



Storage Solution

SpycerBox

Ultra/Flex

Hardware Guide



SpycerBox Ultra/Flex Hardware Guide

Introduction

Overview

Installation

Operation

Maintenance

Appendix

Index

1

2

3

4

5

A

I

Hardware Guide Version 3.0 for the SpycerBox Ultra (SpycerBox Ultra II Revision 1.2) and Spycer-Box Flex (SpycerBox Flex Revision 1.1)

Copyright © 2012 by Rohde & Schwarz DVS GmbH, Hanover. All rights reserved.

The manuals as well as the soft- and/or hardware described here and all their constituent parts are protected by copyright. Without the express permission of Rohde & Schwarz DVS GmbH any form of use which goes beyond the narrow bounds prescribed by copyright legislation is prohibited and liable to prosecution.

This particularly applies to duplication, copying, translation, processing, evaluation, publishing, and storing and/or processing in an electronic system.

Specifications and data may change without notice. We offer no guarantee that this documentation is correct and/or complete. In no event shall Rohde & Schwarz DVS GmbH be liable for any damages whatsoever (including without limitation any special, indirect or consequential damages, and damages resulting from loss of use, data or profits, or business interruption) arising out of the use of or inability to use the hardware, software and/or manual materials.

Those parts of this documentation that describe optional software or hardware features usually contain a corresponding note. Anyway, a lack of this note does not mean any commitment from Rohde & Schwarz DVS GmbH.

DVS and Spycer are registered trademarks of Rohde & Schwarz DVS GmbH. FireWire is a trademark of Apple Inc., registered in the U.S. and other countries. Linux is a registered trademark of Linus Torvalds.

Any other product names mentioned in this documentation may be trademarks or registered trademarks of their respective owners and as such are subject to the usual statutory provisions.



Headquarters:

Rohde & Schwarz DVS GmbH
Krepenstr. 8
30165 Hannover
GERMANY

Phone: +49-511-67807-0
Fax: +49-511-630070
E-mail: info.dvs@rohde-schwarz.com
Internet: <http://www.dvs.de>

Support:

Phone: +49-511-67807-125
Fax: +49-511-371985
E-mail: service.dvs@rohde-schwarz.com

Registration Form

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/support/support-login.html>

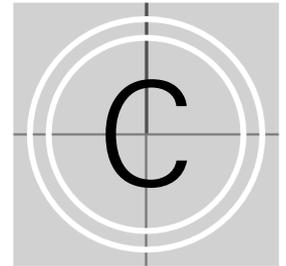
PLEASE SEND TO:

Rohde & Schwarz DVS GmbH
Krepenstr. 8
30165 Hannover
GERMANY
Fax: +49-511-630070

Customer	
Name:	_____
Company:	_____
Contact:	_____
Address:	_____

Phone:	_____
Fax:	_____
Vendor:	_____
SpycerBox Ultra/Flex	
Serial No.:	_____
Remarks:	_____

Connected devices (used network connections, connected storages, file systems, etc.)	



Contents

1	Introduction	1-1
1.1	Overview	1-2
1.2	Target Group	1-3
1.3	Conventions Used in this User Guide	1-4
1.4	Safety Instructions	1-5
1.5	Important Notes	1-7
2	Overview	2-1
2.1	Variants: SpycerBox Ultra and SpycerBox Flex	2-2
2.2	Overview of the Front	2-2
2.2.1	The Front of the System	2-2
2.2.2	DVD Drive	2-3
2.2.3	HDD LEDs	2-4
2.2.4	Faceplate	2-5
2.2.5	Hard Disk Array	2-6
2.2.6	Operation Items	2-9
2.3	Overview of the Rear	2-11
2.3.1	The Rear of the System	2-11
2.3.2	System Disk Array	2-12
2.3.3	ATX Connector Panel	2-13
2.3.4	Power Supply	2-14
2.3.5	Slot Panel Connectors	2-15
2.4	Battery Backup Unit	2-17
3	Installation	3-1
3.1	System Setup	3-1
3.2	Note about the Network Installation	3-2

4	Operation	4-1
	4.1 Starting the System	4-2
	4.2 DVS Configuration Tool	4-3
	4.3 Shutting Down the System	4-4
5	Maintenance	5-1
	5.1 Hard Disk Maintenance	5-2
	5.1.1 Introduction to RAID	5-2
	5.1.2 Identifying a Broken Hard Disk	5-4
	5.1.3 Replacing a Hard Disk	5-5
	5.2 Opening and Closing the Casing	5-8
	5.2.1 Opening the Casing	5-8
	5.2.2 Closing the Casing	5-8
	5.3 Fan Maintenance	5-9
	5.4 Controller Maintenance	5-12
	5.5 Power Supply Maintenance	5-14
	5.6 Backup or Recovery of the System Disk	5-16
	5.6.1 Creating a Backup Image of the System Disk	5-16
	5.6.2 Restoring the System Disk	5-18
	5.7 Removal of the Faceplate	5-20
A	Appendix	A-1
	A.1 Troubleshooting	A-2
	A.2 Technical Data	A-4
	A.2.1 General Technical Data	A-4
	A.2.2 Dimensions	A-5
	A.3 Packing Instructions	A-6
	A.4 Conformity Declarations	A-8
	A.4.1 RoHS Compliance	A-8
	A.4.2 EC Declaration of Conformity (CE Marking)	A-8
	A.4.3 FCC Compliance Statement	A-8
I	Index	I-1

Introduction



This documentation describes how to use the hardware of the SpycerBox manufactured by DVS. The SpycerBox is a multi-purpose storage as well as server device delivered with several data management tools. It is the ideal solution for users at broadcast and post production facilities who want to make the most of their file-based workflows. The SpycerBox can be used, for example, ...

- ... as a high-performance automated backup and archiving solution,
- ... as a powerful file server with proxy clip generation, or
- ... as an NAS solution for a network.

Together with the hardware of the SpycerBox you also receive the SpycerBox software, an extended version of DVS's data management software Spycer. With the SpycerBox software you can, for instance, automatically create low-resolution proxy video clips of the content on the local or a connected storage, defragment an SNFS storage such as a SAN, or perform scheduled maintenance tasks automatically in your network.

The SpycerBox hardware uses Linux as its operating system and can be delivered with various storage capacities. Furthermore, several connection possibilities are optionally available to integrate the system seamlessly into your workflows.

The SpycerBox can be delivered in two hardware variants: SpycerBox Ultra using 3.5" hard disks (normally 24 pcs.) and providing a storage capacity of up to 72 TB, and SpycerBox Flex using 2.5" hard disks (normally 48 pcs.) with up to 43.2 TB of storage capacity.



1.1 Overview

This guide informs you about the installation of the SpycerBox hardware, its operation as well as all connection possibilities. Furthermore, it describes maintenance tasks that you may carry out on your own.

The chapters contain the following information:

Chapter 1	Begins with a short introduction to the SpycerBox, followed by a note regarding the audience this manual is written for and an explanation of the conventions used in this manual. Furthermore, it provides safety instructions that you must adhere to and some important notes that you should observe.
Chapter 2	This chapter gives a front and rear overview of the system detailing all items, connectors and interfaces. Additionally, it contains some further information, for example, about the battery backup unit.
Chapter 3	Describes the hardware installation of the DVS system.
Chapter 4	Explains how to operate the DVS system, i.e. how to start and shut down the device. Additionally, the DVS Configuration Tool is described briefly.
Chapter 5	Details maintenance work, for example, in case of a hard disk, fan or power supply unit failure.
Appendix	Provides technical details and general information about the hardware of the DVS system. Furthermore, it gives hints how to resolve irregularities during operation.
Index	This chapter facilitates the search for specific terms.

1.2 Target Group

To use this manual you should know how to handle computer equipment. Furthermore, to connect the DVS system to a network or a SAN storage you should have experience as a network administrator and know how to set up the required network connections on the installation site in hard- as well as software.

When performing maintenance tasks on the hardware of the DVS system, you must be qualified to work on, repair and test electrical equipment.



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.

Entry	Indicates entries to be made at a command line or an output of a program on the screen
[Key]	A key on a keyboard

Keyboard Shortcuts

To perform options or procedures with the keyboard often requires a simultaneous pressing of two keys.

Example:

[Ctrl + F1]	If this is given, hold down the [Ctrl] key and press simultaneously the [F1] key.
-------------	---

1.4 Safety Instructions

To use the SpycerBox correctly please heed the following:



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

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

General

The SpycerBox 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 the DVS system the manuals and guides delivered with it must be read and observed.

- Use the DVS system only in apparent good technical order.
- The hardware of the DVS system 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 system. Avoid touching the internal components of the DVS system whenever possible.
- Computer hardware contains components that are sensitive to changing voltages. Connecting or disconnecting the DVS system 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, store and transport the DVS system only in compliance with the technical data laid out in section “Technical Data” on page A-4.
- If fluids or solid objects get inside the casing, the DVS system must be disconnected from the power supply immediately. Before using the DVS system again, it has to be checked by authorized service personnel.
- Only use a damp tissue without any cleaning agents to clean the casing.
- The DVS system must 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 the DVS system whatsoever.



Transportation

The SpycerBox is a very sensitive device. Especially the hard disks of the system must be handled with great care. Therefore, observe in case of transportation:

- Handle the DVS system with great care.
- Always use the original packing or a similar structured packing for transportation as detailed in section “Packing Instructions” on page A-6.
- Avoid shocks or vibrations during transport. For longer distances it is recommended to use a lifting truck.
- Keep the DVS system as a transportation good dry.
- In the warranty period you have to keep the original packing and use it in case of transportation.

Environmental Conditions

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

- Do not expose the DVS system to sources of heat, such as direct sunlight or a radiator.
- Do not cover or obstruct the ventilation holes of the system.
- When installing the DVS system in a rack, take care that warmed up air is conducted to the rear of the rack and properly vented away.
- Avoid areas with high humidity or dust. Best operating conditions are given in an air-conditioned site.
- Do not expose the DVS system to strong electric or magnetic fields.
- Avoid areas where the DVS system will be subject to vibrations or shocks.

1.5 Important Notes

The following provides information about warranty, a note about the conformity of the product and some other general information.

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.



You have to keep the original packing and use it in case of transportation. Otherwise this warranty will be void.

In the event of a defect or failure to conform 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's 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. In the warranty period the customer must keep the original packing and pack the DVS product in it in case of a product return. 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 Rohde & Schwarz DVS 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 re-installations.
- 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-8.



Product Disposal (B2B)

Used electrical and electronic products should not be disposed of with general household waste. At the end of its service life you may return the DVS product after appropriate prior notification to either your local distributor or DVS in Germany. DVS will then take the device free of charge to a waste disposal organization which will recycle and reuse it environmental friendly.



General Notes

Please observe the following general important notes:



Leave about 10 to 15% of the overall main storage capacity empty of data for performance reasons.



Your DVS system has been tested thoroughly and is very reliable. However, because of the vast amount of third-party software available, its reactions on the installation of such could not be tested. The installation of third-party software may disrupt the real-time capability and/or limit the functionality of your system.

Overview



This chapter provides a detailed overview of the hardware of the DVS system. First the different hardware variants of system will be explained. After this it will be shown in a front and a rear view and all its parts and connectors will be described. The chapter will be concluded with a description of the battery backup unit installed inside the system.



2.1 Variants: SpycerBox Ultra and SpycerBox Flex

The SpycerBox can be delivered in two different hardware variants depending on, for example, the amount of the storage or the performance that is required. The following variants are available:

- SpycerBox Ultra using 3.5" hard disks (normally 24 pcs.) and providing a storage capacity of up to 72 TB.
- SpycerBox Flex using 2.5" hard disks (normally 48 pcs.) for up to 43.2 TB of storage capacity.

Apart from the hard disk array where the hard disks are installed (see section "Hard Disk Array" on page 2-6) the two variants are in most respects identical. Wherever required the specialities of these variants will be detailed in this document.

2.2 Overview of the Front

This section gives an overview of the front of the DVS system. After an overall overview of the front the DVD drive is described first, followed by details about the HDD LEDs. After this the faceplate and the hard disk array of the system as well as the operation items will be explained.

