◈ BLACK BOX®

ACX048	ACXC8	ACXC32	ACXC64	ACXC48F16
ACX080	ACXC8F	ACXC32F	ACXC64F	ACXC48F32
ACX160	ACXC16	ACXC48	ACXC80	
ACX288	ACXC16F	ACXC48F	ACXC80F	

ServSwitch™ DKM FX and DKM FX Compact

Provides flexible and super-fast crosspoint switching of Full HD video in KVM enterprises.
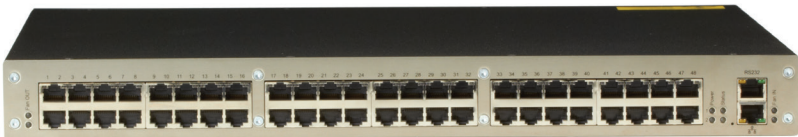
Customer Support Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)
FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746 • Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018 • Web site: www.blackbox.com • E-mail: info@blackbox.com

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NOTE: The ServSwitch DKM FX and the ServSwitch DKM FX Compact function in similar ways. The difference between them is described in the table below.

Table 1. ServSwitch DKM FX and DKM FX Compact comparison.

	ServSwitch DKM FX Compact	ServSwitch DKM FX
Number of Ports	8-, 16-, 32-, 48-, 64-, 80-port options	48-, 80-, 160-, 288-port options
Type of Ports	CATx/Fiber	CATx/fiber I/O ports dependent on I/O card
Form Factor	Small form factor (1/2U)	Large form factor (4U+)
Modular or Not	Not modular	Modular

Disclaimer

Black Box Network Services shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Network Services may revise this document at any time without notice.

FEDERAL COMMUNICATIONS COMMISSION AND
INDUSTRY CANADA RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

Normas Oficiales Mexicanas (NOM)
Electrical Safety Statement
INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

Safety Instructions

For reliable and safe long-term operation of your ServSwitch DKM FX, follow these guidelines:

Installation

- Only use the device according to this user manual.

- Only use in dry, indoor environments.

- The ServSwitch DKM FX and the power supply units can get warm. Don't put them in an enclosed space without any airflow.

- 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 case.

- Connect all power supplies to grounded outlets. In each case, make sure that the ground connection is maintained from the outlet socket 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 circuits and false voltages at the serial interface.

- To disconnect the switch from the power supply, remove the power cords of all power supply units that are in use or set the power switch (if available) to the OFF position.

- 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 ServSwitch DKM FX. There are no user-serviceable parts inside.

- Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com if there is a fault.

Table of Contents

Table of Contents

1. Specifications

1.1 Interfaces

1.1.1 DVI-D Single Link

The video interface supports the DVI-D protocol. All signals that comply with DVI-D single-link standard can be transmitted. This includes, for example, monitor resolutions such as 1920 x 1200 @ 60 Hz, Full HD (1080p), or 2K HD (up to 2048 x 1152). Data rate is limited to 165 MPixel/s.

1.1.2 USB HID

Devices with USB HID interface support a maximum of two devices with USB HID protocol. Each USB HID port provides a maximum current of 100 mA.

Keyboard

The DKM FX or FXC is compatible with most USB keyboards. Certain keyboards with additional functions may require custom firmware to operate. Keyboards with an integral USB Hub (Mac® keyboards, for example) are also supported, but you cannot use more than two active USB HID devices on the DVI and USB HID cards.

Mouse

Compatible with most 2-button, 3-button, and scroll mice.

Other USB HID devices

The proprietary USB emulation also supports certain other USB HID devices, such as specific touchscreens, graphics tablets, bar-code scanners, or special keyboards. Support cannot be guaranteed, however, for every USB HID device.

NOTE: Only two USB HID devices are supported concurrently, such as keyboard and mouse or keyboard and touchscreen. A hub is allowed, but it does not increase the number of HID devices allowed.

To support other USB "non-HID" devices, such as scanners, Web cams or memory devices, choose our devices with transparent USB support.

1.1.3 RJ-45 (Network)

CATx device communication requires a 1000BASE-T connection. Pin the cable according to EIA/TIA-568-B (1000BASE-T) standard with RJ-45 connectors at both ends. All four wire pairs are used in both directions. The cabling is suitable for full-duplex operation. For the cable connection to a source (computer, CPU), use a cross-pinned network cable.

1.1.4 RS-232 (Serial)

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

1.1.5 RJ-45 (Interconnect)

CATx device communication requires a 1000BASE-T connection.

Connector wiring must comply with EIA/TIA-568-B (1000BASE-T), with RJ-45 connectors at both ends. All four wire pairs are used.

1.1.6 Fiber SFP Type LC (Interconnect)

Fiber device communication is performed via Gigabit SFPs connected to suitable fibers fitted with LC connectors (see Section 1.2.2).

NOTE: The correct function of the device can only be guaranteed with SFPs provided by Black Box.

CAUTION: SFP modules can be damaged by electrostatic discharge (ESD). Follow ESD handling precautions.

1.1.7 SDI (Interconnect)

SDI device communication requires a mini coax connection with mini BNC connectors or 3G SFPs with transmission speeds of 0.360 Gbps (SD-SDI, SMPTE 259M), 1.485 Gbps (HD-SDI, SMPTE 292M), and 2.970 Gbps (3G SDI).

1.2 Interconnect Cable

1.2.1 CATx

NOTE: A point-to-point connection is required. Operation with several patch cables is possible. Routing over an active network component, such as an Ethernet hub or router is not allowed.
  - *Avoid routing CATx cables along power cables.*
  - *If the site has three-phase AC power, make sure that the CPU Unit and CON Unit are on the same phase.*

NOTE: To maintain regulatory EMC compliance, use correctly installed shielded CATx cable throughout the interconnection link.

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

Type of Interconnect Cable

The ServSwitch DKM FX requires interconnect cabling specified for Gigabit Ethernet (1000BASE-T). Use solid-core (24 AWG), shielded, CAT5e (or better) cable.

Table 1-1. CATx interconnect cable.

Cable Type	Description
CATx solid-core 24 AWG cable	This S/UTP (CAT5e) cable confoms to EIA/TIA-568-B. Uses four pairs of 24 AWG wires. Connects according to EIA/TIA-568-B (1000BASE-T).
CATx solid-core 26/8 AWG cable	This S/UTP (CAT5e) cable confoms to EIA/TIA-568-B. Uses four pairs of 26/8 AWG wires. Connects according to EIA/TIA-568-B (1000BASE-T).

NOTE: You can use use type 26/8 AWG flexible cables (patch cables), but the maximum possible extension distance is cut in half.

Table 1-2. Maximum acceptable cable length.

Cable Type	Distance
CATx 24 AWG solid conductor cable	400 ft. (140 m)
CATx 26/8 AWG stranded conductor cable	200 ft. (70 m)

1.2.2 Fiber

NOTE: A point-to-point connection is necessary. Operation with multiple patch panels is allowed. Routing over active network components, such as Ethernet hubs, matrices, or routers, is not allowed.

Type of Interconnect Cable

Table 1-3. Fiber interconnect cable.

Cable Type	Description
Single-mode, 9-µm	• Two fibers, 9-µm • In-house patch cable (EFN092)
Multimode 50-µm	• Two fibers, 50-µm • In-house patch cable (EFN6020)
Multimode 62.5-µm	• Two fibers, 62.5-µm • In-house patch cable (EFN116-LCLC)

NOTE: Only use single-mode cables for fiber connections that are based on 3G SFPs.

Table 1-4. Maximum acceptable fiber cable length.

Cable Type	Distance
Single-mode 9-μm	32,800 ft. (10,000 m)
Multimode 50-μm (OM3)	3280 ft. (1000 m)
Multimode 50-μm	1300 ft. (400 m)
Multimode 62.5μm	650 ft. (200 m)

NOTE: If you use single-mode SFPs with multimode fiber optic cable, you can double the maximum acceptable cable length.

Type of Connector

The fiber cable uses LC connectors.

1.2.3 Coaxial

NOTE: A point-to-point connection is necessary.

Table 1-5. Coaxial interconnect cable.

Cable Type	Description
Mini coaxial cable, 18 AWG	RG-6 Impedance: 75 ohms

Table 1-6. Maximum acceptable coaxial cable length.

Bandwidth	Distance
0.270 Gbps	1312 ft. (400 m)
1.485 Gbps	459 ft. (140 m)
2.970 Gbps	394 ft. (120 m)

Type of Connector

The coaxial cable uses mini BNC connectors.

1.3 Connector Pinouts
1.3.1 CPU Board
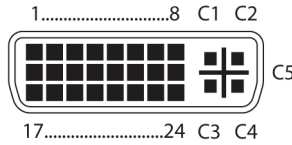
Figure 1-1. DVI-D single-link connector.

Table 1-7. DVI-D single-link connector pinout.

Pin	Signal	Pin	Signal	Pin	Signal
1	T.M.D.S. data 2-	9	T.M.D.S. data 1-	17	T.M.D.S. data 0-
2	T.M.D.S. data 2+	10	T.M.D.S. data 1+	18	T.M.D.S. data 0+
3	T.M.D.S. data 2 GND	11	T.M.D.S. data 1 GND	19	T.M.D.S. data 0 GND
4	Not connnected	12	Not connected	20	Not connected
5	Not connected	13	Not connected	21	Not connected
6	DDC input (SCL)	14	+5 VDC high impedance	22	T.M.D.S. GND
7	DDC output (SDA)	15	GND	23	T.M.D.S. clock+
8	Internal use	16	Hot plug recognition	24	T.M.D.S. clock-
C1	Internal use	—	—	C3	Internal use
C2	Not connected	C5	GND	C4	Internal use

Table 1-8. USB Type A connector.

Picture	Pin	Signal	Color
	1	VCC (+5 VDC)	Red
	2	Data -	White
	3	Data +	Green
	4	GND	Black

Table 1-9. DB9 (serial) connector.
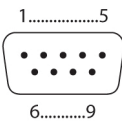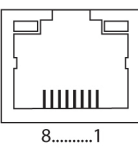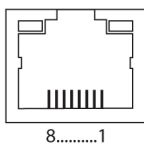
Picture	Pin	Signal	Color	Signal
1............5	9	Not connected	4	DTR
	8	CTS	3	TxD
	7	RTS	2	RxD
6.........9	6	DSR	1	Not connected
	5	GND	—	—

Table 1-10. RJ-45 connector.

Picture	Pin	Signal	Color	Signal
	1	D1+	5	Not connected
	2	D1-	6	D2-
	3	D2+	7	Not connected
8.........1	4	Not connected	8	Not connected
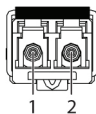
1.3.2 I/O Board CATx

Table 1-11. RJ-45 CATx connector.

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

1.3.3 I/O Board SFP

Table 1-12. LC fiber connector.

Picture	Diode	Signal
	1	Data OUT
1 2	2	Data IN

1.3.4 I/O Board SDI

Table 1-13. BNC connector.

Picture	Pin	Signal
1 2	1	Data In
	2	GND

1.4 Power Supply, Environment, Dimensions, and Weight

Power	ACXC48, ACXC48F, ACXC32, ACXC32F, ACXC16, ACXC16F: 1.4 A, 100–240 VAC, 50–60 Hz internal power supply; ACXC80, ACXC80F, ACXC64, ACXC64C, ACXC48F32, ACXC48F16: 2.3 A, 100–240 VAC, 50–60 Hz; ACXC80, ACXC80F, ACXC48F32: Max. 125 W; ACXC64, ACXC64F, ACXC48F16: Max. 105 W; ACXC48, ACXC48F: Max. 90 W; ACXC32, ACXC32F: Max. 65 W; ACXC16, ACXC16F: Max. 40 W; ACXC8, ACXC8F: Max. 13 W; ACX048: 5 A, 94 W max. without I/O boards; ACX080, ACX080-PS: 5 A, 99 W max. without I/O boards; ACX160, ACX160-PS: 9 A, 188 W max. without I/O boards; ACX288, ACX288-PS: 12 A, 202 W max. without I/O boards; I/O boards (ACXI08-C, ACXI08-SM, ACXI08-SPF): 13 W max.
Environment	Temperature Tolerance: Operating: +41 to +113° F (+5 to +45° C); Storage: -13 to +140° F (-25 to +60° C); Relative Humidity: Max. 80%, non-condensing

Specifications

Dimensions	ACX288: 19"H x 22.8"W x 12"D (48.3 x 57.8 x 33 cm), Shipping box: 25.6"H x 26.8"W x 29.9"D (65 x 68 x 76 cm); ACX160: 19"H x 15.8"W x 12"D (48.3 x 40 x 33 cm), Shipping box: 25.6"H x 26.8"W x 12"D (65 x 68 x 54 cm); ACX080: 19"H x 7"W x 9.1"D (64 x 57 x 36 cm), Shipping box: 25.2"H x 22.4"W x 21.3"D (64 x 57 x 36 cm); ACX048: 19"H x 5.3"W x 9.1"D, Shipping box: 25.2" x 22.4"W x 12.4"D (64 x 57 x 23.1 cm); ACXC8, ACXC8F: 1.7"H x 8.75"W x 5.75"D (4.3 x 22.3 x 14.6 cm); ACXC48, ACXC48F, ACXC32, ACXC32F, ACXC16, ACXC16F: 1.7"H x 17.4"W x 16.9"D (4.4 x 44.4 x 42.9 cm); ACXC48F16, ACXC48F32: ACXC64, ACXC64F, ACXC80, ACXC80F: 3.4"H x 17.48"W x 16.88"D (8.6 x 44.4 x 42.9 cm)
Weight	ACX288: 76.2 lb (34.6 kg) fully equipped, Shipping box: 90.6 lb. (41.1 kg); ACX160: 60 lb. (26.3 kg) fully equipped, Shipping box: 69.9 lb. (31.7 kg); ACX080: 24.5 lb. (11.1 kg) fully equipped, Shipping box: 34.4 lb. (15.6 kg); ACX048: 19.6 lb. (8.9 kg), Shipping box: 26.7 lb. (12.1 kg) ACXC80, ACXC80F, ACXC48F32: 15.9 lb. (7.2 kg); ACXC64, ACXC64F, ACXC48F16: 15.4 lb. (7 kg); ACXC48, ACXC48F: 9 lb. (4.1 kg); ACXC32, ACXC32F: 8.8 lb. (4 kg); ACXC16, ACXC16F: 8.6 lb. (3.9 kg); ACXC8, ACXC8F: 1.9 lb. (0.9 kg)

Specifications

MTBF	The mean time between failure (MTBF) in power-on hours (POH) is listed here. The estimate is based on the FIT rates of the parts included. FIT rates are based on normalized environmental conditions of T = 60°C and activation energy (Ea) of 0.7 eV. Calculations are based on 90% confidence limit.
	We estimate that inside the housing, temperature will be 15°C higher than the ambient temperature. Therefore, the MTBF calculation refers to an ambient temperature of 45°C. The humidity is limited to 60%.

	ACX288: 260,000 POH;
	ACX160: 310,000 POH;
	ACX080: 320,000 POH;
	ACX048: 350,000 POH;
	CPU board: 480,000 POH;
	I/O board SFP: 500,000 POH;
	I/O board CATx: 410,000 POH
	DKM FX 288/160 PSU: 200,000 POH;
	DKM FX 80/48 PSU: 130,000 POH;
	ACXC80: Chassis: 90,690;
	  Per fan: 280,000 POH,
	  Per PSU: 238,000;
	ACXC80F: Chassis: 83,350;
	  Per fan: 280,000 POH,
	  Per PSU: 238,000;
	ACXC48F32: Chassis: 87,250;
	  Per fan: 280,000 POH,
	  Per PSU: 238,000;
	ACXC64: Chassis: 97,300;
	Per fan: 280,000 POH,
	  Per PSU: 238,000;
	ACXC64F: Chassis: 92,900;
	  Per fan: 280,000 POH,
	  Per PSU: 238,000;
	ACXC48F16: Chassis: 95,600;
	  Per fan: 280,000 POH,
	  Per PSU: 238,000;

Specifications

MTBF (continued)	ACXC48: Chassis: 140,000;
	   Per fan: 280,000 POH,
	   Per PSU: 295,700;
	ACXC48F: Chassis: 133,400;
	   Per fan: 280,000 POH,
	   Per PSU: 295,700;
	ACXC32: Chassis: 165,300;
	   Per fan: 280,000 POH,
	   Per PSU: 295,700;
	ACXC32F: Chassis: 161,200;
	   Per fan: 280,000 POH,
	   Per PSU: 295,700;
	ACXC16: Chassis: 208,322;
	   Per fan: 280,000 POH,
	   Per PSU: 295,700;
	ACXC16F: Chassis: 206,100;
	   Per fan: 280,000 POH,
	   Per PSU: 295,700;
	ACXC8,ACXC8F: Chassis: 684,700
	   Per fan: 280,000 POH,
	   Per PSU: 309,700

2. Overview

2.1 Description

2.1.1 Application

The ServSwitch DKM FX is used to establish connections from consoles (monitor, keyboard, mouse, and other peripheral devices) to various sources (computer, CPU). In a maximum configuration, up to 288 independent ports can be defined and switched either as a console or a CPU.

The ServSwitch DKM FX Compact is used to establish connections from consoles (monitor, keyboard, mouse, and other peripheral devices) to various sources (computer, CPU). In a maximum configuration, up to 8 (using the ACXC8 or ACXC8F), 16 (using the ACXC16), 32 (using the ACXC32), 48 (using the ACXC48), 48 CATx ports/16 SFP slots (using the ACXC48F16), or 48 CATx ports/32 SFP slots (using the ACXC48F32), 64 CATx (using the ACXC64), or 80 CATx (using the ACXC80) independent ports can be defined and switched either as a console or a CPU.

The ServSwitch DKM FX or FXC is mainly specified for the use with extenders that are able to transmit video, KVM, and USB 2.0 signals. You can also use it as a video-only matrix.

For the connection between the ServSwitch DKM FX or FXC and the peripheral devices, such as KVM extenders or video sources, you can use CATx, fiber, or coaxial cables, depending on the hardware used.

The ServSwitch DKM FX serves as a repeater. You can place it up to 6.2 miles (10 km) from the consoles and 6.2 miles (10 km) from the sources.

2.1.2 Access Options

You have the following options to access the ServSwitch DKM FX for configuration and operation:

Table 2-1. Access options.

Access option	Symbol
OSD	OSD
Java tool	JAVA
Serial interface	RS232

2.2 System Overview

A ServSwitch DKM FX system consists of a ServSwitch DKM FX or DKM FX Compact and, for KVM applications, one or more CPU units/CON units. The ServSwitch connects to the CPU units/CON units by interconnect cables (copper or fiber) or is connected directly to the video devices when used as a video matrix.

The CPU units connect directly to the sources (computer, CPU), using the included cables.

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

The ServSwitch DKM FX and the CPU units/CON units communicate over CATx, fiber, or coaxial interconnect cables. The ServSwitch DKM FX Compact and the CPU units/CON units communicate over CATx or fiber cable.

Figure 2-1 shows the system overview. Table 2-2 describes its components.
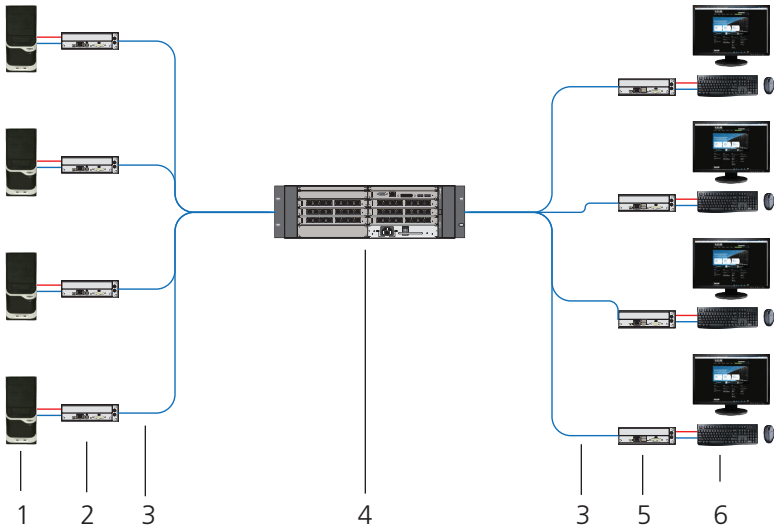
Figure 2-1. System overview.

Table 2-2. System components.

Number	Component
1	Computer/Server or Video Source
2	CPU units (Transmiters)
3	Interconnect cable
4	ServSwitch DKM FX or FXC
5	CON units (Receivers)
6	User Station/Console

See Section 3.2 for installation examples.

2.3 Available Products

Table 2-3. Available products.

Number	Description
ServSwitch DKM FX	
ACX048	ServSwitch DKM FX 48-port with control card and power supply
ACX080	ServSwitch DKM FX 80-port with control card and power supply
ACX160	ServSwitch DKM FX 160-port with control card and (2) power supplies
ACX288	ServSwitch DKM FX 288-port with control card and (2) power supplies
ServSwitch DKM FX Compact	
ACXC8	ServSwitch DKM FX Compact 8-port, CATx
ACXC8F	ServSwitch DKM FX Compact 8-port, SFP
ACXC16	ServSwitch DKM FX Compact 16-port, CATx
ACXC16F	ServSwitch DKM FX Compact 16-port, 16 SFP slots
ACXC32	ServSwitch DKM FX Compact 32-port, CATx
ACXC32F	ServSwitch DKM FX Compact 32-port, 32 SFP slots
ACXC48	ServSwitch DKM FX Compact 48-port, CATx
ACXC48F	ServSwitch DKM FX Compact 48-port, 48 SFP slots
ACXC48F16	ServSwitch DKM FX Compact 48 CATX ports, 16 SFP slots
ACXC48F32	ServSwitch DKM FX Compact 48 CATx ports, 32 SFP slots
ACXC64	ServSwitch DKM FX Compact 64-port, CATx
ACXC64F	ServSwitch DKM FX Compact 64-port, 64 SFP slots
ACXC80	ServSwitch DKM FX Compact 80-port, CATx
ACXC80F	ServSwitch DKM FX Compact 80-port, 80 SFP slots
Accessories	
ACX-JAV	DKM FX Java Switch and Preset License
ACX-API	DKM FX API License for external control, includes ACX-JAV
ACX-SYS	DKM FX SNMP Switch and Syslog License
ACX-CAS	DKM FX Cascade License
ACX-GSW	Multi-Screen Control License
ACXIO8-C	8-port CATx input/output (I/O) module
ACXIO8-SM	8-port single-mode fiber input/output (I/O) module
ACXI08-HS	8-port single-mode fiber SFP input/output (I/O) module 3.125 Gbps
ACXI08-SDI	8-port single-mode SDI fiber input/output (I/O) module
ACXIO8-SFP	8-port single-mode fiber SFP input/output (I/O) module

Table 2-3 (continued). Available products.

Number	Description
Accessories (continued)	
ACXI08-G G	8-port universal I/O module that can support third-party SFPs
ACX288-CTL	ServSwitch DKM FX controller card
ACXSFPC	CATx SFP module
ACXSFPS	Single-mode fiber SFP module
ACXSFPHS	Single-mode fiber SFP module 3.125 Gbps
ACXSDI-SM-T	SDI fiber transmitter card
ACXSDI3G-SM-T	HD-SDI/3G-SDI fiber transmitter card
ACXSDI-CX-T	SDI CATx transmitter card
ACXSDI3G-CX-T	HD-SDI/3G-SDI CATx transmitter card
ACXSDI-SM-R	SDI fiber receiver card
ACXSDI3G-SM-R	HD-SDI/3G-SDI fiber receiver card
ACXSDI-CX-R	SDI CATx receiver card
ACX288-FAN	Fan for the 160/288-port chassis
ACX080-FAN	Fan for the 80-port chassis
ACX048-FAN	Fan for the 48-port chassis
ACX288-PS	Power supply for ACX288
ACX160-PS	Power supply for ACX160
ACX080-PS	Power supply for ACX048 and ACX080
ACX288-FIL	Spare Filter Module
ACX080-FIL	Spare Filter Module
ACX048-FIL	Spare Filter Module
ACX288-BLKP-1S	DKM FX 48/80/160/288 blank plate, 1-slot
ACX288-BLKP-2S	DKM FX 48/80/160/289 blank plate, 2-slots
ACX288-BLKP-4S	DKM FX 48/80/160/290 blank plate, 4-slots
ACX288-BLKP-8S	DKM FX 48/80/160/291 blank plate, 8-slots

2.4 What's Included

Your package should contain the following items. If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

ACX048, ACX080, ACX160, ACX288, ACXC8, ACXC8F, ACXC16, ACXC16F, ACXC32, ACXC32F, ACXC48, ACXC48F, ACXC48F16, ACXC48F32, ACXC64, ACXC64F, ACXC80, ACXC80F:

• DKM FX or DKM FX Compact matrix

• (1) power cord per built-in power supply unit

• (1) serial control cable (DKM FXC includes a DB9 to RJ-45 adapter)

• Mounting accessories

• Quick Install Guide

• (1) CATx network cable (cross-wired)

2.5 Device Views

In Sections 2.5.1 through 2.5.4, Figures 2-2 through 2-5 illustrate the ServSwitch DKM FX chassis models. Tables 2-4 through 2-7 describe their components.

NOTE: The following images of the chassis are fully populated with I/O cards and are intended to be example diagrams. The chassis do not come with any I/O cards. You need to purchase the I/O cards separately.

2.5.1 ServSwitch DKM FX 48-Port (ACX048)
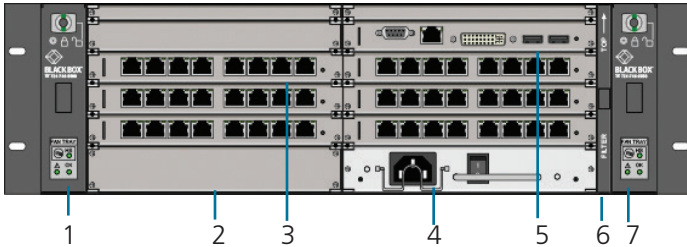
Figure 2-2. Front view, ACX048.

Table 2-4. ACX048 components.

Number	Component
1	Slot for fan tray
2	Slot for Power Supply Unit 1
3	Slot for I/O Boards 1–6
4	Slot for Power Supply Unit 2
5	Slot for CPU board
6	Slot for air filter
7	Slot for Fan Tray 2

2.5.2 ServSwitch DKM FX 80-Port (ACX080)
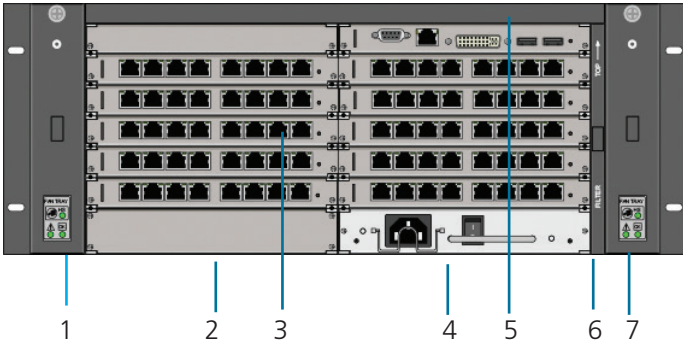
Figure 2-3. Front view, ACX080.

Table 2-5. ACX080 components.

Number	Component
1	Slot for fan tray
2	Slot for Power Supply Unit 1
3	Slot for I/O Boards 1–10
4	Slot for Power Supply Unit 2
5	Slot for CPU board
6	Slot for air filter
7	Slot for Fan Tray 2

2.5.3 ServSwitch DKM FX 160-Port (ACX160)
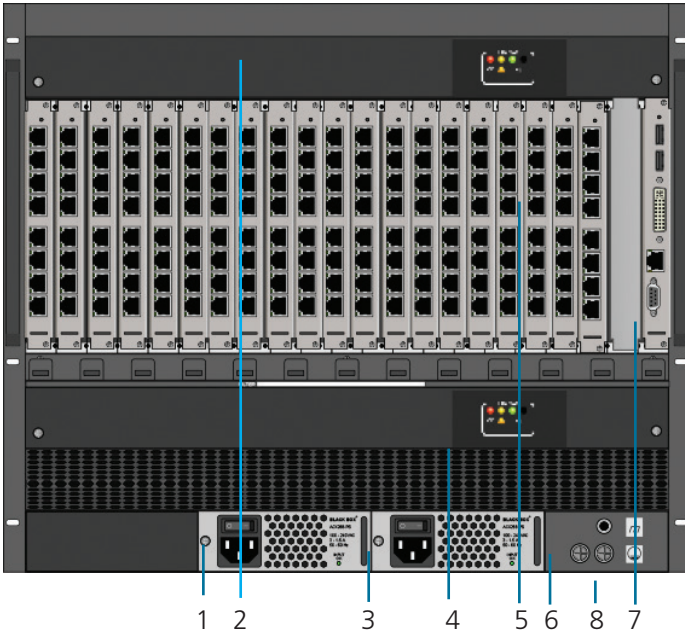
Figure 2-4. Front view, ACX160.

Table 2-6. ACX160 components.

Number	Component
1	Slot for Power Supply Unit 1
2	Slot for Fan Tray 1
3	Slot for Power Supply Unit 2
4	Slot for Fan Tray 2
5	Slot for I/O Boards 1–36
6	Slot for Power Supply Unit 3
7	Slot for CPU board
8	Grounding

2.5.4 ServSwitch DKM FX 288-Port (ACX288)
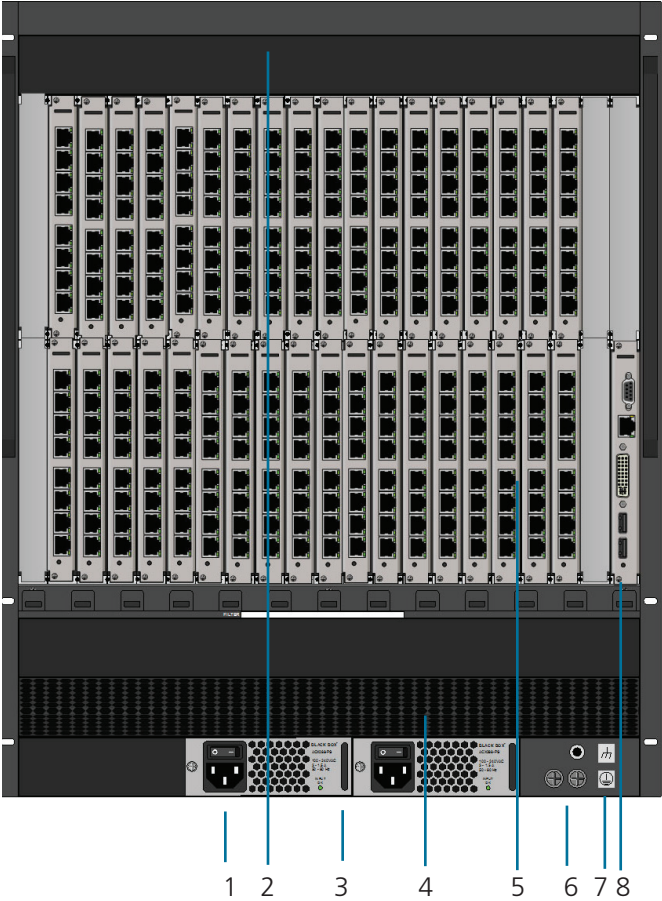
Figure 2-5. Front view, ACX288.

Table 2-7. ACX288 components.

Number	Component
1	Slot for Power Supply Unit 1
2	Slot for Fan Tray 1
3	Slot for Power Supply Unit 2
4	Slot for Fan Tray 2
5	Slot for I/O Boards 1–36
6	Slot for Power Supply Unit 3
7	Grounding
8	Slot for CPU board

NOTE: The ServSwitch DKM FX Compact models are described next.

2.5.5 ServSwitch DKM FX Compact 8-Port, CATx (ACXC8)
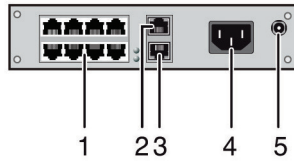
Figure 2-6. Front view, ACXC8.

Table 2-8. ACXC8 components.

Number	Component
1	I/O ports 1–8 (CATx)
2	Serial connection (RJ-45)
3	Network connection (RJ-45)
4	Connect to power supply
5	Connect to a 5-VDC power supply (redundancy, optional)

2.5.6 ServSwitch DKM FX Compact 8-Port, SFP (ACXC8F)
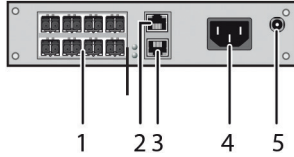
Figure 2-7. Front view, ACXC8F.

Table 2-9. ACXC8F components.

Number	Component
1	I/O ports 1–8 (SFP)
2	Serial connection (RJ-45)
3	Network connection (RJ-45)
4	Connect to power supply
5	Connect to a 5-VDC power supply (redundancy, optional)

2.5.7 ServSwitch DKM FX Compact 16-Port (ACXC16)

Figure 2-8. Front view, ACXC16.

Table 2-10. ACXC16 components.

Number	Component
1	I/O ports 1–16 (CATx)
2	Serial connection (RJ-45)
3	Network connection (RJ-45)
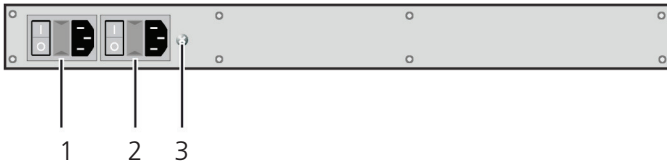
Figure 2-9. Back view, ACXC16.

Table 2-11. ACXC16 back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.8 ServSwitch DKM FX Compact 16-Port Fiber (ACXC16F)

1   2 3

Figure 2-10. Front view, ACXC16F.

Table 2-12. ACXC16F components.

Number	Component
1	I/O ports 1–16 (SFP)
2	Serial connection (RJ-45)
3	Network connection (RJ-45)

1   2   3
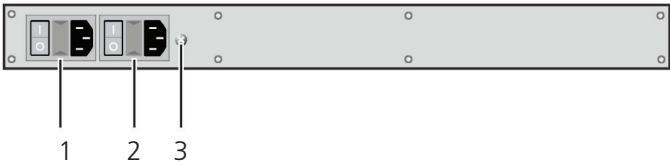
Figure 2-11. Back view, ACXC16F.

Table 2-13. ACXC16F back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.9 ServSwitch DKM FX Compact 32-Port (ACXC32)
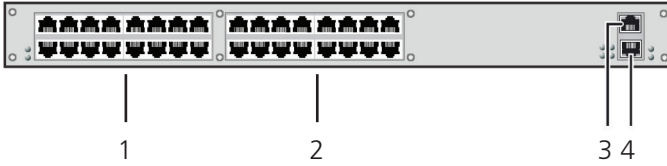
Figure 2-12. Front view, ACXC32.

Table 2-14. ACXC32 components.

Number	Component
1	I/O ports 1–16 (CATx)
2	I/O ports 17–32 (CATx)
3	Serial connection (RJ-45)
4	Network connection (RJ-45)
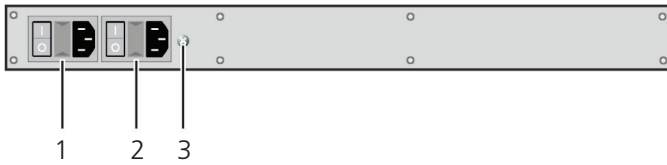
Figure 2-13. Back view, ACXC32.

Table 2-15. ACXC32 back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.10 ServSwitch DKM FX Compact 32-Port Fiber (ACXC32F)
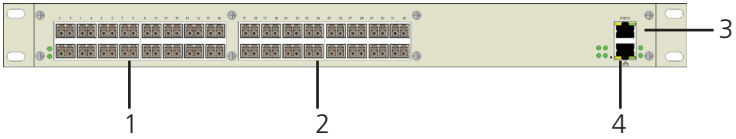
Figure 2-14. Front view, ACXC32F.

Table 2-16. ACXC32F components.

Number	Component
1	I/O ports 1–16 (SFP)
2	I/O ports 17–32 (SFP)
3	Serial connection (RJ-45)
4	Network connection (RJ-45)
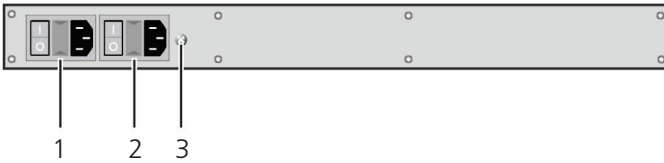
Figure 2-15. Back view, ACXC32F.

Table 2-17. ACXC32F back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.11 ServSwitch DKM FX Compact 48-Port (ACXC48)
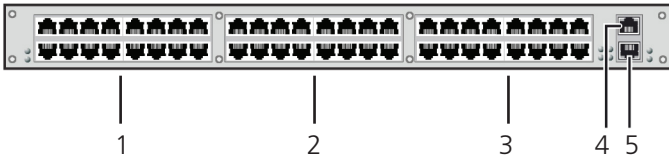
Figure 2-16. Front view, ACXC48.

Table 2-18. ACXC48 front-panel
components.

Number	Component
1	I/O ports 1–16 (CATx)
2	I/O ports 17–32 (CATx)
3	I/O ports 33–48 (CATx)
4	Serial connection (RJ-45)
5	Network connection (RJ-45)
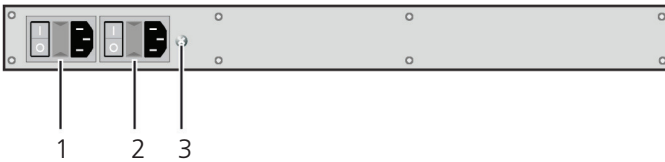
Figure 2-17. Back view, ACXC48.

Table 2-19. ACXC48 back-panel
components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.12 ServSwitch DKM FX Compact 48-Port Fiber (ACXC48F)

1   2   3   4 5
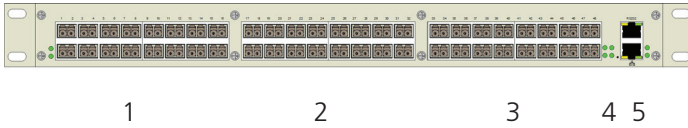
Figure 2-18. Front view, ACXC48F.

Table 2-20. ACXC48F front-panel components.

Number	Component
1	I/O ports 1–16 (SFP)
2	I/O ports 17–32 (SFP)
3	I/O ports 33–48 (SFP)
4	Serial connection (RJ-45)
5	Network connection (RJ-45)

1   2 3
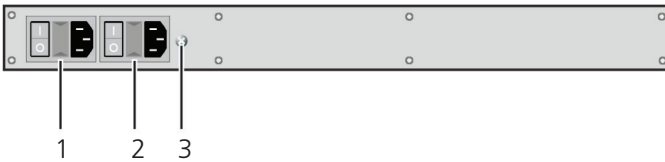
Figure 2-19. Back view, ACXC48F.

Table 2-21. ACXC48 back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.13 ServSwitch DKM FX Compact 64-Port
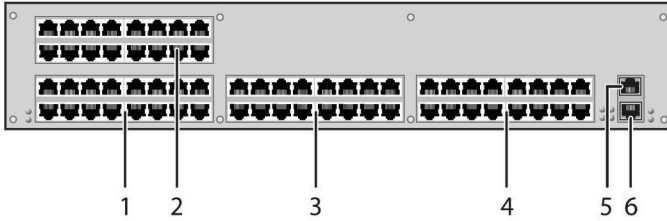
Figure 2-20. Front view, ACXC64.

Table 2-22. ACXC64 components.

Number	Component
1	I/O ports 1–16 (CATx)
2	I/O ports 49–64 (CATx)
3	I/O ports 17–32 (CATx)
4	I/O ports 33–48 (CATx)
5	Serial connection (RJ-45)
6	Network connection (RJ-45)

Figure 2-21. Back view, ACXC64.

Table 2-23. ACXC64 back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.14 ServSwitch DKM FX Compact 64-Port Fiber (ACXC64F)
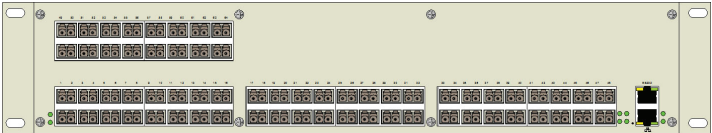
Figure 2-22. Front view, ACXC64F.

Table 2-24. ACXC64F components.

Number	Component
1	I/O ports 1–16 (SFP)
2	I/O ports 49–64 (SFP)
3	I/O ports 17–32 (SFP)
4	I/O ports 33–48 (SFP)
5	Serial connection (RJ-45)
6	Network connection (RJ-45)

Figure 2-23. Back view, ACXC64F.

Table 2-25. ACXC64F back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.15 ServSwitch DKM FX Compact 80-Port (ACXC80)
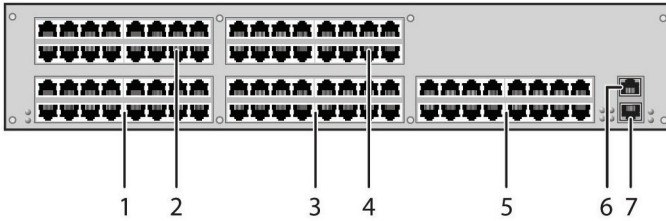
Figure 2-24. Front view, ACXC80.

