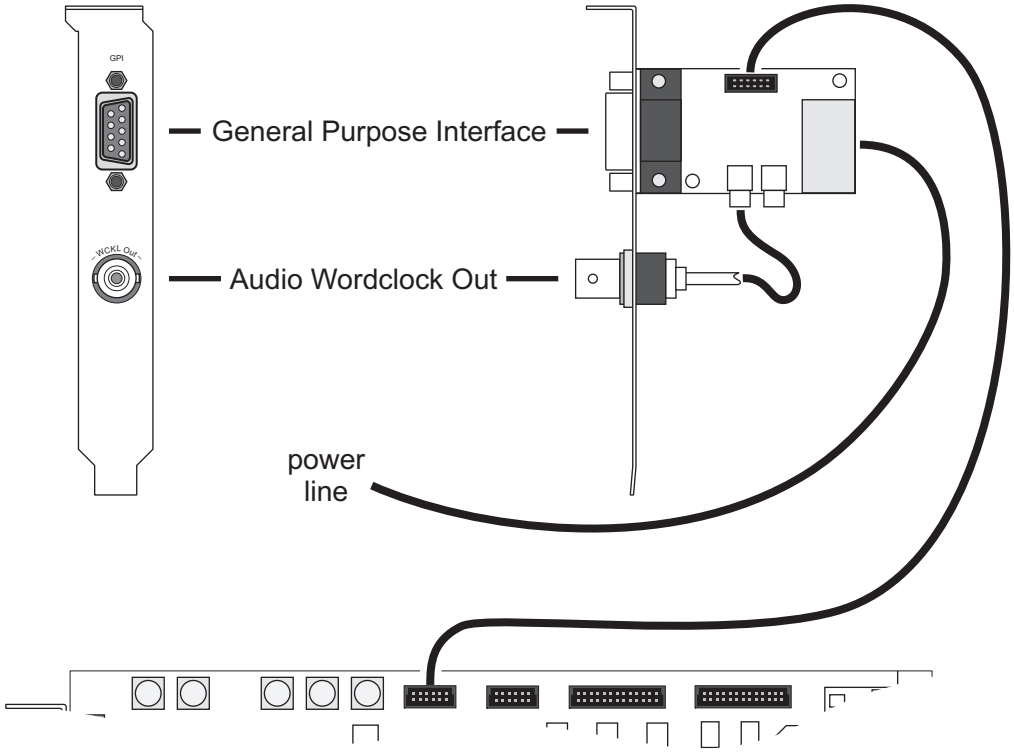


Figure 3-5: Internal connections of GPI and wordclock panel

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:

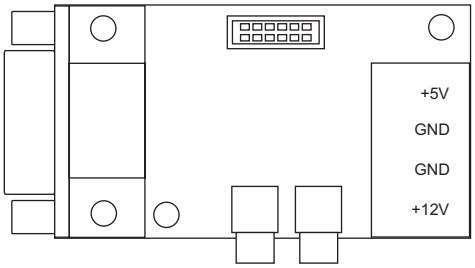


Figure 3-6: Power line specification

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.

Connecting the GPI and LTC Panel

The printed circuit board of the GPI and LTC panel has to be connected via 12-pin and 26-pin flat cables to the top of the Centaurus II 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 LTC panel you have to check the jumper on the printed circuit board of the GPI for its correct setting. This is described in detail in section “Jumper Settings of the GPI Panel(s)” on page 3-4.

