Draco tera flex

KVM Matrix Switch
Series 480

Introduction

This manual contains important safety instructions as well as instructions for setting up the product and operating it. Please read the general safety instructions (see chapter 2, page 12) and additional notice in the respective chapters. Read carefully through the User Manual before you switch on the product.

Product Identification

The model and serial number of your products are indicated on the bottom of our products. Always refer to this information when you need to contact your dealer or the support of IHSE GmbH (see chapter 13, page 324).

Trademarks and Trade Names

All trademark and trade names mentioned in this document are acknowledged to be the property of their respective owners.

Validity of this Manual

This manual applies to all products of the series named on the cover page and to the firmware / software listed in chapter 1.1, page 10. Please note the change log for this manual in the chapter 17, page 335).

Differences between the various models are clearly described.

The manufacturer reserves the right to change specifications, functions or circuitry of the series described here without notice. Information in this manual can be changed, expanded, or deleted without notice. You can find the current version of the manual in the download area of our website.

Copyright

Available Documentation

Name	Format	Description	Provision
User Manual	PDF	Provides an overview of the product together with technical data and safety instructions. Contains all instructions required to operate the product to a basic level.	Download from website
Quick Setup	Print	Provides a quick installation guide and safety instructions	Contained in the scope of delivery

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Table of Contents

1 Important Information

1.1 Firmware and Software

The release information for the firmware and software described in this user manual is listed below. The manual is updated when firmware or software changes affect user behavior or system behavior.

Firmware	Version from	Release date
MATAPP	F04.00	2021-01-15
MATLBDG	F01.00	2018-06-26
MATLOS	F01.08	2021-03-18
MATLOSD	F02.00	2020-11-10
MATLPXP	F01.02	2020-05-07
MATLVOSC	F01.14	2020-12-09
MATLVOSD	F02.01	2020-12-08
MATXDVI	F01.15	2015-03-12
MATXHID	F04.03	2021-01-22
MATXLNK	F01.05	2020-01-16
MATXOSD	F03.48	2020-05-06
MATXOSL	F03.15	2020-05-11
MATXVOSD	F04.03	2020-02-18
MATXVOSL	F03.06	2019-04-30

Software	Version from	Release date
Tera Tool	V4.0.2.0	2021-01-29

1.2 Symbols for Warnings and Helpful Information

The meaning of the symbols used for warnings and helpful information in this manual is described below:

NOTICE
NOTICE identifies information if not observed, endangers the functionality of your device or the security of your data.

This symbol indicates information about special features on the device or when using device and function variants.

This symbol indicates instructions for procedures recommended by the manufacturer for an effective utilization of the device potential.

1.3 Spellings

Uniform spellings are used in this manual for better readability or easier assignment.

The following spellings are used for products and descriptions:

Product	Description
Tera Tool	Management software
Source	Computer, CPU
Sink	Console (monitor, keyboard, mouse)

The following spellings are used for keyboard commands:

Keyboard command	Description
`<key>`	Description of a key on the keyboard
`<key> + <key>`	Press keys simultaneously
`<key>, <key>`	Press keys successively
`2x <key>`	Press key quickly, twice in a row (like a mouse double-click)

The following spellings are used for software descriptions:

Spelling	Description
Bold print	Description of terms that are used in the device firmware or software
Menu item	Description of a menu item in the device firmware or software
Menu item > Menu item	Select menu items successively

Mouse settings	Function
Left mouse button	Primary mouse button* (default in most operating systems)
Right mouse button	Secondary mouse button*

* Unless you have customized your mouse settings in your used operating system.

1.4   Intended Use

The Draco tera matrix is used to establish connections from consoles (monitor, keyboard, mouse, and other peripheral devices) to various sources (computer, CPU).

In its maximum configuration, up to 160 independent ports can be defined and switched either as a console or a CPU.

The Draco tera matrix is designed to operate with extender modules that transmit KVM, audio, and data signals.

The connection between the matrix and the peripheral devices, such as KVM extender modules, can be made by Cat X or fiber.

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

NOTICE
Possible radio interference in a domestic environment
This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.
➡ Follow the safety and installation instructions given in this manual.
➡ Use connection cables according to the specifications for the length and type given in this manual.

1.5   EU Declaration of Conformity

Please find the EU Declaration of Conformity for the product series under:
www.ihse.com/eu-declaration-of-conformity

A copy of the original, product-specific EU Declaration of Conformity can be provided upon request. For contact details, see page 2 of this manual.

2   Safety instructions

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

➡ Read this user manual carefully.

➡ Only use the device according to this user manual. Failure to follow the instructions described can damage the device or endanger the security of your data.

➡ Take any required ESD precautions.

⚠ **WARNING**

Risk of electric shock or bruising, abrasions or severing due to an opened chassis

If the housing is opened while power is supplied to the device, electric shock may occur if the internal wiring is touched. If a running fan is touched, bruising, abrasions or severing of fingers may occur.

There are no necessary maintenance procedures that require opening the case.

➡ Do NOT remove the cover of the chassis.

➡ Do NOT install the device in environments where children are likely to be present.

⚠ **CAUTION**

Risk of burns due to tremendously heated chassis surface after a long period of operation

When the chassis is fully equipped, the surface of the chassis can become very warm after a long period of operation. If the chassis surface is touched after a long period of operation, this can cause skin burns.

➡ Protective gloves must be worn to transport a fully equipped housing after a long period of operation.

➡ Ensure that there is sufficient distance from the operator.

➡ Do NOT install the device in environments where children are likely to be present.

Installation Location

While operating the device can get warm. Damage to the device can occur in a damp environment.

➡ Use the device only in dry, indoor environments.

➡ Use the device only in a room with adequate ventilation.

➡ For rack-mount installations, at least 0.5 RU (rack unit) is required above the device for ventilation.

➡ Existing ventilation openings on the device must always be free.

➡ Place all power outlets easily accessible and directly next to each other.

Connection

➡ Check the device for visible damage before connecting it.

➡ Only connect the device if the device and the ports are not damaged.

➡ Place all power outlets easily accessible and directly next to each other.

➡ In case the device is equipped with one or more grounding screws, it is obligatory to use these for normal operation to ensure the grounding of the chassis.

➡ Connect all power supplies to grounded outlets. In each case, ensure that the ground connection is maintained from the outlet socket through to the power supply's AC power input.

➡ Only connect the device to KVM devices using the interconnect cable - not to other devices, particularly not to telecommunications or network devices.

Disconnect the Device from the Circuit

NOTICE
The cable plugs on the device side can contain a lock. In the event of a necessary quick and complete disconnection from external electric circuits: ➥ remove all corresponding cable plugs from the socket, ➥ or set the power switch of the power outlets (if available) to the "Off" position.

3   Consignes de Sécurité

Pour garantir un fonctionnement fiable et sûr de votre périphérique à long terme, veuillez respecter les
directives suivantes :

➡ Lisez attentivement ce manuel d'utilisation.

➡ N'utilisez le périphérique que conformément à ce manuel d'utilisation. Le non-respect des instructions
    décrites peut endommager le périphérique ou mettre en danger la sécurité de vos données

➡ Prenez toutes les précautions nécessaires contre les décharges électrostatiques.

⚠ **AVERTISSEMENT**

Risque d'électrocution ou de contusions, d'abrasions ou de coupures dues à un châssis ouvert

Si le châssis est ouvert alors que le périphérique est sous tension, un choc électrique peut se produire si
le câblage interne est touché.

Si vous touchez un ventilateur en marche, vous risquez de vous blesser, de vous écorcher ou de vous
couper les doigts.

Aucune procédure d'entretien nécessaire ne requiert l'ouverture du boîtier.

➡ Ne retirez PAS le couvercle du châssis.

➡ N'installez PAS le périphérique dans des environnements où des enfants sont susceptibles d'être
    présents.

⚠ **ATTENTION**

**Risque de brûlures dues à la surface du châssis très chaude après une longue période
d'utilisation**

Lorsque le châssis est entièrement équipé, la surface du châssis peut devenir très chaude après une
longue période de fonctionnement.

Si la surface du châssis est touchée après une longue période d'utilisation, cela peut provoquer des
brûlures de la peau.

➡ Des gants de protection doivent être portés pour transporter un châssis entièrement équipé après une
    longue période d'opération.

➡ Veillez à ce que la distance avec l'opérateur soit suffisante

➡ N'installez PAS le périphérique dans des environnements où des enfants sont susceptibles d'être
    présents.

Emplacement de l'installation

Pendant le fonctionnement, le périphérique et les prises d'alimentation peuvent chauffer. L'appareil peut
être endommagé dans un environnement humide.

➡ N'utilisez le périphérique que dans un environnement sec et intérieur.

➡ N'utilisez le périphérique dans un lieu correctement ventilée.

➡ Pour les installations en rack, au moins 0,5 RU (unité de rack) est nécessaire au-dessus du
    périphérique pour la ventilation.

➡ Les ouvertures de ventilation existantes sur l'appareil doivent toujours être libres.

➡ Placez toutes les prises d'alimentation y comprises les prises des alimentations du module externe
    fourni dans un endroit facilement accessible et les unes à côté des autres.

Connexion

➡ Avant de connecter le périphérique et les unités d'alimentation, vérifiez qu'ils ne présentent pas de dommages visibles.

➡ Seulement connectez le périphérique et les unités d'alimentation que si l'appareil et les ports ne sont pas endommagés.

➡ Placez toutes les prises de courant facilement accessibles et directement les unes à côté des autres.

➡ Si le périphérique est équipé d'une ou plusieurs vis de mise à la terre, il est obligatoire de les utiliser en fonctionnement normal pour assurer la mise à la terre du châssis.

➡ Connectez toutes les alimentations électriques à des prises reliées à la terre. Dans chaque cas, assurez-vous que la connexion à la terre est maintenue depuis la prise de courant jusqu'à l'entrée d'alimentation CA de l'alimentation.

➡ Ne connectez le périphérique qu'à des périphériques KVM à l'aide du câble d'interconnexion - pas à d'autres périphériques, en particulier pas à des périphériques de télécommunications ou de réseau.

Déconnecter le périphérique du circuit

AVIS
Les fiches de câble du côté du périphérique peuvent contenir un verrou. En cas de nécessité d'une déconnexion rapide et complète des circuits électriques externes : ➡ retirez toutes les fiches de câble correspondantes de la prise, ➡ ou mettez l'interrupteur des prises de courant (si elles existent) sur la position « Off ».

4   Description

4.1   System Overview

A Draco tera matrix system consists of a Draco tera matrix and, for KVM applications, one or more CPU Units / CON Units. The Draco tera matrix is connected to the CPU Units / CON Units by interconnect cables. All available ports of the matrix can be used either as an input or as an output port depending on components and equipment. Non-blocking access is available for all users, i.e., user access is not limited by the activities of another user.

CPU Units are connected directly to the sources (computer, CPU) by the provided cables. Monitor(s), keyboards, and mice are connected to the CON Units. The communication between the Draco tera matrix and the CPU Units / CON Units occurs over the respective interconnect cables.

The Draco tera matrix supports a wide and flexible range of system configurations:

A part of the Draco tera can be configured as a Single-Head workstation, a part as Dual-Head workstation, or even as Quad-Head workstation for example. In addition, there are configurations with KVM and USB 2.0 available.

4.2   Installation Examples

The following section shows typical exemplary installations of the Draco tera:

Single-Head Installation
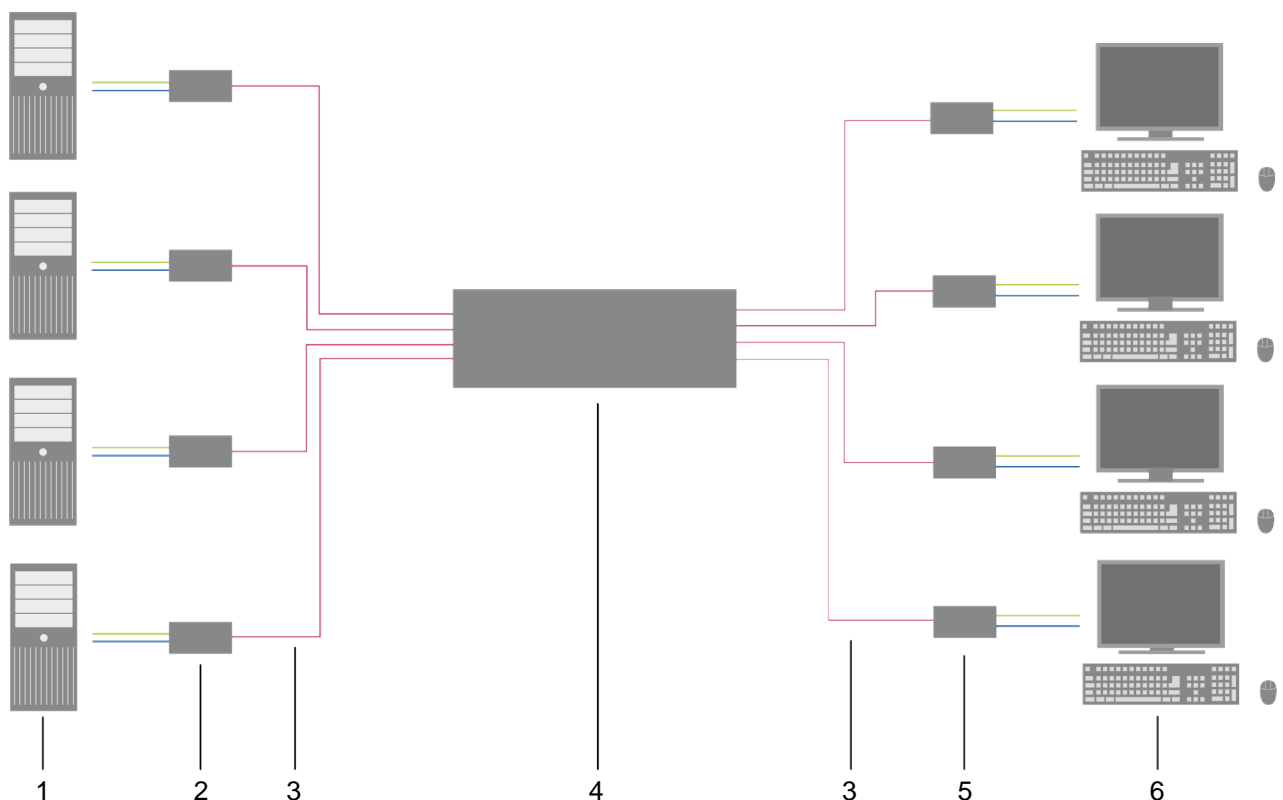
Fig. 1   Example - System overview Single-Head installation

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

If you have a Single-Head console, you can also get access to a Dual-Head or Quad-Head source (computer, CPU) for example. However, control is only possible at monitor 1 and only one video signal is displayed.

Any signal source can be switched to any number of monitors that will show the video signal at the same time. Audio may also be switched if required.

Single-Head Installation with Multi-Screen Control

When using Multi-Screen Control, switching control between up to eight connected sources (computers, CPUs) can be performed at one sink with only one connected mouse or keyboard. In a Single-Head installation, the sink can consist of up to eight monitors. In a matrix system, Multi-Screen Control can be set up at multiple sinks.
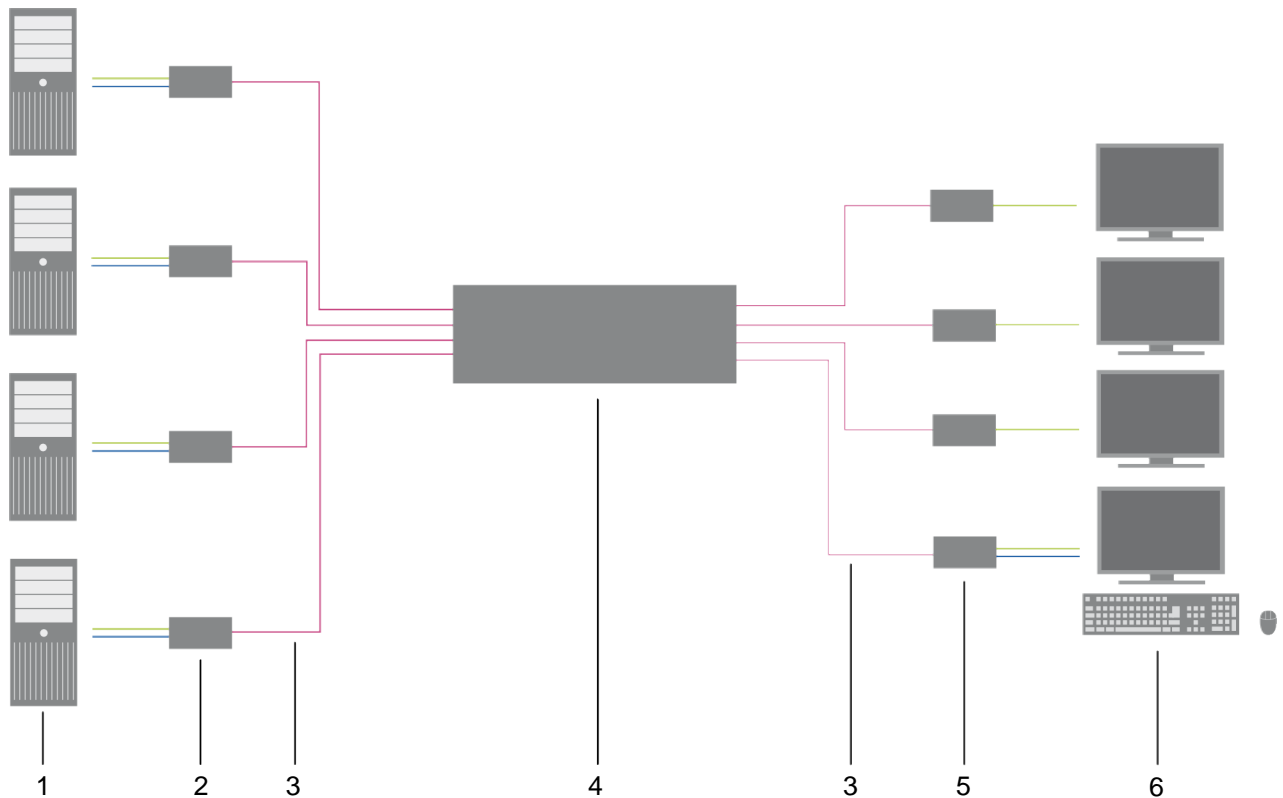
Fig. 2   Example - System overview Single-Head installation with Multi-Screen Control

1	Single-Head sources (computer, CPU)	5	Single-Head CON Units
2	Single-Head CPU Units	6	Multi-Screen Control console (e.g., 8x monitor, 1x keyboard, 1x mouse)
3	Interconnect cable		
4	Draco tera matrix		

If you have a Single-Head console, you can also get access to a Dual-Head or Quad-Head source (computer, CPU) for example. However, control is only possible at monitor 1 and only one video signal is displayed.

Any signal source can be switched to any number of monitors that will show the video signal at the same time. Audio may also be switched if required.

Dual-Head Installation with Multi-Screen Control

When using Multi-Screen Control, switching control between up to eight connected sources (computers, CPUs) can be performed at one sink with only one connected mouse or keyboard. In a Dual-Head installation, the sink can consist of up to sixteen monitors when operating Dual-Head Sources. In a matrix system, Multi-Screen Control can be set up at multiple sinks.
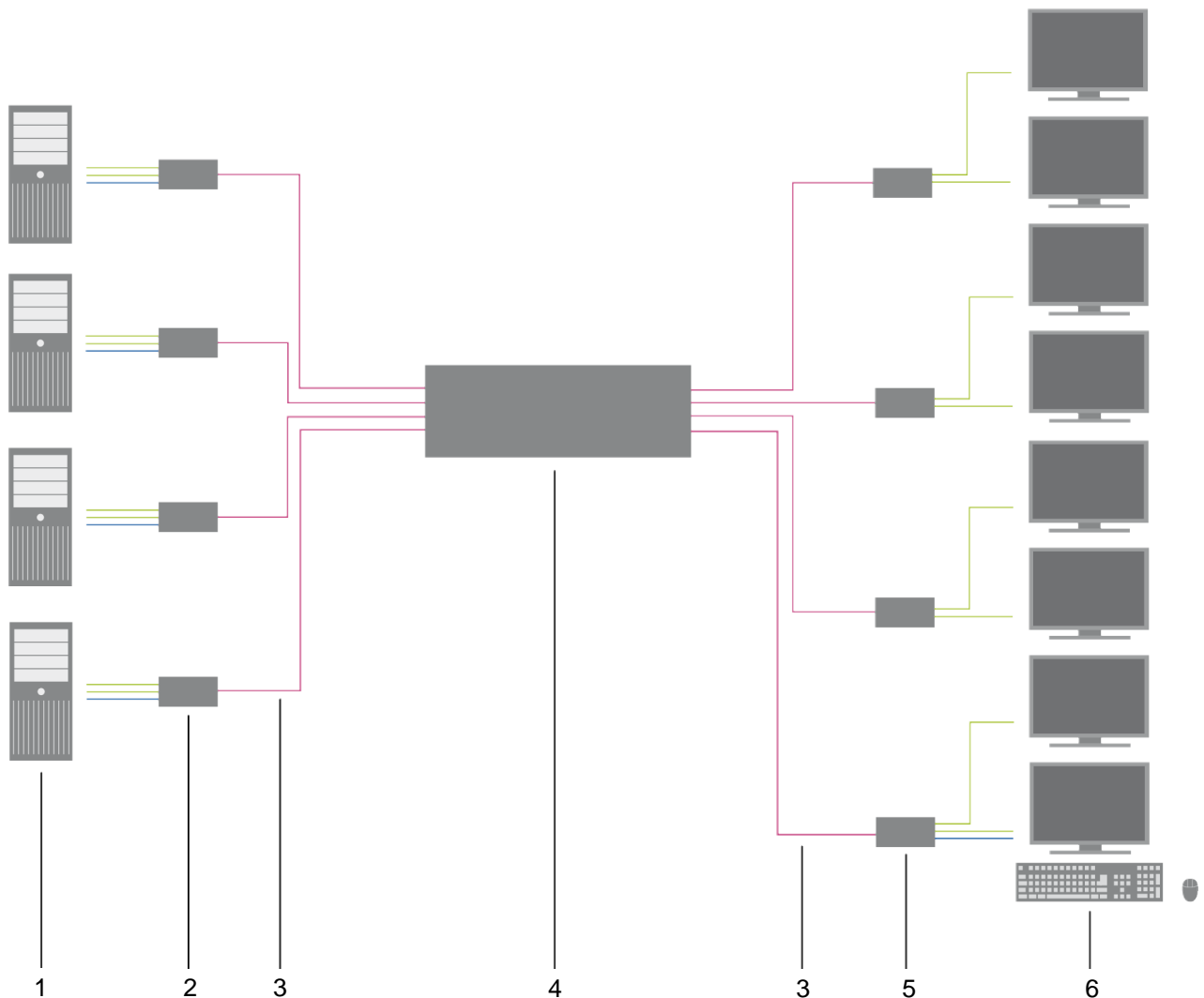
Fig. 3   Example - System overview Dual-Head installation with Multi-Screen Control

1	Dual-Head sources (computer, CPU)	5	Dual-Head CON Units
2	Dual-Head CPU Units	6	Multi-Screen Control console (e.g., 8x monitor, 1x keyboard, 1x mouse)
3	Interconnect cable		
4	Draco tera matrix		

Any signal source can be switched to any number of monitors that will show the video signal at the same time. Audio may also be switched if required.