Table 2-26. ACXC80 components.

Number	Component
1	I/O ports 1–16 (CATx)
2	I/O ports 49–64 (CATx)
3	I/O ports 17–32 (CATx)
4	I/O ports 65–80 (CATx)
5	I/O ports 33–48 (CATx)
6	Serial connection (RJ-45)
7	Network connection (RJ-45)

Figure 2-25. Back view, ACXC80.

Table 2-27. ACXC80 back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.16 ServSwitch DKM FX Compact 80-Port Fiber (ACXC80F)
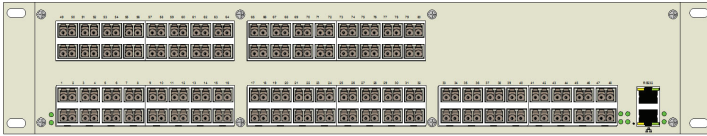
Figure 2-26. Front view, ACXC80F.

Table 2-28. ACXC80F components.

Number	Component
1	I/O ports 1–16 (SFP)
2	I/O ports 49–64 (SFP)
3	I/O ports 17–32 (SFP)
4	I/O ports 65–80 (SFP)
5	I/O ports 33–48 (SFP)
6	Serial connection (RJ-45)
7	Network connection (RJ-45)

Figure 2-27. Back view, ACXC80.

Table 2-29. ACXC80 back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.17 ServSwitch DKM FX Compact 48 CATx Ports, 16 Fiber Ports (ACXC48F16)
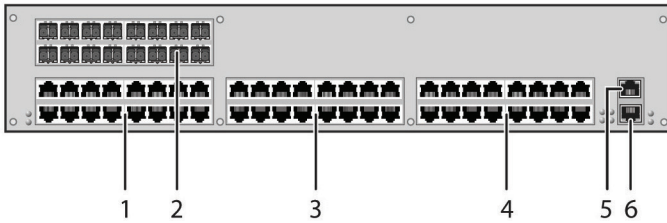
Figure 2-28. Front view, ACXC48F16.

Table 2-30. ACXC48F16 components.

Number	Component
1	I/O ports 1–16 (CATx)
2	I/O ports 49–64 (SFP)
3	I/O ports 17–32 (CATx)
4	I/O ports 33–48 (CATx)
5	Serial connection (RJ-45)
6	Network connection (RJ-45)
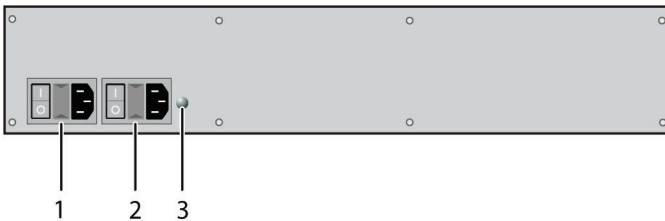
Figure 2-29. Back view, ACXC48F16.

Table 2-31. ACXC48F16 back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.5.18 ServSwitch DKM FX Compact 48 CATx Ports, 32 Fiber Ports (ACXC48F32)
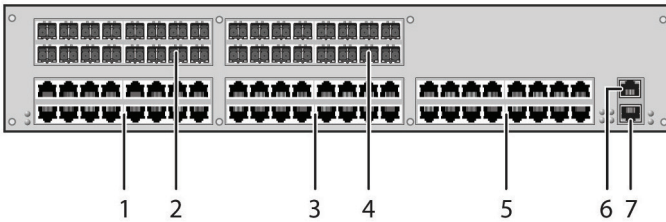
Figure 2-30. Front view, ACXC48F32.

Table 2-32. ACXC48F32 components.

Number	Component
1	I/O ports 1–16 (CATx)
2	I/O ports 49–64 (SFP)
3	I/O ports 17–32 (CATx)
4	I/O ports 65–80 (SFP)
5	I/O ports 33–48 (CATx)
6	Serial connection (RJ-45)
7	Network connection (RJ-45)
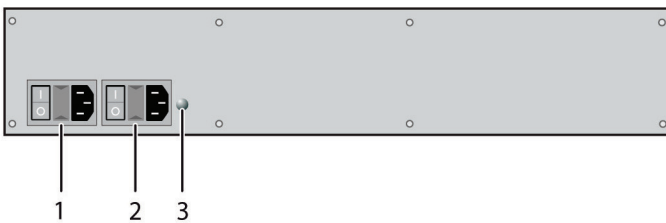
Figure 2-31. Back view, ACXC48F32.

Table 2-33. ACXC48F32 back-panel components.

Number	Component
1	Power supply unit 1
2	Power supply unit 2
3	Grounding

2.6 Diagnostics and Status

2.6.1 Status LEDs

The ServSwitch DKM FX and DKM FX Compact LED indicators are shown in Figures 2-12 through 2-22, and described in Tables 2-14 through 2-25.
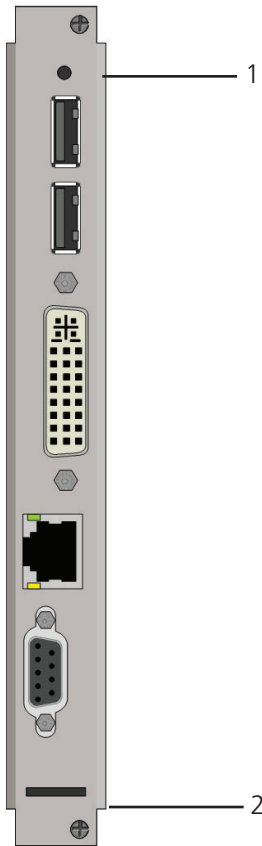
Figure 2-32. CPU board, front view.

Table 2-34. Status LEDs on the CPU board.

Number	LED	Status	Description
1	Status 1	White	CPU board is in registration process
		Blue flashing	Registration at the matrix is started
		Red flashing	Registration is in progess
		Green flashing	Operating condition
		Green	CPU board de-registered
2	Status 2	White	CPU board is in registration process
		Red flashing	Registration at the matrix is started
		Off	Operating condition

NOTE: Because of variations in the LED type, "white" may also appear as light purple or light blue.
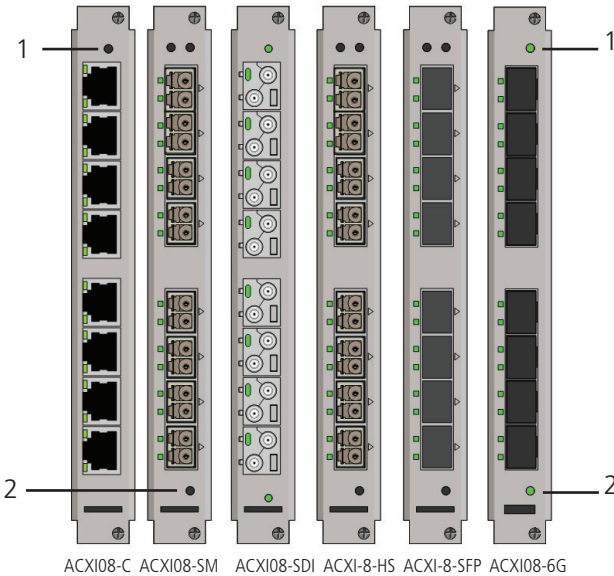
Figure 2-33. LEDs on the I/O boards.

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Table 2-35. Status LEDs on the I/O boards.

Number	LED	Status	Description
1	Status 1	Light blue	I/O board in boot process
		Red flashing	I/O board in registration process
		Red/Yellow flashing	I/O board in service mode or firmware conflict with CPU board
		Green flashing	Operating condition, I/O board registered at the matrix
		Green	I/O board de-registered (locking pin pulled out)
2	Status 2	White	I/O board in boot process
		Blue	I/O board in registration process
		Blue flashing	Operating condition, communication active with CPU board active
		Red flashing	I/O board de-registered (locking pin pulled out)

CATx   SFP fiber   SFP coax
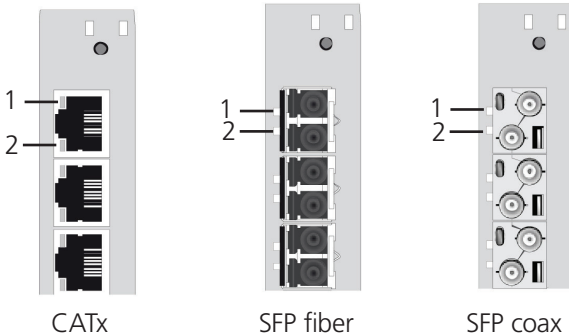
Figure 2-34. Ports status LEDs on the I/O boards.

Table 2-36. Port status LEDs on the I/O boards.

Number	LED	Status	Description
1	Link status (green)	Off	Port not activated
		Flashing	Port activated, no connection via interconnect cable
		On	Connection via interconnect cable OK, data traffic active
2	Link status (orange)	Off	Port not activated
		Flashing	Port activated, no connection via interconnect cable
		On	Connection via interconnect cable OK, data traffic active
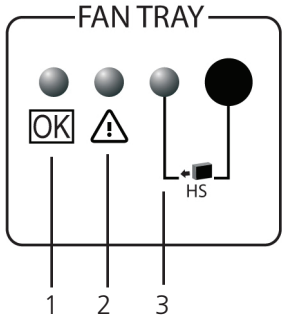
Figure 2-35. Status LEDs on the fan tray.

Table 2-37. Status LEDs on the fan tray.

Number	LED	Status	Description
1	Status 1 (green)	On	Operating condition
2	Status 2 (blue)	Off	Operating condition
		On	Error indication
3	Hot swap (blue)	Off	Hot swap option deactivated
		On	Hot swap option activated
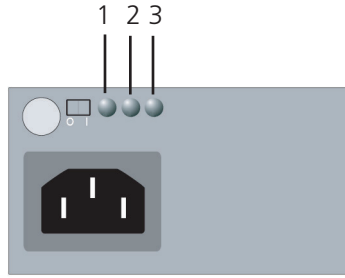
Figure 2-36. Status LEDs on the power supply unit (ACX288-PS).

Table 2-38. Status LEDs on the power supply unit
(ACX288-PS).

Number	LED	Status	Description
1	AC input OK (green)	On	Operating condition
2	DC output OK (green)	On	Operating condition
3	O/T (yellow)	Off	Normal temperature
		On	High temperature
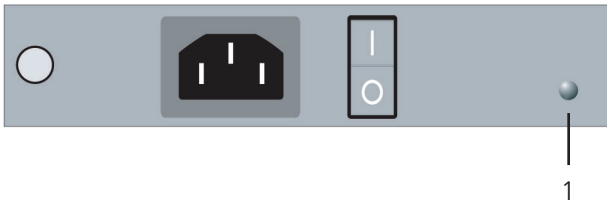
Figure 2-37. Status LEDs on the power supply unit (ACX080-PS).

Table 2-39. Status LEDs on the power supply unit
(ACX080-PS).

Number	LED	Status	Description
1	DC input OK (green)	On	Operating condition
	DC output OK (green)	Off	No power supply

Status LEDs on ACXC8, ACXC8F, ACXC16, ACXC16F, ACXC32, ACXC32F, ACXC48, ACXC48F16, ACXC38F32, ACXC64, ACXC64F, ACXC80, ACXC80F

1 2
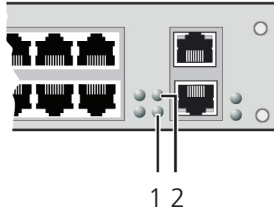
NOTE: Because LED type varies, "white" might also appear as light purple or light blue.

LAN Port LEDs on the ACXC8, ACXC8F, ACXC16, ACXC16F, ACXC32, ACXC32F, ACXC48, ACXC48F16, ACXC38F32, ACXC64, ACXC64F, ACXC80, ACXC80F

1 2
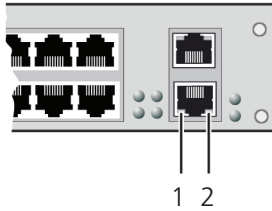
Number	LED	Status	Description
1	Status LED 1 (orange)	On	Connection to network is available
		Off	No connection to network
2	Status LED 2 (green)	Flashing	Data traffic is active
		Off	Data traffic is not active

I/O Port LEDs on the ACXC8, ACXC8F, ACXC16, ACXC16F, ACXC32, ACXC32F, ACXC48, ACXC48F16, ACXC38F32, ACXC64, ACXC64F, ACXC80, ACXC80F

1 2
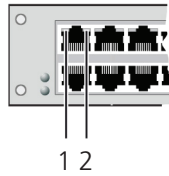
Number	LED
1	Link status port 1
2	Link status port 2

Table 2-38. Status LEDs at the ports of the
ACXI08-C, ACXI08-SM, ACXI08-SFP I/O boards.

Number	LED	Status	Description
1	Link status	Off	Initialization
		Green	Connection via interconnect cable is OK, data traffic is active
		Orange	Extender is not recognized

1 2
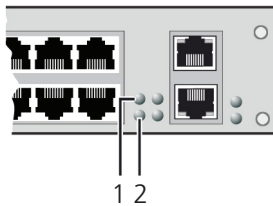
Number	LED	Status	Description
1	Status PSU 1 (green)	On	Operating condition
		Off	Power supply unit off
2	Status PSU 2 (green)	On	Operating condition
		Off	Power supply unit off

Fan Tray Status LEDs on ACXC8, ACXC8F, ACXC16, ACXC16F, ACXC32, ACXC32F, ACXC48, ACXC48F16, ACXC38F32, ACXC64, ACXC64F, ACXC80, ACXC80F

1 2

1 2
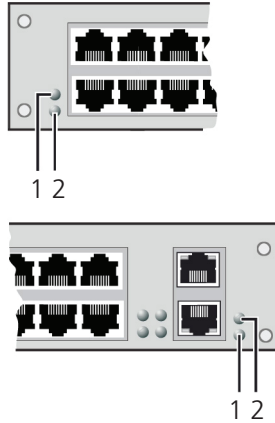
Number	LED	Status	Description
1	Left Fan Status 1 (red)	On	Error indication
		Off	Operating condition
2	Left Fan Status 2 (green)	On	Operating condition
		Off	Fan off
3	Right Fan Status 2 (green)	On	Operating condition
		Off	Fan off
4	Right Fan Status 1 (red)	On	Error indication
		Off	Operating condition

2.6.2 Port Status

The connections and the switching status between the various consoles and CPUs are shown in this menu.

You can access the menu via Java.

Figure 2-39. OSD and Java icons.

Java® Tool

The current port configuration of the ServSwitch DKM FX is illustrated in this menu.

Select "Status > Matrix View" in the task area.
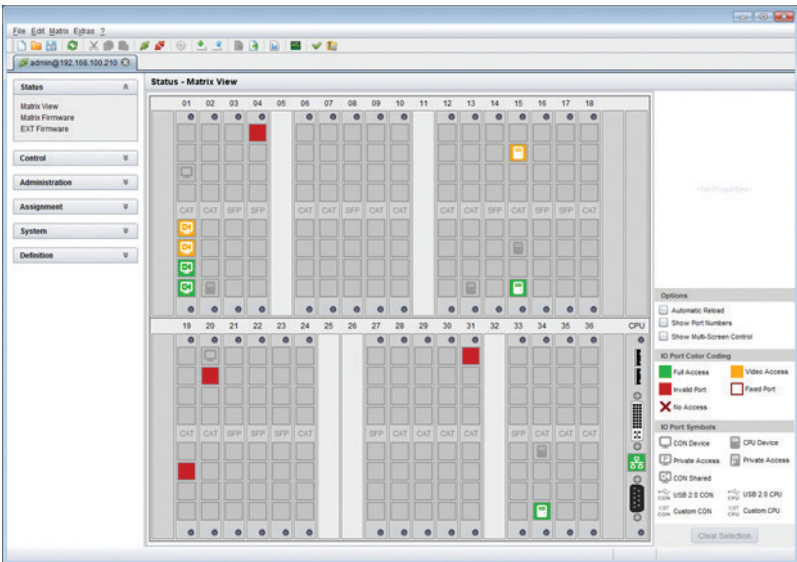
Figure 2-40. Menu Status—Matrix View screen, Example #1.
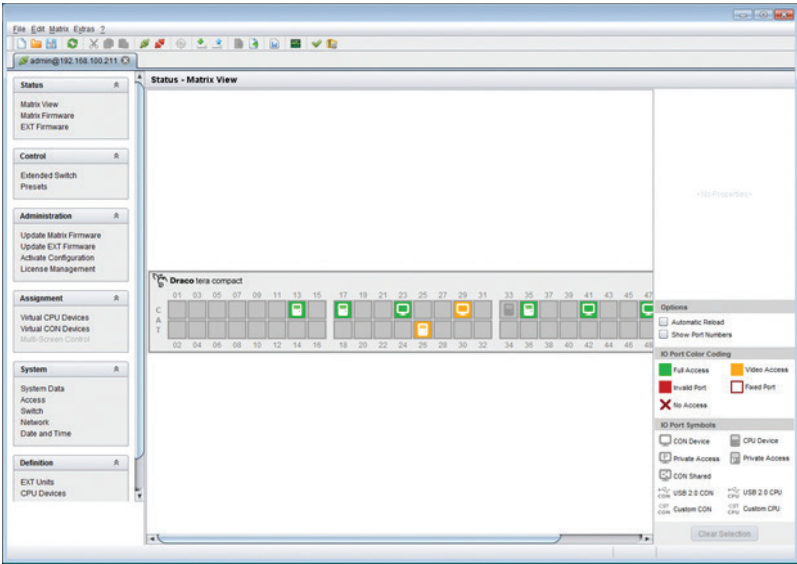
Figure 2-41. Menu Status—Matrix View screen, Example #1.

Table 2-41. Connection status.

Color	Description
Gray	Port not connected
Yellow	Video connection
Green	KVM connection
Red	Faulty Port/unconfigured USB 2.0 card

The symbol in Table 2-42 indicates the extender that is recognized and defined at a certain port.

Table 2-42. Extender recognized.

Symbol	Description
	Port connected to a CPU unit
	Port is connected to a CPU unit that is switched to a CON unit in Private Mode (see Section 3.7.3).
	Port connected to a CON unit
	Port connected to a CON unit with Shared Access to a CPU.
	Port is connected to a CON unit that is connected to a CPU unit in Private Mode (see Section 3.7.3).
	Port connected to a USB 2.0 CPU unit
	Port connected t a USB 2.0 CON unit
	Port is configured as a CON port for customer-specific applications.
	Port is configured as a CPU port for customer-specific applications.

• Red framed ports are defined as "fixed" (for example, for USB 2.0 connections).

• The port with four static blue squares is currently selected.

• If a port is selected, all the other ports will be shown transparently, except for those ports that are connected to the currently selected port. To clear a selected port, press the "Clear Selection" button.

• If there is a red cross on a port when switching by the matrix view, the console chosen to be connected does not have access rights to the respective CPU at this port.

NOTE: To show the extender information of the currently selected port in the right part of the working area, press the left mouse button.

The information in Table 2-38 is available:

Table 2-43. Extender information.

Symbol	Description
Extender name	Name of the selected extenders
Extender type	Type of the selected extender
Port ID	Number of the selected port
Device name	Name of the connected console or CPU
Connections	Listing of assigned connections to the marked port (full access or video access)

NOTE: To open the context menu for the currently selected port with further functions, press the right mouse button.

The context functions in Table 2-39 are available:

Table 2-44. Context functions.

Function	Description
Open extender	The menu for definition of the currently selected extender is opened
Open device	The menu for definition of the currently selected console or CPU is opened
Switch	The menu for execution of switching applications is opened

To reload the Matrix View:

• Press the "F5" key of a connected keyboard.

• Execute "Edit > Reload" in the menu bar.

• Press the "Reload " button in the tool bar.

• Wait several seconds if "automatic reload" checkbox is checked.

2.6.3 Port Status Matrix Grid

In this menu, the connections and the switching status between the various CON and CPU Devices are shown within the Matrix Grid.

The port view is divided into the different Grid matrices. As a result, each matrix is displayed in an optimized view of 24 ports per line in order to be able to show also a larger number of ports.

You have the following option to access the menu:

Figure 2-42.

Java Tool

The current port configuration of the Matrix Grid is illustrated in this menu.

• Select Status > Grid Port View in the task area when connected to the matrix.
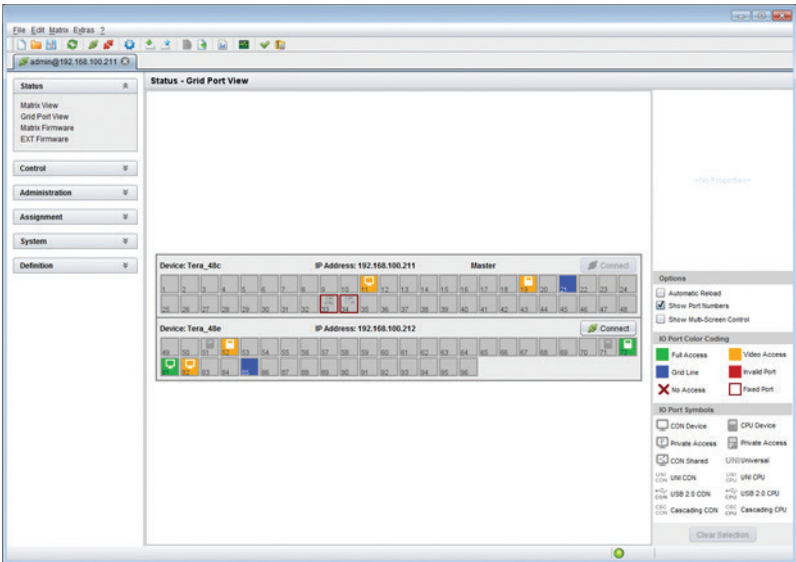
Figure 2-43. Menu Status—Grid Port View.

NOTE: Functions, colors, and symbols used in the Grid Port View are identical to those in the port status of the Matrix View (see Section 2.6.2).

2.6.4 Extender OSD

All extenders used with the matrix switch have an individual OSD to display the connection status of the console.
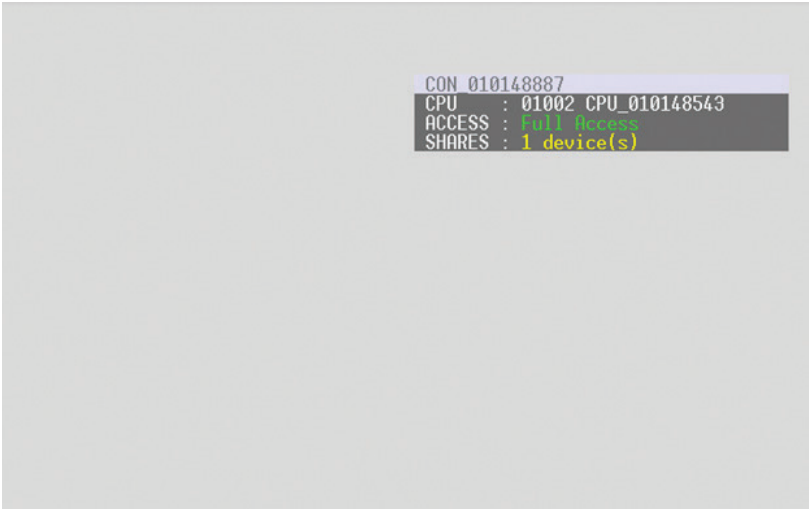
Figure 2-44. Example view of extender OSD.

Table 2-47. Extender OSD information.

Field	Description
CON	Name of the extender's individual console
CPU	Name of the currently connected CPU
Access	Full Access: The extender's indivdual console has a KVM connection to the displayed CPU.
	Video Access: The extender's individual console has a video-only connection to the displayed CPU.
	Private Mode: The extender's individual console has a Private Mode connection to the displayed CPU.
	Not connected: The individual console is not connected to a CPU.
SHARED	x device(s) shows the exact number of devices connected to the current CPU. If the field remains empty, no other shared connections are active.

NOTE: If the Mouse Connect or Keyboard Connect options are used, the name of the console with keyboard/mouse control will be displayed at those consoles that do not have K/M control at the moment. The console is displayed in a yellow color under "Access."

2.6.5 Network Status

The current network configuration is shown in this menu.

You can access the menu via OSD or Java:

Figure 2-45. OSD and Java icons.

OSD

Select "Status > Network" in the main menu.
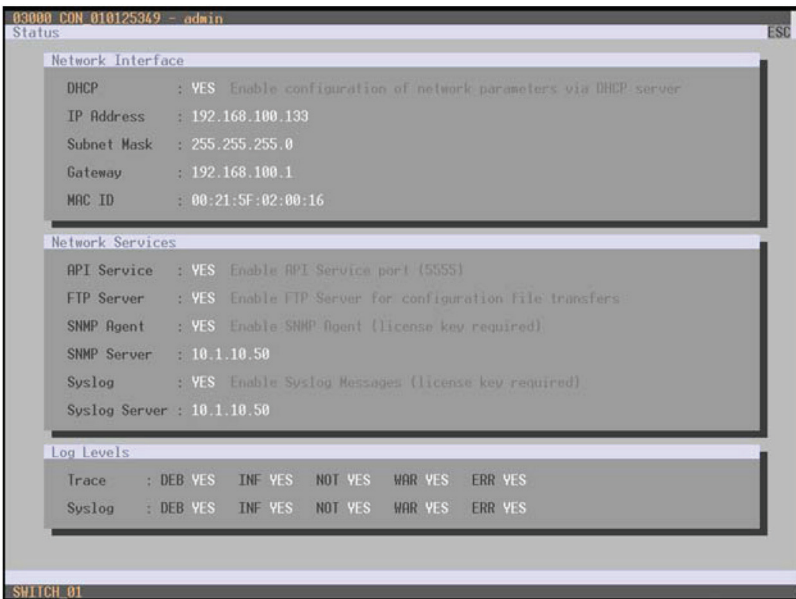
Figure 2-40. Status—Network screen.

The following information is shown in the Network Status menu:

Table 2-48. Network status.

Field	Description
DHCP	Information if the network settings are applied dynamically. Display Y (Yes) or N (No)
IP address	Information about the IP address as provided manually or via DHCP
Subnet mask	Information about the subnet mask as provided manually or via DHCP
Gateway	Information about the gateway address as provided manually or via DHCP
MAC ID	Information about the MAC address in the matrix

Java Tool

1. Select "Status > Matrix View" in the task area.
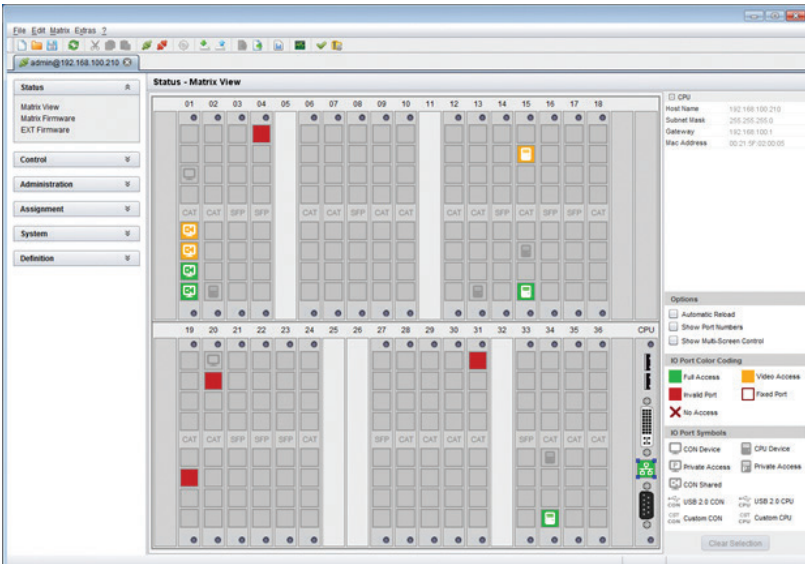
Figure 2-46. Menu status—matrix view.

2. Use the left-mouse button to click on the network port of the CPU board. The corresponding network status will be shown in the right part of the working area.

2.6.6 Firmware Status Matrix

The current firmware status of the installed boards is shown in this menu.

You can access the menu via OSD or Java:

Figure 2-47. OSD and Java icons.
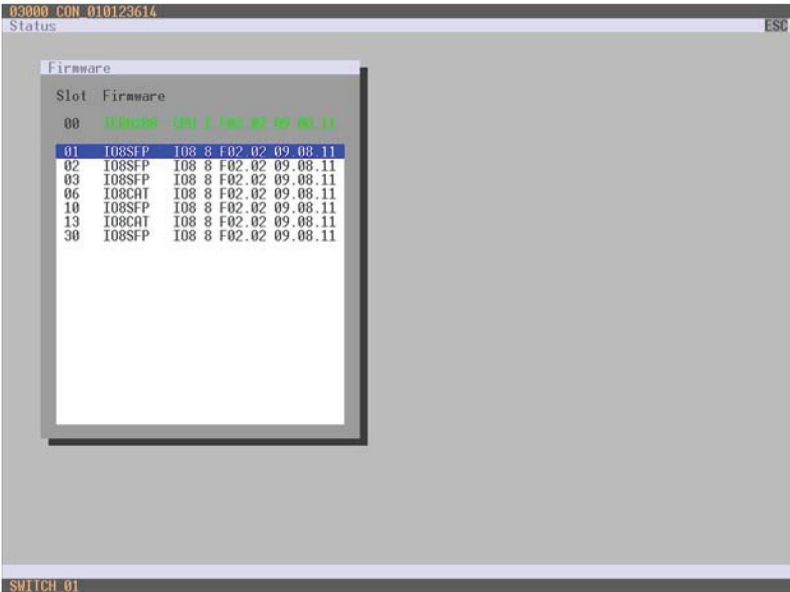
Figure 2-48. Menu status—firmware.

Table 2-49. Menu status—firmware.

Field	Description
Name	Description of the modules
Type	Type number
Ports	Number of ports
Version	Complete description of the firmware version
Date	Date of the firmware version
Status	Module status

Java Tool

1. Select Status > Matrix Firmware in the task area.
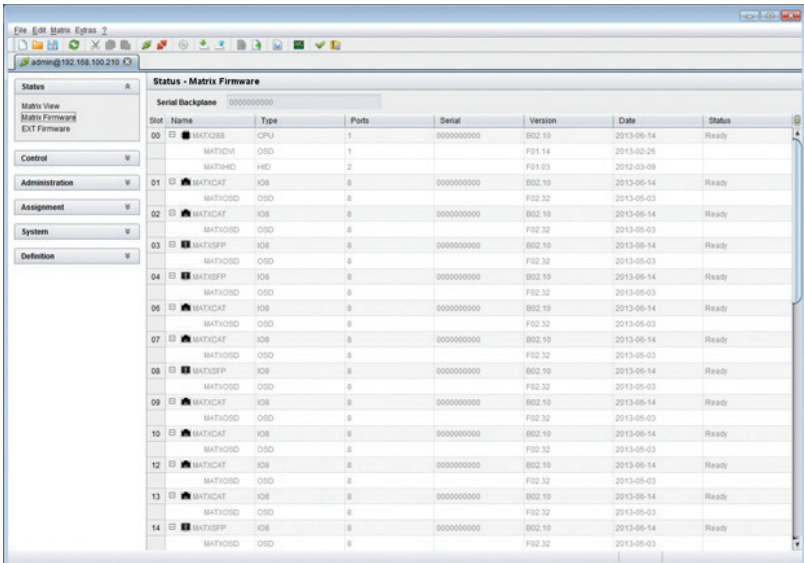
Figure 2-49. Menu Status—Matrix Firmware.

2. To read the firmware status and store it locally (file extension .dtf), select "Switch > Save Firmware Status to File…."

3. To read the overall status of the ServSwitch DKM FX and store it locally (file extension .zip), select "Switch > Save Status to File…", or press the respective button in the symbol bar.

The various modules can expanded and retracted in the "Name" column by clicking the left-mouse button on the plus or minus symbols to get a better overview.

Click on the plus/minus symbol in the upper right corner of the working area to expand and retract all module information with one click of the left-mouse button.

2.6.7 Firmware Status Extender

The current firmware status of the connected extenders is shown in this menu.

To access the menu, use the Java tool.

Figure 2-50. Java Tool icon.

The following information is shown in this menu:

Table 2-50. Menu status—firmware status extender.

Field	Description
Name	Description of the firmware
Type	Description of the extender module
Ports	Number of ports
Cur. Version	Complete description of the current firmware version
Cur. Date	Date of the current firmware version

Select "Status >EXT Firmware" in the task area.

Figure 2-51. Menu status—EXT firmware.

2.7 Trace Function

All events—for example, activities and switching operations of the ServSwitch DKM FX or FXC—are logged and displayed in this menu.

This function is used for diagnostic purposes.

You can request various trace views in the menu:

Figure 2-52. OSD icon.

The following information is shown in this menu:

Table 2-51. Trace menu function.

Field	Description
Date	Datestamp
Time	Timestamp
Message	Detailed description of the event

Trace possibilities

• Select "Status > Trace IO Board" in the main menu to check the events on your current I/O board.

• Select "Status > Trace Matrix" to check the ServSwitch DKM FX events.

2.8 Syslog Monitoring

This menu logs matrix activities, switching operations, and the surveillance of function-critical components (such as fans or power supply units).

Click on the Java icon to access the menu:

Figure 2-53. Java icon.

To start Syslog Monitoring, proceed as follows:

Select the Monitoring symbol in the symbol bar.
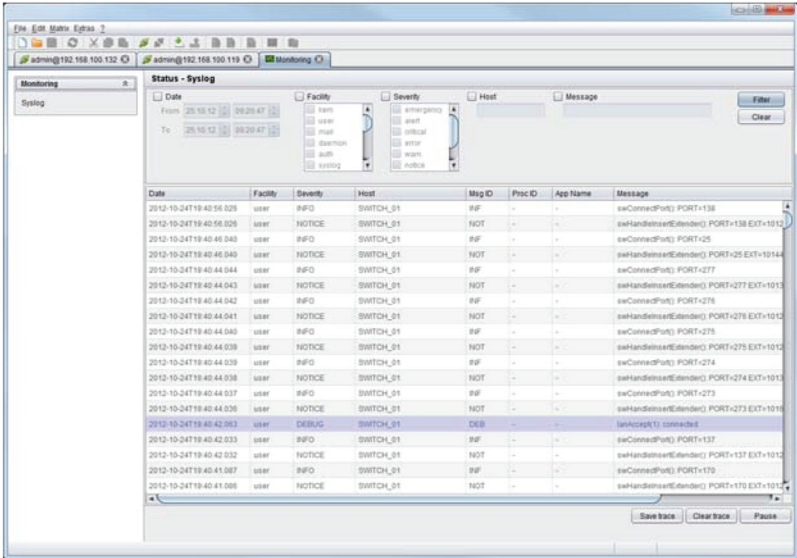
Figure 2-54. Monitoring Menu—Syslog.

Logging system activities start when opening the Monitoring menu, and remain active until the appropriate tab is closed.

NOTE: Syslog messages are transmitted via UDP. Therefore, Port 514 within the used network should not be blocked, e.g., by a firewall.

During logging, the activities are written continuously into logging files and stored locally. This process can be set with various options.

Options

Select Extras > Options in the menu bar and open the Syslog tab.

The following options are available:

Table 2-52. Syslog options.

Option	Description
Log File Directory	Default directory to store the log files.
Log File Name	Default name of the log file to be saved.
Log File Extension	Default extension for the log file.
Maximum Log File Size (KB)	Allowed maximum size of a log file.
Maximum Number of Log Files	Allowed maximum number of log files.

NOTE: When the maximum log file size is reached, a new log file will be created. When the maximum number of log files is reached, the oldest one will be overwritten with the new information.

Filter Function

To filter relevant messages out of a number of logged activities of the matrix switch, the Syslog Monitoring offers various filter options.

To set and activate a filter, follow these steps:

1. Set the desired filter option(s) by activating the respective checkbox(es).

2. Activate the filter settings by pressing the "Filter" button.

3. To deactivate an activated filter setting, press the "Clear" button.

The following filter options are available:

Table 2-53. Filter options.

Option	Description
Date	Messages of a defined range will be filtered.
Facility	Messages of a defined facility will be filtered.
Severity	Messages of a defined severity will be filtered.
Host	Messages of a defined host will be filtered.
Message	Messages with defined text parts will be filtered.

NOTE: Filter options are not valid within the locally stored log files.

Recording Function

All messages shown in the Syslog are equipped with various recording functions.

• To store the messages shown in the Syslog (filtered or unfiltered), press the "Save trace" button. The messages will be stored in a .txt file.

• To remove the messages shown in the Syslog, press the "Clear trace" button.

• To stop recording the messages, press the "Pause" button. To continue recording, press the button again.

2.9 SNMP

Use SNMP to monitor all vital hardware and safety-critical parts of the matrix and to query their status. This function complies with the RFC 1157 standard.

NOTE: During SNMP monitoring, we strongly recommend that you use a dedicated network to ensure access security.

You can access the menu via OSD or Java:

Figure 2-55. OSD and Java icons.

OSD

To activate SNMP via OSD, follow these steps:

1. Select "Configuration > SNMP" in the main menu.
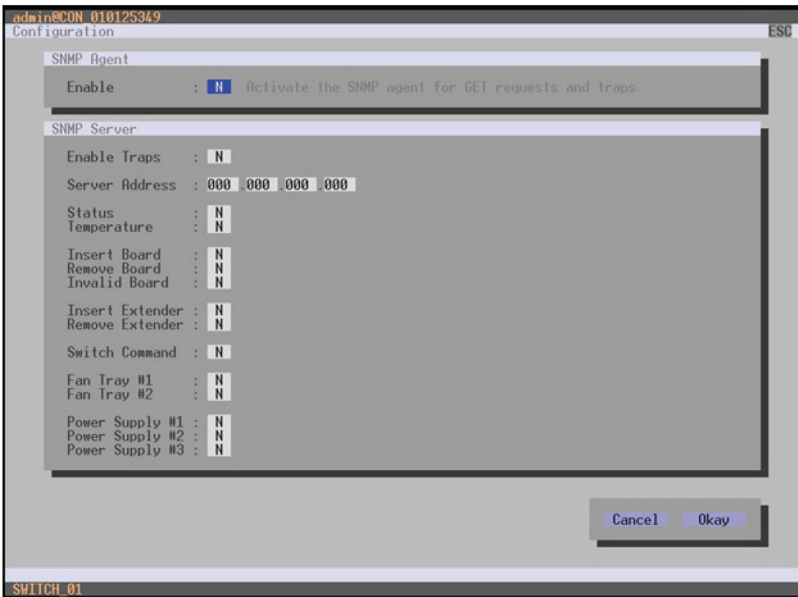
Figure 2-56.

2. Set the "Enable" option to "Y" (Yes) under SNMP Agent. Activating this option grants permission to run an active query of the SNMP agent.

To activate the SNMP agent, proceed as follows:

1. Select "Configuration > SNMP" in the main menu.

2. Set the "Enable Traps" option to "Y" (Yes) within SNMP server. This function allows an active transmission of trap messages from the SNMP agent to the SNMP server.

3. Set the IP address of the SNMP server within Server Address.

4. Activate the requested traps by enabling them to "Y" (Yes).

You can select between the following traps:

Table 2-54. Traps.

Trap	Description
Status	Notification about the matrix status.
Temperature	Notification about the temperature within the matrix.
Insert Board	Notification about the insertion of a new I/O board into a slot.
Remove Board	Notification about the removal of an I/O board out of a slot.
Invalid Board	Notification about a improperly-working I/O board.
Insert Extender	Notification about a newly-connected extender to the matrix or notification of a newly-established link between extender and matrix.
Remove Extender	Notification about an extender removed from the matrix, notification about a switched off extender, or notification about an interrupted link between extender and matrix.
Switch Command	Notification about a performed switching operation at the matrix.
Fan Tray #1	Notification about the status of fan tray #1.
Fan Tray #2	Notification about the status of fan tray #2.
Power Supply #1	Notification about the status of power supply #1.
Power Supply #2	Notification about the status of power supply #2.
Power Supply #3	Notification about the status of power supply #3.

NOTE: To activate the SNMP agent function, or the SNMP server function, you must restart the matrix.

Java Tool

To activate SNMP via Java tool, follow these steps:

1. Select "System > Network" in the task area.
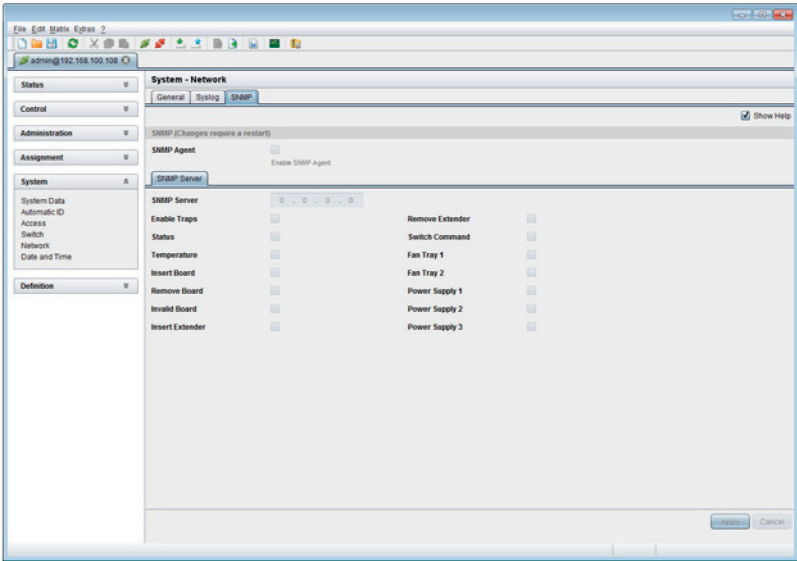
Figure 2-57. Menu System–Network.