2.2.1 The Front of the System

This section provides an overview of the front of the system:

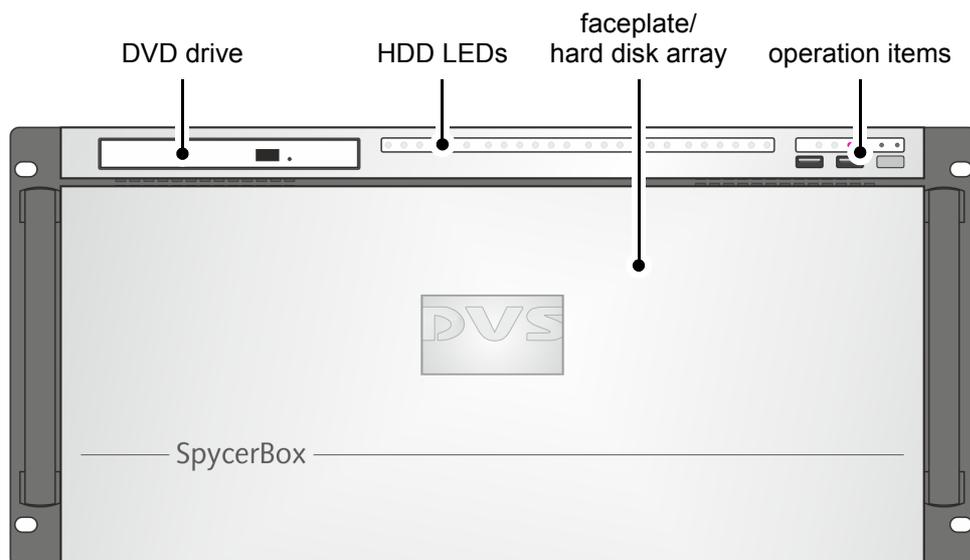


Figure 2-1: Overview of the front

DVD drive	The DVD drive can be used, for example, for software installations. Further information about the DVD drive can be found in section "DVD Drive" on page 2-3.
HDD LEDs	The upper part of the front is equipped with LEDs that indicate the statuses (activities) of the hard disks of the hard disk array. Further information about the LEDs and their meaning can be found in section "HDD LEDs" on page 2-4.
faceplate/ hard disk array	The faceplate covers the hard disk array. If you need access to one of the hard disks, for example, to replace it, it can be lifted. The faceplate will be described in more detail in section "Faceplate" on page 2-5.
operation items	The hard disk array contains the main storage hard disks which can be used to store video, audio or backup material. All disks can be replaced easily in case of failure. The disk array is described in more detail in section "Hard Disk Array" on page 2-6. With the operation items the system can be controlled (e.g. turned on or off). Additionally, they offer some LEDs that allow you to assess the state of the DVS system as well as USB connectors for an easy connectivity of additional devices such as memory sticks. Further information about the operation items can be found in section "Operation Items" on page 2-9.



2.2.2 DVD Drive

The system is equipped with a DVD drive which can be used for service purposes or to install additional software. It also provides burning capability.

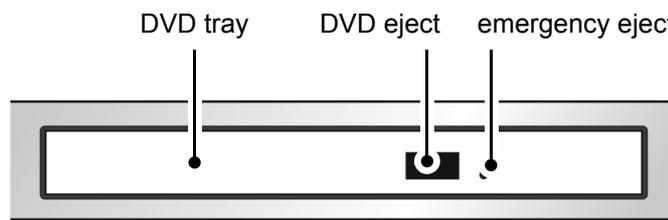


Figure 2-2: Overview of DVD drive

DVD tray The DVD tray holds the CD or DVD.

DVD eject	Opens the DVD tray when the system is turned on.
emergency eject	You can open the DVD tray with the system cut from power: Insert a thin, pointed object into the emergency eject hole. Then the DVD tray opens.

For further information regarding the operation of the drive, please refer to the original manufacturer’s documentation.

2.2.3 HDD LEDs

The HDD LEDs show the statuses (activities) of the hard disks of the hard disk array (see section “Hard Disk Array” on page 2-6). They can be seen only when they are flashing because they are located behind the white strip and thus not visible when off.



Figure 2-3: HDD LEDs

SpycerBox Ultra

For the SpycerBox Ultra each LED represents one hard disk of the hard disk array:

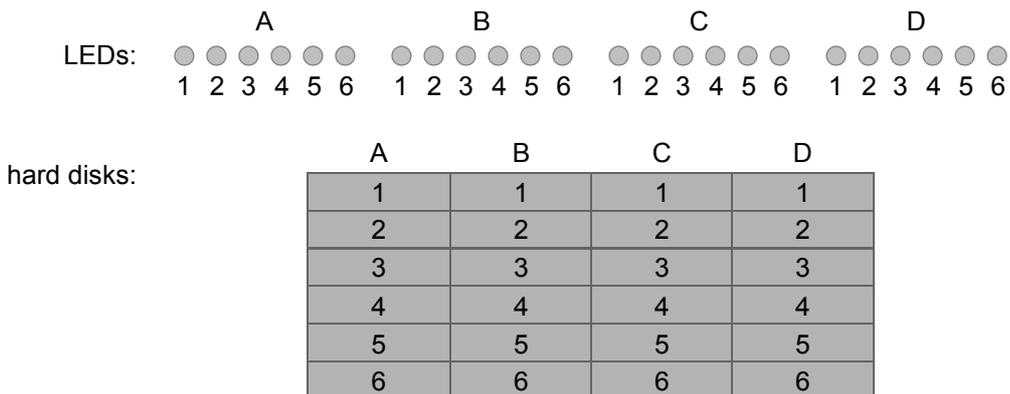


Figure 2-4: HDD LEDs and the hard disk array (SpycerBox Ultra)

Starting from the left, the first six LEDs display the accesses to hard disks in the very left column of the array, the second six LEDs show the state of the hard disks of the second column, and so on.

The top side of the faceplate is hinge-fastened, while its bottom side is fixed with magnets. If you need access to one of the hard disks, for example, to replace it, you just have to lift the faceplate:

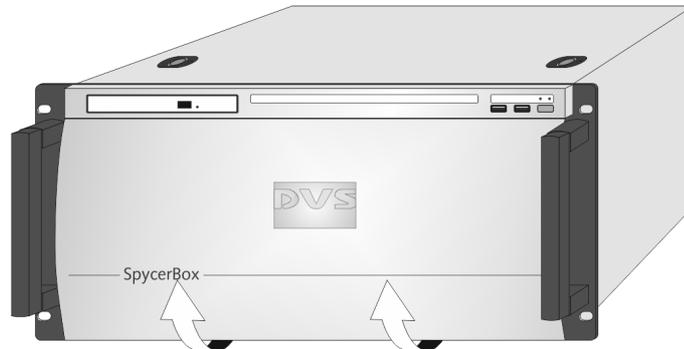


Figure 2-7: Lifting of faceplate

Then you can access the hard disks of the hard disk array (see section “Hard Disk Array” on page 2-6).



The faceplate can be removed for transport reasons (see section “Removal of the Faceplate” on page 5-20).

2.2.5 Hard Disk Array

The hard disks of the hard disk array are used, for example, to store proxy clips of your video and audio material or backup files of the connected central storage. It is the main storage of the DVS system. To prevent data loss in case a hard disk fails, it is normally RAID protected.



Further information about RAID can be found in section “Introduction to RAID” on page 5-2.

The system hard disk is not among the hard disks of the hard disk array. It can be found in the system disk array (see section “System Disk Array” on page 2-12).

Once the faceplate is lifted (see section “Faceplate” on page 2-5), you have access to the hard disk array:

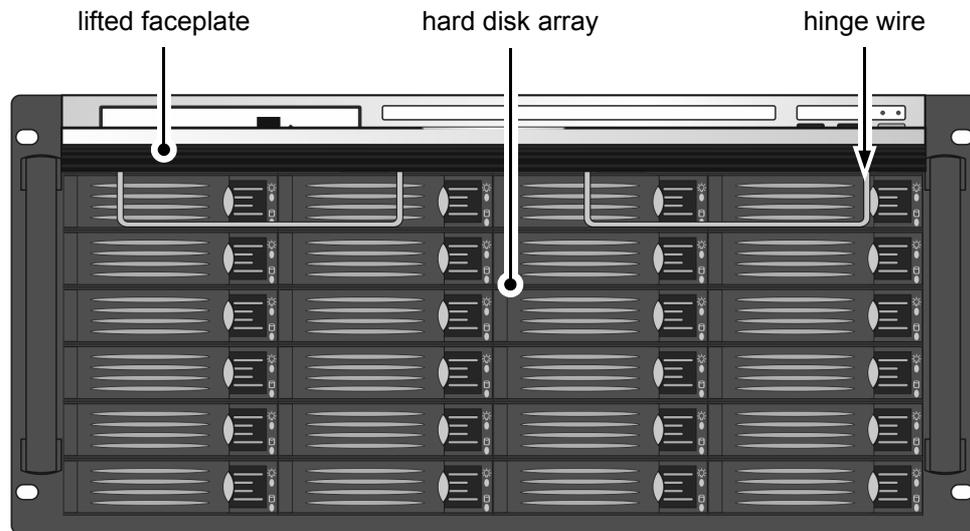
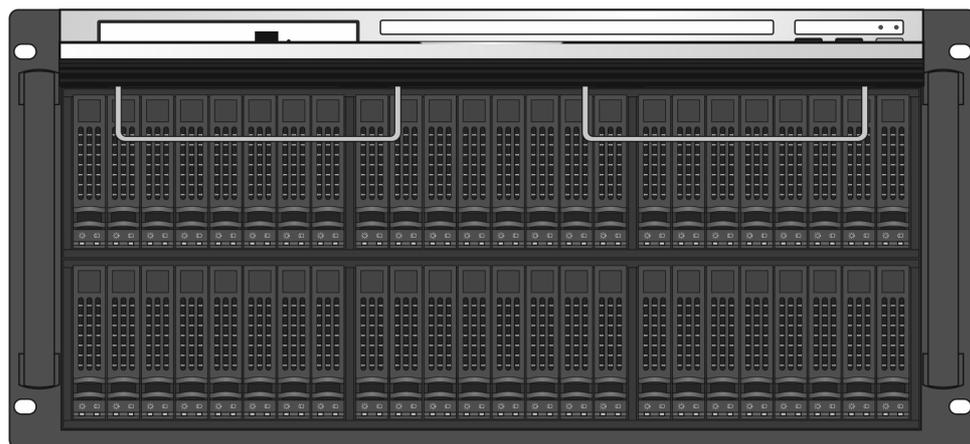
SpycerBox Ultra:*SpycerBox Flex:*

Figure 2-8: Hard disk array (*SpycerBox Ultra* and *SpycerBox Flex*)

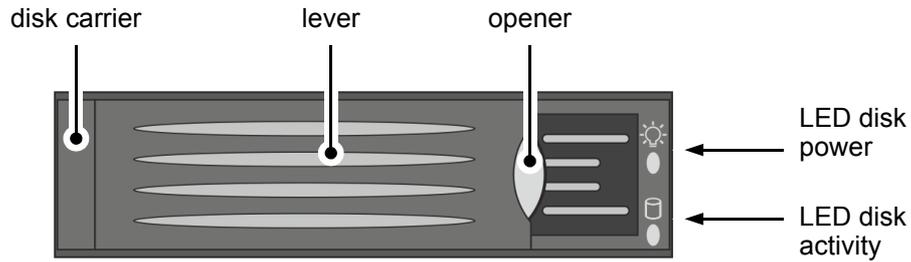


The hinge wires hold the faceplate in place and allow you to lift it. For further information see section "Faceplate" on page 2-5 and section "Removal of the Faceplate" on page 5-20.

Each hard disk of the array is connected to the system with the help of a disk carrier which makes the removal of a hard disk from the system easy, for example, in the event of a failure.