4.3   Product Range

4.4   Product Range - Standard Systems

4.4.1   Draco tera flex Cat X 1G

Part No.	Description	Rack unit
K480-C16	Draco tera flex KVM Matrix 16-Port, Cat X 1G	1 RU
K480-C24	Draco tera flex KVM Matrix 24-Port, Cat X 1G	1 RU
K480-C32	Draco tera flex KVM Matrix 32-Port, Cat X 1G	1 RU
K480-C40	Draco tera flex KVM Matrix 40-Port, Cat X 1G	1 RU
K480-C48	Draco tera flex KVM Matrix 48-Port, Cat X 1G	2 RU
K480-C64	Draco tera flex KVM Matrix 64-Port, Cat X 1G	2 RU
K480-C80	Draco tera flex KVM Matrix 80-Port, Cat X 1G	2 RU
K480-C120	Draco tera flex KVM Matrix 120-Port, Cat X 1G	4 RU
K480-C128	Draco tera flex KVM Matrix 128-Port, Cat X 1G	4 RU
K480-C144	Draco tera flex KVM Matrix 144-Port, Cat X 1G	4 RU
K480-C160	Draco tera flex KVM Matrix 160-Port, Cat X 1G	4 RU

4.4.2   Draco tera flex Cat X 3G

Part No.	Description	Rack unit
K480-CX16	Draco tera flex KVM Matrix 16-Port, Cat X 3G	1 RU
K480-CX24	Draco tera flex KVM Matrix 24-Port, Cat X 3G	1 RU
K480-CX32	Draco tera flex KVM Matrix 32-Port, Cat X 3G	1 RU
K480-CX40	Draco tera flex KVM Matrix 40-Port, Cat X 3G	1 RU
K480-CX48	Draco tera flex KVM Matrix 48-Port, Cat X 3G	2 RU
K480-CX64	Draco tera flex KVM Matrix 64-Port, Cat X 3G	2 RU
K480-CX80	Draco tera flex KVM Matrix 80-Port, Cat X 3G	2 RU
K480-CX120	Draco tera flex KVM Matrix 120-Port, Cat X 3G	4 RU
K480-CX128	Draco tera flex KVM Matrix 128-Port, Cat X 3G	4 RU
K480-CX144	Draco tera flex KVM Matrix 144-Port, Cat X 3G	4 RU
K480-CX160	Draco tera flex KVM Matrix 160-Port, Cat X 3G	4 RU

4.4.3 Draco tera flex Fiber 1G

Part No.	Description	Rack unit
K480-F16	Draco tera flex KVM Matrix 16-Port, fiber 1G	1 RU
K480-F24	Draco tera flex KVM Matrix 24-Port, fiber 1G	1 RU
K480-F32	Draco tera flex KVM Matrix 32-Port, fiber 1G	1 RU
K480-F40	Draco tera flex KVM Matrix 40-Port, fiber 1G	1 RU
K480-F48	Draco tera flex KVM Matrix 48-Port, fiber 1G	2 RU
K480-F64	Draco tera flex KVM Matrix 64-Port, fiber 1G	2 RU
K480-F80	Draco tera flex KVM Matrix 80-Port, fiber 1G	2 RU
K480-F120	Draco tera flex KVM Matrix 120-Port, fiber 1G	4 RU
K480-F128	Draco tera flex KVM Matrix 128-Port, fiber 1G	4 RU
K480-F144	Draco tera flex KVM Matrix 144-Port, fiber 1G	4 RU
K480-F160	Draco tera flex KVM Matrix 160-Port, fiber 1G	4 RU

4.4.4 Draco tera flex Fiber 3G

Part No.	Description	Rack unit
K480-FX16	Draco tera flex KVM Matrix 16-Port, fiber 3G	1 RU
K480-FX24	Draco tera flex KVM Matrix 24-Port, fiber 3G	1 RU
K480-FX32	Draco tera flex KVM Matrix 32-Port, fiber 3G	1 RU
K480-FX40	Draco tera flex KVM Matrix 40-Port, fiber 3G	1 RU
K480-FX48	Draco tera flex KVM Matrix 48-Port, fiber 3G	2 RU
K480-FX64	Draco tera flex KVM Matrix 64-Port, fiber 3G	2 RU
K480-FX80	Draco tera flex KVM Matrix 80-Port, fiber 3G	2 RU
K480-FX120	Draco tera flex KVM Matrix 120-Port, fiber 3G	4 RU
K480-FX128	Draco tera flex KVM Matrix 128-Port, fiber 3G	4 RU
K480-FX144	Draco tera flex KVM Matrix 144-Port, fiber 3G	4 RU
K480-FX160	Draco tera flex KVM Matrix 160-Port, fiber 3G	4 RU

4.4.5 Draco tera flex Hybrid 1G

Part No.	Description	Rack unit
K480-C24F16	Draco tera flex KVM Matrix 40-Port, hybrid 1G	1 RU
K480-C24F40	Draco tera flex KVM Matrix 64-Port, hybrid 1G	2 RU
K480-C40F24	Draco tera flex KVM Matrix 64-Port, hybrid 1G	2 RU
K480-C40F40	Draco tera flex KVM Matrix 80-Port, hybrid 1G	2 RU
K480-C80F40	Draco tera flex KVM Matrix 120-Port, hybrid 1G	4 RU
K480-C80F80	Draco tera flex KVM Matrix 160-Port, hybrid 1G	4 RU
K480-C120F40	Draco tera flex KVM Matrix 160-Port, hybrid 1G	4 RU

4.4.6 Draco tera flex Hybrid 3G

Part No.	Description	Rack unit
K480-CX24FX16	Draco tera flex KVM Matrix 40-Port, hybrid 3G	1 RU
K480-CX24FX40	Draco tera flex KVM Matrix 64-Port, hybrid 3G	2 RU
K480-CX40FX24	Draco tera flex KVM Matrix 64-Port, hybrid 3G	2 RU
K480-CX40FX40	Draco tera flex KVM Matrix 80-Port, hybrid 3G	2 RU
K480-CX80FX40	Draco tera flex KVM Matrix 120-Port, hybrid 3G	4 RU
K480-CX80FX80	Draco tera flex KVM Matrix 160-Port, hybrid 3G	4 RU
K480-CX120FX40	Draco tera flex KVM Matrix 160-Port, hybrid 3G	4 RU

4.4.7 Draco tera flex Grid Cat X 1G and Fiber 1G

The following products are expected to be available from Q3/2021.

Part No.	Description	Rack unit
K480-C32G	Draco tera flex KVM Matrix 32 Ports + Grid, Cat X 1G	1 RU
K480-F32G	Draco tera flex KVM Matrix 32 Ports + Grid, fiber 1G	1 RU

4.5 Scope of Delivery

The scope of delivery contains the following items:

Product type	Scope of delivery
Standard systems	• Draco tera flex • 2x IEC connection cable for power supply lockable 2,0 m • 2x Mounting brackets • Quick Setup

If anything is missing, contact your dealer.

4.6 Accessories

Spare parts as e.g., cables can be requested from the manufacturer if required.

4.7   Device Views

The following views of the Draco tera flex matrix illustrate the currently available variants:

4.7.1   Overview Draco tera flex 16-Port
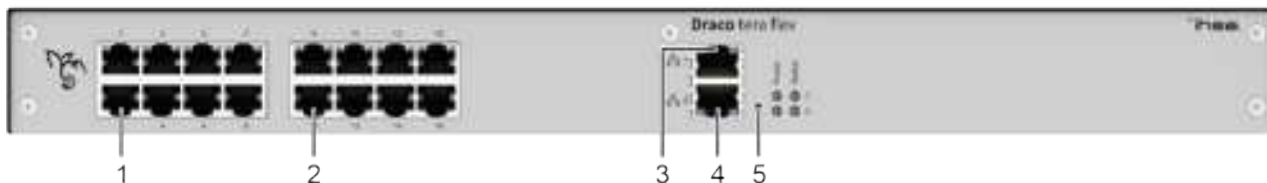
Fig. 4   Front side - K480-C16 and K480-CX16
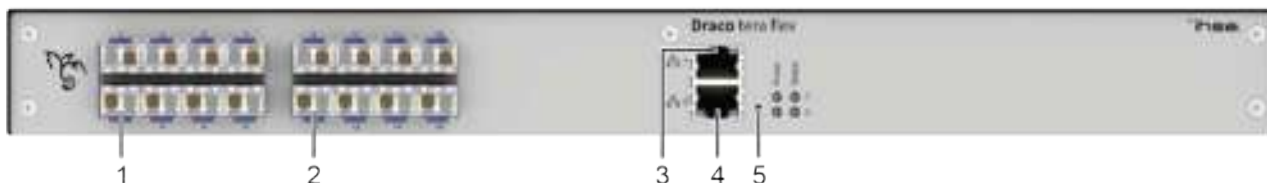
Fig. 5   Front side - K480-F16 and K480-FX16

1	I/O-Ports 1 to 8	4	Network port 2 (RJ45)
2	I/O-Ports 9 to 16	5	Reset button
3	Network port 1 (RJ45)		

Fig. 6   Rear side - 16-port

1	Power supply connector (standard)	3	Grounding
2	Power supply connector (redundancy)		

4.7.2 Overview Draco tera flex 24-Port

Fig. 7   Front side - K480-C24 and K480-CX24
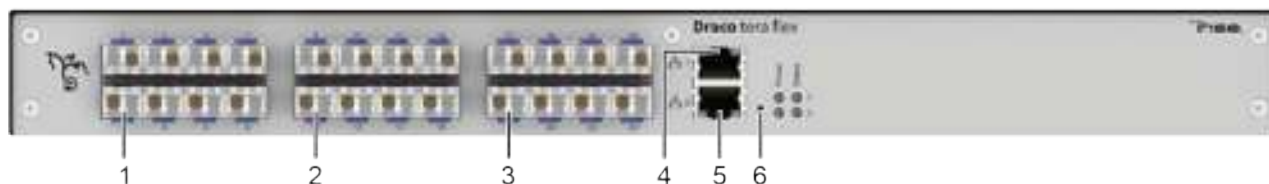
Fig. 8   Front side - K480-F24 and K480-FX24

1	I/O-Ports 1 to 8	4	Network port 1 (RJ45)
2	I/O-Ports 9 to 16	5	Network port 2 (RJ45)
3	I/O-Ports 17 to 24	6	Reset button

Fig. 9   Rear side - 24-port

1	Power supply connector (standard)	3	Grounding
2	Power supply connector (redundancy)		

4.7.3   Overview Draco tera flex 32-Port
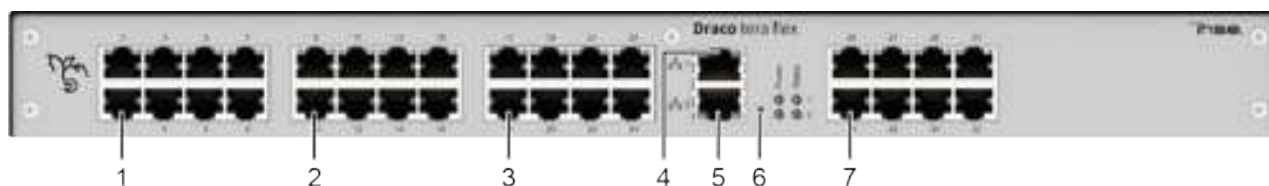
Fig. 10   Front side - K480-C32 and K480-CX32
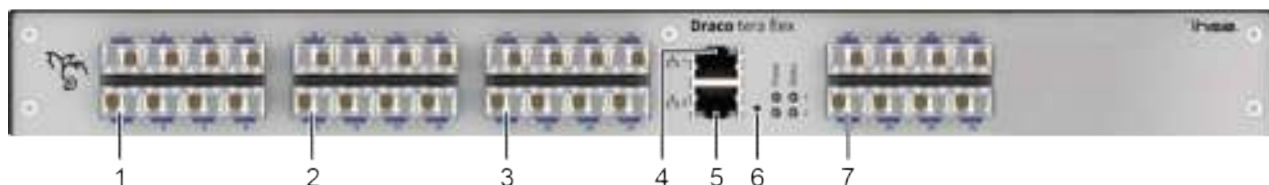
Fig. 11   Front side - K480-F32 and K480-FX32

1	I/O-Ports 1 to 8	5	Network port 2 (RJ45)
2	I/O-Ports 9 to 16	6	Reset button
3	I/O-Ports 17 to 24	7	I/O-Ports 25 to 32
4	Network port 1 (RJ45)		

Fig. 12   Rear side - 32-Port

1	Power supply connector (standard)	3	Grounding
2	Power supply connector (redundancy)		

4.7.4   Overview Draco tera flex 32-Port with Grid

The following products are expected to be available from Q3/2021.
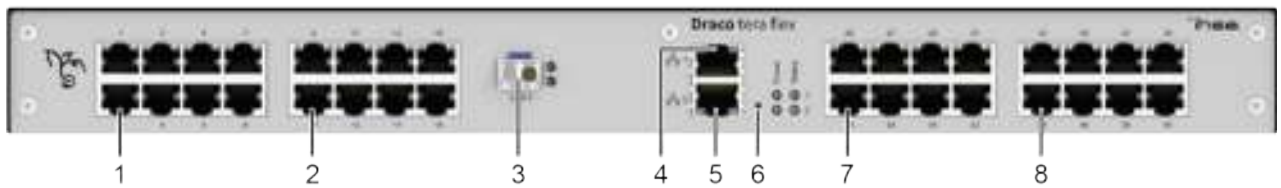
Fig. 13   Front side - K480-C32G
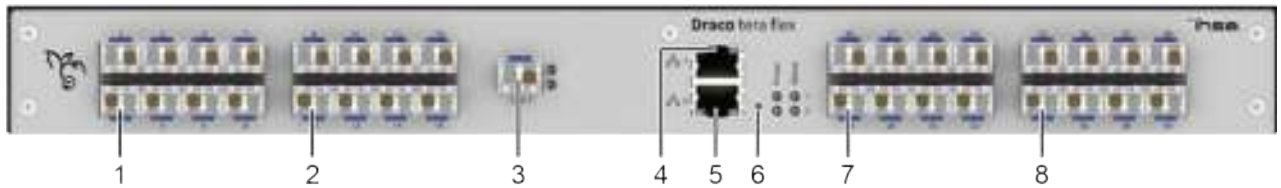
Fig. 14   Front side - K480-F32G

1	I/O-Ports 1 to 8	5	Network port 2 (RJ45)
2	I/O-Ports 9 to 16	6	Reset button
3	Grid port 1	7	I/O-Ports 25 to 32
4	Network port 1 (RJ45)	8	I/O Ports 33 to 40

Fig. 15   Rear side - 32-Port with Grid

1	Power supply connector (standard)	3	Grounding
2	Power supply connector (redundancy)		

4.7.5   Overview Draco tera flex 40-Port
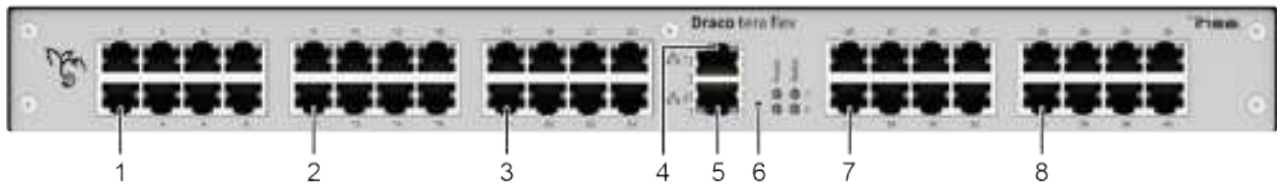
Fig. 16   Front side - K480-C40 and K480-CX40
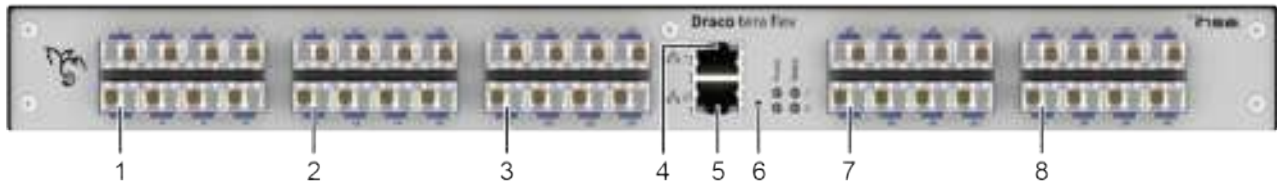
Fig. 17   Front side - K480-F40 and K480-FX40
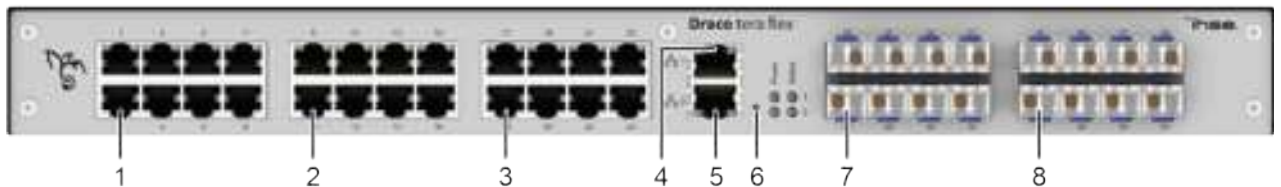
Fig. 18   Front side - K480-C24F16 and K480-CX24FX16

1	I/O-Ports 1 to 8	5	Network port 2 (RJ45)
2	I/O-Ports 9 to 16	6	Reset button
3	I/O-Ports 17 to 24	7	I/O-Ports 25 to 32
4	Network port 1 (RJ45)	8	I/O Ports 33 to 40

Fig. 19   Rear side - 40-Port

1	Power supply connector (standard)	3	Grounding
2	Power supply connector (redundancy)		

4.7.6   Overview Draco tera flex 48-Port
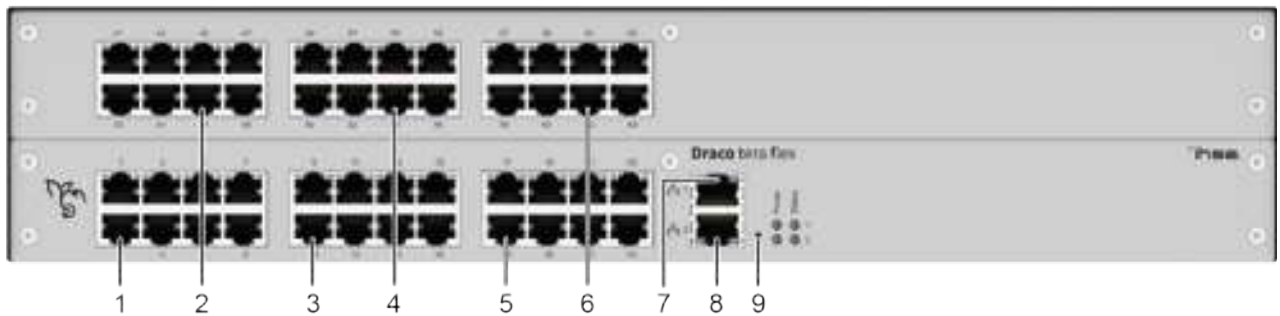
Fig. 20   Front side - K480-C48 and K480-CX48
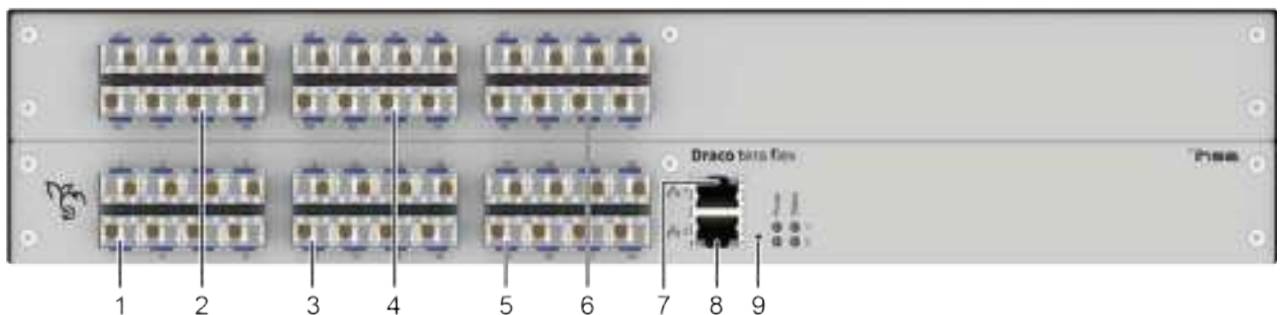
Fig. 21   Front side - K480-F48 and K480-FX48