2. Activate the option SNMP Agent under SNMP. Activating this option grants permission for an active query of the SNMP agent.

To configure an SNMP server, proceed as follows:

1. Select "Configuration > Network" in the task area.

2. Activate the "Enable Traps" option within SNMP Server. This function allows an active transmission of trap messages from the SNMP agent to the SNMP server.

3. Set the IP address of the SNMP within SNMP Server.

4. Activate the requested traps.

NOTE: To activate the SNMP agent, or the SNMP server, you must restart the matrix.

2.10 System Check

The System Check offers a diagnostic function for checking your current matrix configuration. The purpose of this feature is to find suboptimal and faulty settings.

The System Check is exclusively used for a plausibility check and does not make any active changes in the configuration.

You have the following option to access the menu:

Figure 2-58.

The following configuration parts are checked:

• Matrix Firmware

• Extender Firmware

• Multi-Screen Control

• Ext Units

• CPU Devices

• CON Devices

• User

• System Configuration

The following notification levels can be shown:

Table 2-55. Notification levels.

Level	Description
OK (green)	System check completed without any abnormalities.
WARNING (yellow)	System check revealed (without being system critical) incomplete parts of the configuration, firmware differences, duplications, or not connected extenders.
Error (red)	System check revealed errors in the configuration that can have both functional and system critical influences on the system.

NOTE: If the messages "WARNING" and "ERROR" are created by the System Check function, the problem will be described and a basic guideline will be provided.

To start System Check, proceed as follows:

• Select the symbol System Check in the symbol bar.
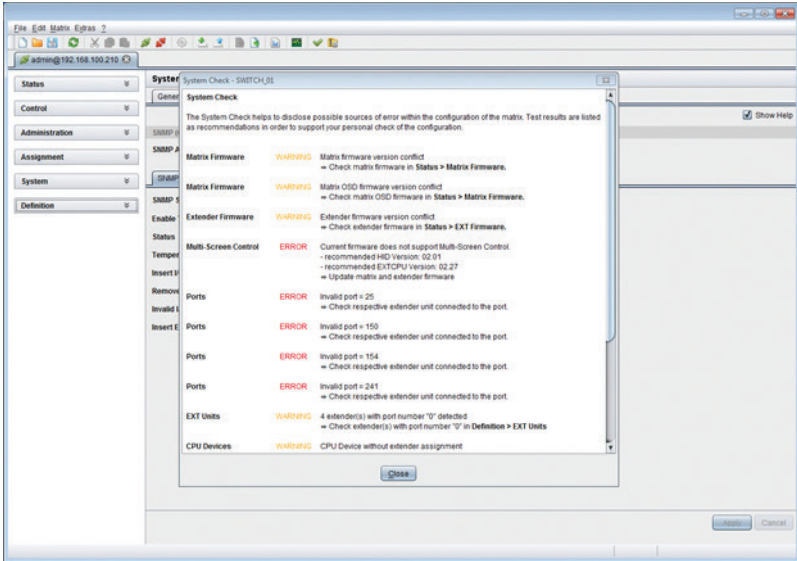
Figure 2-59. Menu – System Check.

3. Installation

3.1 Package Contents

• DKM FX or DKM FX Compact matrix

• (1) power cord per built-in power supply unit

• (1) serial control cable (DKM FXC includes a DB9 to RJ-45 adapter)

• Mounting accessories

• Quick Install Guide

• (1) CATx network cable (cross-wired)

3.2 System Setup

NOTE: If you are a first-time user, we recommend that you set up 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.

Setup of the ServSwitch DKM FX

1. Install the CPU and I/O boards.

2. Connect the keyboard, mouse, and monitor to the CPU board of the ServSwitch DKM FX.

3. Connect the ServSwitch DKM FX to the power supply.

4. Open OSD via hotkey and log in with administrator rights in the main menu under configuration (see Section 4.2.1).

> default login:
> username: admin
> password: admin
> default hotkeys: L-shift, L-shift, O

5. Begin configuration.

NOTE: After configuring the system, we recommend that you save the configuration by selecting Configuration > Save and restart the ServSwitch DKM FX by selecting Restart Matrix.

6. Optional: Establish a network connection between the ServSwitch DKM FX and the Java tool to set an extended configuration (see Section 4.2.2). The default address of the DKM is 192.168.100.99.

Setup of the ServSwitch DKM FX Compact

1. Connect a CON unit to an I/O port of the matrix.

2. Connect the keyboard, mouse, and monitor to the CON unit of the ServSwitch DKM FXC.

3. Connect the ServSwitch DKM FXC to the power supply.

4. Open OSD via hotkey and log in with administrator rights in the main menu under configuration (see Section 4.2.1).

> **default login:**
> **username: admin**
> **password: admin**
> **default hotkeys: L-shift, L-shift, O**

5. Begin configuration.

NOTE: After configuring the system, we recommend that you save the configuration by selecting Configuration > Save and restart the ServSwitch DKM FX by selecting Restart Matrix. The alternative is to save the configuration, then open the configuration, then upload the configuration to the DKM FX. After you login, select the first option in the configuration and check the box that says: "Activate configuration after upload," then press "Finish." The DKM will reboot and the new configuration will be active.

6. Optional: Establish a network connection between the ServSwitch DKM FX and the Java tool to set an extended configuration (see Section 4.2.2).

Extender Setup

1. Connect the CON units to the ServSwitch DKM FX by using the interconnect cables (CATx or fiber).

2. Connect the CON units to the input devices to be used (for example, keyboard and mouse).

3. Connect the 5-VDC power supply units to the CON units.

4. Check the basic function of the CON unit by opening the OSD via hotkey.

> **Default: (default: L-Shift, L-Shift, O)**

5. Connect the source (computer, CPU) to the CPU unit of the extender by using the provided connection cables.

6. Connect the CPU unit to the matrix by using the interconnect cables (CATx or fiber).

7. If you have a video matrix and you are using the universal or coaxial I/O cards, connect the video source directly to the matrix by using the interconnect cables (coax, fiber).

8. Connect the 5-VDC power supply units to the CPU units.

9. Start the system.

3.3 Example Applications

The ServSwitch DKM FX supports a flexible configuration of your system environment:

For example, part of the ServSwitch DKM FX can be configured as a single-head, dual-head, quad-head, or octo-head computer or workstation, or even as a video matrix. You can also configure KVM and USB 2.0.

In addition to the access via OSD by the keyboard connected to the CPU board or an extender CON unit, you have the following access options:

• via Java Tool

• via serial interface

A connection to common media controls is possible, too, if you have the ACX-API installed.

Sections 3.2.1 through 3.2.4 describe typical installations of the ServSwitch DKM FX.

3.3.1 KVM Matrix

In single-head mode, up to 288 ports can be used either as an input or as an output port, depending on components and equipment. At the same time, the DKM offers non blocking access for all users (user access is not limited by the activities of another user).
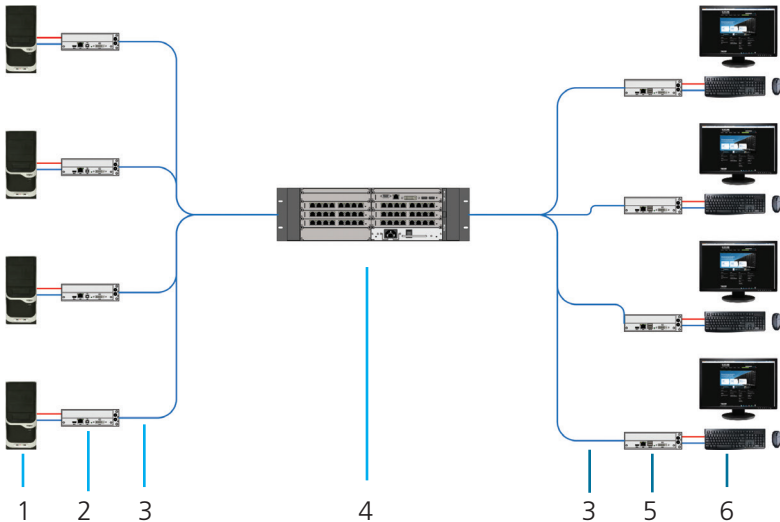
Figure 3-1. KVM using ServSwitch DKM FX application.

Table 3-1. Single-head KVM matrix components.

Number	Description
1	Source (computers, CPU)
2	CPU unit/transmitter
3	Interconnect cable
4	ServSwitch DKM FX or FXC
5	CON unit/receiver
6	Keyboards/mice/monitors

If you have a single-head console, you can also access a dual-head or quad-head console. However, you can control the system only at Monitor 1.

Any signal source can be switched to any number of monitors that will show the video signal at the same time. Even (optional) audio can be switched.

3.3.2 Video Matrix

If you use the ServSwitch DKM FX as a video matrix, it can switch up to 144 input ports to up to 144 output ports, depending on components and equipment.

NOTE: 144 ports means total ports that can break down to 1 input and 143 outputs or the other way around.
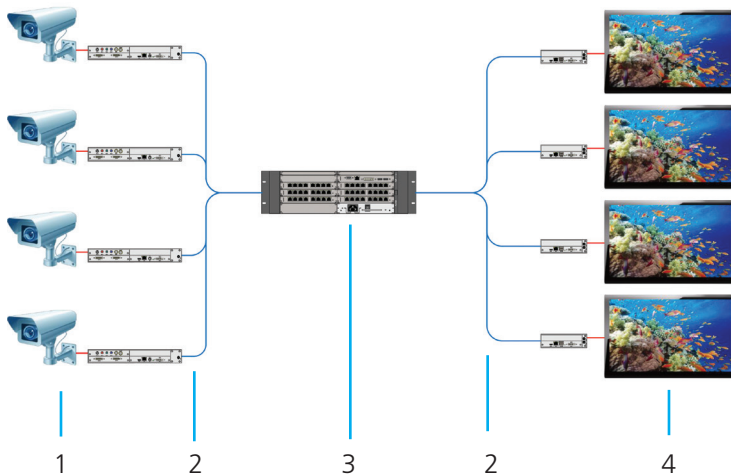
Figure 3-2. Video using ServSwitch DKM FX application.

Table 3-2. Video matrix components.

Number	Description
1	Video sources, for example, an SDI camera
2	Interconnect cable
3	ServSwitch DKM FX or FXC
4	Monitors/Displays

3.3.3 Parallel Operation (Stacking)

If you have special configurations, especially at installations with several monitors per workstation, or you need additional support for USB 2.0 transmission paths, you can increase the number of CPUs and consoles connected using a parallel operation (stacking) of several ServSwitch DKM FX devices.

One of the DKM FX or DKM FX Compact matrices has to be defined as the master matrix. All the others have to be configured as slave matrices and the IP address of the master matrix has to be entered in the Master IP Address field. They have to be connected to the master matrix via the network connector (RJ-45) of the CPU board. The option Enable LAN Echo has to be activated at the master matrix.

If a switching command is done in the OSD, the slave matrices will also switch automatically.

NOTE: Switching of stacked devices might be delayed by several seconds.
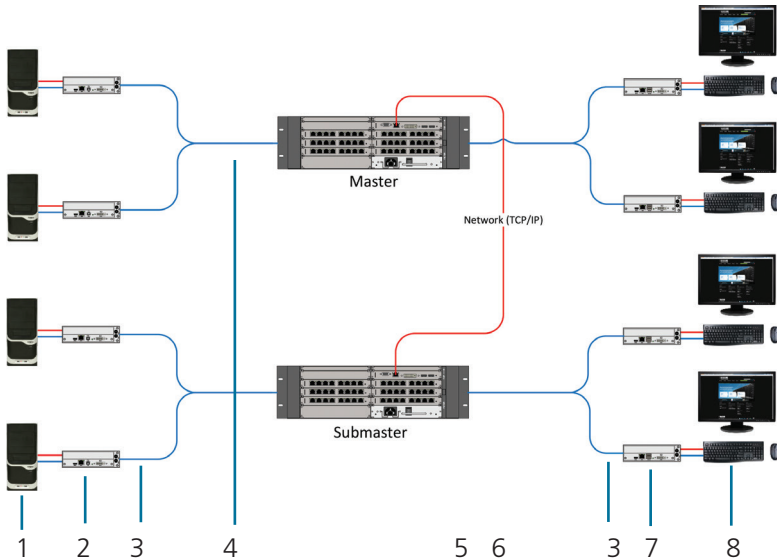
Figure 3-3. Parallel operation (stacking) application.

Table 3-3. Parallel operation
(stacking) components.

Number	Description
1	Single-head source (computer)
2	CPU unit/transmitter
3	Interconnect cable
4	ServSwitch DKM FX (master matrix)
5	ServSwitch DKM FX (sub-master matrix)
6	Network connection master/slave(s)
7	CON unit/receiver
8	Keyboard/monitor/mouse

3.3.4 Matrix Grid

You can use a matrix grid for applications where the required number of ports is not sufficient or important connections need to be made to several matrices to provide redundancy.

A matrix grid consists of one master matrix and at least one slave matrix. In its maximum configuration, it can consist of up to 16 matrices.

To build a matrix grid, the grid matrices are interconnected by "Grid Lines." In this case, the slave matrices can be connected directly to the master matrix or between themselves.

When arranging the grid lines, various grid setups can be used, for example: a ring setup, a hub and spoke setup, or a fully connected setup of matrices.

Grid lines can process signals bidirectional (Smart Connect). Per grid line, one KVM connection can be transmitted. If multiple receivers are sharing one transmitter, you can support this over one cable/tie line between the matrixes, assuming all CONs/receivers are on one matrix and the transmitter/CPU is on a different matrix.

Switching operations that extend beyond a single grid matrix are made by the grid master. Local switching operations will still be made by each sub matrix.

To configure the matrix grid, see Section 4.13.
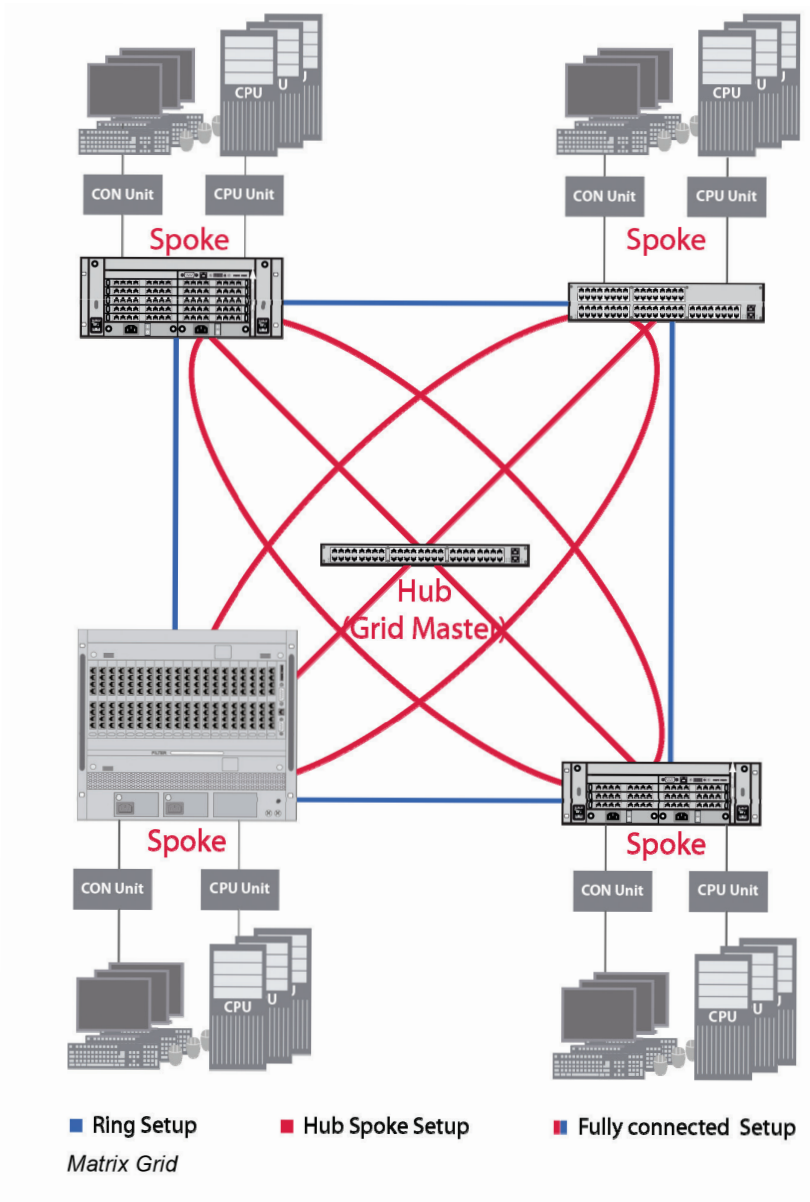
Figure 3-4. Matrix Grid.

3.3.5 Cascading

For applications that exceed the number of available ports, you can extend the system by cascading.

In this case, the ServSwitch DKM FX devices are connected by "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 must be configured as a sub-matrix.
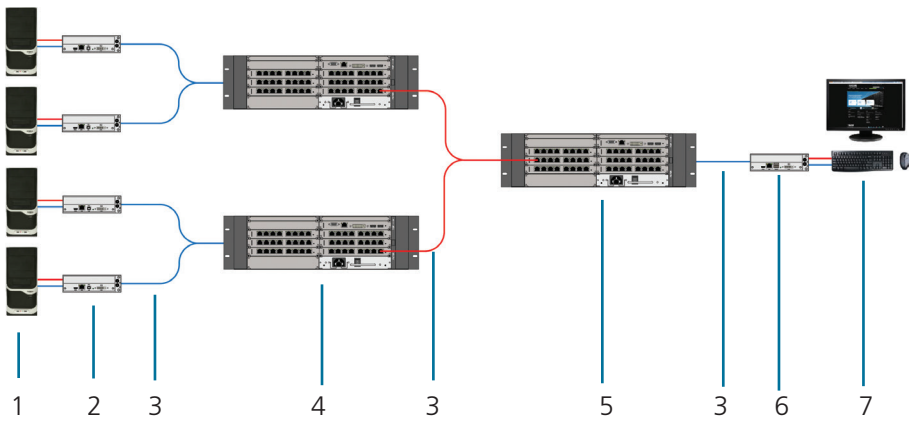
Figure 3-5. Cascading application.

Table 3-4. Cascading components.

Number	Description
1	Source (computer, CPU)
2	CPU units/transmitters
3	Interconnect cable
4	ServSwitch DKM FX (sub matrix)
5	ServSwitch DKM FX (master matrix)
6	CON unit/receiver
7	Console (keyboard, monitor, mouse)

4. Configuration

4.1 Command Mode

The ServSwitch DKM FX has a Command Mode that enables several functions via keyboard command during normal use.

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

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

NOTE: If there is no keyboard command executed within 10 seconds after activating Command Mode, it willl be automatically deactivated.

The following table lists the keyboard commands to enter/exit Command Mode and to change the hotkey sequence:

Table 4-1. Command mode components.

Function	Keyboard command
Enter Command Mode (default)	2x <Left-Shift> (or hotkey)
Exit Command Mode	<Esc>
Change hotkey sequence	<hotkey>, <c>, <new hotkey code>, <Enter> Earlier versions of firmware (before 9/30/2011): <Left Ctrl> + Left Shift> + <c>, <hotkey Code>, <Enter>

NOTE: <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).

You can change the hotkey sequence to enter Command Mode. The following table lists the hotkey codes for the available key sequences:

Table 4-2. Command mode components.

Hotkey code	Hotkey
0	Freely selectable (for firmware 12/1/2012 or later)
2	2x <Scroll>
3	2x <Left-Shift>
4	2x <Left-Ctrl>
5	2x <Left-Alt>
6	2x <Right-Shift>
7	2x <Right-Ctrl>
8	2x <Right-Alt>

NOTE: When using the DKM FX or DKM FXC with another KVM switch, be sure the hotkeys do not match on both switches; otherwise, the KVM closest to the physical keyboard and mouse at the user station will execute the hotkeys and not pass them on to the DKM FX or DKM FXC.

Set freely selectable "Hotkey" (exemplary)

To set a freely selectable Hotkey (for example, <O> <space>), use the following keyboard sequence:

<current "Hotkey">, <c>, <0>, <Space>, <Enter>

Set "Hotkey" for direct OSD access

When setting a second hotkey, next to the hotkey for standard functions, this hotkey can be exclusively used for opening the OSD directly.

To select a hotkey from the hotkey table for opening OSD directly, use the following keyboard sequence:

<current hotkey>, <f>, <hotkey code>, <Enter>

To select a freely selectable hotkey (e.g., 2x <Space>) for opening OSD directly, use the following keyboard sequence:

<current hotkey>, <f>, <0>, <Space>, <Enter>

Reset "Hotkey"

To set a Hotkey back to the default settings of the extender, press the key combination <Right-Shift> + <Del> within 5 seconds after switching on the CON unit or plugging in a keyboard.

4.2 Control Options

The ServSwitch DKM FX or FXC contains an internal CPU that enables you to control all functions from any console without the need for an external CPU or media control.

You can access the ServSwitch DKM FX for configuration and operation in three ways:

• via OSD —configuration and operation

• via Java Tool—configuration and operation

• via serial interface—operation only

4.2.1 Control via OSD

Figure 4-1. OSD icon.

Via OSD (on-screen display), you can set the configuration of the ServSwitch DKM FX operating system. The settings of the Configuration menu are described in this chapter. All other menus are described in later chapters.

You can enter the OSD of the ServSwitch DKM FX:

• via keyboard connected to the CPU board

NOTE: You cannot view/control the computers from the CPU board.

• via keyboard connected to a CON unit of an extender

Entering OSD

1. Start Command Mode with the hotkey (see Section 4.1).

2. Press <o> to open OSD. You will see a list of all available CPUs as a start menu.

3. Press <Esc> to enter the main menu.

NOTE: If the "Enable CPU Selection" option is activated in the Configuration menu, the list of computers that can be selected will be opened. To skip this list, press <F7>.

Leaving OSD

• Press the <Esc> key in the main menu, or simultaneously press <Left-Shift> + <Esc> anywhere within the OSD. The OSD will close without any further changes and the currently active CPU connection will display.

Menu Structure
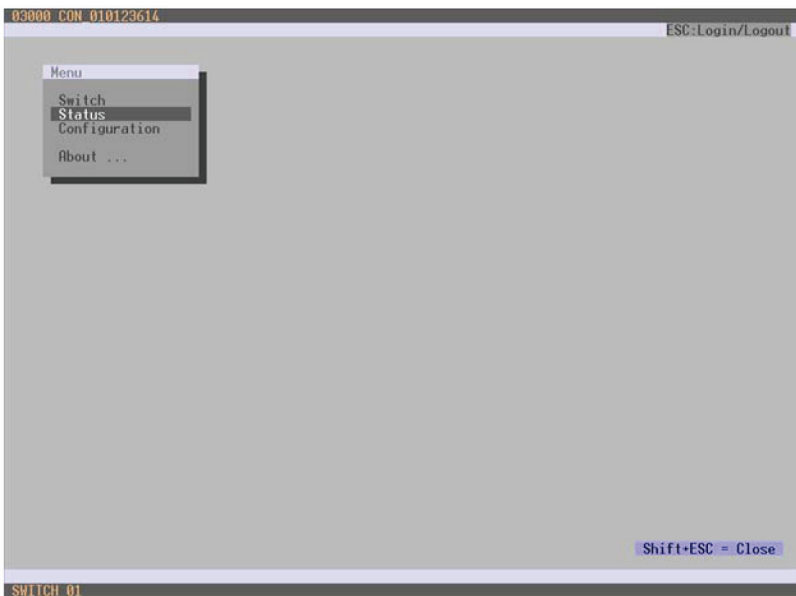
Figure 4-2. Menu structure.

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

• Upper status area (top-most two text lines)

• Working area

• Lower status area (lowest two text lines)

Keyboard control

You can select between the following keyboard commands:

Table 4-3. Keyboard commands.

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>
• In input fields: Line down (with wrap-around) • In menus: Line down (without wrap-around)	<Cursor-Down>
Previous page in menus with more than one page	<Page-Up>
Next page in menus with more than one page	<Page-Down>
Next input field	<Tab>
Previous input field	<Left-Shift> + <Tab>
Next option in selection fields	<+>
Previous option in selection fields	<->
Switching in selection fields between two conditions, for example, between ON/OFF or Y(Yes)/N(No)	<Space>
• In menus with input fields: Save data • In menus: Select menu item	<Enter>
• In menus with input fields: Cancel data input without saving. • In menus with selection fields: Go back to the superior menu	<Esc>

Sorting Function

You can sort lists and tables in the Java Tool for fast and smooth searching.

Table 4-4. Sorting functions.

Function	Keyboard command
Sort ID numbers in a descending order or in an ascending order by pressing the keyboard command twice (ID)	<F1>
Sort ID names in a descending order or in an ascending order by pressing the keyboard command twice (Name)	<F2>
Go to the next result in the list of results for the search field (Next)	<F3>
Go to the previous result in the list of results for the search field (Previous)	<F3>
Refresh the currently shown list (Previous)	<F4>
Refresh the currently shown field (Refresh)	<F5>
Jump between the search field and the list of results (Find)	<F6>

Password request

You have to log in with administrator rights to be able to set configurations.
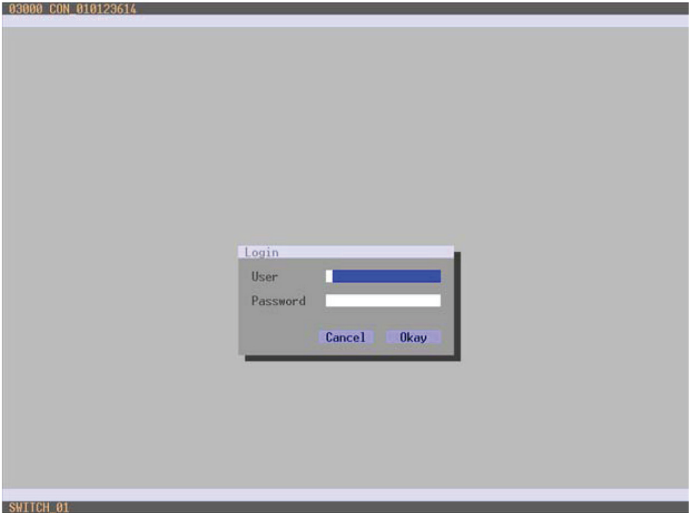
Figure 4-3. Login Menu screen.

Access to the configuration menu requires administrator rights. Login is mandatory.

Table 4-5. Menu login parameters.

Field	Input
User	admin
Password	admin

Press the <F10> key in the main menu of the OSD to open the login mask. To log out a user, press the <F10> key again.

NOTE: For security reasons, change the administrator password as soon as possible.

NOTE: If needed, create a secondary administrator user and password in case the administrator of the system is not available and you need access. If you lose the password for the admin account, there is no way to retrieve it. We recommend that you set up a second admin account and keep the credentials in a safe place.

4.2.2 Control via Java Tool

Figure 4-4. Java icon.

Requirements

If you want to use the Java tool, you need these items:

• Computer with an executable Java tool and an installed Java Runtime Environment (JRE, version 1.6 or higher). You can download the latest version from the Java website.

• Java Tool software. This tool is available at the Black Box website or FTP site.

• Available network connection between the Java tool and the ServSwitch DKM FX or FXC

NOTE: Contact your system administrator concerning JRE and network connection.

Installation of the Java Tool

The Java tool is available as 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. All of the config files that the Java tool uses will be stored within the same directory as the Java executable program.

If you do not have the Java Tool, you can download it from the blackbox.com website. Simply go to the website and search for ACX048. On the product page, scroll down until you see the "Resources" tab and click on it. You can now download the latest Java Tool available.

NOTE: If you do not have a Java tool, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

Computer Connection to the ServSwitch DKM FX

NOTE: For a direct connection between the computer and ServSwitch DKM FX, use a cross-wired network cable.

For a connection between the computer and ServSwitch DKM FX via switch or hub, use a straight-pinned network cable.

Do not use a network connection between Java Tool and matrix that is primarily used for transmitting audio data.

Connect the network cable to the RJ-45 port of the computer and CPU board of the ServSwitch DKM FX.

Start of the Java Tool

Open the Java tool by a double-clicking on the program icon or use the <Enter> key on the keyboard.

Connection to the Matrix

NOTE: When connecting to the matrix using the Java Tool, make sure the user that you are logging in as has FTP rights.

1. Open the Java tool.

2. Select Matrix > Connect in the menu bar.

3. Enter the IP address in the popup input field according to the network configuration of the ServSwitch DKM FX. (Default IP: 192.168.100.99)

4. Enter the user name and password for the ServSwitch DKM FX. (Default: "admin" admin.)

5. Confirm ywith the "OK" button or reject with "Cancel."
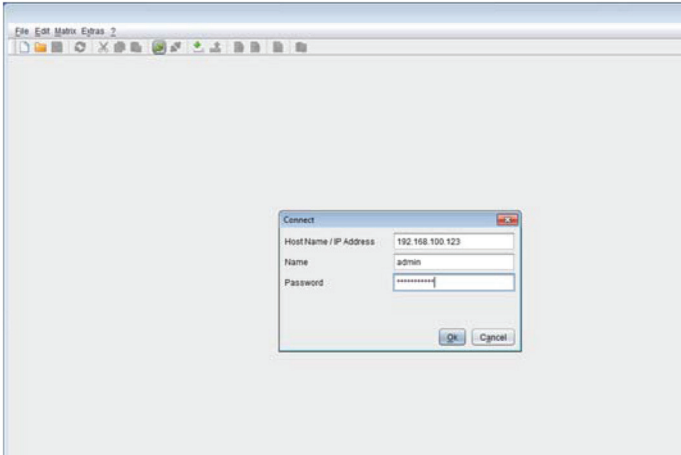
Figure 4-5. Menu Connection screen.

NOTE: Up to 12 connections between the matrix and the Java tool can be established at the same time because available sockets are limited. When you are done using the Java Tool, be sure to correctly disconnect/logout from the switch. If you close the Java Tool before disconnecting from the switch, the socket being used will not be released for a certain period of time. Once you use all 12 sockets, you will get an error message when attempting to connect to the DKM FX or DKM FXC.

Menu structure
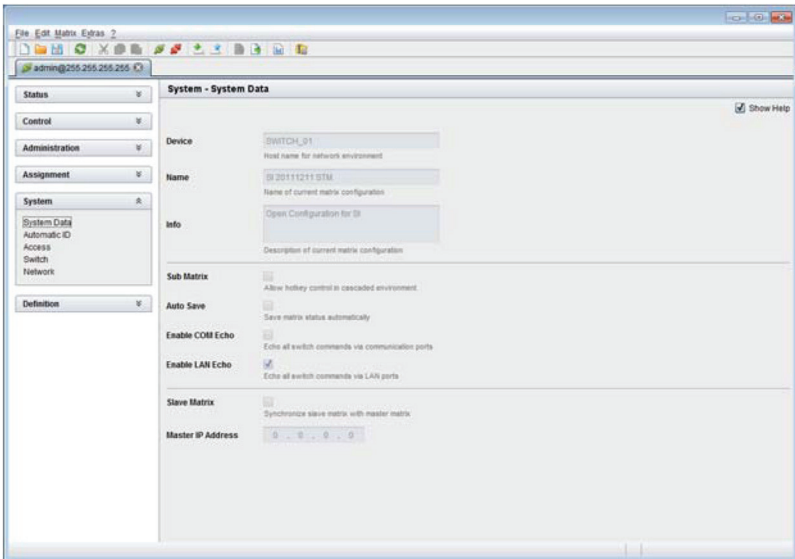
Figure 4-6. Example menu view (system-switch).

The menu structure of the Java tools 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)

• Status bar (bottom line 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.

You can activate or deactivate the integrated help texts in the working area of the Java tool by checking the box in the upper right corner.

Mouse Control

You can select between the following mouse commands:

Table 4-6. Mouse commands.

Function	Mouse command
Menu selection, marking	Left mouse button
Open function-specific selection menus	Double-click the left mouse button
Open content-specific selection menus	Right mouse button

Keyboard Control

You can select between the following keyboard commands:

Table 4-7. 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) • Open already marked fields with editing or selecting capablility	<Space>
• In menus: data saving • Menu item selection	<Enter>
• Leave tables • Jump from tables into the next field	<Ctrl> + <Tab>

Table 4-7 (Continued). Keyboard commands.

Function	Keyboard command
• Leave tables • Jump from tables into the previous field	<Ctrl> + <Left-Shift> + <Tab>

NOTE: Various functions within the menus in the menu bar can be executed with the provided keyboard commands that are listed to the right of the respective menu item (for example, press <Ctrl> + <S> to execute "Save").

Reload Options

The information shown in the Java tool can be reloaded in different ways.

• Via <F5> key on the used keyboard

• Via Edit > Reload in the menu bar

• Via "Reload" Symbol in the symbol bar

Context Function

The Java tool offers several context functions that support a user-friendly and effective operation of the tool. The context functions are described in the respective chapters.

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

Sorting Function

Lists and tables in the Java tool offer a sorting function for fast and smooth searching.

1. For ascending sort status, use the left mouse button once to click into the header of the column you want to sort.

    The sort status is indicated by an arrow that points upwards.

2. For descending sort, use the left mouse button twice to click on the header of the column that you want to sort. The sort is displayed by an arrow that points downwards.

3. To cancel 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 disappears.

Filter Function

Lists and tables in the Java tool offer a filter function that enables fast and smooth searching.

1. To activate a filter, use the right-mouse button to click on the header of the column you want to filter and select Set Filter.

2. Write the word or part of a word you want to filter directly 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 you want to filter and select "Clear Filter."

NOTE: An asterisk in the header indicates an active filter.

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

Configuration in the Java Tool (Off-line Configuration)

You can only change configuration and system settings via the Java tool in off-line mode without a direct connection between ServSwitch DKM FX and Java tool.

To activate a configuration in the ServSwitch DKM FX:

1. Select "File > Upload to" in the menu bar.

2. Enter the IP address of the ServSwitch DKM FX and the name and password of the authorized user. Then, select the storage location of the new configuration (default or config 01–08) in the menu "Select Configuration."

3. Select "Matrix > Connect" in the menu bar and enter the IP address of the matrix and the name and password for the authorized user.

4. Select "Administration > Activate Configuration" in the task area and select the storage location that you selected above.

5. Use the "Activate" button to open the selected configuration within the matrix.

NOTE: If you want to use the current configuration, check the box at the bottom of the dialog window before proceeding.

The connection and the open tab will close, and the matrix will restart.

NOTE: During the activation of a configuration, the matrix is temporarily not available because it is rebooting.

On-line Configuration

Configurations and system settings can be also modified using the Java tool in On-line mode with an active connection between matrix and Java tool.
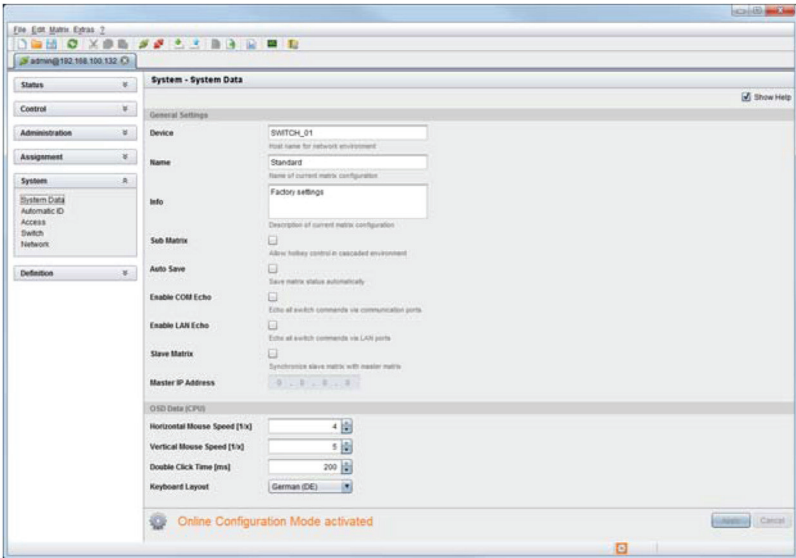
Figure 4-7. Menu System—System Data.

To edit a configuration in online mode, proceed as follows:

1. Select the menu item "Matrix > Activate Online Configuration Mode." This setting will also be shown in the lower part of the working area. You can also activate the "online configuration mode" by clicking on the gear icon in the shortcut tool bar.

2. Make any changes in the configuration and system settings and confirm by pressing the "Apply" button. The changes will be applied immediately.

3. To deactivate the On-line mode, select the menu item "Matrix > Deactivate Online Configuration Mode" in the menu bar.

Options menu

You can adapt and customize the Java tool by editing various default settings.

To activate or change the default settings, proceed as follows:

Select "Extras > Options" in the menu bar. The tab Default Settings will open.

The default settings parameters are:

Table 4-8. Default settings.

Option	Description
IP/Hostname	Default IP address of the matrix required for connection.
User	Default user name used for connection.
Configuration Directory	Default directory for configuration files.
Firmware Directory	Default directory for update files.
Status Directory	Default directory for the firmware status.
Import/Export Directory	Default directory for import and export files.
Presets Directory	Default directory for macro files.

To set various font sizes for the Java tool, proceed as follows:

1. Select "Extras > Options" in the menu bar.

2. Open the Font tab.

3. Select the desired font size (normal or large).

Report

The Java tool is equipped with a report function that shows the current switching status and all relevant parts of the matrix configuration in a PDF file.

To create a report, proceed as follows:

1. Select "File > Report..." in the menu bar. A selection assistant will be opened.

2. Select those contents that should be included in the report (Matrix View, EXT Units, CPU Devices, CON Devices, and Users) and confirm with the "Next >" button.

3. Select the preferred location for storage of the report and confirm with the "Finish" button.

The report will be created as a PDF file.
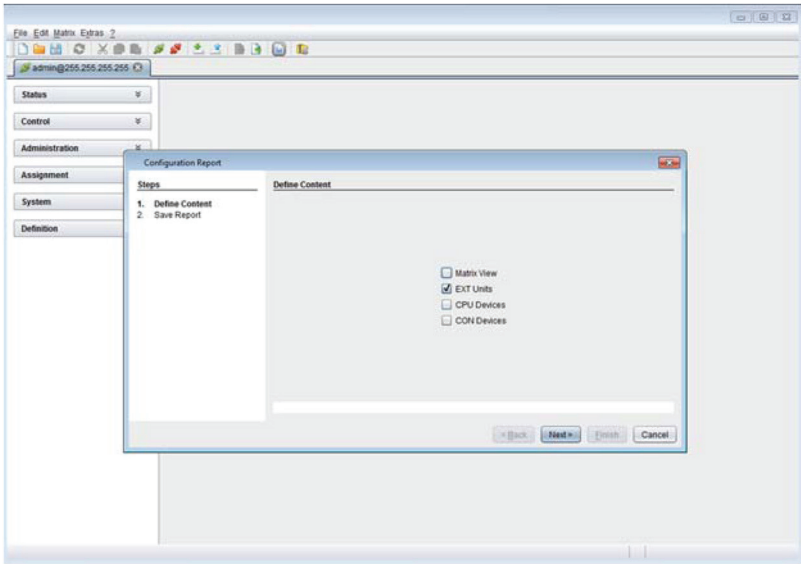
Figure 4-8. Menu File > Report.

NOTE: The report function can be used in both On-line or Off-line mode of the Java tool.

4.2.3 Control via Serial Interface

Figure 4-9. RS-232 icon.

The ServSwitch DKM FX operating system offers various functions for external RS-232 (serial) communication. There are telegrams for switching single or all connections available, both unidirectional and bidirectional. There are also telegrams for an overall definition of the total switching status and for saving and loading such switching states.

The ServSwitch DKM FX has an option that provides an echo of all affected switching operations via serial interface or network interface. This will allow the system to communicate with other applications and provide switch status.

You can also switch sub-master DKM FX or FXC clones as slaves (stacking) via a serial network interface.

4.3 Assignment

The ServSwitch DKM FX enables you to create a console-specific or a CPU-specific assignment.

• You can assign virtual CPUs to real CPUs.

• You can assign real consoles to virtual consoles.

4.3.1 Virtual CPU

You can assign virtual to real CPUs in this menu. Switch several consoles to the same CPU. If there are several consoles connected to a virtual CPU that is assigned to a real CPU, you will only have to change the real CPU once and all the consoles will receive the video signal of the new CPU.

You can access the menu via OSD or Java.

Figure 4-10. OSD and Java icons.