SpycerBox Ultra:



SpycerBox Flex:

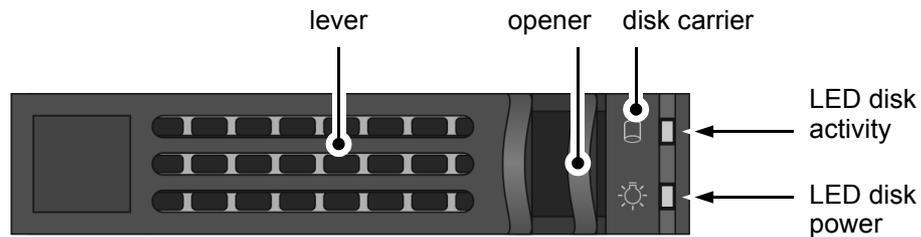


Figure 2-9: Hard disk carrier overview (SpycerBox Ultra and SpycerBox Flex)



Further information about how to remove and exchange a hard disk can be found in section “Hard Disk Maintenance” on page 5-2.

disk carrier	The disk carriers hold each one hard disk of the array. The hard disks are mounted to the disk carriers with several screws.
lever	Once the lever is unlatched with the opener, it can be used to pull the disk carrier and its hard disk out of the system.
opener	Unlatches the lever and with it the disk carrier.
LED disk power	Shows whether the disk of the disk carrier receives power.
LED disk activity	Indicates the status of the hard disk of the disk carrier (see also section “HDD LEDs” on page 2-4): <ul style="list-style-type: none"> off Hard disk is idle. green Hard disk is accessed. red A hard disk or hard disk carrier related error has occurred.

2.2.6 Operation Items

With the operation items at the system's front the hardware of the SpycerBox can be controlled (e.g. turned on or off). There you can also find LEDs that allow you to assess the state of the DVS system as well as USB connectors.

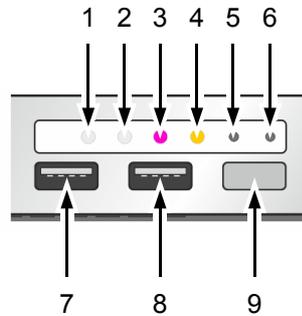


Figure 2-10: Operation items overview



The LEDs can be seen only when they are flashing because they are located behind the white strip and thus not visible when off.

Further information about what to do in case of an alarm can be found in section "Troubleshooting" on page A-2.

No.	Item	Explanation
1, 2	LAN 1/2 LEDs	Indicate that a valid network is connected to the first/second LAN connection at the rear of the system (see section "ATX Connector Panel" on page 2-13).
3	alarm LED	This LED indicates that a hardware malfunction has occurred.
4	DVD	Indicates accesses to the DVD drive.
5	mute	In case of a hardware malfunction a system alarm turns on. By pressing this button the alarm buzzer can be switched mute. Use a thin, pointed object to press this button.  Some alarms (e.g. the one in case of a hard disk failure) are independent of the system alarm and cannot be switched mute with the mute button.
6	reset	Resets your system and initiates a warm re-boot. Use a thin, pointed object to press this button.  Save your data before resetting the system. Otherwise data may be lost.



No.	Item	Explanation
7, 8	USB ports	The USB connectors (universal serial bus) at the front offer you the possibility to connect other devices such as memory sticks easily.
9	power	The power switch turns the system on or off. The respective state of the system will be indicated by the DVS logo in the middle of the faceplate (see section "Faceplate" on page 2-5).

2.3 Overview of the Rear

This section provides an overview of the rear of the system. After an overall overview of the rear the system disk array will be described, followed by detailed descriptions of the ATX connector panel and the slot panel connectors. The section will be concluded with further details about the power supply.

2.3.1 The Rear of the System

This section provides an overview of the rear of the system:

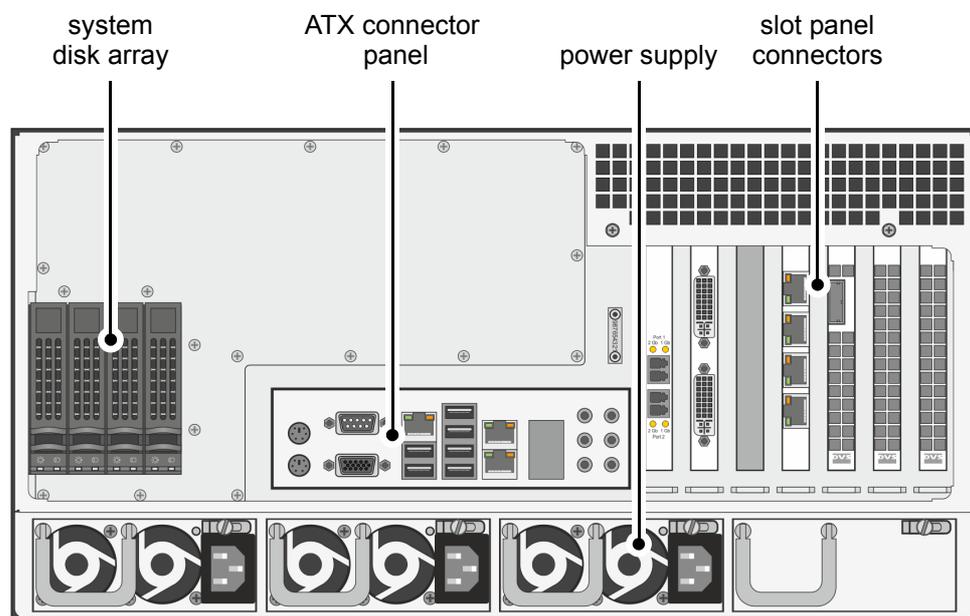


Figure 2-11: Overview of the rear

system disk array	The system disk array contains the hard disks for the operating system and metadata. You can find further information about this in section “System Disk Array” on page 2-12.
ATX connector panel	On this panel you can find the standard connectors of the computer system. Further information about them can be found in section “ATX Connector Panel” on page 2-13.
power supply	The redundant power supply provides the system with power. It consists of several independent power supply units: Even if one fails the others will still supply enough power to keep the system operational. Further information about the power supply can be found in section “Power Supply” on page 2-14.

slot panel connectors The slot panel connectors of the DVS system provide, for example, the network connections to connect the system to a SAN. Furthermore, if applicable, some additional panels may be present for internal reasons or on customer request. More details about the slot panel connectors can be found in section “Slot Panel Connectors” on page 2-15.

2.3.2 System Disk Array

The system disk array contains hard disks for the operating system and metadata. To prevent data loss in case a hard disk fails, they are normally RAID protected. Furthermore, these hard disks are protected with a battery backup unit to prevent data loss, for instance, in case of a power failure.



More information about RAID can be found in section “Introduction to RAID” on page 5-2. The battery backup unit is described in section “Battery Backup Unit” on page 2-17.

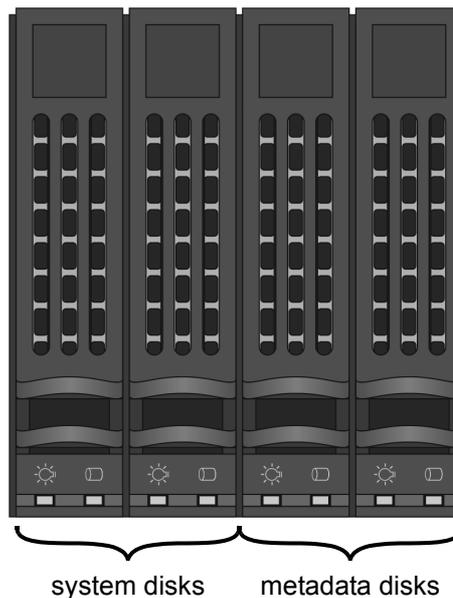


Figure 2-12: System disk array

The hard disks of the array are connected to the system with the help of disk carriers which make the removal of a hard disk easy, for example, in the event of a failure. The system disk array is equipped with the same type of disk carriers as used in the hard disk array of the SpycerBox Flex (see section “Hard Disk Array” on page 2-6).



Further information about how to remove and exchange a hard disk can be found in section “Hard Disk Maintenance” on page 5-2.

2.3.3 ATX Connector Panel

The ATX connector panel on the rear of the DVS system holds the connectors of the computer system. It provides the following connections:

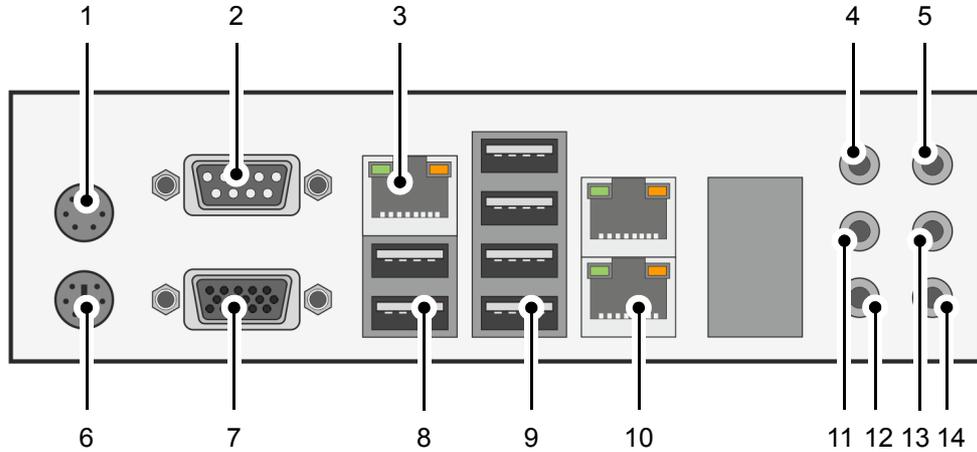


Figure 2-13: ATX connector panel on rear

No.	Item	Explanation
1	mouse	PS/2 connector to connect a mouse to the system
2	COM port	RS-232 connector for the connection of serial interface devices
3	IPMI	Dedicated LAN port for IPMI 2.0 (Intelligent Platform Management Interface) providing KVM (Keyboard, Video, Mouse redirection) as well; for further information see the documentation(s) of the original manufacturer(s) <div style="display: flex; align-items: flex-start;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">i</div> <div> <p>IPMI can be activated by assigning an IP address to its port via the DVS Configuration Tool (see section "DVS Configuration Tool" on page 4-3). After the assignment you may have to wait several minutes before the configuration takes effect.</p> </div> </div>
4	CEN/LFE	Connector for center out and subwoofer speakers
5	line in	Connector to input audio signals
6	keyboard	PS/2 connector to connect a keyboard to the system



No.	Item	Explanation
7	VGA	DB-15 connector (female) to connect a monitor; normally with an extra graphics card installed, this connector will not be operational; however, it can be used in combination with IPMI/KVM for system management; if you want to use this port, please contact DVS directly in case of setup questions
8, 9	USB ports	These USB connectors (universal serial bus) offer you the possibility to connect other devices to your system
10	LAN (1000 Mb)	Gigabit Ethernet (1000 Base-T) connection ports to connect the system to a network
11	back surround	Connector for rear surround speakers
12	side surround	Connector for middle surround speakers
13	front	Connector to output audio signals (line out), e.g. for front speakers or headphones
14	mike	Connector to input low-level audio signals

2.3.4 Power Supply

The redundant power supply provides the system with power. It consists of several independent power supply units: Even if one fails the others will still offer enough power to keep the system working.



The system can be operated with one power supply unit out of order. However, if another one fails, a continued operation of the system cannot be guaranteed. Therefore, it is recommended to change a failed power supply unit immediately (see section "Power Supply Maintenance" on page 5-14).

The following provides an overview of one of the power supply units:

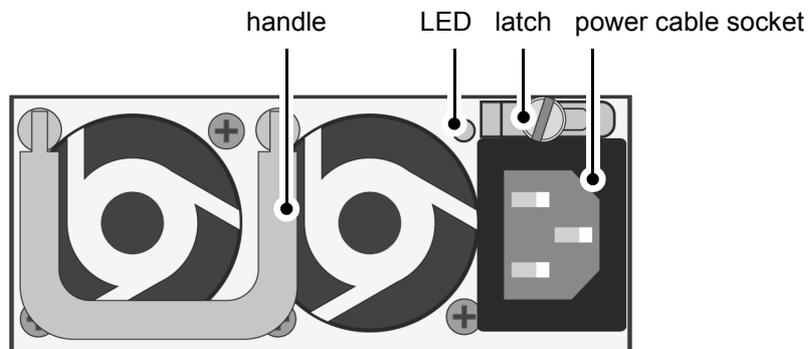


Figure 2-14: Overview of power supply unit

handle	With the handle of the power supply unit you can pull the unit out of the power supply once it is unlocked with the latch.
LED	The LED indicates the state of the power supply unit: green Operating normally off Standby mode off (alarm LED on) Disconnected from power or malfunction
latch	The latch of a power supply unit locks it in the power supply. With it the unit can be unlocked and pulled out of the power supply with the help of the handle.
power cable socket	The socket where the power cable has to be plugged in to provide the system with power.