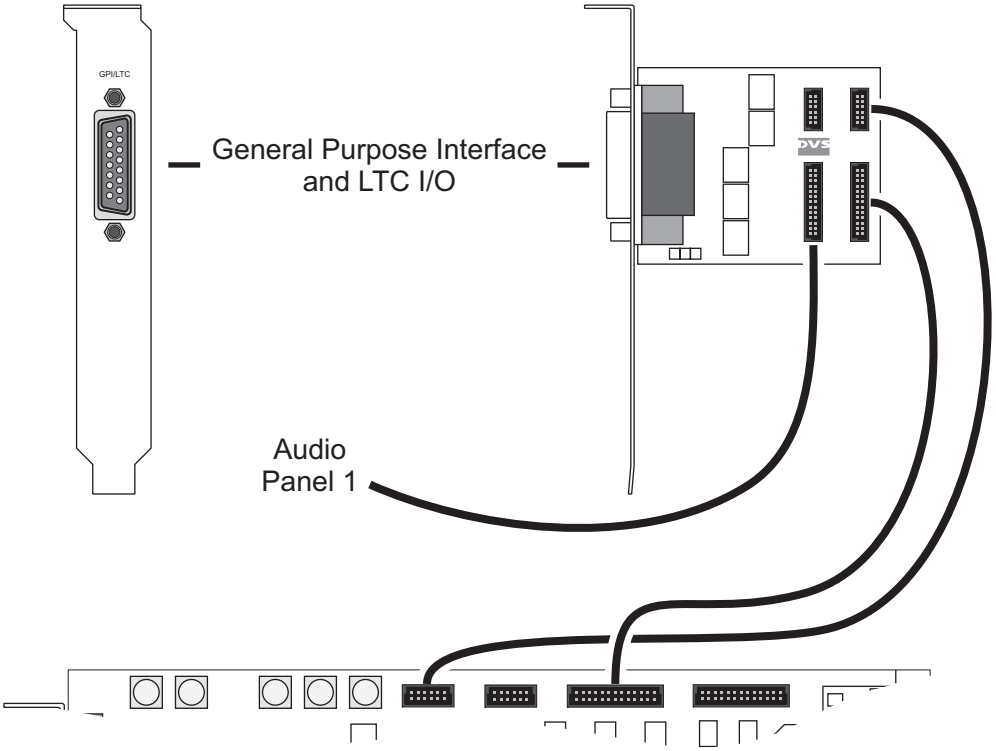


Figure 3-7: Internal connections of GPI and LTC panel

If provided with audio, connect the audio panel 1 to the Centaurus II board as detailed above. With this setup you will receive four stereo channels audio (via audio panel) as well as LTC (via GPI and LTC panel) when the audio panel is configured to '4th audio channel activated' (see section “Jumper Settings of the Audio Panels” on page 3-3).

When the internal connections are all set up, Centaurus II 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 II board is the last step to be performed. To finish the hardware installation do the following:

In case you want to run the PCI-X variant of the Centaurus II board with a clock frequency different from the factory setting, you may have to adjust the frequency of the respective PCI-X bus where the board is installed in the BIOS settings of the computer system.

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

Once the computer system has finished the loading of the operating system, the installation of Centaurus II 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 3-13).

3.2 Software Installation

Beside the files for software development, the DVS SDK software package also includes the Centaurus II board driver and tools for a basic hardware setup and diagnostics.

For descriptions of the software and driver as well as their installations please refer to the separate SDK documentation.

Once the software installation is completed, you have to activate the feature set available for Centaurus II 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 II. 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 II to be able to use the full feature set.

Centaurus II is capable of holding three license keys. The first key (key 1) is usually used for licensing the features that were ordered with Centaurus II. 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 II until date of expiration (if applicable). Each time Centaurus II 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 Only' and 'All Operating Systems').

3.3.1 Setting of License Key (Windows Only)

Once the DVS SDK and the driver are properly installed, you have to set the license key for Centaurus II 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 3-15.

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 'Card 0' tab.

For each installed Centaurus II board there is a 'Card' tab available. If you have more than one Centaurus II board installed in your computer system, you have to repeat the following steps with 'Card 1', 'Card 2', etc.