OSD

Select "Assignments > Virtual CPU Devices" in the main menu.
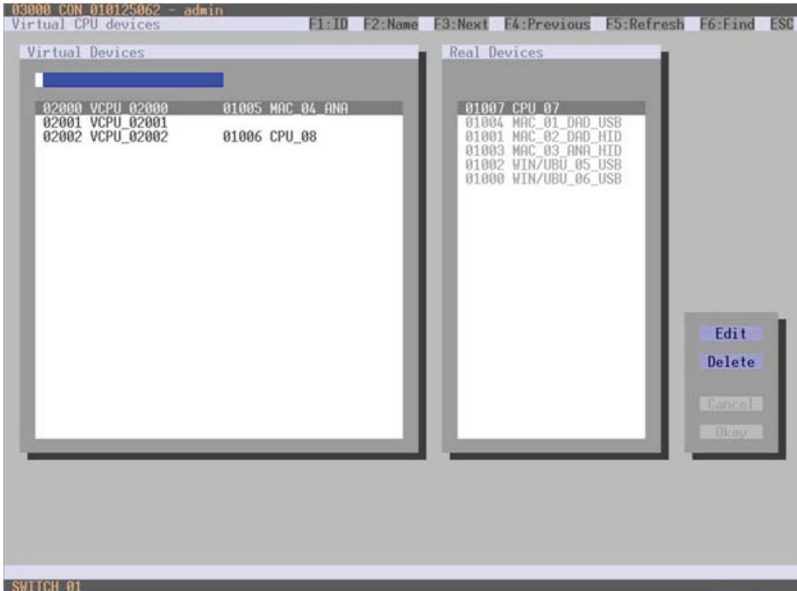
Figure 4-11. Menu Assignments – Virtual CPU Devices.

For an assignment, proceed as follows:

1. Select the virtual CPU in the list Virtual Devices that has to be assigned to a real CPU.

2. Press the "Edit" button.

3. Select the CPU in the list Real Devices that has to be assigned to the selected virtual CPU.

4. Press the "OK" button to confirm the assignment.

The assignment will be done.

NOTE: Only one virtual CPU can be assigned to a real CPU.

Java Tool

Select "Assignment > Virtual CPU Devices" in the task area.
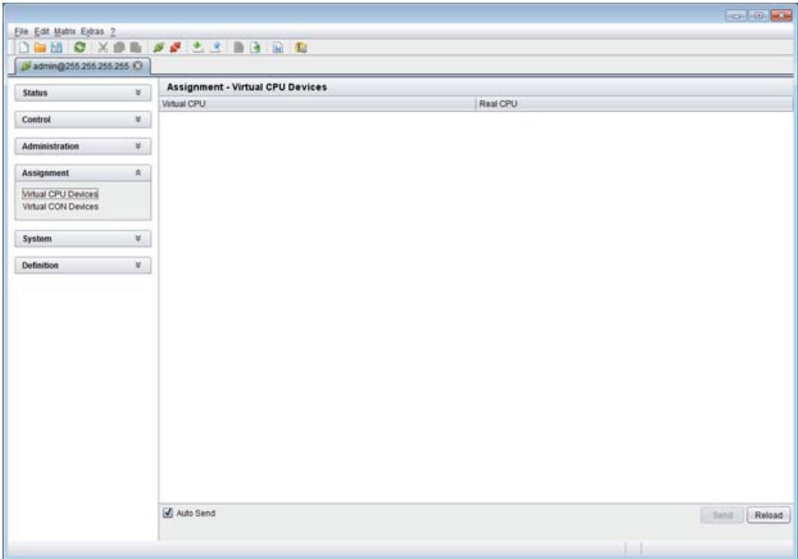
Figure 4-12. Menu assignment—Virtual CPU devices screen.

For an assignment, proceed as follows:

1. Select a virtual CPU in the "Virtual CPU" list.

2. Double-click in the "Real CPU" column to get a list of all available real CPUs.

3. Select a real CPU.

You can select between the following buttons:

Table 4-9. Selection buttons.

Button	Function
Send	Send assignments to the matrix
Reload	Reload changes

NOTE: By activating the "Auto Send" function in the left lower corner of the working area, switching operations will occur immediately without pressing the "Send" button to confirm.

The selection boxes in the Real CPU column contain a filter function for an easy selection of single consoles from a larger pool of consoles.

The Java tool also offers the possibility to go directly from the Assignment menu to the Definition menu to check specific settings for the respective console or CPU.

Use the right-mouse button to select the respective console or CPU and select "Open CON Device" or "Open CPU Device."

4.3.2 Virtual Console

You can assign real consoles to virtual consoles in this menu.

Using this function, you can change access permissions of the virtual console and apply them to all assigned real consoles, too.

Virtual consoles can be switched exactly in the same way as real consoles. If a virtual console is switched to a CPU, all real consoles that are assigned to the virtual console will receive the video signal. The real console that is last scheduled in the list of assignments will additionally receive keyboard and mouse control.

You can access the menu via OSD or Java.

Figure 4-13. OSD and Java icons.

OSD

Select "Assignments > Virtual CON Devices" in the main menu.
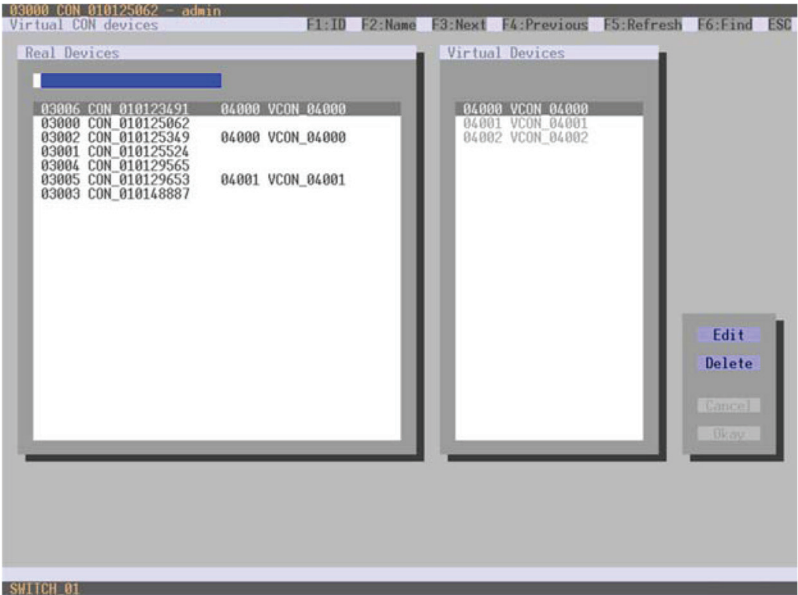
Figure 4-14. Menu Assignments – Virtual CON Devices.

For an assignment, proceed as follows:

1. From the "Real Devices" list, select the real console that has to be assigned to a virtual CPU.

2. Press the "Edit" button.

3. Select the virtual console in the Virtual Devices list that has to be assigned to the selected real console.

4. Press the "OK" button to confirm the assignment.

NOTE: A virtual console can be assigned to more than one real console.

Java Tool

Select "Assignment > Real to Virtual Console" in the task area.
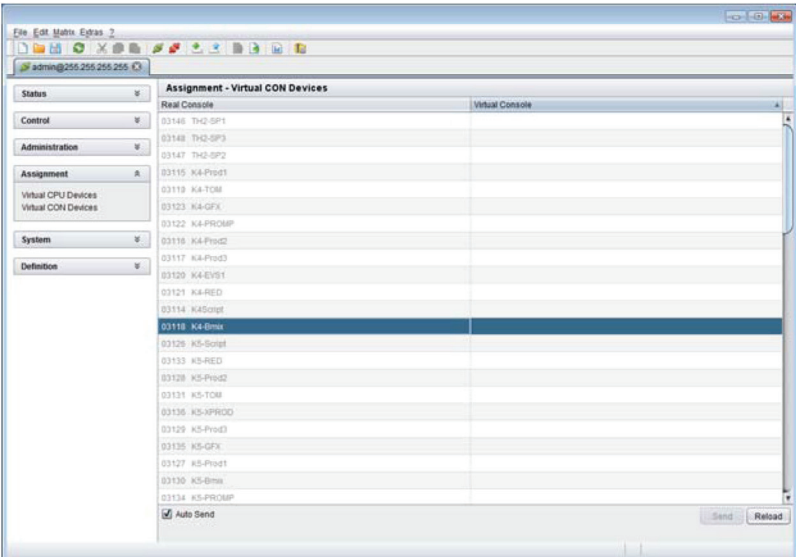
Figure 4-15. Menu Assignment—Virtual Console Devices screen.

To place an assignment, proceed as follows:

1. Select the required real console in the "Real Console" table.

2. Double-click in the "Virtual Console" column to get a list of all available virtual consoles.

3. Select the required virtual console.

You can select between the following buttons:

Table 4-10. Send and Cancel selection buttons.

Button	Function
Send	Send assignments to the matrix
Cancel	Reject changes

NOTE: If you activate the Auto Send function in the left lower corner of the working area, switching operations will occur automatically without pressing the Send button to confirm.

The selection boxes in the Virtual Console column contain a filter function so you can easily select a single CPU from a larger pool of CPUs (see Section 4.2.2).

4.4 System Settings

You can configure the following system settings on the ServSwitch DKM FX.

NOTE: Only users with administrator rights can configure the system settings.

4.4.1 System Data

The system configuration is set in this menu.

You can access the menu via OSD and Java:

Figure 4-16. OSD and Java icons.

Select from the following settings:

Table 4-11. System data settings.

Field	Selection	Description
Device	Text	Enter the device name of the matrix (default: SWITCH 01)
Name	Text	Enter the name of the configuration that is used to save the current settings (default: Standard)
Info	Text	Additional text field to describe the configuration (default: Factory settings)
Sub matrix	Activated	If the matrix is defined as a slave in the OSD, the user will lose control automatically. Use the keyboard command <Shift><Shift><s><o>to recover control. The OSD will open again in the matrix defined as slave.
	Deactivated	Function not active (default)
Load Default	activated	Starting the matrix after a restart or a switch-on with the default configuration.
	deactivated	Starting the matrix after a restart or a switch-on with the last-saved configuration (default).
Auto Save	Activated	Save the current configuration of the matrix in the flash memory periodically.
	Deactivated	Function not active (default)

Table 4-11 (continued). System data settings.

Field	Selection	Description
Enable COM echo	Activated	Send all performed switching commands in the matrix as an echo via serial interface. *NOTE: Enable this function when using media control via the serial interface.*
	Deactivated	Function not active (default)
Enable LAN echo	Activated	Send all performed switching commands in the matrix as an echo via LAN connection. *NOTE: Enable this function when using media control via the serial interface.*
	Deactivated	Function not active (default)
Slave matrix	Activated	Synchronize the slave matrix according to the switch status of the master matrix.
	Deactivated	Function not active (default)
Master IP address	Numerical value	Set the network address of the master matrix (default value: 000.000.000.000)
Hor. Mouse Speed 1/x	1–9	Adjust the horizontal mouse speed, 1= slow, 9 = fast (default value: 5)
Ver. Mouse Speed 1/x	1–9	Adjust the vertical mouse speed, 1= slow, 9 = fast (default value: 5)
Double click time	100–800 ms	Adjusts the time slot for a double click (default value: 200 ms)
Keyboard layout	Region	Set the OSD keyboard layout according to the used keyboard; Default: English (US)

OSD

Select Configuration > System in the main menu.
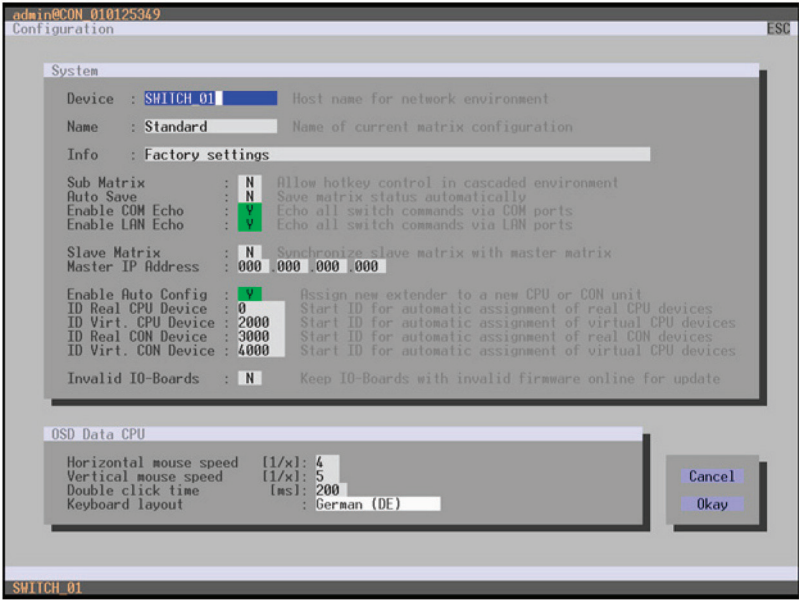
Figure 4-17. Menu Configuration—System screen.

Table 4-12. Cancel and Okay
selection buttons.

Button	Function
Cancel	Reject changes
Okay	Save changes

Java Tool
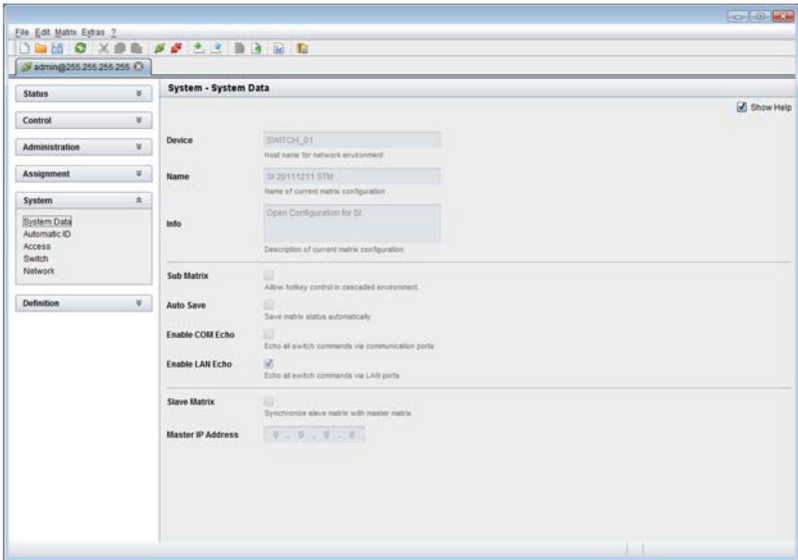
Figure 4-18. Menu System—System Data.

4.4.2 Automatic ID

From this menu, you can automatically create CPU and CON devices' settings by connecting a new extender unit.

You can access the menu via OSD or Java:

Figure 4-19. OSD and Java icons.

You can select between the following settings:

Table 4-13. Automatic ID settings.

Field	Selection	Description
Enable Auto Config	Activated	Automatically creates a new CPU or CON device if new extender units are connected (default)
	Deactivated	Function not active
ID Real CPU Device	Numerical value	Initial value of the automatic ID for real CPUs (default value: 1000)
ID Virtual CPU Device	Numerical value	Initial value of the automatic ID for virtual CPUs (default value: 2000)
ID Real CON Device	Numerical value	Initial value of the automatic ID for real CONs (default value: 3000)
ID Virtual CON Device	Numerical value	Initial value of the automatic ID for virtual CONs (default value: 4000)

OSD

Select Configuration > System in the main menu.
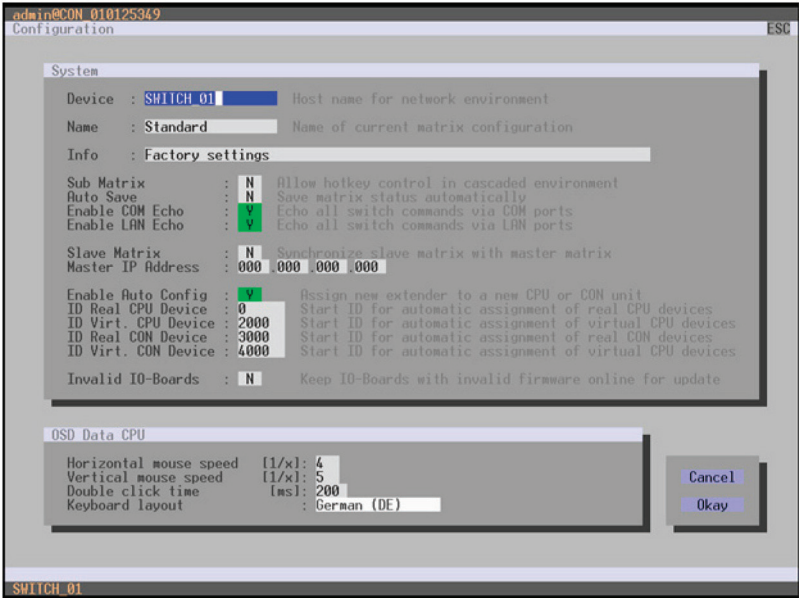
Figure 4-20. Menu Configuration—System screen.

Table 4-14. Cancel and Okay
selection buttons.

Button	Function
Cancel	Reject changes
Okay	Save changes

Java Tool

Select "System > Automatic ID" in the task area.
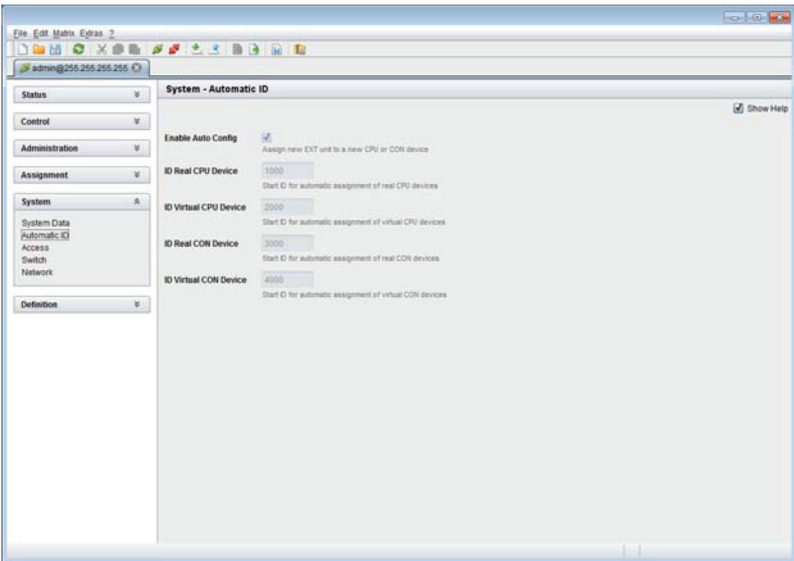
Figure 4-21. Menu System—Automatic ID screen.

4.4.3 Access

The access configuration is set in this menu.

You have the following options to access the menu:

Figure 4-22. OSD and Java icons.

Table 4-15. Access settings.

Field	Selection	Description
Force User Login	Activated	The user has to log in with a user name and a password code to enter OSD. Thereafter, the user remains logged in until he explicitly logs out or an auto logout is initiated.
	Deactivated	Function not active (default)
Enable User ACL	Activated	CPU access is restricted according to the permissions in the ACL (Access Control List). • User login is required. • Switching by keyboard hotkeys requires a prior login.
	Deactivated	Function not active (default)
Enable Console ACL	activated	CPU access is restricted according to the permissions of the respective Access Control List (ACL). No login is required.
	deactivated	Function not active (default)
Enable new user	activated	Newly-created users automatically receive access to all CPUs
	deactivated	Function not active (default)
Enable new CON	activated	Newly-created CON devices automatically receive access to all CPUs
	deactivated	Function not active (default)
Auto Disconnect	activated	Upon opening the OSD, the console will automatically disconnect from the current CPU.
	deactivated	Function not active (default)
OSD Timeout	0–999 seconds	Period of inactivity after which OSD will close automatically. • Select 0 seconds, for no timeout (default: 0 seconds)
Auto Logout	0–999 seconds	Period of inactivity of a logged-in user after which he will be automatically logged out at the console. There might be a disconnect because of the logout, depending on the defined rights in each CON and user ACL. • Select 0 minutes, for an automatic logout when leaving OSD. • Using the setting -1 allows the user to be logged in permanently, until a manual logout is executed. • The timer is not active as long as the OSD is open. (default: 0 minutes)

OSD

Select "Configuration > Access" in the main menu.
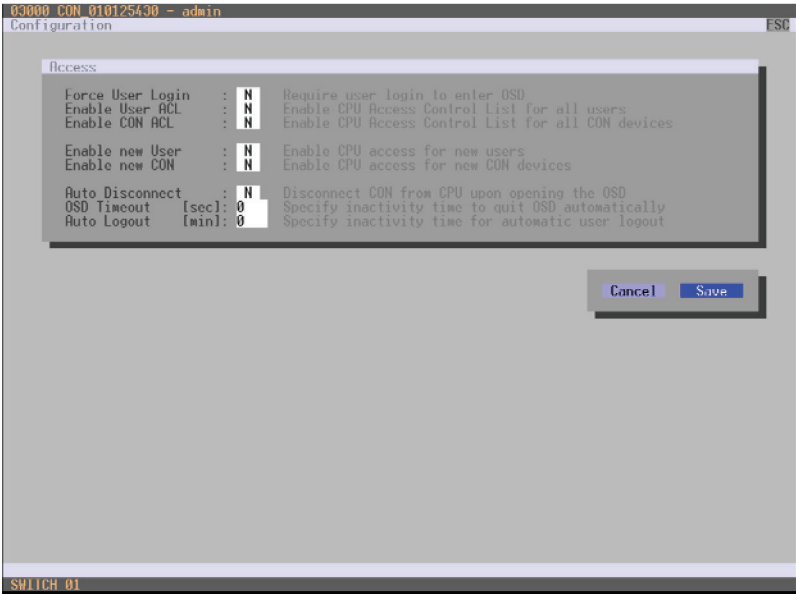
Figure 4-23. Menu Configuration Access screen.

You can select between the following buttons:

Table 4-16. Cancel and Save
selection buttons.

Button	Function
Cancel	Reject changes
Save	Save changes

Java Tool

Select "System > Access" in the task area.
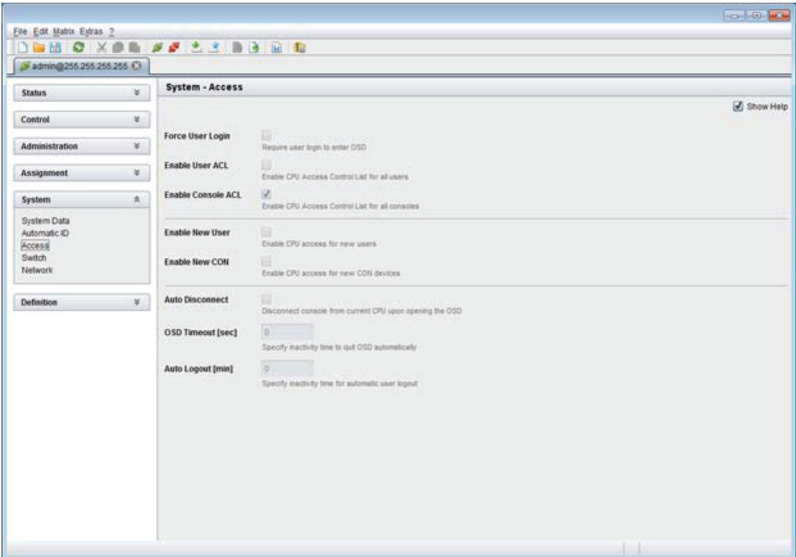
Figure 4-24. Menu System—Access screen.

4.4.4 Switch

The configuration of the switching parameters is set in this menu.

You have the following possibilities to access the menu:

Figure 4-25. OSD and Java icons.

You can select between the following settings:

Table 4-17. Switch settings.

Field	Selection	Description
Video Sharing	Activated	The user can switch to any CPU as an observer, even to ones that are already assigned to another user (observer without keyboard/mouse access). • *NOTE: Switch with the <Space> key , not the <Enter> key.* • The operator will not be informed if further users connect as an observer to the CPU that is connected to his console.
	Deactivated	Function not active (default)
Force Connect	Activated	The user can connect to every single CPU as an operator, even to ones that are related to another user. • *NOTE: The previous user is set to video-only status.* • To share K/M control, Force Connect must be activated.
	Deactivated	Function not active (default)
Force Disconnect	Activated	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 Connect must be deactivated.*
	Deactivated	Function not active (default)
CPU Auto Connect	Activated	If a console is not connected to a CPU, you can establish an automatic connection to the next available CPU by pressing any key or mouse button.
	Deactivated	Function not active (default)
CPU Timeout	0–999 minutes	Period of inactivity after which a console will automatically disconnect from its current CPU. (default value = 0 minutes)
Keyboard Connect	Activated	Activate request of K/M control by keyboard event (key will be lost)
	Deactivated	Function not active (default)
Mouse Connect	Activated	Activate request of K/M control by mouse event
	Deactivated	Function not active (default)

Table 4-17 (continued). Switch settings.

Field	Selection	Description
Release Time	0–999 seconds	Period of inactivity of a connected console after which K/M control can be requested by other consoles connected to the CPU. • *NOTE: Set "0" for an immediate 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 (default value: 10 seconds)

NOTE: If the "Keyboard Connect" and/or "Mouse Connect" options are activated, the Release Time condition must be met until a new user gains control.

OSD

Select "Configuration > Switch" in the main menu.
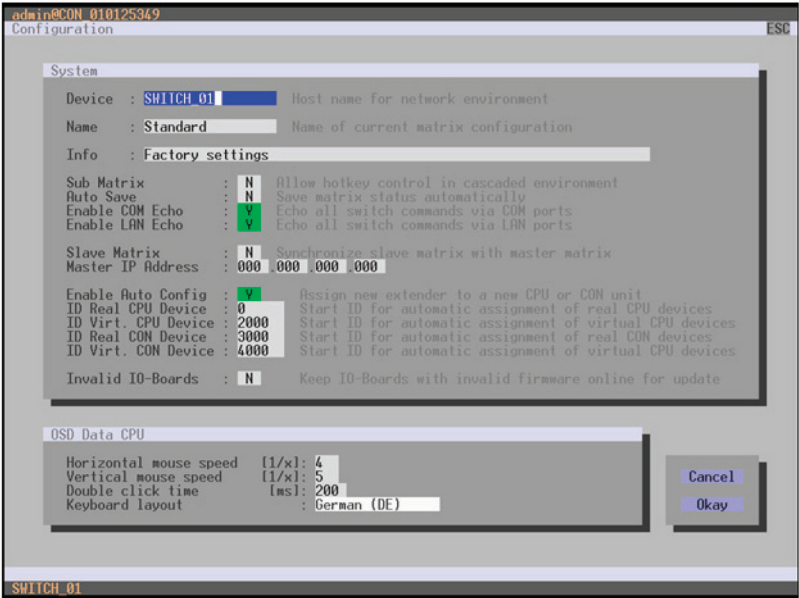
Figure 4-26. Menu configuration–System.

Table 4-18. Cancel and Save
selection buttons.

Button	Function
Cancel	Reject changes
Save	Save changes

Java Tool

Select "System > Switch" in the task area.
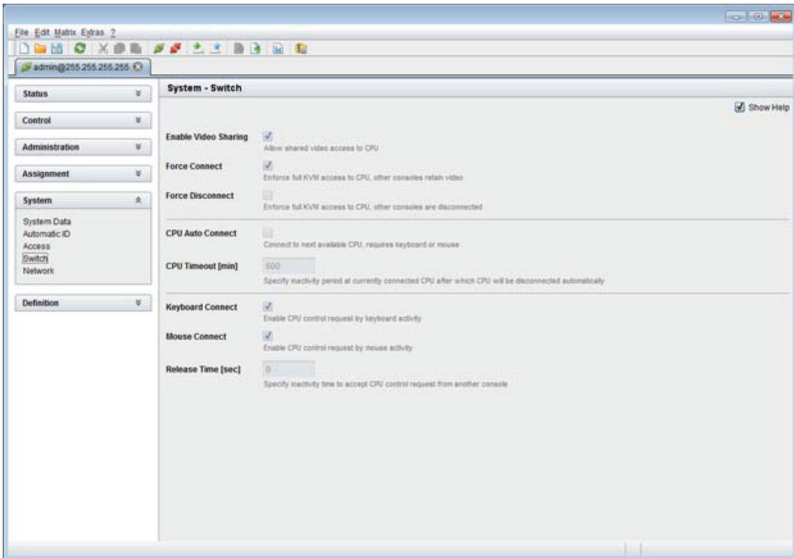
Figure 4-27. Menu system—switch.

4.4.5 Network

The network configuration is set in this menu.

You have the following possibilities to access the menu:

Figure 4-28. OSD and Java icons.

Table 4-19. Network settings.

Field	Selection	Description
DHCP	Activated	The network settings are automatically supplied by a DHCP server (default)
	Deactivated	Function not active
IP address	Byte	Input of the IP address in the form "192.168.1.1," if DHCP is not active
Subnet mask	Byte	Input of the subnet mask in the form "255.255.255.0," if DHCP is not active (default 255.255.255.0)
Gateway	Byte	Input of the subnet mask in the form "192.168.1.1," if DHCP is not active
API service	Activated	LAN interface at the DKM FX or FXC is activated for access via Java tool (API service port 5555)
	Deactivated	Function not active
FTP server	Activated	FTP server for tranmission of configuration files activated.
	Deactivated	Function not active
Syslog	Activated	Syslog server for status request is active
	Deactivated	Function not active
Syslog server	Byte	Input of the IP address of the Syslog server in the form "192.168.1.1"
Trace	DEB	Activate debug messages in Trace (default: Yes); *NOTE: The debug messages are exclusively for matrix diagnostics. They only should be activated after consultation with Black Box. Otherwise, increased traffic of data might limit the performance of the CPU board.*
	INF	Activate information messages in Trace (default: Yes)
	NOT	Activate notification messages in Trace (default: Yes)
	WAR	Activate warning messages in Trace (default: Yes)
	ERR	Activate error messages in Trace (default: Yes)
Syslog	DEB	Activate debug messages in Syslog (default: Yes); *NOTE: The debug messages are exclusively for matrix diagnostics. They only should be activated after consultation with Black Box. Otherwise, increased traffic of data might limit the performance of the CPU board.*
	INF	Activate information messages in Syslog (default: Yes)
	NOT	Activate notification messages in Syslog (default: Yes)
	WAR	Activate warning messages in Syslog (default: Yes)
	ERR	Activate error messages in Syslog (default: Yes)

NOTE: To activate the modified network parameters, restart the ServSwitch DKM.

CAUTION: Consult your system administrator before modifying the network parameters. Otherwise, unexpected results and failures can occur in combination with the network.

OSD

Select "Configuration > Network" in the main menu.
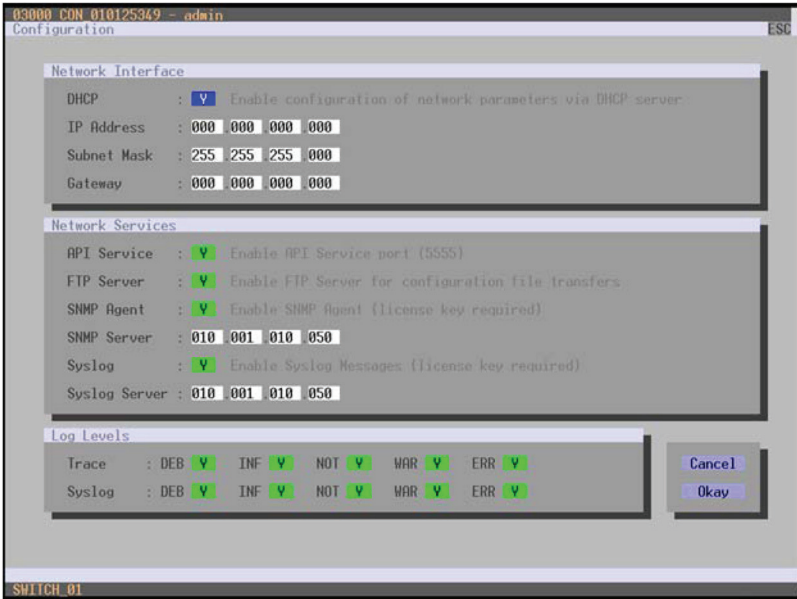
Figure 4-29. Menu Configuration—Network screen.

Table 4-20. Cancel and Save selection buttons.

Button	Function
Cancel	Reject changes
Save	Save changes

Java Tool

Select "System > Network" in the task area.
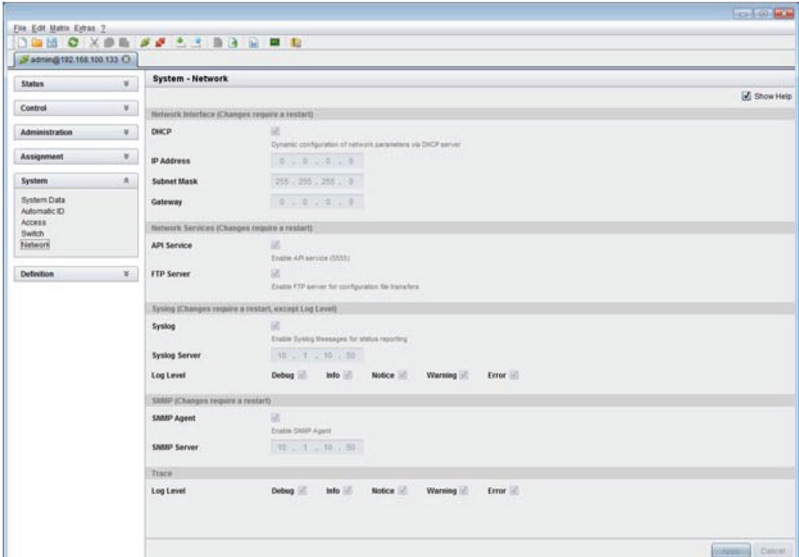
Figure 4-30. Menu system—network.

4.4.6 Date and Time

Date and Time are set in this menu, based on Simple Network Time Protocol (SNTP).

You can access the menu via OSD:

Figure 4-31. OSD icon.

Table 4-21. Date and time settings.

Field	Selection	Description
SNTP Client	activated	Enable network time server synchronization
	deactivated	Function not active (default)
SNTP Server	Byte	Input of the SNTP server IP address (default: 000.000.000.000)
Month	1–12	Enter month
Date	1–31	Enter date
Year	1–99	Enter year
Day	1–7	Enter day of the week
Hours	0–23	Enter hour
Minutes	0–59	Enter minute
Seconds	0–59	Enter second

OSD

Select "Configuration > Date+Time" in the main menu.

Figure 4-32. Menu Configuration—Date and Time screen.

NOTE: Date format according to the English notation.

To configure a time server, proceed as follows:

1. Set the option SNTP Client to Y (Yes).

2. Enter the IP address of your SNTP server in the field SNTP Server.

3. Select your time zone in the field Time Zone.

4. Press the "OK" button to confirm your settings.

5. Restart the matrix. The system time will be now be by the SNTP server.

To set the real time clock without using SNTP, proceed as follows:

1. Set the current date in the field Date.

2. Set the current Day in the field Day.

3. Set the current time in the field Time.

4. Press the "RTC" button to confirm your settings.

Java

Select System > Date and Time in the main menu.
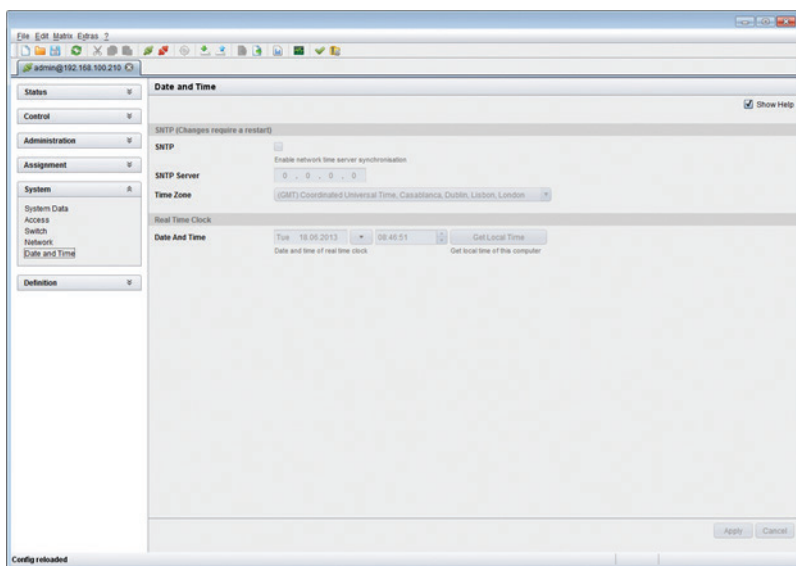
Figure 4-33.

To configure a time server, proceed as follows:

1. Enable option SNTP.

2. Enter the IP address of your SNTP server in the field SNTP Server.

3. Select your time zone in the field Time Zone.

4. Press the Apply button to confirm your settings.

5. Restart the matrix. The system time will be now provided by the SNTP server.

To set the real time clock without using SNTP, proceed as follows:

1. Set the current date in the field Date and Time.

2. Set the current time in the field Day and Time.

3. Press the Apply button to set the system time.

4. Option: If you want to receive the time from your currently used computer, press the button Get Local Time.

You can select between the following buttons:

Table 4-22. Cancel and Okay
selection buttons.

Button	Function
Cancel	Reject changes
Okay	Save changes

4.5 User Settings

4.5.1 User Data

New users and their user settings and permissions are set in this menu.

You have the following options to access the menu:

Figure 4-34. OSD and Java icons.

You can select between the following settings:

Table 4-23. User data settings.

Field	Selection	Description
Name	Text	User name (case-sensitive)
Password	Text	User password (case-sensitive)
Repeat Password	Text	Repeat user password (case-sensitive)
FTP	Activated	Access permission via FTP. This setting is necessary for file access from the Java tool or any Web browser.
	Deactivated	Function not active (default)
Power User	activated	• User has rights • Permission for crosspoint operations
	deactivated	Function not active (default)
Super User	activated	• Permission for system configuration and all switching operations • User has administrator rights • This setting is required for an online connection with the Java tool
	deactivated	Function not active (default)
Administrator	activated	• Permission for system configuration and all switching operations • User has administrator rights • This setting is required for an online connection to the Java tool
	deactivated	Function not active (default)

OSD

Select "Configuration > User" in the main menu.
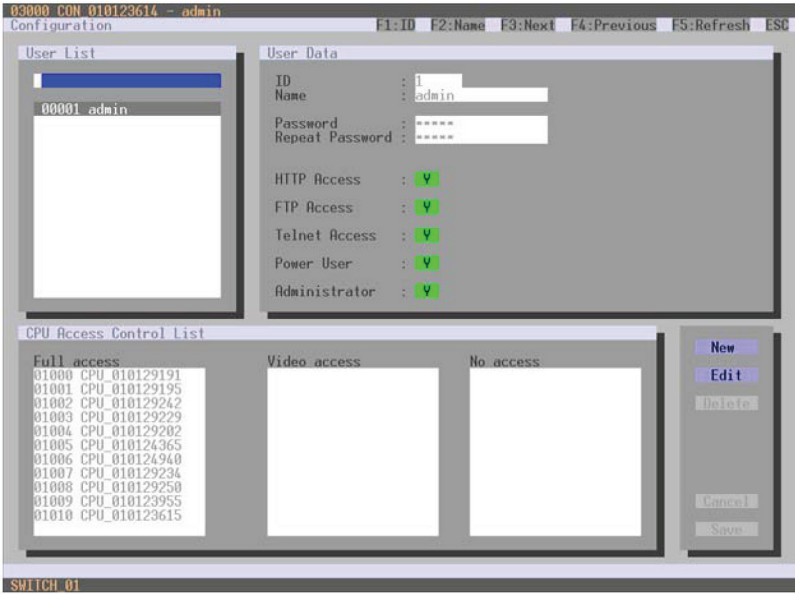
Figure 4-35. Menu Configuration—User screen.

Table 4-24. OSD settings.

Button	Function
New	Create a new user
Edit	Edit an existing user
Delete	Delete an existing user
Cancel	Reject changes
Save	Save changes

Java Tool

Select "User > User Data" in the task area.
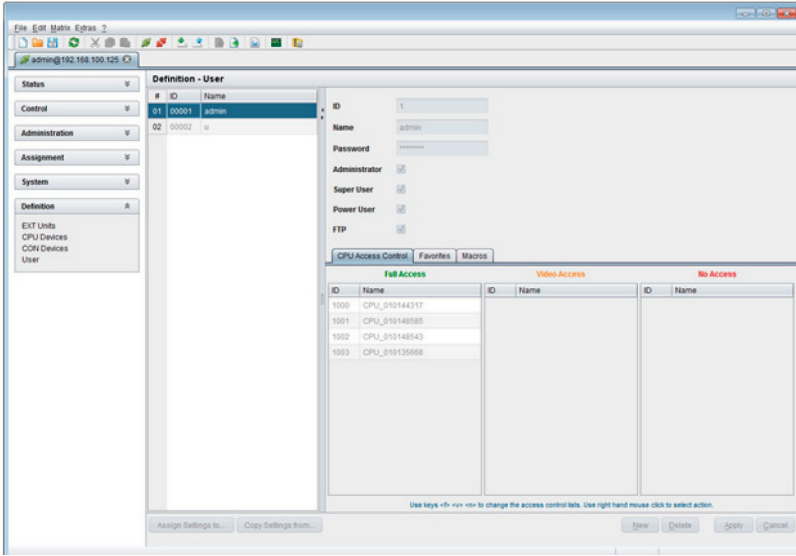
Figure 4-36. Menu User—User Data screen.