1	I/O-Ports 1 to 8	6	I/O-Ports 57 to 64
2	I/O-Ports 41 to 48	7	Network port 1 (RJ45)
3	I/O-Ports 9 to 16	8	Network port 2 (RJ45)
4	I/O-Ports 49 to 56	9	Reset button
5	I/O-Ports 17 to 24		

Fig. 22   Rear side - 48-Port

1	Power supply connector (standard)	3	Grounding
2	Power supply connector (redundancy)		

4.7.7   Overview Draco tera flex 64-Port
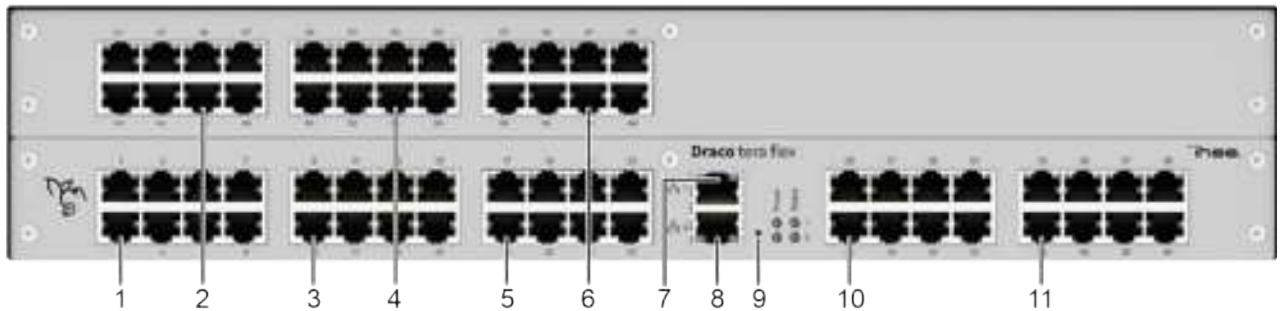
Fig. 23   Front side - K480-C64 and K480-CX64
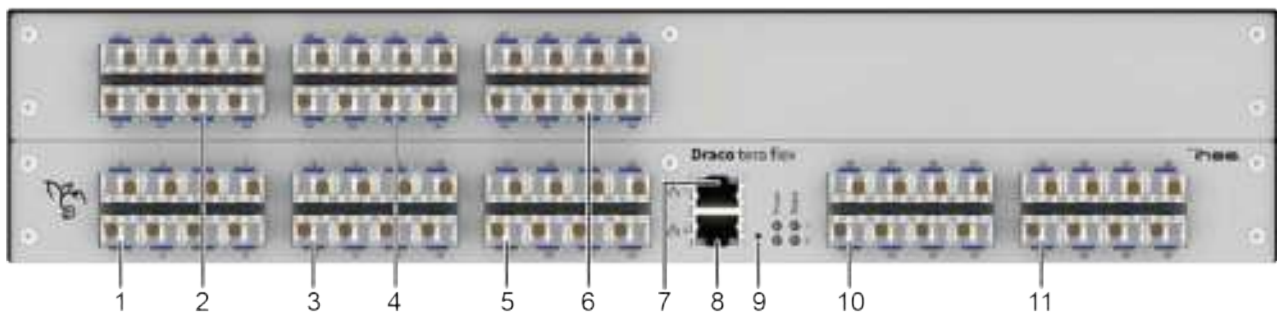
Fig. 24   Front side - K480-F64 and K480-FX64
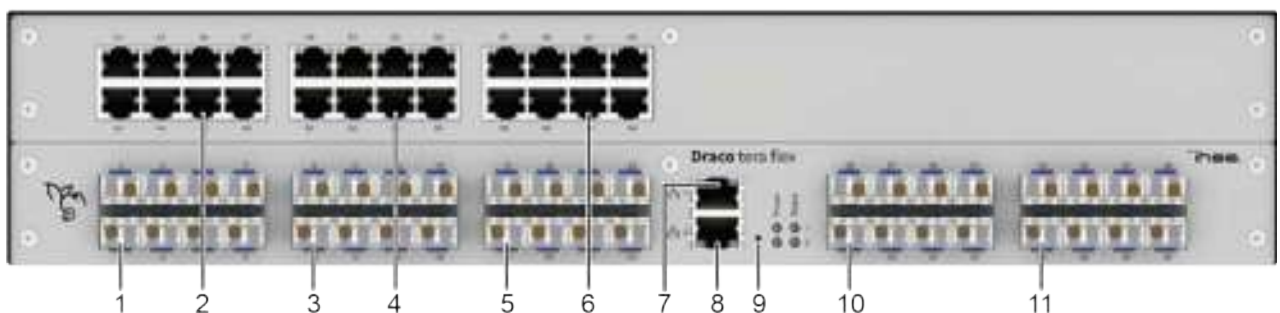
Fig. 25   Front side - K480-C24F40 and K480-CX24FX40
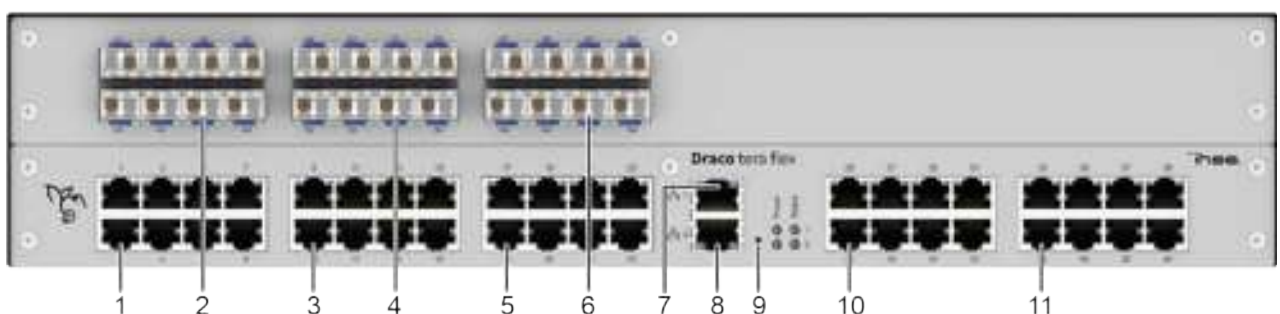
Fig. 26   Front side - K480-C40F24 and K480-CX40FX24

1	I/O-Ports 1 to 8	7	Network port 1 (RJ45)
2	I/O-Ports 41 to 48	8	Network port 2 (RJ45)
3	I/O-Ports 9 to 16	9	Reset button
4	I/O-Ports 49 to 56	10	I/O-Ports 25 to 32
5	I/O-Ports 17 to 24	11	I/O-Ports 33 to 40
6	I/O-Ports 57 to 64		

Fig. 27   Rear side - 64-Port

1   Power supply connector (standard)   3   Grounding
2   Power supply connector (redundancy)

4.7.8   Overview Draco tera flex 80-Port
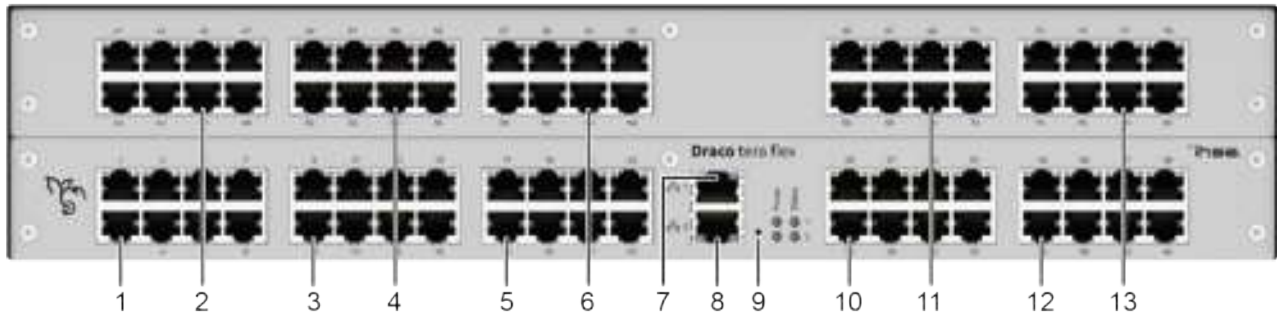
Fig. 28   Front side - K480-C80 and K480-CX80
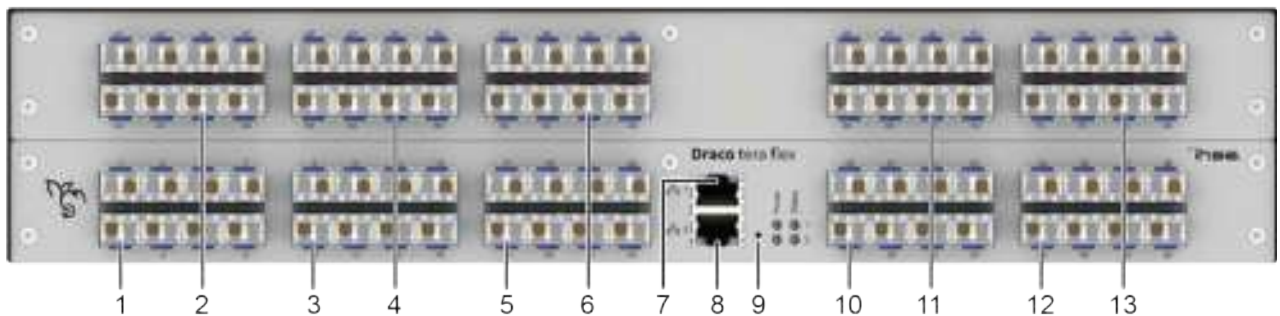
Fig. 29   Front side - K480-F80 and K480-FX80
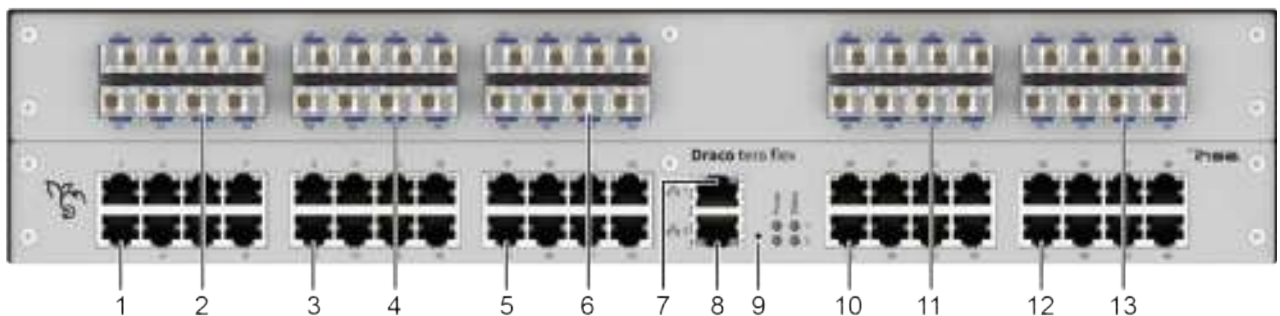
Fig. 30   Front side - K480-C40F40 and K480-CX40FX40

1	I/O-Ports 1 to 8	8	Network port 2 (RJ45)
2	I/O-Ports 41 to 48	9	Reset button
3	I/O-Ports 9 to 16	10	I/O-Ports 25 to 32
4	I/O-Ports 49 to 56	11	I/O-Ports 65 to 72
5	I/O-Ports 17 to 24	12	I/O-Ports 33 to 40
6	I/O-Ports 57 to 64	13	I/O-Ports 73 to 80
7	Network port 1 (RJ45)		

Fig. 31   Rear side - 80-Port

1   Power supply connector (standard)   3   Grounding
2   Power supply connector (redundancy)

4.7.9   Overview Draco tera flex 120-Port
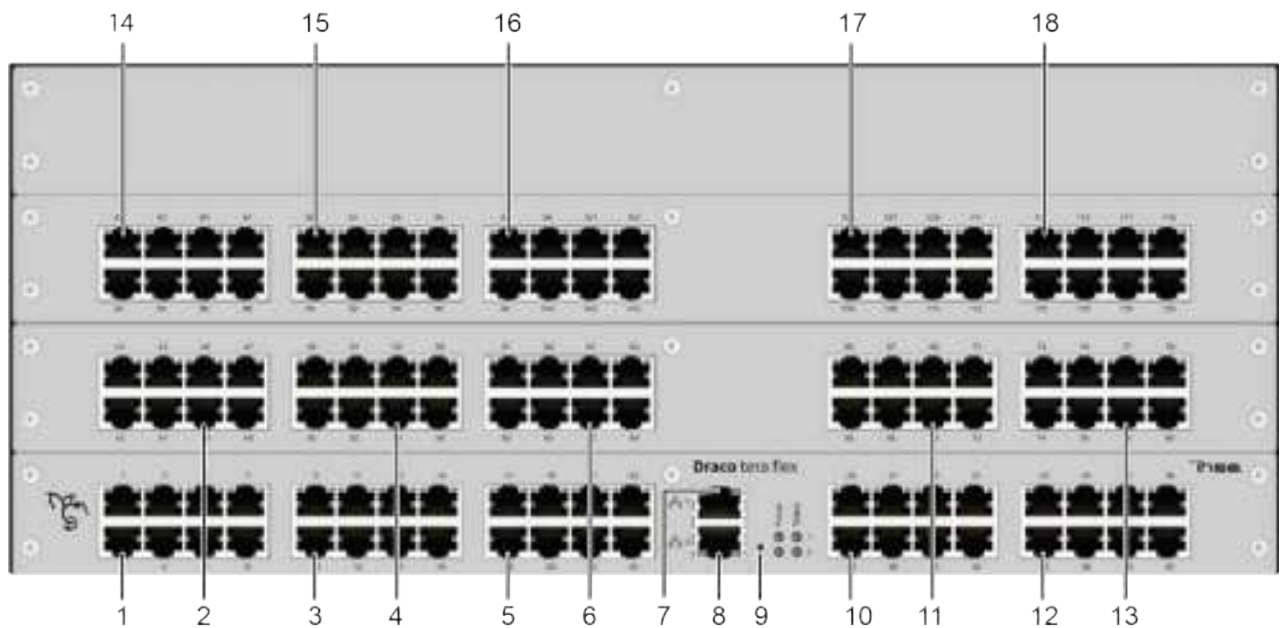
Fig. 32   Front side - K480-C120 and K480-CX120
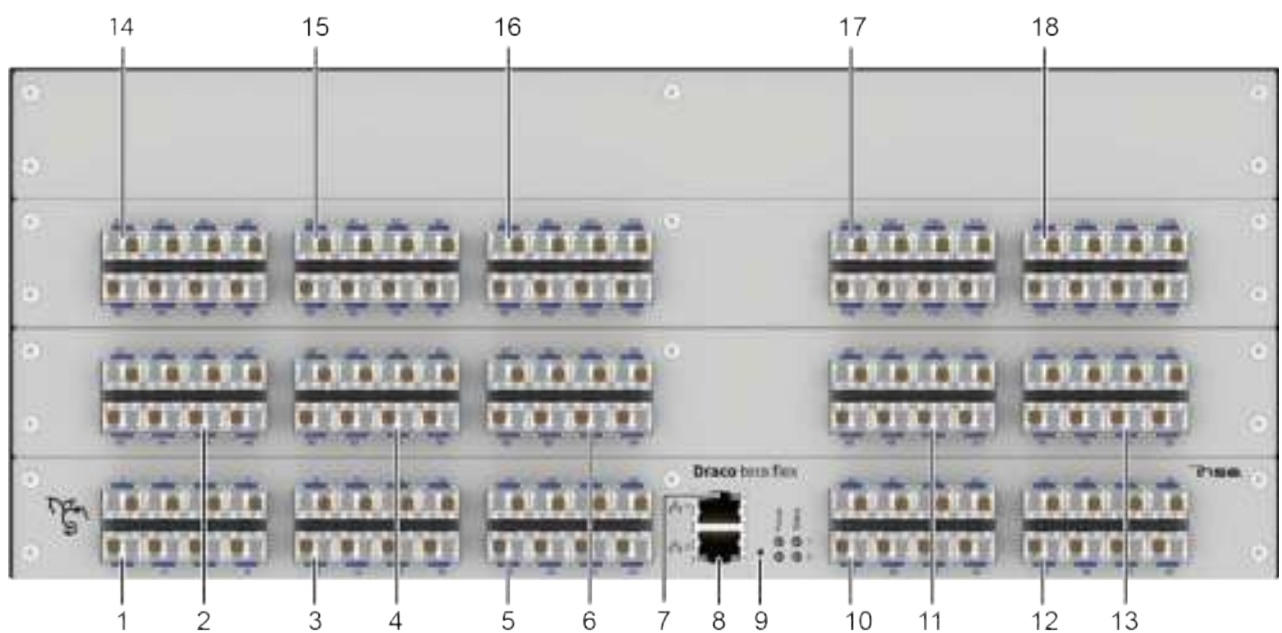
Fig. 33   Front side - K480-F120 and K480-FX120
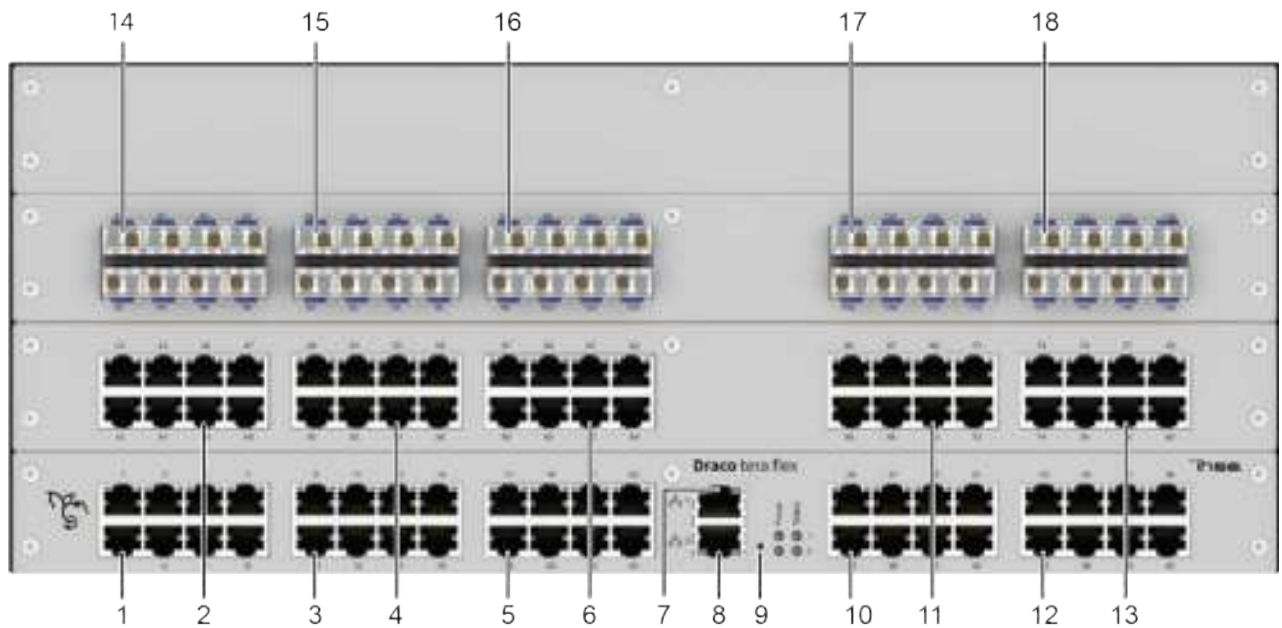
Fig. 34   Front side - K480-C80F40 and K480-CX80FX40

1	I/O-Ports 1 to 8	10	I/O-Ports 25 to 32
2	I/O-Ports 41 to 48	11	I/O-Ports 65 to 72
3	I/O-Ports 9 to 16	12	I/O-Ports 33 to 40
4	I/O-Ports 49 to 56	13	I/O-Ports 73 to 80
5	I/O-Ports 17 to 24	14	I/O-Ports 81 to 88
6	I/O-Ports 57 to 64	15	I/O-Ports 89 to 96
7	Network port 1 (RJ45)	16	I/O-Ports 97 to 104
8	Network port 2 (RJ45)	17	I/O-Ports 105 to 112
9	Reset button	18	I/O-Ports 113 to 120
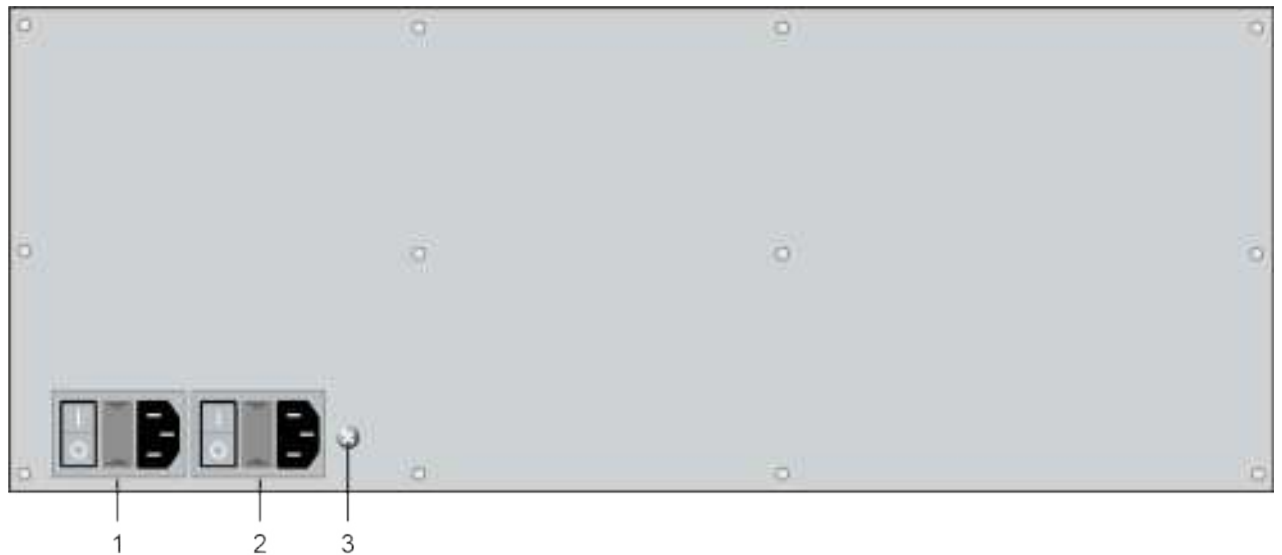
Fig. 35   Rear side - 120-Port