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

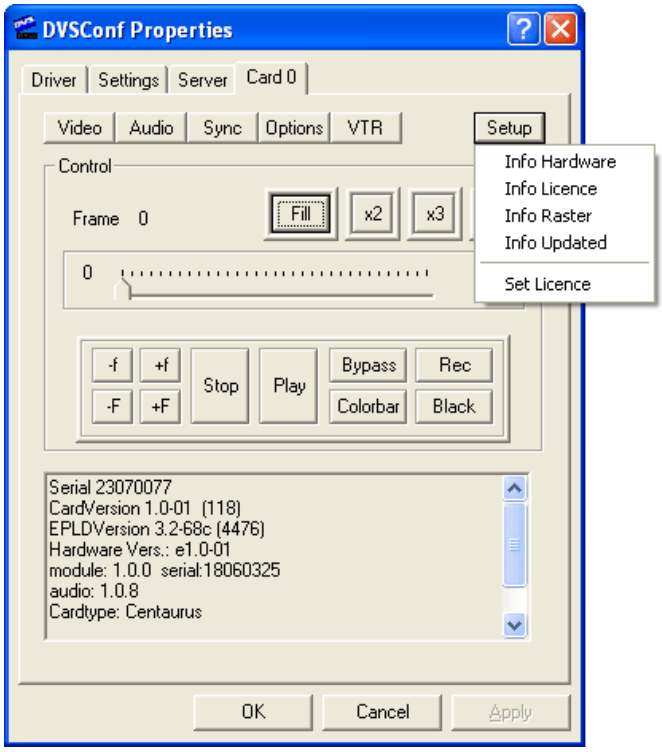


Figure 3-8: 'Card 0' tab

The following dialog window opens:

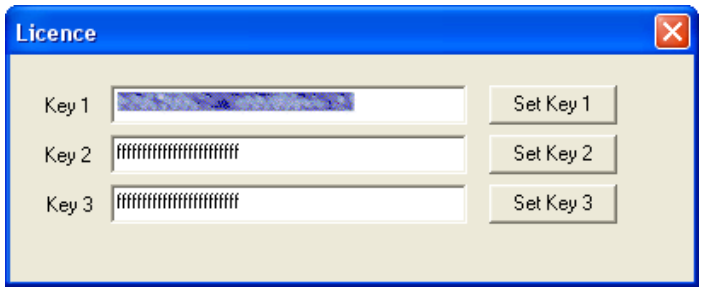


Figure 3-9: 'Licence' dialog window

- In the field 'Key 1' enter the license key that you have received with Centaurus II 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 II.

The features activated with this license 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 II 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 II.

Depending on the SDK version, you may need to upgrade the PCI interface (firmware) of the Centaurus II board. More information about this can be found in section "Upgrading the PCI Interface" on page 3-17.

To be sure your Centaurus II 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 3-20.

3.3.2 Setting of License Key (All Operating Systems)

Once the DVS SDK and the driver are properly installed, you have to set the license key for Centaurus II 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 II 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 have received with Centaurus II.

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

The features activated with this license 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 II 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 II.

Depending on the SDK version, you may need to upgrade the PCI interface (firmware) of the Centaurus II board. More information about this can be found in section “Upgrading the PCI Interface” on page 3-17.

To be sure your Centaurus II 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 3-20.

3.4 Upgrading the PCI Interface

Depending on the DVS SDK version you may need to upgrade the PCI interface (firmware) of the Centaurus II board. This can be done with a program named *lucyup###*. 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 II board as detailed in chapter "Maintenance" on page 4-1.

For the newest version of the firmware (*lucyup###*) check the DVS OEM web site (http://private.dvs.de/oem).

3.4.1 Determining the PCI Interface Version

Before upgrading the PCI interface you have to determine whether a PCI interface upgrade is necessary. For this you need to know the PCI interface version that is required at least to work properly with the DVS SDK installed. You can find this information on the DVS OEM web site (http://private.dvs.de/oem, see the respective page of your installed SDK). Look for the line that says 'Required firmware version: Version 3.2.68.7_11_2' or similar. The numbers tell you the PCI interface version.

Next you have to check the PCI interface version of your Centaurus II 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 II 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: 3.2.68.8_11_2' or similar.

The numbers indicate the PCI interface version of your Centaurus II board. In detail they stand for three version numbers that are separated by underscores, i.e. with the pattern <v_1>_<v_2>_<v_3>.

The first version number (<v_1>) consists of four figures which have to be treated as one version number, whereas the other two version numbers (<v_2> and <v_3>) provide only one figure.

- Compare the three version numbers separately with the numbers stated on the DVS OEM web site.

If one of the version numbers is lower than the respective numbers stated on the DVS OEM web site, the PCI interface has to be upgraded.

In our example above the PCI video board does not need a PCI interface upgrade because a firmware version of 3.2.68.8_11_2 and higher is sufficient.

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 site.
- Open a command line (shell).
- Run the update program *lucyup###*:

is the PCI interface version that *lucyup###* upgrades the Centaurus II board to. Make sure that a *lucyup###* of a high enough version is available.

The program *lucyup###* upgrades all Centaurus II 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 *lucyup###* 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 II 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 3-17.

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 II installation has been successful. The tools delivered with the DVS SDK software package offer you the possibility to generate and display test pictures to check the Centaurus II 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 3-22.

