



User Manual

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Draco major

**Model:
K474-UX / CX**

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1 About This Manual

1.1 Scope

This manual describes how to install your Draco major, how to operate it and how to perform trouble shooting.

1.2 Validity

This manual is valid for all devices listed on the front page. The product code is printed on the base of the devices.

1.3 Cautions and Notes

The following symbols are used in this manual:



This symbol indicates an important operating instruction that should be followed to avoid any potential damage to hardware or property, loss of data, or personal injury.



This symbol indicates important information to help you make the best use of this product.

1.1 Spellings

You can find the following spellings in the manual:

Spelling	Description
<key>	Description of a key on the keyboard
<key> + <key>	Press keys simultaneously
<key>, <key>	Press keys successively
2x <key>	Press key 2x in quick succession (cf. mouse double click)
Menu item	Description of a menu item in the software
Menu item > Menu item	Select menu items successively
Bold print	Description of terms that are used in the device software

2 Safety Instructions

To ensure reliable and safe long-term operation of your Draco major please note the following guidelines:

Installation

- ➔ Only use the device according to this User Manual. Otherwise the provided safety can be affected.
- ➔ Only use in dry, indoor environments.
- ➔ The Draco major and the power supply units can get warm. Do not situate them in an enclosed space without any airflow.
- ➔ Do not place the power supply directly on top of the device.
- ➔ Do not obscure ventilation holes.
- ➔ Only use power supplies originally supplied with the product or manufacturer-approved replacements. Do not use a power supply if it appears to be defective or has a damaged chassis.
- ➔ Connect all power supplies to grounded outlets. In each case, ensure that the ground connection is maintained from the outlet socket through to the power supply's AC power input.
- ➔ Do not connect the link interface to any other equipment, particularly network or telecommunications equipment.
- ➔ Only connect devices to the serial interface that are sufficiently secured against short circuit currents and false voltages at the serial interface.
- ➔ Take any required ESD precautions.

Repair

- ➔ Do not attempt to open or repair a power supply unit.
- ➔ Do not attempt to open or repair the Draco major. There are no user serviceable parts inside.
- ➔ Please contact your dealer or manufacturer if there is a fault.

3 Description

3.1 Application

The Draco major matrix is used to switch from consoles (monitor, keyboard, mouse, and other peripheral devices) to various sources (computer, CPU) for establishing a connection.

In a maximum configuration, up to 16 independent consoles can be switched with up to 32 independent sources.

The Draco major matrix is only specified for the use with extenders that are able to transmit video, KVM and USB 2.0 signals.

The connection between the matrix and the KVM extenders can only be made by Cat X or fiber cables.

The matrix serves as a repeater. Thus the matrix can be run in a maximum distance of 10 km away from the consoles and 10 km away from the sources.

3.2 Access Possibilities

You have the following possibilities to access the Draco major for configuration and operation:

Access Option	Symbol
OSD	
Java tool	
LCD display	
Serial interface	

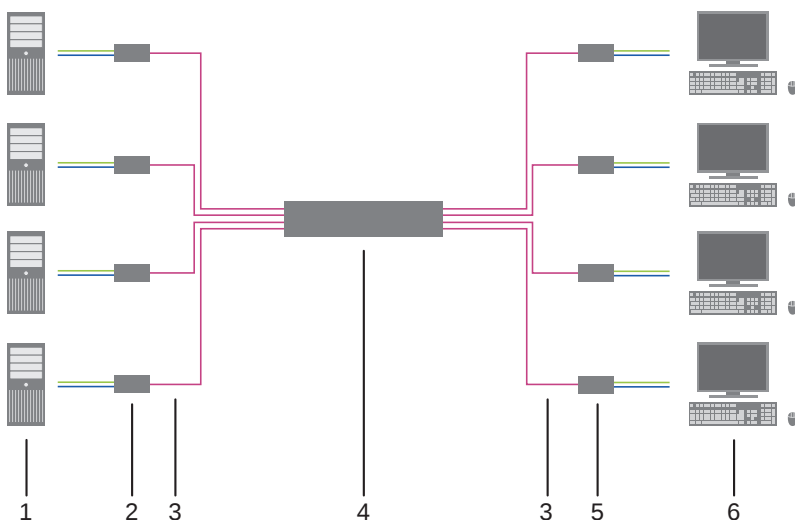
3.3 System Overview

A Draco major matrix system consists of a Draco major matrix and one or more CPU and CON units. The Draco major matrix is connected to the CPU and CON units by interconnect cables.

The CPU units are connected directly to the source (computer, CPU) by the provided cables.

Monitor(s), keyboard and mouse are connected to the CON units.

The communication between the Draco major matrix and the CPU and CON units takes place over the respective interconnect cables.



System Overview (exemplary)

- 1 Source (computer, CPU)
- 2 CPU Units
- 3 Interconnect cable
- 4 Draco major matrix
- 5 CON Units
- 6 Console (monitor, keyboard, mouse)



See Chapter 4.3, Page 32 for installation examples.

3.4 Product Range

Part No.	Description
K474-U8/C8	Draco major matrix for 8 users and 8 CPUs
K474-U8/C16	Draco major matrix for 8 users and 16 CPUs
K474-U8/C24	Draco major matrix for 8 users and 24 CPUs
K474-U8/C32	Draco major matrix for 8 users and 32 CPUs
K474-U16/C8	Draco major matrix for 16 users and 8 CPUs
K474-U16/C16	Draco major matrix for 16 users and 16 CPUs
K474-U16/C24	Draco major matrix for 16 users and 24 CPUs
K474-U16/C32	Draco major matrix for 16 users and 32 CPUs
K474-UX/CX	Draco major matrix empty (consisting of a basic chassis, a basic circuit board, a control board and a plug-in power supply unit for free configuration)

3.5 Accessories

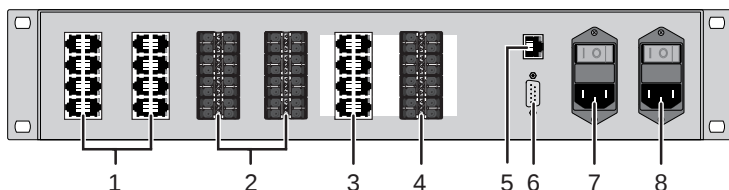
Part No.	Description
474-PSU	Plug-in power supply unit as a replacement or for an upgrade to a redundant power supply
474-OSD	Draco major OSD card
474-DIS	Draco major display card
474-C8	Draco major Cat X I/O card
474-M8	Draco major fiber I/O card, Multi-mode
474-S8	Draco major fiber I/O card, Single-mode
474-X8	Draco major I/O card empty, for free configuration
459-1M	Multi-mode GBIC for the use in 474-X8
459-1S	Single-mode GBIC for the use in 474-X8
474-KEY	16 key macro keyboard



You can find appropriate extenders or other components in Chapter 7.3, Page 146.

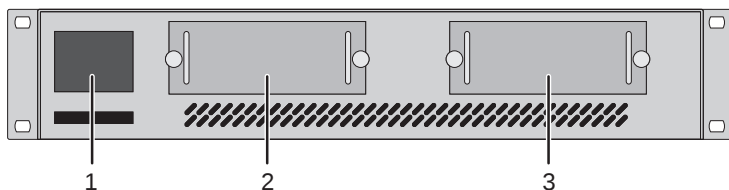
3.6 Device Views

3.6.1 Configuration Redundancy



Rear View

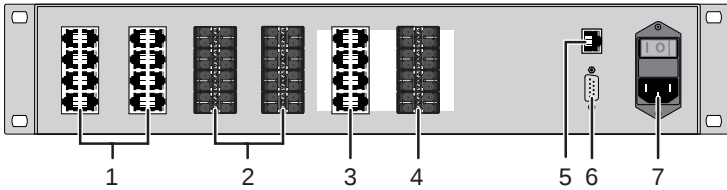
- 1 I/O module CPU (Cat X)
- 2 I/O module CPU (fiber)
- 3 I/O module console (Cat X)
- 4 I/O module console (fiber)
- 5 Connect to network (RJ45)
- 6 Connect to serial interface (D-sub 9-pole)
- 7 Connect to power supply unit 2 (redundancy)
- 8 Connect to power supply 1 (standard)



Front View

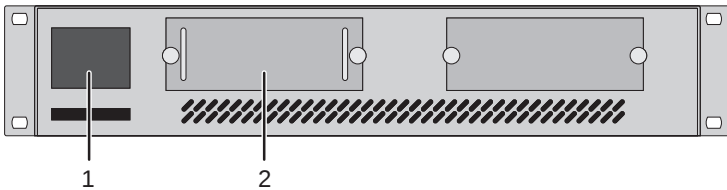
- 1 LCD display
- 2 Plug-in power supply unit 1 (standard)
- 3 Plug-in power supply unit 2 (redundancy)

3.6.2 Configuration Standard 1



Rear View

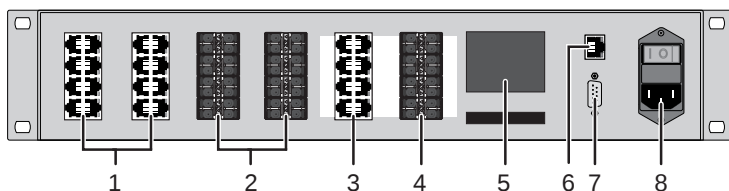
- 1 I/O module CPU (Cat X)
- 2 I/O module CPU (fiber)
- 3 I/O module console (Cat X)
- 4 I/O module console (fiber)
- 5 Connect to network (RJ45)
- 6 Connect to serial interface (D-sub 9-pole)
- 7 Connect to power supply



Front View

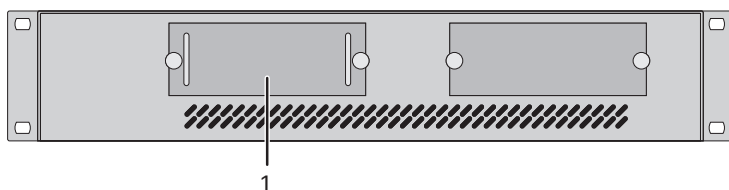
- 1 LCD display
- 2 Plug-in power supply unit

3.6.3 Configuration Standard 2



Rear View

- 1 I/O module CPU (Cat X)
- 2 I/O module CPU (fiber)
- 3 I/O module console (Cat X)
- 4 I/O module console (fiber)
- 5 LCD display
- 6 Connect to network (RJ45)
- 7 Connect to serial interface (D-sub 9-pole)
- 8 Connect to power supply



Front View

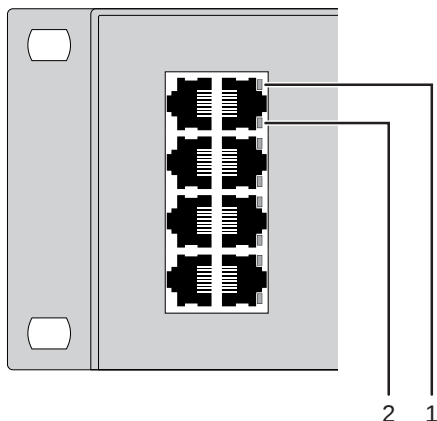
- 1 Plug-in power supply unit

3.7 Diagnostics and Status

3.7.1 Status LEDs

The Draco major is fitted with the following LEDs for overall status indication on every I/O module:

I/O card Cat X

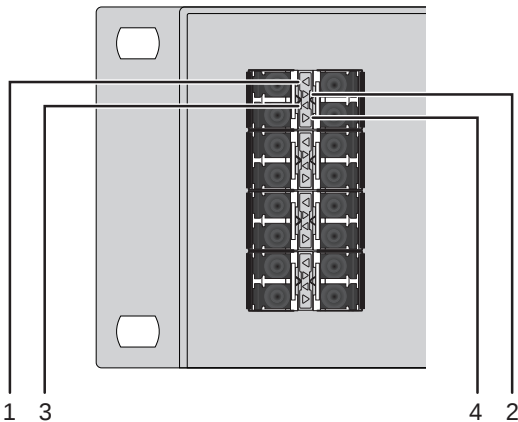


Rear View

- 1 Status LED left port
- 2 Status LED right port

Pos.	LED	Status	Description
1,2	Link Status (green)	Off	Port offline
		Flashing	Port online, no connection via Cat X cable
		On	Connection via Cat X cable ok, data traffic active.
	Link Status (orange)	Off	Port offline
		Flashing	Port online, no connection via Cat X cable.

I/O card fiber



Rear View

- 1 Failure LED left port
- 2 Status LED left port
- 3 Status LED right port
- 4 Failure LED right port

Pos.	LED	Status	Description
1,4	Failure Status (red)	Off	Port offline
		Flashing	Port online, SFP module failure signal
2,3	Link Status (green)	Off	Port offline
		On	Port online, signal ok
		Flashing	Port online, no signal

3.7.2 Status of Console Ports

All of the connections between the various consoles and CPUs are shown in this menu.

You have the following possibilities to access the menu:



OSD

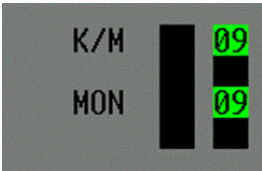
- 1. Select **Status > CON Ports** in the main menu.



Menu **Status – CON Ports**

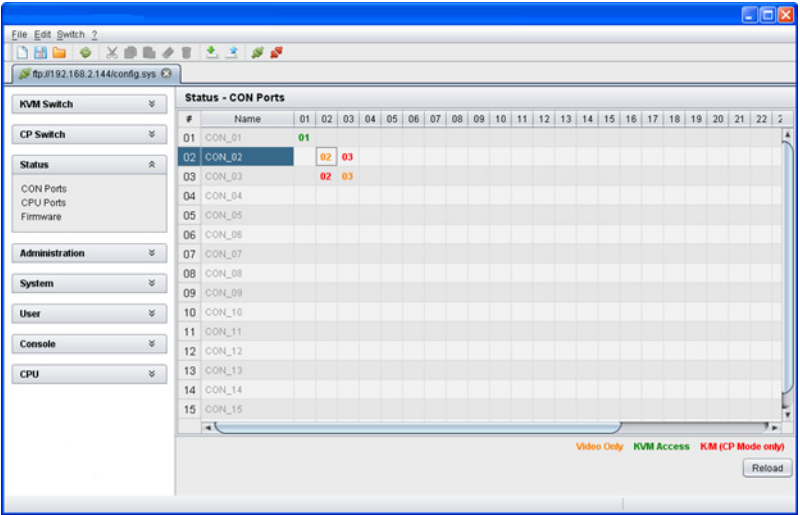
- 2. Press key <F1> to get to the view **CPU Ports**.

The following information is shown in this menu:

Field	Description
	- Black: Number of the CON port - Green: Name of the CON port
	K/M: Number of the CPU port with keyboard and mouse connection MON: Numbers of the CPU ports with video connection

Java Tool

➔ Select **Status > CON Ports** in the task area.



Menu **View Status > CON Ports**

In this view, video only connections are displayed in orange. Connections with keyboard and mouse are displayed in red. Finally, full KVM connections are displayed in green.

You can select between the following buttons:

Button	Function
Reload	Reload status of the CON ports

LCD Display

➔ Select **Status > Ports** in the main menu.

Status	Ports
Output	Input
CPU_01	CON_01
CPU_02	n.c.
CPU_03	n.c.
CPU_04	n.c.
CPU_05	n.c.
CPU_06	n.c.
CPU_07	n.c.
CPU_08	n.c.
Draco major	

Menu **Status – Ports** (Video)



The menu consists of six pages. The first four pages inform about the set video connections, the last two pages inform about the set mouse and keyboard connections.

- ➔ To open the next page, press the key <Page Down>.
- ➔ To open the previous page, press the key <Page Up>.

The following information is shown in this menu:

Field	Description
Output	Name of CPU port
Input	Name of CON ports connected to the output signal (Video) of the CPU port.

```
Status                                     Ports
Output                                   Input
CON_01                                CPU_01
CON_02                                n.c.
CON_03                                n.c.
CON_04                                n.c.
CON_05                                n.c.
CON_06                                n.c.
CON_07                                n.c.
CON_08                                n.c.
Draco major
```

Menu **Status – Ports** (mouse / keyboard)

The following information is shown in this menu:

Field	Description
Output	Name of CON port
Input	Name of CPU port connected to the output signal (K/M) of the CON port.

3.7.3 Status of the CPU Ports

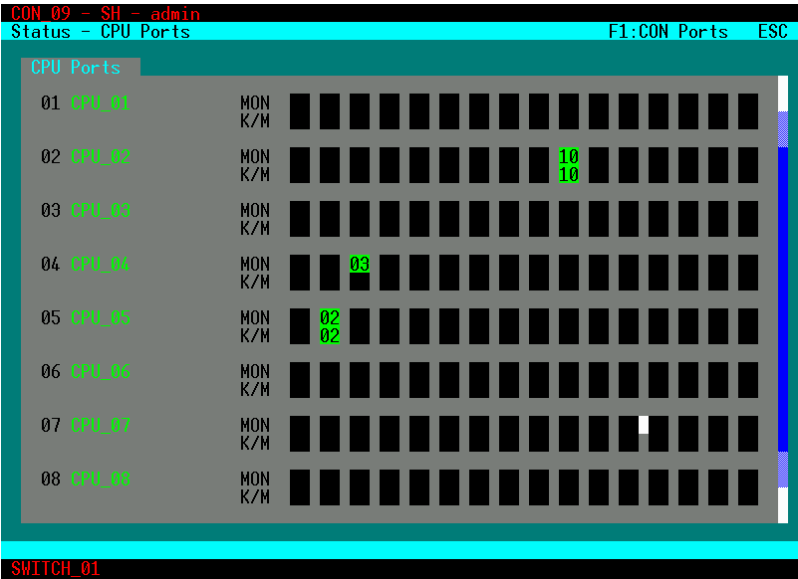
All of the connections between the various consoles and CPUs are shown in this menu.

You have the following possibilities to access the menu:



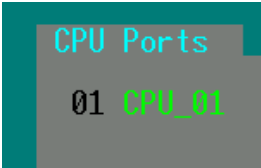
OSD

1. Select **Status > CON Ports** in the main menu.
2. Press the key <F1> to switch to **CPU Ports**.



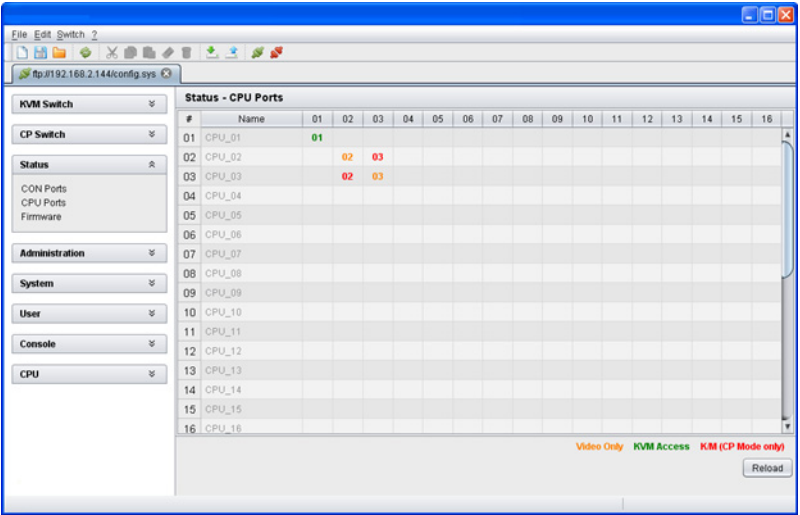
Menu *Status – CPU Ports*

The following information is shown in this menu:

Field	Description
	- Black: Number of the CPU port - Green: Name of the CPU port
	K/M: Number of the CON port with keyboard/mouse connection MON: Number of the CON port with video connection

Java Tool

➔ Select **Status > CPU Ports** in the task area.

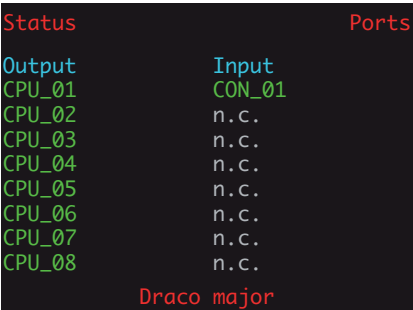


Menu **Status – CPU Ports**

In this view, video only connections are displayed in orange. Connections with keyboard and mouse are displayed in red. Finally, KVM connections are displayed in green.

LCD Display

➔ Select **Status > Ports** in the main menu.



Menu **Status – Ports** (Video)

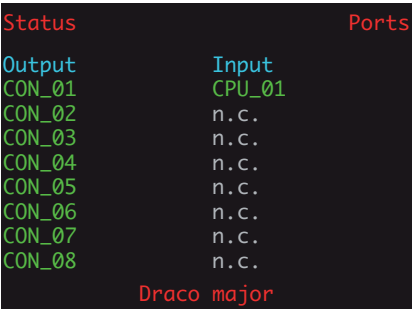


The menu consists of six pages. The first four pages inform about the set video connections, the last two pages inform about the set mouse and keyboard connections.

- ➔ To open the next page, press the key <Page Down>.
- ➔ To open the previous page, press the key <Page Up>.

The following information is shown in this menu:

Field	Description
Output	Name of CPU port
Input	Name of CON ports connected to the output signal (Video) of the CPU port.



Menu **Status – Ports** (mouse / keyboard)

The following information is shown in this menu:

Field	Description
Output	Name of CON port
Input	Name of CPU port connected to the output signal (KM) of the CON port.

3.7.4 Network Status

The current network configuration is shown in this menu.

You have the following possibilities to access the menu:

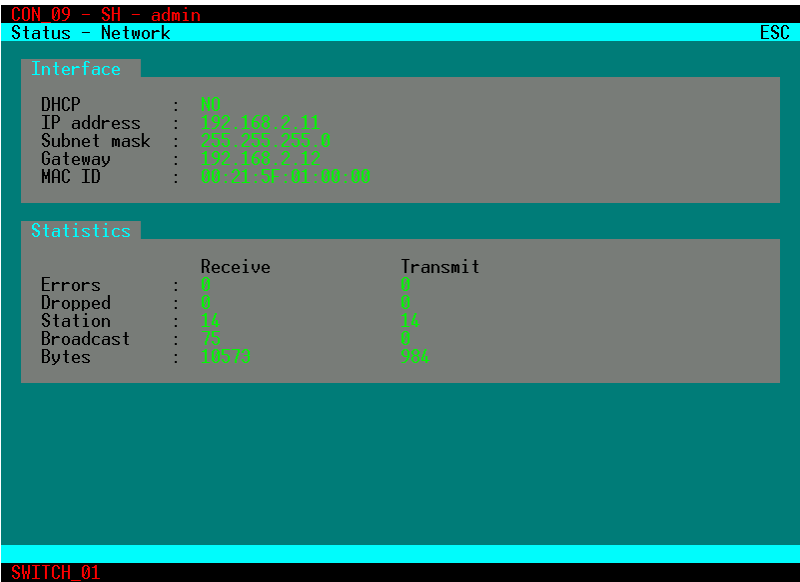


The following information is shown in this menu:

Field	Description
DHCP	Display that shows, if the network settings are set dynamically (YES or NO).
IP Address	Display of the IP address as entered manually or set by DHCP
Subnet Mask	Display of the subnet mask as entered manually or set by DHCP
Gateway	Display of the gateway address as entered manually or set by DHCP
MAC ID	Display of the MAC address of the matrix
Errors	Number of data packets with errors
Dropped	Number of dropped data packets
Station	Number of data packets for single receivers
Broadcast	Number of data packets for all receivers
Bytes	Number of received/transmitted bytes

OSD

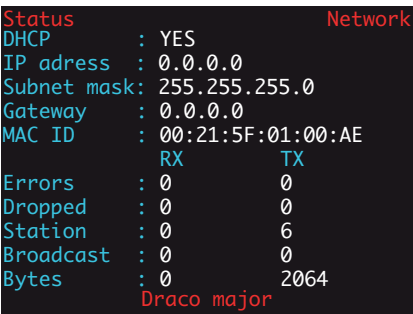
➔ Select **Status > Network** in the main menu.