Table 4-25. OSD settings.

Button	Function
New	Create a new user
Delete	Delete an existing user
Apply	Create a new user account
Cancel	Reject changes

To configure user access rights for CPUs, proceed as follows:

1. Select a user in the User list.

2. By using the right mouse button once on a CPU in one of the respective access lists (Full Access, Video Access, and No Access), two lists for selection will appear in which the respective CPU can be moved and the access rights can be changed.

3. Confirm the configuration by pressing the "Apply" button.

To create a new user, proceed as follows:

1. Press the "New" button.

2. Select a template of an existing user if applicable (choose template).

3. Press the "OK" button.

4. Set a user name.

5. Set a password.

6. Set general access permissions.

7. Set user permissions for CPU access (paste function).

8. Set user favorites for OSD access.

9. Press the "Apply" button to save the new user settings.

You can select between the following keyboard commands:

Table 4-26. Keyboard commands.

Function	Keyboard Command
Add CPU to Full Access list	\<F\>
Add CPU to Video Access list	\<V\>
Add CPU to No Access list	\<N\>

NOTE: To select all CPUs/targets, highlight one CPU/target, and press Ctrl-A on the keyboard.

4.5.2 Favorites List Users

Individual favorites lists of CPUs that have to be switched frequently can be created for different users in this menu. A Favorites list can contain up to sixteen different CPUs.

The switching of the favorites is done via hotkeys using the keyboard.

You can access the menu in two ways: via OSD or Java.

Figure 4-37. OSD and Java tool icons.

OSD

Select "Assignments > User Favorites" in the main menu.
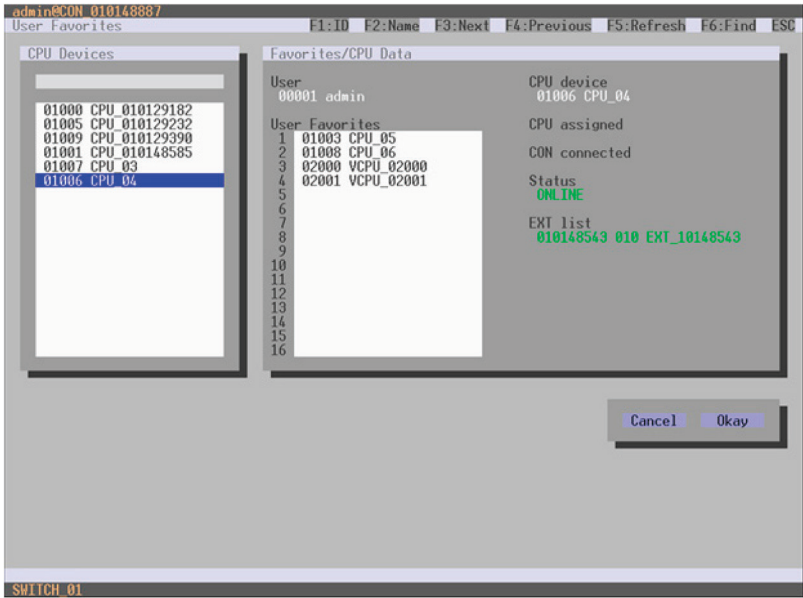
Figure 4-38. Menu Assignments – User Favorites.

To create a Favorites list for you own user, proceed as follows:

1. Select CPUs from the list CPU Devices that have to be moved to the Favorites list. By pressing the <a> key, a CPU device will be moved to the Favorites list and it will be removed by pressing <r>.

2. To change the order of the CPU devices within the Favorites list, press the <+> and <-> keys.

3. Press the "Save" button to save the settings.

Java Tool

Select the respective user in the working area of the User menu for the Favorites list and open the Favorites tab.
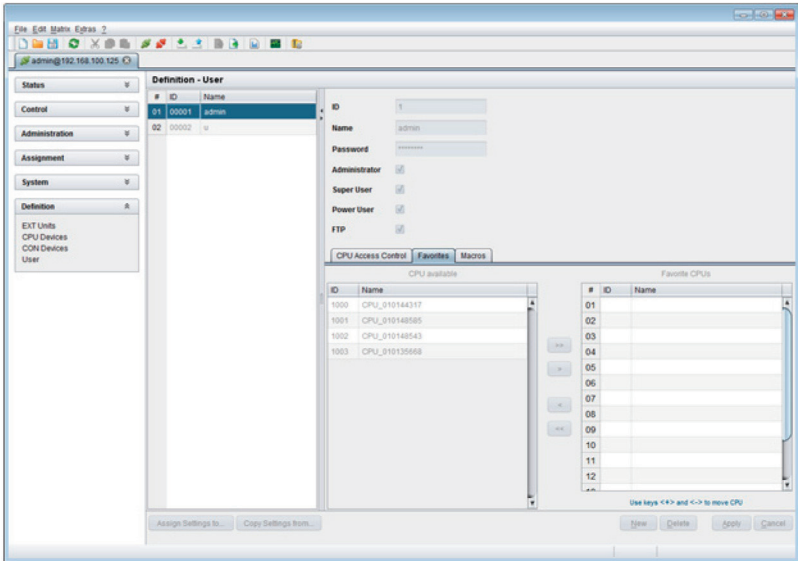
Figure 4-39. Definition – User.

To create a favorite list for any user, proceed as follows:

1. Select the CPUs in the CPUs Available list to add to the Favorites list (CPU assigned). Press the <Ctrl> key to mark more than one CPU device.

2. Press the ">" button to move the marked CPU devices to the Favorites list. Press the >> button, to move the first sixteen CPU devices from the CPU Available list to the Favorites list (CPU assigned).

3. To change the order of marked CPU devices within the Favorites list, press the <+> and <-> keys.

4. To remove marked CPU devices from the Favorites list, press the "<" button. Press the "<<" button to remove all CPU devices from the Favorites list.

4.5.3 User Macros

User macros can be created to switch or disconnect CON units to CPU units, using different access rights. The macro commands are created for each user or CON separately.

A macro can execute up to 16 switching commands successively.

You will use hotkeys and the function keys <F1>-<F16> to execute the macros.

NOTE: To execute user macros, the user has to be logged in at the matrix.

You can select between the following settings:

Table 4-27. Settings.

Field	Selection	Description
Function (01–06)	Connect, (P1 = CON, P2 = CPU)	Set bidirectional connection from console P1 to CPU P2.
	Connect Video, (P1 = CON, P2 = CPU)	Set video connection from console P1 to CPU P2.
	Disconnect (P1=CON)	Disconnect console P1.
	Logout User	Logout current user.
	Set Real CPU (P1 = VCPU, P2 = RCPU)	Assign a virtual CPU to a real CPU.
	Set Virtual CON (P1 = RCON, P2 = VCON)	Assign a real console to a virtual console.
	Push (P1 = CON)	The individual KVM connection is forwarded to console P1 and is changed to a video-only connection.
	Push Video (P1 = CON)	The video signal of the current connection (KVM or video only) is forwarded to console P1. The individual connection remains unchanged (KVM or video only).
	Get (P1 = CON)	The individual console gets a video-only connection to the CPU that is currently connected to console P1. The connection of console P1 remains unchanged (KVM or video only).
P1	CON or CPU Device	Name of CON or CPU device.
P2	CPU or CON Device	Name of CON or CPU device.

You can access the menu in two ways: OSD or Java.

Figure 4-40. OSD and Java icons.

OSD

Select the user that you want to create a user macro for from the "Configuration > User Macros" in the main menu.
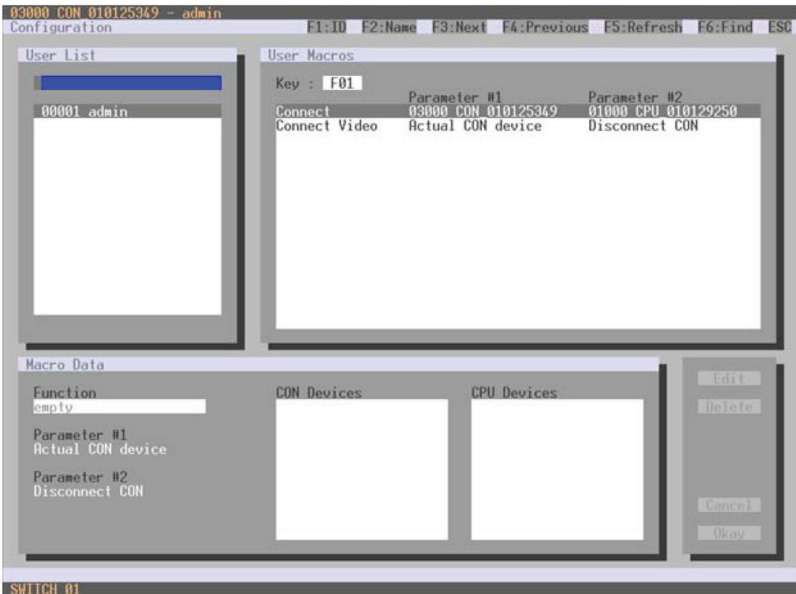
Figure 4-41. Menu Configuration - User Macros.

To create a macro for the selected user, proceed as follows:

1. Select the key for which a macro has to be created. Choose from 1–16.

2. Select the respective place on the list (1–16) of the key that has to be set with a macro key.

3. Select the marked place on the list a macro command in the "Macro Data" field.

4. Set the necessary parameters P1 and P2 (for example, CON Devices or CPU Devices) for the selected macro command.

5. Confirm your inputs by pressing the <Enter> key and repeat the process for further macro commands, if necessary.

Java-Tool

In the working area of menu "Definition > User," select the user for which macros have to be created and open the tab Macros.
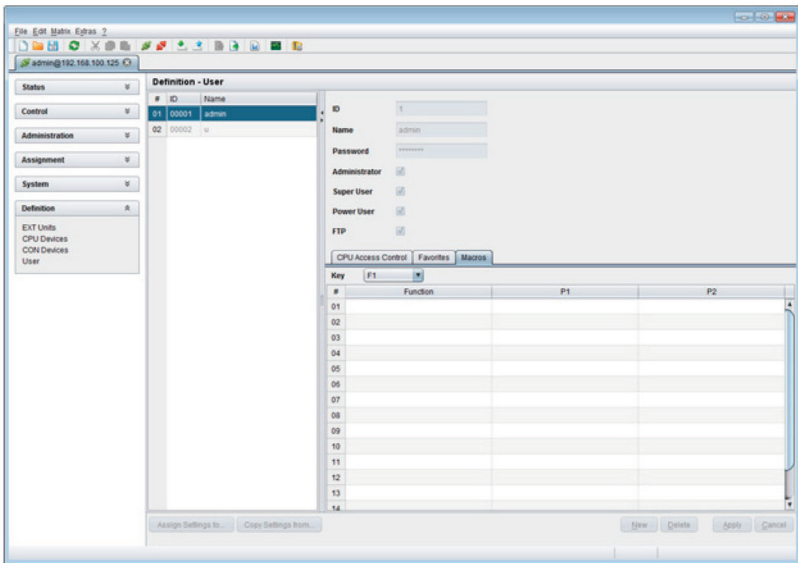
Figure 4-42. Menu Definition - User

To create a macro for the selected user, proceed as follows:

1. Select the Key (1-16) for which a macro has to be created.

2. Select in the Function the commands that should be part of the macro. Open the selection list by double-clicking on the empty fields.

3. Select the respective parameters for the macro functions (for example, corresponding consoles and CPUs) in the P1 and P2 columns.

4. Confirm your inputs by pressing the "Apply" button.

For an efficient macro configuration, the following context functions are available:

Via right-click on the tab Macros, macros can be assigned to other users by using the "Assign Macros to ..." function and can be copied from other users by using the "Copy Macros from ...." function.

Via right click on the macro list, you can copy macros of the selected key into the cache by using the "Copy Key Macros" function. You can paste the macros from the cache into a key by using the "Paste Key Macros" function and you can reset all macros of the selected key by using the "Key Macros" function.

4.6 Extender Settings

All extender units are managed in this menu. This also contains the creation of new extender units and the deletion of existing extender units.

The extender unit describes the connection of a physical extender to the matrix. Every extender board with a direct cable connection to the matrix is recognized as an extender unit. Dual-head KVM extenders will be recognized as two independent extender units.

NOTE: KVM extenders automatically create extender units inside the matrix.

To access the menu, use OSD or Java:

Figure 4-43. OSD and Java icons.

Table 4-28. OSD settings.

Field	Selection	Description
ID	Text	Numerical value of the extender ID (KVM extenders: ID is provided by extender unit [serial no.] and cannot be changed)
Name	Text	Name of the extender unit
Fixed	Activated	Create an extender unit with a fixed port assignment (default)
	Deactivated	Function not active (default)
Port	1–288 (depending on the matrix)	Port number of the extender unit

OSD

Select "Configuration > EXT Units" in the main menu.
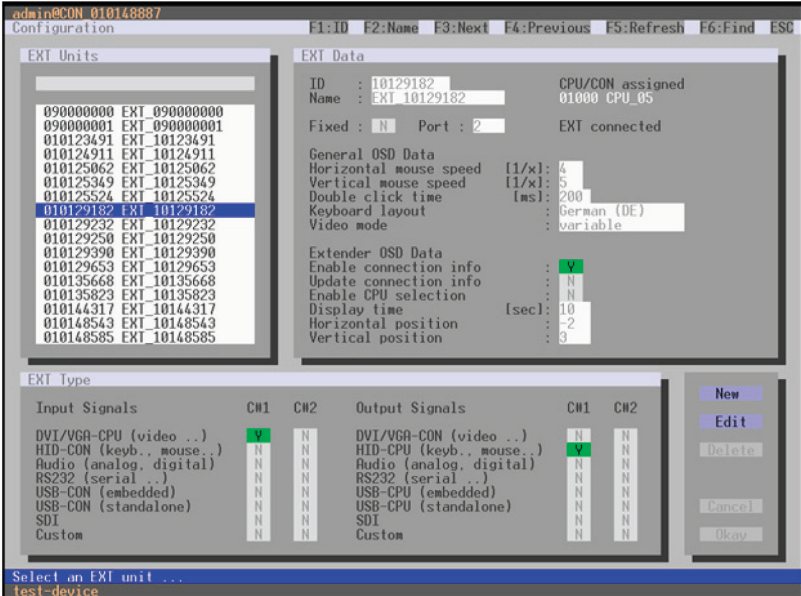
Figure 4-44. Menu Configuration—EXT Units screen.

You can select between the following buttons:

Table 4-29. Extender (EXT) units settings.

Button	Function
New	Create an extender unit
Edit	Edit an existing extender unit
Delete	Delete an existing extender unit
Cancel	Reject changes
Save	Save changes

The settings for the tab OSD Data are described in Section 4.8.2.

Java Tool

Select "Definition > EXT Units" in the task area.
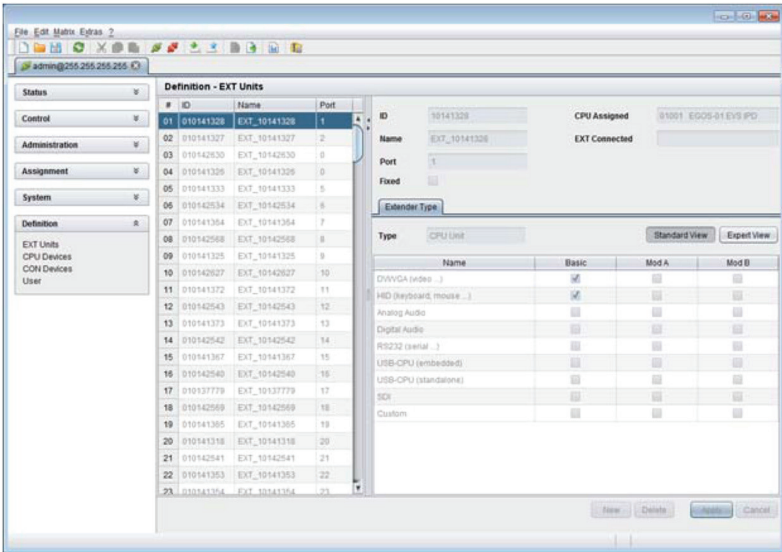
Figure 4-45. Menu Definition—EXT Units screen.

You can select between the following buttons:

Table 4-30. OSD settings.

Button	Function
New	Create a new extender unit
Delete	Delete an existing unit
Apply	Confirm changes of an extender unit
Cancel	Reject changes

4.6.1 Creating Flex-Port Extender Units

Extenders with ID function are automatically recognized by the system and cannot be created manually. They are used as "Flex-Ports" on the matrix.

NOTE: The connection of fixed-port extender units (for example, USB 2.0) to a Flex-Port can cause unintended results.

4.6.2 Creating Fixed-Port Extender Units

To create a fixed-port extender unit (for example, USB 2.0), proceed as follows:

1. Press the "New" button.

2. Select whether a template for a USB 2.0 CON unit (USB CON Unit) or USB 2.0 CPU unit (USB CPU Unit) should be used.

3. Press the "OK" button.

4. Determine a port at the matrix that should be used with the USB 2.0 extender unit (Fixed Port). As an option, the name of the USB 2.0 extender unit can be changed (Name). You need to choose a port that has not already been assigned.

5. Press the "Apply" button to save the new extender unit.

NOTE: Created extender units are always set as fixed-port extenders. These configurations are necessary, if you want to switch, for example, USB 2.0 connections via the matrix.

NOTE: After creating the Fixed Port for USB 2.0 extenders, the I/O board will need to be restarted, otherwise it will not function properly.

4.6.3 Deleting Flex-Port Extender Units

Deleting Flex-Port extender units connected to the matrix is not possible.

4.6.4 Deleting Fixed-Port Extender Units

To delete a fixed-port extender unit (for example, USB 2.0), proceed as follows:

1. Verify that the fixed-port extender unit to be deleted is currently not assigned to a device.

2. Select the fixed-port extender unit to be deleted in the selection list on the left side of the menu EXT Units and confirm with the key <Okay>.

3. Press the "Delete" button.

4. Press the "OK" button to confirm the deletion.

NOTE: To make a fixed port available again for Flex-Port extender units after deleting a fixed-port extender unit, restart the I/O board.

4.7 USB 2.0 Extender

This section helps you to configure and use your USB 2.0 extenders. These extenders will have to be connected to standard I/O boards in this case. USB 2.0 extenders can be configured for independent switching or can be assigned to already existing KVM extenders.

You have the following options to configure the extenders:

Figure 4-46.

OSD

• Select Configuration > EXT Units in the main menu.
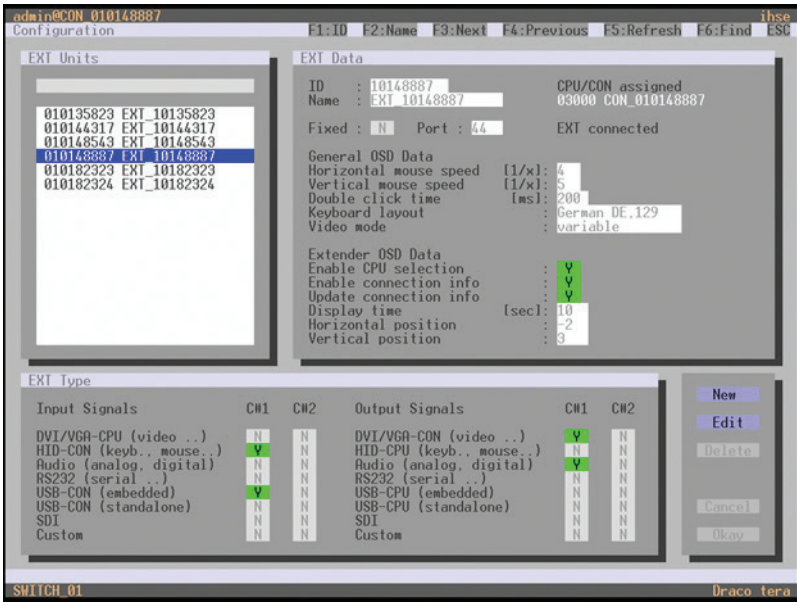
Figure 4-47. Menu Configuration – EXT Units.

1. To configure a USB 2.0 extender unit, press the "New" button. An extender with an eight-digit ID will be created, starting with digit 9.

2. Assign an appropriate name to the extender in the Name field.

3. Enter the port number of the matrix physically connected to the USB 2.0 extender unit into the Port field.

4. To configure the created extender as a CON Unit, set the USB-CON (standalone) option to Y (C#1 in the Input Signals column) and confirm by pressing the "OK" button.

5. To configure the created extender as a CON Unit, set the USB-CPU (standalone)

option to Y (C#1 in the Output Signals column) and confirm by pressing the "OK" button.

6. To create an individually switchable Device for the USB 2.0 CON extender, select Configuration > CON Devices and press the "New R" button.

Alternatively, you can assign the USB 2.0 CON extender to an already existing CON Device. To do this, select the Device and move the USB 2.0 CON extender from the EXT available field into the EXT assigned field.

7. Give an appropriate name to the new Device in the Name field.

8. Repeat steps 6 and 7 for all USB 2.0 CPU extenders in the Configuration > CPU Devices menu.

9. If you use parallel operation within the matrix, set the Release Time in the Configuration > Switch menu to 10 seconds or more.

10. Restart all I/O boards on which USB 2.0 extenders have been configured or alternatively restart the matrix.

The USB 2.0 extenders are now configured and can be used.

Java Tool

Select Definition > EXT Units in the task area.
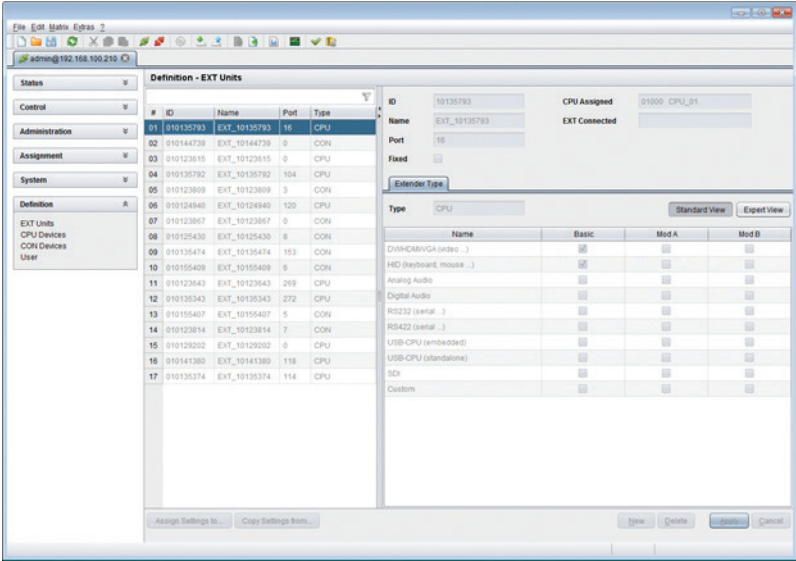
Figure 4-48. Menu Definition —EXT Units.

1. Press the "New" button.

A popup window opens.

2. Select (Templates) in the selection box, if you want to use a template for a USB 2.0 CON Unit (USB CON Unit) or a USB 2.0 CPU Unit (USB CPU Unit).

An extender with an eight-digit ID will be created, starting with digit 9.

3. Give an appropriate name to the extender in the Name field.

4. Enter the port number of the matrix physically connected to the USB 2.0 extender unit into the Port field.

5. Confirm your settings by pressing the "Apply" button.

6. The USB 2.0 CON extenders now has to be either assigned to an existing CON Device in the menu Definition > CON Devices or a new CON Device has to be created for the assignment by pressing the "New" button.

7. The USB 2.0 CPU extenders now has to be either assigned to an existing CON Device in the Definition > CPU Devices menu or a new CON Device has to be created for the assignment by pressing the New button.

8. If you use parallel operation within the matrix, set the Release Time in the Configuration > Switch menu to 10 seconds or more (see Chapter 5.9.6, Page 138).

9. Restart all I/O boards on which USB 2.0 extenders have been configured or alternatively restart the matrix.

The USB 2.0 extenders are now configured and can be used.

NOTE: Created extender units are always set as fixed port extenders. This configuration is necessary if you want to switch USB 2.0 connections via the matrix.

To make a fixed port available again for Flex-Port extender units after deleting a fixed port extender unit, restart the I/O board.

4.8 CPU Settings

New CPU devices are configured in this menu including their assignment to extenders.

The assignment helps to describe and switch more complex computer configurations (for example, Quad-Head with USB 2.0) in the matrix.

You can access the menu via the OSD or Java icon:

Figure 4-49. OSD and Java icons.

You can select between the following settings:

Table 4-31. CPU settings.

Field	Selection	Description
ID	Text	ID of the CPU unit (see Section 4.4.2)
Name	Text	Name of the CPU device
Virtual Device	Activated	Create new CPU device as a virtual one
	Deactivated	Function not active (default)
Allow Private	Activated	Allows switching to the respective CPU device in Private Mode.
	Deactivated	Function not active (default)
Force Private	Activated	Force switching to the respective CPU only in Private Mode.
	Deactivated	Function not active (default)
Fix Frame	Activated	Force showing a red frame when switching to the respective CPU.
	Deactivated	Function not active (default)

OSD

Select "Configuration > CPU Units" in the main menu.

Figure 4-50. Menu Configuration—CPU Devices screen.

You can select between the following buttons:

Table 4-32. CPU unit buttons.

Button	Function
New R.	Create a new real CPU unit
New V.	Create a new virtual CPU unit
Edit	Edit an existing CPU device
Delete	Delete an existing CPU device
Cancel	Reject changes
Save	Save changes

Java Tool

Select "Definition > CPU Devices" in the task area.

Figure 4-51. Menu Definition—CPU Devices screen.

You can select between the following buttons:

Table 4-33. CPU devices buttons.

Button	Function
New	Create a new CPU device
Delete	Delete a new CPU device
Apply	Confirm a created CPU device
Cancel	Reject changes
>	Assign selected extender units
>>	Assign all available extender units
<	Remove the selected extender units
<<	Remove all extender units

You can select between the following keyboard commands:

Table 4-34. Keyboard commands.

Function	Keyboard Command
Change assignment number of the extender unit upwards	<+>
Change assignment number of the extender unit downwards	<->

To create a new CPU device, proceed as follows:

1. Press the "New" button.

2. Select whether a real CPU ("Create a real CPU") or a virtual CPU ("Create a virtual CPU") should be created or a template of an existing CPU should be used ("Choose template").

NOTE: A template can be used only if there is at least one existing CPU device.

3. Press the "OK" button.

4. Determine all parameters that are relevant for the CPU.

5. To confirm the new CPU, press the "Apply" button.

To access a new CPU via matrix, an assignment of one or more CPU-type extender units is required. Proceed as follows:

1. Select the new CPU in the CPU devices list.

2. Select one or more extenders in the Extender Available list.

3. Perform the assignment by pressing the ">"button. To assign all available extenders to the CPU, press the ">>" button.

   The assignments are displayed in the Extender Assigned list.

4. Confirm the assignment by pressing the "Apply" button.

To remove an extender assignment, proceed as follows:

1. Select a CPU in the CPU Devices list.

2. Select one or more extenders in the Extender Assigned list.

3. Remove the assignment with the "<" button. To remove all existing assignments, press the "<<" button.

4. Confirm the removal with the "Apply" button.

4.9 Console Settings

You can perform the following console settings:

4.9.1 CON Devices

New CON devices are created in this menu, which include access rights and assignment to extenders.

You can access the menu via OSD or Java:

Figure 4-52. OSD and Java icons.

You can select between the following settings:

Table 4-35. CON devices settings.

Field	Selection	Description
ID	Text	ID of the CON unit (see Section 4.4.2)
Name	Text	Name of the CON device
Virtual device	Activated	Create new CON device as a virtual one
	Deactivated	Function not active (default)
Allow User ACL	Activated	Allow activation of the User ACL at the local console.
	Deactivated	Function not active
Force login	Activated	Force user login at this CON device
	Deactivated	Function not active
LOS frame	Activated	If there is a loss of connection, the last picture shown will still be displayed and is surrounded by an orange frame. If you switch to a CPU that does not have a video signal, a blank screen will appear surrounded by an orange frame.
	Deactivated	Function not active (default)
Allow CPU Scan	Activated	Allow a scan mode with an automatic change of the video signal for the favorite list (CPU devices) of the respective console or a logged in user.
	Deactivated	Function not active (default).
Force CPU Scan	Activated	Force a scan mode with an automatic change of the video signal for the favorite list (CPU devices) of the respective console or logged-in user.
	Deactivated	Function not active (default).
Scan Time	0–99 seconds	Retention period until switching to the next CPU device.

OSD

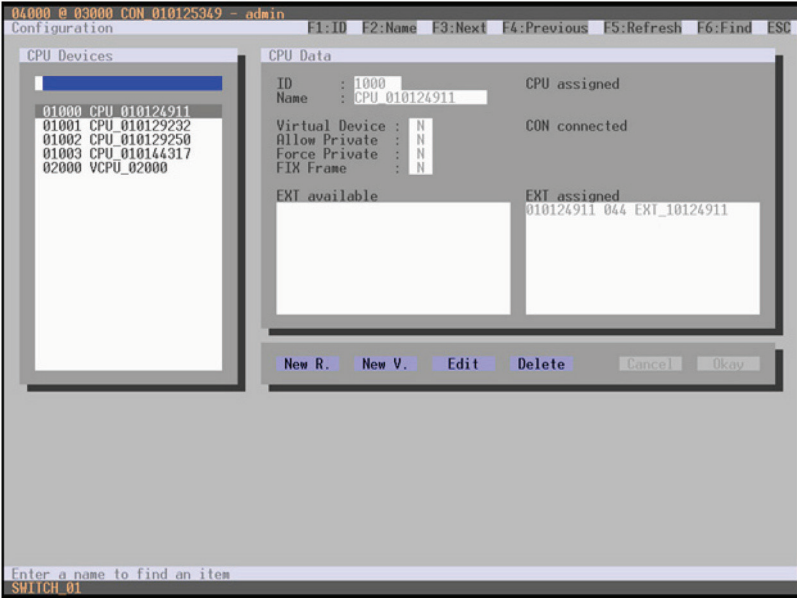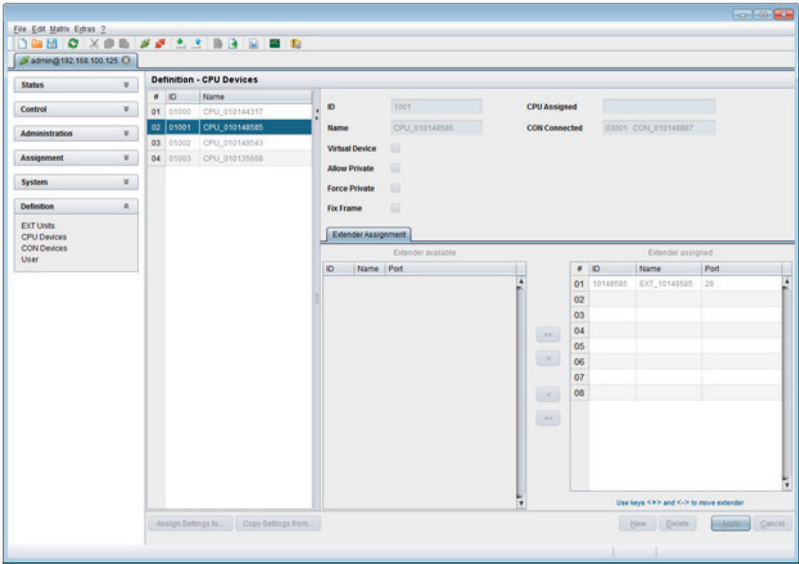Select "Configuration > CON Devices" in the main menu.

Figure 4-53. Menu Configuration—CON Devices screen.

You can select between the following buttons:

Table 4-36. CON devices buttons.

Button	Function
New R.	Create a real console
New V.	Create a virtual console
Edit	Edit an existing console
Delete	Delete an existing console
Cancel	Reject changes
Save	Save changes

Java Tool

Select "Definition > CON Devices" in the task area.
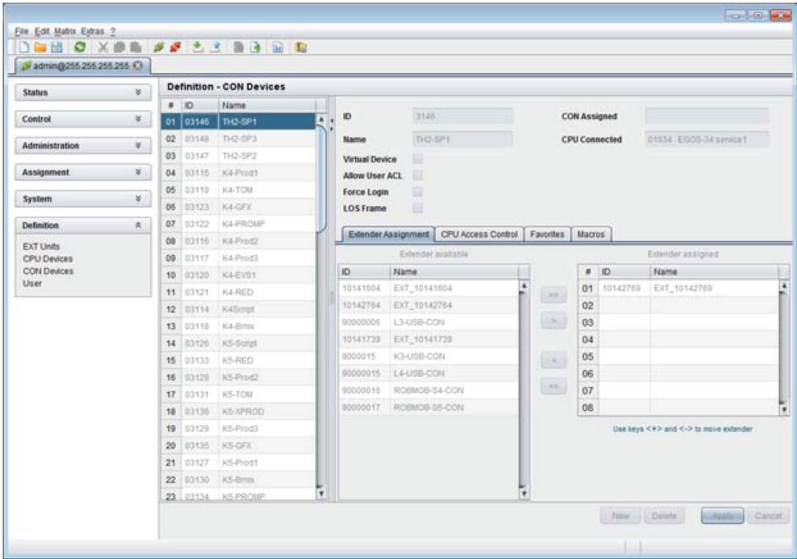
Figure 4-54. Menu Configuration—CON Devices screen.

Table 4-37. Menu configuration—
CON devices buttons.

Button	Function
New	Open a new CON device
Delete	Delete a new CON device
Apply	Confirm a created CON device
Cancel	Reject changes
>	Assign selected extender units
>>	Assign all available extender units
<	Remove the selected extender units
<<	Remove all extender units

You can select between the following keyboard commands:

Table 4-38. Keyboard commands.

Function	Keyboard Command
Decrease assignment number of the extender unit	<+>
Increase assignment number of the extender unit	<->

To create a new console, proceed as follows:

1. Press the "New" button.

2. Select "Create a real Console" to create a real console or a select "Create a virtual Console" to create a virtual console, or select "Choose template" to use the template of an existing console.

NOTE: A template can only be used if there is at least one existing CON device.

3. Press the "OK" button.

4. Determine all parameters that are relevant for the console.

5. To confirm a created console, press the "Apply" button.

To run a created CPU via matrix, you need to assign one or more CON units (extenders). To place an assignment, proceed as follows:

1. Select the console in the CON devices list to be assigned to an extender.

2. Select the extender in the Extender Available list to be assigned to the CON.

3. Perform the assignment by pressing the ">" button. To assign all available extenders to the console, press the ">>" button. The assignments are displayed in the Extender Assigned list.

4. Confirm the assignment by pressing the "Apply" button.

To remove an extender assignment, proceed as follows:

1. Select the console in the CON devices to be modified list.

2. Select the extender(s) in the Extender assigned to be removed list.

3. Remove the assignment with the "<" button. To remove all existing assignments, press the "<<" button.

4. Confirm the changes by pressing the "Apply" button.

To configure the access rights of consoles to CPUs, proceed as follows:

1. Select a console in the CON devices list.

2. Open the "CPU Access Control" tab.

3. Assign new access rights by using the right mouse button or the respective keyboard commands (see below).

4. Confirm the configuration by pressing the "Apply" button.

You can select between the following keyboard commands:

Table 4-39. Keyboard commands.

Function	Keyboard Command
Add CPU to Full Access list	<F>
Add CPU to Video Access list	<V>
Add CPU to No Access list	<N>

4.9.2 Mouse and Keyboard

From this menu, you can set the OSD configuration for mouse and keyboard. You can access the menu via OSD or Java.

Figure 4-55. OSD and Java icons.

Table 4-40. Mouse and keyboard settings.

Field	Selection	Description
Horizontal speed 1/x	1–9	Adjusts the horizontal mouse speed: 1= slow, 9 = fast (default value = 4)
Vertical speed 1/x	1–9	Adjusts the vertical mouse speed: 1= slow, 9 = fast (default value = 5)
Double-click	100–800	Adjusts the time slot for a double-click (default value = 200 ms)
Keyboard layout	Region	Set the OSD keyboard layout according to the keyboard you are using (default: German [DE])
Video Mode	Variable or specific resolution	Resolution that is used when opening OSD

NOTE: The mouse and keyboard settings are console specific. You can set them separately for every console.
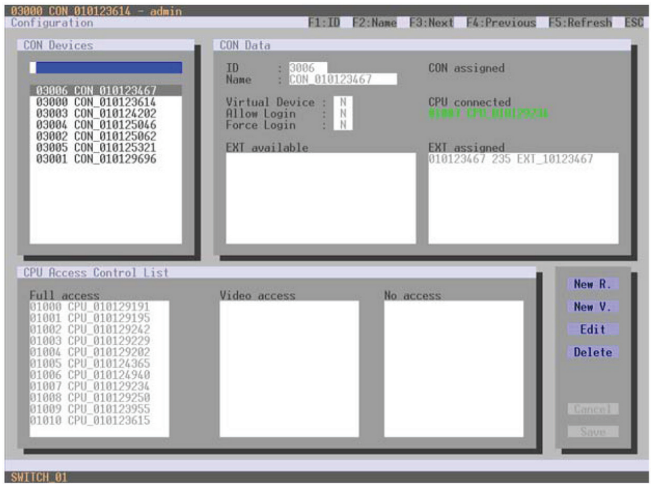
OSD

Select "Configuration > EXT Units" in the main menu.
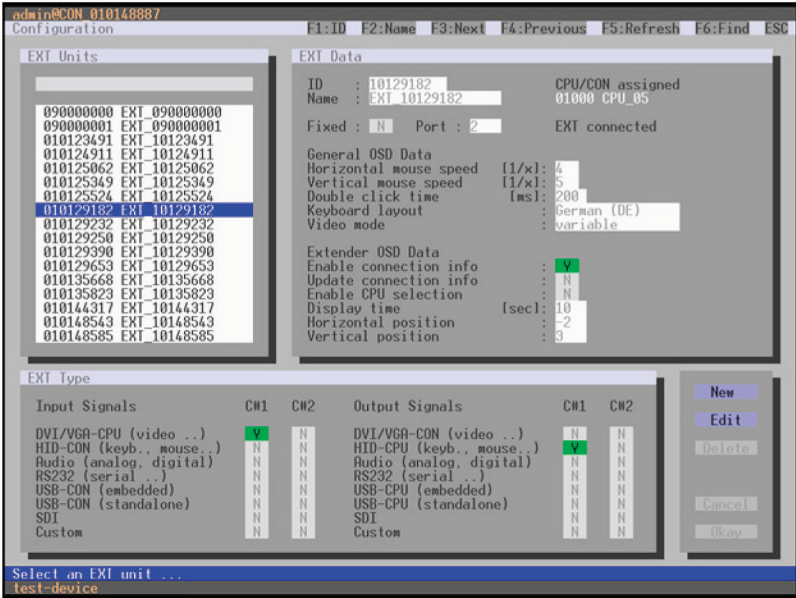
Figure 4-56. Menu Configuration—EXT Units screen.

You can select between the following buttons:

Table 4-41. Buttons.

Button	Function
Cancel	Reject changes
Save	Save changes

Java Tool

Select "Definition > EXT Units" in the task area.

NOTE: Set mouse and keyboard settings using the OSD Data tab.
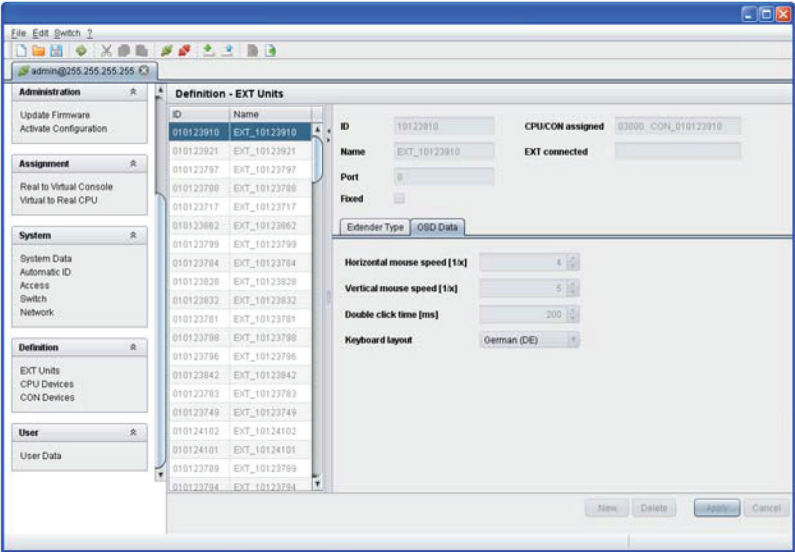
Figure 4-57. Menu Definition—EXT Units screen.