2.3.5 Slot Panel Connectors

The SpycerBox provides on its slot panel connector area several connection possibilities such as the network ports or ports to connect the system to a SAN. The following figure shows an example configuration of the slot panel connector area:

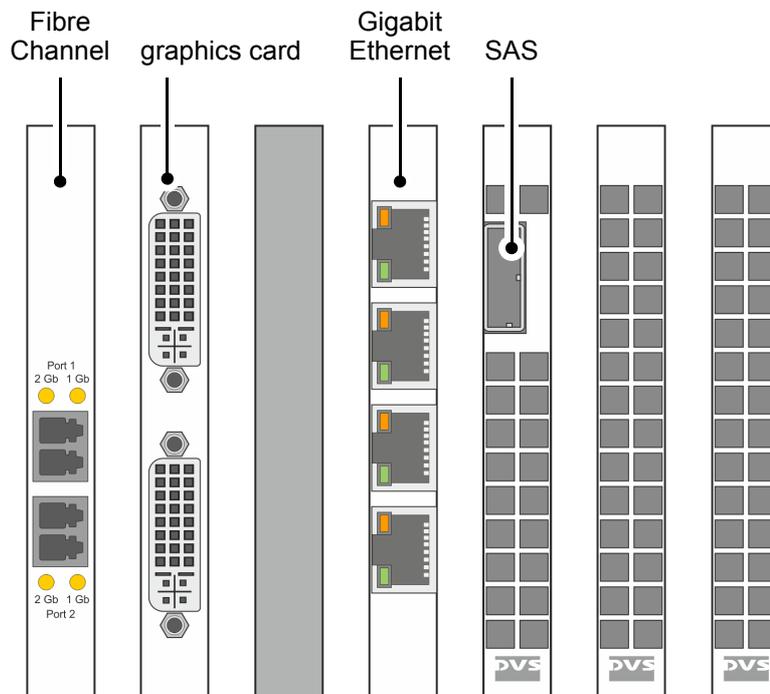


Figure 2-15: Example of a slot panel configuration



The above layout of the slot panel area is just an example. The one at your system may differ from the figure above: The position of the individual slot panels may vary and/or other panels may be installed, either for internal reasons or on your request.

To provide connections to most networks there are various interface possibilities optionally available for the SpycerBox, such as the following:

Gigabit Ethernet	Either a 1 Gigabit Ethernet connection with four ports or a 10 or 40 Gigabit Ethernet connection with up to two ports.
Fibre Channel	Fibre Channel connection interface with up to four ports.
FireWire	Two port FireWire interface.
eSata	eSata interface
USB	Additional USB 2.0 or 3.0 connection interface

The DVS system provides furthermore the following connection possibilities by default:

graphics card	The monitor for the DVS system has to be connected here. For further information about the graphics card, please refer to the original manufacturer's documentation included in the delivery of the system.
SAS	The SAS (serial attached SCSI) connector is an external mini-SAS (SFF-8088) connector that can be used to connect external storages. An external storage connected to this port can even be configured to provide RAID protection.



Data transfers on this port may interfere with the real-time capability of the DVS system. It is recommended to use it only at times when no real-time performance is required.

2.4 Battery Backup Unit

To prevent data loss especially for the metadata, the hard disks of the system disk array (see section “System Disk Array” on page 2-12) are protected by a battery backup unit. If the system’s operation gets interrupted, for example, in case of a power failure, it will provide power to the cache of the connected RAID controller, so that buffered data will not get lost. Once the operation of the system is restored, the cached data will be written to the hard disks.

The battery backup unit is located inside the casing of the DVS system:

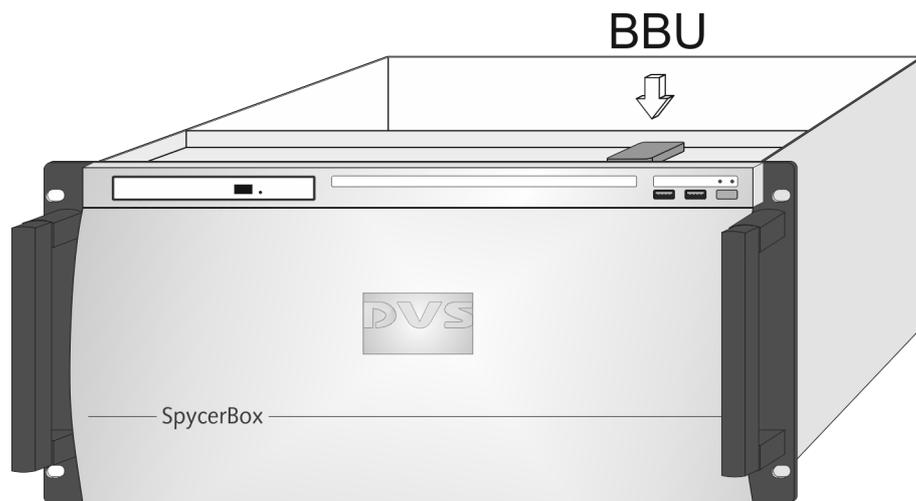


Figure 2-16: Location of battery backup unit inside the system

The battery backup unit is a rechargeable battery that will be charged automatically when the system is turned on.



Installation



This chapter describes the installation of the SpycerBox. It is divided into the setup of the system's hardware and a note about how to connect it to a network.

3.1 System Setup

This section describes the setup of the SpycerBox hardware. The system must be installed properly before you can start working with it.

To install the hardware of the SpycerBox perform the following:

- Unpack the DVS system and its accessories.



Check your delivery and compare it with the delivery note included in the package on an extra sheet of paper. In case of missing items, please contact your local vendor or DVS immediately.



To make warranty claims you have to keep the original packing and use it in case of a return transportation.

- Place the DVS system on a firm, flat surface within reach of a power outlet or mount it in a rack. For good air circulation and cooling make sure the ventilation holes are not covered.
- Connect at least the following computer peripherals:
 - Mouse,
 - keyboard and
 - a monitor that is operable at a resolution of at least 1280 × 1024 pixels (default manufacturing setting).
- Connect any other peripheral computer equipment. For an overview of the panels and connectors at the system's rear see section "Overview of the Rear" on page 2-11.
- Connect the power cable(s) to the system.



The SpycerBox hardware is now properly installed and you can switch on the system as described in section “Starting the System” on page 4-2.

3.2 Note about the Network Installation

Because of the amount of possible workflows that customer’s may use the SpycerBox for as well as network connections (see section “Slot Panel Connectors” on page 2-15), this document does not describe how to connect the DVS system to a network or central storage. On the DVS web page (www.dvs.de) you can find some diagrams showing how the SpycerBox may fit in a workflow/network.

To connect the DVS system to a network/central storage you should have experience as a network administrator and know how to set up the required network connections on the installation site in hard- as well as software. In case you experience difficulties during the installation, DVS offers you special assistance that will be tailored to your personal needs and which can range from remote diagnosis to on-site services. Please contact the DVS service department for further information about this.

Operation



This chapter describes how to operate the SpycerBox hardware, i.e. it is explained how to start the system and how to shut it down. For both procedures you have to use the power switch of the operation items at the front of the system.

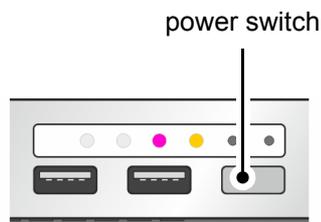


Figure 4-1: The power switch

Additionally, the DVS Configuration Tool is described briefly which allows you to configure, reboot and shut down the SpycerBox.



All other items necessary for a correct operation of the SpycerBox hardware, such as the LEDs or the buttons, are described in chapter "Overview" on page 2-1.



4.1 Starting the System

After a proper installation of the system (see chapter “Installation” on page 3-1) you may start the DVS system at any time.

To start the system perform the following:

- Press the power switch briefly to turn on the system.

The system will be started and the DVS logo in the middle of the faceplate lights up. As with any standard computer after initial booting, the system begins to load the installed operating system.



During the start-up of the system several alarm beeps will be sounded. This is part of a self-test and does not indicate an error or malfunction.

When the operating system has finished its loading, you can begin to work with the DVS system right away.

4.2 DVS Configuration Tool

The DVS Configuration Tool can be used to configure, reboot and shut down the SpycerBox. Once the operating system is loaded, it can be found on the desktop of the SpycerBox.

The DVS Configuration Tool will run in the standard web browser of your system. The address is either `localhost` (127.0.0.1) or the IP address of the SpycerBox in the network. After starting it you have to enter a user name (default: `admin`) and password (default: `dvssan`).

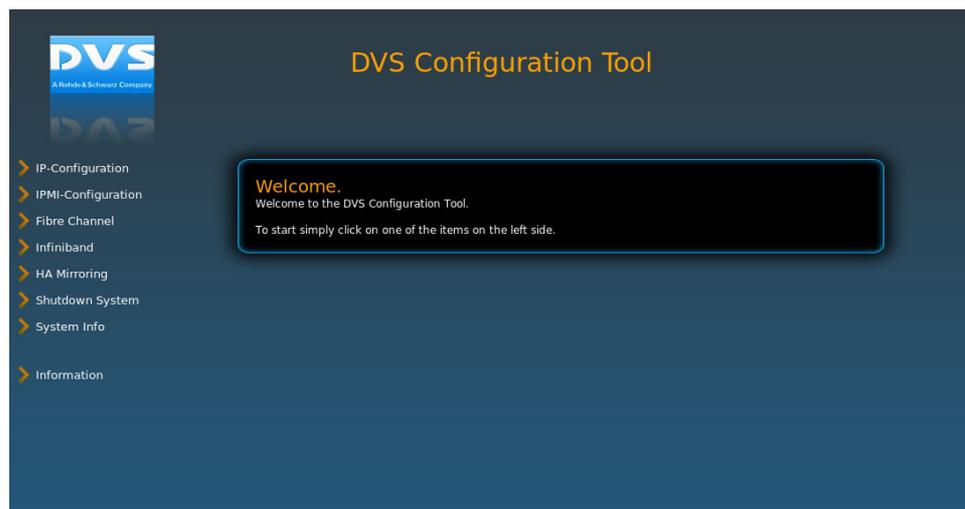


Figure 4-2: Starting screen of the DVS Configuration Tool

With the DVS Configuration Tool you can change the configurations of the DVS system (e.g. its IP address or Fibre Channel connections). Click on the respective item to the left to view and change the configurations. Afterwards you will see the options that can be changed.

The DVS Configuration Tool can also be used to gather log files of the system, for example, for troubleshooting. By default they will be saved in a single archive file on the desktop of your system.

Additionally, with the DVS Configuration Tool you can reboot or shut down the DVS system.



4.3 Shutting Down the System

There are several possibilities to shut down the DVS system. All depend on whether the operating system is already loaded, frozen or not completely loaded. Please act accordingly.

To shut down the system perform the following according to the state of the system's operating system:



After a shut-down wait at least ten seconds before starting the system again. This time is needed to safely erase all memory banks of the system.

With the operating system fully loaded

If the operating system is up and running, there are two ways to shut down your system:

1. Turn the system off by shutting down the operating system the usual way (see also section "DVS Configuration Tool" on page 4-3).

The operating system will then save your personal settings and once it has ended, the system will turn off.

2. Alternatively, you can initiate a fast shut down by pressing the power switch briefly.



The fast shut down may not save all your system data and personal settings before the system turns off.

Some settings will be saved and afterwards the system turns off.

With the operating system frozen or not completely loaded

If the operating system is not responding anymore or not completely loaded, perform the following:



This procedure can cause corrupted system data. However, the system should be sufficiently protected against this by the journaling file system and the battery backup unit (see section "Battery Backup Unit" on page 2-17).

- Shut down the system by pressing the power switch until the system turns off.

The system will then shut down immediately.

Maintenance



This chapter explains the maintenance work that you can perform on your own. For each work a detailed procedure description is given. If you experience trouble with the system that cannot be resolved with the work described here or in section "Troubleshooting" on page A-2, please contact your local vendor or DVS directly.