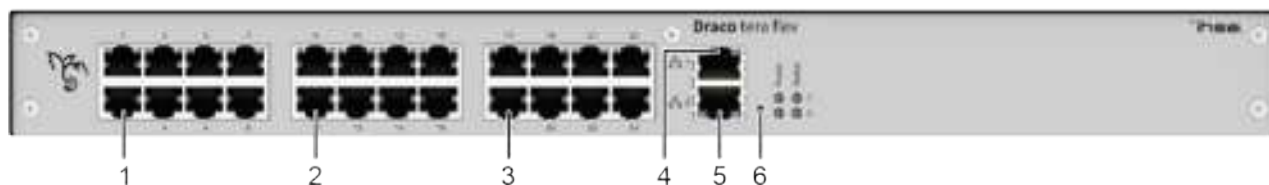|			
1	Power supply connector (standard)	3	Grounding
2	Power supply connector (redundancy)		

4.7.10 Overview Draco tera flex 128-Port
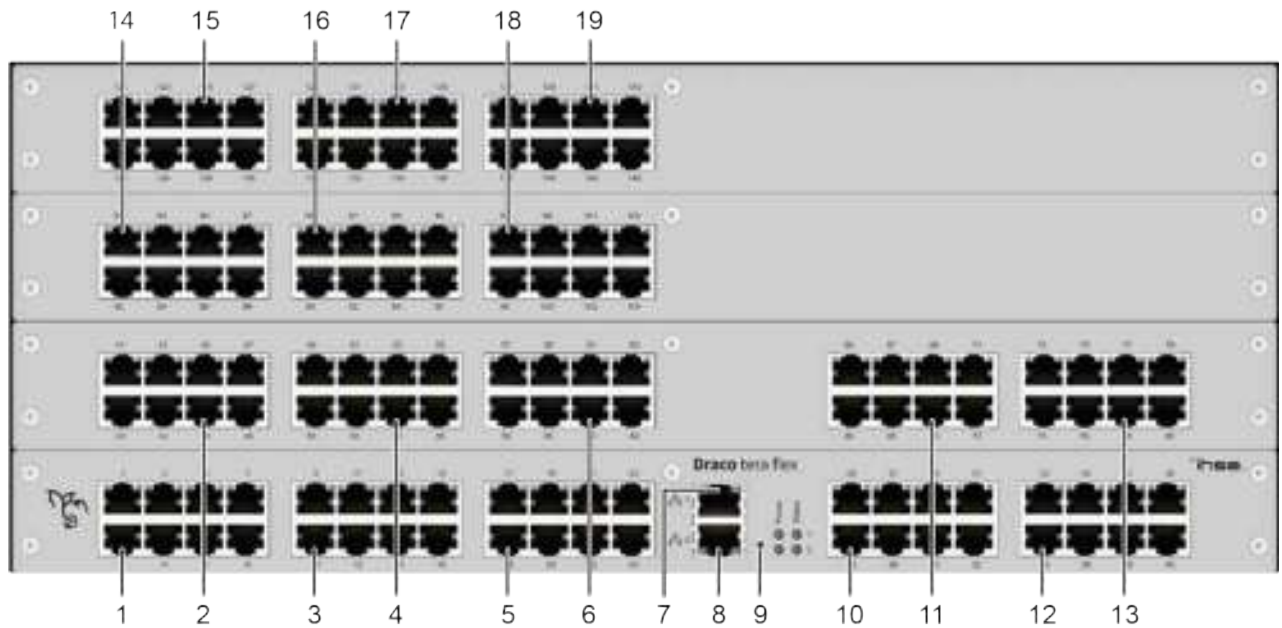
*Fig. 36   Front side - K480-C128 and K480-CX128*
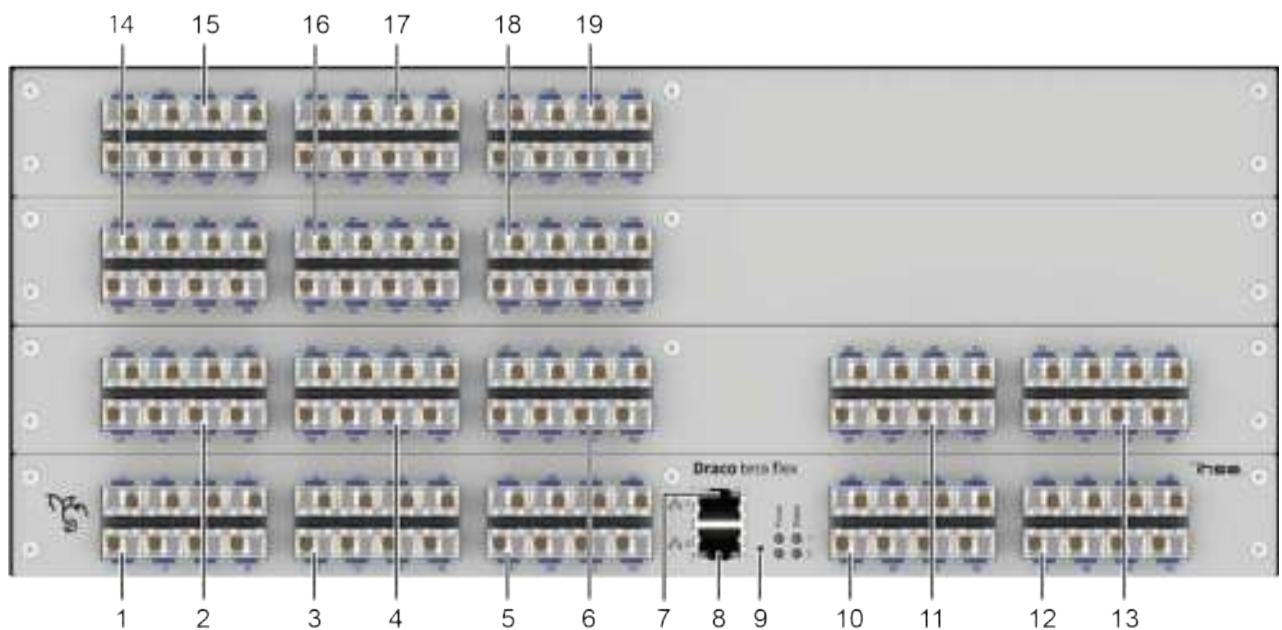
Fig. 37   Front side - K480-F128 and K480-FX128

1 I/O-Ports 1 to 8		11 I/O-Ports 65 to 72
2 I/O-Ports 41 to 48		12 I/O-Ports 33 to 40
3 I/O-Ports 9 to 16		13 I/O-Ports 73 to 80
4 I/O-Ports 49 to 56		14 I/O-Ports 81 to 88
5 I/O-Ports 17 to 24		15 I/O-Ports 121 to 128
6 I/O-Ports 57 to 64		16 I/O-Ports 89 to 96
7 Network port 1 (RJ45)		17 I/O-Ports 129 to 136
8 Network port 2 (RJ45)		18 I/O-Ports 97 to 104
9 Reset button		19 I/O-Ports 137 to 144
10 I/O-Ports 25 to 32		
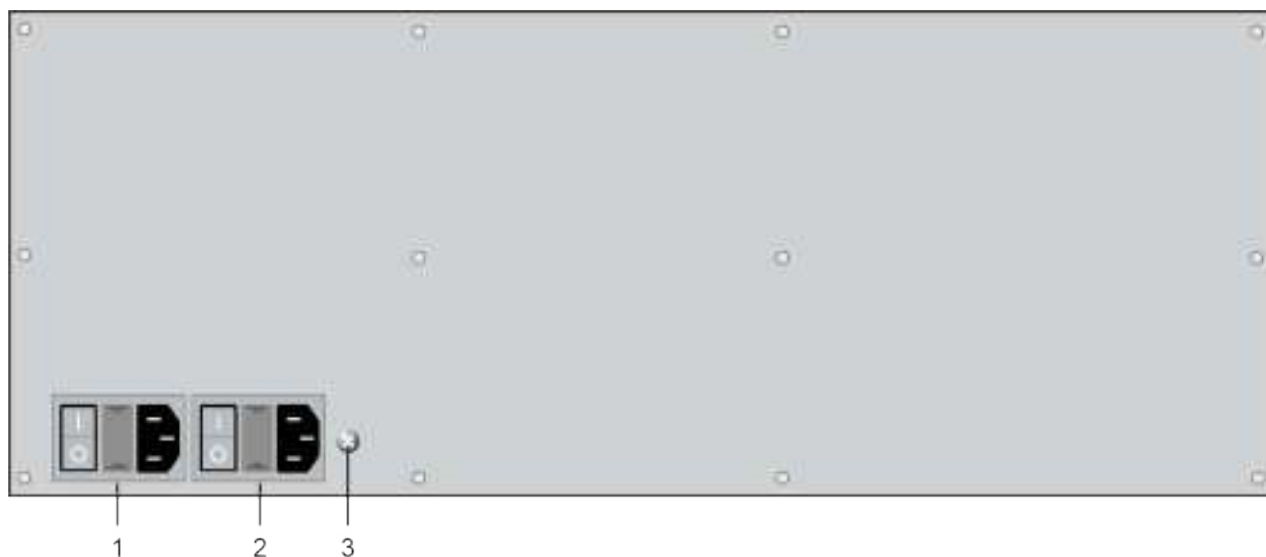
Fig. 38   Rear side - 128-Port

1   Power supply connector (standard)   3   Grounding
2   Power supply connector (redundancy)

4.7.11 Overview Draco tera flex 144-Port
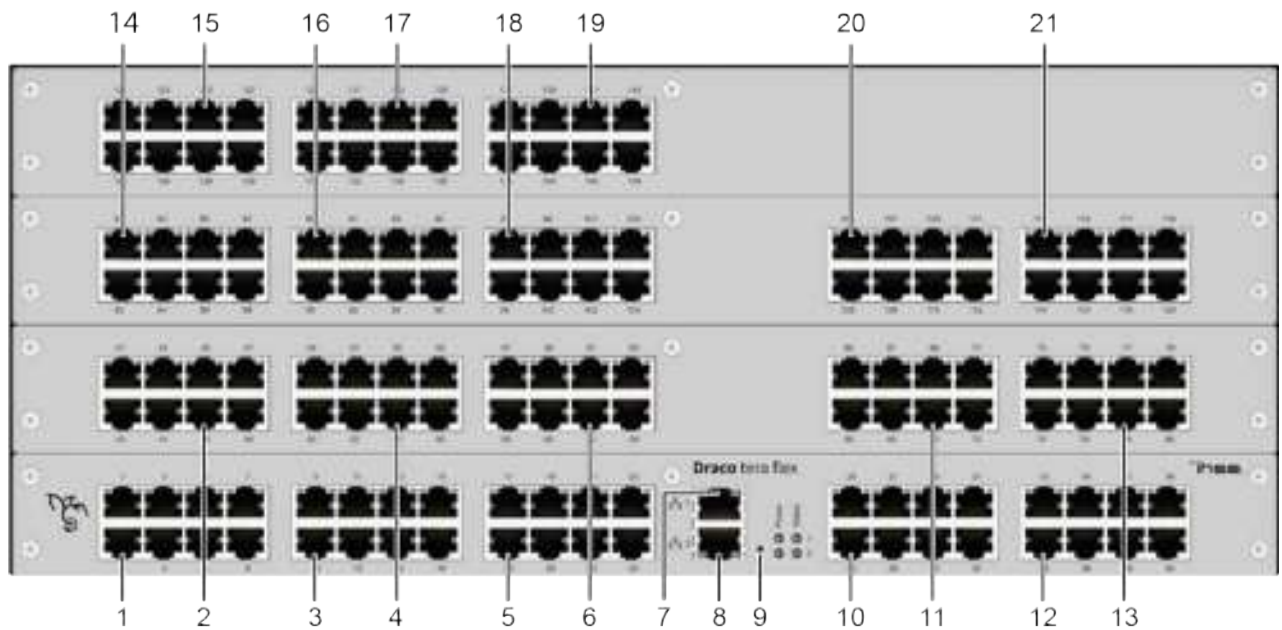

Fig. 39   Front side - K480-C144 and K480-CX144
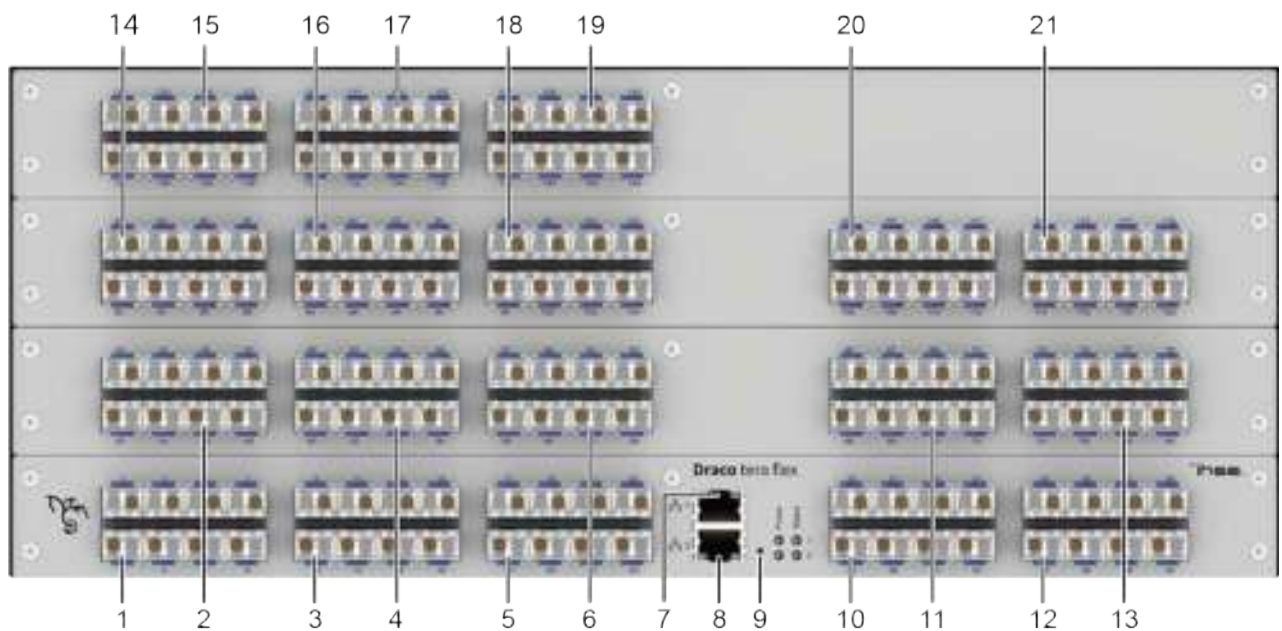
Fig. 40   Front side - K480-F144 and K480-FX144

1	I/O-Ports 1 to 8	12	I/O-Ports 33 to 40
2	I/O-Ports 41 to 48	13	I/O-Ports 73 to 80
3	I/O-Ports 9 to 16	14	I/O-Ports 81 to 88
4	I/O-Ports 49 to 56	15	I/O-Ports 121 to 128
5	I/O-Ports 17 to 24	16	I/O-Ports 89 to 96
6	I/O-Ports 57 to 64	17	I/O-Ports 129 to 136
7	Network port 1 (RJ45)	18	I/O-Ports 97 to 104
8	Network port 2 (RJ45)	19	I/O-Ports 137 to 144
9	Reset button	20	I/O-Ports 105 to 112
10	I/O-Ports 25 to 32	21	I/O-Ports 113 to 120
11	I/O-Ports 65 to 72		
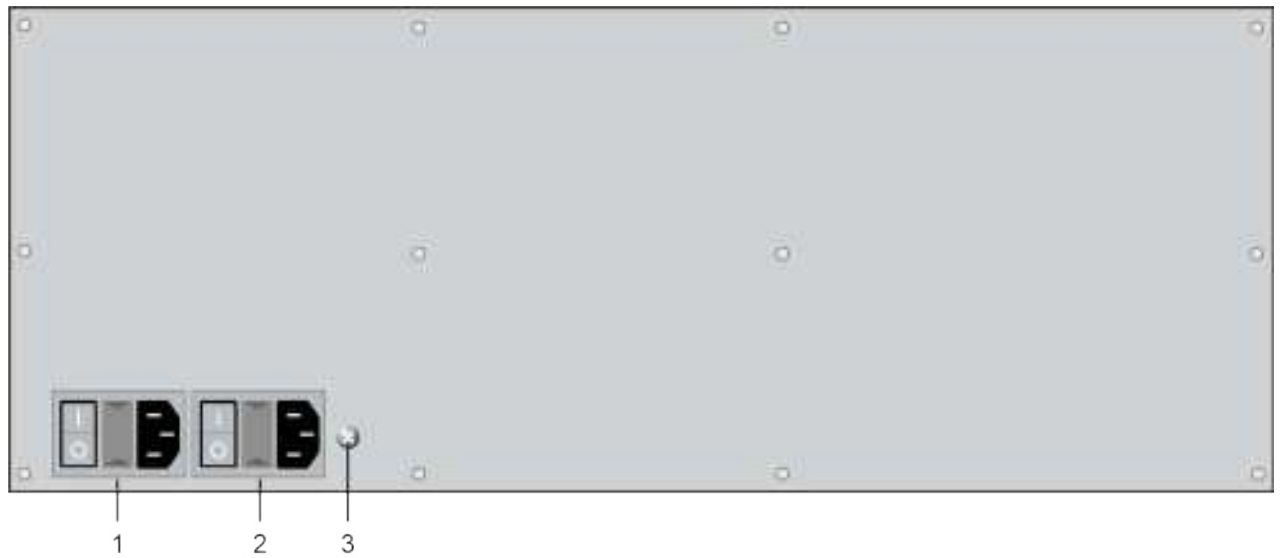
Fig. 41   Rear side - 144-Port

1   Power supply connector (standard)   3   Grounding
2   Power supply connector (redundancy)

4.7.12   Overview Draco tera flex 160-Port
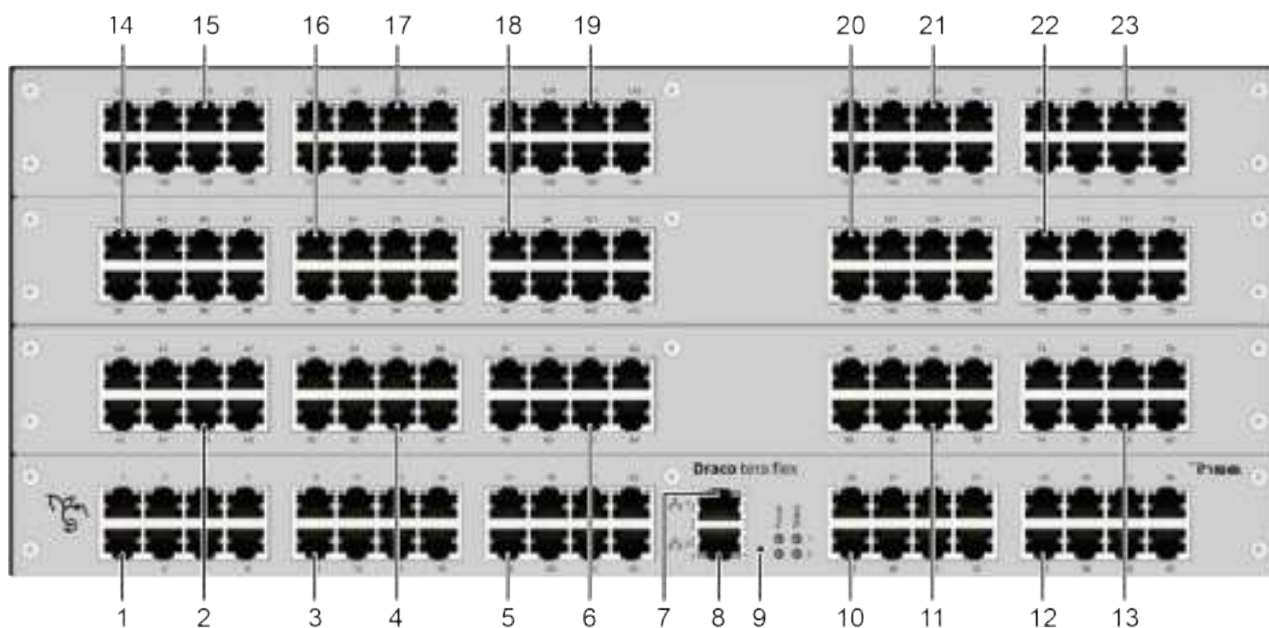

Fig. 42   Front side - K480-C160 and K480-CX160
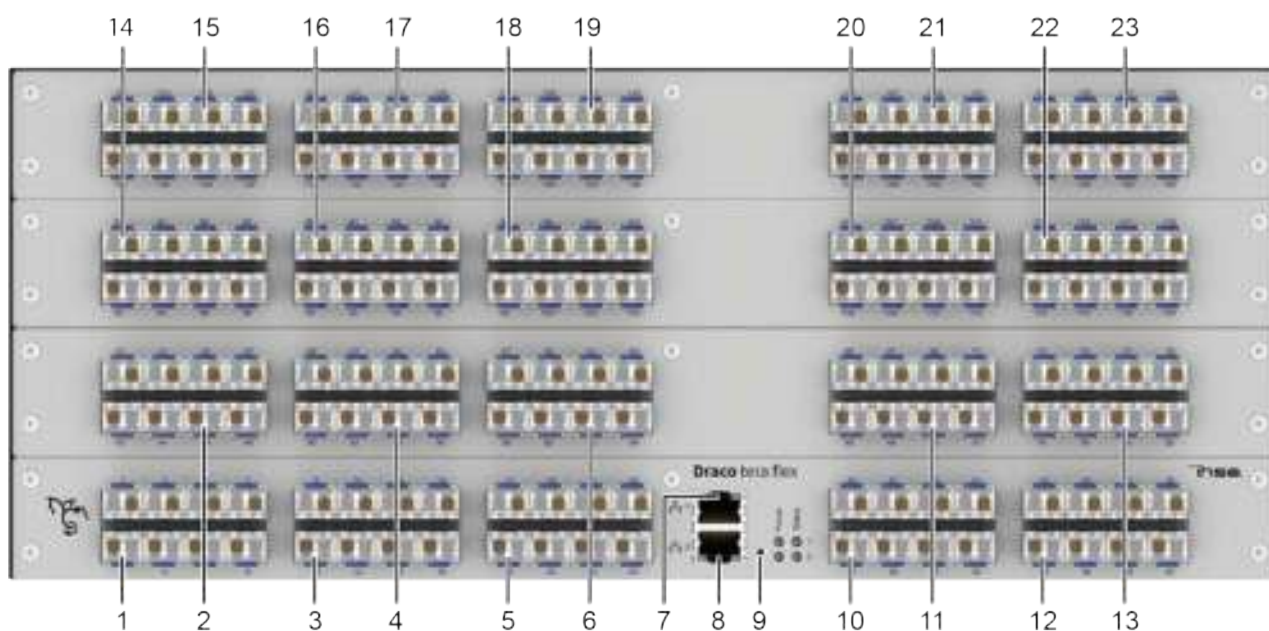