4.9.3 Extender OSD

In this menu, the settings for the Extender OSD settings can be adjusted. These are local settings that can be made individually for each console.

You can select between the following Extender OSD settings:

Table 4-42. Mouse and keyboard settings.

Field	Selection	Description
Enable CPU selection	Activated	When executing the key sequence for opening the OSD, a selection list for switching CPU devices will be displayed in the center of the monitor. Pressing the button <F7> within the selection list opens the standard OSD.
	Deactivated	Function not active
Enable connection info	Activated	Enable Extender OSD (default: Yes)
	Deactivated	Function not active
Update connection info	Activated	Update connection changes during fade-in of Extender OSD (default: Yes)
	Deactivated	Function not active
Display time	0–999 seconds	Duration of OSD fade-in (default: 10)
Horizontal position	10 pixels	Horizontal OSD position (default: 2)
Vertical position	10 pixels	Vertical OSD position (default: 2)

NOTE: When setting the horizontal OSD position, a prefixed minus describes the orientation to the right edge of the monitor, for example, -2 means 2 x 10 = 20 pixels of distance to this edge. When setting a vertical position, a prefixed minus describes an orientation to the bottom edge of the monitor.

If the "Update Connections" function is deactivated, the Extender OSD only appears when switching via OSD.

You can access the menu in two ways: via OSD or Java.

Figure 4-58. OSD and Java icons.

OSD

Select "Configuration > EXT Units" in the main menu.
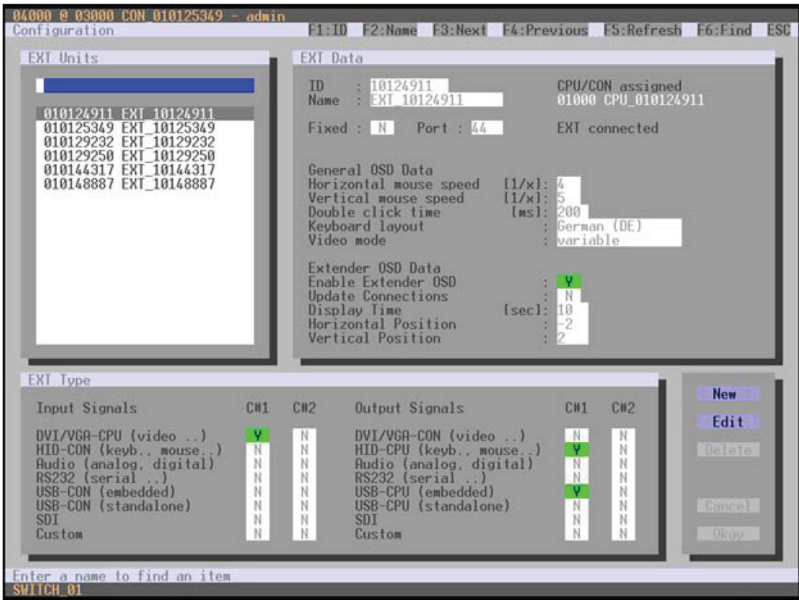
Figure 4-59. Menu Configuration – EXT Units

To change the Extender OSD settings, proceed as follows:

1. Select the console extender in the list EXT-Units whose Extender OSD settings has to be adjusted.

2. When confirming the selection by pressing the key <Enter>, the respective console extender will be enabled for editing.

Java Tool

Select "Definition > EXT Units" in the task area.
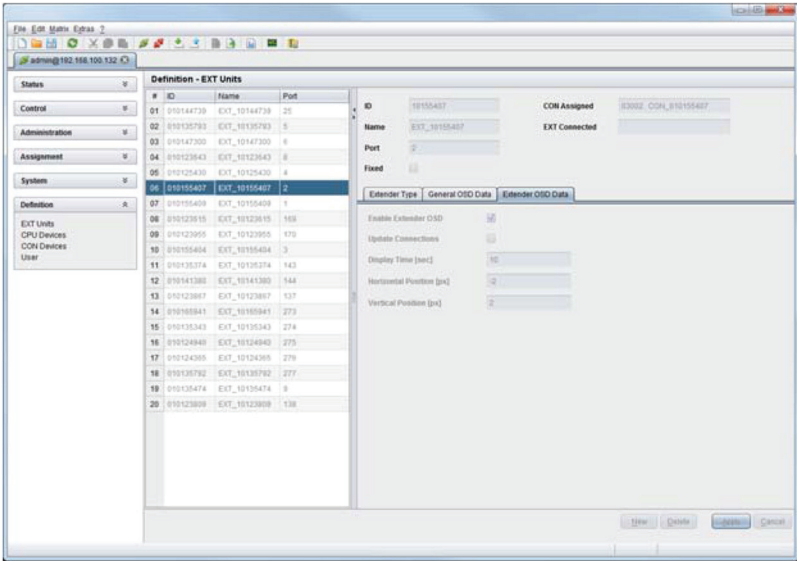
Figure 4-60. Menu Definition – EXT Units.

To change the Extender OSD settings, proceed as follows:

1. Select the console extender in the list EXT-Units whose Extender OSD settings have to be adjusted.

2. Open the "Extender OSD Data" tab.

3. Adjust the desired settings and confirm by pressing the "Apply" button.

4.9.4 Favorite List Consoles

Individual Favorites lists of CPUs that have to be switched frequently can be created for different consoles in this menu. A Favorites list can contain up to 16 different CPUs. You can switch favorites via hotkeys.

You can access the menu in two ways: via OSD or Java.

Figure 4-61. OSD and Java icons.

OSD

Select "Assignments > CON Favorites" in the main menu.
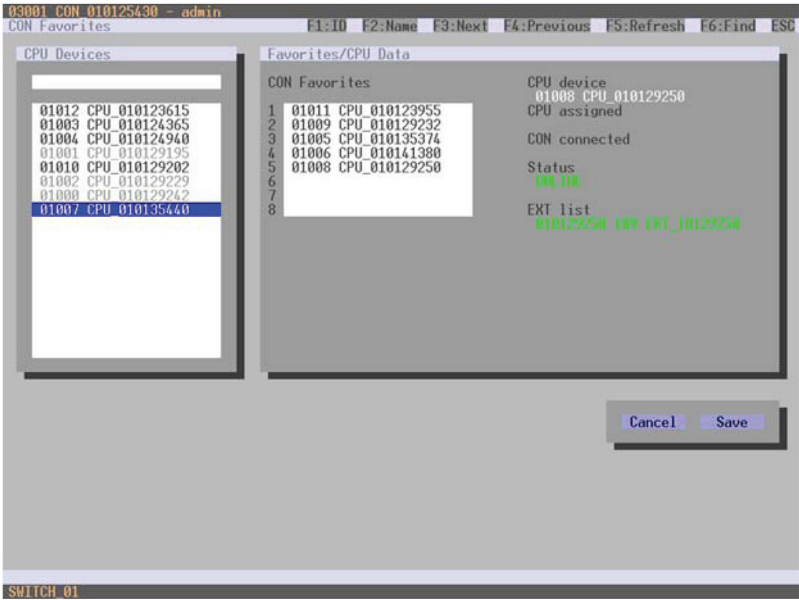
Figure 4-62. Menu Assignments – CON Favorites.

To create a Favorites list for your own console, proceed as follows:

1. Select successively the CPUs from the list CPU Devices that have to be moved to the Favorites list. Press the <a> key to move a CPU device to the Favorites list. Press the <r> key to remove a CPU device from the Favorites list.

2. To change the order of the CPU devices within the Favorites list, press the <+> and <-> keys.

3. Press the "Save" button to save the settings.

Java Tool

Select the respective user in the working area of the "CON Devices" menu for the Favorites list and open the Favorites tab.
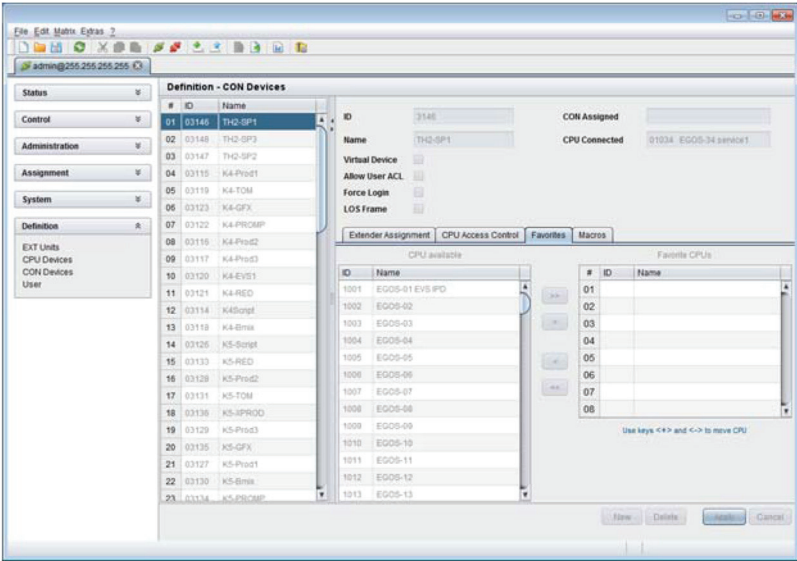
Figure 4-63. Menu Definition – CON Devices

To create a Favorites list for any console, proceed as follows:

1. Select the CPUs in the CPU Available list that should be added to the Favorites list (CPU assigned). To mark more than one CPU device at the same time, press the <Ctrl> key.

2. Press the" >" button to move the marked CPU devices to the Favorites list. If you press the ">>' button, the first eight CPU devices from the CPU Available list will be moved to the Favorites list (CPU assigned).

3. To change the order of marked CPU devices within the Favorites list, press the <+> and <-> keys.

4. To remove marked CPU devices from the Favorites list, press the "<" button. To remove all CPU devices from the Favorites list, press the "<<" button.

4.9.5 Console Macros

In this menu, you can create macro commands for switching, disconnection, or

user administration. The macro commands are created for each console separately.

A macro can execute up to 16 switching commands successively.

Execute the macros via "Hotkey" and the <F1>-<F16> function keys.

You can select between the following settings:

Table 4-43. Console macros settings.

Field	Selection	Description
Function (01–16)	Connect (P1 = CON, P2 = CPU)	Set bidirectional connection from Console P1 to CPU P2.
	Connect video (P1 = CON, P2 = CPU)	Set video connection from Console P1 to CPU P2.
	Disconnect (P1 = CON)	Disconnect Console P1.
	Logout user	Logout current user.
	Set Real CPU (P1 = VCPU, P2 = RCPU)	Assign a virtual CPU to a real CPU.
	Set Virtual CON (P1 = RCON, P2= VCON)	Assign a real console to a virtual console.
	Push (P1 = CON)	The KVM connection is forwarded to Console P1 and is changed to a video-only connection.
	Push video (P1 = CON)	The video signal of the current connection (KVM or video only) is forwarded to Console P1. The connection remains unchanged (KVM or video-only).
	Get (P1 = CON)	The console gets a KVM connection to the CPU that is currently connected to Console P1. The connection of Console P1 is changed into a video-only connection.
	Get video (P1 = CON)	The console gets video-only connection to the CPU that is currently connected to console P1. The connection of Console P1 remains unchanged (KVM or video-only).
P1	CON or CPU device	Name of CON or CPU device.
P2	CON or CPU device	Name of CON or CPU device.

You can access the menu in two ways: via OSD or Java.

Figure 4-64. OSD and Java icons.

OSD

Via "Configuration > CON Macros" in the main menu, select the console for which a console macro has to be created.
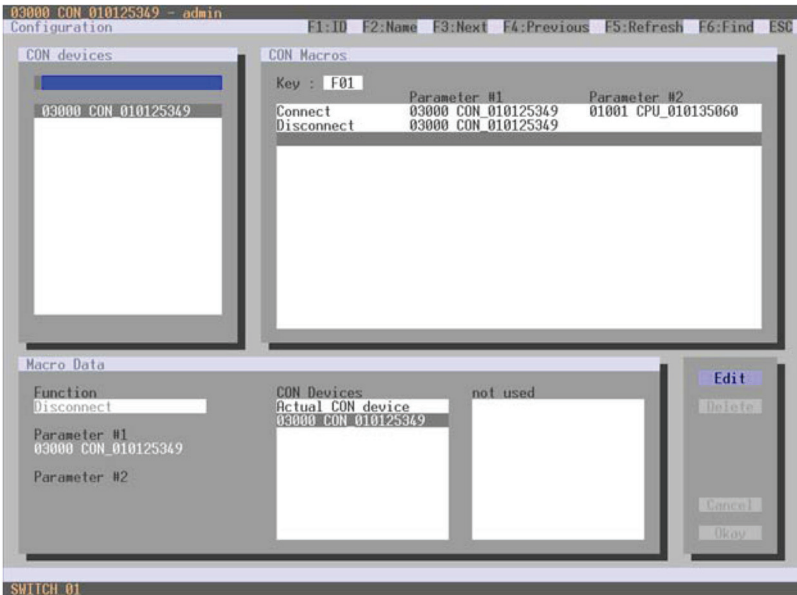
Figure 4-65. Menu Configuration - CON Macros

To create a macro for the selected console, proceed as follows:

1. Select the number key (1–16) for which a macro has to be created.

2. Select the respective place on the list (1–16) of the key that has to be set with a macro key.

3. Select a macro command in the "Macro Data" field from the macro list.

4. Set the necessary parameters P1 and P2 (for example, CON Devices or CPU

Devices) for the selected macro command.

5. Confirm your inputs by pressing the <Enter> key and repeat the process for further macro commands, if necessary.

Java Tool

In the working area of the "Definition > CON Devices" menu, select the console for which a console macro has to be created and open the "Macros" tab.
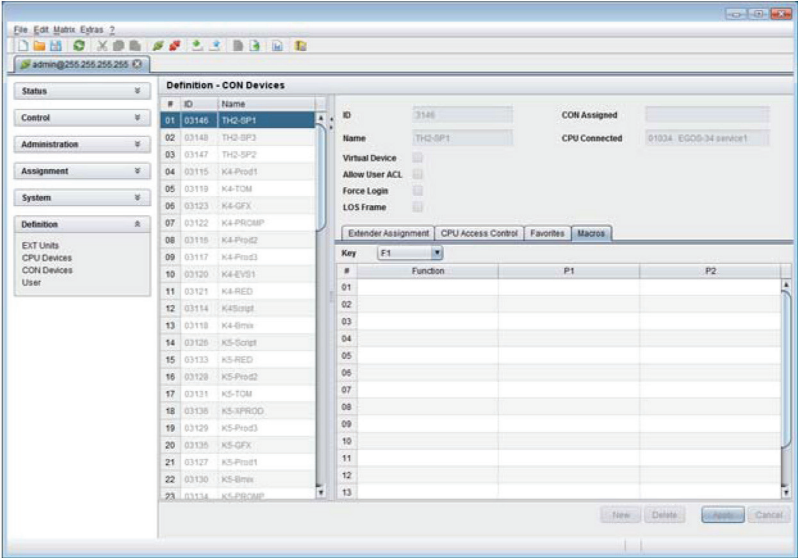
Figure 4-66. Menu Definition - CON Devices

To create a macro for the selected console, proceed as follows:

1. Select the number key (1-16) for which a macro has to be created.

2. In the "Function" column, select the commands that should be part of the macro. Open the selection list by double-clicking on the empty fields.

3. In the P1 and P2 columns, select the respective parameters for the macro functions (for example, corresponding consoles and CPUs).

4. To confirm your inputs, press the "Apply" button.

For an efficient macro configuration, the following context functions are available:

• Right-click on the "Macros" tab to assign macros to other consoles by using the "Assign Macros to ..." function. Copy macros from other consoles by using the "Copy Macros from ...." section.

• Right-click on the macro list to copy macros of the selected key into the cache by using the "Copy Key Macros" function. You can paste the macros from the cache into a key by using the "Paste Key Macros" function and you can reset all macros of the selected key by using the "Reset Key Macros" function.

4.9.6 Parallel Operation

This section explains how to configure the parallel operation of a CPU Device by two or more CON Devices. Only one CON Device at a time can control the CPU Device, but the CPU device can be taken over exclusively by other CON Devices, too. Taking over control is immediately possible or after the controlling CON Device's inactivity timer of the expires. You can use the mouse or keyboard to take over control.

NOTE: To allow a smooth and accurate function of the parallel operation, you should use identical mice and keyboards. They should be connected to the same USB-HID ports of each CON Unit.

The alternative is using the USB-HID Ghosting (see Chapter 5, Page 203).

You have the following options to configure parallel operation:

Figure 4-67.

OSD

• Select Configuration > Switch in the main menu.
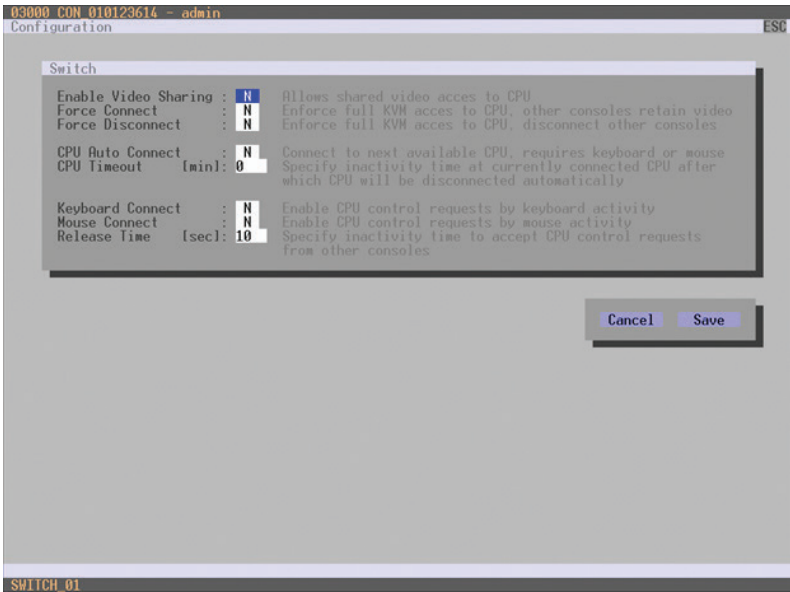
Figure 4-68. Menu Configuration—Switch.

To configure parallel operation, proceed as follows:

1. Activate the Enable Video Sharing function.

2. Activate the Force Connect function.

3. Activate the Keyboard Connect function, if taking over control by a keyboard event should be possible.

4. Activate the Mouse Connect function, if taking over control by a keyboard movement should be possible.

5. Define a Release Time of inactivity (0–999 sec.) after which control can be taken over.

Java Tool

• Select System > Switch in the task area.
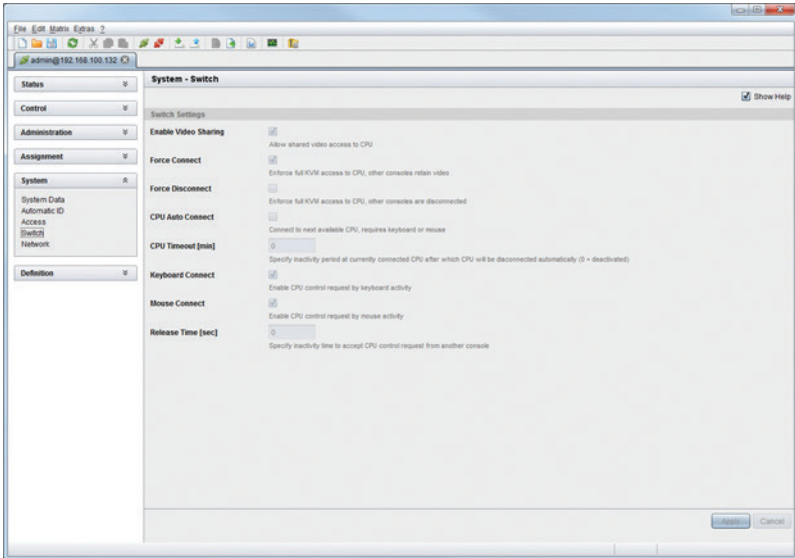
Figure 4-69. Menu System—Switch.

To configure parallel operation, proceed as follows:

1. Activate the Enable Video Sharing function.

2. Activate the Force Connect function.

3. Activate the Keyboard Connect function, if taking over control by a keyboard event should be possible.

4. Activate the Mouse Connect function, if taking over control by a keyboard movement should be possible.

5. Define a Release Time of inactivity (0 - 999 sec.) after that control can be taken over.

4.9.7 Multi Screen Control

A CON device with several monitors can be configured via USB-HID switching to control several connected sources (computer, CPU). To support this feature, you will need to have the ACX-GSW license activated.

Switch between up to four connected sources (computer, CPU) smoothly. Simply move the mouse pointer to the next monitor.

Monitors can be arranged in sequence or as a square.

NOTE: When using sources (computers, CPUs) in multi-head operation (e.g., dual-head), the switching only works manually via keyboard commands.

NOTE: To enable Multi-Screen Control, all Extender Units assigned to the CON device must be physically connected to the same block of four ports consecutively on the I/O board of the matrix.

NOTE: CON Units that have been already configured for Multi-Screen Control can be connected together to other blocks of four ports. In this case, any further configuration is not necessary. The functionality will still be available.

OSD

Select Assignments > Multi-Screen Control in the main menu.
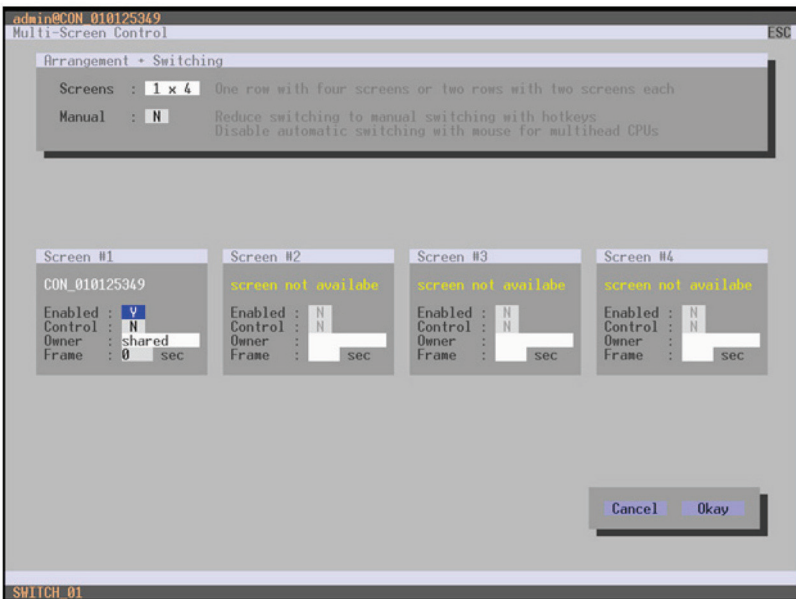
Figure 4-70. Menu Assignments—Multi-Screen Control.

To configure the Multi-Screen Control, proceed as follows:

1. In the Arrangement field, select the respective display arrangement that is available at the CON Device you want to configure (1 x 4 or 2 x 2).

   The fields for the configuration of the individual displays will be arranged accordingly.

2. To switch the USB-HID only by using keyboard commands, enable manual switching. You can use multi-head consoles.

3. Ensure that the option "Enabled" is set to "Y" on all used displays to activate the display that uses the Multi-Screen Control.

4. Select one or more control displays within the CON Device by setting the function "Control" as "Y" in the respective display field. Control displays are referred to the extender units within the Multi-Screen Control that are connected to keyboard and mouse.

5. When using the Owner function, you can determine which control display is permitted for USB-HID switching to the different displays. Select that display from the list. To set all neighboring control displays to access a display, set the function "Owner" to "shared."

6. Use the Frame function to configure a red frame that shows the current display with mouse control after a selectable timer expires. Activate the frame to fade in individually by using a timer >0 seconds.

Java Tool

Select "Assignment > Multi-Screen Control" in the main menu.
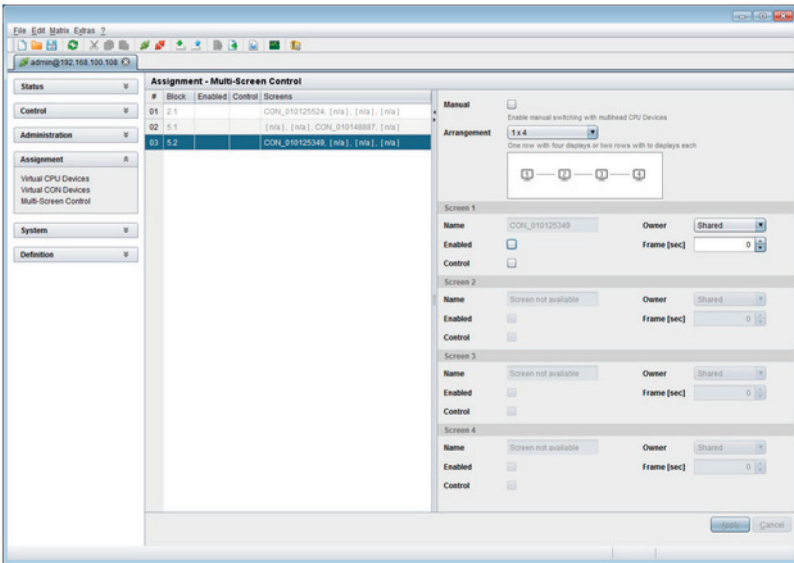
Figure 4-71. Menu Assignment—Multi-Screen Control.

To configure the Multi-Screen Control, proceed as follows:

1. Select a block of four ports in the working area list that you want to configure for Multi-Screen Control. The block of four ports should contain at least one CON unit.

2. Activate the Manual option, and the USB-HID switching will only be allowed by using keyboard commands. With manual switching, you can use multi-head consoles.

3. In the Arrangement field, select the display arrangement for the CON device you want to configure (1 x 4 or 2 x 2). The fields for the individual display's configuration will be arranged accordingly.

4. To select one or more control displays within the CON Device, set Control as "Y" in the respective display field. Control displays are referred to the extender units within the Multi-Screen Control that are connected to keyboard and mouse.

5. When using the function Owner, you can determine which control display is permitted for USB-HID switching to the different displays. Select that display from the list. To make a display accessible for all neighboring control displays, set the Owner function to shared.

6. Use the function Frame to configure a red frame that shows the current display with mouse control after a selectable timer expires. The frame to fade in can be individually activated by using a timer >0 seconds.

4.10 Saving and Loading Configurations

4.10.1 Active Configuration

Use the OSD button to access the menu:

Figure 4-72. OSD button.

Select "Configuration > Save" in the main menu.

By selecting this menu item, the active configuration of the matrix is saved to the permanent matrix memory. By default, the last configuration that has been saved in this way will be restored after the matrix restarts.

NOTE: Changing or saving configurations blocks the matrix memory and freezes all OSD menus for a few seconds. The switching connections are not affected by this freeze.

If you select "Auto Save" within the system settings, it will automatically save the configuration periodically.

4.10.2 Saving of Configurations (Internal)

In this menu, the current matrix configuration to predefined storage locations is saved. However, it does not replace configuration buffering.

You can access the menu via OSD or Java:

Figure 4-73. OSD and Java icons.

In Active, the name and detailed information of the current configuration is shown. This configuration can be saved now.

In Default and File #1 to File #8, the name and the detailed information of the respective saved configurations are shown. You can overwrite these storage locations.

The storage location to be overwritten by the current configuration must be selected explicitly.

Afterwards, the current configuration will be saved to this storage location and will be immediately shown in the menu. The previously saved configuration that was saved to this storage location is deleted.

OSD

You can save the created configuration within eight storage locations in the matrix (File #1–File #8). You can also save a configuration as the default configuration.

1. Select "Configuration > Save As…" in the main menu.

2. Select the required storage location "(File #1–File #8)" or "Default."
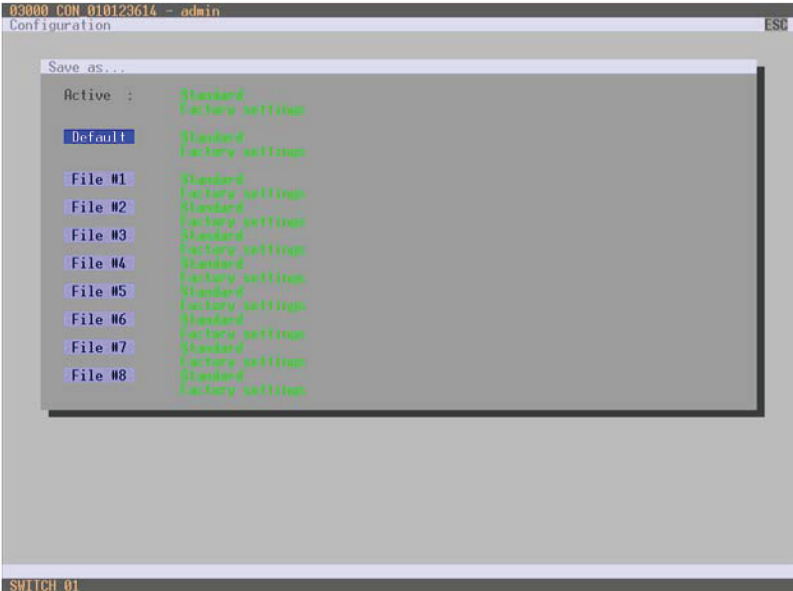
Figure 4-74. Menu Configuration—Save As screen.

Java Tool

To save the configuration into the internal matrix memory, proceed as follows:

1. Select "File > Upload to…" in the menu bar.

2. Enter the IP address of the matrix, your user name, and your password, and and confirm the inputs. Press the "Next" button.

3. Select the storage location where the configuration will be saved (default or config01–config08). Press the "OK" button to confirm.
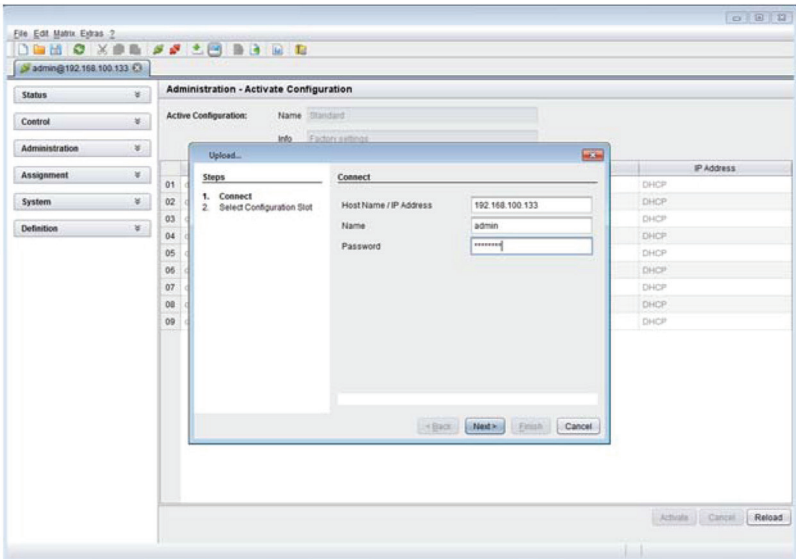
Figure 4-75. Menu File—Upload to screen.

4.10.3 Loading of Configurations (Internal)

Previously saved configurations are loaded in this menu.

You have the following possibilities to load configurations from files:

Figure 4-76. OSD and Java icons.

In Active, the currently loaded configuration is displayed.

In addition to the default configuration, you can load up to eight further configurations.

Select the configuration to be loaded from eight personalizable configurations and the default settings.

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

OSD

1. Select "Configuration > Open" in the main menu.

2. Select the desired configuration.

3. Load the configuration by pressing the <Enter> key.
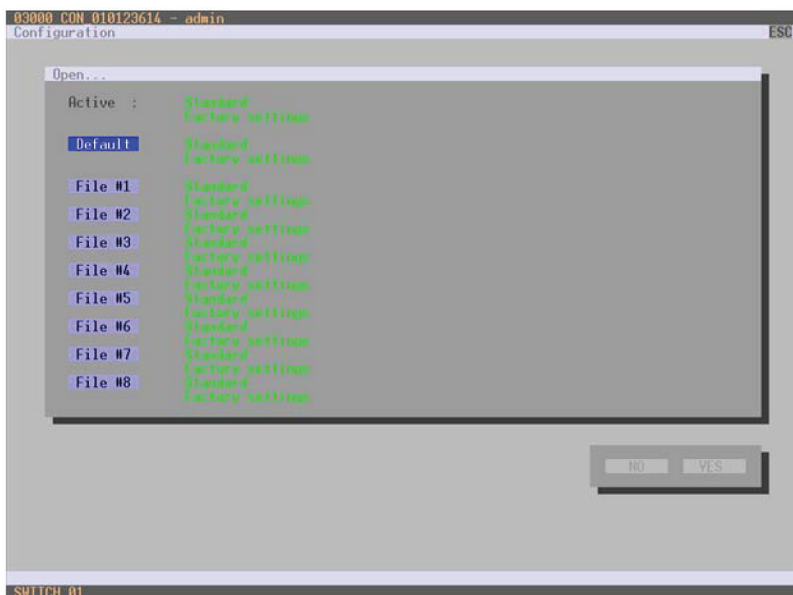
Figure 4-77. Menu Configuration—Open screen.

Java Tool

1. Select "Administration > Activate Configuration" during on-line mode in the task area.

2. Select the required configuration.

3. Load the configuration by pressing the "Activate" button.
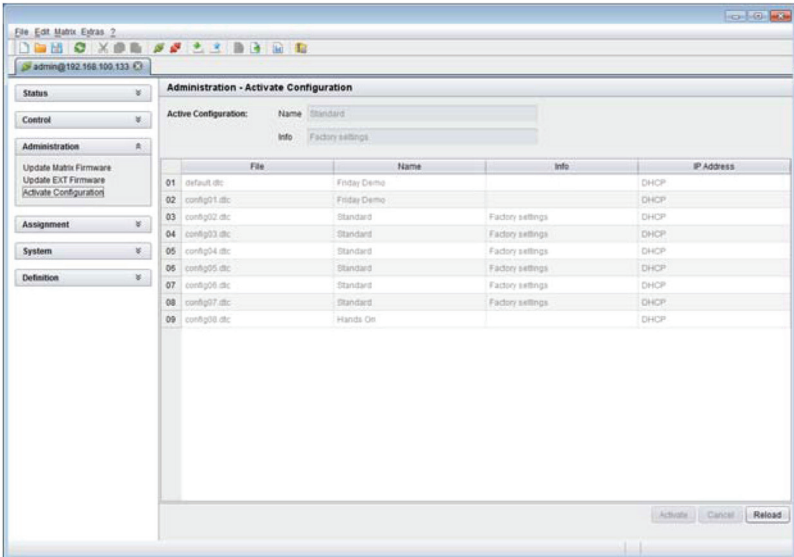
Figure 4-78. Menu Administration—Activate Configuration on Switch screen.

4.10.4 Saving of Configurations (External)

Created configurations can be saved as a file on your local computer or laptop for backup purposes.

You can access the menu via the Java icon:

Figure 4-79. Java icon.

1. Select "File > Save As" in the menu bar.

2. Select the directory of the configuration on your storage medium where it will be saved.

NOTE: Configurations are always saved in a file ending "dtc."
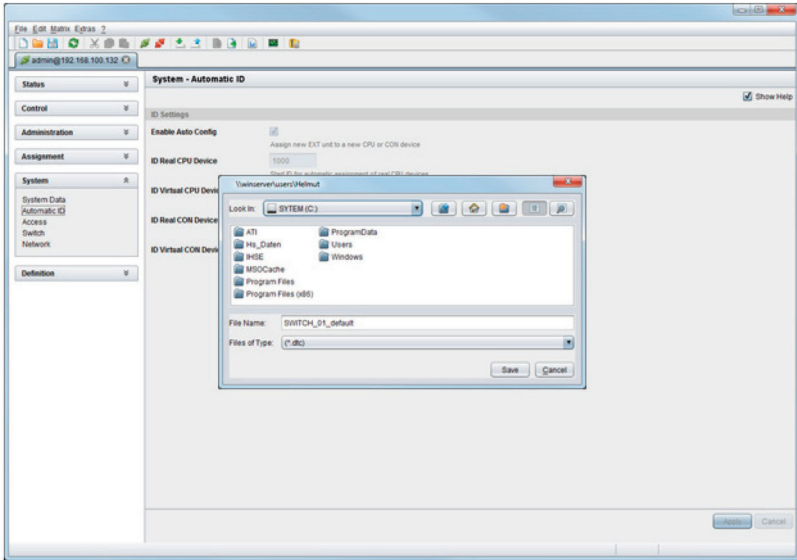
Figure 4-80. Menu File—Save As screen.

4.10.5 Loading of Configurations (External)

Externally saved configurations are opened and activated in this menu.

You have the following possibilities to load configurations from files:

1. Select "File > Open…" during off-line mode and select the storage location of the configuration file that has to be opened.

2. Open the configuration by pressing the "Open" button.

3. Select "File > Upload to…" in the menu bar to transfer the opened configuration to the matrix. Enter the necessary parameters.

4. Select "Matrix > Connect" in the menu bar to make a connection between the matrix and the Java tool. Enter the necessary parameters.

5. Select "Administration > Activate Configuration" and select the configuration to be activated.

6. Confirm the process with the "Activate" button.

The opened configuration is activated now and can be used.
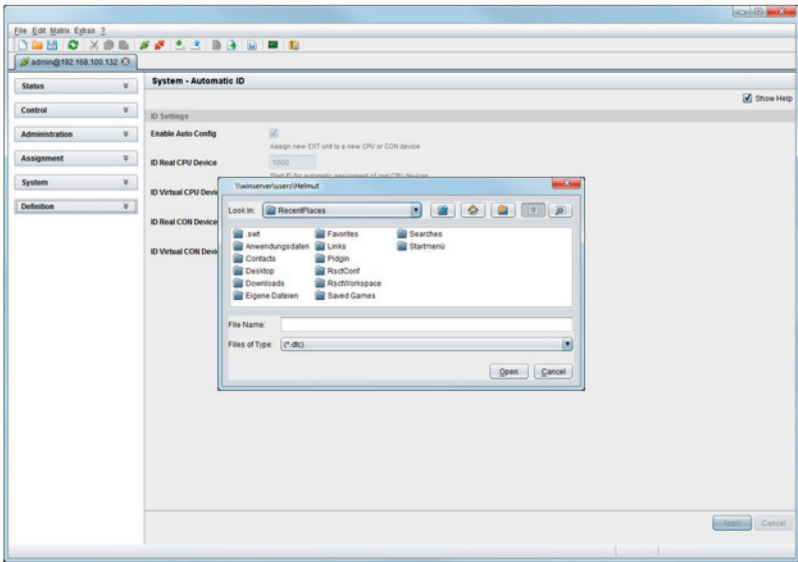
Figure 4-81. Menu File–Open screen.

4.11 Export and Import Options

The ServSwitch DKM FX offers the possibility to read out available configuration lists (extender, CPUs, consoles and users) for exporting and importing again via Java tool. You have the following possibilities to handle configuration lists.

Exported configuration lists are always saved in ".csv" format that allows off-line editing with common spreadsheet applications.

You can export or import configuration lists via the Java icon:

Figure 4-82. Java icon.

4.11.1 Export Options

Configuration lists are exported in this menu. To export, proceed as follows:

1. Select "File > Export" in the menu bar.

2. After opening the menu, select the list to export (Extender, CPU, Console or User).

3. Select the storage location for the export file.

4. Confirm the export with the "Finish" button.
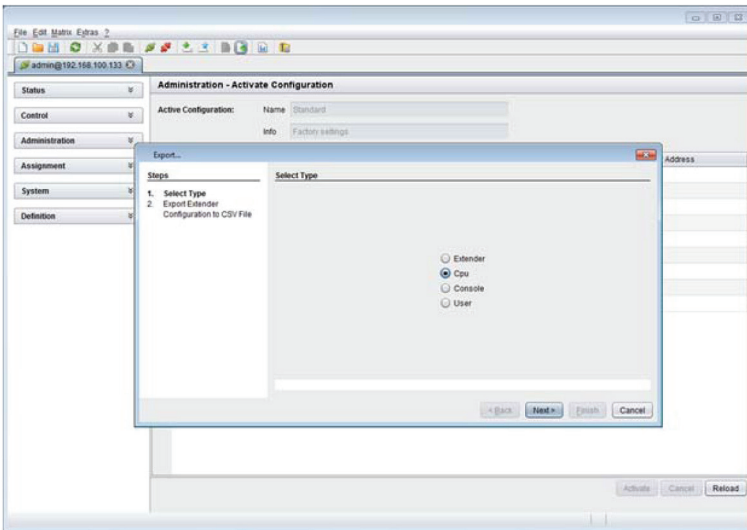
Figure 4-83. Menu File–Export screen.