- Connect a video monitor to the video output connectors of Centaurus II (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.

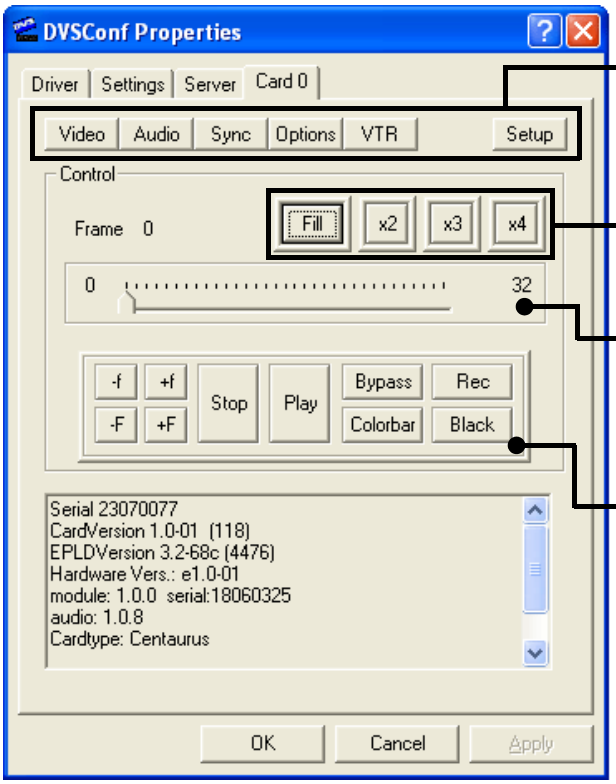
Further information on how to operate the DVSConf program can be found in the separate SDK documentation.

- 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 'Card 0' tab.

For each installed Centaurus II board there is a 'Card' tab available. If you have more than one Centaurus II board installed in your computer system, you have to repeat the following steps with 'Card 1', 'Card 2', 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 3-10: '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 II board buffer with a test pattern.
- Perform the display operations with the lower buttons.

If this works, you have successfully completed the Centaurus II installation. Together with the DVS 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 II board. For testing optionally installed video hard disks you 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 video output connectors of Centaurus II (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 II 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 II installation. Together with the DVS 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 II board. For testing optionally installed video hard disks you have to use your own test routines.

Maintenance

This chapter explains maintenance work that you may perform on your own, i.e. it will be explained in detail what to do in case of a PCI upgrade failure (see section “Upgrading the PCI Interface” on page 3-18).

An upgrade of the PCI interface (see section “Upgrading the PCI Interface” on page 3-18) 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 II.

- If appropriate, turn off the computer system where Centaurus II 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 II Board Layout" on page 2-4) to the setting indicated in the following figure:

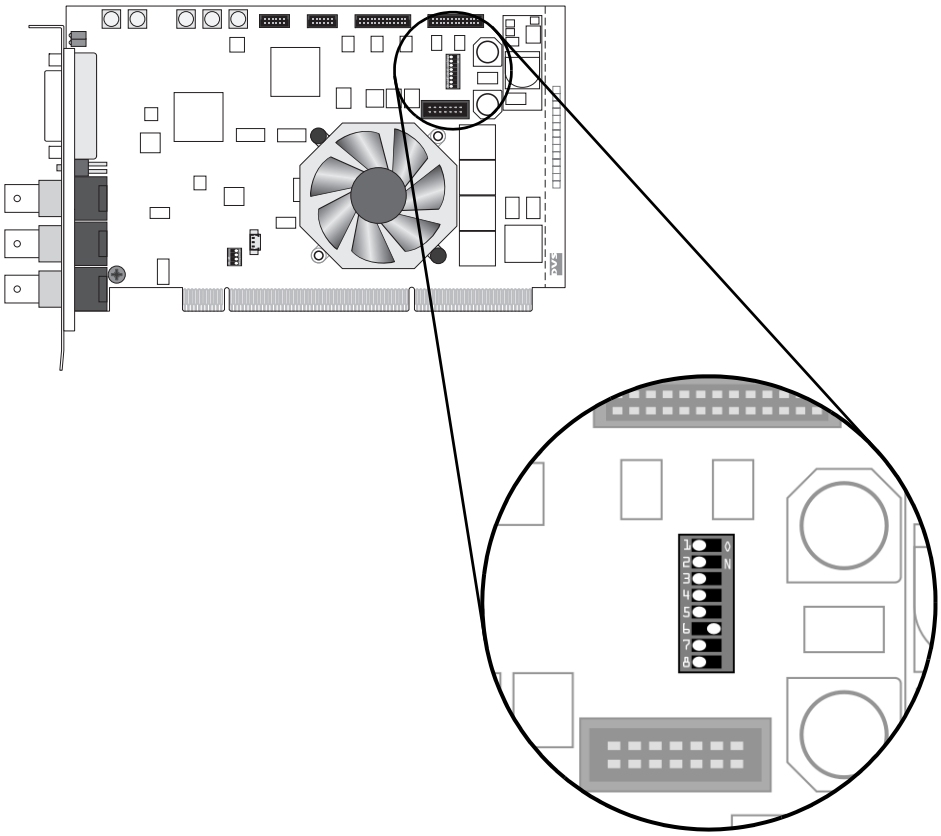


Figure 4-1: Setting of Flash controller DIP switch

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 (`lucyup###`) once again:

The PCI upgrade program upgrades all installed Centaurus II 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 3-17.

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

Appendix

This chapter provides technical data and general information about Centaurus II.

A.1 Technical Data

The following shows the technical data of the Centaurus II board.

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

PCI bus requirements	PCI-X at either 66, 100 or 133 MHz PCIe x8
Board size	Half-length, single-slot
Electrical type	PCI-X: 3.3 volt PCIe: 3.3/12 volt
Conformity	PCI-X: Specification 2.0 Mode 1 PCIe: Specification 1.0a
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 II.

Table A-1: Centaurus II specifications

Video	Input	Output
Analog		CVBS and Component
DVI (analog and digital)		1 DVI-I
HD Serial Digital 4:2:2 8/10/12 bit HD Serial Digital 4:4:4 8/10/12 bit (Dual Link)	1 BNC 2 BNC	1 BNC 2 BNC
Serial Digital 4:2:2 8/10/12 bit Serial Digital 4:4:4 8/10/12 bit (Dual Link)	1 BNC 2 BNC	1 BNC 2 BNC
Key	**Input**	**Output**
HD Serial Digital 4:0:0 8/10/12 bit for 4:2:2:4 and 4:4:4:4 Mode	1 BNC	1 BNC
Serial Digital 4:0:0 8/10/12 bit for 4:2:2:4 and 4:4:4:4 Mode	1 BNC	1 BNC
Reference	**Input**	**Output**
Analog Reference Genlock	1 BNC	
Wordclock		1 BNC
Audio	**Input**	**Output**
Embedded Audio, 8 Digital Channels (16 optionally)	1 BNC (via Video In)	1 BNC (via Video Out)
AES/EBU, 8 Digital Channels (16 optionally)	4 (8) XLR female or 4 (8) BNC via breakout boxes	4 (8) XLR male or 4 (8) BNC via breakout boxes
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 switch-able)	1 DB-9 female (software switch-able)
GPI (1 DB-9/DB-25)	2 TTL	3 TTL (1 for hard-ware watchdog)

Table A-1: Centaurus II 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) 8/10/12 bit, user selectable
Internal Processing	Color space conversion Low-pass filtering (4:4:4 ↔ 4:2:2) User definable LUT Frame repetition Real-time (alpha channel) mixer HD-to-SD down-converter Input raster detection 3:2 & 2:3 pulldown insertion/removal Watchdog with hardware relay
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 II 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 Optocoupler GPI

This section provides further details about the GPI based on optocoupler technology (see section "GPI (Optocoupler Based) and LTC Panel" on page 2-19).