5.1 Hard Disk Maintenance

This section deals with the possible event of a hard disk failure. First, some introductory information about RAID are provided. After that follow descriptions how to act when a hard disk fails.

5.1.1 Introduction to RAID

In a system where huge amounts of data are processed, large storage capacities combined with high data throughputs are mandatory. To provide both at the same time it is common practice in the area of video and digital film to configure several hard disks together into a stripe set or RAID. The IT world has defined several 'levels' of RAID, most of them providing some kind of data protection.

The RAID feature makes the DVS system tolerant of disk failures. Even with a broken disk operations can still be continued and, once the failed disk has been replaced, the missing data can be recovered easily. The data protection is provided by RAID controllers installed inside the system. Each controller independently administers the data protection for the set of hard disks that is connected to it.

The system disk array for the system/metadata hard disks comprises four disks. They are connected to a RAID controller that applies a RAID 1 to the data, meaning that they are protected by a mirroring of the data between two disks. If one of the hard disks fails, the missing data can be restored with the mirrored information stored on the other disk.



If the second disk fails in the meantime, the data will be unrecoverable.

The main storage of the DVS system comprises up to 24 hard disks (SpycerBox Ultra; SpycerBox Flex: 48 hard disks). These are connected to three RAID controllers which connect a set of eight hard disks each (SpycerBox Ultra; SpycerBox Flex: 16) and apply a RAID 5 to the data. With this, the data is striped across these hard disks during write procedures. At the same time the information necessary to rebuild a failed hard disk (parity information) is generated and written across the disks as well. With the parity information written, one hard disk per disk set (RAID pack) can fail and your data will still be recoverable due to the information stored on the other disks.



If a second disk within the same disk set fails in the meantime, the data will be unrecoverable.

You can identify the hard disks that are connected to a RAID controller easily at the DVS system because every three rows (SpycerBox Ultra; SpycerBox Flex: every column of 16 hard disks) represent one disk set/ RAID pack:

SpycerBox Ultra:



SpycerBox Flex:

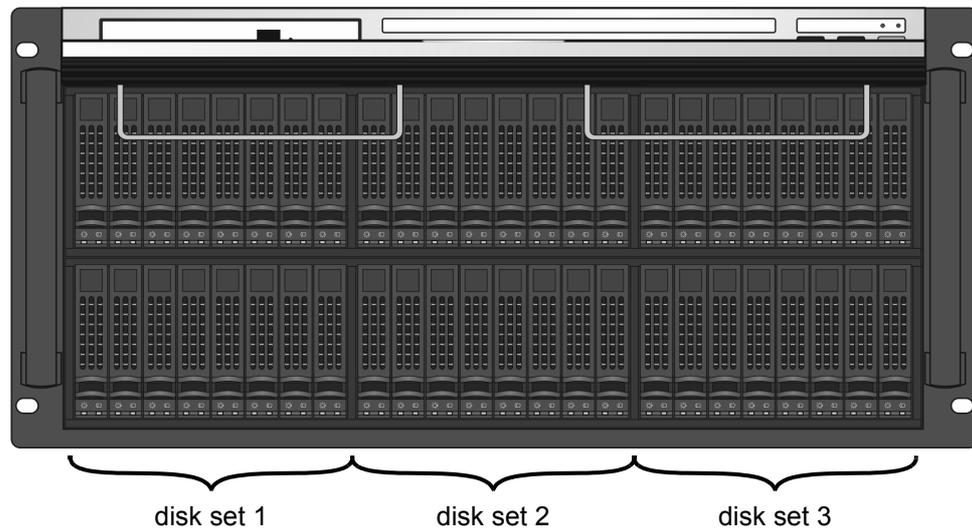


Figure 5-1: Disk sets (RAID packs) of the hard disk array (SpycerBox Ultra and Flex)

With the available RAID feature the DVS system can withstand disk failures without losing data or access to data.

5.1.2 Identifying a Broken Hard Disk

In case of an alarm or when suspecting a worn hard disk, you have to identify the broken hard disk first in order to replace it.



An alarm can be caused by a number of reasons. Please refer to section "Troubleshooting" on page A-2 first for further details about what to do in case of an alarm.

If a hard disk fails, the alarm will be sounded by a RAID controller. It cannot be switched mute with the mute button of the operation items. It can be turned off either with the RAID software manager or by replacing the broken hard disk.

Data accesses to the hard disk array are still possible because any missing data will be recalculated from the parity information stored on the other hard disk(s). This can limit the overall performance and real-time operations may no longer be possible.



Replace the failed disk as soon as possible. If you do not replace a broken disk in time and another disk fails in the meantime, your data may be unrecoverable.

Before replacing a hard disk you have to gather the log files of the RAID controller. If you know how to do this you may proceed on your own. If not, please contact the DVS service department first.

In most cases you can find the broken disk by simply observing the LEDs of the disk array (see section "Hard Disk Array" on page 2-6 and section "System Disk Array" on page 2-12). While performing continuous accesses to the data, it will be the one:

- no longer blinking (either continuously on or off),
- irregularly blinking compared to the other hard disks of the same disk set, or
- showing a hard disk or disk carrier related error (see section "Hard Disk Array" on page 2-6 and section "System Disk Array" on page 2-12).

Once the broken disk has been identified, you can replace it as described in section "Replacing a Hard Disk" on page 5-5.



Replacing the wrong hard disk, i.e. a good one instead of the broken one, may result in a total loss of data.

If you are unsure about having detected the correct hard disk please contact the DVS service department.

5.1.3 Replacing a Hard Disk

As soon as the broken hard disk has been identified (see section “Identifying a Broken Hard Disk” on page 5-4), it can be replaced easily. The replacement of a broken hard disk can be divided into three steps:

1. Removing the hard disk from the system.
2. Replacing the hard disk.
3. Reassembling it into the system.

All steps are explained in the following.



Before replacing a hard disk you have to gather the log files of the RAID controller. If you know how to do this you may proceed on your own. If not, please contact the DVS service department first.

Step 1: Removing the Hard Disk

The hard disks that are accessible at the front and rear of the system are connected to the system with the help of disk carriers. They can be removed easily, even when the system is running (hot-swappable).



For an overview of a disk carrier as well as further information about it see section “Hard Disk Array” on page 2-6 and section “System Disk Array” on page 2-12.

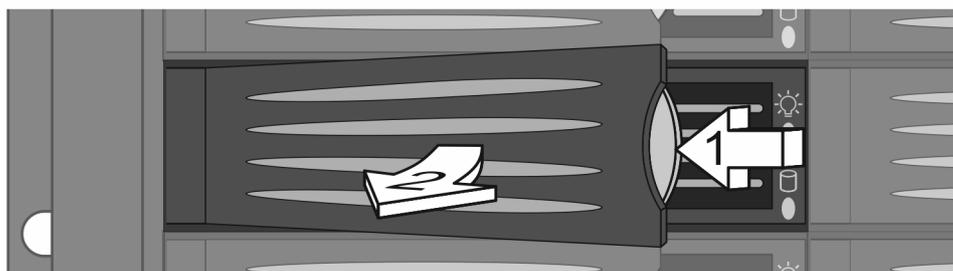
To remove a hard disk from the system perform the following:

- If appropriate, stop all accesses to the hard disks of your system, for example, by exiting software and severing the network connections.
- Lift the faceplate of the system (see section “Faceplate” on page 2-5).
- Then, unlatch the disk carrier of the defective hard disk by pressing the opener of the disk carrier (1).

This will cause the lever to come out of the disk carrier so that it protrudes from the rest of the disk carriers.

- Take the lever and turn it in its hinge (2) until it cannot be moved further:

SpycerBox Ultra:



SpycerBox Flex and system disk array:

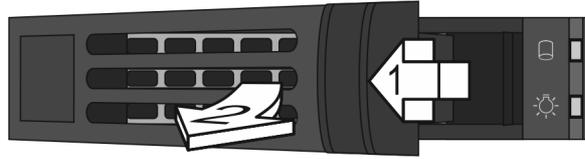


Figure 5-2: Pulling out the lever

This takes the hard disk installed in the disk carrier out of the system's interfaces inside.

- Once the interface connections inside the system are severed, you can pull the disk carrier out of the system.

Now the hard disk is removed from the system and it has to be replaced in the next step.

Step 2: Replacing the Hard Disk

To replace the hard disk do the following:



Significant environmental changes, for example, altitude, voltage, temperature, shock, vibration, etc., can damage a hard disk. Therefore, handle hard disks with great care.

- Unscrew the screws that fix the hard disk to the disk carrier.
- Exchange the broken disk with a new one and assemble it in the disk carrier with the screws.



It is best to use the same brand and type of hard disk again. Otherwise a loss of performance might occur.

After that the hard disk is replaced and the disk carrier with the new disk has to be reassembled in the system.

Step 3: Reassembling the Hard Disk

After replacing the hard disk, the disk carrier with the new disk has to be reassembled in the system. For this perform the following:

- Slide the disk carrier back into its shaft at the disk array.
- Push the disk carrier completely back into the shaft by applying pressure to the disk carrier directly (i.e. do not use the lever to push the carrier). Move it until you feel the resistance of the hard disk interface inside the system and until the lever retracts by itself from the pushing.



It is important that you do not use the lever to insert the disk carrier. Apply an even pressure only to the carrier directly until the lever moves back by itself.

- Then simply close the lever until it snaps back in place which as a result will slide the carrier completely back in.



The disk carrier of the replaced disk should be level with the others of the array.

Once the faceplate of the DVS system is back in place, the replacement of the hard disk is finished. After several minutes the replaced hard disk will be automatically recognized by the system. Then the rebuild of the data will be initiated on its own. When the system has finished the rebuild, the DVS system will be fully operational again.



During a rebuild real-time processes may not be possible. It is recommended to restrict accesses to the hard disk array until the rebuild is finished.

A rebuild takes several hours. It is strongly recommended to avoid accesses to the disk array during this time, otherwise it may take considerably longer.



5.2 Opening and Closing the Casing

Some tasks described in this manual require an opening of the system's casing and the closing of it afterwards once the intended work is finished. Both tasks will be explained in this section.

5.2.1 Opening the Casing

To open the casing of the DVS system perform the following:



The system you are working on 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.



The system must be operated only with the chassis' cover installed to ensure proper cooling.

- Shut down the system as described in section "Shutting Down the System" on page 4-4.
- Disconnect all power cords from the system.
- Press the two buttons at the top of the system (1) and move the cover towards the rear of the system (2).

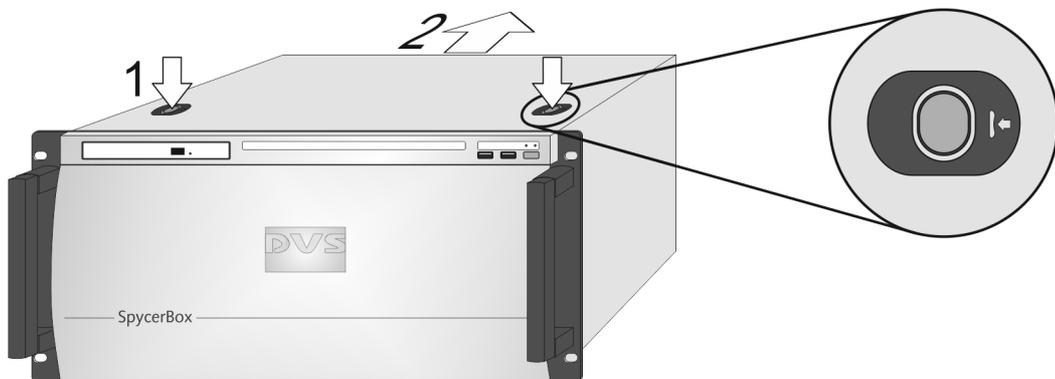


Figure 5-3: Removal of the cover of the casing

Once the cover is slid backward, it can be taken off the system.

5.2.2 Closing the Casing

After finishing your task at hand you have to close the casing of the DVS system again. For this perform the following:

- Simply put the cover back on and slide it into place until it locks.
- Afterwards reconnect the power cords.

With this the task of closing the casing is finished and you can turn the system back on at any time.