4.11.2 Import Options

Configuration lists are imported in this menu. To import, proceed as follows:

1. Select "File > Import" in the menu bar.

2. After opening the menu, select the list to import (Extender, CPU, Console or User).

3. Select the directory of the list to import.

4. Confirm the import with the "Finish" button.
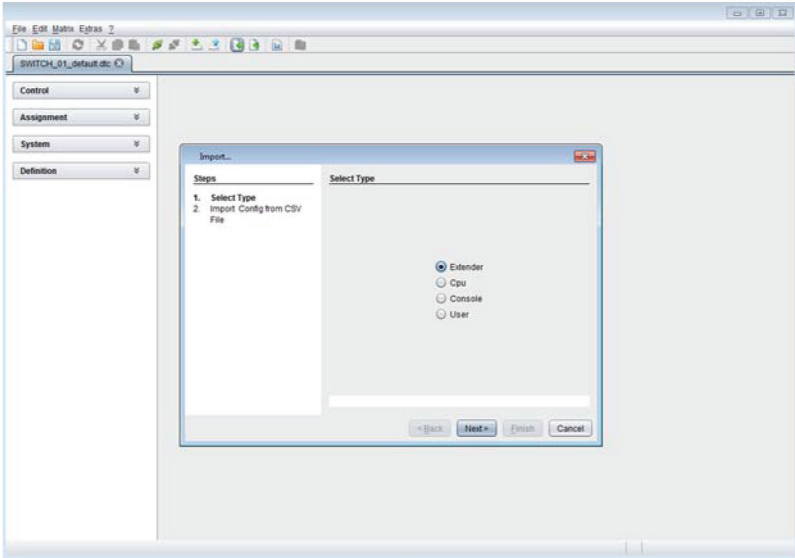
Figure 4-84. Menu File–Import screen.

4.12 Matrix Cascading

This simple method of cascading allows a switchable connection between two matrices via "Tie Lines."

The Matrix Cascading does not require Bundle 4. (Bundle 4 is the ACX-CAS license.)

This kind of configuration may become necessary if the number of ports in the entire system has to be increased or if certain important connections should be distributed to several matrices because of redundancy.

The Tie Lines are unidirectional and can only be used in one direction according to their configuration. For a bidirectional cascading, you have to configure opposite Tie Lines.

To connect Tie Lines to the matrices, you have to create intended Master/Slave CON und Master/Slave CPU Devices to be switched within the cascaded environment.

You have the following options to configure Matrix Cascading:

Figure 4-85.

General Preparation

1. Define a Master Matrix. All further matrices will be configured as Sub Matrices in the configuration process.

2. Ensure that the Tie Lines will only be connected after finishing the configuration.

OSD

• Select Configuration > EXT Units in the main menu of the master matrix.
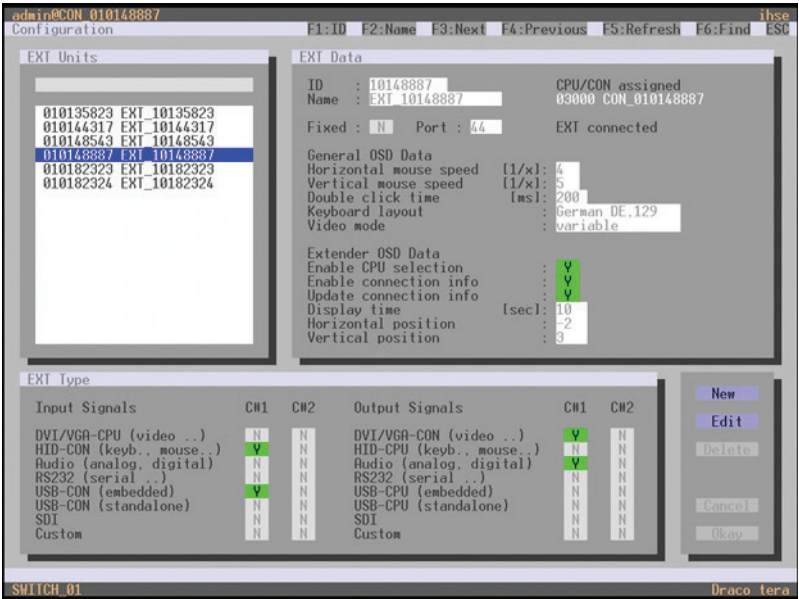
Figure 4-86. Menu configuration—EXT units.

1. Press the "New" button. A new Extender Unit will be created that is needed for the connection of Tie Lines.

2. Enter an appropriate extender name into the Name field.

3. Enter a port number into the Port field according to the required connection of the Tie Line.

4. If the Tie Line should be directed from the Sub to the Master, set the Master/Slave CON option to Y (C#1) in the Input Signals column. If the Tie Line should be directed from the Sub to the Master, set the Master/Slave CPU option to Y (C#1) in the Output Signals column.

5. Save your settings by pressing the "Okay" button.

6. If you have created a Master/Slave CON Unit, select "Configuration > CON Devices" in the main menu of the master matrix and press the "New R" button.

   A switchable CON Device will be created.

7. If you have created a Master/Slave CPU Unit, select Configuration > CPU Devices in the main menu of the master matrix and press the New R button.

A switchable CPU Device will be created.

8. Enter an appropriate Device name into the Name field.

9. Assign the previously configured Extender Unit to the newly-created device by moving the Extender Unit from the Ext available field into the Ext assigned field and save your settings.

10. Repeat steps 1 to 9 for the Sub Matrix.

11. Select Configuration > System in the main menu of the Sub Matrix and set the Sub Matrix option to Y.

    The OSD of the Sub Matrix will immediately freeze and will be only accessible by using the keyboard command <hotkey>, <s>, <o>.

12. Restart all I/O boards on which any Master/Slave CON or CPU Units have been configured or alternatively restart the matrix.

13. Connect the Tie Lines to the matrices. Ensure that each Master/Slave CON on one matrix is connected to Master/Slave CPU on the other matrix to switch between two matrices.

The Matrix Casacading is now configured and can be used. Additional Tie Lines are configured accordingly.

Java Tool

1. Connect to the Master Matrix and activate the Online Configuration Mode.

2. Select the menu Definition > EXT Units in the task area and press the New button.

A popup window opens.
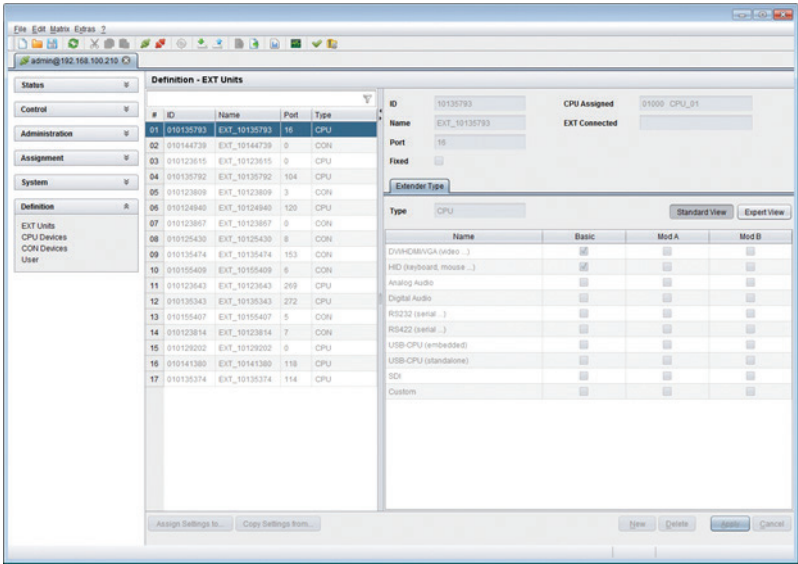
Figure 4-87. Menu Definition—EXT Units.

3. If the Tie Line should be directed from the Sub to the Master, select Master/
Slave CON Unit in the Choose Extender Type selection box.

4. Enter an appropriate extender name into the Name field.

5. Enter a port number into the Port field according to the required connection of
the Tie Line.

6. Confirm your settings by pressing the "Apply" button.

7. If you have created a Master/Slave CON Unit, select "Definition > CON Devices"
in the task area of the master matrix and press the New button.

   A switchable CON Device will be created.

8. If you have created a Master/Slave CPU Unit, select "Definition > CPU Devices"
in the task area of the Master Matrix and press the "New" button.

   A switchable CPU Device will be created.

9. Enter an appropriate extender name into the Name field.

10. Assign the previously configured Extender Unit to the just-created Device by
moving the Extender Unit from the Extender available field into the Extender
assigned field and save your settings by pressing the "Apply" button.

11. Connect to the Sub Matrix and repeat steps 1 to 10.

12. Select System > System Data in the task area of the Sub Matrix and activate the Sub Matrix option.

    The OSD of the Sub Matrix will immediately freeze and will be only accessible by using the keyboard command <hotkey>, <s>, <o>.

13. Restart all I/O boards on which any Master/Slave CON or CPU Units have been configured or alternatively restart the matrix.

14. Connect the Tie Lines to the matrices. Ensure that each Master/Slave CON on one matrix is connected to Master/Slave CPU in the other matrix in order to switch between two matrices.

The Matrix Cascading is now configured and can be used. Additional Tie Lines are configured accordingly. The use of cascading is described in Section 4.12.

4.13 Matrix Grid

In this menu, you can configure a Matrix Grid in order to connect two or more matrices. This kind of configuration may become necessary if the number of ports in the entire system has to be increased or if certain important connections should be distributed to several matrices for redundancy. This setup will require the ACX-CAS license to be enabled.

The connections between two matrices have to be established by "Grid Lines" that are connected between particular I/O ports as connecting links. The Grid Lines can be used bidirectionally and can respectively handle a full access connection of a CON Device to a CPU Device.

The number of Grid Lines in the system specifies if a CON Device can be switched to a CPU Device in Non-Blocking Access or in Blocking Access and has to be separately determined for each Grid environment.

In this case Non-Blocking Access means that a Grid Line for a crossmatrix switching operation of a CON Device to a CPU Device is available at any time.

Blocking Access means that for a certain switching operation no Grid Line may be available according to the switching status within the Grid. The result will be that no cross-matrix switching will be possible.

You have the following options to configure a Matrix Grid:

Figure 4-88.

Administration of Settings

Within a Matrix Grid, there is a difference between settings that have to be made locally for each matrix and settings that can be made globally so that they are valid for the whole Matrix Grid.

The settings in the following menus have to be made separately for each matrix or within the master matrix in order to affect all matrices in the Grid:

System, Access, Switch, Network, Date + Time, SNMP, Matrix Grid, Multi-Screen Control

The settings in the following menus have to be made globally and only once within the Matrix Grid:

EXT Units, CPU Devices, CON Devices, User, CON Macros, User Macros, CON Favorites, User Favorites, Virtual CPU Devices, Virtual CON Devices.

NOTE: If global settings are made in the respective menus, they will be immediately available on each matrix within the Matrix Grid.

General Preparation

The following requirements have to be fulfilled before starting the Matrix Grid configuration:

1. The Matrix Grid function (Bundle 4) must be activated on all matrices to be connected to the Grid by a license key. Bundle 4 is the Black Box part number ACX-CAS and will need to be activated.

2. Firmware V3.00 must be installed on all matrices to be connected to the Grid.

3. All matrices to be connected to the Grid must be within the same TCP/IP network.

4. The port 5556 needed for network communication must not be blocked by a firewall.

OSD

To configure a Matrix Grid, proceed as follows. The following configuration steps have to be repeated for each matrix separately:

• Select Configuration > System in the main menu.
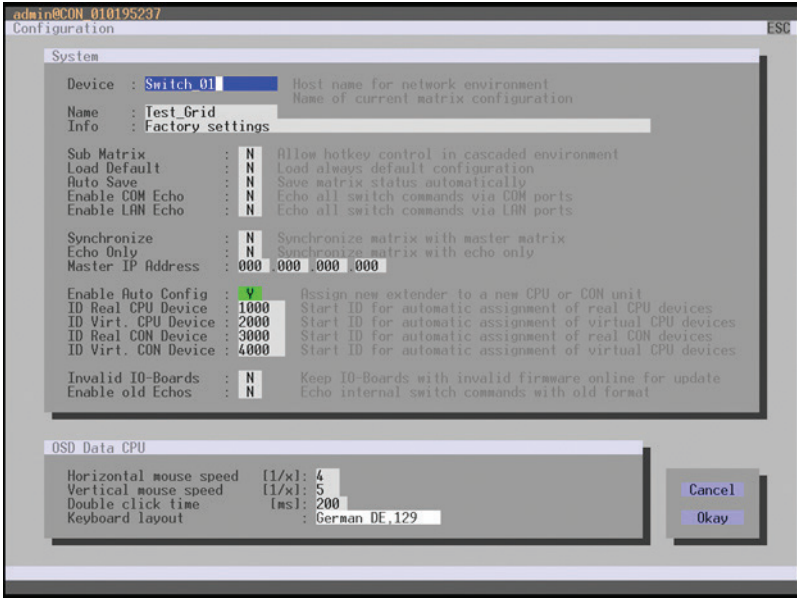
Figure 4-89. Menu Configuration—System.

1. Enter a unique name for each matrix into the Device field. Each name may only exist once within the Matrix Grid.

2. Enter a unique Grid name into the Name field. The Grid name has to be the same within all Grid matrices.

3. Select Configuration > Matrix Grid in the main menu.
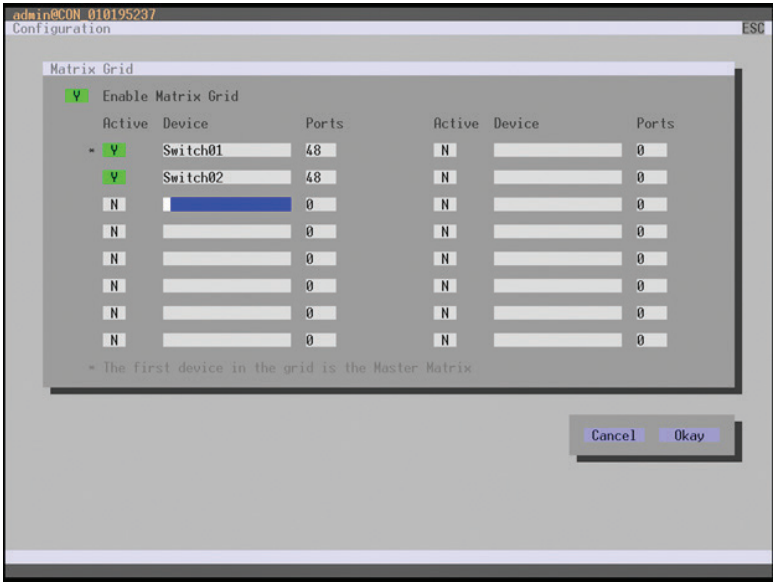
Figure 4-90. Menu Configuration—Matrix Grid.

4. Activate the Enable Matrix Grid function.

5. Write all device names of the Grid matrices into the Matrix Grid list, starting in the left column. Based on the listings, a Grid master will be automatically determined for the Matrix Grid. The closer to the top a matrix is listed in the matrix Grid list, the more likely the matrix is considered in the automatic master selection, provided that certain criteria, such as system availability, are fulfilled.

6. Activate the single matrices in the Matrix Grid list by enabling the Y (YES) function.

7. Enter the number of chassis ports for each matrix (8, 16, 32, 48, 64, 80, 160 or 288).

8. Restart all matrices, beginning with the master matrix.

The Matrix Grid can be used now and offers the possibility for a cross-matrix switching of CON Devices to CPU Devices.

Java Tool

• To use the Matrix Grid, execute the configuration wizard in the menu System > Matrix Grid. It guides you through the configuration of Matrix Grids.
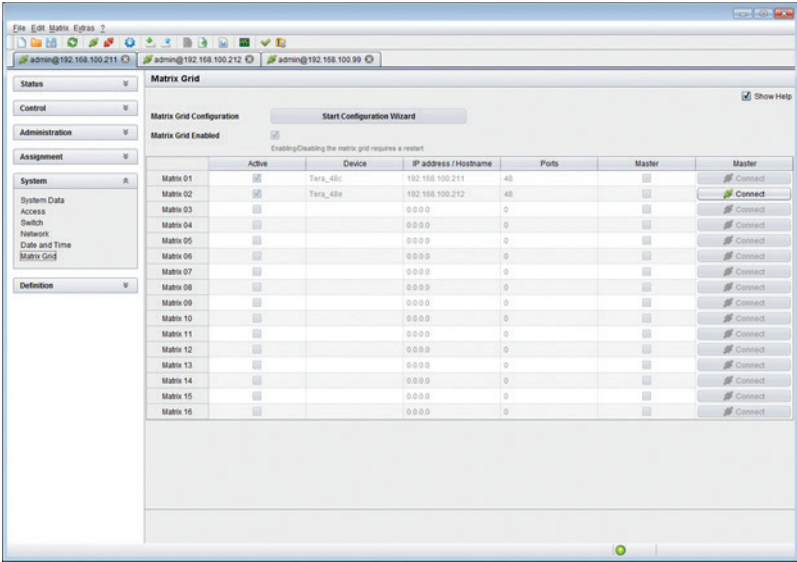
Figure 4-91. Menu System—Matrix Grid.

4.14 Firmware Update

4.14.1 Matrix Update

The firmware of the matrix can be updated in this menu.

To access the menu, use the Java icon:

Figure 4-92. Java icon.

NOTES:

To update the matrix, only use computers that are self-sustaining and not integrated in the KVM extender/matrix setup.

Ensure that the computer used for the update is not set in standby mode or sleep mode during the update.

Save your configuration externally before you start the update.

We do not recommend updating the matrix via a WLAN because this can cause files to be half uploaded and a firmware upgrade to fail. If you have the option to use a cross-over CATx cable to perform the update, use this method.

Preparation

Follow these steps to prepare for the matrix update:

1. Save the matrix configuration externally.

2. Open "Extras > Options" in the menu bar and insert the directory from which the updated files should be sourced in the "Firmware Directory" setting.

3. Put all hot spare boards into the matrix.

4. Activate the Syslog function for the monitoring of the update, if unlocked via license key.

CAUTION: Make sure that all USB 2.0 extenders are only connected to the provided ports (fixed ports) before you start the matrix update. If you don't, the stability of the update will be compromised.

Performing the Update

Prepare for the matrix update by following these steps:

1. Select "Administration > Update Matrix Firmware" in the task area.
   All updateable components of the matrix will be automatically selected and highlighted in green after you browse for a valid .TFW file.
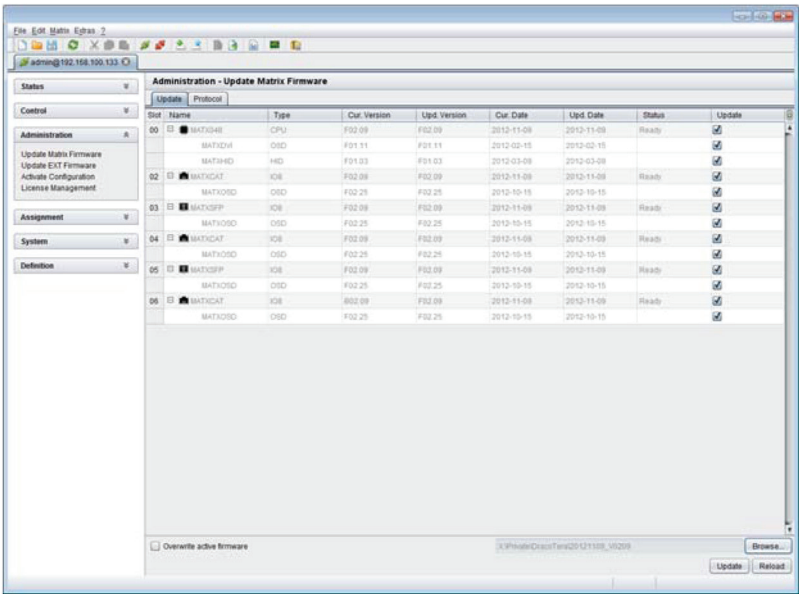
Figure 4-93. Menu Administration – Update Matrix Firmware.

2. To start the update, press the "Update" button in the popup window that appears.

3. Restart the matrix after the update by pressing the "Restart matrix" button in the lower part of the working area.

CAUTION: For a safe start of the matrix, we recommend a cold start (power cycle).

4.14.2 Extender Update

In this menu, you can update the firmware of the extenders connected to the matrix.

You can access the menu via the Java icon:

Figure 4-94. Java icon.

Preparation

Follow these steps to prepare for the extender update:

1. Save the matrix configuration externally.
   Open "Extras > Options" in the menu bar and insert the directory from which the update files should be standardly sourced in the "Firmware Directory" setting.

2. Connect all hot spare extenders to the matrix.

NOTE: *We do not recommend updating the matrix via a WLAN. This might compromise network stability.*

Performing the Update in Standard Mode (parallel Update)

1. Select "Administration > Update EXT Firmware" in the task area. The standard mode for the parallel update will be selected by default, and the "Upload Firmware" tab will be open.
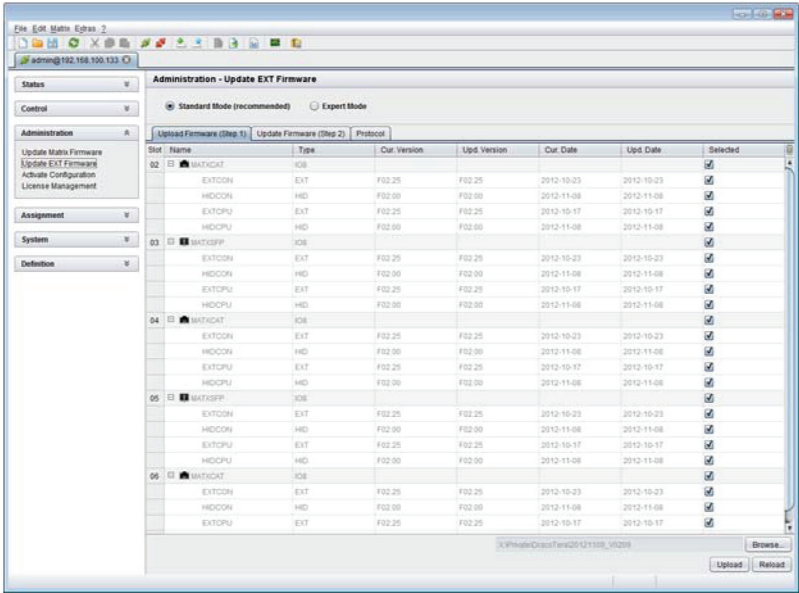
Figure 4-95. Menu Administration – Update EXT Firmware.

2. Before the actual update process, all firmware files that have to be uploaded to the respective I/O boards on the extenders will have to be updated. By selecting the update files, the I/O boards will be automatically chosen for the upload in the "Selected" column and highlighted in green, but only if a newer firmware version is selected.

3. Start the upload and distribution of the update files by pressing the "Upload" button.

NOTE: By running the upload process, no update files will be installed. The update process can be performed at a later time. If there are no selected I/O cards, the upload of the update files will be performed in sequence.

4. A successful upload process will be confirmed by a popup. If you want to directly start the actual update process, you will have to confirm this by pressing the "Yes" button. You will be immediately forwarded to the "Update Firmware" tab.

NOTE: When updating an identical or an older firmware version as the version that is currently installed, the "Force Update" option in the lower part of the working area has to be enabled.
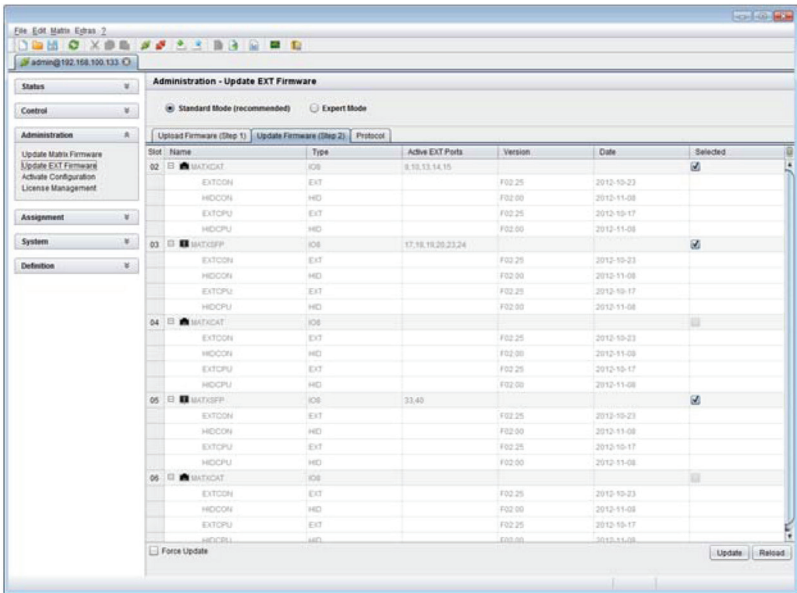
Figure 4-96. Menu Administration – Update EXT Firmware.

5. Start the actual update process by pressing the "Update" button.

NOTE: Just before the update process, all affected I/O boards will be set to Service Mode and retrieved gradually after finishing the respective updates.

Performing the Update in Expert Mode (Sequential Update)

Follow these steps to prepare for the extender update:

1. Select "Administration > Update EXT Firmware" and select "Expert Mode" in the upper part of the working area. All updateable extenders will be automatically selected and highlighted in green after a valid .EFW file has been selected using the Browse button.
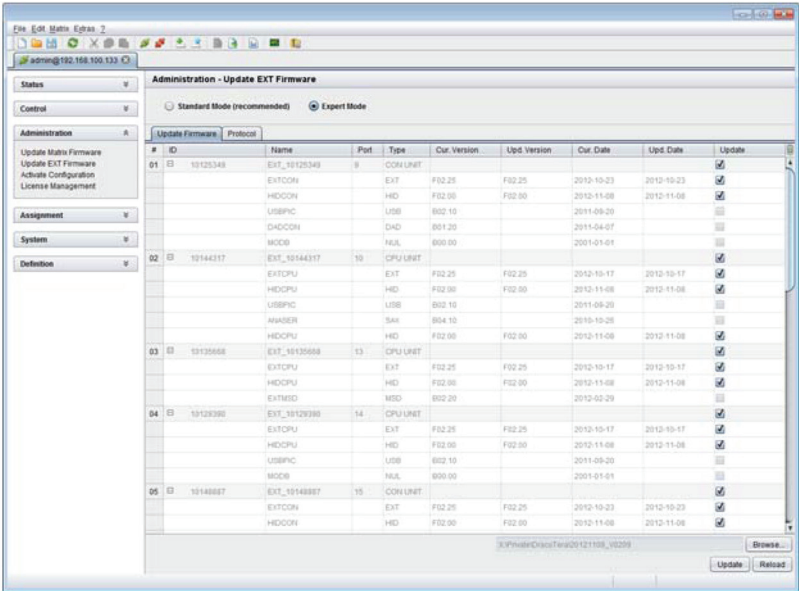
Figure 4-97. Menu Administration – Update EXT Firmware.

2. Set the matrix into Service Mode upon request in the popup window or via "Matrix > Activate Service Mode" in the menu bar.

During activation, all matrix functions are disabled on the I/O boards on which an update is currently performed. An OSD picture indicates the activation of the Service Mode and is displayed on all monitors that are connected to the matrix via a CON device. Additionally, the Service Mode is indicated by a red tool icon in the lower part of the working area.
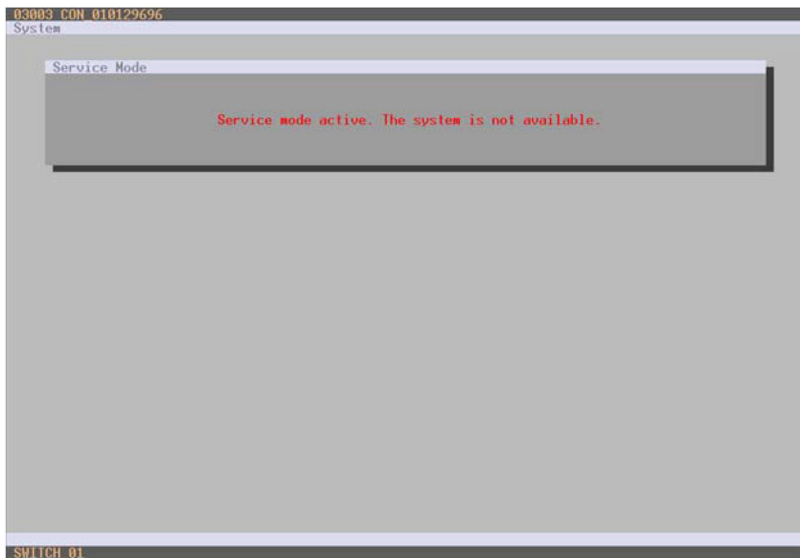
FIgure 4-98. OSD View Service Mode.

3. Start the update by pressing the "Update" button in the lower part of the working area.

4. Quit Service Mode after updating upon request in the popup window or via "Matrix > Deactivate Service Mode" in the task area.

5. In the Java tool via "Administration > Update EXT Firmware" in the "Expert Mode Protocol" tab, verify that updates for all extenders have been installed correctly.

4.15 License Management

In this menu, the matrix can be upgraded with new function bundles by using license keys.

You will need to purchase the licenses to obtain the additional features. Currently the licenses are:

ACX-JAV — Extended switching capabilities with DKM FX Java utility.

ACX-API — API switching feature enabled, also includes ACX-JAV.

ACX-SYS — Enable syslog.

ACX-CAS — Required for every chassis for cascading.

ACX-GSW — Glide and switch for four receivers to seamlessly control them.

You can access the menu via the Java tool:

Figure 4-99. Java Tool.

To activate a function bundle, follow these steps:

1. Select "Administration > License Management" in the task area.
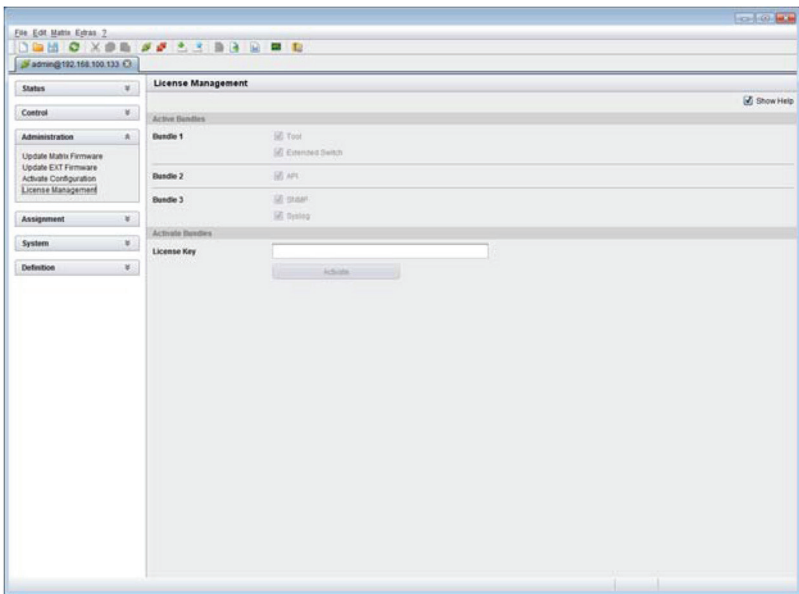
Figure 4-100. Menu Administration – License Management.

2. Enter your license key in the working area under "Activate Bundles" in the "License Key" field.

3. To activate the license key, press the "Activate" button. The new functions will be immediately enabled; a restart of the matrix will not be necessary.

5. Operation

You can operate the ServSwitch DKM FX in three different ways:

1. Direct Switching

• via a keyboard connected to a CON port and the hotkeys

• by Macro functions on a keyboard (F1-F16)

2. OSD

• via keyboard/mouse directly connected to the CPU board of the matrix

• via keyboard/mouse connected to a CON Unit and the OSD

3. External Switching Commands:

• via an external computer via Java tool (network connection required)

• via a media control (network or serial connection required)

5.1 Operation via Hotkeys
5.1.1 Direct Switching

The direct switching by hotkeys on a keyboard is the fastest way for a user to switch at his console between different CPUs. He can switch video, keyboard and mouse, or only video.

Direct Switching of Video, Keyboard, and Mouse

1. Start Command Mode with the hotkey. For control, the LEDs Shift and Scroll flash at the keyboard, if Command Mode is activated.

2. Enter the index number of the new CPU from the list of favorites and confirm with <Enter>. At the same time, the Command Mode is closed and the console is connected to the new CPU with complete control.

Example: Switching to favorite CPU 7 with video, keyboard and mouse:

<left Shift>, <left Shift>, <7>, <Enter>.

NOTE: For best switching time, use identical mice, keyboards, and monitors. This contributes to a smooth and seamless direct switching of the matrix.

Switching in Private Mode

1. Start Command Mode with the hotkey. The Shift and Scroll LEDs on the keyboard flash at the keyboard when command mode is activated.

2. Enter the index number of the new CPU from the list of favorites and confirm with <left Shift>, <Enter>. The Command Mode closes and the console connects to the new CPU with complete control in Private Mode.

Example: Switching to favorite CPU 3 in Private Mode

<left Shift>, <left Shift>, <3>, <left Shift>, <Enter>

Direct Switching of Video

1. Start Command Mode with the hotkey. For control, the LEDs Shift and Scroll flashes at the keyboard, if command mode is activated.

2. Enter the index number of the new CPU from the list of favorites 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.

Example: Switching to favorite CPU 1 with video only:

<left Shift>, <left Shift>, <1>, <Space>

NOTE: You can only use the hotkeys to switch to unused and allowed CPUs. Hotkeys are only supported if neither "Enable User Login" nor "Enable User ACL" is selected and the user is logged in the OSD.

Switch to previous CPU

1. Start Command Mode using hotkeys. For control, the Shift and Scroll LEDs on the keyboard flash when Command Mode is activated.

2. Press the <p> key on your keyboard. At the same time, the Command Mode closes, and the console connects to the previous CPU with complete control.

NOTES:

If you switch to a previous CPU that was connected with Video Access before, you will be connected to this CPU with full KVM access.

You can only switch to unused and allowed CPUs with hotkeys. The "Force Connect" and "Force Disconnect" options, as well as the restrictions of the User ACL and CON ACL, are taken into account. Hotkeys are only supported if neither Enable User Login nor the Enable User ACL is selected and the user is logged in the OSD.

Disconnect current connection

1. Start Command Mode with the hotkey. When this mode is activated, the Shift and Scroll LEDs flash at the keyboard.

2. Press the <Backspace> key on your keyboard. The Command Mode closes and the console disconnects from the previously connected CPU.

5.1.2 Scan Mode

The Scan Mode can show video signals of the different CPUs fast and without delay and switch continuously using the hotkey. Switching between two video signals can even take place within one frame.

1. Start command mode with the hotkey. For control, the "Shift" and "Scroll" LEDs flash at the keyboard if command mode is activated.

2. Press the "<Left Shift>" key and hold it down. You can now enter the index numbers of the various CPUs from the list of favorites with the keyboard and immediately switch to the video signal of the respective CPU after entering the index number.

3. Leave Scan Mode by pressing "<Left Shift> + <Esc>."

NOTE: For optimal results, use identical resolutions. This contributes to a smooth and seamless scan mode function. If the computers/targets are using different video resolutions or refresh rates, the switching time is reduced because the user monitor will need to sync on the new signal, thus causing the monitor to go blank for a few moments.

5.1.3 Function Keys <F1>–<F16>

In Command Mode you can retrieve the Macros 1–16 with the function keys <F1>–<F16> 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.

NOTE: You don't need to press the "Enter" key for confirmation of macros.

5.1.4 Addressing of Main and Sub Matrices

The ServSwitch DKM FX can be cascaded in two steps. You can optionally send the commands (including opening the OSD) to the main or the sub matrix.

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

OSD Access

• OSD access to the main matrix:

  <Left Shift>, <Left Shift>, <m> (optional), <o>

• OSD access to the sub matrix:

  <Left Shift>, <Left Shift>, <s>, <o>

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

1. Switching to the CPU port (e.g. 12) of the master matrix that has the connection to the sub matrix:

  <Left Shift>, <Left Shift>, <1>, <2>, <Enter>

2. Switching to the CPU Port 23 of the sub matrix:

  <Left Shift>, <Left Shift>, <s>, <2>, <3>, <Enter>

NOTE: The selected main/sub matrix mode is permanently activated until another mode is manually activated. This means that if you select <s> for example, all prospective commands will be sent to the sub matrix, but not if the Command Mode is left in the meantime.

5.2 KVM Switching

To switch using the ServSwitch DKM FX, use OSD:

Figure 5-1. OSD icon.

OSD

Select "Switch" in the main menu.

NOTE: Press the <F8> key to hide inactive CPU Devices for a better overview.
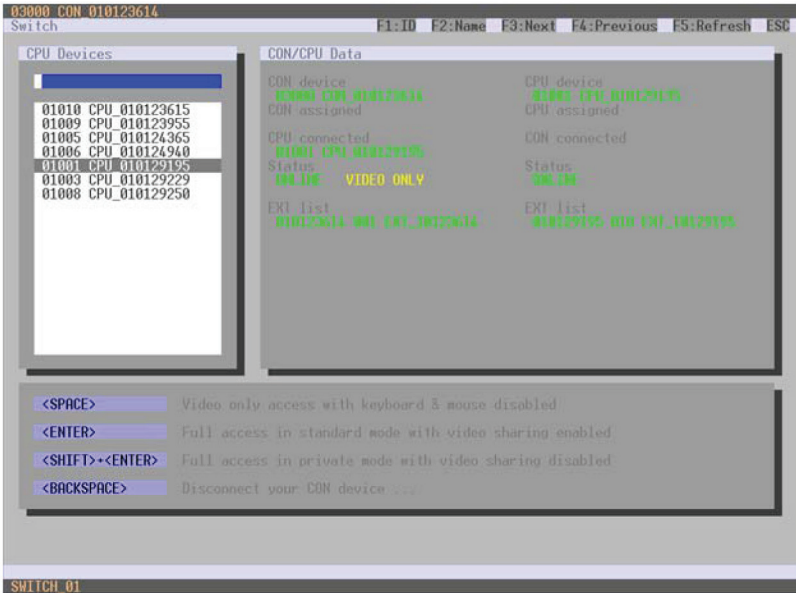
Figure 5-2. Menu Switch screen.

The following information is shown in this menu:

Table 5-1 Menu switch.

Field	Description
CON device	Assigned physical extender unit (CON unit)
CON assigned	Virtual CON device that is assigned to the real CON device
CPU connected	Currently connected CPU device
CON status	Current connection status (CON device)
EXT list	LIst of all available physical extender units (CON units)
CPU device	Assigned physical extender unit (CPU unit)
CPU assigned	Real CPU device that is assigned to a virtual CPU device
CON connected	Currenlty connected CON device
CPU status	Current connection status (CPU device)
EXT list	List of all available extender units (CPU units)

To switch the console to any available CPU, follow these steps:

1. Select the CPU device you want to connect to the CON device from the "CPU Devices" list.

2. Confirm with the respective keyboard command according to the desired connection type.

You can only switch the CON device to CPU devices that are available in the "CPU Devices" list.

NOTE: Listed CPU devices highlighted in red color are currently connected in Private Mode and are blocked by the connected CON device.

Switching via Selection List for CPU Devices

You can use a selection list for KVM switching CPU devices. Proceed as follows:

1. Activate the option "Enable CPU Selection" in the Configuration menu for those consoles where the selection list for CPU devices should be available.

2. Execute the key sequence for opening the OSD. The selection list immediately appears in the preset position of the extender OSD.

NOTE: Press the <F8> key to hide inactive CPU Devices for a better overview.

3. Execute the desired switching operation by pressing the respective key.

To not execute a switching operation and access OSD, press the <F7> key.

To close the selection list, press the <Esc> key.
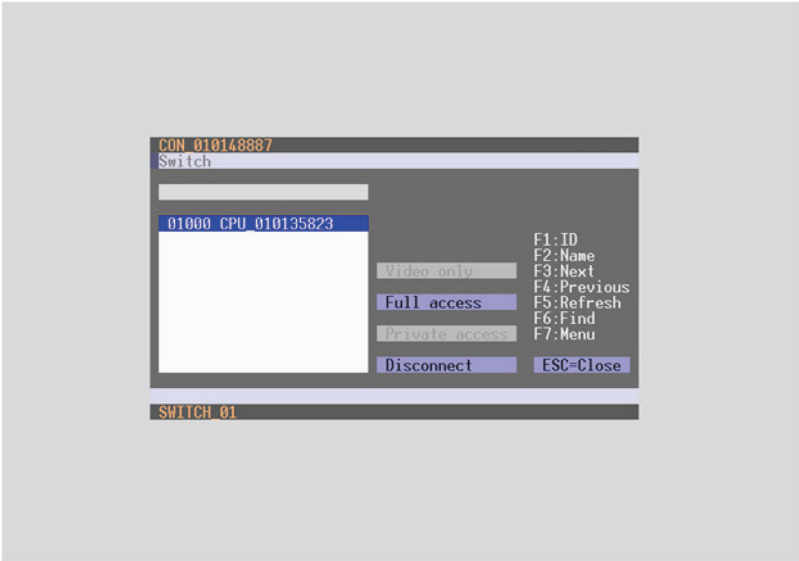
Figure 5-3. Example view Selection list CPU Devices.

Activating the automatic Scan Mode for CPU Devices

You can use a scan mode based on the favorite list of each console or user. The scan mode allows the matrix to switch in sequence between the CPU Devices in the favorite list within a predefined time. All scans are performed in video only mode.

To configure the scan mode, go to Chapter 5.8.1.