Fig. 43   Front side - K480-F160 and K480-FX160
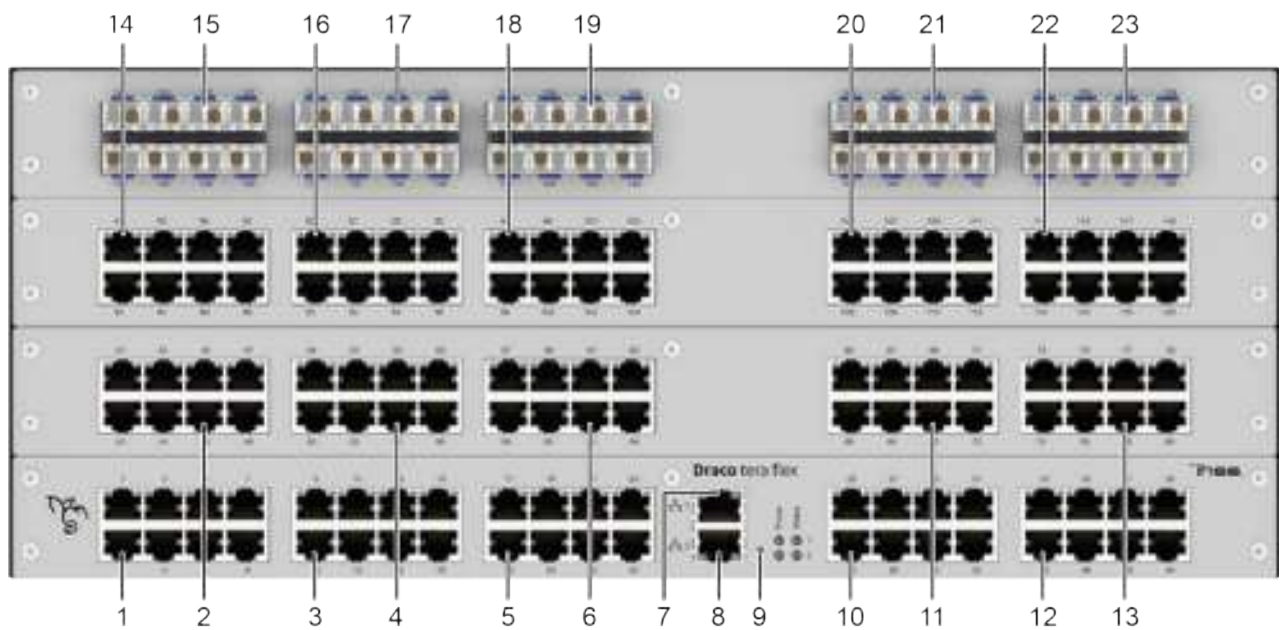
Fig. 44   Front side - K480-C120F40 and K480-CX120FX40
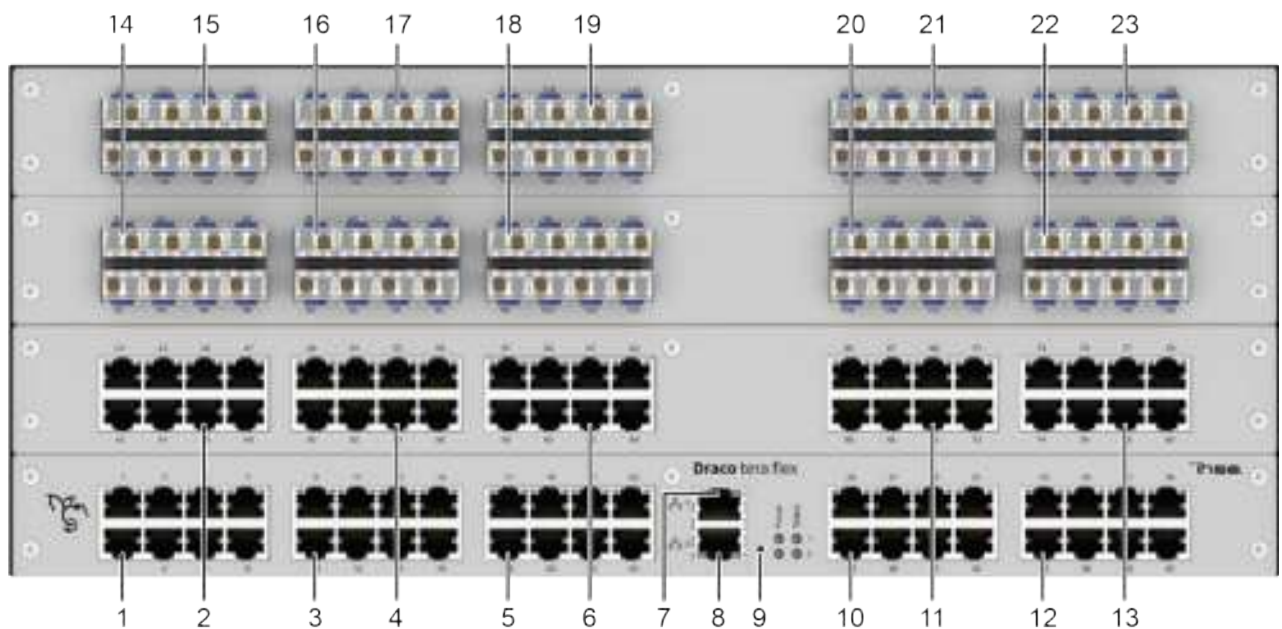
Fig. 45   Front side - K480-C80F80 and K480-CX80FX80

1	I/O-Ports 1 to 8	13	I/O-Ports 73 to 80
2	I/O-Ports 41 to 48	14	I/O-Ports 81 to 88
3	I/O-Ports 9 to 16	15	I/O-Ports 121 to 128
4	I/O-Ports 49 to 56	16	I/O-Ports 89 to 96
5	I/O-Ports 17 to 24	17	I/O-Ports 129 to 136
6	I/O-Ports 57 to 64	18	I/O-Ports 97 to 104
7	Network port 1 (RJ45)	19	I/O-Ports 137 to 144
8	Network port 2 (RJ45)	20	I/O-Ports 105 to 112
9	Reset button	21	I/O-Ports 145 to 152
10	I/O-Ports 25 to 32	22	I/O-Ports 113 to 120
11	I/O-Ports 65 to 72	23	I/O-Ports 153 to 160
12	I/O-Ports 33 to 40		
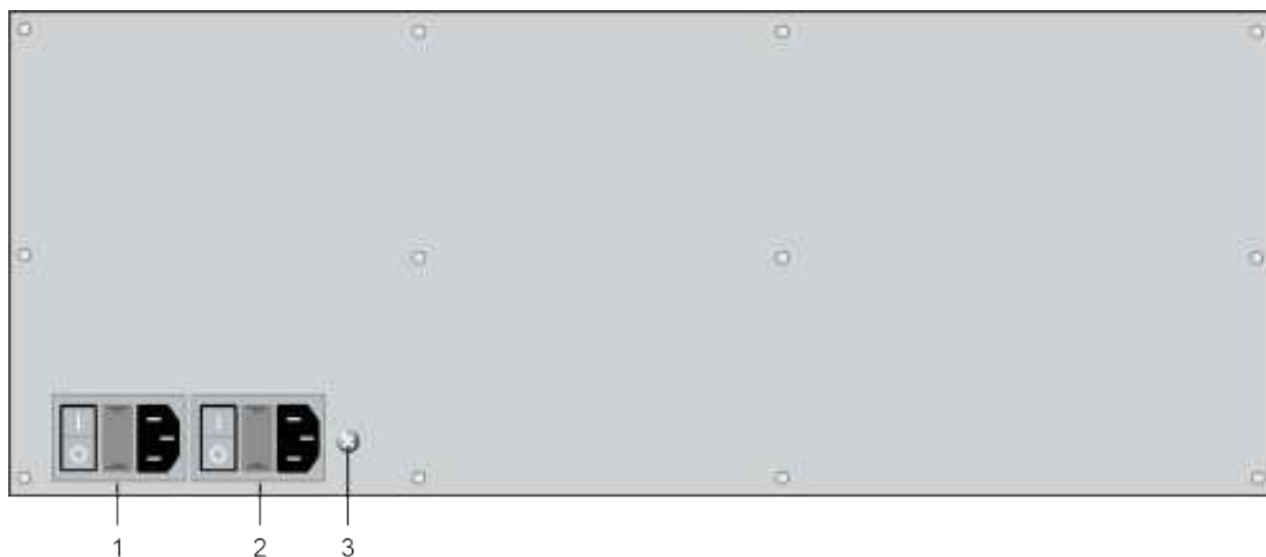
Fig. 46   Rear side - 160-Port

1   Power supply connector (standard)   3   Grounding
2   Power supply connector (redundancy)

4.8   Status Indication at the Device

4.8.1   Status LEDs for Device Status

Fig. 47   Front side - LEDs for device status

| 1   Device status LED 1 | 2   Device status LED 2 |

LEDs for Device Status (CPU Module)

LED 1	LED 2	Description
White	White	System boots
Green	Off	System is ready
Red	Red	System shuts down
Flashing green	Flashing red	System is off
Off	Blue	I/O Modules are initialized

> ℹ️ Due to variations in LED type "white" might also appear as light purple or light blue.

4.8.2   Status LEDs for Link Connection, 1G Cat X

Fig. 48   Front side - LEDs at I/O Ports, 1G Cat X

| 1   Link status LED for upper port | 2   Link status LED for lower port |

Status LEDs at the I/O Ports, 1G Cat X

When an interconnection is established, the LEDs light up in the following sequence:

LED 1 / 2	Description
Off	No connection detected
Orange	Connection via interconnection cable ok, extender detection is running
Green	Connection via interconnection cable ok, data traffic active

An interconnection failure is indicated as follows:

LED 1 / 2	Description
Flashing orange	Extender is not detected

4.8.3 Status LEDs for Link Connection, 3G Cat X
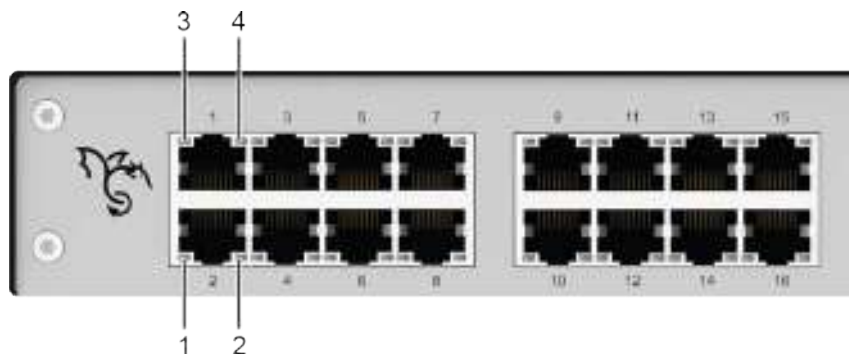
Fig. 49   Front side - LEDs at I/O Ports, 3G Cat X

1	Link status LED 1 for lower port		3	Link status LED 1 for upper port
2	Link status LED 2 for lower port		4	Link status LED 2 for upper port

Status LEDs at the I/O Ports, 3G Cat X

When an interconnection is established, the LEDs light up in the following sequence:

LED 1 / 3	LED 2 / 4	Description
Off	Green	No connection detected
Orange	Green	Connection via interconnection cable ok, extender detection is running
Off	Green	Connection via interconnection cable ok, data traffic active

An interconnection failure is indicated as follows:

LED 1 / 3	LED 2 / 4	Description
Flashing orange	Off	Extender is not detected

4.8.4   Status LEDs for Link Connection, Fiber
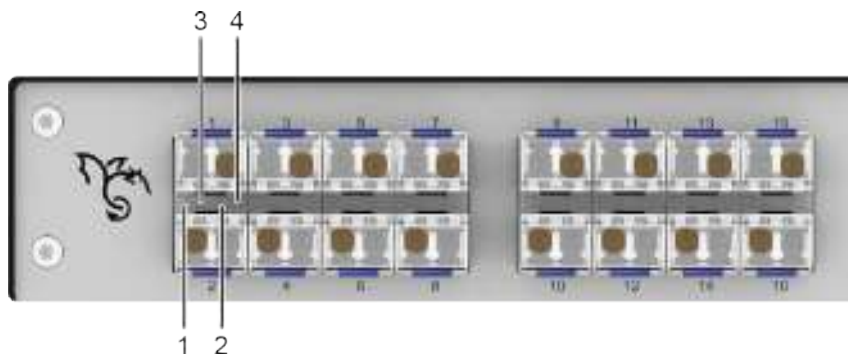
Fig. 50   Front side - LEDs at I/O Ports, Fiber

1	Link status LED 1 for lower port	3	Link status LED 1 for upper port
2	Link status LED 2 for lower port	4	Link status LED 2 for upper port

Status LEDs at the I/O Ports, Fiber

When an interconnection is established, the LEDs light up in the following sequence:

LED 1 / 3	LED 2 / 4	Description
Green	Off	Connection is established
Green	Red	Connection via interconnection cable ok, extender detection is running
Green	Off	Connection via interconnection cable ok, data traffic active

An interconnection failure is indicated as follows:

LED 1 / 3	LED 2 / 4	Description
Flashing red	Off	Extender is not detected

4.8.5   Status LEDs for Network Connection
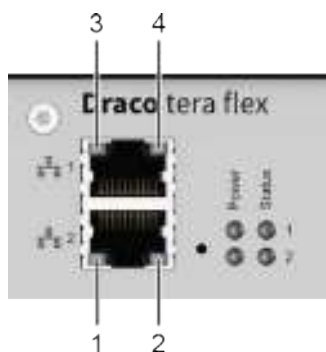
Fig. 51   Front side - status LEDs for network connection

1	Activity status LED network connection 2	3	Activity status LED network connection 1
2	Link status LED network connection 2	4	Link status LED network connection 1

Status LEDs of the Network Port

Pos.	LED	Status	Description
1 /3	**Activity status** (orange)	Off	No network connection available or data traffic not active
		On	Network connection available, data traffic active
2 /4	**Link status** (green)	Off	No network connection available
		On	Network connection available

4.8.6   Status LEDs for Power Supply

Fig. 52   Front side - LEDs for power supply

1   Status LED for power supply 1   2   Status LED for power supply 2

LEDs for Power Supply

Pos.	LED	Status	Description
1	**AC Input 1** (green)	On	Power supply available
		Off	No power supply available
2	**AC Input 2** (green)	On	Power supply available
		Off	No power supply available

5   Access Options

You have following options to configure and operate the Draco tera:

Access option	Description
OSD	Via OSD (On-Screen-Display) you can configure the basic settings of the matrix operating system, query several states, and control several functions by keyboard commands during normal use.
Tera Tool	The Tera Tool (below referred to as "management software") is available as a single executable program file (desktop) does not require installation. The management software can be downloaded from the link https://www.ihse.com/software. Advanced settings can be configured on the Draco tera operating system using the management software: • Advanced configuration • Extended monitoring options • System update (firmware update) • Local backup option • Documentation

5.1   Control Options via OSD

5.1.1   Command Mode

The extender modules include a command mode that allows to access the matrix and to control several functions by keyboard commands during normal use.

To access the command mode, use a keyboard sequence (Hot Key) at the keyboard of a CON Unit plugged in the matrix.

To quit the command mode, press the `<Esc>` key to exit the command mode.

NOTICE
While in command mode, ➡ the **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing, ➡ the USB-HID devices are not operable, mouse and keyboard functions are deactivated, ➡ only selected keyboard commands are available.

If there is no keyboard command executed within 10 seconds after activating the command mode, it will be deactivated automatically.

The following spellings are used for keyboard commands:

Keyboard command	Description
`<key>`	Description of a key on the keyboard
`<key> + <key>`	Press keys simultaneously
`<key>, <key>`	Press keys successively
`2x <key>`	Press key quickly, twice in a row (like a mouse double-click)

The following keyboard commands are used to enter, and to exit the command mode, and to change the Hot Key.

Function	Keyboard command
Enter command mode (default)	`2x <Left Shift>` (Hot Key)
Exit command mode	`<Esc>`
Change Hot Key	`<current Hot Key>, <c>, <new Hot Key code>, <Enter>`

Hot Key Code

The Hot Key to enter the command mode can be changed. The following table lists the Hot Key codes for the available Hot Keys.

Hot Key Code	Hot Key
0	Freely selectable
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>`

NOTICE
In a combined KVM matrix/U-Switch configuration, select different Hot Keys for extender modules connected to the KVM matrix (e.g., `2x <Left Shift>`) and the U-Switch (e.g., `2x <Right Shift>`).

Set freely selectable Hot Key (exemplary)

To set a freely selectable Hot Key (e.g., `2x <Space>`), use the following keyboard sequence:

`<current Hot Key>, <c>, <0>, <Space>, <Enter>`

Set Hot Key for direct OSD access

Next to the Hot Key for standard functions, a second Hot Key can be exclusively set for opening the OSD directly.

To select a Hot Key from the Hot Key table for a direct opening of the OSD, use the following keyboard sequence:

`<current Hot Key>, <f>, <Hot Key Code>, <Enter>`

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

`<current Hot Key>, <f>, <0>, <Space>, <Enter>`

Delete Hot Key for direct OSD access

To delete the Hot Key for direct OSD access, use the following keyboard sequence.

`<current Hot Key>, <f>, <0>, <Del>, <Enter>`

Reset Hot Key

To set a Hot Key back to default settings, press the key combination `<Right Shift> + <Del>` within 5 s after plugging in a keyboard.

5.1.2 OSD Keyboard Control

Via OSD (On-Screen-Display) you set the basic configuration of the matrix operating system, query several states, and control several functions by keyboard commands during normal use.

➡ To enter the OSD of the matrix, connect a keyboard to a CON Unit of an extender.

The following keyboard commands are used to open and to exit the OSD:

Keyboard command	Function
`<Hot Key>, <o>`	Open OSD
`<ESC>`	Exit OSD (in the main menu)
`<Left Shift> + <ESC>`	Exit OSD (within the menus)

NOTICE
If the OSD is closed with one of the keyboard commands mentioned above, possible changes are not saved. For information on saving changes, see configuration descriptions from chapter 7.10, from page 129.

Entering the OSD and the Main Menu

1. Start the command mode with the Hot Key (see chapter 5.1.1, page 46).

2. Press the `<o>` key to open the OSD.

    You will see a list of all available CPUs as a start menu.

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

ℹ️ If the **Enable CPU Selection** option is enabled in the **Configuration** menu, the selection list for switching CPU devices will be opened initially. This list can be skipped by pressing the `<F7>` key.

Leaving the OSD

➡ Press the `<Esc>` key in the main menu or simultaneously `<Left Shift> + <Esc>` anywhere within the OSD.

    The OSD will be closed without any further changes and the currently active CPU connection will be displayed.