5.3 Fan Maintenance

To cool the many hard disks installed in the system as well as the other electronic parts (e.g. the motherboard), the system is equipped with several fans that can be exchanged in case of a failure easily. This section describes what to do if a fan failure takes place.

When a fan failure occurs, you will be notified by a lit alarm LED and the sounding of an alarm buzzer of the system. The alarm can be switched mute with the mute button at the front of the system (see section "Operation Items" on page 2-9). Then you have to do the following to exchange the failed fan:



An alarm can be caused by a number of reasons. Please refer to section "Troubleshooting" on page A-2 first for further details about what to do in case of an alarm.



The system you are working on 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.

Maintenance inside the system should only be performed by personnel qualified for handling and testing electrical equipment.



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 system. Avoid touching the internal components of the computer system.

- Open the casing of the system as described in section "Opening the Casing" on page 5-8.

With the casing of the system open, you can now test the fans. For this you have to plug in the power supply again.



Testing the fans is possible only with an opened casing and the power turned back on.

Once the power cables are plugged in again do not touch anything else than the external power cords or the power switch at the front of the system. Under no circumstances reach inside the system.

After testing the fans switch off the power and disconnect the power cables immediately.



- Reconnect the power cords.
- Press the power switch to turn on the system.
- Observe the fans and memorize the failed one (the fan not revolving is the broken one).
- Press the power switch until the system turns off.
- After this disconnect the power cables once again.

With the broken fan identified you can replace it. For this perform the following:

- Press the latch of the respective fan module towards the front of the system (1).
- With the locking mechanism released pull the fan module up and out of the system (2).

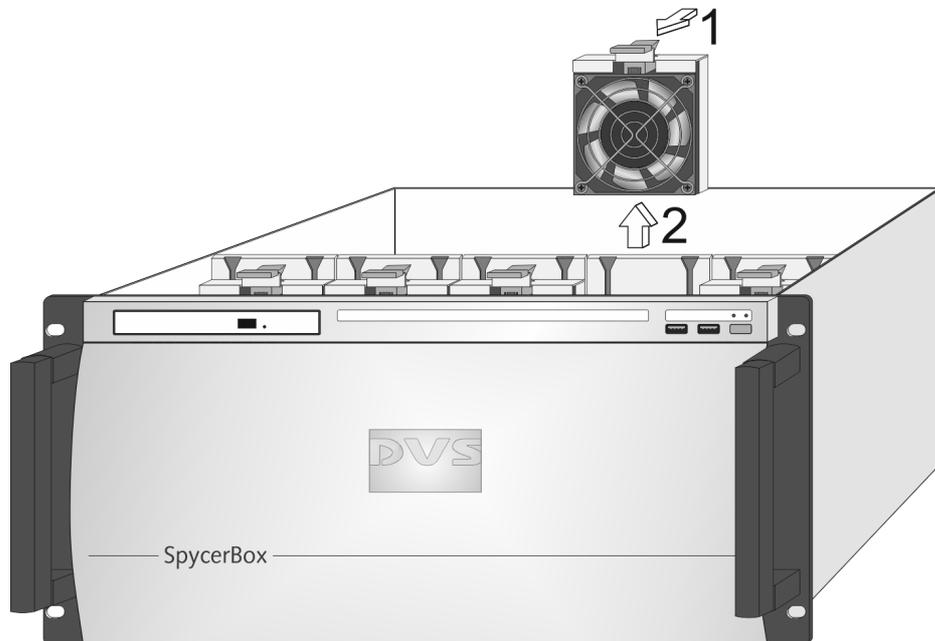


Figure 5-4: Removal of fan module

This will sever the connection of the fan to the system.

- Unscrew the finger protection grille from the broken fan and afterwards screw off the fan from the fan bracket.
- Replace the broken fan with a new one and reassemble the fan module: Screw the fan to the fan bracket and afterwards the finger protection grille to the fan.



Only use original manufacturer spare parts. Other spare parts might damage your system.

- Re-insert the repaired fan module into the system.



See to it that the fan module plugs properly into the system's fan interface and that, when completely inserted, the locking mechanism snaps back into its locked position.

- Next close the casing of the system as described in section "Closing the Casing" on page 5-8.

With the last step finished you have successfully replaced the defective fan module. Once the system is turned on, no alarm should be sounded anymore.



5.4 Controller Maintenance

During the service life of the DVS system you may have to exchange a RAID controller (see section “Introduction to RAID” on page 5-2). It may be indicated, for example, if a disk set (RAID pack) cannot be accessed anymore. This section describes how to exchange a RAID controller.



Before exchanging a RAID controller contact the DVS service department.



The system you are working on 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.

Maintenance inside the system should only be performed by personnel qualified for handling and testing electrical equipment.



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 system. Avoid touching the internal components of the computer system.

- Identify the controller or disk set that causes the problem, for example, by consulting either the RAID software manager or the BIOS of the RAID (press [Ctrl + H] at the indicated moment during start-up of the system).
- Then, open the casing of the system as described in section “Opening the Casing” on page 5-8.
- On the defective controller memorize the order of the cables that are connected to it. To make this easy the cables are numbered.
- Disconnect the cables connected to the controller.
- Remove the defective controller from the system and in its place install a new one.



Only use original manufacturer spare parts. Other spare parts might damage your system.

The new controller must have the same firmware installed as the other controllers.

- Connect the cables to the controller again in the same manner as they were on the old controller.
- Next close the casing of the system as described in section “Closing the Casing” on page 5-8.

With the last step finished you have successfully replaced the defective RAID controller. Now, you have to integrate the new controller in the existing configuration:

- Turn on the system as described in section “Starting the System” on page 4-2.

After the initial booting you will see something like the following on the screen:

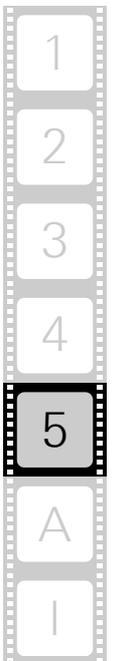
```
Foreign configuration(s) found on adapter:
Press any key to continue or 'C' to load the
configuration utility,
or 'F' to import foreign configuration(s) and continue
```

- Press [F] on the keyboard to accept the configuration detected by the system.

After this the newly installed RAID controller automatically initiates a verify of the connected hard disks which may take some time. When finished, the system will continue its booting procedure until the operating system is fully loaded. You may then continue your work with the system.



In some cases the boot device cannot be found after accepting a configuration. Then you have to specify the boot device in the BIOS of the RAID. To access the RAID BIOS press [Ctrl + H] at the indicated moment during the start-up of the system. The setting can be found after selecting the respective controller and switching to 'Virtual Drives'.



5.5 Power Supply Maintenance

The redundant power supply provides the system with power. It is a reliable and enduring part of the system because it consists of several independent power supply units: Even if one fails the others will still offer enough power to keep the system working.



The system can be operated with one power supply unit out of order. However, if another one fails, a continued operation of the system cannot be guaranteed. Therefore, it is recommended to change a failed power supply unit immediately.

When a power supply unit failure occurs, you will be notified by a lit alarm LED and the sounding of an alarm buzzer of the system. The alarm can be switched mute with the mute button at the front of the system (see section "Operation Items" on page 2-9).



An alarm can be caused by a number of reasons. Please refer to section "Troubleshooting" on page A-2 first for further details about what to do in case of an alarm.

Each power supply unit in the DVS system is hot-swappable, so you can safely replace it with the system running. Follow these steps to replace a power supply unit:



For an overview of a power supply unit see section "Power Supply" on page 2-14.

- Take a look at the power supply at the rear of the system and examine the LEDs of the units. The LED of the malfunctioning power supply unit should be extinguished.
- Next unplug the power cord from this power supply unit.
- Unscrew the security screw of the latch.
- Take the handle of the respective unit and press the unit's latch to the left to unlock it.
- Then pull the unit at its handle out of the power supply.



Do not reach inside the system when removing a power supply unit or when the unit is out of the system.

- Change the power supply unit against a new and operable one.
- Slide the new unit into the power supply until it clicks into place.



Only use original manufacturer spare parts. Other spare parts might damage your system.



When completely inserted please observe that the latch is truly in place and locking the unit.

- Tighten the security screw of the latch again.
- Connect the power source (power cord) to the newly installed power supply unit.
- After that check the LED indicating the status of the power supply unit: If it is lit up in green, the unit is working properly.

With this the power supply unit has been replaced successfully.



5.6 Backup or Recovery of the System Disk

The DVS system provides internally a USB flash drive that can be used to back up or restore the operating system on the system hard disk. With it you can, for example, set the system disk back to its manufacturing state. Once selected as a boot device, it will launch a Live Linux which in turn will either back up or restore the system hard disk. The following sections describe how to create a backup image or perform a recovery of the system disk.

5.6.1 Creating a Backup Image of the System Disk

The following describes the steps to make a backup image of the system hard disk and save it to the internal USB flash drive:



Do not execute any commands if you are not sure about the correct source and target device. For example, selecting the wrong source device could lead to a full storage space and a termination of the process.



To complete the loading of the DVS Rescue environment some user entries are required. For this follow the instructions given on the screen.

The loading of the environment and the process itself will both try to initialize hardware that may not be present on your system. Any error messages displayed during loading/initialization, e.g. *Failed* or *Warning*, can be disregarded. The backup/recovery process should work nonetheless.

The storage space on the USB is limited. The number of backup images that can be stored on the drive, besides the DVS recovery image ex factory available, depends on the size of the image files. If the process fails, the storage drive may be full. However, an already created image can be overwritten when assigning the same name to it.

- If appropriate, disconnect all Fibre Channel cables and all externally connected storage devices from the system.
- Turn on or restart the DVS system and at the indicated moment during start-up press [F11] on your keyboard to enter the boot menu.
- Once the boot menu is displayed on the screen, select the internally installed USB flash drive as the boot device and then press [Enter] on your keyboard.

With this the target device has been selected. The system will now boot from the internal USB and you will see a window on the screen where you can select the DVS Rescue environment for loading:

- Select *DVS Rescue* and press [Enter] on your keyboard.

Once the loading has finished, you will see the DVS Rescue script with its options on the screen. Your display should look similar to the following:

```
--- DVS Rescue ---  
  
1 - Backup on internal USB device  
2 - Restore from internal USB device  
3 - Reboot the system  
4 - Poweroff the system  
  
0 - Exit
```

Enter selection:

- To make a backup image of your system disk and save it to the internal USB, press [1] and then [Enter] on your keyboard.

Afterwards a list of possible source devices will be detailed on the screen. In a SpycerBox the system drive normally will be 'sdc', but on special systems it may also be 'sda', 'sdb', etc.



Ex factory the DVS system will be delivered with 'sdc' as the default system disk. If other configurations have been made later or on customer request, this may be different.



Continue with the following steps only, when you are able to identify the correct source device.

- Enter the name of the system disk: Type in `sdc` (or in other cases `sda`, `sdb`, etc.) and press [Enter] on your keyboard.

The system will now ask you to enter the image name for your backup image to be saved. By entering the name of an already existing backup image you can overwrite it.

- Type in the name of the image you want to save to the USB and press [Enter] on your keyboard.

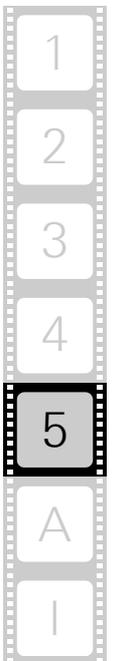
The system will ask you to confirm your selection and whether you want to continue:

- To start the backup process type in `y` for 'yes' and press [Enter] on your keyboard.



To abort the process at this point enter `n` for 'no' and press [Enter] on your keyboard. You will be redirected to the DVS Rescue script.

After starting the process a termination is not possible anymore.



The program will now start the backup process. Its progress will be indicated on the screen.



The backup process may take some time.

If during the process the screen turns black, press [Space] to get it back again.

When the system has finished the backup process, you will be notified about this. Then after pressing [Enter] on your keyboard, you will be redirected to the DVS Rescue script once more where you can choose, for example, 'reboot' or 'poweroff' to restart or turn off the system.

5.6.2 Restoring the System Disk

The following describes the steps to make a recovery of the system hard disk:



Do not execute any commands if you are not sure about the correct source and target device. For example, selecting the wrong target device can lead to a total loss of data.