Menu **Status – Network**

LCD Display

➔ Select **Status > Network** in the main menu.



Menu **Status – Network**

3.7.5 Firmware Status

The firmware version of the built-in modules is shown in this menu.

You have the following possibilities to access the menu:

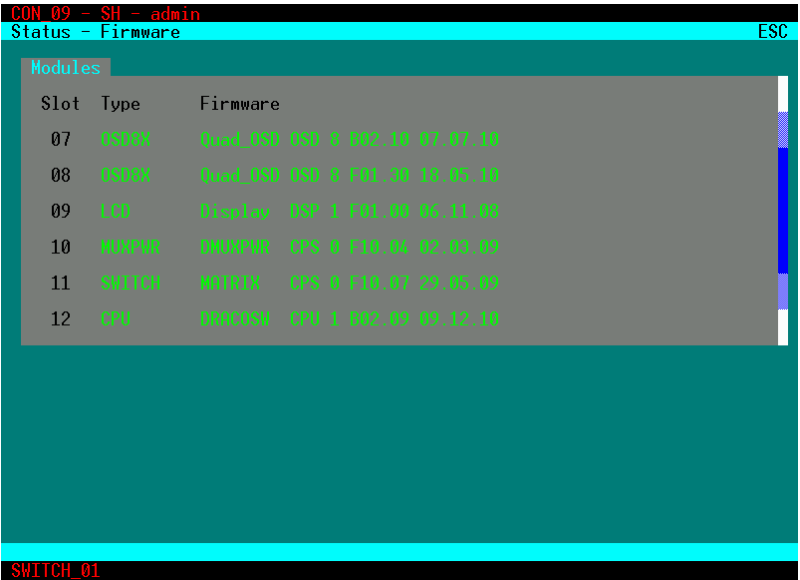


The following information is shown in this menu:

Field	Description
Slot	Assignment of single modules by a slot number
Type	Type of module
Firmware	Name of the firmware of a module including appropriate release date

OSD

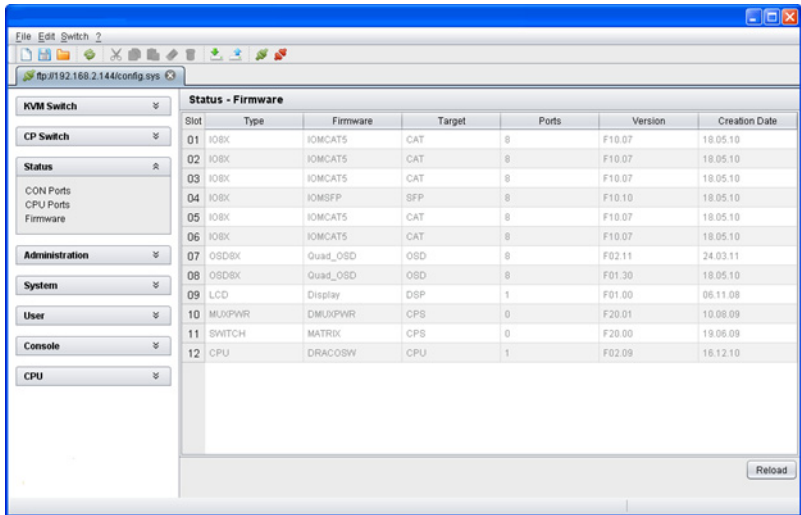
➔ Select **Status > Firmware** in the main menu.



Menu **Status – Network**

Java Tool

➔ Select **Status > Firmware** in the task area.



Slot	Type	Firmware	Target	Ports	Version	Creation Date
01	IOBK	IOMCAT5	CAT	8	F10.07	18.05.10
02	IOBK	IOMCAT5	CAT	8	F10.07	18.05.10
03	IOBK	IOMCAT5	CAT	8	F10.07	18.05.10
04	IOBK	IOMSFP	SFP	8	F10.10	18.05.10
05	IOBK	IOMCAT5	CAT	8	F10.07	18.05.10
06	IOBK	IOMCAT5	CAT	8	F10.07	18.05.10
07	OSDEX	Quad_OSD	OSD	8	F02.11	24.03.11
08	OSDEX	Quad_OSD	OSD	8	F01.30	18.05.10
09	LCD	Display	DSP	1	F01.00	06.11.08
10	MUXPWR	DMUXPWR	CPS	0	F20.01	10.08.09
11	SWTCH	MATRIX	CPS	0	F20.00	19.06.09
12	CPU	DRAC08W	CPU	1	F02.09	16.12.10

Menu **Status – Firmware**

3.8 Trace Function

All of the activities and switching operations of the Draco major are logged and recorded in this menu.

This function will be used for diagnostic purposes, if there are problems with the matrix.

You have the following possibility to access the menu:



OSD

➔ Select **Status > Trace** in the main menu.

```
CON_09 - SH - admin
Status - Trace ESC
Trace
Time      Message
00:19:29.11 su0x4B(): CPU=13 CON=4
00:19:29.11 su0x47(): CON=7 CPU=13
00:19:22.84 su0x47(): CON=9 CPU=4
00:19:19.84 su0x4B(): CPU=9 CON=1
00:19:19.84 su0x47(): CON=1 CPU=9
00:19:16.75 su0x4B(): CPU=10 CON=9
00:19:16.75 su0x47(): CON=3 CPU=10
00:19:13.24 su0x4B(): CPU=5 CON=2
00:19:13.24 su0x47(): CON=2 CPU=5
00:19:10.79 su0x4B(): CON=2
00:19:08.47 su0x47(): CON=2 CPU=21
00:10:58.83 scrDisplayOn(): CON=9
00:10:55.98 scrDisplayOff(): CON=9
00:10:43.10 su0x47(): CON=9 CPU=0
00:10:43.10 su0x4C(): CPU=1
00:06:40.00 suENDPGOFF2(): CMD=0x4C CPU=1
```

Menu Status – Trace

The following information is shown in this menu:

Field	Description
Time	Time specification for the execution of an activity or a switching operation
Message	Accurate documentation of the execution of an activity or a switching operation

3.9 Flash Memory Status

The name and size of the configuration files are shown in this menu.

You have the following possibility to access the menu:



LCD

➔ Select **Status > Flash** in the main menu.

Status		Flash
Filename	Size	
config.sys	31284	*
default.sys	31284	
config01.sys	31284	
config02.sys	31284	
config03.sys	31284	
config04.sys	31284	
config05.sys	31284	
config06.sys	31284	
Draco major		

Menu **Status – Flash** (Page 1)

Status		Flash
Filename	Size	
config07.sys	31284	
config08.sys	31284	
modul.sys	528	*
dmTools.jar	420492	
Draco major		

Menu **Status – Flash** (Page 2)

An asterisk at the end of a line shows a system file that cannot be changed. All of the other files can be loaded, saved or deleted by FTP (see Chapter 5.7.4, Page 116).

4 Installation

4.1 Package Contents

Your extender package contains the following items:

- Draco major matrix
- 1x power cord per built-in power supply unit
- 1x serial control cable
- 1x infrared remote control
- 2x 19" rack mount
- User Manual
- Java tool



If anything is missing, contact your dealer.

4.2 System Setup



First time users are recommended to setup the system in the same room as a test setup. This will allow you to identify and solve any cabling problems, and experiment with your system more conveniently.



Optimal results can be achieved by the use of identical mice, keyboards and monitors. This makes a contribution to a smooth and fast switching without any delay.

1. Switch off all devices.
2. Connect the monitor(s), keyboard and mouse to the CON unit of the extender. Connect the source (computer, CPU) via provided connection cables to the CPU unit of the extender. Ensure that the cables are not strained.
3. Connect the matrix to the extenders via interconnect cables (Cat X or fiber). Ensure that for the connection with fiber I/O modules all required ports are equipped with GBICs.



Please assure that your interconnect cables correspond to the specifications (see Chapter 7.2, Page 143).

4. Connect the 5VDC power supply units to the extenders.
5. If you have a dual access system, please connect the monitor for the local console with the appropriate female connector at the CPU unit. To connect a local (USB) keyboard or mouse, please use free USB ports on your source (computer, CPU) or use a USB hub between CPU and CPU unit.
6. Power up the system.
7. Log in at the console as administrator (see Chapter 5, Page 49).
8. Configure your system.



Reconfiguration of a CPU or CON Port between DVI/KVM and USB 2.0 function needs a saving of the new configuration and a restart of the Draco major (see Chapter 6.5.2, Page 141).

4.3 Example Applications

The Draco major Matrix offers a completely flexible configuration of your Matrix environment:

A part of the Draco major can be configured as a Single-Head work station, another part as a Dual-Head or Quad-Head work station. There are configurations with KVM and USB 2.0 additionally available.

You can copy your own screen content with the function **Follow Me** to one or several monitors, e.g. to a projector for training or presentation purposes.

In addition to that, you can use the Matrix in every operation mode with the function **Crosspoint Switch**.

This function can be used for example to do

- the total
- or a special

switching operation(s) from a central place that is not possible in standard operation modes.

In addition to the access by OSD and with a connected keyboard, the following additional access methods are available:

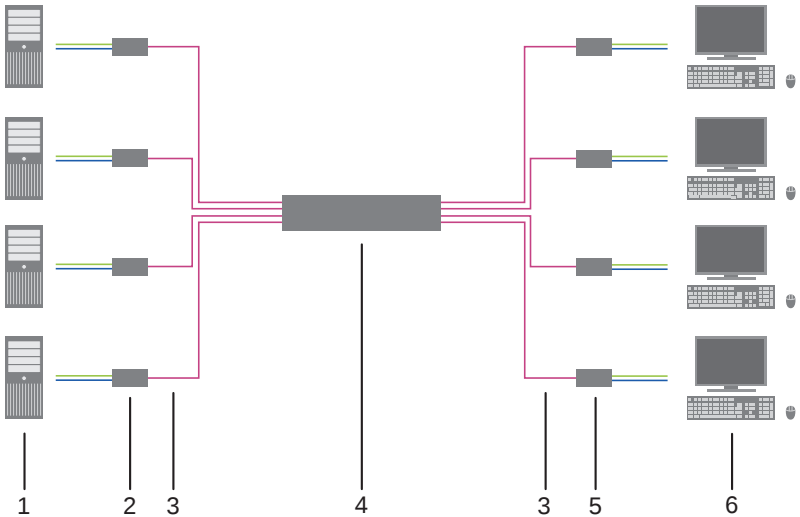
- By the built-in display and the provided infrared remote control
- By the Java tool
- By the serial interface

A connection to standard media controls is possible.

The following pages show typical and exemplary installations of the Draco major:

4.3.1 Single-Head Matrix (KVM)

Up to 16 users can have access to up to 32 CPUs in the Single-Head operation mode. Though a non-blocking access is given for all users that means no user can be disturbed by any activity from another user.



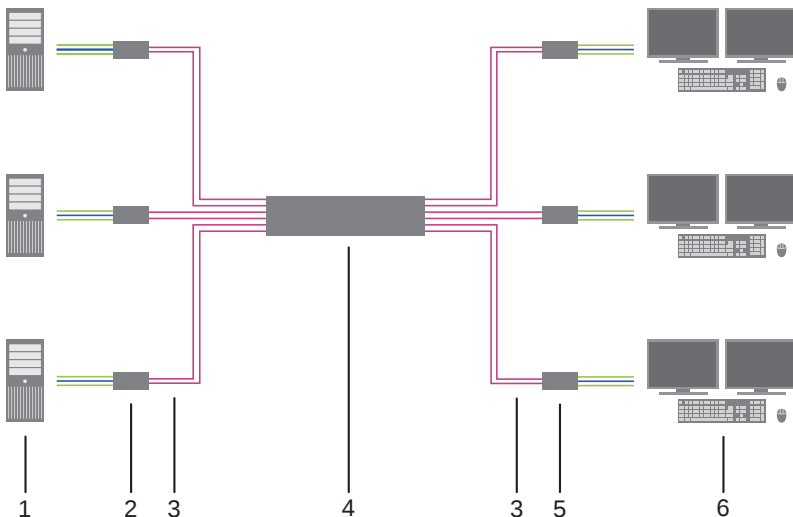
Single-Head Matrix (KVM)

- 1 Source (computer, CPU)
- 2 CPU Unit
- 3 Interconnect cable
- 4 Draco major matrix
- 5 CON Unit
- 6 Console (monitor, keyboard, and mouse)

If you have a Single-Head console, you can also get access to Dual-Head or Quad-Head CPUs. However, control will only be given at monitor one.

4.3.2 Dual-Head Matrix (KVM)

Up to 8 users can have access to up to 16 CPUs in the Dual-Head operation mode. Though a non-blocking access is given for all users that means not user can be disturbed by any activity from another user.



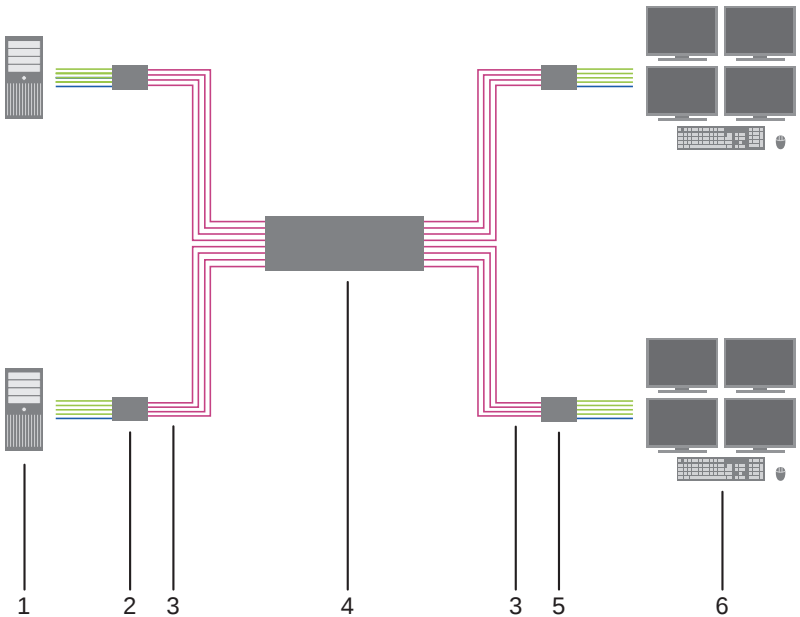
Quad-Head Matrix (KVM)

- 1 Dual-Head source (computer, CPU)
- 2 CPU Unit
- 3 Interconnect cable
- 4 Draco major matrix
- 5 CON Unit
- 6 Console (2x monitor, keyboard, and mouse)

If you have a Dual-Head console, you can also get access to a Single-Head or Quad-Head CPU. However, the second monitor will remain black, if you have a Single-Head CPU and if you have a Quad-Head CPU, control will only be given at monitor one and two.

4.3.3 Quad-Head Matrix (KVM)

Up to 4 users can have access to up to 8 CPUs in the Dual-Head operation mode. Though a non-blocking access is given for all users that means not user can be disturbed by any activity from another user.



Quad-Head Matrix (KVM)

- 1 Quad-Head source (computer, CPU)
- 2 CPU Unit
- 3 Interconnect cable
- 4 Draco major matrix
- 5 CON Unit
- 6 Console (4x monitor, keyboard, and mouse)

If you have a Quad-Head console, you can also get access to a Single-Head or Dual-Head CPU.

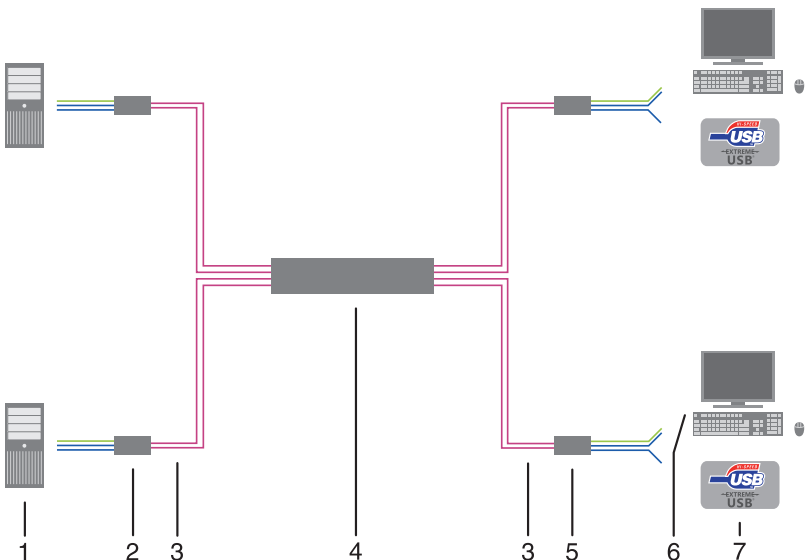
However, the second, third and fourth monitor will remain dark, if you have a Single-Head CPU and if you have a Dual-Head CPU, the third and fourth monitor will stay dark.

4.3.4 Single-Head Matrix (KVM / USB 2.0)

Up to 8 users with an USB 2.0 link (for USB 2.0 devices such as memory sticks, printers additionally to keyboard and mouse) can have access to up to 16 CPUs in the Single-Head KVM/USB operation mode.

Up to 4 USB 2.0 peripheral devices can be connected directly to the CON unit; more devices can be connected by a standard USB 2.0 hub.

Though a non-blocking access is given for all users that means no user can be disturbed by any activity from another user.



Single-Head-Matrix (KVM / USB-2.0)

- 1 Source (computer, CPU)
- 2 CPU Unit
- 3 Interconnect cable
- 4 Draco major matrix
- 5 CON Unit
- 6 Console (monitor, keyboard, and mouse)
- 7 USB 2.0 device

If you have a Single-Head KVM/USB 2.0 console, you can also get access to a Triple-Head KVM/USB 2.0 CPU. However, if you have a Single-Head CPU, the second monitor will remain black and if you have a Quad-Head CPU, control will only be given at monitor one and two.

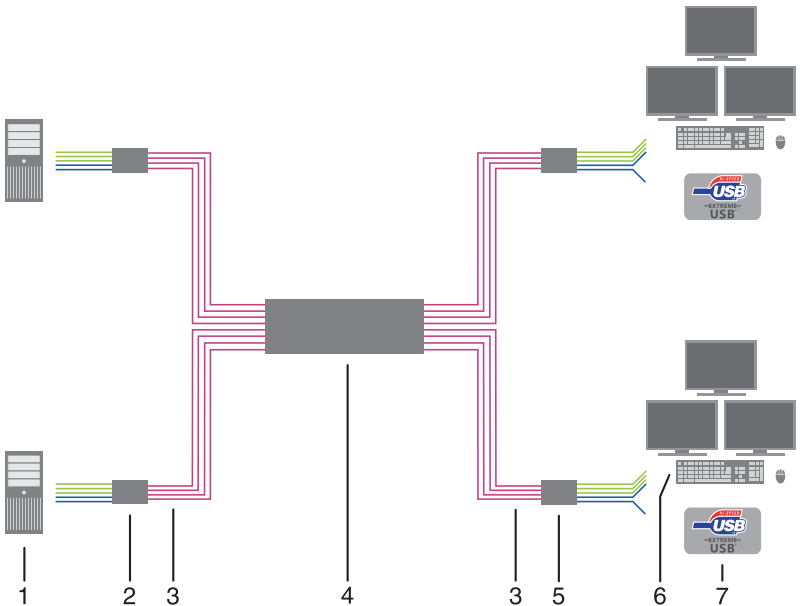
However, control will only be given at monitor one. You cannot use the USB periphery if you try to get access to CPUs without USB 2.0 connection.

4.3.5 Triple-Head-Matrix (KVM / USB 2.0)

Up to 4 users with an USB 2.0 link (for USB 2.0 devices such as memory sticks, printers additionally to keyboard and mouse) can have access to up to 16 CPUs in the Triple-Head KVM/USB operation mode.

Up to 4 USB 2.0 peripheral devices can be connected directly to the CON unit; more devices can be connected by a normal USB 2.0 hub.

Though a non-blocking access is given for all users that means no user can be disturbed by any activity from another user.



Triple-Head-Matrix (KVM / USB 2.0)

- 1 Triple-Head source (computer, CPU)
- 2 CPU Unit
- 3 Interconnect cable
- 4 Draco major matrix
- 5 CON Unit
- 6 Console (3x monitor, keyboard, and mouse)
- 7 USB 2.0 device

If you have a Triple-Head KVM/USB 2.0 console, you can also get access to a Single-Head KVM/USB 2.0 CPU. However, the second and third monitor will remain black.

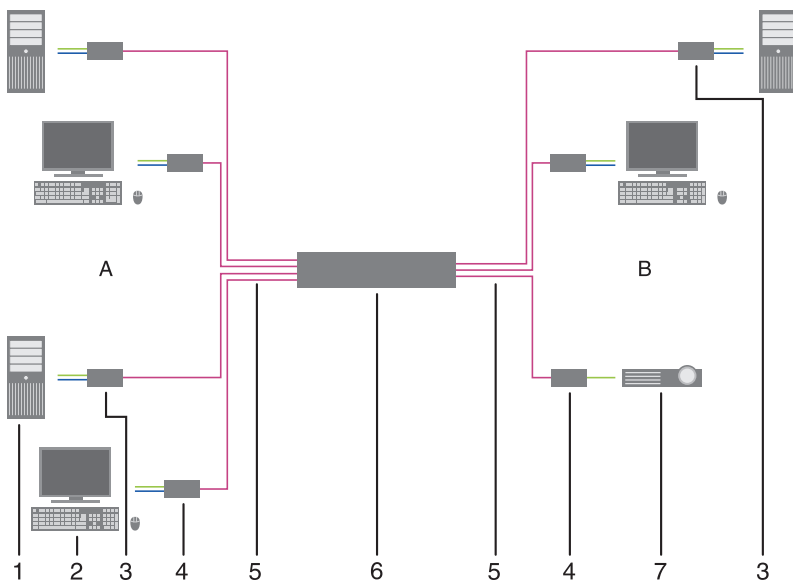
You cannot use the USB periphery if you try to get access to CPUs without USB 2.0 connection.

4.3.6 Training System 15

You can have a flexible access for up to 15 students if you use the 'Training System 15' operation mode. All of the work stations of the students and of the teacher are connected to the Draco major matrix with a interconnect cable.

The following functions are possible:

- The teacher can get the screen content of every single student and can take control, if necessary.
- The screen content of the teacher can be shown to one, several or all of the student work stations.
- The screen content of every single student can be shown to one, several or all of the student work stations.



Training System 15

A Students' area

B Teacher's area

- 1 Source (computer, CPU)
- 2 Console (monitor, keyboard, mouse)
- 3 CPU Unit
- 4 CON Unit
- 5 Interconnect cable
- 6 Draco major matrix
- 7 Projector (as an option)

The CPU that should be displayed on the respective monitor can be selected by the OSD or by a macro keyboard with control keys.

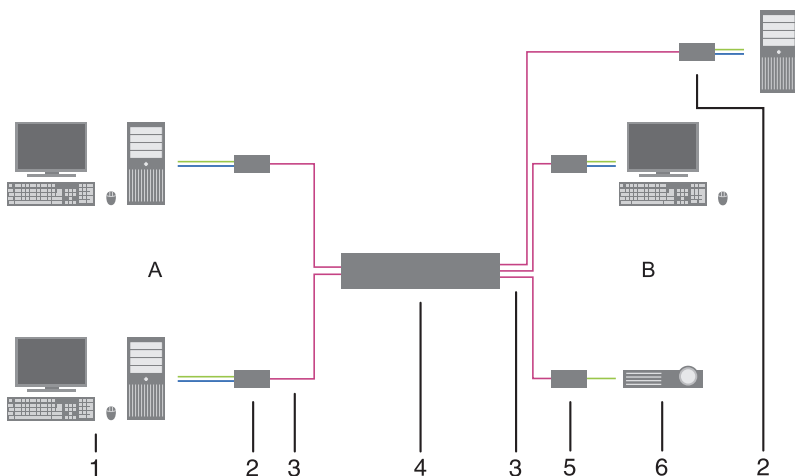
If you use the **Follow Me** function, the screen content of the teacher can be duplicated to one or more additional monitors (e.g. to a projector) – in this case, the number of available students will be reduced.