5.1.3 OSD Keyboard Commands

The following keyboard commands are available for the navigation and configuration within the menus:

Keyboard command	Function
`<Cursor Left>`	Input field: cursor left
	In menus: next input field
`<Cursor Right>`	Input field: cursor right
	In menus: previous input field
`<Cursor Up>`	In input fields: line up (with wrap around)
	In menus: line up (without wrap around)
`<Cursor Down>`	In input fields: line down (with wrap around)
	In menus: line down (without wrap around)
`<Page Up>`	Previous page in menus with more than one page

Keyboard command	Function
`<Page Down>`	Next page in menus with more than one page
`<Tab>`	In menus with input fields: next input field
`<Left Shift> + <Tab>`	In menus with input fields: previous input field
`<+>`	Next option in selection fields
	In the CPU selection list with cursor on a CPU Group: expand members of a group
`<->`	Previous option in selection fields
	In the CPU selection list with cursor on a CPU Group: collapse members of a group
`<Space>`	Switching in selection fields between two conditions, e.g., between **ON** / **OFF** or **Y** (Yes) / **N** (No)
`<Enter>`	In menus with input fields: save data
	In menus: select menu item
	With buttons: confirm selected button
`<Esc>`	In menus with input fields: cancel data input without saving
	In menus with selection fields: go back to the superior menu

5.1.4   OSD Menu Structure

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

- upper status area (topmost two text lines)
- working area
- lower status area (lowest two text lines)
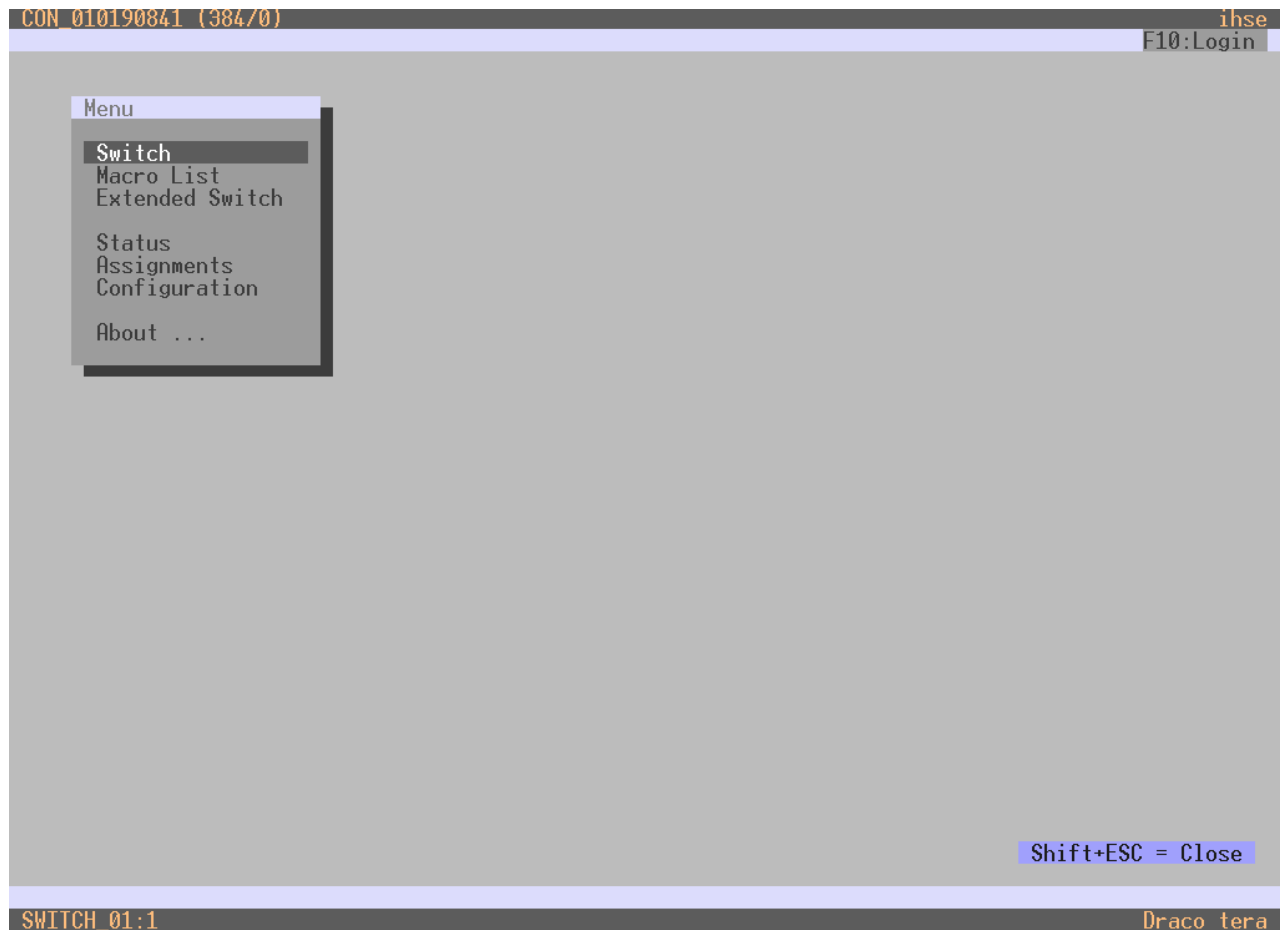
Fig. 53   OSD Main menu

The following functions are available in most of the menus:

Button	Function
Cancel	Reject changes
Okay	Apply changes (temporary storage of the active configuration in the volatile memory of the matrix).

NOTICE

Possible loss of configuration changes

By clicking the **Okay** button, changes are applied to the active configuration and saved in the volatile memory of the matrix. In the event of a sudden power failure, these changes are lost. To save changes permanently:

➡ save the configuration changes into the active configuration (**Save**, see chapter 7.10.1, page 129), save a predefined configuration (**Save as…**, from chapter 7.10.2, page 130), or perform a restart (see chapter 9.9.1, page 300).

5.1.5   OSD Sort Function

Lists and tables in the OSD offer a sorting function for fast and smooth search.

The following sorting functions are available:

Keyboard command	Function
<F1>	Sort ID numbers in descending order by pressing the keyboard command once.
	Sort ID numbers in ascending order by pressing the keyboard command twice (**ID**).
<F2>	Sort ID names in descending order by pressing the keyboard command once.
	Sort ID names in ascending order by pressing the keyboard command twice (**Name**).
<F3>	Go to the next result in the list of results of the search field (**Next**).
<F4>	Go to the previous result in the list of results of the search field (**Previous**).
<F5>	Refresh the currently shown list (**Refresh**).
<F6>	Jump between the search field and the list of results (**Find**).
<F8>	Show unavailable CPUs
<F9>	Activate search function from the beginning of the name (**Compare**).

5.2   Control Options via Management Software

5.2.1   Management Software Menu Structure

The menu structure of the management software is subdivided into various sections:
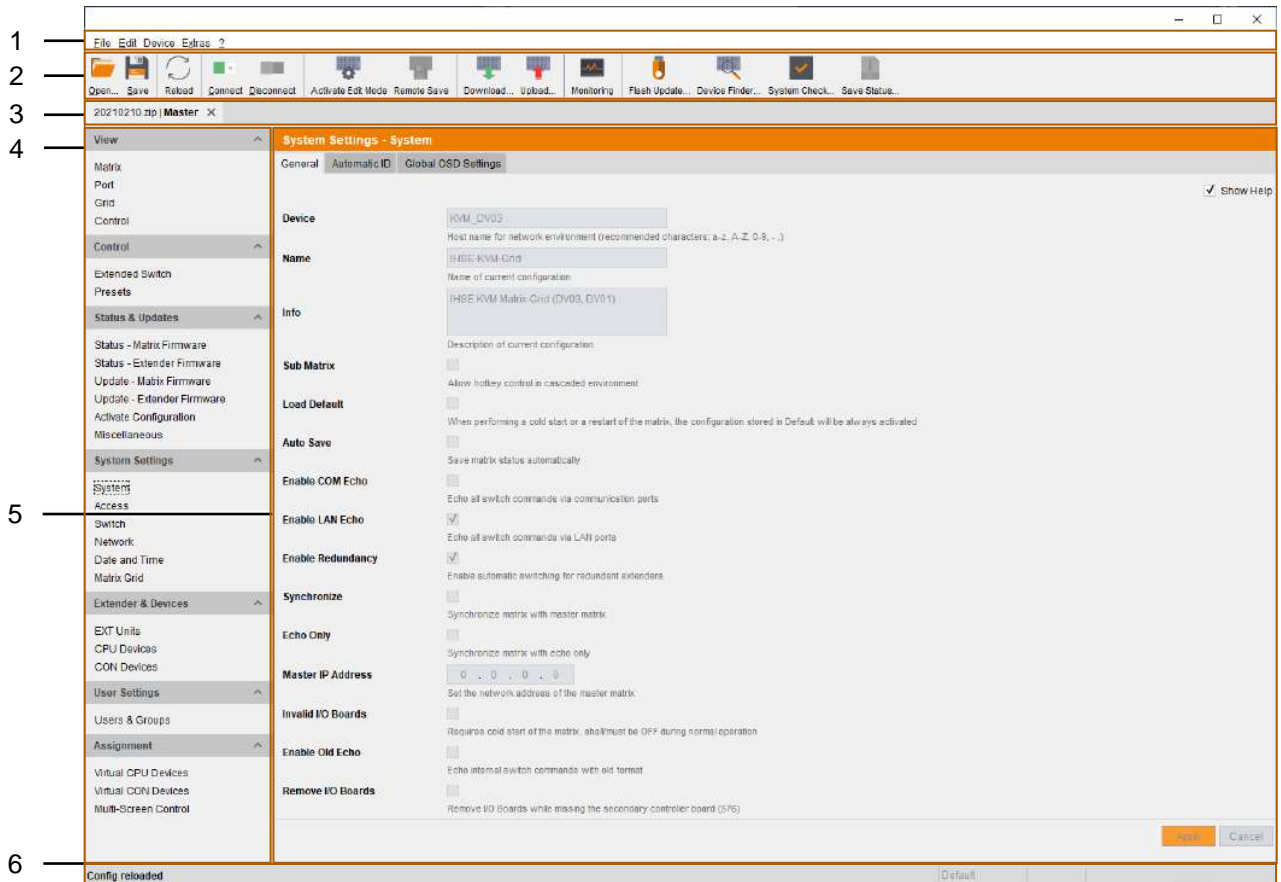
*Fig. 54   Management software **Menu structure***

1 Menu bar (top line)	4 Task area (left menu section)
2 Toolbar (second line)	5 Working area (right menu section)
3 Tab bar (third line)	6 Status bar (bottom line)

The following functions are available in most of the menus:

Button	Function
Apply	Confirm changes (temporary storage of the active configuration in the volatile memory of the matrix)
Cancel	Reject changes

<table>
<tr><td align="center">**NOTICE**</td></tr>
</table>

Possible loss of configuration changes

By clicking the **Apply** button changes are applied to the active configuration and saved in the volatile memory of the matrix. In the event of a sudden power failure, these changes are lost. To save changes permanently:

➡ save the configuration changes into the active configuration (**Remote Save**, see chapter 8.11.1, page 238), save a predefined configuration (**Save as…**) (see from chapter 8.11.2, page 239), or perform a restart (see from chapter 9.10.1, page 305).

Information for Operating and for Support Functions

The operation of the management software is intuitive and corresponds to the user interface of common operating systems.

- Help texts:

  The management software contains its own support function. The integrated help texts in the working area of the management software can be activated or deactivated by clicking the checkbox in the upper right corner. Auxiliary names (tooltips) for the menu items can be activated in the options.

- Online help:

  After calling up a function from the task area, a menu opens in the work area of the management software, sometimes with several sub-pages (tabs). An online help is available for these functions, which can be called up by pressing the **F1** key on the keyboard. An internet connection and a browser are required for opening the online help (PDF file).

5.2.2 Management Software Toolbar

Some functions are only available if a connection to the matrix has been established (online mode). The respective functions are colored if available.
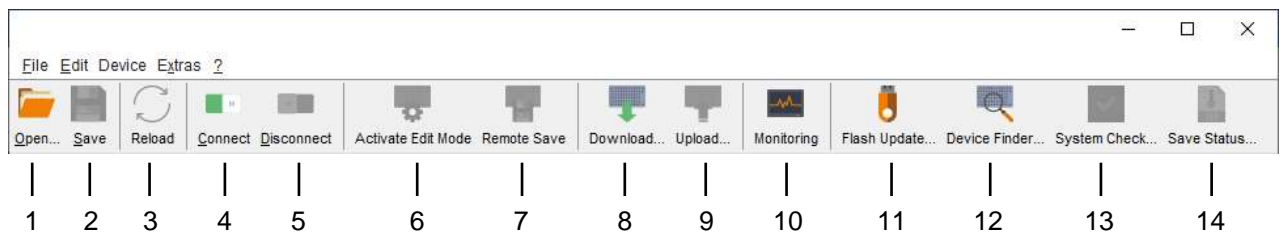
*Fig. 55   Management software **Toolbar***

1	Load locally saved configuration
2	Save configuration locally
3	Update configuration
4	Connect to the matrix
5	Disconnect from the matrix
6	Activate/deactivate the edit mode
7	Save active configuration (online mode)
8	Show predefined configuration saved on the matrix (online mode)

9	Save predefined configuration on the matrix (online mode)
10	Monitoring (online)
11	Flash update for single devices
12	Overview of devices in the subnet (online mode)
13	System check
14	Save status locally (online mode)

5.2.3 Management Software Mouse Control

The following mouse commands are selectable for menu functions:

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

5.2.4 Management Software Keyboard Control

The following keyboard commands are available for the navigation and configuration within the menus:

Keyboard command	Function
`<Cursor Left>`	Cursor to the left
`<Cursor Right>`	Cursor to the right
`<Cursor Up>`	Line up
`<Cursor Down>`	Line down
`<Page Up>`	In input or status menus with more than one page: previous page
`<Page Down>`	In input or status menus with more than one page: next page
`<Tab>`	In input menus: next field
`<Left Shift> + <Tab>`	In input menus: previous field
`<Space>`	• Switch in selection fields between two conditions (checkmark or not). • Open already highlighted fields with editing or selecting possibility.
`<Enter>`	• Select menu item • In menus: save data
`<Ctrl> + <Tab>`	• Leave tables • Jump from tables into the next field
`<Ctrl> + <Left Shift> + <Tab>`	• Leave tables • Jump from tables into the previous field

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

5.2.5 Management Software Reload Options

The information shown in the management software can be reloaded in different ways:

• Press the `<F5>` key on the used keyboard.

• Click the **Reload** menu item in the toolbar.

• Click **Edit >Reload** in the drop-down menu of the menu bar.

• Activate the Automatic Reload option by clicking the **Automatic Reload** checkbox in the right panel of the **View >Matrix** menu under **Options**.

5.2.6 Management Software Context Function

The management software offers several context functions that support user-friendly and effective operation. The context functions are described in the respective chapters.

Context function	Action	Results
Execute context function	Click with the right mouse button on a field.	A context menu opens and displays functions available for the corresponding filed (if existing).
	Click with the left mouse button on the desired function.	The desired function is executed.

5.2.7   Management Software Sort Function

Lists and tables in the management software offer a sorting function for fast and smooth search. An active filter is indicated by an arrow in the header.

Sort function	Action	Result
Ascending sort	Click with the left mouse button once on the header of the column to be sorted.	• The column is sorted in ascending order. • The sort of status is indicated by an arrow pointing upwards.
Descending sort	Click with the left mouse button twice on the header of the column to be sorted.	• The column is sorted in descending order. • The sort is displayed by an arrow that points downwards.
Cancel sort	Click with the left mouse button once or twice on the head of the sorted column.	The arrow displayed disappears.

5.2.8   Management Software Filter Function

Lists and tables in the management software offer a filter function that supports a fast and smooth search. The filter entry field is located above the header. An active filter is indicated by a green filter symbol in the filter entry field.

Filter function	Action	Results
Activate filter	Click with the left mouse button in the filter entry field above the header. Write the word or part of a word to be filtered.	• The filter results are shown immediately. • The filter symbol is displayed in green.
Cancel filter	Delete the text in the filter entry field.	• The list or table shows the complete content. • The filter symbol is displayed in gray.

5.2.9   Management Software Report Function

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

ℹ️ The report function can be used in both online and offline mode of the management software.

To create a report, proceed as follows:

1. Select **File > Report...** in the menu bar.
1. A selection dialog appears.
2. Select contents that should be included in the report (**Matrix View**, **EXT Units**, **CPU Devices**, **CON Devices** and **Users**).
3. Click the **Next >** button to confirm the selection.
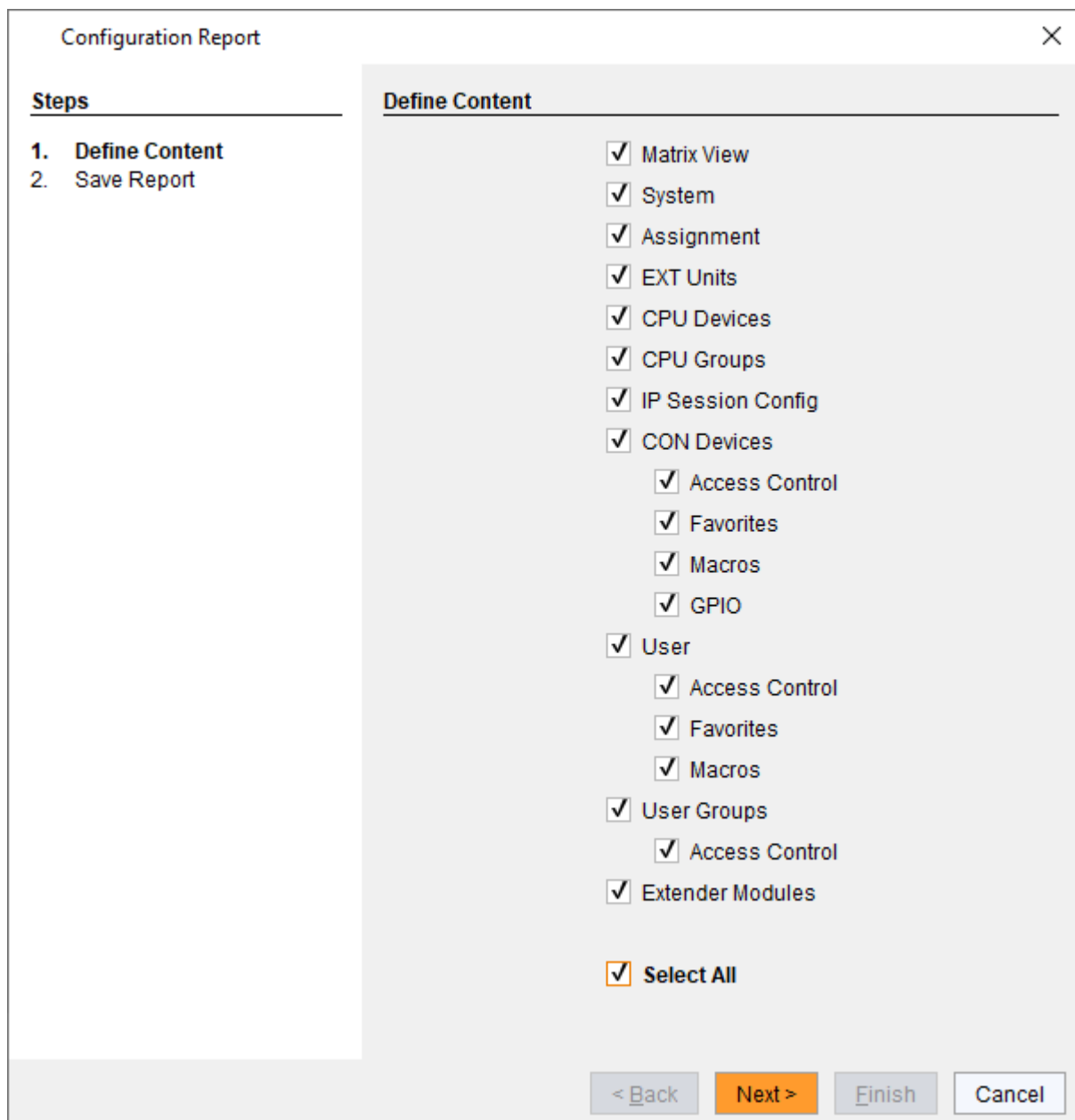
*Fig. 56   Management software **File - Report - Define Content***

4. Navigate to the preferred location for storage of the report.

5. Click the **Finish** button to confirm the report.

   The report will be created as a PDF file.

*Fig. 57   Management software **File - Report - Save Report***

6   Installation

NOTICE
Please verify that interconnect cables, interfaces, and handling of the devices comply with the requirements (see chapter 10, page 314).

First-time users are recommended to set up the system in a test environment that is limited to a single room. This makes it easier to identify and solve any cabling problems, and experiment with your system more conveniently.

6.1   Preparing the Matrix for Rack Mounting

NOTICE
Due to the construction of a matrix with 16, 32 and 40 ports into a 19'' rack, it is recommended to use an additional subfloor below the matrix. It should be used in addition to the provided mounting brackets.

The supplied mounting brackets are required for mounting the KVM matrix switch.

1.   For front rack mounting, remove the front and middle screws on both sides of the cover.

2.   For rear rack mount, remove the rear and middle screws on both sides of the cover.

3.   Mount the mounting bracket in the desired position using the screws on the cover/chassis.

6.2   Setting up the Matrix

6.2.1   Prerequisites for failure-free Installation of a Matrix Setup

To achieve the best possible performance and results with the matrix system, we recommend using the supplied cables. If you need a replacement, please use the spare parts specified for this device, which can be requested from the manufacturer if required.

To achieve a failure-free installation of a matrix system, we recommend to first establish a point-to-point connection between a CPU Unit and a CON Unit before connecting to the matrix as follows:

➡   Source (computer, CPU) - CPU Unit - Link - CON Unit - console (monitor, keyboard, mouse)

➡   Ensure that this most simplistic setup works.

➡   Then continue as follows.

1.   First connect the CPU Unit to the source (computer, CPU) by using the provided connection cables.

2.   Connect the CPU Unit to the CON Unit by using the interconnect cables (Cat X or fiber).

3.   Connect the monitor, keyboard, and mouse to the CON Unit.

4.   Connect the power supply units to the CPU Unit and CON Unit.

5.   Power up the CPU Unit and CON Unit.

6.   Boot the source (computer, CPU) and check that everything works correctly.

6.2.2   Initial Commissioning of the Matrix

1. Connect the monitor, keyboard, and mouse to a functionally tested CON Unit.
2. Connect the CON Unit to an I/O port of the matrix by using the interconnect cables (Cat X or fiber).
3. Connect the matrix and the CON Unit to the power supply.
4. Power up the matrix and wait until the boot process is finished (status LED flashes green).
5. Open the OSD via keyboard command `2x <Left Shift>, <o>`.

   The **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing, and the OSD is opened on the display showing the KVM List view.
6. Press the **<ESC>** key to enter the advanced menus.

   The OSD can be operated via keyboard and mouse.
7. Select **Configuration** in the main menu.
8. Login with administrator rights (see chapter 7.1, page 65).
9. Configure initially as requested (see from chapter 7.2, from page 66).

   Optional: Establish a network connection between the matrix and the management software to set an extended configuration (from chapter 6.4, page 60).
   The default IP address is 192.168.100.99 and DHCP is deactivated.

> ℹ️ After the configuration of the system it is recommended to save the configuration by selecting **Configuration > Save** (see chapter 7.10.1, page 129) and restart the matrix by selecting **Restart Matrix** (see chapter 9.9.1, page 300).

> ℹ️ When installing several matrices at the same time, it is strongly recommended to install them in sequence and to assign unique IP addresses to avoid IP address conflicts.