A.4.1 Technical Data

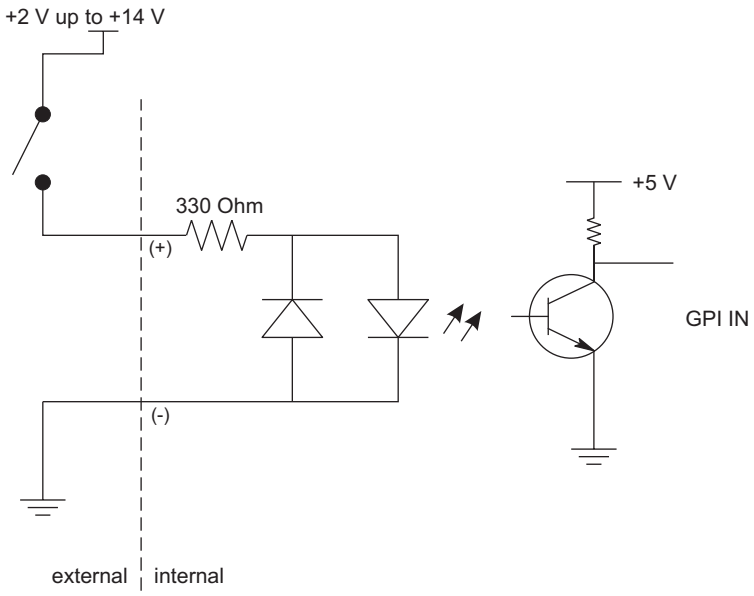
The following shows some technical data of the optocoupler GPI:

Output	DC or peak AC load voltage	200 V
	continuous DC load current	200 mA bidirectional
Input	min. voltage to turn to ON	2 V DC
	max. voltage to turn to ON	14 V DC

A.4.2 Block Diagrams

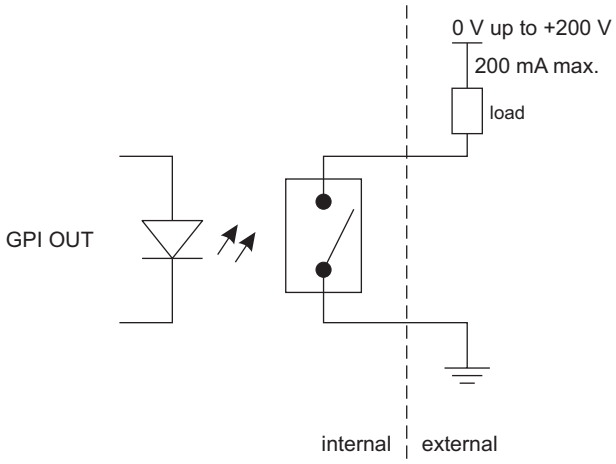
This section shows block diagrams of the GPI in- and output.

GPI Input



The inputs turn on if you feed a current between 2 mA and 40 mA to the positive pins, negative must then be connected to ground.

GPI Output



The output can switch loads with a maximum current of 200 mA at a voltage range from 0 V to 200 V, or up to 200 V (peak with AC) at no current.

A.5 Video Rasters

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

Table A-2: Supported video rasters

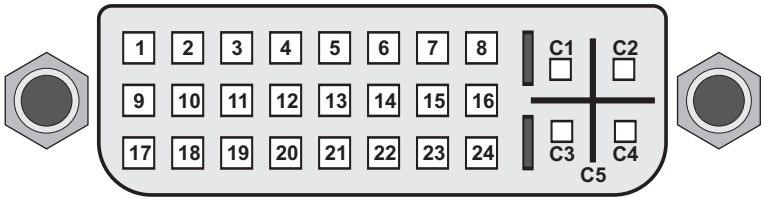
Raster	Total lines per frame	x size	y size	Aspect ratio
525i /29.97 (NTSC)	525	720	486	4:3
625i /25 (PAL)	625	720	576	4:3
525i /29.97 (NTSC HR)	525	960	486	16:9
625i /25 (PAL HR)	625	960	576	16:9
720p /23.976/24/25/29.97/30 /50/59.94/60	750	1280	720	16:9
1035i /29.97/30	1125	1920	1035	16:9
1080i /23.976/24/25/29.97/30	1250	1920	1080	16:9
1080p /23.976/24/25/29.97/30 /50/59.94/60	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.6 Signal In- and Outputs

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

Digital Video Interface (DVI-I Connector)

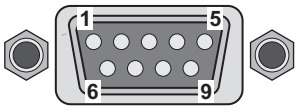


(external view;
female on interface, male on cable)

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)



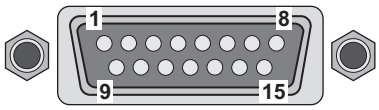
(external view;
male on interface, female on cable)

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.

GPI/LTC Pin-out (15-Pin D-Sub Connector)

The DB-15 plug provides the optocoupler GPI as well as LTC in- and output. It can be connected to a breakout cable providing one DB-25 and two XLR connectors.