4.3.7 Training System 30

If you want to use the Draco major matrix with the 'Training System 30' operation mode, the access is slightly limited, but still comfortable.

The following functions are possible:

- The teacher can receive the screen content of every single student, but he cannot take over control.
- The screen content of the teacher can be displayed on an additional monitor (e.g. a projector).
- The screen content of every single student can be displayed on an additional monitor (e.g. a projector).



Training System 30

A Students' area

B Teacher's area

1 Student's work station (source console)

2 CPU Unit

3 Interconnect cable

4 Draco major matrix

5 CON Unit

6 Projector (optional)

The CPU displayed on the teacher's monitor and on an additional monitor can be selected respectively by the OSD or by a control panel with control keys at any time.

4.3.8 Crosspoint Matrix

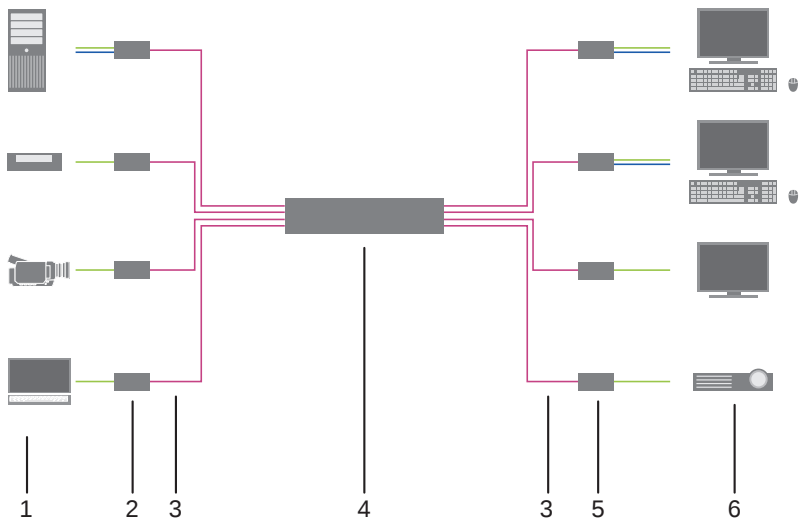
The use of the 'Crosspoint Switch' function allows a flexible performance of the switching functions. This operation mode is generally used to switch up to 32 sources (Computer, CPU) and up to 16 consoles.

Reverse Mode

In 'reverse mode', up to 16 sources (computer, CPU) can be switched to 32 consoles.

The switching can be done in a number of different ways:

- By the OSD of a console that is connected to the CON port
- By a PC and the Java tool
- By switching commands in combination with the network connection
- By switching commands in combination with the serial connection



Crosspoint Matrix

- 1 Source (e.g. computer, DVD player and video camera)
- 2 CPU Unit
- 3 Interconnect cable
- 4 Draco major matrix
- 5 CON Unit
- 6 Console (e.g. monitor, keyboard, mouse and projector)

Any signal source can be switched to as many displays as required. On these displays, video can be shown at the same time. In addition to that, even (optional) audio signals can be disposed.

4.3.9 Parallel Operation (Stacking)

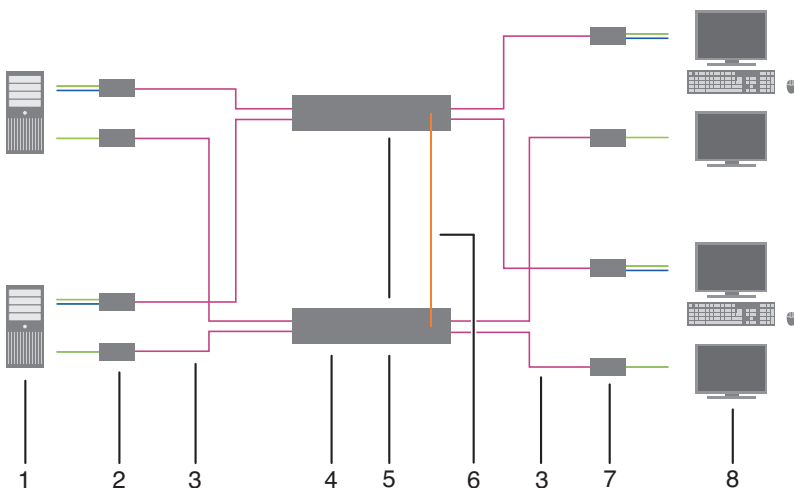
If you have special configurations, especially at installations with several monitors per work station or additional support of USB 2.0 transmission paths, the number of connectable CPUs and consoles can be increased by a parallel operation (stacking) of several Draco major matrices.

One of the Draco major matrices has to be defined as the **master** matrix, all of the others have to be configured as **slave** and the IP address of the master matrix has to be entered in the field **Master IP Address** (see Chapter 5.3.1, Page 67).

They have to be connected to the master matrix by the network connector (RJ45) of the CPU board. The option **Enable LAN Echo** has to be activated at the master matrix (see Chapter 5.3.1, Page 67).



Switching of stacked devices might be delayed by several seconds.



Parallel Operation (Stacking)

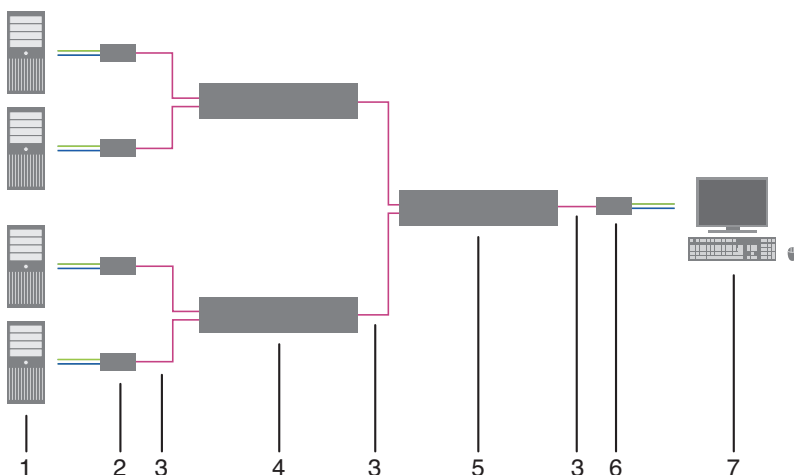
- 1 Dual-Head source (computer, CPU)
- 2 CPU Unit
- 3 Interconnect cable
- 4 Draco major matrix (Master)
- 5 Draco major matrix (Slave)
- 6 Network connection Master / Slave(s)
- 7 CON Unit
- 8 Console (2x monitor, keyboard and mouse)

4.3.10 Cascading

For applications exceeding the number of available ports, the system can be extended by cascading.

In this case, the Draco major devices are connected by so-called "tie lines". The tie lines are dynamically configured to support connections in both directions.

To access cascaded matrices from a console, one of the matrices has to be configured as sub matrix (see Chapter 5.3.1, Page 67).



Cascading

- 1 Source (computer, CPU)
- 2 CPU Unit
- 3 Interconnect cable
- 4 Draco major (sub matrix)
- 5 Draco major (main matrix)
- 6 CON Unit
- 7 Console (monitor, keyboard and mouse)

5 Configuration

5.1 Command Mode

The Draco major has a Command Mode that allows several functions via keyboard command during normal use.

To enter Command Mode use a 'Hot Key' sequence and to exit Command Mode, press <Esc>. While in Command Mode, the LEDs **Shift** and **Scroll** on the console keyboard will flash.



In Command Mode normal keyboard and mouse operation will cease. Only selected keyboard commands are available.

The following table lists the keyboard commands to enter and to exit Command Mode and to change the 'Hot Key' sequence:

Function	Keyboard Command
Enter Command Mode (default)	2x <Right Shift> (or 'Hot Key')
Exit Command Mode	<Esc>
Change 'Hot Key' sequence	<current 'Hot Key'> + <c>, <new 'Hot Key' code>, <Enter> Until 2011-30-09: <Left Ctrl> + <Left Shift> + <c>, <'Hot Key' Code>, <Enter>



<Key> + <Key>	Press keys simultaneously
<Key>, <Key>	Press keys successively
2x <Key>	Press key quickly, twice in a row (similar to a mouse double-click)

The 'Hot Key' sequence to enter Command Mode can be changed. The following table lists the 'Hot Key' Codes for the available key sequences:

'Hot Key' Code	'Hot Key'
1	<Left Ctrl> + <Left Shift> + <i>
2	2x <Scroll>
3	2x <Left Shift>
4	2x <Left Ctrl>
5	2x <Left Alt>
6	2x <Right Shift>

Draco major

'Hot Key' Code	'Hot Key'
7	2x <Right Ctrl>
8	2x <Right Alt>



In a KVM matrix configuration, choose different 'Hot Keys' for the KVM extender and the Draco U-Switch.

5.2 Control of the Draco major

5.2.1 Control via OSD



Via On-Screen-Display (OSD) you can do all of the settings for the Draco major operating system from every single console. The settings are described in the submenu **Configuration**. All the other submenus are described in later chapters.

Entering OSD

1. Open Command Mode with the 'Hot Key' (see Chapter 5.1, Page 49).
2. Press <O> to open OSD. The menu **KVM-List** is opened as a start menu.
3. Press <Esc> to enter the main menu.



If the option **Listview** is not active, **KVM Switch** view will be shown.

Leaving OSD

- ➔ Press keys <Shift> + <Esc>.

OSD will be closed without any further change and the currently selected CPU connection will be established.

General layout of the OSD screen



Example Main Menu

The general layout of the OSD is structured into three areas:

- Upper status area (topmost two text lines)
- Working area
- Lower status area (lowermost two text lines)

Keyboard control in the OSD

You can navigate within the various screens with the following keys and key combinations:

Function	Keyboard Command
Left cursor - only within an input field or a switching screen	<Cursor Left>
Right Cursor - only within an input field or a switching screen	<Cursor Right>
• In input fields: Line up (with wrap around) • In menus: Line up (without wrap around)	<Cursor Up>

Function	Keyboard Command
- In input fields: Line down (with wrap around) - In menus: Line down (without wrap around)	<Cursor Down>
Previous page in input masks or status screens with several pages	<Page Up>
Next page in input masks or status screens with several pages	<Page Down>
Next field in input masks	<Tab>
Previous field in input masks	<Left Shift> + <Tab>
Next option in selection fields	<+>
Previous option in selection fields	<->
(On/Off and No/Yes). Only if Allow Sharing is active: Switching and data transfer by save function in the menu KVM-Switch screen Switching between selection fields in selection screens with two conditions, e. g. between On / Off or between Y (Yes) / N (No) If Allow Sharing is active: Data is additionally saved in the menu KVM-Switch.	<Space>
- In menus with input fields: Save data - In menus: Select menu item	<Enter>
- In input fields: Cancel data input without saving - In selection fields: Return to menu	<Esc>

Menu options in the OSD

The following functions are available:

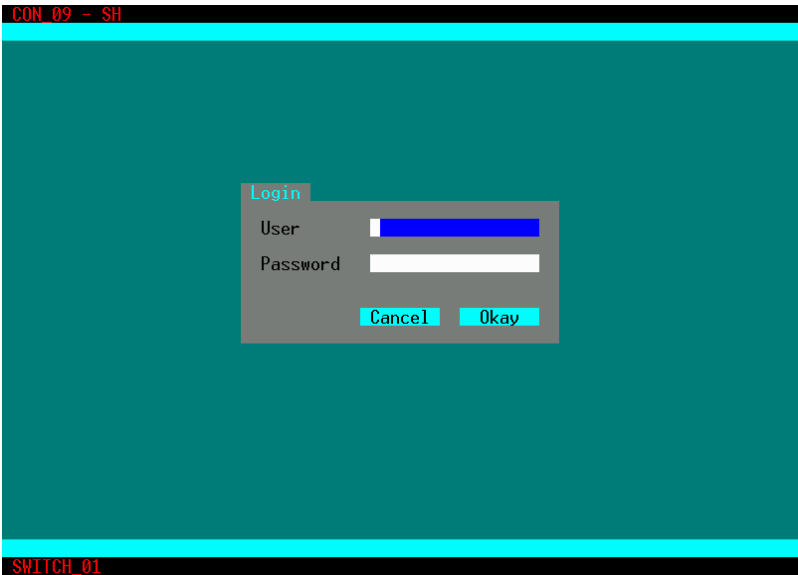
Button	Function
All	Selection of all options
None	Deselection of all options
Cancel	Abort data transfer without saving
Save	Data transfer with saving



All and **None** have to be confirmed with **Save** or rejected with **Cancel**.

Password request in the OSD

You have to login with administrator rights to set configurations.



Menu *Login*

You have to login with administrator rights to be able to do configuration settings. By default, a user with administrator rights is predefined:

Login	Password
User	admin
Password	admin (until 2009-10-20: draco)



This user should be supplied with an own password as fast as possible (see Chapter 5.4.1, Page 84).

5.2.2 Control via Java Tool



Requirements

If you want to use the Java Tool, the following requirements have to be fulfilled:

- Computer with an executable Java tool and an installed Java Runtime Environment (JRE)
- Available network connection between the computer and the matrix
- Appropriate matrix configuration
- Available connection between the Java tool and the matrix

Installation of the Java Tool

The Java-Tool is available in the form of a single executable program file that does not require a separate installation.

➔ Copy the tool after receiving the file to a directory on your computer.



If you do not have a Java tool, contact your dealer.

Computer Connection to the Matrix



For the connection between computer and matrix, a crossed network cable is required.

➔ Connect the network cable with the appropriate RJ45 connectors of both devices.

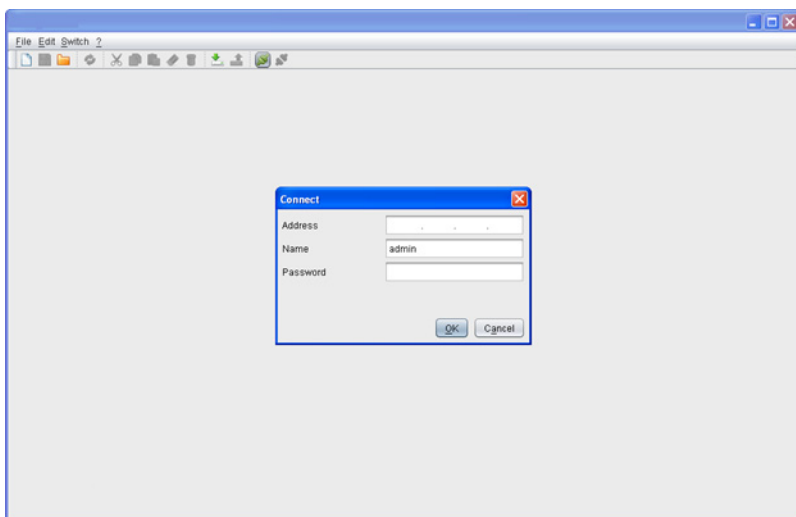
Start of the Java Tool

➔ Open the Java tool by a double click on the program file or use the key <Enter> of the keyboard.

Connection to the Matrix

1. Open the Java tool.
2. Select **Switch > Connect** in the menu bar.

3. Enter the IP address in the appearing input field according to the network configuration of the Draco major (see Chapter 5.3.4, Page 79). In addition to that the user name and password according to the predefined user properties of the Draco major is requested (see Chapter 5.4.1, Page 84).
4. Confirm your inputs with the button **OK** or reject with **Cancel**.

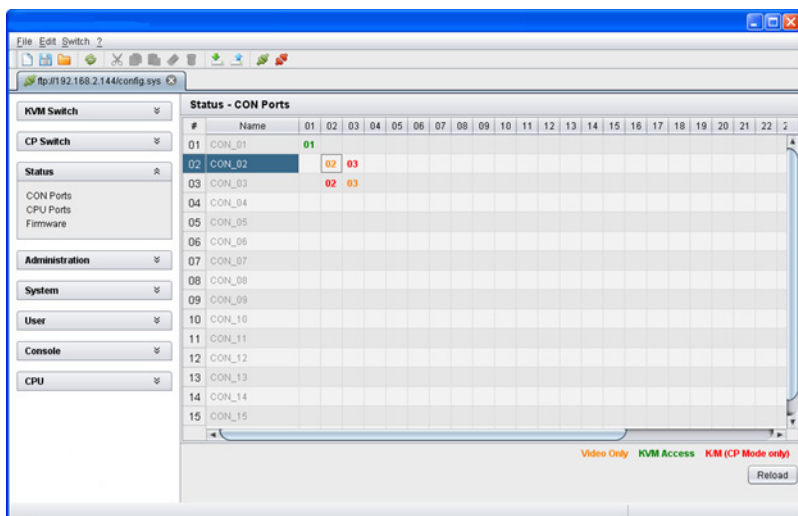


View **Connect**



Up to eight connections between the matrix and the Java tool can be established at the same time due to a limitation of available sockets.

Menu structure



Example View

The menu structure of the Java tool is subdivided into various sections:

- Menu bar (top line)
- Toolbar (second line)
- Tab bar (third line)
- Task area (left menu section)
- Working area (right menu section)

Operating Instructions

The operation of the Java tool is intuitive and corresponds to the user interface of common operating systems.

The Java tool contains its own support function.

In the User Manual of the Draco major is only described, how to find and open the appropriate menus in the Java tool. For further operations use the Java tool support function.

The integrated help texts in the working area of the Java tool can be activated or deactivated by the checkbox in the right upper corner.

Mouse Control

You can select between the following mouse commands:

Function	Mouse Command
Select menu, marking	Left mouse button
Open function specific selection field	Double click left mouse button
Open context specific selection field	Right mouse button

Keyboard Control

You can select between the following keyboard commands:

Function	Keyboard Command
Cursor to the left	<Cursor Left>
Cursor to the right	<Cursor Right>
Line up	<Cursor Up>
Line down	<Cursor Down>
Previous page in input or status menus with more than one page	<Page Up>
Next page in input or status menus with more than one page	<Page Down>
Next field in input menus	<Tab>
Previous field in input menus	<Left Shift> + <Tab>
Switching in selection fields between two conditions (checkmark or not). Opening of already marked fields with editing or selecting possibility.	<Space>
Data saving in menus. Menu item selection – in menus	<Enter>
- Exit from tables - Switching from tables into the next field	<Ctrl> + <Tab>
- Exit from tables - Switching from tables into the previous field	<Ctrl> + <Left Shift> + <Tab>



Various functions within the menus in the menu bar can be done with the provided keyboard commands (e. g. press <Ctrl> + <s> to execute **Save**) that are listed to the right of the respective menu item.

Context Function

The Java tool is equipped with several context functions that support a user friendly and effective operation of the tool. The context functions are described in the appropriate chapters.

- ➔ To execute a context function, use the right mouse button on the corresponding field and select the desired function.

Sorting Function

The lists and tables in the Java tool are equipped with a sorting function that allows a fast and smooth search inside.

1. To do an ascending sort, use the left mouse button once to click on the header of the column that has to be sorted. The sort is displayed by an arrow that points upwards.
2. To do a descending sort, use the left mouse button twice to click on the header of the column that has to be sorted. The sort is displayed by an arrow that points downwards.
3. To remove the sort, use the left mouse button once or twice to click on the header of the column that is sorted until the displayed arrow will disappear.

Filter Function

The lists and tables in the Java tool are equipped with a filter function that allows a fast and smooth search inside.

1. To activate a filter, use the right mouse button to click on the header of the column that has to be filtered and select **Set Filter**.
2. Write directly the word or part of a word that has to be filtered into the header. The filter results are shown immediately.
3. To delete a filter, use the right mouse button to click on the header of the column that has to be filtered and select **Clear Filter**.



The filter function is based on the functional principle of common web search engines.

Configuration in the Java Tool

Configurations and system settings via Java tool can only be done in offline mode without a direct connection between matrix and Java tool.

To activate a created configuration in the matrix, proceed as follows:

1. Select **File > Upload to** in the menu bar. Enter the IP address of the matrix (see Chapter 5.3.4, Page 79) and the name and password of the user identification and select the storage location of the new configuration (**default** or **config01-08**) in the menu **Select Configuration**.
2. Select **Switch > Connect** in the menu bar and enter the IP address of the matrix and the name and password of the user identification ein.
3. Select **Administration > Activate Configuration** in the task area and select the storage location that has been selected in point 1.
4. Use the button **Activate** to load the selected configuration in the matrix. The connection and the open tab will be closed and the matrix will be restarted.



During the activation of a configuration, the matrix is temporarily not available.

Configuration File

The Java tool is equipped with an additional configuration file (**defaults.cfg**) by default. This file allows the user to set various configuration parameters of the Java tool.

The file can be opened and edited by standard text editor programs,

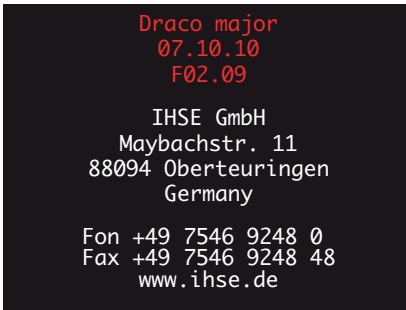
The following configuration parameters can be edited:

Parameter	Description
IP	Default IP address of the matrix required for connection
user	Default user name required for connection
sys.dir	Default directory for configuration files
upd.dir	Default directory for update files
dfw.dir	Default directory for the firmware status
dmx.dir	Default directory for the switching matrix
safemode	true: safemode activated false: safemode deactivated

5.2.3 Control via LCD Display

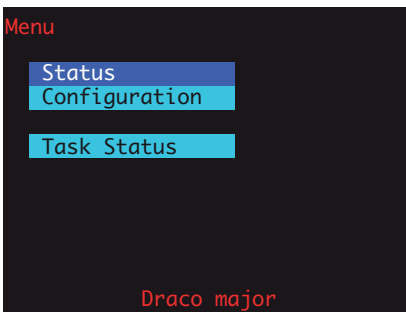


In normal operation of the LCD displays the 'Home' screen is shown. In this view you can find various device information:



Start Menu

- ➔ Press the key <Enter> on the infrared remote control to get from the 'Home' screen into the main menu.

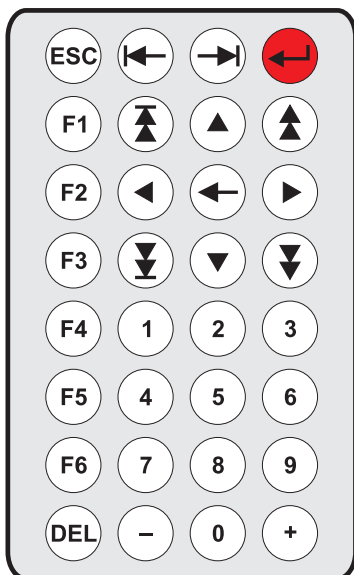


Menu Main Menu

- ➔ Navigate with the cursor keys and press the key <Enter> (red) to get to the respective submenu.

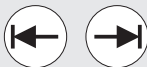
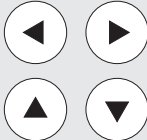
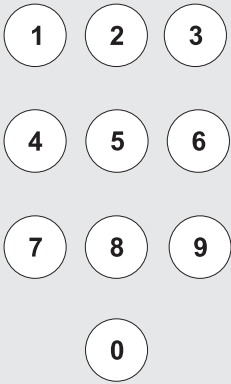
Infrared Remote Control

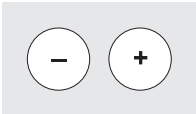
The LCD display at the Draco major can be controlled by an infrared remote control.