To complete the loading of the DVS Rescue environment some user entries are required. For this follow the instructions given on the screen.

The loading of the environment and the process itself will both try to initialize hardware that may not be present on your system. Any error messages displayed during loading/initialization, e.g. *Failed* or *Warning*, can be disregarded. The backup/recovery process should work nonetheless.

- If appropriate, disconnect all Fibre Channel cables and all externally connected storage devices from the system.
- Turn on or restart the DVS system and at the indicated moment during start-up press [F11] on your keyboard to enter the boot menu.
- Once the boot menu is displayed on the screen, select the internally installed USB flash drive as the boot device and then press [Enter] on your keyboard.

The system will now boot from the internal USB and you will see a window on the screen where you can select the DVS Rescue environment for loading:

- Select *DVS Rescue* and press [Enter] on your keyboard.

Once the loading has finished, you will see the DVS Rescue script with its options on the screen. Your display should look similar to the following:

```
--- DVS Rescue ---
```

- ```
1 - Backup on internal USB device
2 - Restore from internal USB device
```

- 3 - Reboot the system
- 4 - Poweroff the system
  
- 0 - Exit

Enter selection:

- To restore your system disk from the internal USB, press [2] and then [Enter] on your keyboard.

Afterwards a list of possible target devices will be detailed on the screen. In a SpycerBox the system drive normally will be 'sdc', but on special systems it may also be 'sda', 'sdb', etc.



Ex factory the DVS system will be delivered with 'sdc' as the default system disk. If other configurations have been made later or on customer request, this may be different.



Continue with the following steps only, when you are able to identify the correct target device.

A recovery will overwrite all your data.

- Enter the name of the system disk: Type in `sdc` (or in other cases `sda`, `sdb`, etc.) and press [Enter] on your keyboard.

Another list will be displayed on the screen detailing the possible source images. If there is only the DVS recovery image on the USB flash drive, this one will be listed. If there are several images, all will be displayed.

- Select the image you want to use for the recovery. Normally, it provides the serial number of the DVS system in its name. To confirm your choice press [Enter] on your keyboard.

The system will ask you to confirm your selection and whether you want to continue:

- To start the recovery process type in `y` for 'yes' and press [Enter] on your keyboard.



To abort the process at this point enter `n` for 'no' and press [Enter] on your keyboard. You will be redirected to the DVS Rescue script.

After starting the process a termination is not possible anymore.

The program will now start the recovery process. Its progress will be indicated on the screen.



The recovery process may take some time.

If during the process the screen turns black, press [Space] to get it back again.

When the system has finished the recovery process, you will be notified about this. Then after pressing [Enter] on your keyboard, you will be redirected to the DVS Rescue script once more where you can choose,



for example, 'reboot' or 'poweroff' to restart or turn off the system. The next time the DVS system is started, it will load the restored operating system.

## 5.7 Removal of the Faceplate

The faceplate of the system can be removed, for example, for transports. For this perform the following:



The system must be operated only with the faceplate installed to ensure electromagnetic compatibility.

- Lift the faceplate of the system (see section "Faceplate" on page 2-5).

Beneath it you will see a cable with a jack connection that supplies the DVS logo of the faceplate with power.

- Unplug the jack connection.
- Next hold tight the faceplate and remove the hinge wires as indicated in the following figure:



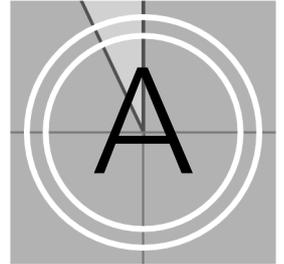
Figure 5-5: Removing the hinge wires

Afterwards the faceplate can be taken off.



To reassemble the faceplate reverse the above steps.

# Appendix



This chapter first gives some hints how to resolve irregularities during operation. After that technical data and general information about the DVS system are provided.



## A.1 Troubleshooting

The table below lists some errors that may occur during the operation of the DVS system and details how to resolve them. If you experience trouble that cannot be resolved with the solutions described here or in chapter “Maintenance” on page 5-1, please contact your local vendor or DVS directly.

| Error                                                                                              | Cause                                                                            | Solution                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accesses to the main storage are slow.                                                             | The data storage is too full.                                                    | It is recommended to use only 85 to 90% of the overall hard disk capacity. If the storage is too full, delete some of your data.                                                                                                                                                  |
|                                                                                                    | One or more hard disks of the hard disk array are worn.                          | Try to identify the worn disk and replace it as described in section “Hard Disk Maintenance” on page 5-2.                                                                                                                                                                         |
|                                                                                                    | Configurations of the system or its network ports have been altered.             | Contact your local system and network administrator and try to reconfigure the network connections of the system. If this is not successful contact the DVS service department.                                                                                                   |
|                                                                                                    | A RAID controller is defective.                                                  | If you can rule out the above mentioned causes, a RAID controller may be defective. Before attempting to exchange a RAID controller (see section “Controller Maintenance” on page 5-12) contact the DVS service department.                                                       |
| An alarm is sounded and the alarm LED is lit. The alarm can be switched mute with the mute button. | One of the power supply units has been disconnected from power during operation. | Check the LEDs of the power supply units. If one is extinguished, this unit may be disconnected from power. Examine the power cord of the unit. See to it that it is in good technical order, correctly plugged in at both ends and that the mains current is operating properly. |
|                                                                                                    | One of the power supply units has failed.                                        | Check the LEDs of the power supply units. If one is extinguished and you can rule out the above mentioned cause, a power supply unit has failed. Replace the broken unit as described in section “Power Supply Maintenance” on page 5-14.                                         |

| Error                                                                                                                                                                                      | Cause                                                                                                   | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                            | A fan has failed.                                                                                       | Check the LEDs of the power supply units. If all are green, shut down the system (see section "Shutting Down the System" on page 4-4) and check whether a fan has failed (see section "Fan Maintenance" on page 5-9). If necessary replace the broken module as described in the same section.                                                                                                                                                            |
|                                                                                                                                                                                            | The system is overheated.                                                                               | If you can rule out the above mentioned causes, the alarm must be due to overheating. See to it that the ambient temperature at the front of the system does not exceed the operating temperature specified in section "Technical Data" on page A-4. If the temperature is within the range, check the ventilation holes of the system and free them from all obstructions (e.g. dust). In case the problem persists, contact the DVS service department. |
| An alarm is sounded and the alarm LED is off. The alarm cannot be switched mute with the mute button.<br><br><i>OR</i><br><br>At start-up the system is not able to initialize a disk set. | A hard disk or a hard disk carrier got loose/jammed (e.g. after transport) or is not mounted correctly. | Shut down the system as described in section "Shutting Down the System" on page 4-4. Then perform the following: Pull all disk carriers partially out of the chassis and afterwards install them again. See to it that they are pulled out and reassembled correctly as described in section "Replacing a Hard Disk" on page 5-5. After that start the system again.                                                                                      |
|                                                                                                                                                                                            | A hard disk of the hard disk array is defective.                                                        | Replace the defective disk as explained in section "Hard Disk Maintenance" on page 5-2.                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                            | A RAID controller is defective.                                                                         | If you can rule out the above mentioned causes, a RAID controller may be defective. Before attempting to exchange a RAID controller (see section "Controller Maintenance" on page 5-12) contact the DVS service department.                                                                                                                                                                                                                               |



## A.2 Technical Data

This section provides technical data of the SpycerBox.



When installing the DVS system in a rack, take care that warmed up air is conducted to the rear of the rack and properly vented away.

### A.2.1 General Technical Data

The general technical data of the SpycerBox are as follows:

|                                     |                                                                                                          |
|-------------------------------------|----------------------------------------------------------------------------------------------------------|
| Weight                              | approx. 70 kg                                                                                            |
| Environment (also during transport) | No exposure to heat<br>No exposure to strong electric or magnetic fields<br>No vibrations/shocks allowed |
| Operating temperature               | Maximum: 10 - 30 °C (50 - 86 °F)<br>Optimum: 15 - 25 °C (59 - 77 °F)                                     |
| Storage temperature                 | 0 - 50 °C (32 - 122 °F)                                                                                  |
| Humidity                            | 10 - 80 %, non-condensing at all times                                                                   |
| Air                                 | Dust-free                                                                                                |
| Power consumption                   | max. 2500 W (primary)<br>nominal 1400 W (primary)                                                        |
| AC power                            | 100 - 120 VAC, 220 - 240 VAC                                                                             |

### A.2.2 Dimensions

The following figure shows the dimensions of the DVS system. The drawing already includes some space for connectors and plugs that can protrude from the rear ('plug safety' ( $l$  minus  $j$ )), usually plus 150 mm). However, this amount of space depends on the type of connectors used.

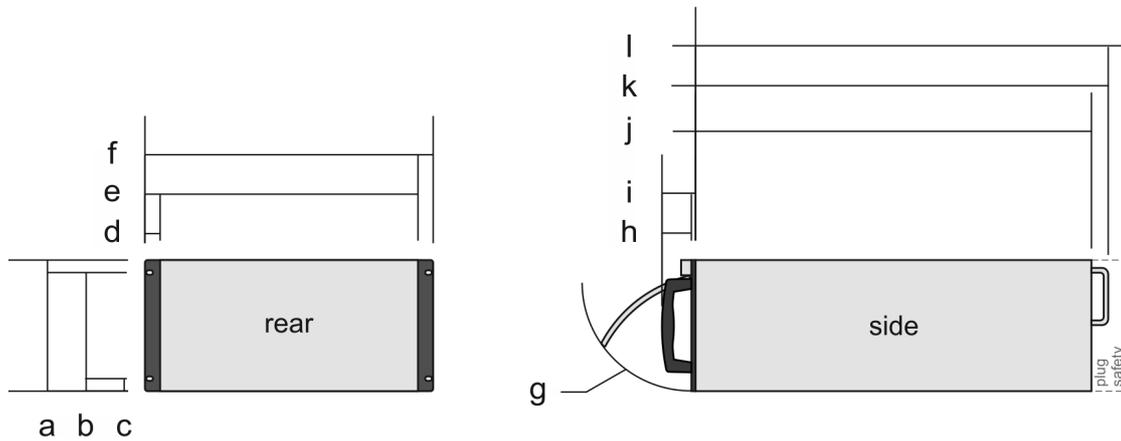


Figure A-1: Measured dimensions

*SpycerBox Ultra:*

|   |        |   |        |
|---|--------|---|--------|
| a | 220 mm | g | 197 mm |
| b | 199 mm | h | 50 mm  |
| c | 21 mm  | i | 55 mm  |
| d | 25 mm  | j | 697 mm |
| e | 455 mm | k | 729 mm |
| f | 480 mm | l | 847 mm |

*SpycerBox Flex:*

|   |        |   |        |
|---|--------|---|--------|
| a | 220 mm | g | 197 mm |
| b | 199 mm | h | 50 mm  |
| c | 21 mm  | i | 55 mm  |
| d | 25 mm  | j | 630 mm |
| e | 455 mm | k | 662 mm |
| f | 480 mm | l | 780 mm |



## A.3 Packing Instructions

The following describes the best way to pack a DVS system.



Keep the original packing and use it in case of transportation. Otherwise the warranty will be void.

In any other case, if you do not have the original packing anymore, use a similar structured packing for transportation. DVS cannot be held liable for damages due to transportation.



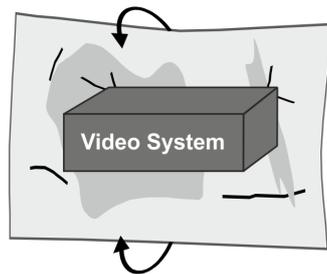
Fragile. Avoid shocks or vibrations. For longer distances use a lifting truck.



Keep dry.