6.3   Connecting the Matrix to the Sink (Console) and the Sources (Computer, CPUs)

6.3.1   Connecting the Sink (Console) to the Matrix

1. Connect the monitor, keyboard, and mouse to the CON Unit.
2. Connect the CON Unit to an I/O port of the matrix by using the interconnect cables (Cat X or fiber).
3. Connect the matrix and the CON Unit to the power supply.
4. Connect the power supply units to the CON Unit.
5. Establish the power supply to the CON Unit.
6. Check the basic function of the CON Unit by opening the OSD via keyboard command `<Hot Key>, <o>`.

6.3.2   Connecting the Sources (Computer, CPU) to the Matrix

1. Connect the source (computer, CPU) to the CPU Unit by using the provided connection cables.
2. Connect the CPU Unit to the matrix using the interconnect cables (Cat X or fiber).
3. Connect the power supply units to the CPU Unit.
4. Establish the power supply to the CPU Unit.

6.4   Connecting the Matrix via Management Software

NOTICE
Connection to the matrix blocked
Synchronization directories or offline directories require special attention regarding the firewall settings, e.g., Windows: roaming directories. If blocked by the firewall, no connection to the matrix can be established.
➡ Save the management software in a locally available directory.

ℹ The management software is available as a single executable program file (desktop) that does not require installation.

➡ Save the management software in a locally available directory.

Requirements

If you want to use the management software on Windows operating systems with integrated Java Runtime, the following requirements must be fulfilled:

Computer / Software / Network		Requirements / Recommendations
Free memory	RAM	Recommended: 512 MB
Operating system	Microsoft	Windows 8, Windows 8.1, Windows 10
Management software with integrated Java Runtime	Tera Tool	Downloaded from https://www.ihse.com/software
Network connection	-	Available between computer and matrix

If you want to use the management software without integrated Java Runtime, the following requirements must be fulfilled:

Computer / Software / Network		Requirements / Recommendations
Free memory	RAM	Recommended: 512 MB
Operating system	Microsoft	Windows 8, Windows 8.1, Windows 10
	macOS	macOS 10.14 (Mojave) or higher, Intel platform
Specification	Java	Installed: Oracle Java Runtime Environment (JRE) 1.8.x or higher Strongly recommended: Oracle Java 1.8 update 152, or higher. (https://adoptopenjdk.net, https://github.com/ojdkbuild/ojdkbuild
Management software	Tera Tool	Downloaded from https://www.ihse.com/software
Network connection	-	Available between computer and matrix

ℹ Contact your system administrator concerning JRE and network connection.

6.4.1   Setting up Network and Firewall Releases

Releasing Network Ports

The following ports are used by the matrix depending on the configuration and have to be released at the security gateway if necessary. The ports will only have to be released if you want to use the respective function.

Function	Port
FTP	21 / TCP
DNS	53
SNTP	123 / UDP
SNMP	161/162 / both UDP
LDAP	389 (636 for SSL)
Syslog	514 / UDP
API	5555 / TCP (5565 for SSL)
Broadcast	5556 / UDP (5566 for SSL)
Matrix Grid	5557 / TCP (5576 for SSL)

Releasing Java Application in the Firewall

If using the management software, the Java application (file javaw.exe) has to be released in the firewall settings to use the management software. Contact your administrator to configure the firewall settings accordingly.

Using the management software with integrated Java Runtime, no firewall modification is necessary.

6.4.2   Connecting the Computer to the Matrix

NOTICE
For a connection between computer and matrix via switch or hub, parallelly assembled network cables are required.
➡ Only use a network connection between computer and the matrix that is not primarily used for streaming audio or video data.

➡ Connect the network cable to the RJ45 ports of computer and matrix.

6.4.3   Starting the Management Software

➡ Open the management software by a double-click on the program icon on the desktop or the file in the directory.

The management software starts in offline mode.
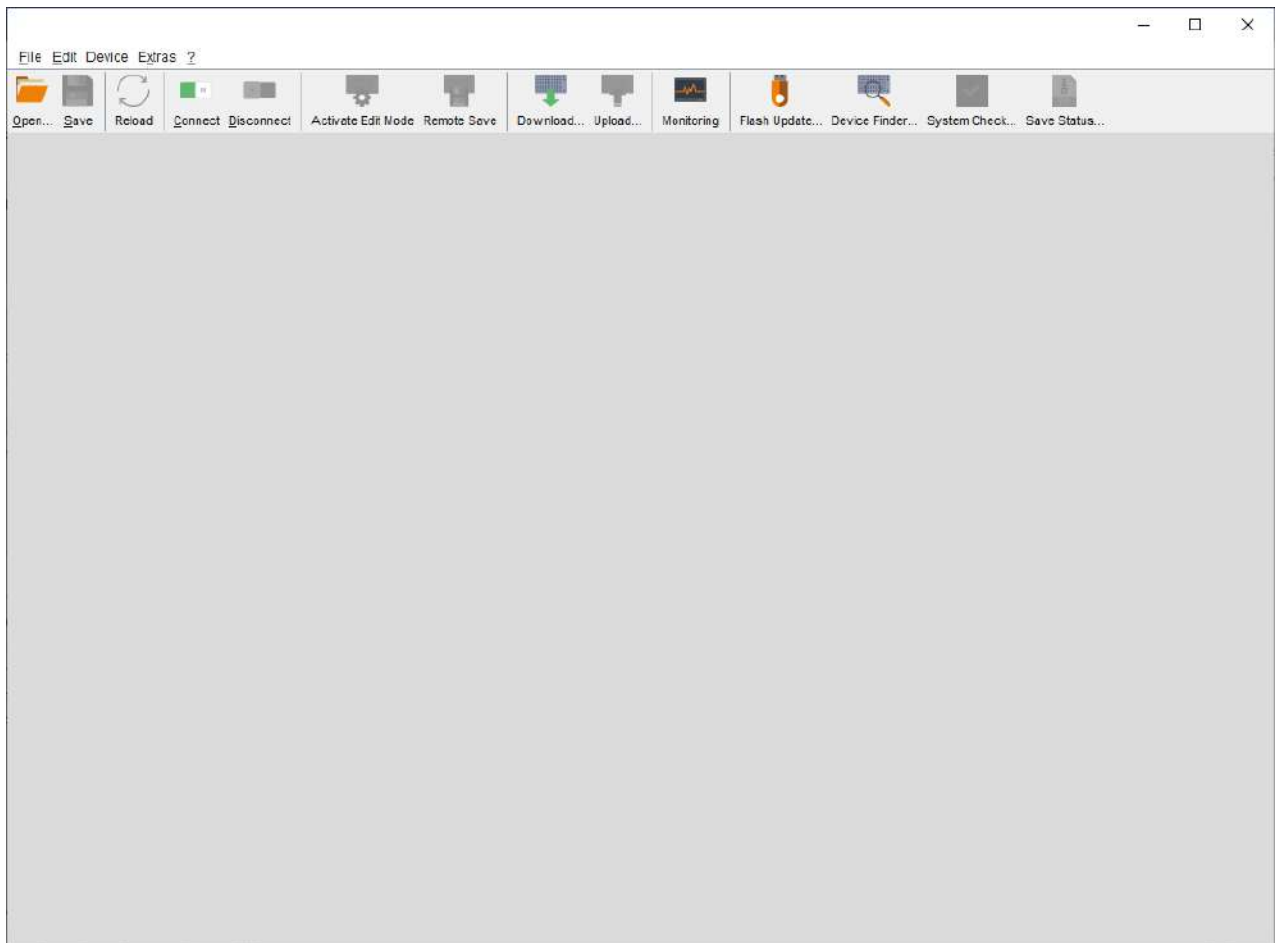
*Fig. 58   Management software **Offline mode***

There are two options to connect to a matrix.

- Via a known IP address
- Via Device Finder

6.4.4   Connecting to the Matrix with known IP Address

> At least FTP rights are required.

> Up to twelve connections between the matrix and the management software can be established at the same time due to a limitation of available sockets.

To connect to a matrix when the IP address is known, proceed as follows:

1. Open the management software.
2. Click the **Connect** menu item in the tool bar.

   An access window appears.
3. Enter the IP address according to the network configuration of the matrix (see chapter 8.4.6, page 149).

   By default, the IP address of the matrix is 192.168.100.99 and DHCP is deactivated.

4. Enter the username and password of the administrator (see chapter 8.5, page 165).

   By default, the username is admin, and the password of the administrator is admin.

5. Click the **Login** button to confirm your entries.

Fig. 59   Management software dialog Connect

✅ The data must be entered each time the network connection is re-established.

Alternately, the data can be entered and stored in the management software under **Extras > Options** (see chapter 8.3.1, page 134).

6.4.5   Connecting to the Matrix via Device Finder

ℹ️ At least FTP rights are required.

ℹ️ Up to twelve connections between the matrix and the management software can be established at the same time due to a limitation of available sockets.

The **Device Finder** offers the possibility to find all matrices that are in the same subnet. This is useful, for example if the IP address of a specific matrix is unknown and should be accessed via IP.

Fig. 60   Management software menu Device Finder

The following device information is shown in the Device Finder:

Information	Description
Broadcast/Multicast	Search parameters for finding devices. Search via broadcast: 255.255.255.255 (default). Input for search within a multicast group: multicast address (chapter 8.4.6, page 149)
Device	Name of the device
Name	Name of the active configuration
IP Address	Current IP address of the device
MAC Address	MAC address of the device
Type	Type of the device

The last column of the **Device Finder** can be used to access the respective matrix directly clicking the **Connect** button.

To find and access a device, proceed as follows:

1. Click the menu item **Device Finder** in the tool bar.
2. For searching within a multicast group, enter the multicast address. By default, the search is set via broadcast: 255.255.255.255.
3. Click the **Connect** button in the last column of the Device Finder to establish direct access to the respective device within the same subnet.
4. Enter the username and password of the administrator (see chapter 8.5, page 165).

   By default, the username is admin, and the password of the administrator is admin.
5. Click the **Login** button to confirm your entries.

7   Configuration via OSD

> **NOTICE**
>
> **Possible loss of configuration changes**
>
> By clicking the **Okay** button, changes are applied to the active configuration and saved in the volatile memory of the matrix. In the event of a sudden power failure, these changes are lost. To save changes permanently:
>
> ➡ save the configuration changes into the active configuration (**Save**, see chapter 7.10.1, page 129), save a predefined configuration (**Save as…**, from chapter 7.10.2, page 130), or perform a restart (see chapter 9.9.1, page 300).

> **NOTICE**
>
> A change in system-relevant parameters (e.g., change of the IP address) is immediately displayed in the OSD. To initialize system-relevant configuration changes on the matrix, the matrix must be restarted. The restart of the matrix may take several minutes, and the matrix is not available during the restart.

7.1   Password Request

All configuration or assignment settings can only be configured with administrator rights. The following login data is saved in the factory settings:

Field	Entry
User	admin
Password	admin

To access the configuration menu, proceed as follows:

1.   Press the <F10> key in the main menu of the OSD.

      The login mask appears.

2.   Enter the login data of the administrator.
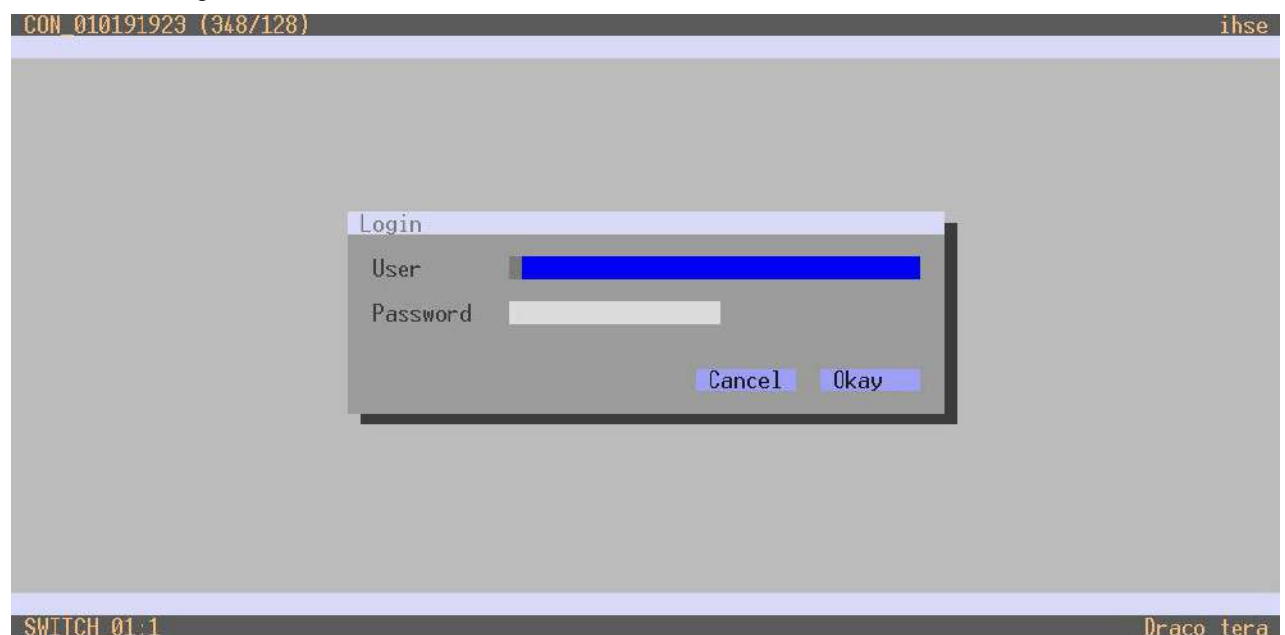
*Fig. 61   OSD Menu **Configuration - Login***

NOTICE
For security reasons, please change the administrator password as soon as possible (see chapter 7.4.1, page 87).

> ℹ️ To log out a user, press the <F10> key again.
>
> When leaving the configuration or assignment menu, the administrator is logged out automatically.

7.2   Overview Configuration Menu

Various system functions and options are available in the configuration menu. In addition, the following functions can be called up here: save (as active or predefined configuration) and shutdown, restart, or reset to factory settings.
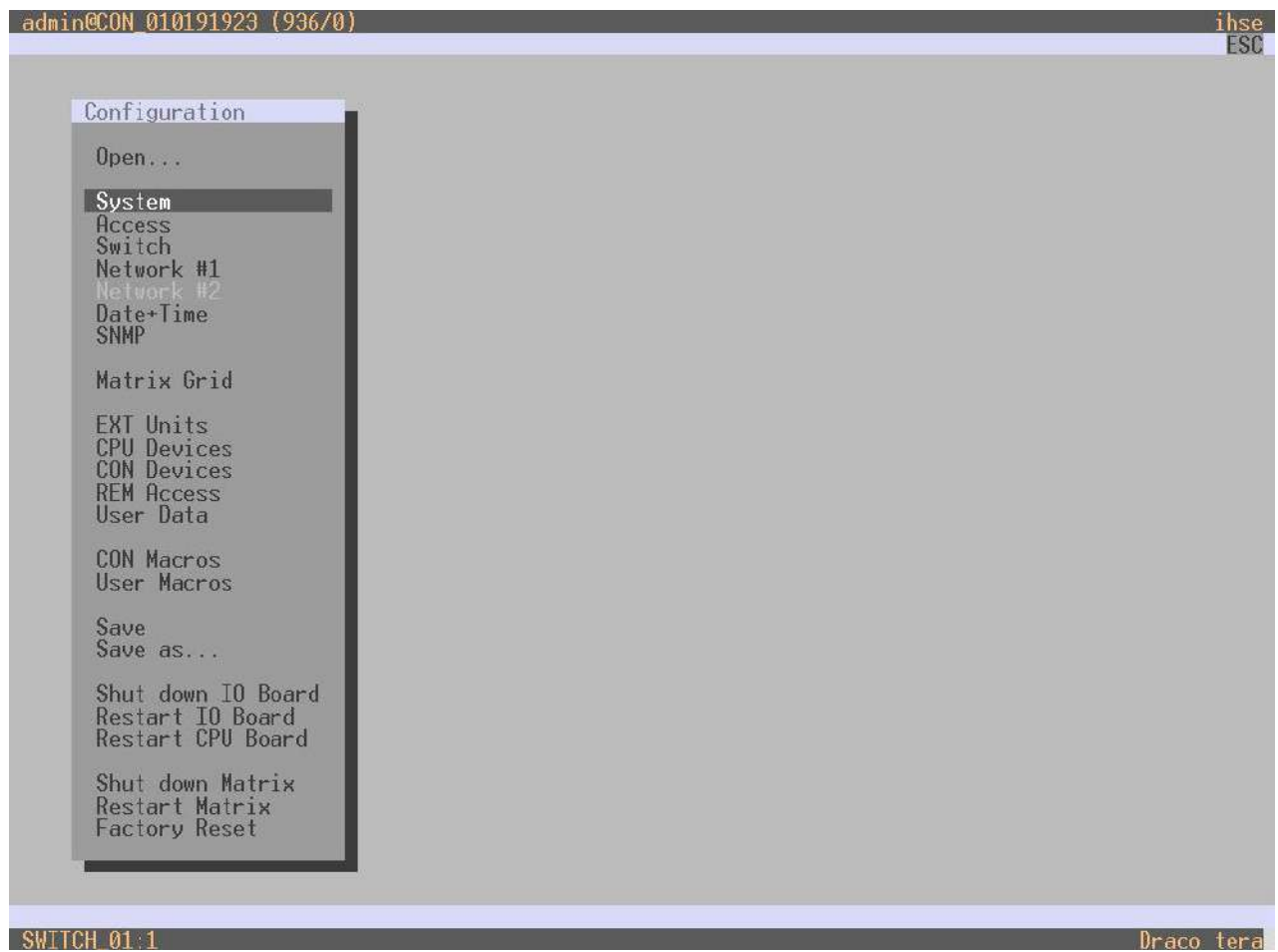
*Fig. 62   OSD Menu **Configuration***

7.3   System Settings

7.3.1   Setting System Configuration

The parameters for the system configuration are set in this menu:
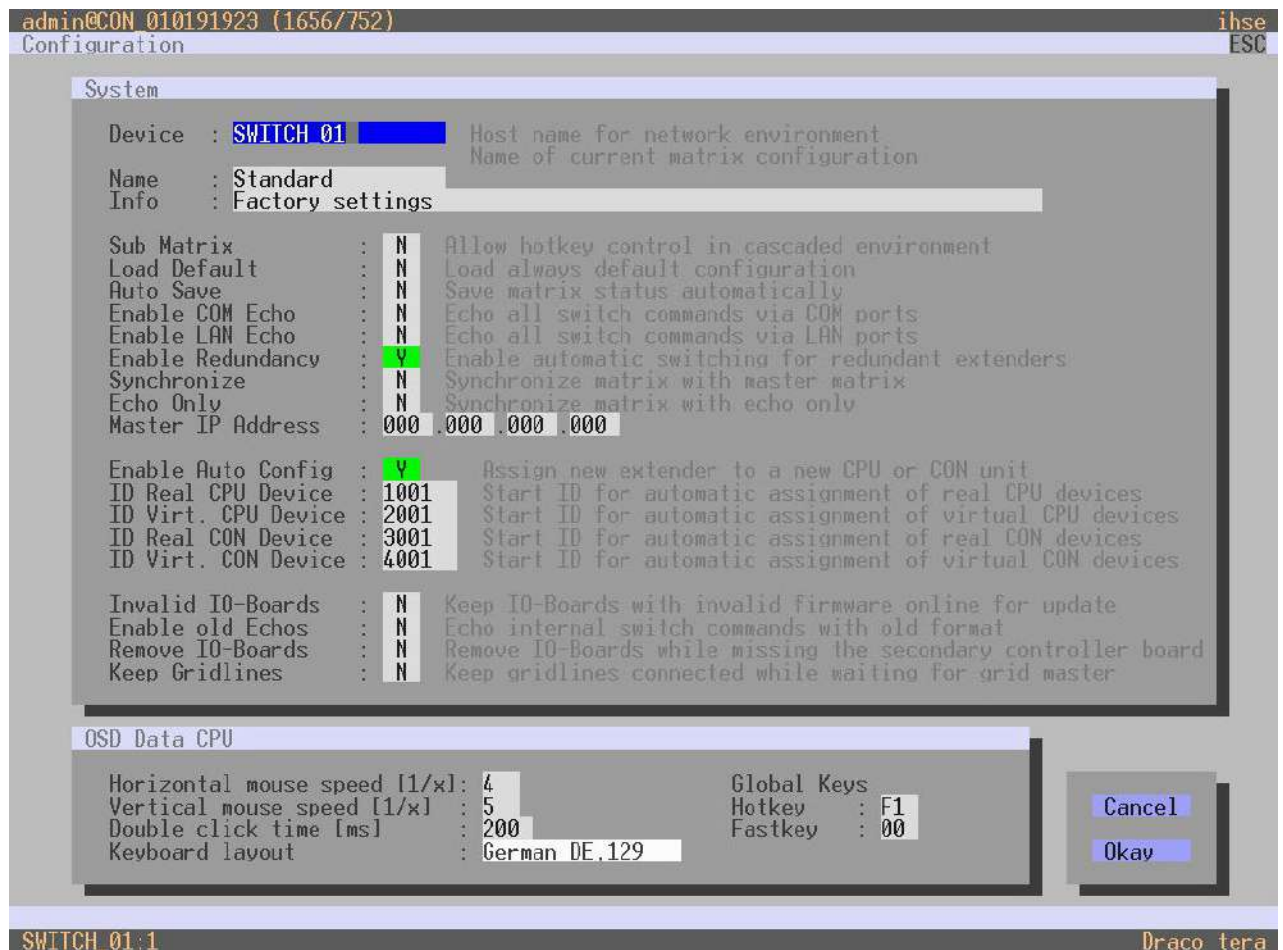
*Fig. 63   OSD Menu **Configuration - System***

The following parameters can be configured:

System

Field	Entry	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	Y	If the matrix is defined as a sub matrix in the OSD, the user will lose control. Control can be recovered by using the keyboard command `<Hot Key>`, `<s>`, `<o>`. The OSD for the matrix that has been defined as sub matrix will be reopened.
	N	Function not active (default)
Load Default	Y	Starting the matrix after a restart or a switch-on with the default configuration.
	N	Starting the matrix after a restart or a switch-on with the last saved configuration (default).