The following keys are applicable for the use with the LCD display:

Key	Description
	Open OSD and select menu.
	Open OSD and select menu.
	- Leave current menu and go back to the previous menu level. - Exit OSD.

Key	Description
	Delete contents in the input field.
	Switch between two input fields.
	Navigate to the beginning or the end of an input field.
	Scroll page by page in multilateral menu items.
	- Navigate within the menu level. - Navigate within the input field.
	Set parameters directly by the keypad.

Key	Description
	Select between different possibilities in the selection field.

5.2.4 Control via Serial Interface



The Draco major comes with widespread functions for an operation via serial interface (see Chapter 7.4, Page 152). There are telegrams for Switching single or all connections available, both unidirectional and bidirectional. In addition to that, there are telegrams for an overall definition of the total switching status and for saving and loading such switching states.

The functionality is consistent with the switching in the **Crosspoint Mode** of the OSD (see Chapter 6.3, Page 132).

By request, the Draco major optionally provides an echo of all effected switching operations via serial interface or network interface. That is why you have the possibility to track the actual configurations of the matrix at any time and so update your own applications.

5.3 System Settings

5.3.1 System

You can configure the parameters for the system configuration in this menu.

You have the following possibilities to access the menu:



You can only set a selection of system parameters in the LCD display, in contrast to the OSD.

You can select between the following settings:

Field	Selection	Description
Name	Text	Insert a name of the configuration in which the current settings should have to be saved (default: Name).
Device	Text	Insert the name of the matrix that is shown in the lower left corner of all menus (default: SWITCH_01).
Info	Text	Additional text field for the description of the configuration (default: Factory settings).
Sub Matrix	Y (Yes)	Configuration and remote control of the sub matrix according to the settings of the main matrix. No local configuration opportunity available. Note: If the matrix is defined as a sub matrix, the user automatically loses control in the OSD. Control can be gained again, if you open the OSD of the defined sub matrix again by using the 'Hot Key' command <Shift>, <Shift>, <S>, <O>.
	N (No)	Function not active (default)
Load Default	Y (Yes)	Starting the matrix after restart or a switch-on with the default configuration.
	N (No)	Start the matrix after a restart or a switch-on with the last saved configuration (default).

Field	Selection	Description
Auto Save	Y (Yes)	Save the current configuration of the matrix in the flash memory periodically.
	N (No)	Function not active (default)
Enable COM Echo	Y (Yes)	Send echoes of all switching commands done by the matrix.
	N (No)	Function not active (default)
Lock COM Ports	Y (Yes)	Reject commands via external interfaces (RJ45, RS232) during OSD is open.
	N (No)	Function not active (default)
Baud rate kBaud	Numerical value	Select a predefined Baud rate for the serial control (default: 115.2 kBaud).
Slave Matrix	Y (Yes)	Synchronize the slave matrix according to the settings of the master matrix.
	N (No)	Function not active (default)
Master IP Address	Numerical value	Set the network address of the master matrix (default: 0.0.0.0).

OSD

➔ Select **Configuration > System** in the main menu.

CON 09 - SH - admin
Configuration - System F1:Touch ESC

System

Name : Standard Device : SWITCH_01
Info : Factory settings

Sub Matrix	: N	Load Default	: N	Auto Save	: N
Enable COM Echo	: N	Lock COM Ports	: N	Baudrate	kBaud : 115.2
Slave Matrix	: N	Master Address	: 0		.0 .0 .0

Display

Enable Login	: N	User Matrix	: N	CON Matrix	: N
Auto Disconnect	: N	OSD Timeout sec	: 0	Auto Logout min	: 0

SWITCH

File Sharing	: N	Force Connect	: N	Force Disconnect	: N
KVM Inverse	: <u>Y</u>	KVM Auto Close	: <u>Y</u>		
Auto Connect	: N	CON Timeout min	: 0		
Keyboard Connect	: N	Mouse Connect	: N	Release Time sec	: 10

Mouse/Keyboard

Hor. Speed 1/x	: 4	Ver. Speed 1/x	: 5	Double Click ms	: 200
Keyboard Layout	: English (US)	Single Click	: N		

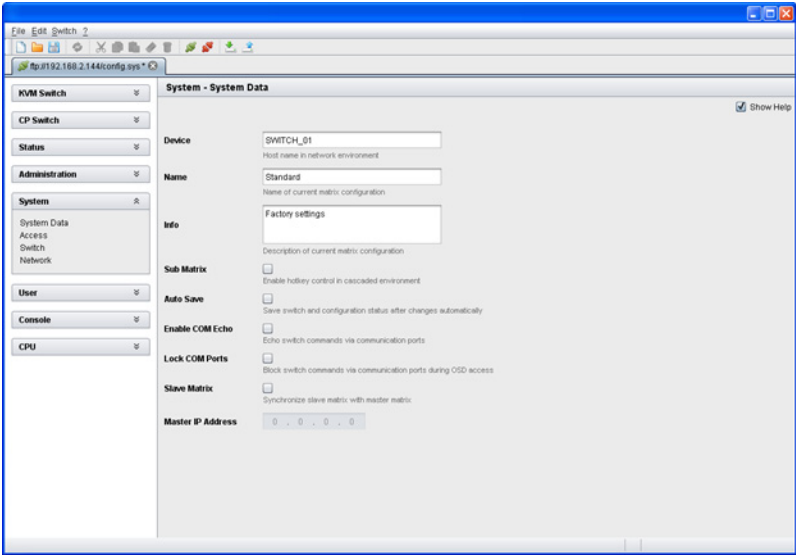
Cancel Save

SWITCH_01

Menu Configuration – System

Java Tool

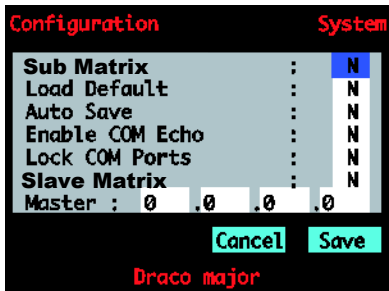
➔ Select **System > System Data** in the task area.



Menu **System – System Data**

LCD Display

➔ Select **Configuration > System** in the main menu.



Menu **Configuration – System**

5.3.2 Access

You can configure the parameters for the access configuration in this menu.

You have the following possibilities to access the menu:



You can select between the following settings:

Field	Selection	Description
Enable Login	Y (Yes)	The user has to login with an user name and a password once to enter OSD. Thereafter the user remains logged in until he explicitly logs out or an Auto Logout is done.
	N (No)	Function not active (default)
User Matrix	Y (Yes)	The user can only switch to CPU ports that are unlocked for him in the User Matrix. KVM switching with 'Hot Key' commands is only possible if the user is logged in.
	N (No)	Function not active (default)
CON Matrix	Y (Yes)	The user can only switch from his console to CPU ports that are unlocked in the menu CON Matrix (see Chapter 5.5.2, Page 93).
	N (No)	Function not active (default)
Auto Disconnect	Y (Yes)	If you open the OSD, the console will be automatically disconnected from the current CPU. Only effective with Enable Login or User Matrix . Note: Only keyboard/mouse connections will be disconnected, video connections will be preserved.
	N (No)	Function not active (default)

Field	Selection	Description
OSD Timeout	Seconds	Period of inactivity after OSD will be closed automatically. If you select 0 seconds, there will be no timeout (default: 0 seconds). Note: The timer is inactive during OSD is open.
Auto Logout	Minutes	Period of inactivity after a user is automatically logged out from the OSD at this console (default: 0 minutes).

OSD

➔ Select **Configuration > System** in the main menu.

CON 09 - SH - admin
Configuration - System F1:Touch ESC

System

Name : Standard Device : SWITCH_01
Info : Factory settings

Sub Matrix : N Load Default : N Auto Save : N
Enable COM Echo : N Lock COM Ports : N Baudrate : 115.2
Slave Matrix : N Master Address : 0 0 0 0

Access

Enable Login : N User Matrix : N CON Matrix : N
Auto Disconnect : N OSD Timeout sec : 0 Auto Logout min : 0

Switch

Allow Sharing : N Force Connect : N Force Disconnect : N
KVM Listview : Y KVM Auto Close : Y
Auto Connect : N COM Timeout min : 0
Keyboard Connect : N Mouse Connect : N Release Time sec : 10

Mouse/Keyboard

Hor. Speed 1/x : 4 Ver. Speed 1/x : 5 Double Click ms : 200
Keyboard Layout : English (US) Single Click : N

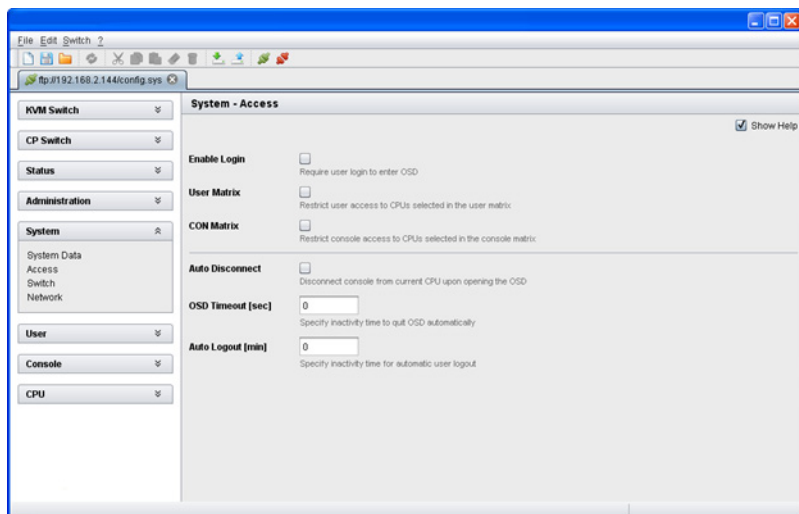
Cancel Save

SWITCH 01

Menu Configuration – System

Java Tool

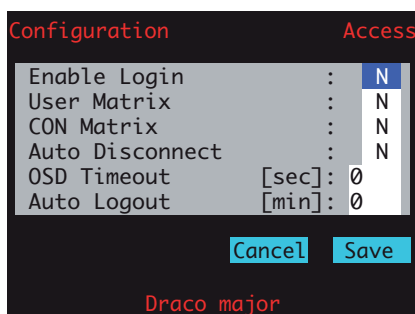
➔ Select **System > Access** in the task area.



Menu **System – Access**

LCD Display

➔ Select **Configuration > Access** in the main menu.



Menu **Configuration – Access**

5.3.3 Switch

You can configure the parameters for the matrix configuration in this menu.

You have the following possibilities to access the menu:



You can select between the following settings:

Field	Selection	Description
Allow Sharing	Y (Yes)	The user can switch the video signal from any CPU to his monitor (observer). Keyboard/mouse control is not possible. Note: Switching with the key <Space> and not <Enter>. The operator will not be informed if further users connect as an observer to the CPU that is connected to his console.
	N (No)	Function not active (default)
Force Connect	Y (Yes)	The User can connect to every single CPU as an operator, even to such ones that are related to another user. The previous user is set to observer status. Note: To share K/M control Force Connect has to be activated.
	N (No)	Function not active (default)
Force Disconnect	Y (Yes)	Extension of 'Force Connect': If the user connects to a CPU as an operator that is already related to another user, the connection to the previous user will be completely disconnected. Note: To share K/M control Force Disconnect has to be deactivated.
	N (No)	Function not active (default)

Field	Selection	Description
KVM Listview	Y (Yes)	After opening the OSD, the user attains to the mask KVM List . This list only contains the CPU ports available at this console (default).
	N (No)	Function not active. After opening the OSD, the user attains to the extended switching mask KVM-Switch .
KVM Auto Close	Y (Yes)	After switching of the CPU port in the masks KVM-List or KVM-Switch , OSD will be automatically left and the connection to the new CPU will be displayed (default).
	N (No)	Function not active
Auto Connect	Y (Yes)	After pressing any key a KVM connection to the first available CPU will be established. Note: The option Auto Connect is only functional, if there is no active connection to a CPU yet.
	N (No)	Function not active (default)
CON Timeout	Minutes	Period of inactivity until the connection of the own console to the connected CPU will be automatically disconnected (default: 0 minutes).
Keyboard Connect	Y (Yes)	Activate request of keyboard control between two consoles.
	N (No)	Function not active (default)
Mouse Connect	Y (Yes)	Activate request of mouse control between two consoles.
	N (No)	Function not active (default)
Release Time	Seconds	Period of inactivity of a connected console until keyboard and mouse control can be requested for further consoles that are connected to the same CPU (default: 10 seconds) Note: Set value '0' for a delay less transfer in real-time. Only one console can have keyboard and mouse control at the same time. The other consoles that are connected to the same CPU have a video only status.

OSD

➔ Select **Configuration > System** in the main menu.

CON 09 - SH - admin
Configuration - System F1:Touch ESC

Online

Name : Standard Device : SWITCH_01
Info : Factory settings

Sub Matrix	N	Load Default	N	Auto Save	N
Enable COM Echo	N	Lock COM Port	N	Baudrate	115.2
Slave Matrix	N	Master Address	0	0	0

Access

Enable Login	N	User Matrix	N	COM Matrix	N
Data Disconnect	N	OSD Timeout sec	0	Auto Logout min	0

Switch

Allow Sharing	N	Force Connect	N	Force Disconnect	N
KVM Listview	Y	KVM Auto Close	Y		
Auto Connect	N	CON Timeout min	0		
Keyboard Connect	N	Mouse Connect	N	Release Time sec	10

Mouse/Keyboard

Hor. Speed 1/x	4	Var. Speed 1/x	5	Double Click ms	200
Keyboard layout	English (US)			Single Click	N

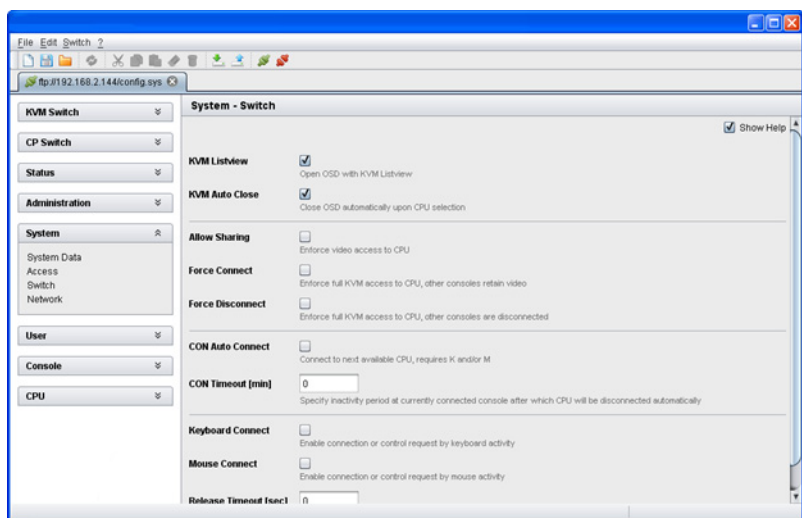
Cancel Save

SWITCH_01

Menu **Configuration – System**

Java Tool

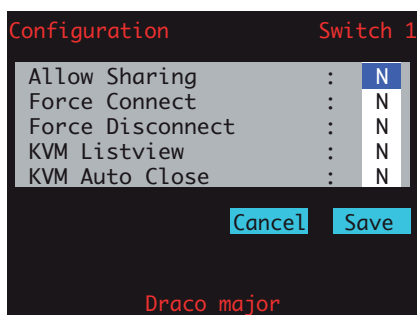
➔ Select **System > Switch** in the task area.



Menu System – Switch

LCD Display

➔ Select **Configuration > Switch 1** or **Configuration > Switch 2** in the main menu.



Menu Configuration – Switch 1

ConfigurationSwitch 2

Auto Connect	:	☒ N
CON Timeout	[min]:	0
Keyboard Connect	:	☐ N
Mouse Connect	:	☐ N
Release Time	[sec]:	0

Draco major

Menu Configuration – Switch 2

5.3.4 Network

You can configure the network parameters in this menu.

You have the following possibilities to access the menu:



You can select between the following settings:

Field	Selection	Description
DHCP	Y (Yes)	Selection whether network settings are supplied automatically
	N (No)	Function not active (default)
IP Address	Byte	Input of the IP address in the form '192.168.1.1' in combination with an operation without DHCP
Subnet Mask	Byte	Input of the subnet mask in the form '255.255.255.0' in combination with an operation without DHCP
Gateway	Byte	Input of the subnet mask in the form '192.168.1.1' in combination with an operation without DHCP.



Only modify the network parameters in consultation with your system administrator. Otherwise unexpected results and failures can occur in combination with the network.

OSD

➔ Select **Configuration > Network** in the main menu.

CON_09 - SH - admin

Configuration - Network

ESC

Interface

DHCP : N

IP Address : 192 168 2 11

Subnet Mask : 255 255 255 0

Gateway : 192 168 2 12

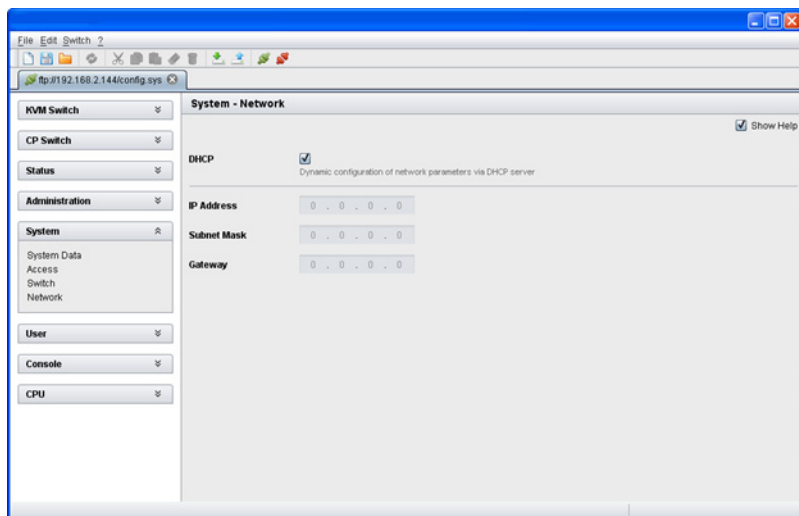
Cancel Save

SWITCH_01

Menu **Configuration – Network**

Java Tool

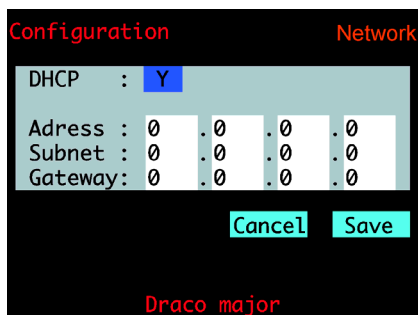
➔ Select **System > Network** in the task area..



*Menu **System – Network***

LCD Display

➔ Select **Configuration > Network** in the main menu.



*Menu **Configuration – Network***

5.3.5 Date and Time

You can configure date and time in this menu.

You have the following possibilities to access the menu.



You can select between the following settings:

Field	Selection	Description
Month	1 -12	Select month
Date	1 – 31	Select date
Year	1 – 99	Select year
Day of the week	1 – 7	Select day of the week
Hours	0 – 23	Select hour
Minutes	0 – 59	Select minute
Seconds	0 – 59	Select second



The date input should be done accordingly to the English notation with the prefixed month notation.

OSD

→ Select **Configuration > Date + Time** in the main menu.

CON 01 - SH - admin
Configuration - Date+Time ESC

Date

Enter the date with format MM/DD/YY
MM = month (1..12) DD = day (1..31) YY = year (0..99) 4/23/10

Enter the day of the week
1 = Monday 2 = Tuesday ... 7 = Sunday 5

Time

Enter the time with format hh:mm:ss
hh = hours (0..23) mm = minutes (0..59)
ss = seconds (0..59) 7:46:37

Cancel Save

SWITCH_01

Menu Configuration – Date + Time

LCD Display

→ Select **Configuration > Date + Time** in the main menu.

Configuration Date+Time

Month	(1-12):	1
Date	(1-31):	24
Year	(1-99):	11
Day of the week	(1-7):	1
Hours	(0-23):	15
Minutes	(0-59):	16
Seconds	(0-59):	3

Cancel Save

Draco major

Menu Configuration – Date + Time

5.4 User Settings

5.4.1 User Properties

You can configure the various user properties and add new users in this menu.

You have the following possibilities to access the menu:



You can select between the following settings:

Field	Selection	Description
Name	Text	User name (case sensitivity)
Password	Text	User password (case sensitivity)
HTTP	Y (Yes)	User is allowed to login and access via HTTP.
	N (No)	Function not active
FTP	Y (Yes)	User is allowed to login and access via FTP.
	N (No)	Function not active
PPP	Y (Yes)	User is allowed to login and access via Internet (currently not realized).
	N (No)	Function not active
TEL	Y (Yes)	User is allowed to login and access via Telnet.
	N (No)	Function not active
POW	Y (Yes)	User is 'Power-User' and is allowed to open crosspoint mode.
	N (No)	Function not active
ADM	Y (Yes)	User is Administrator and is allowed to do all configurations and settings at the matrix.
	N (No)	Function not active

OSD

→ Select **Configuration > User** in the main menu.

CON 09 - SH - admin
Configuration - User ESC

User

	Name	Password	HTP	FTP	PPP	TEL	POW	ADM
01	admin	admin	Y	Y	Y	Y	Y	Y
02	power	power	N	N	N	N	Y	N
03	user	user	N	N	N	N	N	N
04			N	N	N	N	N	N
05			N	N	N	N	N	N
06			N	N	N	N	N	N
07			N	N	N	N	N	N
08			N	N	N	N	N	N

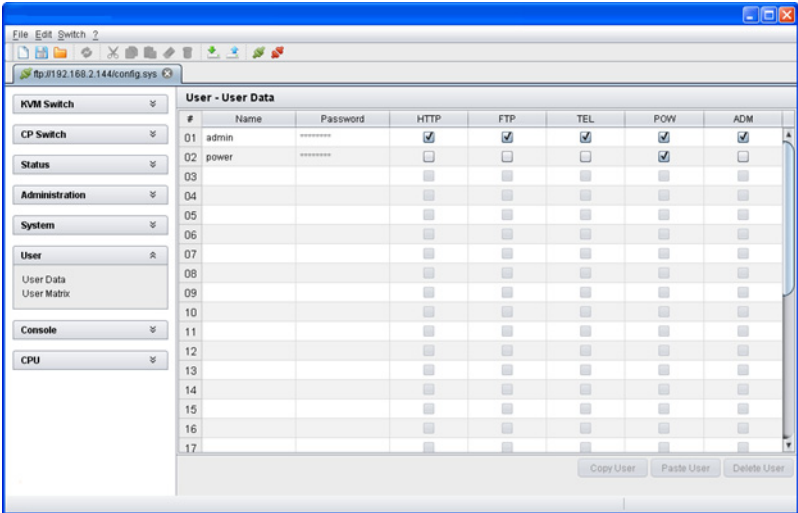
Cancel Save

SWITCH_01

Menu **Configuration - User**

Java Tool

➔ Select **User > User Data** in the task area.



Menu User – User Data

You can select between the following buttons:

Button	Function
Copy User	Copy marked user to clipboard
Paste User	Paste user from clipboard
Delete User	Delete selected user

5.4.2 User Matrix

In this menu you can unlock a specific selection of CPU ports for every single user.