*Figure 1:*

Wrap video system in foil:



*Figure 2:*

Pack video system in box A with foam:

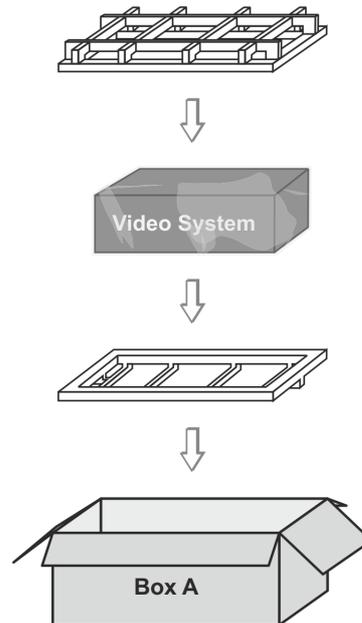


Figure 3:

Pack accessories:

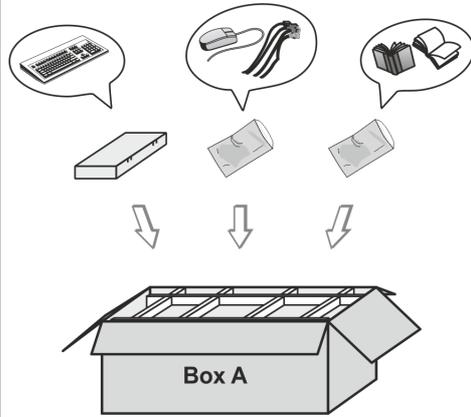


Figure 4:

Close box A:



Figure 5:

Pack box A in box B with foam:

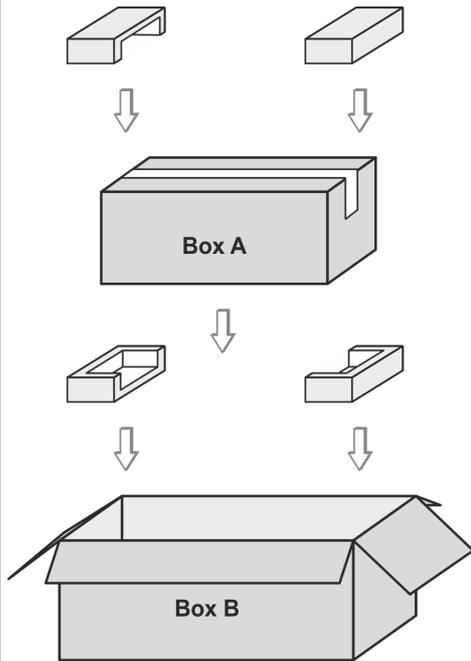
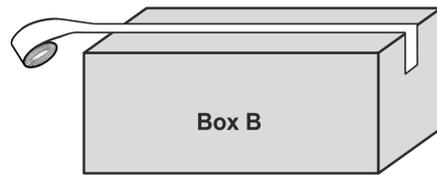


Figure 6:

Close box B:



## A.4 Conformity Declarations

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

### A.4.1 RoHS Compliance

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

### A.4.2 EC Declaration of Conformity (CE Marking)

Rohde & Schwarz DVS 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:

|                                                 |                                                                                                                                                                                                                                       |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SpycerBox Ultra</b><br><b>SpycerBox Flex</b> | EC Directives:<br>– EMC Directive 2004/108/EC<br>– Low-Voltage Directive 2006/95/EC                                                                                                                                                   |
|                                                 | Applied Harmonized Standards:<br>– EN 55022<br>– EN 55024<br>– IEC 61000-3-2<br>– IEC 61000-3-3<br>– IEC 61000-4-2<br>– IEC 61000-4-3<br>– IEC 61000-4-4<br>– IEC 61000-4-5<br>– IEC 61000-4-6<br>– IEC 61000-4-8<br>– IEC 61000-4-11 |

### A.4.3 FCC Compliance Statement

Rohde & Schwarz DVS GmbH herewith declares that the following equipment has been tested according to the applying valid FCC regulations:

- SpycerBox Ultra
- SpycerBox Flex

## FCC Notice

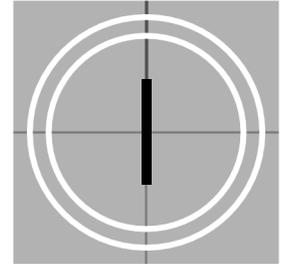
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates,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





# Index



## A-C

accessing the hard disk array .....2-6  
 activity of hard disks ..... 2-3, 2-4, 2-8  
 alarm ..... 2-9, A-2  
   fan .....5-9  
   fan failure ..... A-3  
   hard disk failure ..... 5-4, A-3  
   LED .....2-9, 5-9, 5-14, A-2  
   overheating ..... A-3  
   power supply unit failure ... 5-14, A-2  
   RAID controller ..... 5-4, A-2, A-3  
 ATX connector panel ..... 2-11, 2-13  
 backup image of the system disk .....5-16  
 backup solution .....1-1  
 battery backup ..... 2-12, 2-17  
 casing  
   close .....5-8  
   location of battery backup .....2-17  
   open .....5-8  
 chapter overview ..... 1-2  
 closing of casing .....5-8  
 COM port .....2-13  
 configuration .....4-3  
 conformity declaration ..... 1-7, A-8  
 connectors  
   ATX connector panel ..... 2-11, 2-13  
   slot panels ..... 2-12, 2-15  
   USB .....2-10  
 conventions (typographical) ..... 1-4

## D-F

data loss ..... 2-6, 2-12, 2-17  
 data protection .....5-2  
 declaration of conformity ..... 1-7, A-8  
 dimensions ..... A-5

disk activity LED  
   disk carrier .....2-8  
   HDD LEDs .....2-4  
 disk array  
   see hard disk array or system disk  
   array  
 disk carrier ..... 2-7, 2-8, 2-12, 5-5  
   overview .....2-7, 2-12  
 disk power LED (disk carrier) .....2-8  
 disk set (RAID pack) .....5-2  
 DVD drive .....2-3  
   eject .....2-4  
   emergency eject .....2-4  
   LED .....2-9  
   tray .....2-3  
 DVS Configuration Tool .....4-3  
 DVS logo (faceplate) .....2-5, 2-10  
 DVS Rescue .....5-17, 5-18  
 eject (DVD drive) .....2-4  
 emergency eject (DVD drive) .....2-4  
 environmental conditions ..... 1-6, A-4  
 eSata .....2-16  
 Ethernet .....2-14, 2-16  
 exchanging  
   fan .....5-9  
   hard disk .....5-5  
   power supply unit .....5-14  
   RAID controller .....5-12  
 faceplate .....2-3, 2-5  
   DVS logo .....2-5, 2-10  
   lift .....2-6  
   removal .....5-20  
 fan failure ..... 5-9, A-3  
 fan module .....5-10  
 fast shut down .....4-4  
 Fibre Channel .....2-16  
   configuration .....4-3  
 file server .....1-1  
 FireWire .....2-16  
 front overview .....2-2



## G-I

|                        |               |
|------------------------|---------------|
| Gigabit Ethernet       | 2-16          |
| graphics card          | 2-16          |
| guarantee              | 1-7           |
| handle                 | 2-15          |
| hard disk array        | 2-3, 2-6      |
| access                 | 2-6           |
| hard disk(s)           | 2-6           |
| activity               | 2-3, 2-4, 2-8 |
| assembly               | 5-6           |
| disk power LED         | 2-8           |
| disk set (RAID pack)   | 5-2           |
| failure                | 5-2           |
| rebuilding failed disk | 5-7           |
| removal                | 5-5           |
| replace                | 5-5, 5-6      |
| status                 | 2-3, 2-4, 2-8 |
| system/metadata        | 2-12, 5-2     |
| hardware variants      | 2-2           |
| HDD LEDs               | 2-3           |
| hinge                  | 2-6, 5-20     |
| important notes        | 1-7, 1-8      |
| installation           | 3-1           |
| network                | 3-2           |
| instructions           |               |
| installation           | 3-1           |
| maintenance            | 5-1           |
| operation              | 4-1           |
| packing                | A-6           |
| safety                 | 1-5           |
| IP address             | 4-3           |
| IPMI                   | 2-13, 2-14    |

## J-L

|                      |                     |
|----------------------|---------------------|
| keyboard             | 2-13, 3-1           |
| KVM                  | 2-13, 2-14          |
| LAN                  | 2-9, 2-14           |
| latch                | 2-15                |
| LEDs                 |                     |
| alarm                | 2-9, 5-9, 5-14, A-2 |
| disk activity        | 2-4, 2-8            |
| disk power           | 2-8                 |
| DVD drive            | 2-9                 |
| HDD                  | 2-3, 2-4, 2-8       |
| LAN                  | 2-9                 |
| power supply         | 2-15, 5-14          |
| lever (disk carrier) | 2-8                 |
| Linux                | 1-1                 |
| log files            | 4-3                 |

## M-O

|                          |                          |
|--------------------------|--------------------------|
| magnets                  | 2-6                      |
| main storage             | 2-6                      |
| metadata HDD             | 2-12, 5-2                |
| monitor                  | 2-16, 3-1                |
| mouse                    | 2-13, 3-1                |
| mute button              | 2-9, 5-9, 5-14, A-2, A-3 |
| NAS solution             | 1-1                      |
| network                  | 2-14                     |
| connection               | 2-9, 2-14                |
| connection possibilities | 2-15                     |
| connection status        | 2-9                      |
| installation             | 3-2                      |
| notes (important)        | 1-7, 1-8                 |
| opener (disk carrier)    | 2-8                      |
| opening of casing        | 5-8                      |
| operating system         | 1-1, 2-12                |
| operation items          | 2-3, 2-9                 |
| overheating              | A-3                      |
| overview                 | 2-1                      |
| chapters                 | 1-2                      |
| disk carrier             | 2-7, 2-12                |
| front                    | 2-2                      |
| power supply unit        | 2-14                     |
| rear                     | 2-11                     |

## P-R

|                           |                |
|---------------------------|----------------|
| packing instructions      | A-6            |
| parity information (RAID) | 5-2, 5-4       |
| power                     | 2-10           |
| on/off status             | 2-5            |
| switch                    | 2-10, 4-1      |
| power cable socket        | 2-15           |
| power supply              | 2-11           |
| handle                    | 2-15           |
| latch                     | 2-15           |
| LED                       | 2-15           |
| overview of one unit      | 2-14           |
| power cable socket        | 2-15           |
| status of unit            | 2-15           |
| unit failure              | 5-14, A-2      |
| power switch              | 2-10, 4-1      |
| proxy                     | 1-1, 2-6       |
| RAID                      | 2-6, 2-12, 5-2 |
| controller                | 2-17, 5-2, 5-4 |
| controller exchange       | 5-12           |
| disk set (RAID pack)      | 5-2            |
| parity information        | 5-2, 5-4       |
| rebuilding failed disk    | 5-7            |
| rear overview             | 2-11           |
| reboot                    | 4-3            |
| rebuilding failed disk    | 5-7            |

- removal of the faceplate .....5-20
  - replacing a hard disk .....5-5
  - reset button .....2-9
  - restoring the system disk .....5-18
  - RS-232 .....2-13
- S-T**
- safety instructions .....1-5
  - shutting down .....4-3, 4-4
    - fast shut down .....4-4
  - slot panel connectors .....2-12, 2-15
  - software .....1-1
  - Spycer .....1-1
  - SpycerBox .....1-1
    - configuration .....4-3
    - installation .....3-1
    - log files .....4-3
    - main storage .....2-6
    - metadata .....2-12, 5-2
    - operating system .....1-1, 2-12
    - reboot .....4-3
    - shut down .....4-3, 4-4
    - software .....1-1
    - start .....4-2
    - storage capacity .....1-1, 2-2
    - technical data .....A-4
    - variants .....2-2
  - SpycerBox Flex .....2-2
    - see also SpycerBox
  - SpycerBox Ultra .....2-2
    - see also SpycerBox
  - starting .....4-2
  - status
    - of disk power .....2-8
    - of hard disks .....2-3, 2-4, 2-8
    - of network connection .....2-9
    - of power supply unit .....2-15
    - of power-on/-off .....2-5
  - storage capacity .....1-1, 2-2
  - stripe set .....5-2
  - system disk array .....2-11
  - system HDD .....2-6, 2-12, 5-2
  - system reset .....2-9
  - system/metadata HDD .....2-12, 5-2
  - target group .....1-3
  - technical data .....A-4
    - dimensions .....A-5
    - general .....A-4
  - transportation .....1-6, A-6
  - tray (DVD drive) .....2-3
  - troubleshooting .....4-3, A-2
  - typographical conventions .....1-4
- U-Z**
- USB connectors .....2-10, 2-14, 2-16
  - variants .....2-2
  - VGA .....2-14
  - warranty .....1-7
  - workflow .....3-2