Activate the scan mode via OSD:

Figure 5-4.

1. Define a favorite list for the CON device or user.

2. Start Command Mode with the hotkey and press <o> to open OSD.

3. Select one of the CPU devices defined in your favorite list from the CPU selection list.

4. Press the CPU Scanner button to confirm your selection. The scan will start automatically.

5. If the Force CPU Scan option is enabled, the scan will automatically start switching the CON device to any CPU device from the favorite list without you presing the CPU Scanner button.

5.3 Extended Switching

You can perform switching operations via the OSD or Java icon.

Figure 5-5. OSD and Java icons.

OSD

To switch any console to any available CPU, proceed as follows:

Select "Extended Switch" in the main menu.

NOTE: By pressing the key <F8>, inactive CPU Devices can be hidden to ensure a better overview.
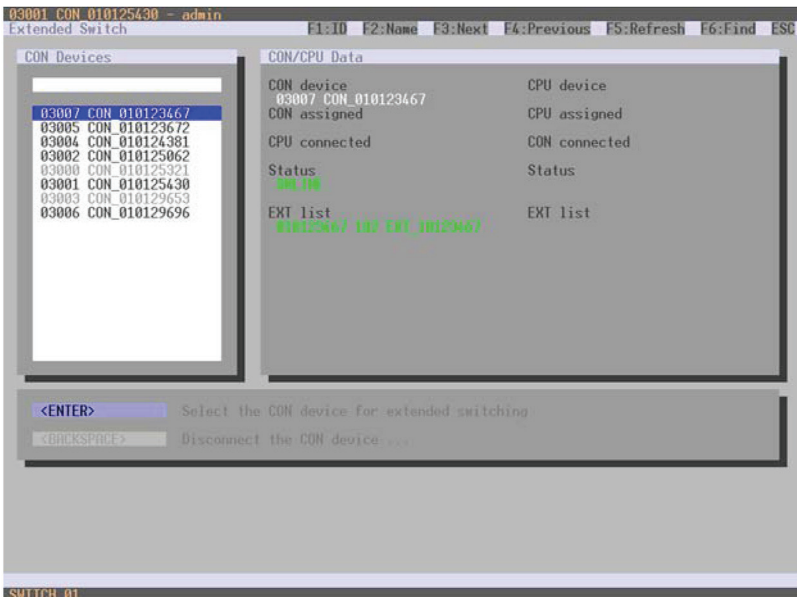
Figure 5-6. Menu Extended Switch.

1. Select the CON device from the "CON Devices" list that you want to switch to a CPU device and open it by pressing "Enter".

2. Select the CPU device from the "CPU Devices" list that you want to connect to the open CON device.

3. Confirm with the respective keyboard command according to the desired connection type.

Switching operations from the CON device can only be done to CPU devices that are available in the "CPU Devices" list.

The following information is shown in this menu:

Table 5-2. Extended switch menu fields.

Field	Description
CON device	The assigned physical extender unit.
CON assigned	Virtual CON device that is assigned to the real CON device.
CPU connected	Currently connected CPU device.
CON status	Current connection status (CON device).
EXT list	List of all available physical extender units (CON units).
CPU device	Assigned physical extender unit (CPU unit).
CPU assigned	Real CPU device that is assigned to a virtual CPU device.
CON connected	Currently connected CON device.
CPU status	Current connection status (CPU device).
EXT list	List of all available physical extender units (CPU units).

You can select between the following switching functions:

Table 5-3. Switching functions.

Function	Keyboard Command
Set a video-only connection.	<Space>
Set a KVM connection.	<Enter>
Set a KVM connection in private mode (video sharing disabled).	<Shift> + <Enter>
Disconnect the CON device from the CPU device.	<Backspace>

Java Tool

You can switch using the Java Tool in two ways:

Option 1: You will need the ACX-JAV license to perform Java extended switching.

Select "Control > Extended Switch" in the task area.
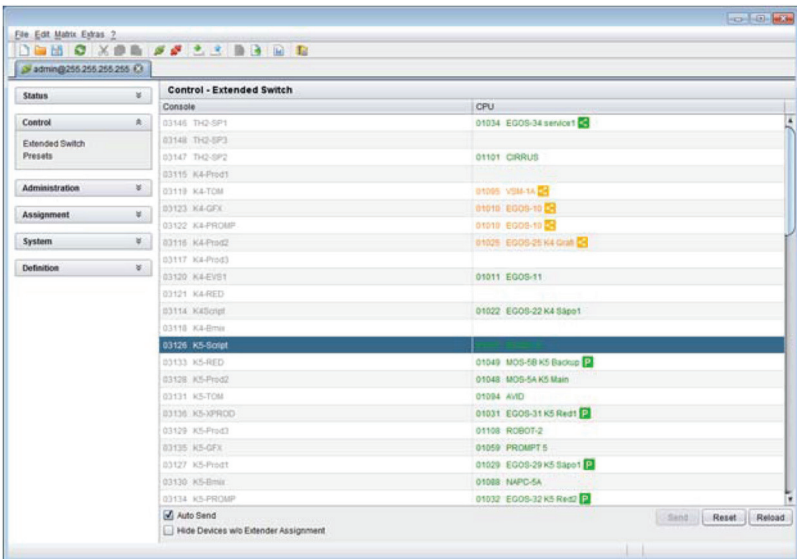
Figure 5-7. Menu Control – Extended Switch.

All connected consoles and the associated CPU connections are shown in columns in the working area in this menu.

NOTE: Switching operations can only be performed in on-line mode, so you need an active network connection between the matrix and the Java Tool.

To set a KVM connection between a console and a CPU, double-click on the corresponding selection box in the "Full Access" column and select the requested CPU.

To set a video connection between a console and a CPU, double-click on the corresponding selection box in the "Video Only" column and select the requested CPU.

To set a Private Mode connection between a console and a CPU, double-click on the corresponding selection box within the "Private Mode" column and select the requested CPU.

NOTE: CPUs with respective consoles that do not have access rights will not appear in the list.

The following symbols are shown in the connection overview:

Table 5-4. Connection overview fields.

Field	Description
	The CON device is connected via Shared Access with at least one further console to the same CPU. The CON device has full access at the moment.
	The CON device is connected via Shared Access with at least one further console to the same CPU. The CON device has a video access connection at the moment.

You can use the following button to perform a switching operation:

Table 5-5. Swiching operation buttons.

Button	Function
Send	Send switching operations to the matrix.
Reset	Disconnect all existing connections within the matrix.
Reload	Reload switching status.

NOTES:

To perform switching operations immediately without confirmation, activate the "Auto Send" function in the left lower corner of the working area. Switching operations will be done immediately without confirmation when you press the "Send" button.

By activating the "Hide Devices w/o Extender Assignment" function in the left lower corner of the working area, only CON and CPU devices that are assigned to an extender are shown.

Option 2:

Select "Status > Matrix View" in the task area.
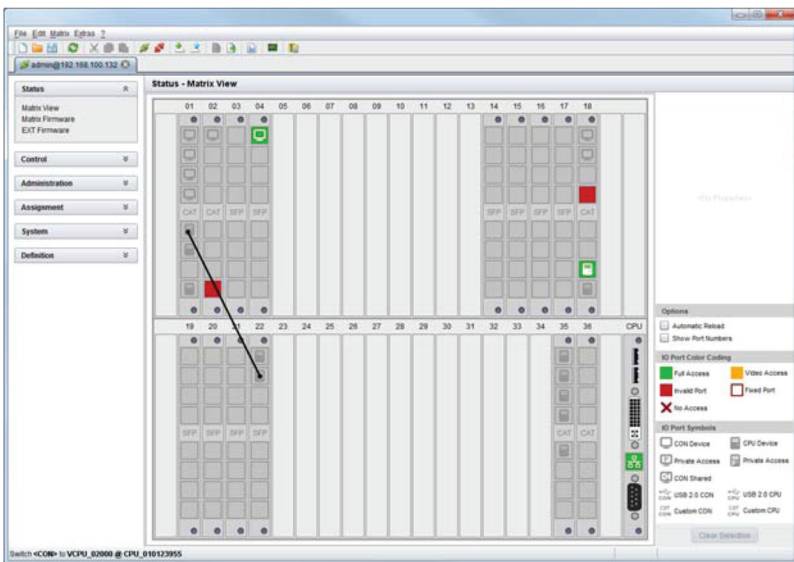
Figure 5-8. Menu Status – Matrix View

To perform switching operations between CON and CPU devices, follow these steps:

1. Move the mouse cursor to the port that has to be switched.

2. Hold down the left-mouse button and move the cursor to the port that has to be connected to the initial port. The current cursor movement will be displayed by a black auxiliary line.

3. Release the left-mouse button. A popup to select the available switching type (Full Access, Video Access, or Private Mode) will be opened.

4. Select the desired switching type. The switching operation will be immediately executed. At the same time, all extender units that are assigned to the involved devices will be switched.

NOTE: If there is a red cross on a port when switching by using the Matrix View, the console to be connected does not have access rights to the respective CPU at this port.

To disconnect an existing link between CON and CPU devices, follow these steps:

1. Click on the port that is to be disconnected by using the right mouse button.

2. Select the "Disconnect" function in the popup that appears. The connected ports will be disconnected immediately. At the same time, all further connections of the extenders assigned to the involved devices will be disconnected.

5.4 CON Switch

KVM extender CON Units connected to a local source (computer, CPU) can be locally switched via the matrix. Switching is performed between the local source and the KVM connection and can be executed via hotkeys or via OSD.

If you switch to the local source, the KVM connection will be automatically disconnected.

NOTE: When using CON units with the option to connect a local source (computer, CPU) in a multi-screen control environment, the local switching will be disabled.

You have the following option to switch to the local source:

Figure 5-9.

OSD

• Select Switch in the main menu.
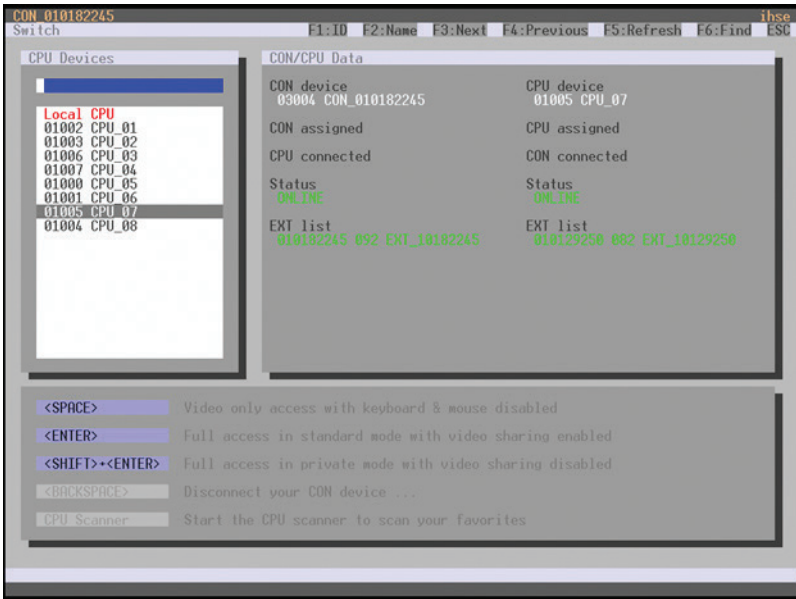
Figure 5-10. Menu—CON Switch.

To switch to a local source, proceed as follows:

1. If you are not yet in the Switch menu of the OSD, start Command Mode with the hotkey (see Chapter 5.1, Page 53).

2. Press <o> to open OSD.

You will see a list of all available CPUs in the menu.

3. Switch to the CPU in the list that is called Local CPU.

The switching operation to the local source will be immediately performed.

NOTE: The local source (computer, CPU) will be only shown in the OSD if the respective CON Unit includes the option for a local connection.

Alternatively, there are the following keyboard commands available in order to switch to the local source:

Table 5-6. Switching operations.

Keyboard Command	Function
<hotkey>, <k>, <1>, <Enter>	Switching to extender connection
<hotkey>, <k>, <2>, <Enter>	Switching to extender connection 2 (only with redundant CON Units)
<hotkey>, <l>, <Enter>	Switching to the local source (computer, CPU)

5.5 Multi-Screen Control

Using the Multi-Screen function, you can switch the USB-HID signal between different statically connected sources (computer, CPU) within a CON Device in two different ways: via mouse or via keyboard.

Switching via Mouse

You can switch the USB-HID signal by moving the mouse pointer beyond the edge of the current display to a neighboring display according to the configuration.

To switch via mouse, proceed as follows:

1. Move the mouse pointer to the edge of the display which that vertically or horizontally borders the neighboring display.

2. Move the mouse pointer beyond the edge of the display. The mouse pointer will appear on the respective position at the target display.

The switching option has been performed and the USB-HID signal will now be available at the target display.

Switching via Keyboard

To switch via keyboard:

1. Start Command Mode with the hotkey.

2. Select the target display by pressing the respective key on the numeric pad of the keyboard.

The switching option has been performed and the USB-HID signal will now be available at the target display.

You can select between the following switching operations:

Table 5-7. Switching operations.

Keyboard Command	Function
<current hotkey> <Num 0>	Switch the USB-HID signal to the display (CON unit with keyboard and mouse)
<current hotkey> <Num 1>	Switch the USB-HID signal to display #1
<current hotkey> <Num 2>	Switch the USB-HID signal to display #2
<current hotkey> <Num 3>	Switch the USB-HID signal to display #3
<current hotkey> <Num 4>	Switch the USB-HID signal to display #4

5.6 USB 2.0 Switching

Switching USB 2.0 extenders works in a similar way as switching KVM extenders. The following scenarios to switch USB 2.0 extenders are possible.

1. A extender unit with USB 2.0 will be created and assigned to an already existing device with existing KVM extender units.

2. A separate device for the extender unit with USB 2.0 will be created without assigning a KVM extender unit to that device. This possibility offers a separate switching of the USB 2.0 signal.

NOTES:

Extended switching includes separate switching of USB 2.0 signals.

When switching USB 2.0 connections you should wait until the process of registration of the USB 2.0 devices has been completed before you switch to the next CPU (approximately 5–15 seconds). Otherwise the stability of the USB 2.0 connection can be affected negatively.

5.7 Presets

In this menu, you can create and activate predefined macros to switch the matrix without loading a new configuration.

You can access the menu via the Java icon.

Figure 5-11. Java icon.

Select "Control > Presets" in the task area.
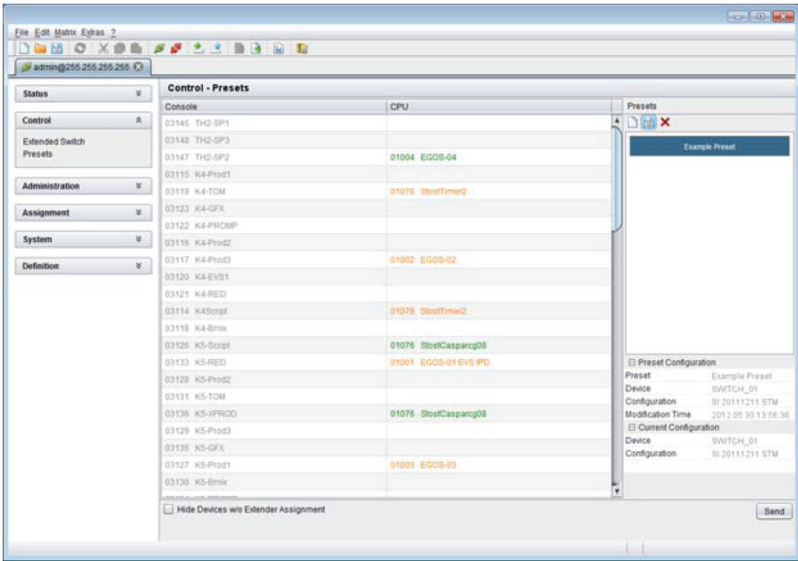
Figure 5-12. Menu Control – Presets.

To create a new switch macro, proceed as follows:

1. Open a new switch macro by pressing on the "New" symbol in the right column of the working area. You'll be asked if the existing connections should be taken over for the new switch macro.

2. Set the desired switching operations in the corresponding columns (Full Access, Video Only or Private Mode) by double-clicking on the respective selection box or use the function for a disconnect (Disconnect CPU).

3. Save the created switch macro by clicking the "Save" symbol in the right column of the working area. A save dialog will be opened.

4. Enter a name or the new switch macro and confirm by pressing the "OK" button in the save dialog box.

5. Click on a selected switch macro with the right mouse button to create a copy of the current switch macro using the option "Save as...."

6. You can delete already saved macros by pressing the "Delete" symbol.

To load a predefined switching, proceed as follows:

1. Select the switch macro in the right column of the working area that has to be loaded.

2. Activate the selected switch macro by pressing the "Send" button on the bottom right of the working area.

NOTES:

A predefined switch macro can only be activated in on-line mode.

When loading presets, only the switching operations that are compliant with the hardware and the configuration of the currently used matrix are taken into account.

5.8 Serial Interface

Figure 5-13. OSD icon.

The ServSwitch DKM FX enables you to switch via a serial interface (RS-232).

Detailed information for the serial interface and the corresponding switching commands can be found in Chapter 6.

5.9 Power On and Power Down Functions

The ServSwitch DKM FX has the following power on and power down functions: restart and reset.

5.10.1 Restart

To perform a restart, use OSD or Java.

Figure 5-14. OSD icon.

OSD

1. Select "Configuration > Restart Matrix" or "Restart IO Board" in the main menu to restart either the matrix or the I/O boards.

2. To confirm the selection, press the "OK" button. The matrix and the I/O boards will be restarted with the current settings.

Java Tool

Select "Matrix > Restart Matrix" in the menu bar. The matrix will restart with the current settings.

NOTE: The boot process of the matrix might take longer if there is no physical network connection available.

5.10.2 Factory Reset
Use the OSD to reset the extender:

Figure 5-15. OSD icon.

CAUTION: If you do a factory reset, all current settings and all configurations stored in the matrix will be lost. This also applies to the network parameters (reset to DHCP) and the admin password.

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

OSD

1. Select "Configuration > Factory Reset" in the main menu.

2. To confirm the selection, press the "Okay" button.

The ServSwitch DKM FX will be reset to the factory settings.

5.8.3 Power Down
To shut down the system:

1. Select "Configuration > Shut down Matrix" in the main menu.

2. Press "Okay" to confirm the selection.

The matrix will shut down.

To shut down an I/O board:

1. Select "Configuration > Shut Down I/O Board" in the main menu.

2. Press "Okay" to confirm the selection.

The I/O board will shut down.

5.11 Summary of Keyboard Commands

Use the hotkeys described in the following tables to activate extender and matrix functions.

Table 5-8. Extender commands.

Keyboard Command	Description
<hotkey> <a>	Download the DDC information of the monitor connected to the CON unit into the CPU unit.
<hotkey> <k> <1> <Enter>	Switch to the KVM connection (only with HDMI CON units with available connection for a local source).
<hotkey> <k> <2> <Enter>	Switch to the KVM connection 2 (only with HDMI CON units with available connection for a local source and a redundant interconnection).
<hotkey> <l> <Enter>	Switch to the local source (computer, CPU) (only with HDMI CON units with available connection for a local source).
<hotkey> <h> <w> <Enter>	USB-HID ghosting: Write the descriptions of the input devices connected to the CON unit into the CPU unit, and activate the emulation in the CPU unit.
<hotkey> <h> <e> <Enter>	Activate the emulation of already-stored device descriptions in the CPU unit.
<hotkey> <h> <d> <Enter>	Deactivare the emulation of active device descriptions in the CPU unit. The input devices are now passed transparently to the source (computer, CPU).
<hotkey> <h> <r> <Enter>	Deactivate the emulation of active device descriptions in the CPU unit, and delete the descriptions in the CPU unit. The input devices are now passed transparently to the source (computer, CPU).

Go to the next page for Matrix commands.

Table 5-9. Matrix commands.

Keyboard Command	Description
<hotkey> <o>	Open OSD.
<hotkey> <m> <o>	Open the master matrix's OSD in a cascaded environment.
<hotkey> <s> <o>	Open the sub-matrix's OSD in a cascaded environment.
<hotkey> <Enter>	Set a KVM connection (keyboard, mouse, and video) to the selected source (computer, CPU).
<hotkey> <Space>	Set a video-only connection to the selected source (computer, CPU).
<hotkey> <Left-Shift> + <Enter>	Set a private mode connection to the selected source (computer, CPU).
<hotkey> <Backspace>	Close the current connection of the console.
<hotkey> <p>	Switch back to the previous connected source (computer, CPU) with a KVM connection.
<hotkey> <1>…<16> <Enter> (<Space> or <Left-Shift> + <Enter>)	Switch to a source (computer, CPU) stored in the favorite list with a KVM connection (video-only or private mode connection).
<hotkey> <F1>… <F16>	Execute a predefined macro.
<hotkey> <c> <new hotkey key code> <Enter>	Change the hotkey according to the predefined hotkey table.
<hotkey> <c> <0> <new hotkey key> <Enter>	Define freely-selectable hotkey.
<hotkey> <f> <new hotkey key code> <Enter>	Change the hotkey for direct OSD access according to the predefined hotkey table.

Table 5-9 (continued). Matrix commands.

Keyboard Command	Description
<hotkey> <f> <0> <new hotkey key> <Enter>	Define freely selectable hotkey for direct OSD access.
<hotkey> <Num 0>	Switch the USB-HID signal to the display (CON unit with keyboard and mouse).
<hotkey> <Num 1>	Switch USB-HID signals to display #1.
<hotkey> <Num 2>	Switch USB-HID signals to display #2.
<hotkey> <Num 3>	Switch USB-HID signals to display #3.
<hotkey> <Num 4>	Switch USB-HID signals to display #4.

5.12 Serial Interface

You can switch the ServSwitch via a serial interface (RS-232).

Detailed information for the serial interface and the corresponding switching commands are available as an application programming interface (API) can be found at www.blackbox.com.

6. Serial Control

Use the following parameters to control the ServSwitch DKM FX via its serial interface.

115.2K, 8, 1, NO

(115.2 kbps, 8 data bits, 1 stop bit, no parity)

Command

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

[ ] = Optional elements

Response

<ACK> , [<ECHO>]

[ ] = Optional elements

<ECHO> reports the ServSwitch DKM FX sequences enabled by a command that shows the new switching status of the ServSwitch DKM FX. 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 the list of allowed commands below).

Data bytes: a) To prevent transferring control statements of control commands while transferring binary data, 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, for example, 0x1F.

=> 0x61 + 0x6F

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

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

Special characters:

ACK	0x06
NAK	0x15
STX	0x02
ETX	0x03
CR	0x0D
ESC	0x1B
HTAB	0x09
LF	0x0A

Sequence of a Data Communication

Table 6-1. Data communication sequence.

ServSwitch KVM DKM FX	Control CPU
—	1. Send a command
2. Acquire a command, process a command, block further commands.	—

3. a) Errors occurred: <NAK>
   b) No errors: <ACK><ECHO>
   c) Optional: Reply telegram with data
	—

—	4. a) Repeat telegram
	   b) Next command
	   c) Receive and process the repeat telegram

NOTE: The serial interface can be blocked while OSD is open.

Switching Functions Telegrams

Table 6-2. Input port's request for output port.

Bytes	Description	Coding
1	Control character	0x1B
1	Server indentification	0x5B
1	Command	0x42
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Requested output port (binary, 1…max. ports)	0x01 0x00 (for port 1) to 0x120 0x00 (for port 288)

Example:
Input port's request for output Port 160
0x1B 0x5B 0x42 0x07 0x00 0xA0 0x00

Table 6-3. Return of input port for output port.

Bytes	Description	Coding
1	Control character	0x1B
1	Server indentification	0x5B
1	Command	0x42
2	Requested output port (binary, 1…max. ports)	0x01 0x00 (for Port 1) to 0x120 0x00 (for Port 288)
2	Assigned input port (binary, 1…max. ports)	0x01 0x00 (for Port 1) to 0x120 0x00 (for Port 288)

Example:
Input Port 17's return for output Port 160
0x1B 0x5B 0x42 0x09 0x00 0xA0 0x00 0x11x00

Table 6-4. Connection of input port with output port.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x43
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Requested output port (binary, 1…max. ports)	0x01 0x00 (for Port 1) to 0x120 0x00 (for Port 288)
2	Assigned input port (binary, 1…max. ports)	0x01 0x00 (for Port 1) to 0x120 0x00 (for Port 288)

Example:

Connection of input Port 17 with output Port 160

0x1B 0x5B 0x43 0x09 0x00 0xA0 0x00 0x11 0x00

Table 6-5. Request of input port for output port with a fixed total port number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x44
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Number of output ports (binary, 1…max. ports)	0x01 0x00 (for Port 1) to 0x120 0x00 (for Port 287)
2	Requested output port (binary, 1…max. ports)	0x01 0x00 (for Port 1) to 0x120 0x00 (for Port 288)

Example:

Request of input port for output Port 25 with a total port number of 160

0x1B 0x5B 0x44 0x09 0x00 0xA0 0x00 0x19 0x00

Table 6-6. Return of input port for output port with a fixed port number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x44
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Number of output ports (binary, 1…max. 288 ports)	0x01 0x00 (for Port 1) to 0x120 0x00 (for 287 ports)

Example:

Return of input Port 17 for output Port 25 with a total port number of 160.

0x1B 0x5D 0x44 0x09 0x00 0xA0 0x00 0x19 0x00 0x11 0x00

Table 6-7. Connection of input port with output port
with a fixed total port number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x45
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Number of output ports (binary, 1…max. 2887ports)	0x01 0x00 (for Port 1) to 0x120 0x00 (for 287 ports)

Example:

Connection of input Port 17 with output Port 25 with a total port number of 160

0x1B 0x5B 0x45 0x07 0x00 0xA0 0x00 0x19 0x00 0x11 0x00

Table 6-8. Request of switching matrix.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x46

Table 6-9. Return of the switching matrix (input port for all output ports).

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x46
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Input port whose signal is sent to output port OutPort (n)	0x01 0x00 (for Port 1) to 0x120 0x00 (for 288 ports)

Example:

Return input Port 17 for all output ports

0x1B 0x5D 0x46 0x07 0x00 0x11 0x00

Table 6-10. Request of CPU (input) for CON (output).

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x46
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Requested output console	0x01 0x00 (for Console 1) to 0x11F 0x00 (for Console 287)

Example:

Request of CPU (input) for Console 23

0x1B 0x5B 0x47 0x07 0x00 0x17 0x00

Table 6-11. Return of CPU (input) for CON (output).

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x47
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Requested output console	0x01 0x00 (for Console 1) to 0x11F 0x00 (Console 287)
2	Requested input CPU	0x01 0x00 (for CPU 1) to 0x11F 0x00 (for CPU 287)

Example:

Return of CPU 34 for Console 23

0x1B 0x5D 0x47 0x09 0x00 0x17 0x00 0x22 0x00

Table 6-12. Connection of CPU (input) with CON (output).

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x48
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Requested console	0x01 0x00 (for Console 1) to 0x11F 0x00 (for Console 287)
2	Requested CPU	0x01 0x00 (for CPU 1) to 0x11F 0x00 (for CPU 287)

Example:

Connection of CPU 43 with Console 23

0x1B 0x5B 0x48 0x09 0x00 0x17 0x00 0x2B 0x00

Table 6-13. Request of CPU (input) for CON (output)
with a fixed console number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x49
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Total number of consoles (binary, 1…max. CONs)	0x01 0x00 (for Console 1) to 0x11F 0x00 (for 287 Consoles)
2	Requested consoles	0x01 0x00 (for Console 1) to 0x11F 0x00 (for Console 287)

Example:

Request of CPU (input) for Console 23 with 50 consoles in total

0x1B 0x5B 0x49 0x09 0x00 0x32 0x00 0x17 0x00

Table 6-14. Return of CPU (input) for CON (output)
with a fixed console number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5D
1	Command	0x49
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Total number of consoles (binary, 1…max. CONs)	0x01 0x00 (for console 1) to 0x11F 0x00 (for 287 consoles)

Example:

Return of CPU 43 for Console 23 with 50 consoles in total

0x1B 0x5D 0x49 0x07 0x00 0x32 0x00 0x17 0x00 0x2B 0x00

Table 6-15. Connection of CPU (input) for CON (output)
with a fixed console number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x50
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Total number of consoles (binary, 1…max. CONs)	0x01 0x00 (for Console 1) to 0x11F 0x00 (for 287 consoles)

Example:

Connection of 43 with Console 23 with 50 consoles total

0x1B -x5B 0x50 0x07 0x00 0x32 0x00 0x17 0x00 0x2B 0x00

Table 6-16. Request of CON (input) for CPU (output).

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x51
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Total number of consoles (binary, 1…max. CONs)	0x01 0x00 (for CPU 1) to 0x11F 0x00 (for CPU 287)

Example:

Request of CON (input) for CPU 23

0x1B 0x5B 0x51 0x07 0x00 0x17 0x00

Table 6-17. Return of CON (input) for CPU (output).

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5D
1	Command	0x51
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Requested output CPU	0x01 0x00 (for CPU 1) to 0x11F 0x00 (for CPU 287)
2	Requested input console	0x01 0x00 (for Console 1) to 0x11F 0x00 (for console 287)

Example:

Request of Console 23 for CPU 23

0x1B 0x5D 0x09 0x00 0x2B 0x00 0x17 0x00

Table 6-18. Connection of CON (input) with CPU (output).

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x52
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Requested output CPU	0x01 0x00 (for CPU 1) to 0x11F 0x00 (for CPU 287)
2	Requested input console	0x01 0x00 (for Console 1) to 0x11F 0x00 (for Console 287)

Example:
Connection of Console 23 with CPU 43

0x1B 0x5B 0x52 0x09 0x00 0x2B 0x00 0x17 0x00

Table 6-19. Request CON (input) for CPU (output) with a fixed CPU number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x52
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Total number of CPUs	0x01 0x00 (for CPU 1) to 0x11F 0x00 (for 159 CPUs)
2	Requested output for CPU (binary, 1…max. CPUs)	0x01 0x00 (for Console 1) to 0x11F 0x00 (for Console 287)

Example:

Request for CPU 43 with 50 CPUs in total

0x1B 0x5B 0x53 0x09 0x00 0x32 0x00 0x2B 0x00

Table 6-20. Return of CON (Input) for CPU (Output) with a fixed CPU number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5D
1	Command	0x53
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Total number of CPUs	0x01 0x00 (for 1 CPU) to 0x11F 0x00 (for 287 CPUs)

Example:

Return of Console 23 for CPU 43 with 50 CPUs in total

0x1B 0x5D 0x53 0x07 0x00 0x32 0x00 0x2B 0x00 0x17 0x00

Table 6-21. Connection of CON (input) with CPU (output)
with a fixed total CPU number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x54
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Total number of CPUs	0x01 0x00 (for 1 CPU) to 0x11F 0x00 (for 287 CPUs)

Example:

Connection of Console 23 with CPU 43 with 50 CPUs in total

0x1B 0x5B 0x54 0x07 0x00 0x32 0x00 0x2B 0x00 0x17 0x00

Table 6-22. Connection of CON (input) with CPU (output)
and CPU (input) with CON (output).

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x55
2	Total length of telegram (9 bytes, binary)	0x09 0x00
2	Requested CPU	0x01 0x00 (for 1 CPU) to 0x11F 0x00 (for 287 CPUs)
2	Requested console	0x01 0x00 (for Console 1to 0x11F 0x00 (for Console 287)

Example:

Connection of Console 23 (input) with CPU 43 (output)

0x1B 0x5B 0x55 0x09 0x00 0x2B 0x00 0x17 0x00

Table 6-23. Connection of CON (input) with CPU (output)
and CPU (input) with CON (output) with a fixed CPU number.

Bytes	Description	Coding
1	Control character	0x1B
1	Server identification	0x5B
1	Command	0x56
2	Total length of telegram (7 bytes, binary)	0x07 0x00
2	Total number of CPUs	0x01 0x00 (for 1 CPU) to 0x11F 0x00 (for 287 CPUs)

Example:

Connection of Console 23 with CPU 43 and Console 24 with CPU 44 with 50 existing CPUs

0x1B 0x5B 0x56 0x07 0x00 0x32 0x00 0x2B 0x00 0x17 0x00 0x2C 0x00

0x18 0x00

7. Troubleshooting

Tables 7-1 through 7-7 provide support for problems with the ServSwitch DKM FX matrix. This help assumes a functional extender route. Before troubleshooting, make sure your extenders work over a point-to-point connection. This can be supported by the using a CATx or fiber coupler.

7.1 External Failure

Table 7-1. External failure.

Problem	Possible Cause	Solution
ServSwitch DKM FX cannot be started	Fuse at the standard appliance outlet is out	Check fuse

7.2 Video Interference

Table 7-2. Video interference.

Problem	Possible Cause	Solution
Opening the OSD is not possible	No OSD jumper set	Set Jumper 11 on the CON unit
	Switch set up as sub-master	Try using hotkeys L-shift, L-shift, S, O
Incorrect video display	Cable connection disturbed	Check the connection, length, and quality of the interconnection cable to the units

7.3 Fans Malfunction

Table 7-3. Fans malfunction.

Problem	Possible Cause	Solution
Fans do not run; LED OK is on	Fans are defective	Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com
Fans do not run; LED OK is off	Power supply	Check power supply and power connections

7.4 Power Supply Units Malfunction

Table 7-4. Power supply units malfunction.

Problem	Possible Cause	Solution
ServSwitch DKM FX cannot be started	No power supply is available	Check that cables for the power supply are connected correctly
	Power supply units are not switched on	Check the slide to switch on the power supply units

7.5 Network Error

Table 7-5. Network error.

Problem	Possible Cause	Solution
Network settings are not resumed after editing	ServSwitch DKM FX restart is not yet completed	Restart the unit
	CPU board was not properly installed	Pull black tab outward on CPU board. Wait 30 seconds, then push back in.

7.6 ServSwitch DKM FX Failure

Table 7-6. ServSwitch DKM FX failure.

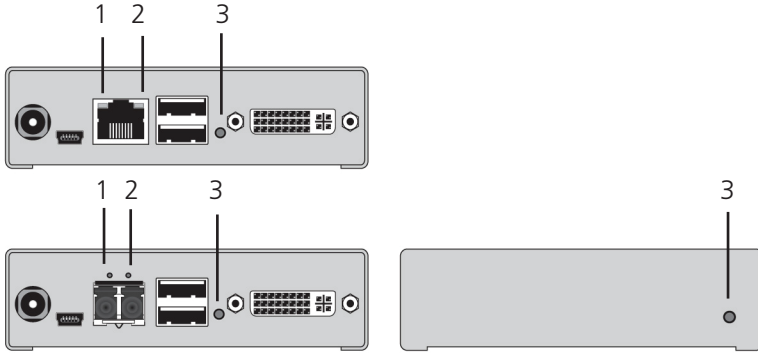| Problem	Possible Cause	Solution
Serial control is impossible or restricted	CPU and ServSwitch DKM FX are running at a different baud rate	Adapt the baud rate in the ServSwitch DKM FX and in the CPU
Serial control via the RJ-45 port is not possible	Wrong network cable	Use a cross-pinned network cable
Port definitions as USB 2.0 invalid	ServSwitch DKM FX restart not yet completed	Restart the ServSwitch DKM FX

7.7 Blank Screen

Figure 7-1. LEDs on the ServSwitch DKM FX.

Table 7-7. LED indications.

Problem	Possible Cause	Solution
Monitor remains dark after switching operation	Switching to a CPU port without active source (computer, CPU)	Connect the computer or CPU
	Connection of a console with a CON port or connection of a CPU to a CPU port not established correctly	Check CON and CPU port connections at the ServSwitch DKM FX
LED 1 on or LED 2 off	Connections of the CON unit, ServSwitch DKM FX, and the CPU unit	Check the cables and connectors (no cable, cable break, CPU/CON unit off-line, CPU/CON unit connected to the wrong port
LED 3 off	Power supply	Check the power supply units and connection to the power network

7.8 Contacting Black Box

If you determine that your ServSwitch DKM FX is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

• the nature and duration of the problem.

• when the problem occurs.

• the components involved in the problem.

• any particular application that, when used, appears to create the problem or make it worse.

7.9 Shipping and Packaging

If you need to transport or ship your ServSwitch DKM FX:

• Package it carefully. We recommend that you use the original container.

• If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.

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

AES/EBU — Digital audio standard officially known as AES3, used for carrying digital audio signals between devices.

CATx — Any CAT5e (CAT6, CAT7) cable.

CGA — The Color Graphics Adapter (CGA) is an old analog graphics standard with up to 16 displayable colors and a maximum resolution of 640 x 400 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 FBAS and it is part of the PAL TV standard.

CON Unit — Component of a ServSwitch DKM FX or media extender that connects to the console (monitor[s], keyboard and mouse; optionally also with USB 2.0 devices).

CPU Unit — Component of a ServSwitch DKM FX or media extender that connects to a source (computer, CPU).

DDC — The Display Data Channel (DDC) is a serial communication interface between a monitor and a source (computer, CPU). It enables data exchange via monitor cable and automatic installation and configuration of a monitor driver by the operating system.

Dual Access — A system that operates 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 2560 x 2048 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). See also Single Link and Dual Link. The signals have TMDS level.

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 multimode fiber cables.

EGA — The Enhanced Graphics Adapter (EGA) is an old analog graphics standard, introduced by IBM® in 1984. It uses a DB9 connector.

FBAS — The analog color video baseband signal (FBAS) is also called Composite Video and it is part of the PAL TV standard.

Console — Keyboard, mouse, and monitor.

KVM — Keyboard, video, and mouse.

Mini-XLR — Industrial standard for electrical plug connections (3-pole) for the transmission of digital audio and control signals.

Multimode — 62.5-μ or 50-μ fiber cable.

OSD — An OSD (on-screen display) is used to display information or to operate a device.

Quad-Head — A system with four video connections.

RCA (Cinch) — A non-standardized plug connection that transmits electrical audio and video signals, especially with coaxial cables.

SFP — SFPs (Small Form Factor Pluggables) are pluggable interface modules for Gigabit connections. SFP modules are available for CATx and fiber interconnect cables.

S/PDIF — A digital audio interconnect 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 1920 x 1200 by signal transmission of up to 165 MPixel/s (24-bit). Alternative frequencies are Full HD (1080p), 2K HD (2048 x 1080), and 2048 x 1152.

Single-Mode — 9μ fiber cable.

S-Video (Y/C) — The S-Video (Y/C) is a video format that transmits luminance and chrominance signals separately. It has a higher-quality standard than FBAS.

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 devices) allow for data input. You don't need a special driver during installation; "New USB-HID device found" is reported. Typical HID devices include keyboards, mice, graphics tablets, and touchscreens. Storage, video, and audio devices are not HID.

VGA — Video Graphics Array (VGA) is a computer graphics standard with a typical resolution of 640 x 480 pixels and up to 262,144 colors. Its is preceded by the graphics standards MDA, CGA and EGA.

A.1 Matrix-Specific Glossary

Auto Disconnect — Matrix function that allows an automatic disconnect between a console and a CPU, if the OSD is opened via this console.

Auto Logout — Matrix function that describes the duration of inactivity after the user has been logged out from the OSD at this console.

CON Device — Logical term that summarizes several physical extenders to switch more complex console systems via matrix.

CON Timeout — Matrix function that allows an automatic disconnect of the console from the connected CPU after a predefined time.

Console ACL — Console ACL (Access Control List) is a list that shows the respective switching rights for the various consoles.

CPU Auto Connect — Matrix function that allows an automatic connection establishment between the own console and a random available CPU.

CPU Device — Logical term that summarizes several physical extenders to switch more complex CPU systems via matrix.

CPU Timeout — Matrix function that allows the user to disconnect after a predefined period of time of inactivity from the respective CPU.

EXT Unit — Part or extender board of a CON or CPU unit with a connection to the matrix. A CON or CPU unit can consist of several EXT devices.

Force Connect — Matrix function that allows a user to switch with his own console to a CPU that is already used. This enables the user to take keyboard and mouse control. The connected console loses K/M control but keeps video.

Force Disconnect — Matrix function that allows to switch with the console to a CPU that is already used. This enables the user to take KVM control. The connected console loses complete KVM control.

Java Tool — Java based control and configuration tool for the ServSwitch DKM FX matrix.

Keyboard Connect — Matrix function that allows taking over the keyboard control of an inactive console.

Macro Keys — Programmable keys that string together commands to the matrix.

Mouse Connect — Matrix function that enables a user to control an inactive console's mouse.

Non-Blocking-Access — Matrix configuration in which no user can be disturbed by an activity of another user.

OSD Timeout — Matrix function that closes the OSD automatically after a predefined period of time of inactivity.

Release Time — Matrix function that enables a console connected to 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.

User ACL — User ACL (Access Control List) is a list that shows the respective switching rights for the various users.

Video Sharing — Matrix function that enables switching from a user's own console to any CPU with video.

NOTES

724-746-5500 | blackbox.com

About Black Box

Black Box provides an extensive range of networking and infrastructure products.
You'll find everything from cabinets and racks and power and surge protection
products to media converters and Ethernet switches all supported by free, live 24/7
Tech Support available in 60 seconds or less.

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