You have the following possibilities to access the menu:

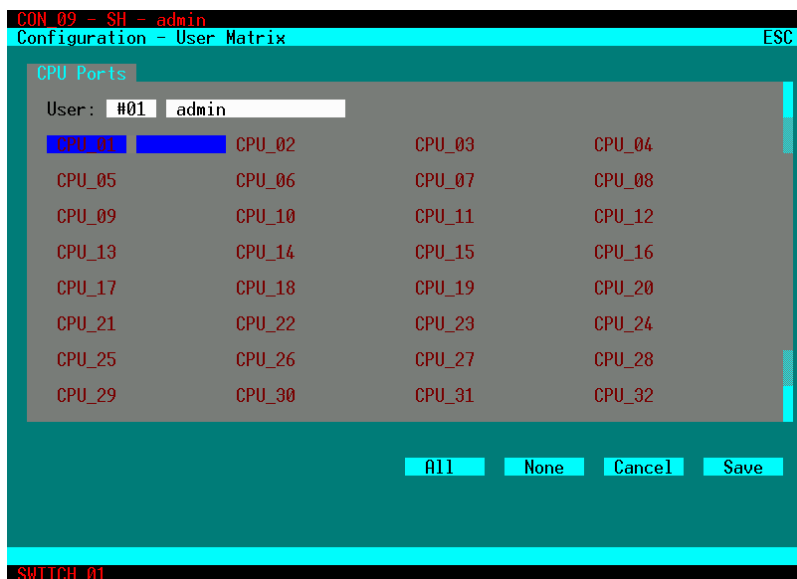


The use of the User Matrix can be activated in the system settings (see Chapter 5.3.1, Page 67). If the option **User Matrix** is active, all switching operations require a logged in user at the console. Also switching by keyboard 'Hot Keys' needs a prior login

OSD

➔ Select **Configuration > User Matrix** in the main menu.

Unlocked ports are marked in green; all the other ports are marked in red.



Menu **Configuration – User Matrix**

You can select between the following buttons:

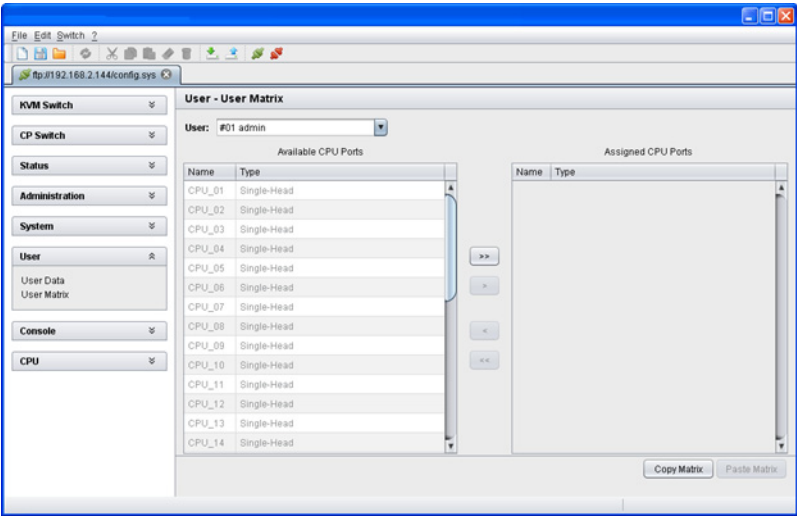
Button	Function
All	Selection of all CPUs
None	Deselection of all CPUs
Cancel	Abort data transfer without saving
Save	Data transfer with saving



The options **All** and **None** have to be confirmed with **Save** or rejected with **Cancel**.

Java Tool

➔ Select **User > User Matrix** in the task area.



Menu **User – User Matrix**

You can select between the following buttons:

Button	Function
Copy Matrix	Copy User Matrix of the selected user to clipboard
Paste Matrix	Paste User Matrix from clipboard

5.5 Console Settings

5.5.1 Console Ports (CON Ports)

The name, type, OSD view and the currently related CPU port for every single console are shown and can be configured in this menu.

You have the following possibilities to access the menu:



If you want to configure the console ports, you will have to consider the following notes for a correct selection of the port types:

- Single-Head ports and USB 2.0 ports can be switched individually.
- Dual-Head ports, Quad-Head ports and also Single-Head/USB 2.0 ports are always switched together.
- Only odd ports (#01, 03, 05, etc.) can be configured as Dual-Head ports or Single-Head/USB 2.0 ports.
- Only every fourth port (#01, 05, 09, etc.) can be configured as Quad-Head port or Triple-Head/USB 2.0 port.
- Respectively, only the first CON port can be still switched by 'Hot Keys'. The other ports behave like 'slaves'.
- If you switch to differently configured CPU ports, one or more monitors can remain dark.
- If a user switches from a Quad-Head console to a Single-Head CPU port, the other three monitors will remain dark.
- If a user switches from a Quad-Head console to a Dual-Head CPU port, two of the four monitors will remain dark.
- If a user switches from a '1U' console to a Single-Head CPU port followed by a '0U' CPU port, the USB port will remain active



If a user switches from a 1U console to a Single-Head CPU port followed by a 0U CPU port, the USB port will remain active.



The reconfiguration of a CPU or CON port between DVI/KVM and USB 2.0 functionality requires a backup of the new configuration by the option **Save** and can only be activated by a subsequent restart of the Draco major.

You can select between the following settings:

Field	Selection	Function
Name	Text	Name of the console connected to this port
Type	SH	Single-Head port
	DH	Dual-Head port
	QH	Quad-Head port
	0U	USB-2.0 port
	1U	Single-Head port with USB 2.0 port
	3U	Triple-Head port with USB 2.0 port
OSD	VAR	OSD embedded to current resolution (default)
	OSD display screen filling:	
	800	800x600
	1024	1024x768
	1280	1280x1024
	1600	1600x1200
	1920	1920x1200
CPU	Port number	Number of the CPU that is connected to this console or will be connected after saving

OSD

→ Select **Configuration > CON Ports** in the main menu.

CON 09 - SH - admin
Configuration - CON Ports ESC

CON Ports

Name	Type	OSD	CPU	Name	Type	OSD	CPU
01 CON_01	SH	VAR	9	02 CON_02	SH	VAR	5
03 CON_03	SH	VAR	4	04 CON_04	SH	VAR	13
05 CON_05	SH	VAR	0	06 CON_06	SH	VAR	0
07 CON_07	SH	VAR	0	08 CON_08	SH	VAR	0
09 CON_09	SH	VAR	0	10 CON_10	SH	VAR	2
11 CON_11	SH	VAR	0	12 CON_12	SH	VAR	0
13 CON_13	SH	VAR	0	14 CON_14	SH	VAR	0
15 CON_15	SH	VAR	0	16 CON_16	SH	VAR	0

Cancel Save

SWITCH_01

Menu **Configuration – CON Ports**

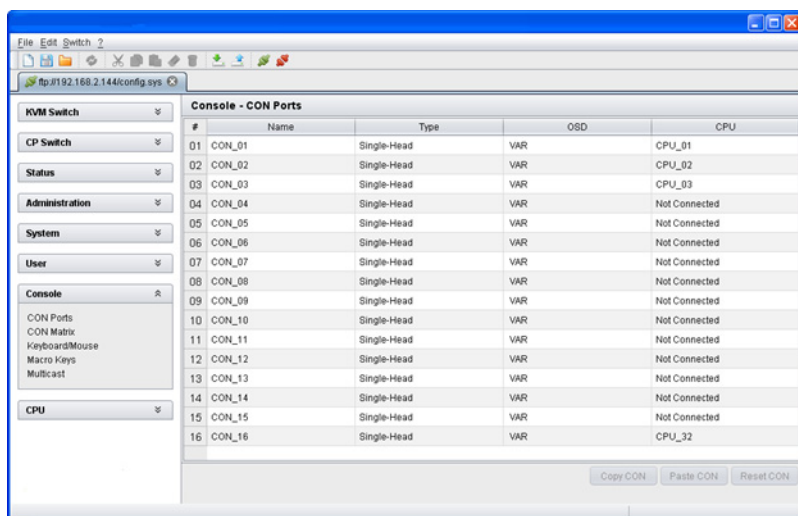


Consider the following notes to configure the OSD:

- If you select **VAR**, the OSD will be embedded in the current screen resolution. If the monitors have different resolutions, the OSD will be displayed in different sizes at the various consoles.
- If you select a constant resolution, the OSD will be displayed in full screen. To this the monitor resolution will be changed. This can lead to a delay regarding video display, both opening and leaving the OSD.

Java Tool

➔ Select **Console > CON Ports** in the task area.



Menu **Console – CON Ports**

You can select between the following buttons:

Button	Function
Copy CON	Copy the settings of the selected console to the clipboard
Paste CON	Paste the console settings from the clipboard
Reset CON	Reset settings of the selected console to default settings

5.5.2 Console Matrix (CON Matrix)

You can unlock a specific selection of CPU ports for every single console in this menu.

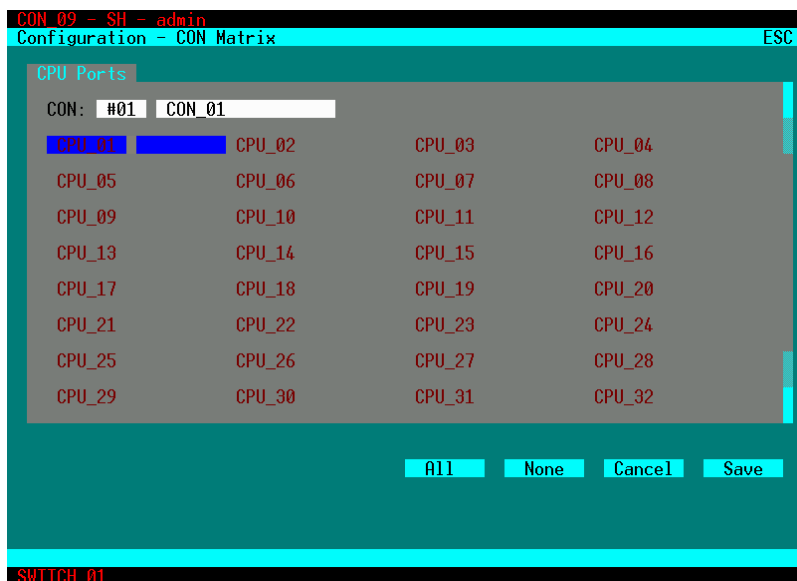
You have the following possibilities to access the menu:



OSD

➔ Select **Configuration > CON Matrix** in the main menu.

Unlocked ports are marked in green; all the other ports are marked in red.



Menu **Configuration – CON Matrix**

You can select between the following buttons:

Button	Function
All	Selection of all CPUs
None	Deselection of all CPUs
Cancel	Abort data transfer without saving

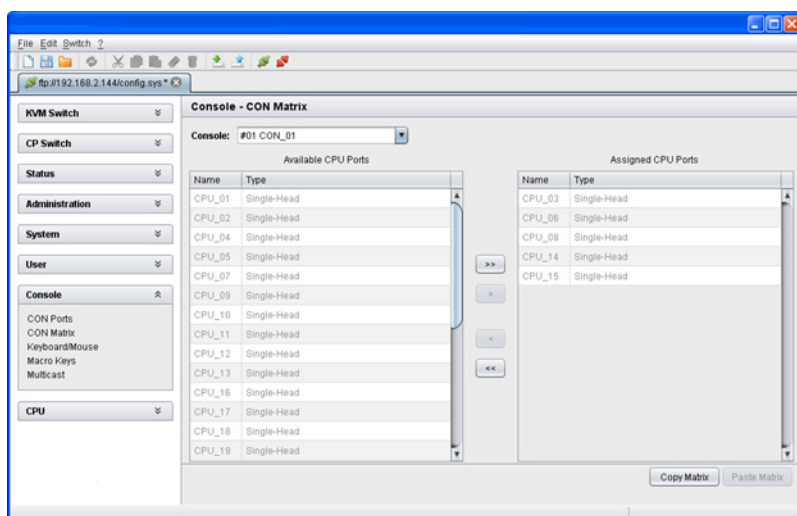
Button	Function
Save	Save data transfer



The options **All** and **None** have to be confirmed with **Save** or rejected with **Cancel**.

Java Tool

➔ Select **Console > CON Matrix** in the task area.



Menu **Console – CON Matrix**

You can select between the following buttons:

Button	Function
Copy Matrix	Copy the settings of the selected console to the clipboard.
Paste Matrix	Paste console settings from the clipboard

5.5.3 Mouse and Keyboard

Mouse and keyboard specific adjustments can be made in this menu.



You can select between the following settings:

Field	Selection	Description
Hor. Speed 1/x	1-9	Adjustment of the horizontal mouse speed (default: 4).
Ver. Speed 1/x	1-9	Adjustment of the vertical mouse speed (default: 5).
Double Click	100-800 Milli-seconds	Adjustment of the time slot for a double click (default: 200 ms)
Keyboard Layout	Region	Set the OSD keyboard layout according to the used keyboard (default: English (US)).
Single Click	Y (Yes)	Execute OSD commands with a single click (relevant with the use of touch screens to control the OSD).
	N (No)	Function not active (default)



The mouse and keyboard settings are console specific and can be separately set for any console.

OSD

➔ Select **Configuration > System** in the main menu.

CON 09 - SH - admin

Configuration - System

F1:Touch ESC

System

Name: Standard

Device: SWITCH_01

Info: Factory settings

Full Matrix: N

Load Default: N

Auto Save: N

Enable COM Echo: N

Lock COM Ports: N

Baudrate xBaud: 115.2

Slave Matrix: N

Master Address: 0

0

0

0

Access

Enable Login: N

User Matrix: N

COM Matrix: N

Auto Disconnect: N

OSD Timeout sec: 0

Auto Logout min: 0

Switch

Allow Sharing: N

Force Connect: N

Force Disconnect: N

KVM Fastview: Y

KVM Auto Close: Y

Auto Connect: N

COM Timeout min: 0

Keyboard Connect: N

Mouse Connect: N

Release Time sec: 10

Mouse/Keyboard

Hor. Speed 1/x: 4

Ver. Speed 1/x: 5

Double Click ms: 200

Keyboard Layout: English (US)

Single Click: N

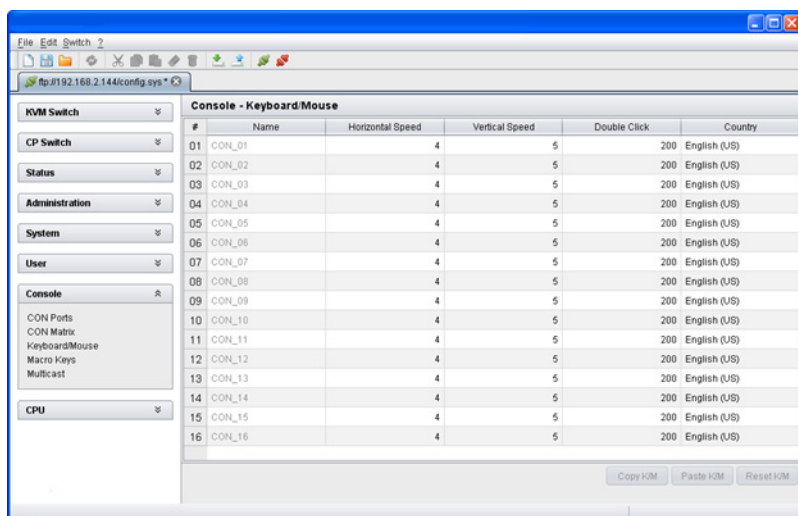
Cancel Save

SWITCH_01

Menu **Configuration – System**

Java Tool

➔ Select **Console > Keyboard/Mouse** in the task area.



Menu Console – Keyboard/Mouse

You can select between the following buttons:

Button	Function
Copy K/M	Copy keyboard/mouse settings of the selected console to clipboard.
Paste K/M	Paste keyboard/mouse settings of the selected console from clipboard.
Reset K/M	Reset mouse/keyboard settings of the selected console to default settings.

5.5.4 Touch Screen

In this menu you can make touch screen specific adjustments. The OSD of the Draco major supports the control by a touch screen.

You have the following possibility to access the menu:



USB-HID based touch screen protocols are supported.
Support of manufacturer specific protocols by request.

➔ Press key <F1>.



Menu Configuration – Touch

In this mask you can do the calibration of your touch screen for every single console. For this purpose you are required to click at least two times at a point at the top left and at the bottom right. After that you will have the opportunity to check the calibration, to save it or to abort it.

The calibration has to be done for every single touch screen at any console.

The control by touch screen corresponds to the mouse control as far as possible. For a smoothly control of the OSD by a touch screen, the activation of the mouse/keyboard setting **Single Click** in the OSD is recommended (see Chapter 5.5.3, Page 95).

5.5.5 Macro Keys

The programming of the macro commands for switching can be done in this menu.

You have the following possibilities to access the menu.



The macros are separately deposited for each console. For the use of the macros, you need a macro keyboard from the range of accessories that is connected to one of the USB-HID ports of the appropriate CON unit. Alternatively, the execution of the macros can also be done by 'Hot Key' and the function keys <F1>–<F12>.



If keyboard, mouse and a macro keyboard should be used at the same time, you will have to use an extender with four USB-HID ports or an USB hub.

You can select between the following settings:

Field	Selection	Description
Function (01–08)	Connect P1 to P2	Set bidirectional connection from console P1 to CPU P2
	Connect Video P1 to P2	Set video connection from console P1 to CPU P2
	Disconnect	Disconnect console P1
	Open P1	Open configuration file P1
	Save	Save current configuration to the matrix
	Save As P1	Save current configuration into configuration file no. P1
	Logout	Logout current user
P1	1-16	Number of the console that has to be connected to a CPU Number of the configuration file (default: 0).
P2	1-32	Number of the CPU that has to be connected to the console

OSD

➔ Select **Configuration > Macro Keys** in the main menu.

CON 09 - SH - admin

Configuration - Macro Keys

ESC

Macro

KEY: #01

Function	P1	P2	Function	P1	P2
01 No Function	0	0	02 No Function	0	0
03 No Function	0	0	04 No Function	0	0
05 No Function	0	0	06 No Function	0	0
07 No Function	0	0	08 No Function	0	0

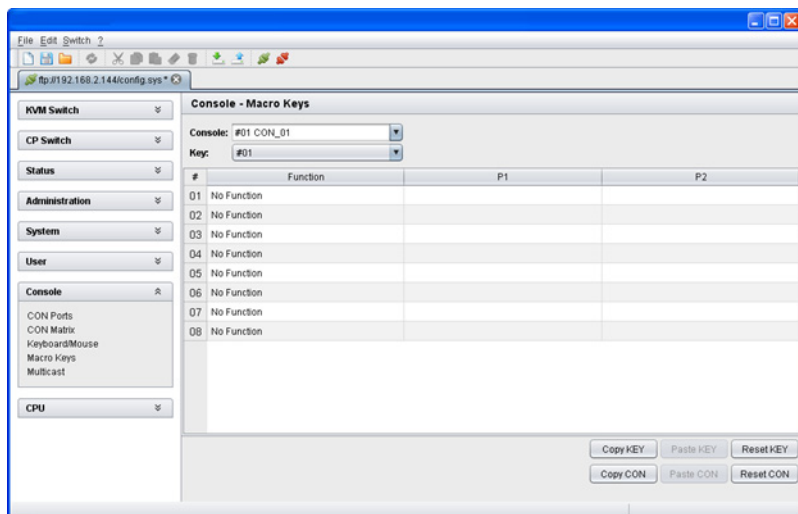
Cancel Save

SWITCH_01

Menu Configuration – Macro Keys

Java Tool

➔ Select **Console > Macro Keys** in the task area.



Menu **Console – Macro Keys**

You can select between the following buttons:

Button	Function
Copy KEY	Copy macro key settings of the selected key into the clipboard
Copy CON	Copy macro key settings of the selected console into the clipboard
Paste KEY	Paste macro key settings of the selected key from the clipboard
Paste CON	Paste macro key settings of the selected console from the clipboard
Reset KEY	Reset macro key settings of the selected key to factory settings
Reset CON	Reset macro key settings of the selected console to factory settings

5.5.6 Multicast (Follow Me)

The function **Follow Me** allows the user to show the own monitor screen to other consoles.

You have the following possibilities to access the menu.



The appropriate consoles are connected to the own CON port. Thereby they lose their keyboard/mouse control and the ability to switch. If you switch to another CPU, the connected consoles will follow.

To ensure an optimal overview, the current switching status is displayed in the menu **Follow Me**.



The consoles that are selected in the menu **Follow Me** will only receive the possibility for control, if the function is explicitly switched off from the single consoles.

OSD

➔ Press key <F2> in the **KVM-List**.



By selecting available CON ports, these consoles can be selected that should be used for the function **Follow Me** function.

The following color combinations are available:

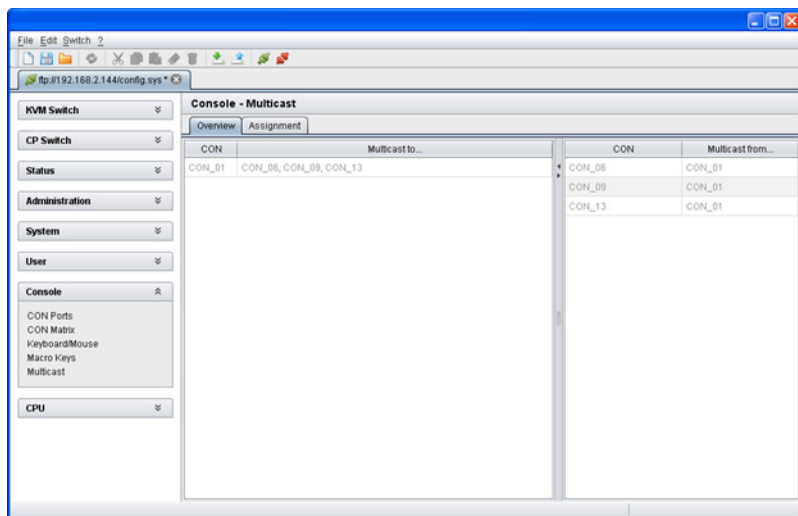
Color CON Port	Color CPU Port	Description
Green	n. c.	Available CON Port
Red	Red	Number of CON port that is connected to the number of the CPU port or to the number of the CON port in the Follow Me mode.
Black	Black	Own CON port connection
Black	n. c.	CON port not available

You can select between the following functions:

Button	Function
Clear all	Unlock all consoles that are connected to the own CON Port.

Java Tool

➔ Select **Console > Multicast** in the task area.



Menu **Console – Multicast**

➔ To make various assignments between consoles, use the tab **Assignment** in the working area.

5.6 CPU Settings

5.6.1 CPU Ports

The name, type and the currently assigned console port are displayed and defined for every single console port in this menu.

You have the following possibilities to access the menu:



Consider the configuration information during configuration (see Chapter 5.5.1, Page 89).

You can select between the following settings:

Field	Selection	Description
Name	Text	Name of the console connected to this port
Type	SH	Single-Head port
	DH	Dual-Head port
	QH	Quad-Head port
	0U	USB 2.0 port
	1U	Single-Head port with USB 2.0 port
	3U	Triple-Head-port with USB 2.0 port
CON	Port number	Number of the console that is connected to this CPU or will be connected after saving (Save)

OSD

→ Select **Configuration > CPU Ports** in the main menu.