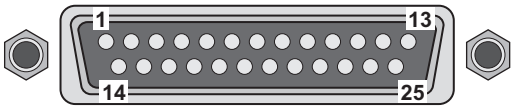


(external view;
male on interface, female on breakout cable)

Pin	Signal	Pin	Signal
1	GPI_IN0 (GPI input 0)	9	/GPI_IN0 (GPI input 0)
2	GPI_IN1 (GPI input 1)	10	/GPI_IN1 (GPI input 1)
3	GPI_OUT0 (GPI output 0)	11	/GPI_OUT0 (GPI output 0)
4	GPI_OUT1 (GPI output 1)	12	/GPI_OUT1 (GPI output 1)
5	GPI_OUT2 (GPI output 2)	13	/GPI_OUT2 (GPI output 2)
6	LTC OUT	14	/LTC OUT
7	LTC IN	15	/LTC IN
8	LTC GND		

GPI Pin-out (25-Pin D-Sub Connector Breakout Cable)

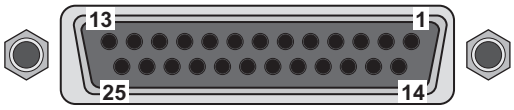
The DB-25 connector of the breakout cable provides the following pin-out once connected to the GPI/LTC plug of the GPI and LTC panel:



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

Pin	Signal	Pin	Signal
1	–	14	–
2	–	15	–
3	/GPI_OUT2 (GPI output 2)	16	GPI_OUT2 (GPI output 2)
4	–	17	/GPI_OUT1 (GPI output 1)
5	GPI_OUT1 (GPI output 1)	18	–
6	/GPI_OUT0 (GPI output 0)	19	GPI_OUT0 (GPI output 0)
7	–	20	–
8	–	21	–
9	–	22	–
10	–	23	–
11	–	24	GPI_IN1 (GPI input 1)
12	/GPI_IN1 (GPI input 1)	25	GPI_IN0 (GPI input 0)
13	/GPI_IN0 (GPI input 0)		

Digital Audio (25-Pin D-Sub Connector)



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

Table A-3: Digital Audio Ch. 1-8/LTC

Pin No.	Signal	Pin No.	Signal
1	Audio OUT CH 7/8, or LTC OUT	14	/Audio OUT CH 7/8, or /LTC OUT
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, or LTC IN	20	/Audio IN CH 7/8, or /LTC IN
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	–		

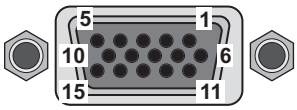
Table A-4: Digital Audio Ch. 9-16

Pin No.	Signal	Pin No.	Signal
1	Audio OUT CH 15/16	14	/Audio OUT CH 15/16
2	GND	15	Audio OUT CH 13/14
3	/Audio OUT CH 13/14	16	GND
4	Audio OUT CH 11/12	17	/Audio OUT CH 11/12
5	GND	18	Audio OUT CH 9/10
6	/Audio OUT CH 9/10	19	GND

Table A-4: Digital Audio Ch. 9-16 (cont.)

Pin No.	Signal	Pin No.	Signal
7	Audio IN CH 15/16	20	/Audio IN CH 15/16
8	GND	21	Audio IN CH 13/14
9	/Audio IN CH 13/14	22	GND
10	Audio IN CH 11/12	23	/Audio IN CH 11/12
11	GND	24	Audio IN CH 9/10
12	/Audio IN CH 9/10	25	GND
13	–		

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

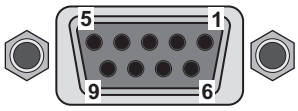


(external view;
female on interface, male on breakout cable)

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 SDI and RS-422 panel of Centaurus II 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 2-6 on page 2-14). The two ports can be switched between master and slave mode via the software, 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.7 Conformity Declarations

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

A.7.1 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.7.2 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 II	EC Directives: – EMC Directive 2004/108/EC – Low-Voltage Directive 2006/95/EC
	Applied Harmonized Standards: – EN50081-1 – EN50082-2 – EN55022 – EN55024 – EN61000-4-2 – EN61000-4-3 – EN61000-4-4 – EN61000-4-5 – EN61000-4-6