CON 09 - SH - admin

Configuration - CPU Ports ESC

CPU Ports

Name	Type	CON	Name	Type	CON
01 CPU_01	SH	0	02 CPU_02	SH	10
03 CPU_03	SH	0	04 CPU_04	SH	0
05 CPU_05	SH	2	06 CPU_06	SH	0
07 CPU_07	SH	0	08 CPU_08	SH	0
09 CPU_09	SH	1	10 CPU_10	SH	3
11 CPU_11	SH	0	12 CPU_12	SH	0
13 CPU_13	SH	4	14 CPU_14	SH	0
15 CPU_15	SH	0	16 CPU_16	SH	0

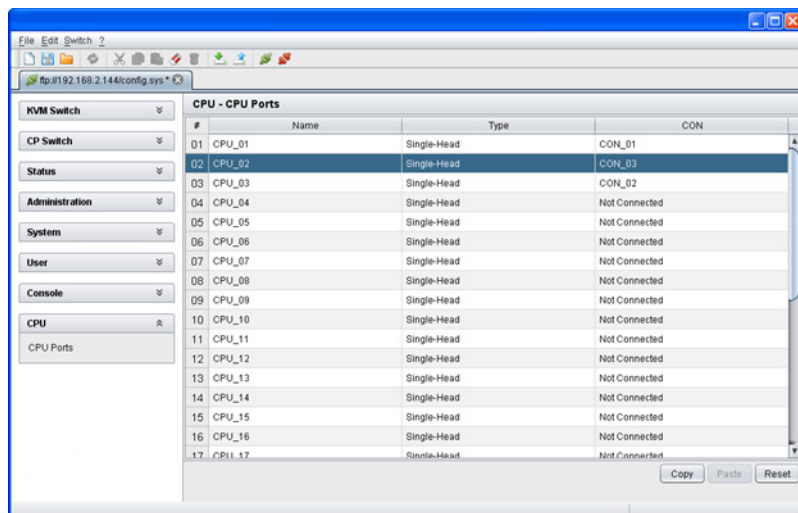
Cancel Save

SWITCH_01

Menu **Configuration – CPU Ports**

Java-Tool

➔ Select **CPU > CPU Ports** in the task area.



Menu CPU – CPU Ports

You can select between the following buttons:

Button	Function
Copy	Copy the settings of the selected CPU to the clipboard.
Paste	Paste CPU settings from the clipboard
Reset	Reset settings of the selected CPU to factory settings

5.7 Saving and Loading of Configurations

5.7.1 Saving of Configurations in the Matrix

You have the following possibility to save the configurations in the matrix:



OSD

➔ Select **Configuration > Save** in the main menu.

By selecting this menu item, the current configuration of the matrix is saved in the matrix memory. As a standard, the last configuration that has been saved in this way will be restored after a restart of the matrix.



These backup needs blocking access to the matrix memory and leads to a freeze of all OSD menus for a few seconds. The switching connections are not affected by this freeze.

By selecting the menu item **Auto Save** in the system settings, an automatic saving of the configuration is done periodically (see Chapter 5.3.1, Page 67).

5.7.2 Saving of Configurations in a File

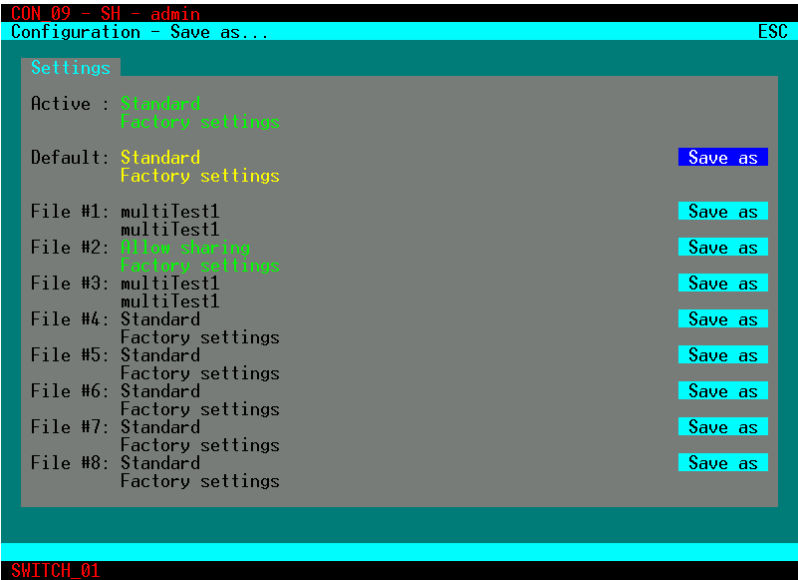
In this menu you can save the current matrix configuration in a file on the matrix. But this does not replace the saving of the configuration in the matrix memory (see Chapter 5.7.1, Page 109).

You have the following possibilities to save the configuration into files:



OSD

➔ Select **Configuration > Save as...** in the main menu.



Menu **Configuration – Save as...**

Field	Description
Active	Name and detailed information of the active configuration Note: This configuration can be saved.

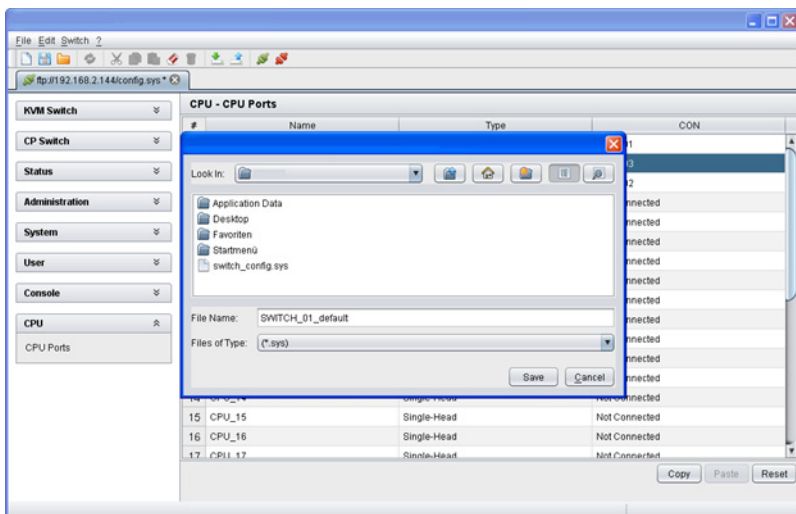
Field	Description
Default	Name and detailed information of the saved configurations Note: These memory positions can be overwritten.
File #1 to File #8	

- ➔ Select the memory location that has to be overwritten with the current configuration.

The current configuration is saved on this memory location and is immediately displayed in the menu. The previous saved configuration is deleted.

Java-Tool

- ➔ Select **File > Save as** in the menu bar.



Menu File – Save as

Serial Interface

Use the following telegram structure:

Telegram	Reply
STX, 0x66, 0x8C, <Config File No>, ETX	ACK

Assignment of a configuration file to telegram:

Configuration file	Telegram
Default.sys	0x80
Config01.sys	0x81
Config02.sys	0x82
Config03.sys	0x83
Config04.sys	0x84
Config05.sys	0x85
Config06.sys	0x86
Config07.sys	0x87
Config08.sys	0x88

5.7.3 Loading of Configurations

You can load previously saved configurations in this menu.

You have the following possibilities to access the menu



The current configuration is shown under **Active**.

Apart from the default configuration, up to eight further configurations can be loaded.

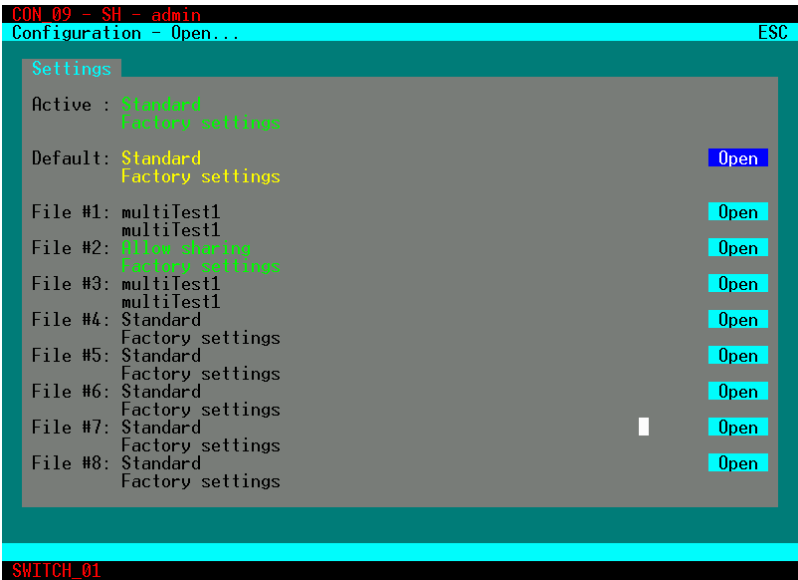
The selection of the configurations for a download can be made between the eight personalizable configurations and the default settings.

The selected configuration is loaded immediately and shown in the menu under **Active**. The previously active configuration is deleted.

You have the following possibilities to load the configurations from files on the Draco major:

OSD

➔ Select **Configuration > Open...** in the main menu.



Menu **Configuration – Open...**

Field	Description
Active	Currently active configuration
Default	Current configuration that is used as default
File #1 – File #8	In the memory locations stored configurations



Up to eight further configurations can be loaded besides the default configuration.

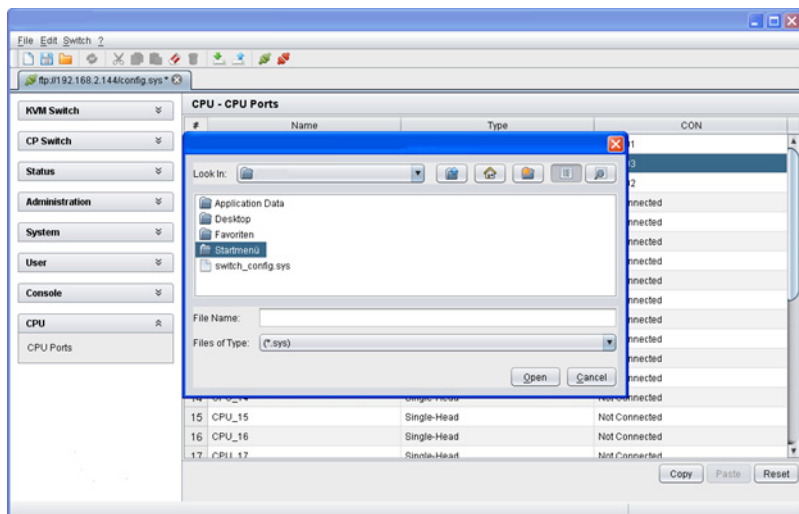
The selection can be made between eight personalizable configurations and the default settings.

➔ Select a configuration.

The selected configuration is loaded immediately and is displayed as **Active** in the menu. The previously active configuration is deleted.

Java-Tool

➔ Select **File > Open** in the menu bar.



Menu **File – Open**

Serial Interface

Use the following telegram structure:

Telegram	Reply
STX, 0x67, 0x8C, <Config File No>, ETX	ACK

Assignment of a configuration file to telegram:

Configuration file	Telegram
Default.sys	0x80
Config01.sys	0x81
Config02.sys	0x82
Config03.sys	0x83
Config04.sys	0x84
Config05.sys	0x85
Config06.sys	0x86
Config07.sys	0x87
Config08.sys	0x88

5.7.4 Saving and Loading of Configurations from FTP

If a matrix is connected to the network and the network interface is configured accordingly (see Chapter 5.3.4, Page 79), the configuration files can be read out via FTP and saved externally. At the same time already externally saved configuration files can be read in via FTP.

To have a FTP access to the configuration files, the Draco major has to be connected to a network and the network interface has to be configured appropriately.

- ➔ Open the file directory with the link
<ftp://user:password@xxx.xxx.xxx.xxx> in the browser.

In this case **user** means the name of the user who is created in the matrix and **password** means the appropriate password for the access. The user must have administrator rights and ftp access rights; **xxx.xxx.xxx.xxx** means the current IP address of the matrix.

You can find the following files in the directory:

File	Description
config.sys	This file includes the reset configuration of the matrices (internal).
default.sys	This file includes the default configuration of the matrix.
config01.sys	Configuration file 1
config02.sys	Configuration file 2
config03.sys	Configuration file 3
config04.sys	Configuration file 4
config05.sys	Configuration file 5
config06.sys	Configuration file 6
config07.sys	Configuration file 7
config08.sys	Configuration file 8
module.sys	This file includes module information of the matrix (internal)



The files **default.sys** and **config01.sys** to **config08.sys** are changable. The file names are predefined; other file names are not supported.

1. Open the directory.
2. Save the required configuration file on an external storage medium.



Note that these configuration files only work with the latest matrix firmware. Compatibility to firmware updates at a later time is possible, but cannot be guaranteed.

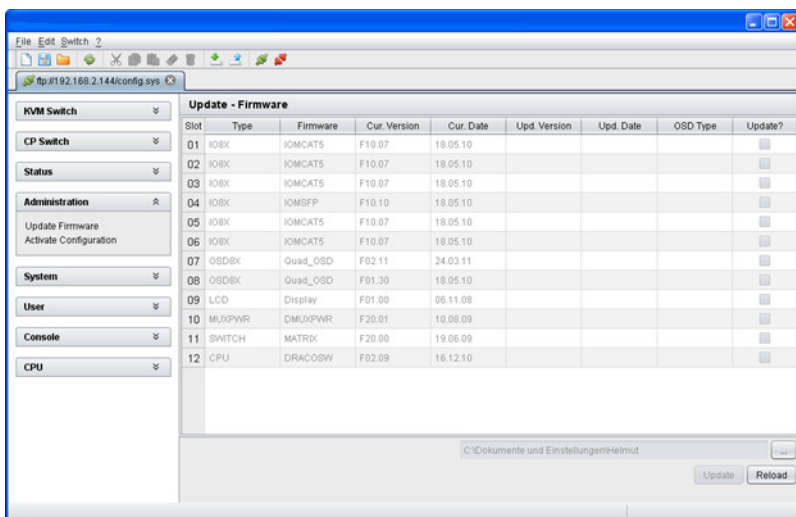
5.8 Firmware Update

The firmware of the matrix can be updated in this menu. You have the following possibility to access the menu:



Only use computers to update the matrix that are self-sustaining and not integrated in the KVM extender / matrix setup.

1. Select **Administration > Update Firmware** in the task area.



Menu Administration – Update Firmware

2. Select the directory in the lower part of the working area in which the update file can be found.



Open the file **defaults.cfg** and insert in the parameter **upd.dir** the directory from which the update files should be standardly sourced.

3. Select those modules in the list that have to be updated and enable the respective checkbox in the column **Update**.
4. Start the update by pressing the button **Update** in the lower part of the working area.



If the expected period of time for one update will exceed 20 minutes, cancel the update. Open the file **defaults.cfg** and set the parameter **safemode** to **true**.

5. Restart the matrix after the update by pressing the button **Restart matrix** in the appearing popup window.

6 Operation

The Draco major can be operated in three different ways:

- Direct Switching
 - by a keyboard connected to a CON port and the 'Hot Keys'
 - by a macro keyboard connected to a console port
- OSD
 - by a keyboard connected to a CON Unit and the OSD
- External Switching Commands
 - by an external computer via Java tool (network connection required)
 - by a media control (network or serial connection required)

6.1 Operation by 'Hot Keys'

6.1.1 Direct Switching

The direct switching by 'Hot Keys' on a keyboard is the fastest possibility for a user to switch at his console between different CPUs. There is a possibility to switch video, keyboard and mouse or only video.

Direct Switching of Video, Keyboard and Mouse

1. Start Command Mode with the 'Hot Key'.
For control, the LEDs **Shift** and **Scroll** flash at the keyboard, if Command Mode is activated.
2. Enter the number of the new CPU port and confirm with the key <Enter>. At the same time the Command Mode is closed and the console is connected to the new CPU with complete control.

Direct Switching of Video

1. Start Command Mode with the 'Hot Key'.
For control, the LEDs **Shift** and **Scroll** flashes at the keyboard, if command mode is activated.
2. Enter the number of the new CPU port and confirm with <Space>.
At the same time the Command Mode is closed and the console is connected to the new CPU with video only.



You can only switch to not used and allowed CPUs with the 'Hot Keys'. The options **Force Connect** and **Force Disconnect** as well as the restrictions of the **User Matrix** and **CON Matrix** are taken into account. 'Hot Keys' are only supported, if neither **Enable Login** nor the **User Matrix** is selected and the user is logged in the OSD.

6.1.2 Scan Mode

The Scan Mode offers the possibility to show video signals of the different CPUs fast and without delay and offers switching in between without continuously using the 'Hot Key'. The switching between two video signals can even take place within one frame.

1. Start command mode with the 'Hot Key'.
For control, the LEDs **Shift** and **Scroll** flashes at the keyboard, if command mode is activated.
2. Press the key <Left Shift> and hold it down.
3. Enter the numbers of the various CPUs with the keyboard and immediately switch to the video signal of the respective CPU after entering the port number.



Optimal results can be achieved by the use of as identical resolutions as possible. This contributes to a smooth and delay less function of the scan mode.

6.1.3 Addressing of Main and Sub Matrix

The Draco major system can be cascaded in two steps. You can optionally send the commands (including opening the OSD) to the main level or the sub matrix.

Whenever command mode is activated, you can select by a <m> or a <s>, if all of the following commands should be handled in the main or in the sub matrix.

OSD Access

- OSD access in the main matrix:
<Left Shift>, <Left Shift>, <m> (optional), <o>
- OSD access in the sub matrix
<Left Shift>, <Left Shift>, <s>, <o>

Example: Switching to the CPU port 23 of the sub matrix.

- Switching to the CPU Port (e.g. 12) of the main matrix that have the connection to the sub matrix:
<Left Shift>, <Left Shift>, <m>, <1>, <2>, <Enter>
- Switching to the CPU Port 23 of the sub matrix:
<Left Shift>, <Left Shift>, <s>, <2>, <3>, <Enter>



The selected main matrix/sub matrix mode is permanently activated until the other mode will be manually activated. This means that if you select <s> for example, all prospective commands will be sent to the sub matrix, also if the Command Mode is left in the meantime.

6.1.4 Macro Keyboard

The control of the Draco major can be efficiently performed by a macro keyboard that is available as an accessory.

For the use of a macro, the macro keyboard has to be connected to a USB-HID port of the CON unit.



If you want to use keyboard, mouse and macro keyboard at the same time, you will have to use an extender with four USB-HID ports or an USB hub.

The programming of the macros is console specific, requires administrator rights and takes place in the OSD (see Chapter 5.5.5, Page 100).

Up to eight commands per key can be saved in the OSD. They can be retrieved sequentially by pressing a key.

➔ For switching, press the favored key. In doing so, the monitor will remain dark for a short time.

6.1.5 Function Keys <F1>–<F12>

In Command Mode you can retrieve the macros 1–12 with the function keys <F1>–<F12> of the connected standard keyboard instead of the special macro keyboard.

The deposited command sequence for the appropriate function key is executed and Command Mode is left immediately.

By a prefixed <s> or <S> and <m> or <M> you can select, if the command sequence should be executed for the master or the slave.



The chosen control level remains selected, until the other one will be selected, even if Command Mode is left in the meantime.

6.2 KVM Mode

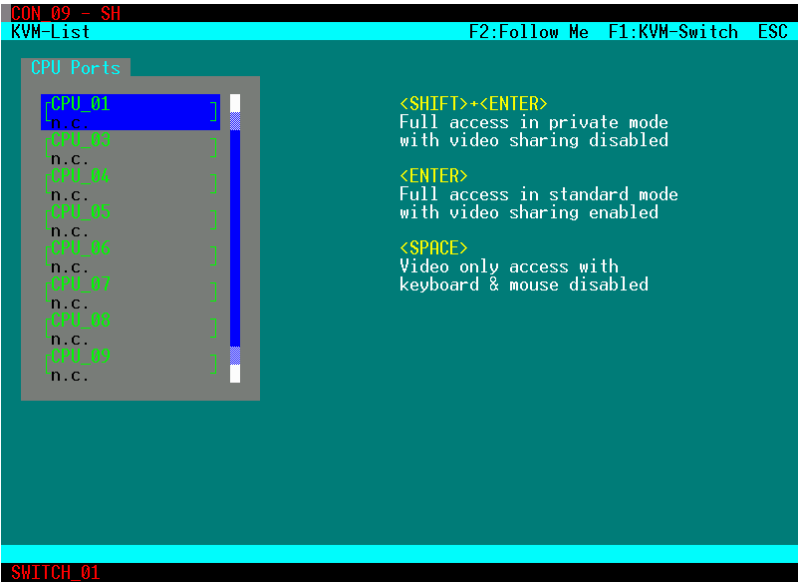
In this menu, the user can only switch the own console. To switch other consoles, the user needs the **Crosspoint Mode** (see Chapter 6.3, Page 132).

You have the possibility to do the following switching operations.

6.2.1 KVM-List



The menu **KVM-List** will be opened as a standard, if you login to the OSD. Alternatively, the configuration can be modified in this way that the **KVM-Switch** menu will be started (see Chapter 5.3.3, Page 74).



Menu *KVM-List*

All CPU ports that are unlocked for the user are shown in this menu. Thereby, the restrictions that are given by used CPU ports and access restrictions in the **User Matrix** as well as in the **Console Matrix** are considered. Restrictions by used CPU ports can be cancelled by a

selection of **Allow Sharing**, **Force Connect** and/or **Force Disconnect** (see Chapter 5.3.3, Page 74).

The following color combinations are available:

Color CPU Port	Color CON Port	Description
Green	n. c.	CPU port not connected bidirectionally. Video connection to another console
Green	Yellow	CPU port not connected bidirectionally. Video connection to the own console
Yellow	Yellow	CPU port bidirectionally connected to the own console
Red	Red	CPU port bidirectionally connected to another console
Red	Yellow	CPU port bidirectionally connected to another console. Video connection with the own console



The user receives a CPU port without control possibility by mouse or by touch screen only, if the CPU is already used and neither **Force Connect** nor **Force Disconnect** is selected. In all the other cases the user receives the CPU port including keyboard/mouse control.

6.2.2 KVM-Switch Function

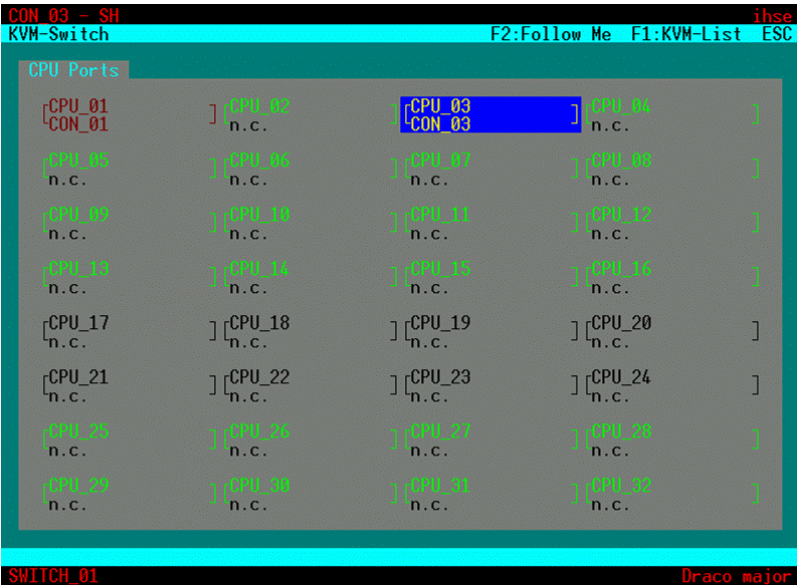
You have the following possibilities to access the menu:



OSD

The menu **KVM Matrix** will be opened, if you login to the OSD and the function **KVM Listview** in **Configuration > System** is activated.

The complete and current switching status is shown in this view.



Menu *KVM-Switch*

The following color combinations are available:

Color CPU Port	Color CON Port	Description
Green	n.c.	CPU port not connected, video can be connected to another console
Green	Yellow	CPU port not connected, video can be connected to the own console

Color CPU Port	Color CON Port	Description
Yellow	Yellow	CPU port connected to the own console
Red	Red	CPU port connected to a different console
Red	Yellow	CPU Port connected with a different console, video connected to the own console
Black	n.c.	CPU Port not available



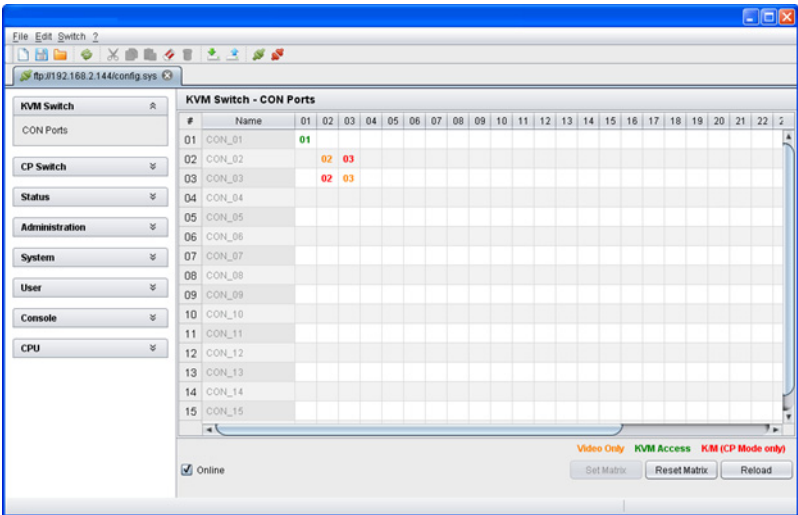
By default the user is only able to switch to available CPU ports.

In the menu **Configuration > System** (see Chapter 5.3.3, Page 74) the user is able to activate the options **Allow Sharing**, **Force Connect** and **Force Disconnect**.

- If **Allow Sharing** is active, the user will be able to switch to an already to another user assigned CPU by using the key <Space> and will receive the monitor display, but without the opportunity to control. The current user will not be informed about this procedure.
- If **Force Connect** is active, the user will be able to switch to any CPU by pressing the key <Enter> and will receive the monitor display including the opportunity for control. The previous user will loose his control, but will still receive the monitor display.
- If **Force Disconnect** is active, the user will be able to switch to any CPU by pressing the key <Enter> and will receive the monitor display including the opportunity for control. The previous user will be disconnected from the CPU.

Java Tool

➔ Select **KVM Switch > CON Ports** in the task area.



Menu **KVM Switch – CON Ports**

6.2.3 Follow Me Function (Multicast)



The function **Follow Me** allows to duplicate the display content of the own console to further monitors. For this purpose the appropriate CON ports are linked with the own CON port. If you set this link, these Con ports will lose their own opportunity for switching and controlling. If another CPU is selected via switching at the guiding console after 'Follow Me' configuration has been done, the linked CON ports will follow according to the switching and will also show the display content of the new CPU.

This function does not provide any access to the display content of other consoles.

The function **Follow Me** is helpful for example:

- to make the display content of a presentation available for a beamer.
- to make monitors in control rooms available for all monitoring purposes.
- to show the own display content to an administrator, if there some questions

You have the following possibilities to do a switching operation with the function **Follow Me**:

OSD



The menu **Follow Me** mask only works from Single-Head work stations with Single-Head work stations.

➔ Press the key <F2>.

For better orientation, the current switching status is shown in the menu **Follow Me** mask:



Menu **Follow Me**

The following color combinations are available:

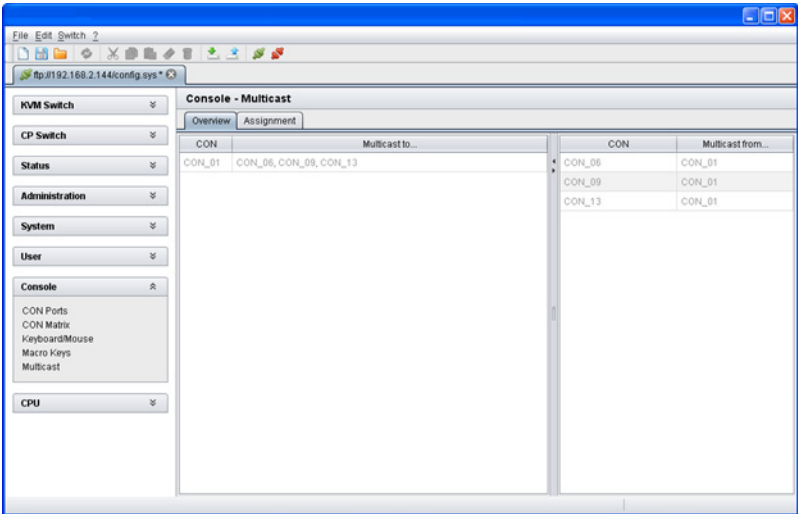
Color CON Port	Color CPU Port	Description
Green	n.c.	CON Port available
Red	Rot	CON port # connected to CPU Port # or with CON Port # in the 'Follow Me' mode
Black	Black	Own CON port connection
Black	n.c.	CON port available

You can select between the following buttons:

Button	Description
Clear all	Unlock all ports that are connected to the own console

Java Tool

➔ Select **Console > Multicast** in the task area.



Menu **Console – Multicast**

6.3 Crosspoint Mode

In **Crosspoint Mode**, assignments of inputs to outputs can be made. As the video signals of a CPU port can be connected to several CON ports, the KM signal can only be connected to a CON port that includes the corresponding video signal at the same time.

All existing connections can be overwritten in the **CP Mode**. That is why only users with power user rights have access to this mode.

The switching result has to be controlled by the user, because there is no plausibility check for reasons of highest flexibility.

6.3.1 Crosspoint Switch Function (CON Ports)

In the menu **Crosspoint Switch** the various consoles that are switchable to available CPUs are shown. For an optimal overview, a matrix display is used in this case.

You can only assign 1x video (**MON**) and 1x keyboard and mouse control (**K/M**) to any console. If another CPU is selected (**K/M** or **MON**), an existing connection will be eventually stopped.

You can assign 1x **MON** without **K/M** to any console. If you assign 1x **K/M** to a console, you will also have to assign the corresponding video signal to this console.

The switching operation of a single keyboard/mouse or video signal is done by pressing the key <Space>. The combined switching of **K/M** and **MON** is done by the key <Enter>. The switching is done immediately. If the switching is done on an existing connection, the connection will be stopped.



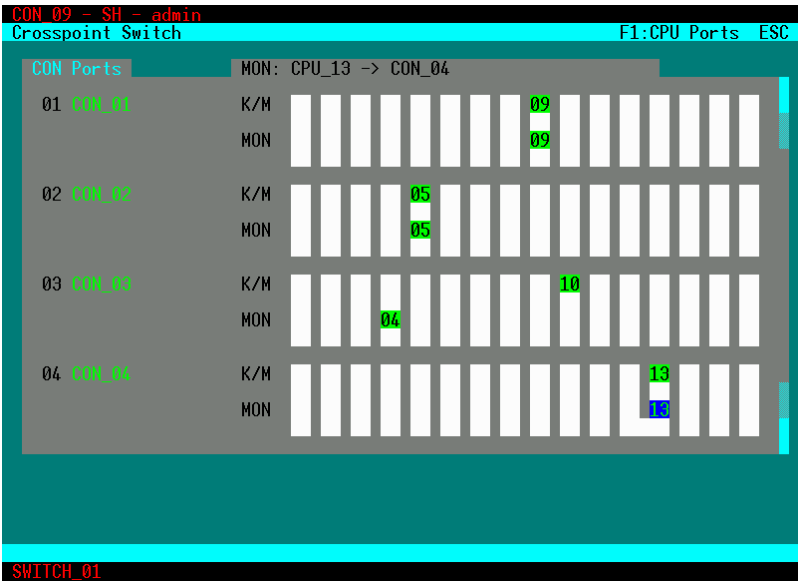
The switching function is done immediately. The user has to take care of the legitimacy of the switching operation. There is no control by the system.

You have the following possibilities to access the menu:



OSD

➔ Select **Status > Crosspoint Switch** in the main menu.



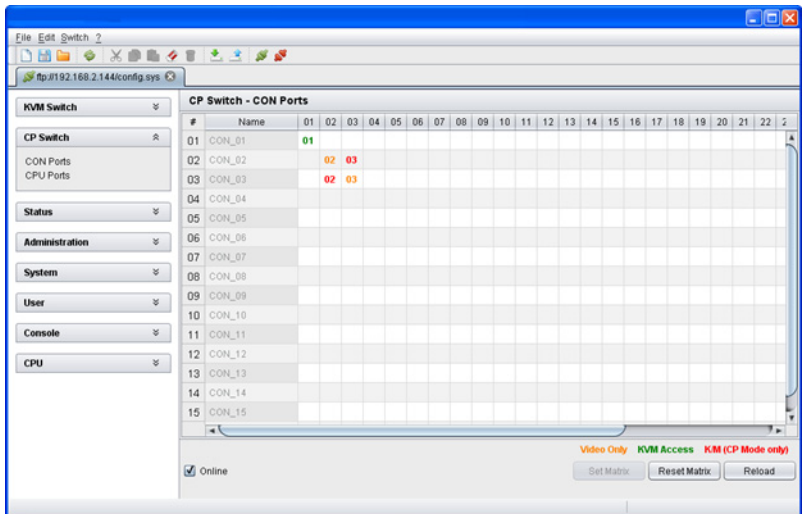
Menu **Crosspoint Switch**

- The data for a maximum of four CON ports are shown in the columns.
- The 32 CPU ports are shown in the lines (two lines with respectively 16 CPUs).
- In the upper two lines (**K/M**) of any CON port is shown, to which CPU the keyboard/mouse signals have to be sent.
- In the lower two lines (**MON**) of every single CON port is shown, from which CPU the video signal is displayed.

The switching of a single keyboard/mouse or video signal is done by the key <Space>. The combined switching of **K/M** and **MON** is done by the key <Enter>.

Java Tool

- ➔ Select in the task area **CP Switch > CON Ports**.



Menu **CP Switch – CON Ports**

To set a connection between a console and a source (Computer, CPU), proceed as follows:

- ➔ Double click with the mouse on the according matrix field and select the desired type of connection (**Video Only** or **KVM-Access**).

If you select the empty field in the selection list, the current connection will be closed.



If connections should be established or closed, a popup window will open after the respective change to confirm the operation by **Yes** or to reject by **No** (online check mark has to be set).

To connect all available CON units to a video signal from a CPU unit at the same time, proceed as follows:

- ➔ Use the right mouse button to click in the respective CPU number in the line **CPU** of the matrix and afterwards select the menu item **Set All Available Video Channels** in the opening selection list.

To close all connections between the respective CPU and the connected consoles, proceed as follows:

- ➔ Use the right mouse button to click in the respective number in the line **CPU** of the matrix and afterwards select the menu item **Clear All CPU Channels** in the opening selection list.

You can select between the following buttons:

Button	Function
Set Matrix	Activate the switching operations done by the Java tool
Reset Matrix	Reset all matrix connections
Reload	Reload the connection overview

6.3.2 Crosspoint Switch Function (CPU Ports)

In the menu **Crosspoint Switch**, the various CPUs are shown that can be switched to available consoles. For the best overview, a matrix display is used in this case.

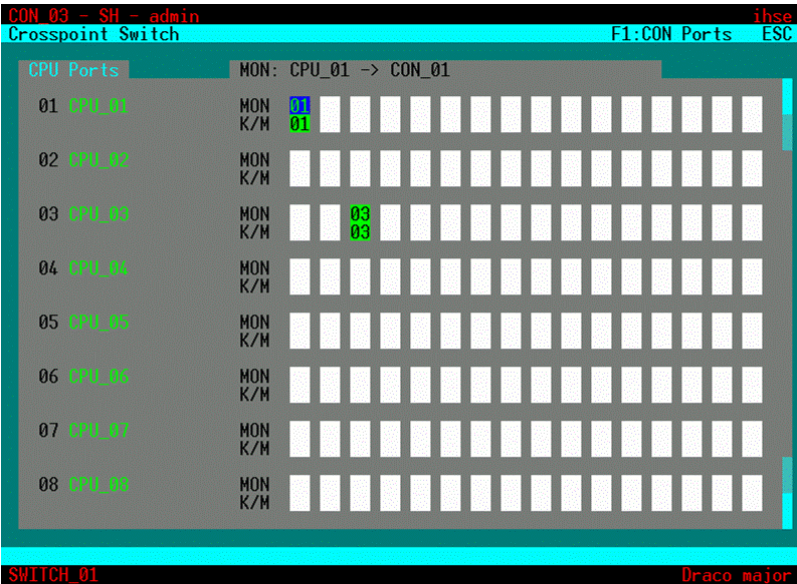
You have the following possibilities to access the menu:



The switching function is done immediately. The user has to take care of the legitimacy of the switching operation. There is no control by the system.

OSD

- ➔ Select **Status > Crosspoint Switch** in the main menu.
- ➔ Press the key <F1> to get to the menu **CPU Ports**.



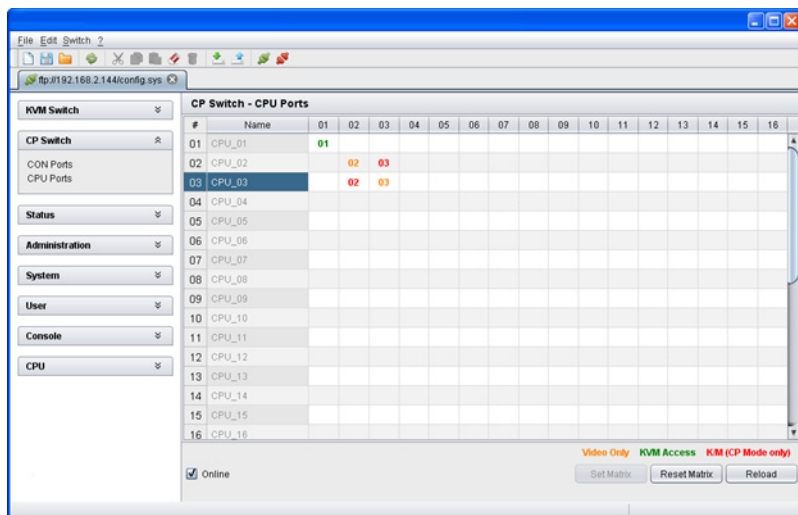
Menu **Crosspoint Switch** (CPU Ports)

- The 32 CPU ports are shown in the columns.
- In the lines the 16 possible CON ports are shown for every single CPU.
- In the upper line (**MON**) of any CPU port is shown, on which console the video signal of the current CPU port is shown.
- In the lower line (**K/M**) of any CPU port is pictured, on which console the keyboard/mouse control is at the moment.

Practically any number of monitors can be switched to a CPU in a line, but always only 1x keyboard/mouse (**K/M**).

Java-Tool

➔ Select **CP Switch > CPU Ports** in the task area.



Menu **CP Switch – CPU Ports**

To set a connection between a console and a source (Computer, CPU), proceed as follows:

➔ Double click with the mouse on the according matrix field and select the desired type of connection (**Video Only** or **KVM-Access**).

If you select the empty field in the selection list, the current connection will be closed.



If connections should be established or closed, a popup window will open after the respective change to confirm the operation by **Yes** or to reject by **No** (online check mark has to be set).

To connect all available CON units to a video signal from a CPU unit at the same time, proceed as follows:

- ➔ Use the right mouse button to click in the respective CPU number in the line **CPU** of the matrix and afterwards select the menu item **Set All Available Video Channels** in the opening selection list.

To close all connections between the respective CPU and the connected consoles, proceed as follows:

- ➔ Use the right mouse button to click in the respective number in the line **CPU** of the matrix and afterwards select the menu item **Clear All CPU Channels** in the opening selection list.

You can select between the following buttons:

Button	Function
Set Matrix	Activate the switching operations done by the Java tool
Reset Matrix	Reset all matrix connections
Reload	Reload the connection overview

6.4 Serial Interface



The Draco major offers the possibility to switch via a serial interface (RS232).

For the control of the Draco major via serial interface, certain parameters are used.

Set up the following format of the serial data transfer for the communication:

115.2 KBaud, 8, 1, NO

(115.2 KBaud, 8 Data bit, 1 Stop bit, no parity)

6.5 Power On and Power Down Functions

6.5.1 Restart

You have the following possibilities to access the menu



If the parameter **Load Default** is enabled in the menu **System**, the matrix will be restarted with the default configuration, otherwise a request will appear before restart, whether the matrix should be started with the default settings.

OSD

1. Select **Configuration > Restart** in the main menu.
If you select the option **Restart**, the Draco major will be restarted with the current settings.
2. Select **Configuration > Default** in the main menu.
If you select the option **Default**, the Draco major will be restarted with the current settings.

Java Tool

- ➔ Select **Switch > Restart Matrix** in the menu bar.
If you select the option **Restart**, the Draco major will be restarted with the current settings.

LCD Display

- ➔ Select **Configuration > Restart** in the main menu.
If you select the option **Restart**, the Draco major will be restarted with the current settings.

6.5.2 Reset

You have the following possibilities to access the menu:



If a firmware update has been done since the delivery, the matrix will be set to the state defined there.

OSD

- Select **Configuration > Reset** in the main menu.

If you select the option **Reset**, the Draco major will be set back into delivery status.

LCD Display

- Select **Configuration > Reset** in the main menu.

If you select the option **Reset**, the Draco major will be set back into delivery status.

6.5.3 Power Down

- Press the 'On' and 'Off' button at the standard appliance outlet to power on and power off the matrix.

7 Specifications

7.1 Interfaces

7.1.1 RJ45 (Interconnect)

The communication of the Cat X devices requires a 1000BASE-T connection.

Connector wiring must comply with EIA/TIA-568-B (1000BASE-T), with RJ45 connectors at both ends. All four cable wire pairs are used.

7.1.2 Fiber SFP Type LC (Interconnect)

The communication of fiber devices is performed via Gigabit SFPs that have to be connected to suitable fibers fitted with connectors type LC (see Chapter 7.2.2, Page 144).



The correct function of the device can only be guaranteed with SFPs provided by the manufacturer.



SFP modules can be damaged by electrostatic discharge (ESD). When handling, care must be taken so that the devices are not damaged.

7.1.3 RJ45 (Network)

The communication of the Cat X devices requires a 1000BASE-T connection.

The cabling has to be done according to EIA/TIA-568-B (1000BASE-T) with RJ45 connectors at both ends. All of the four wire pairs are used in both directions. The cabling is suitable for a full duplex operation. For the cable connection to a source (computer, CPU), a crossed network cable (cross cable) has to be used.

7.1.4 RS-232 (Serial)

The communication takes place with a transmission speed of up to 115.2 KBAud, regardless of the file format. The transmission takes place with eight data bits and a stop bit, but without a parity bit. Limited hardware handshake (DSR) is possible.

7.2 Interconnect Cable

7.2.1 Cat X



A point-to-point connection is required. Operation with several patch fields is possible. Routing over an active network component, such as an Ethernet Hub, Router or Matrix, is not allowed.

- ➔ Avoid routing Cat X cables along power cables.
- ➔ If the site has 3-phase AC power, try to ensure that CPU Unit and CON Unit are on the same phase.



To maintain regulatory EMC compliance, correctly installed shielded Cat X cable must be used throughout the interconnection link.



To maintain regulatory EMC compliance, all Cat X cables need to carry ferrites on both cable ends close to the device.

Type of Interconnect Cable

The Draco major requires interconnect cabling specified for Gigabit Ethernet (1000BASE-T). The use of solid-core (AWG24), shielded, Cat 5e (or better) is recommended.

Cat X Solid-Core Cable AWG24	S/UTP (Cat 5e) cable according to EIA/TIA-568-B. Four pairs of wires AWG24. Connection according to EIA/TIA-568-B (1000BASE-T).
Cat X Patch Cable AWG26/8	S/UTP (Cat 5e) cable according to EIA/TIA-568-B. Four pairs of wires AWG26/8. Connection according to EIA/TIA-568-B (1000BASE-T).



The use of flexible cables (patch cables) type AWG26/8 is possible, however the maximum possible extension distance is halved.

Maximum Acceptable Cable Length

Cat X Installation Cable AWG24	140 m (400 ft)
Cat X Patch Cable AWG26/8	70 m (200 ft)

7.2.2 Fiber



A point-to-point connection is necessary. Operation with multiple patch panels is allowed. Routing over active network components, such as Ethernet Hubs, Matrixes or Routers, is not allowed.

Type of Interconnect Cable (Cable notations according to VDE)

Type of cable	Specifications
Single-mode 9µm	- Two fibers 9µm - I-V(ZN)H 2E9 (in-house patch cable) - I-V(ZN)HH 2E9 (in-house breakout cable) - I/AD(ZN)H 4E9 (in-house or outdoor breakout cable, resistant) - A/DQ(ZN)B2Y 4G9 (outdoor cable, with protection against rodents)
Multi-mode 50µm	- Two fibers 50µm - I-V(ZN)H 2G50 (in-house patch cable) - I/AD(ZN)H 4G50 (in-house or outdoor breakout cable, resistant)
Multi-mode 62.5µm	- Two fibers 62.5µm - I-V(ZN)HH 2G62,5 (in-house breakout cable) - A/DQ(ZN)B2Y 4G62,5 (outdoor cable, with protection against rodents)

Maximum Acceptable Cable Length

Type of cable	Maximum Acceptable Cable Length
Single-mode 9μm	10,000 m (32,800 ft)
Multi-mode 50μm (OM3)	1,000 m (3,280 ft)
Multi-mode 50μm	400 m (1,300 ft)
Multi-mode 62.5μm	200 m (650 ft)



If you use single-mode SFPs with multi-mode fibers, you normally can double the maximum acceptable cable length.

Type of Connector

Connector	LC Connector
-----------	--------------

7.3 Supported Peripherals

7.3.1 KVM Extender

The Draco major matrix has been tested with the following KVM extenders and can be run with them:

KVM Extender with Cat X Connection, K459 Series

Type	Description
L459-0ES	Draco KVM CPU Unit, Single-Head
R459-0ES	Draco KVM CON Unit, Single-Head
L459-0ED	Draco KVM CPU Unit, Dual-Head
R459-0ED	Draco KVM CON Unit, Dual-Head
L459-AES	Draco KVM CPU Unit, Analog Audio, Single-Head
L459-AED	Draco KVM CPU Unit, Analog Audio, Dual-Head
R459-AED	Draco KVM CON Unit, Analog Audio, Dual-Head
L459-1U2	Draco KVM CPU Unit, Single-Head, 4x USB-HID
R459-1U2	Draco KVM CON Unit, Single-Head, 4x USB-HID
L459-2U2	Draco KVM CPU Unit, Dual-Head, 4x USB-HID
R459-2U2	Draco KVM CON Unit, Dual-Head, 4x USB-HID
L459-UT	Draco KVM CPU Unit, Single-Head, 4x USB 2.0
R459-UT	Draco KVM CON Unit, Single-Head, 4x USB 2.0
L459-VES	Draco KVM CPU Unit, DVI-I Input (VGA)

KVM Extender with Cat X Connection, K477 Series

Type	Description
L477-1SHC	Draco KVM CPU Unit, Single-Head, 2x USB-HID
R477-1SHC	Draco KVM CON Unit, Single-Head, 2x USB-HID
L477-1S4CA	Draco KVM CPU Unit, Single-Head, Analog Audio, 4x USB-HID
R477-1S4CA	Draco KVM CON Unit, Single-Head, Analog Audio, 4x USB-HID
L477-1S4CD	Draco KVM CPU Unit, Single-Head, Digital Audio, 4x USB-HID
R477-1S4CD	Draco KVM CON Unit, Single-Head, Digital Audio, 4x USB-HID
L477-1STC	Draco KVM CPU Unit, Single-Head, 2x USB-HID, 4x USB 2.0
R477-1STC	Draco KVM CON Unit, Single-Head, 2x USB-HID, 4x USB 2.0
L477-2S4C	Draco KVM CPU Unit, Dual-Head, 4x USB-HID
R477-2S4C	Draco KVM CON Unit, Dual-Head, 4x USB-HID
L477-SHCV	Draco KVM CPU Unit, Single-Head, DVI-I Input (VGA), 2x USB-HID

KVM Extender with Cat X connection, K474 Series

Type	Description
L474-BSHC	Draco KVM CPU Unit, Single-Head, 2x USB-HID
R474-BSHC	Draco KVM CON Unit, Single-Head, 2x USB-HID
L474-BSHCV	Draco KVM CPU Unit, Single-Head, DVI-I Input (VGA), 2x USB-HID
R474-BSHCV	Draco KVM CON Unit, Single-Head, IR Receiver, 2x USB-HID



The use of KVM extenders with upgrade modules or USB 2.0 modules does not limit the operation with Draco major.