A.7.3 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 II

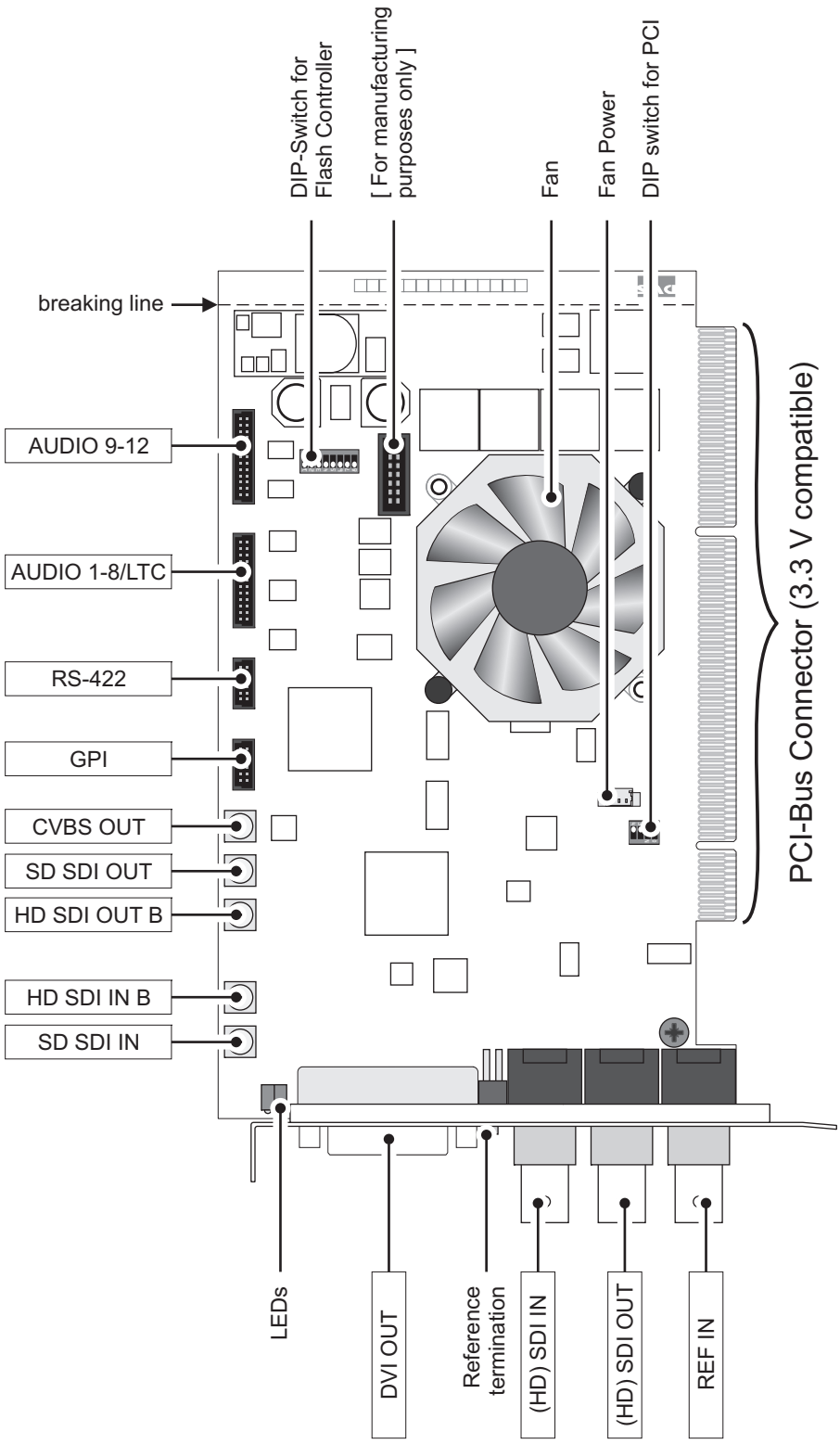
FCC Notice

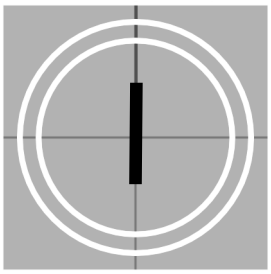
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, 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.

A.8 Short Reference: Centaurus II Board

This section only shows the PCI-X variant of the Centaurus II board. Most items can be found on the PCIe variant as well (see also section "Overview of the Board" on page 2-3).





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