KVM-Extender with Fiber connection (Multi-Mode), K459 Series

Type	Description
L459-0MS	Draco KVM CPU Unit, Single-Head
R459-0MS	Draco KVM CON Unit, Single-Head
L459-0MD	Draco KVM CPU Unit, Dual-Head
R459-0MD	Draco KVM CON Unit, Dual-Head
L459-AMS	Draco KVM CPU Unit, Audio, Single-Head
R459-AMS	Draco KVM CON Unit, Audio, Single-Head
L459-AMD	Draco KVM CPU Unit, Audio, Dual-Head
R459-AMD	Draco KVM CON Unit, Audio, Dual-Head
L459-M1U2	Draco KVM CPU Unit, Single-Head, 4x USB-HID
R459-M1U2	Draco KVM CON Unit, Single-Head, 4x USB-HID
L459-M2U2	Draco KVM CPU Unit, Dual-Head, 4x USB-HID
R459-M2U2	Draco KVM CON Unit, Dual-Head, 4x USB-HID
L459-MUT	Draco KVM CPU Unit, Single-Head, 4x USB 2.0
R459-MUT	Draco KVM CON Unit, Single-Head, 4x USB 2.0
L459-VMS	Draco KVM CPU Unit, DVI-I Input (VGA)
R459-MUT	Draco KVM CON Unit, Single-Head, 4x USB 2.0

KVM Extender with Fiber Connection (Multi-Mode), K477 series

Type	Description
L477-1SHM	Draco KVM CPU Unit, Single-Head, 2x USB-HID
R477-1SHM	Draco KVM CON Unit, Single-Head, 2x USB-HID
L477-1S4MA	Draco KVM CPU Unit, Single-Head, Analog Audio, 4x USB-HID
R477-1S4MA	Draco KVM CON Unit, Single-Head, Analog Audio, 4x USB-HID
L477-1S4MD	Draco KVM CPU Unit, Single-Head, Digital Audio, 4x USB-HID
R477-1S4MD	Draco KVM CON Unit, Single-Head, Digital Audio, 4x USB-HID
L477-1STM	Draco KVM CPU Unit, Single-Head, 2x USB-HID, 4x USB 2.0
R477-1STM	Draco KVM CON Unit, Single-Head, 2x USB-HID, 4x USB 2.0
L477-2S4M	Draco KVM CPU Unit, Dual-Head, 4x USB-HID
R477-2S4M	Draco KVM CON Unit, Dual-Head, 4x USB-HID
L477-SHMOV	Draco KVM CPU Unit, Single-Head, DVI-I Input (VGA), 2x USB-HID

KVM Extender with Fiber Connection (Multi-Mode), K474 Series

Type	Description
L474-BSHM	Draco KVM CPU Unit, Single-Head, 2x USB-HID
R474-BSHM	Draco KVM CON Unit, Single-Head, 2x USB-HID
L474-BSHMOV	Draco KVM CPU Unit, Single-Head, DVI-I Input (VGA), 2x USB-HID
R474-BSHMOV	Draco KVM CON Unit, Single-Head, IR Receiver, 2x USB-HID

KVM Extender with Fiber Connection (Single-Mode), K459 Series

Type	Description
L459-0SS	Draco KVM CPU Unit, Single-Head
R459-0SS	Draco KVM CON Unit, Single-Head
L459-0SD	Draco KVM CPU Unit, Dual-Head
R459-0SD	Draco KVM CON Unit, Dual-Head
L459-ASS	Draco KVM CPU Unit, Audio, Single-Head
R459-ASS	Draco KVM CON Unit, Audio, Single-Head
L459-ASD	Draco KVM CPU Unit, Audio, Dual-Head
R459-ASD	Draco KVM CON Unit, Audio, Dual-Head
L459-S1U2	Draco KVM CPU Unit, Single-Head, 4x USB-HID
R459-S1U2	Draco KVM CON Unit, Single-Head, 4x USB-HID
L459-S2U2	Draco KVM CPU Unit, Dual-Head, 4x USB-HID
R459-S2U2	Draco KVM CON Unit, Dual-Head, 4x USB-HID
L459-SUT	Draco KVM CPU Unit, Single-Head, 4x USB 2.0
R459-SUT	Draco KVM CON Unit, Single-Head, 4x USB 2.0
L459-VSS	Draco KVM CPU Unit, DVI-I Input (VGA)

KVM Extender with Fiber Connection (Single-Mode), K477 Series

Type	Description
L477-1SHS	Draco KVM CPU Unit, Single-Head, 2x USB-HID
R477-1SHS	Draco KVM CON Unit, Single-Head, 2x USB-HID
L477-1S4SA	Draco KVM CPU Unit, Single-Head, Analog Audio, 4x USB-HID
R477-1S4SA	Draco KVM CON Unit, Single-Head, Analog Audio, 4x USB-HID
L477-1S4SD	Draco KVM CPU Unit, Single-Head, Digital Audio, 4x USB-HID
R477-1S4SD	Draco KVM CON Unit, Single-Head, Digital Audio, 4x USB-HID
L477-1STS	Draco KVM CPU Unit, Single-Head, 2x USB-HID, 4x USB 2.0
R477-1STS	Draco KVM CON Unit, Single-Head, 2x USB-HID, 4x USB 2.0
L477-2S4S	Draco KVM CPU Unit, Dual-Head, 4x USB-HID
R477-2S4S	Draco KVM CON Unit, Dual-Head, 4x USB-HID
L477-SHSV	Draco KVM CPU Unit, Single-Head, DVI-I Input (VGA), 2x USB-HID

KVM Extender with Fiber Connection (Single-Mode), K474 Series

Type	Description
L474-BSHS	Draco KVM CPU Unit, Single-Head, 2x USB-HID
R474-BSHS	Draco KVM CON Unit, Single-Head, 2x USB-HID
L474-BSHSV	Draco KVM CPU Unit, Single-Head, DVI-I Input (VGA), 2x USB-HID
R474-BSHSV	Draco KVM CON Unit, Single-Head, IR Receiver, 2x USB-HID

7.4 Serial Control

7.4.1 Telegram Structure

Command

<STX>, <command byte (CMD)>, [data bytes (D0...DN)], <ETX>

[] = Optional elements

Response

<ACK> , [<ECHO>]

[] = Optional elements

<ECHO> reports the matrix sequences solicited by a command and thus the new switching status of the matrix. The echo can be used to update user applications and to operate several matrices in parallel.

Parameter Description

Command byte: In the range 0x40 to 0x6F
(see list of allowed commands below)

Data bytes: **a) Binary data:** In order to prevent that, during the transmission of binary data, control statements of control commands are transferred, the data are divided into low-nibble and high-nibble. The data are distributed to the low-nibbles of two bytes and provided with an offset by 0x60 e.g. 0x1F

=> 0x61 + 0x6F

b) 7bit data: (0x0 to 0x7F) are provided with an offset by 0x80, e.g. 0000011 => 0x83

c) ASCII data => 0x20 to 0x7E are transmitted unencryptedly.

(Special) characters:	ACK	0x06
	NAK	0x15
	STX	0x02
	ETX	0x03
	CR	0x0D
	ESC	0x1B
	HTAB	0x09
	LF	0x0A

Sequence of a Data Communication

Draco major Matrix	Control CPU
–	Sending of a command
Acquiring of a command, processing of a command, blocking of further commands	–
a) Errors occurred: <NAK> b) No errors: <ACK><ECHO> c) Optional: Reply telegram with data	–
–	a) Repeat telegram b) Next command c) Receive and process the repeat telegram



The serial interface can be blocked while OSD has been opened.

7.4.2 Telegrams, Switching Functions

Console Receipt (Video Signal)

#	Function	Telegram	Reply
1	CON# output signal from CPU#	STX, 0x47, <CON#>, <CPU#>, ETX	ACK, ECHO
2	CON# output off	STX, 0x48, <CON#>, ETX	ACK, ECHO
3	CON01...CON16 output signal from CPU#1...CPU#16 - Requires 16 CPU# 0x80 for „not output“	STX, 0x49, <CPU#1>, <CPU#2>, ..., <CPU#16>, ETX	ACK, ECHO
4	Output off for all CON ports	STX, 0x4A, ETX	ACK, ECHO

CPU Receipt (K/M Return Channel)

#	Function	Telegram	Reply
5	CPU# output signal from CON#	STX, 0x4B, <CPU#>, <CON#>, ETX	ACK, ECHO
6	CPU# output off	STX, 0x4C, <CPU#>, ETX	ACK, ECHO
7	CPU01...CPU32 output signal from CON#1...CON#32 - Requires 32 CON# 0x80 for 'no output'	STX, 0x4D, <CON#1>, <CON#2>, ..., <CON#32>, ETX	ACK, ECHO
8	Output off for all CPUs	STX, 0x4E, ETX	ACK, ECHO



Only 16 consoles available, at least 16x 0x80 necessary.

Bidirectional Connections

#	Function	Telegram	Reply
9	Establish a bidirectional connection CON# ↔ CPU#	STX, 0x4F, <CON#>, <CPU#>, ETX	ACK, ECHO
10	Disconnect CON#	STX, 0x50, <CON#>, ETX	ACK, ECHO

Switch Matrix

#	Function	Telegram	Reply
11	Set switch matrix (complete setup): - Requires 48 values Werten (at first 16 CPUs, then 32 consoles) 0x80 for „not output“ - CON 01 - 16 output signal from CPU#1...CPU#16 (cf. telegram 3) - CPU01...CPU32 output signal from CON# to CON#32 (cf. telegram 7)	STX, 0x51, <CPU#1>, <CPU#2>, ..., <CPU#16>, <CON#1>, <CON#2>, ..., <CON#32>, ETX	ACK, ECHO
12	Reset switch matrix	STX, 0x52, ETX	ACK
13	Report matrix (complete setup): - Output of 48 values 0x80 for 'no output' - The first 16 values describe the CON port output (cf. telegram 3) - The next 32 values describe the CPU output (cf. telegram 7)	STX, 0x53, ETX	STX, 0x53, <CPU#1>, <CPU#2>, ..., <CPU#16>, <CON#1>, <CON#2>, ..., <CON#32>, ETX

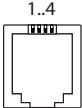


The correct assignment of consoles and CPUs has to be ensured by the user.

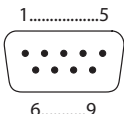
Only 16 consoles are available, at least 16x 0x80 required.

7.5 Connector Pinouts

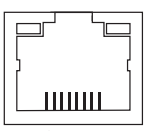
RJ10 (Serial Control)

Picture	Pin	Signal
	1	LED +
	2	LED -
	3	Dry Contact
	4	GND

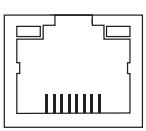
D-Sub 9 (Serial)

Picture	Pin	Signal	Pin	Signal
	1	n.c.	6	DTR
	2	CTS	7	TxD
	3	RTS	8	RxD
	4	DSR	9	n.c.
	5	GND		

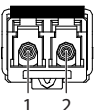
RJ45 (Network)

Bild	Pin	Signal	Pin	Signal
	1	D1+	5	n.c
	2	D1-	6	D2-
	3	D2+	7	n.c
	4	n.c	8	n.c

RJ45 (Interconnect)

Picture	Pin	Signal	Pin	Signal
	1	D1+	5	D3-
	2	D1-	6	D2-
	3	D2+	7	D4+
	4	D3+	8	D4-

Fiber SFP Typ LC

Picture	Diode	Signal
	1	Data OUT
	2	Data IN

7.6 Power Supply

Voltage	100-240V~, 50-60 Hz, 2A max.
Power Requirement	230 V/2000 mA - 115 V/4000 mA
Fuse	T2A, L250V
Battery	Panasonic BR1225, 3 V, 48 mAh

7.7 Environmental Conditions

Operating Temperature	41 to 113°F (5 to 45°C)
Storage Temperature	-13 to 140°F (-25 to 60°C)
Relative Humidity	Max. 80% non-condensing

7.8 Size

Draco major	483 x 85 x 450 mm (19" x 2U x 18")
Shipping Box	500 x 500 x 100 mm (20" x 20" x 4")

7.9 Shipping Weight

Draco major	6.0 kg (12.9 lb)
Shipping Box	8.0 kg (17.2 lb)

8 Troubleshooting

In the following chapters support for problems with the Draco majormatrix is provided. This help is based as regards content on a functional extender route. Ensure before running your extenders with the matrix that they work over a peer-to-peer connection. This can be supported by the use of a Cat X or fiber coupler. If you have problems referring to this, the manuals of the respective extenders will offer support.

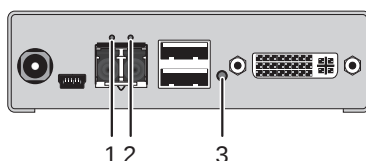
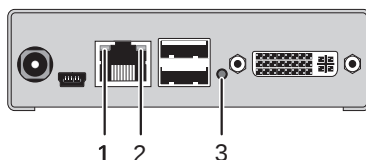
8.1 External Failure

Diagnosis	Possible Reason	Measure
Matrix cannot be started anymore.	Fuse at the standard appliance outlet.	➔ Check fuse.

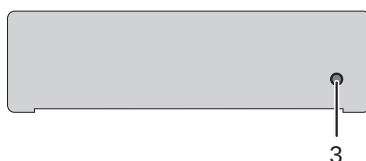
8.2 Failure at the Matrix

Diagnosis	Possible Reason	Measure
Serial control impossible or only restrictedly possible.	Different Baud rate of CPU and matrix.	➔ Adapt Baud rate in the matrix and in the CPU (see Chapter 5.3.1, Page 65)
Serial control via RJ45 port not possible.	Wrong network cable.	➔ Use a crossed network cable
Network settings are not assumed after editing.	Restart of the matrix not yet completed.	➔ Do a restart.
Port definitions as USB 2.0 invalid.	Restart of the matrix not yet completed.	➔ Do a restart.

8.3 Blank Screen



Rear View



Front View

Diagnosis	Possible Reason	Measure
Monitors remains dark after switching operation	Switching to a CPU Port without active Source (computer, CPU).	➔ Switching to a CPU Port with an active source (computer, CPU).
	Connection of a console with a CON port or connection of a CPU to a CPU port not established correctly.	➔ Check connections regarding CON and CPU ports at the matrix.
LED 1 on or LED 2 off	Connections CON unit, matrix and CPU unit.	➔ Check connecting cables and connectors. (No cable, cable break, CPU/CON unit offline, CPU/CON unit connected to the wrong port)
CPU unit LED 3 green	Connection between CON unit, matrix and CPU unit	➔ Establish a connection between CON unit and CPU unit via matrix

8.4 Video Interference

Diagnosis	Possible Reason	Measure
Opening the OSD not possible	No OSD jumper set	➔ Set jumper 11 on the CON unit
	CON unit connected with the wrong port (e.g. USB 2.0 port of a 1U, 2U or 3U port configuration).	➔ Switch to another port
	No OSD card	➔ Mount OSD card
	Wrong Firmware on the OSD card	➔ Run a firmware update of the OSD card according to the extenders that are used in combination with the Draco major.
Incorrect video display	Cable connection disturbed	➔ Check the connection, length and quality of the interconnect cable to the units.

9 Technical Support

Prior to contacting support ensure you have read this manual, and then installed and set-up your Draco major as recommended.

9.1 Support Checklist

To efficiently handle your request it is necessary to complete our checklist for support and problem cases ([Download](#)). Keep the following information available before you call:

- Company, name, phone number and email
- Type and serial number of the device (see bottom of device)
- Date and number of sales receipt, name of dealer if necessary
- Issue date of the existing manual
- Nature, circumstances and duration of the problem
- Involved components (such as graphic source/CPU, OS, graphic card, monitor, USB-HID/USB 2.0 devices, interconnect cable) including manufacturer and model number
- Results from any testing you have done

9.2 Shipping Checklist

1. To return your device, contact your dealer to obtain a RMA number (Return-Material-Authorization).
2. Package your devices carefully, preferably using the original box. Add all pieces which you received originally.
3. Note your RMA number visibly on your shipment.



Devices that are sent in without a RMA number cannot be accepted. The shipment will be sent back without being opened, postage unpaid.

10 Regulatory and Standards Compliance

10.1 CE Declaration of Conformity

The products listed below in the form as delivered comply with the provisions of the following European Directives:

2004/108/EG Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility



CE Marking 2009

Product list:

K474-UX / CX

The products comply with the following harmonized standards for Information Technology Equipment:

- EN 55022:2006 + A1:2007 (Class A)
- EN 55024:1998 + A1:2001+ A2:2003

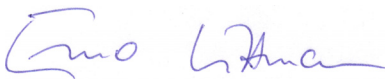
This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety instructions and installation guidelines noted in this manual shall be considered in detail. Compliance with the specifications for cable lengths and types is mandatory.

Manufacturer:

IHSE GmbH
Maybachstrasse 11
88094 Oberteuringen
Deutschland

Oberteuringen, 26 January 2010

The Management

A handwritten signature in blue ink, appearing to read 'Emo L. Hauer', is written over the printed name 'The Management'.

Use in a Domestic Environment

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

10.2 North American Regulatory Compliance

This equipment has been 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Shielded cables must be used with this equipment to maintain compliance with radio frequency energy emission regulations and ensure a suitably high level of immunity to electromagnetic disturbances.

All power supplies are certified to the relevant major international safety standards.

10.3 WEEE

The manufacturer complies with the EC Directive 2002/96/EG on the prevention of waste electrical and electronic equipment (WEEE).

The device labels carry a respective marking.

10.4 RoHS

This device complies with the EC Directive 2002/95/EG on the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The device labels carry a respective marking.

11 Glossary

The following terms are commonly used in this guide or in video and KVM technology:

Term	Explanation
AES/EBU	Digital audio standard that is officially known as AES3 and that is used for carrying digital audio signals between devices.
Cat X	Any Cat 5e (Cat 6, Cat 7) cable
CGA	The Color Graphics Adapter (CGA) is an old analog graphic standard with up to 16 displayable colors and a maximum resolution of 640x400 pixels.
Component Video	The Component Video (YPbPr) is a high-quality video standard that consists of three independently and separately transmittable video signals, the luminance signal and two color difference signals.
Composite Video	The Composite Video is also called CVBS and it is part of the PAL TV standard.
CON Unit	Component of a Draco major or Media Extender to connect to the console (monitor(s), keyboard and mouse; optionally also with USB 2.0 devices)
CPU Unit	Component of a Draco major or Media Extender to connect to a source (computer, CPU)
DDC	The Display Data Channel (DDC) is a serial communication interface between monitor and source (computer, CPU). It allows a data exchange via monitor cable and an automatic installation and configuration of a monitor driver by the operating system.
Dual Access	A system to operate a source (computer, CPU) from two consoles
Dual-Head	A system with two video connections
Dual Link	A DVI-D interface for resolutions up to 2560x2048 by signal transmission of up to 330 MPixel/s (24-bit)
DVI	Digital video standard, introduced by the Digital Display Working Group (http://www.ddwg.org). Single Link and Dual Link standard are distinguished. The signals have TMDS level.

Term	Explanation
DVI-I	A combined signal (digital and analog) that allows running a VGA monitor at a DVI-I port – in contrast to DVI-D (see DVI).
Fiber	Single-mode or multi-mode fiber cables
EGA	The Enhanced Graphics Adapter (EGA) is an old analog graphic standard, introduced by IBM in 1984. A D-Sub 9 connector is used for connection.
Console	Keyboard, mouse and monitor
CVBS	The analog color video baseband signal (CVBS) is also called Composite Video and it is part of the PAL TV standard.
KVM	Keyboard, video and mouse
Mini-XLR	Industrial standard for electrical plug connections (3 pole) for the transmission of digital audio and control signals
Multi-mode	62.5 μ multi-mode fiber cable or 50 μ multi-mode fiber cable
OSD	The On-Screen-Display is used to display information or to operate a device.
Quad-Head	A system with four video connections
RCA (Cinch)	A not standardized plug connection for transmission of electrical audio and video signals, especially with coaxial cables
SFP	SFPs (Small Form Factor Pluggable) are pluggable interface modules for Gigabit connections. SFP modules are available for Cat X and fiber interconnect cables.
S/PDIF	A digital audio interconnect that is used in consumer audio equipment over relatively short distances.
Single-Head	A system with one video connection
Single Link	A DVI-D interface for resolutions up to 1920x1200 by signal transmission of up to 165 MPixel/s (24-bit). Alternative frequencies are Full HD (1080p), 2K HD (2048x1080) and 2048x1152.
Single-mode	9 μ single-mode fiber cable
S-Video (Y/C)	The S-Video (Y/C) is a video format transmitting luminance and chrominance signals separately. Thereby it has a higher quality standard than CVBS.

Term	Explanation
TOSLINK	Standardized fiber connection system for digital transmission of audio signals (F05 plug connection)
Triple-Head	A system with three video connections
USB-HID	USB-HID devices (Human Interface Device) allow for data input. There is no need for a special driver during installation; "New USB-HID device found" is reported. Typical HID devices include keyboards, mice, graphics tablets and touch screens. Storage, video and audio devices are not HID.
VGA	Video Graphics Array (VGA) is a computer graphics standard with a typical resolution of 640x480 pixels and up to 262,144 colors. It can be seen as a follower of the graphics standards MDA, CGA and EGA.

11.1 Matrix specific Glossary

Term	Explanation
Allow Sharing	Matrix function that allows switching from the own console to any CPU with video.
Auto Connect	Matrix function that allows an automatic connection establishment between the own console and a random CPU that is available.
Auto Logout	Matrix function that describes the duration of inactivity after the user has been logged out from the OSD at this console.
CON Timeout	Matrix function that allows an automatic disconnect of the own console from the connected CPU after a predefined time.
Crosspoint Modus	Free switching assignment of inputs and outputs, whereas the video signal can be connected as often as required and the K/M signal for only one time.
Follow-Me	Duplicating of the own display content to further consoles. If you switch to another CPU, the linked consoles will follow.

Term	Explanation
Force Connect	Matrix function that allows to switch with the own console to a CPU that is already used and in doing so to take keyboard and mouse control. The connected console so far loses K/M control, but keeps video.
Force Disconnect	Matrix function that allows to switch with the own console to a CPU that is already used and in doing so to take KVM control. The connected console so far loses complete KVM control.
Java Tool	Java based control and configuration tool for the Draco major matrix.
Keyboard Connect	Matrix function that allows taking over the keyboard control of an inactive console.
KVM Auto Close	Matrix function that allows after a connection establishment with a CPU in the OSD to close it and to set up the connection immediately.
KVM Listview	Listing of all CPUs that are available for the CPU.
KVM Mode	The user can switch with his own console to all available CPUs in the KVM mode.
Macro Keys	Programmable keys that can execute a stringing together of commands to the matrix.
Mouse Connect	Matrix function that allows taking the mouse control of an inactive console.
Non-Blocking-Access	Matrix configuration where no user can be disturbed by an activity of another user.
OSD Timeout	Matrix function that describes the period of inactivity after OSD will be closed automatically.
Release Time	Matrix function that allows a console that is connected with the same CPU to release the K/M control after a predefined time.
Tie-Line	Communication connection to and between extension modules in a network environment.