Field	Entry	Description
Auto Save	Y	Save the current configuration of the matrix in the flash memory periodically. **Note:** During the save operation, the matrix will not react to commands. Saving takes place every 600 seconds if changes of the configuration or switching operations have been executed in the meantime.
	N	Function not active (default)
Enable COM Echo	Y	Send all switching commands performed in the matrix as an echo via serial interface. **Note:** This function should be enabled when using a media controller via serial interface.
	N	Function not active (default)
Enable LAN Echo	Y	Send all switching commands performed in the matrix as an echo via LAN connection. **Note:** This function should be enabled when using a media controller via LAN connection or when using stacking with two or more matrices.
	N	Function not active (default)
Enable Redundancy	Y	Automatically switch to the second link of a connected redundant CON Unit when losing the primary link of a CPU Unit (default). **Note**: This function will have to be activated: • for a single matrix when using redundant link connections, • for both matrices in a fully redundant setup.
	N	Function not active
Synchronize	Y	Synchronize the sub matrix to the switch status of the master matrix.
	N	Function not active (default)
Echo Only	Y	Synchronize the matrix according to the echo of a second matrix. **Note:** This is a bidirectional synchronization where both matrices have to be configured as **Synchronize** with the **Master IP** of the respective other matrix.
	N	Function not active (default)
Master IP Address	Byte	Set the network address of the master matrix (default: 000.000.000.000)
Invalid IO-Boards	Y	Keep I/O boards with incorrect or invalid firmware online in the matrix. **Note**: To keep an I/O board with wrong or damaged firmware online in the matrix, the maintenance mode of the matrix will be activated.
	N	Shut down I/O boards with incorrect or invalid firmware automatically (default).
Enable old Echos	Y	Translate current switching command (implemented since V02.09) internally into the old, already known switching commands and send them as echo.
	N	Function not active (default)

Field	Entry	Description
Remove IO-Boards	Y	**Note:** Only for Draco tera enterprise 576: Shut down of I/O boards if the second controller board is not available. Connection will be disconnected.
Keep Gridlines	Y	Function not available in the firmware described in this manual
	N	Function not active (default)

OSD Data CPU

Field	Entry	Description
Horizontal Mouse Speed [1/x]	1 to 9	Adjust the horizontal mouse speed, 1 = slow, 9 = fast (default: 4)
Vertical Mouse Speed [1/x]	1 to 9	Adjust the vertical mouse speed, 1 = slow, 9 = fast (default: 5)
Double-click Time [ms]	100 to 800	Adjust the time slot for a double-click (default: 200)
Keyboard Layout	Region	Set the OSD keyboard layout according to the keyboard used (default: German (DE))
Hot Key	Keyboard command	Call the command mode via keyboard sequence (default: 00)
Fast Key	Keyboard command	Open the OSD via direct access (default: 00) How often the shortcut key has to be pressed depends on the specified key: 1x for function keys or print key, 2x for all other keys

Settings for Global Hot Key and Fast Key

Field	Entry	Description
Hot Key / Fast Key	00	No global Hot Key / Fast Key defined, no modification of the extender module.
	01 to FE	Overwrite the Hot Key / Fast Key of the extender module with the entered value of the global Hot Key / Fast Key.
	FF	Deactivate the Hot Key / Fast Key of the extender module

Valid values for the Hot Key and the Fast Key are USB-HID keyboard scan codes according to US keyboard layout.

To set modifier keys for the Hot Key and the Fast Key use the following values:

Entry	Modifier Key
F0	Left CTRL
F1	Left SHIFT
F2	Left ALT
F4	Right CTRL
F5	Right SHIFT
F6	Right ALT

Hot Key or Fast Key set in the CON EXT Units have priority over the global settings.

To set the parameters for the system configuration, proceed as follows:

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

2. Modify the desired settings.

3. Click the **Okay** button to confirm your entries.

7.3.2 Enabling Automatic Creation of CPU and CON Devices

Settings for automatic creation of CPU and CON Devices when a new CON extender module or CPU extender module is connected are set in this menu.
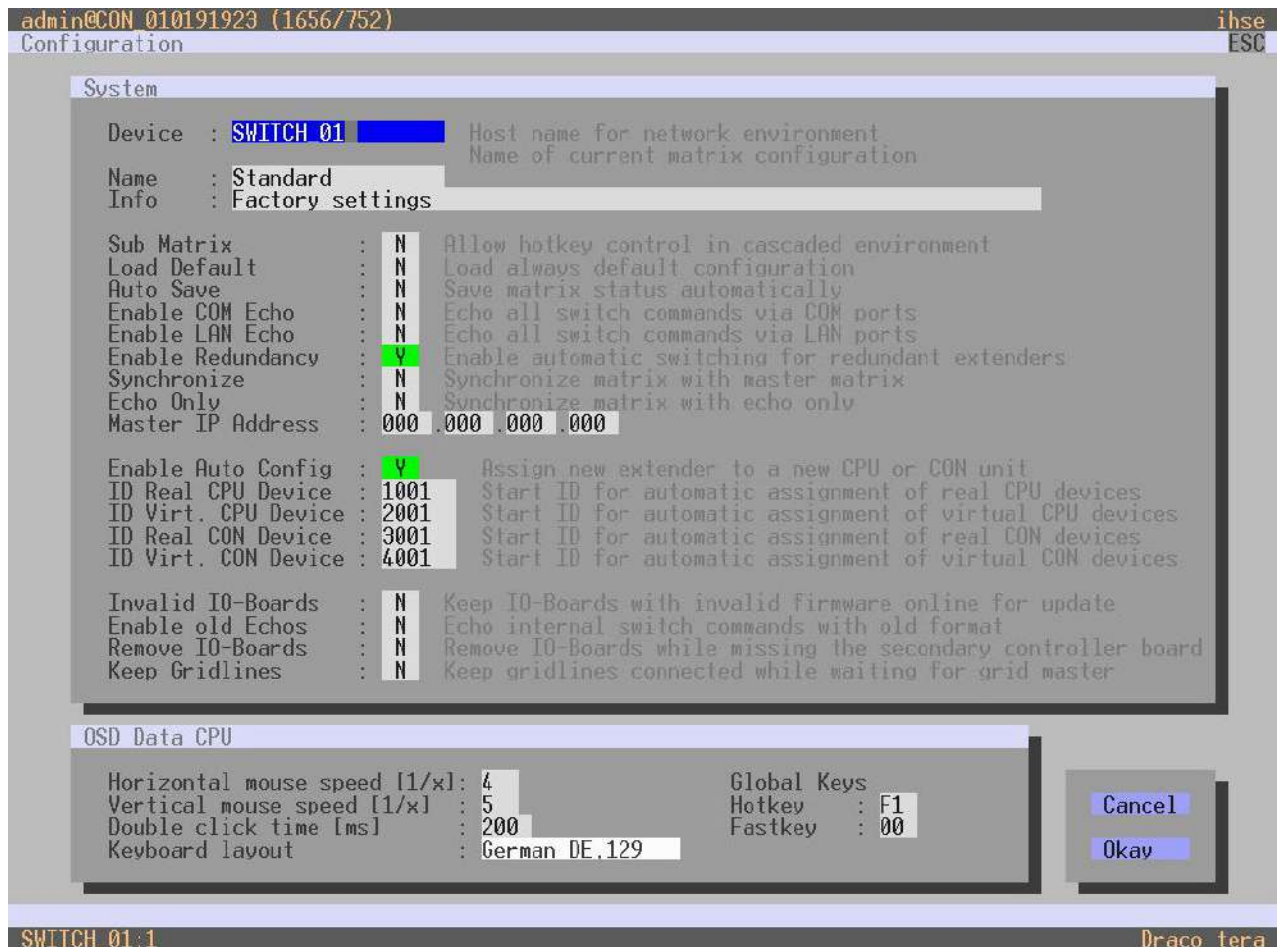
*Fig. 64   OSD Menu **Configuration - System - Automatic ID***

The following parameters can be configured:

Field	Entry	Description
Enable Auto Config	Y	Automatic creation of a new CPU or CON Device if new extender modules are connected (default)
	N	Function not active
ID Real CPU Device	Numerical	Initial value of the automatic ID for real CPUs (default: 1000)
ID Virtual CPU Device	Numerical	Initial value of the automatic ID for virtual CPUs (default: 2000)
ID Real CON Device	Numerical	Initial value of the automatic ID for real CONs (default: 3000)
ID Virtual CON Device	Numerical	Initial value of the automatic ID for virtual CONs (default: 4000)

To set up the automatic creation of CPU Devices or CON Devices, proceed as follows:

1. Select **Configuration > System** in the main menu.
2. Modify the desired settings.
3. Click the **Okay** button to confirm your entries.

7.3.3   Setting Access Configuration

The access configuration is set in this menu.
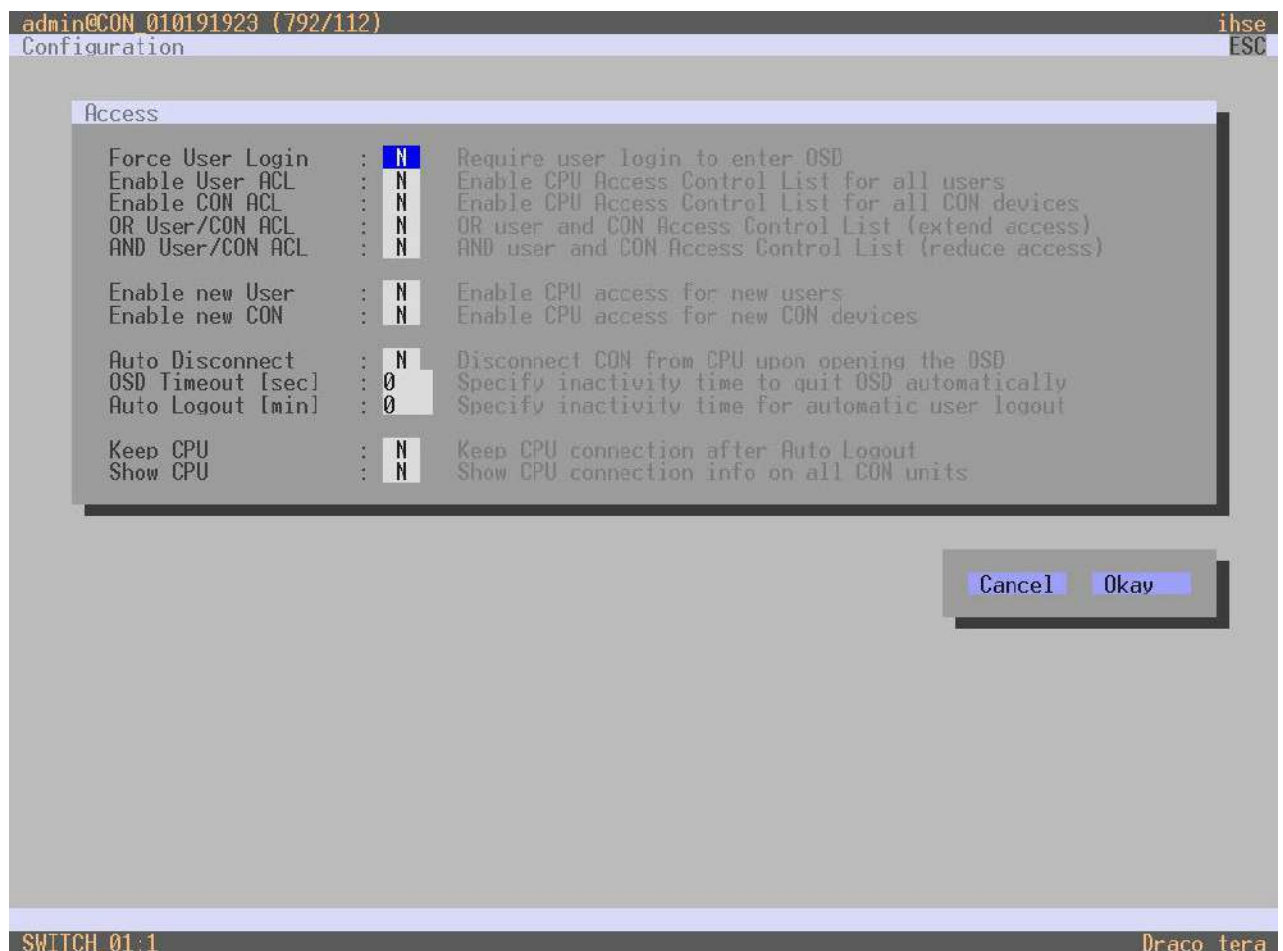
*Fig. 65   OSD Menu **Configuration - Access***

The following parameters can be configured:

Field	Entry	Description
Force User Login	Y	The user has to login with a username and a password once to enter OSD. Thereafter the user remains logged in until he explicitly logs out or an auto logout is affected. **Note:** When the **Force User Login** function is activated and a user is logged in, only the user favorites are available. The CON favorites are not accessible.
	N	Function not active (default)
Enable User ACL	Y	CPU Device access is restricted according to the permissions in the ACL (Access Control List). • User login is required. • Switching by keyboard Hot Keys requires a prior login.
	N	Function not active (default)
Enable CON ACL	Y	CPU Device access is restricted according to the permissions in the respective CON Device ACL (Access Control List). No login required
	N	Function not active (default)

Field	Entry	Description
OR User/CON ACL	Y	The user obtains the sum of access rights from the CON Device and his personal access rights after logging in (extended access)
	N	Function not active (default)
AND User/CON ACL	Y	The user obtains the common divisor of access rights from the CON Device and his personal access rights after logging in (reduced access)
	N	Function not active (default)
Enable new User	Y	Newly created users automatically receive access to all CPUs
	N	Function not active (default)
Enable new CON	Y	Newly created CON Devices automatically receive access to all CPU Devices
	N	Function not active (default)
Auto Disconnect	Y	Upon opening the OSD, the console will be automatically disconnected from the current CPU Device.
	N	Function not active (default)
OSD Timeout [sec]	0 to 999 seconds	Period of inactivity after which OSD will be closed automatically. • Select 0 seconds for no timeout • (default: 0 seconds)
Auto Logout [min]	0 to 999 minutes	Period of inactivity of a logged-in user at a CON Device after which he will be automatically logged out. In addition to the logout process, a complete disconnection from the connected CPU Device occurs under **Full Access** and **Private Mode**. • Select **0** minutes for an automatic user 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).
Keep CPU	Y	Keep the connection to the CPU Device active in the background after Auto Logout. After a new login there is no need to re-connect to the CPU Device.
	N	Function not active (default)
Show CPU	Y	Permanently show the name of the currently connected CPU Device in the **Connection Info** box.
	N	Function not active (default)

To set the access configuration, proceed as follows:

1. Select **Configuration > Access** in the main menu.
2. Modify the desired settings.
3. Click the **Okay** button to confirm your entries.

7.3.4   Setting Switch Configuration

This menu enables shared operation of a CPU Device by two or more CON Devices. A CPU Device can be controlled by only one CON Device at a time but can be taken over successively by other CON Devices. Control of a CPU Unit by a CON Unit is relinquished after the expiration of an inactivity timer associated with the controlling CON Device. The mouse or keyboard may also be used to take over control.

> ℹ️ To allow a smooth and accurate function of the shared 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 9.11, page 312).
>
> When taking over control within 10 s, any assigned USB 2.0 extender modules if available, will not be switched due to security and stability aspects.
>
> The shared operation will be deactivated between CON Devices with a different priority as well as the Release Time.

The switching parameters are set in this menu.
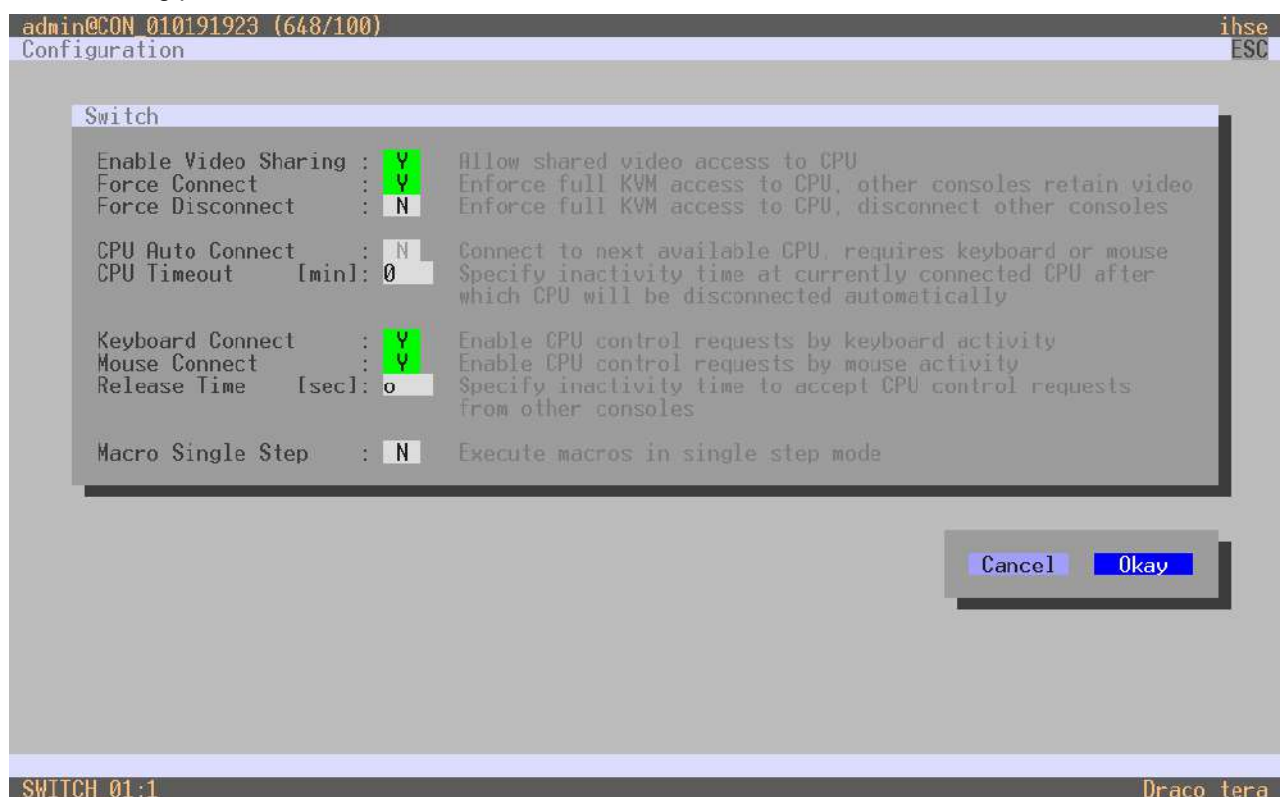
Fig. 66   OSD Menu **Configuration - Switch**

The following parameters can be configured:

Field	Entry	Description
Enable Video Sharing	Y	The user can switch to any CPU Device as an observer, including ones that are already assigned to another user (observer without keyboard/mouse access). **Note:** Switching with the `<Space>` key, not with the `<Enter>` key. The operator only will be informed if further users connect as an observer to the CPU Device that is connected to his CON Device, if the option **Update Connection Info** is activated for his CON EXT Unit.
	N	Function not active (default)

Field	Entry	Description
Force Connect	Y	The user can connect to every single CPU Device as an operator, including those that are related to another user. **Note:** The previous user is set to Video Only status. To share K/M control, **Force Connect** has to be activated.
	N	Function not active (default)
Force Disconnect	Y	Extension of **Force Connect**: If the user connects as an operator to a CPU Device already related to another user, the previous user will be disconnected. **Note:** To share K/M control **Force Disconnect** has to be deactivated and **Enable Video Sharing** has to be activated.
	N	Function not active (default)
CPU Auto Connect	Y	If a CON Device is not connected to a CPU Device, you can establish an automatic connection to the next available CPU Device by hitting any key or mouse button.
	N	Function not active (default)
CPU Timeout [min]	0 to 999 minutes	Period of inactivity after which a CON Device will be automatically disconnected from its current CPU Device (default: 0 minutes)
Keyboard Connect	Y	Activate request of K/M control by keyboard event (key will be lost)
	N	Function not active (default)
Mouse Connect	Y	Activate request of K/M control by mouse event
	N	Function not active (default)
Release Time [sec]	0 to 999 seconds	Period of inactivity of a connected console after which K/M control can be requested by other consoles connected to the CPU Device. **Note:** Set **0** for an immediate transfer in real-time. Only one console can have keyboard and mouse control at a time. The other consoles that are connected to the same CPU Device have a Video Only status (default: 10 seconds)
Macro Single Step	Y	Execute macro commands sequentially
	N	Function not active (default)

To configure shared operation, proceed as follows:

1. Select **Configuration > Switch** in the main menu.
2. Activate the **Enable Video Sharing** function.
3. Activate the **Force Connect** function.
4. Activate the **Keyboard Connect** function if taking over control by a keyboard event should be possible.
5. Activate the **Mouse Connect** function if taking over control by a mouse movement should be possible.
6. Define a **Release Time** of inactivity (0 to 999 seconds) after which KVM control can be taken over.
7. Click the **Okay** button to confirm your settings.

Keyboard Connect and / or **Mouse Connect** are only effective if **Force Connect** and / or **CPU Auto Connect** are activated.

If the **Keyboard Connect** and / or **Mouse Connect** options are enabled, the **Keyboard Connect** and/or **Mouse Connect** will not take effect until the time interval entered in the **Release Time** has elapsed.

7.3.5   Setting Network Configuration

NOTICE
To initialize system-relevant configuration changes, the matrix must be restarted. Restarting the matrix can take several minutes and the matrix is not available during the restart.

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

NOTICE
The Syslog function starts logging after the matrix or controller card is restarted if the Syslog function has been activated in this menu.

The parameters for the network configuration are set in this menu.

*Fig. 67   OSD Menu **Configuration - Network***

The following parameters can be configured:

Network Interface #1

Field	Entry	Description
Dual Interface	Y	Redundant network connection is deactivated
	N	Redundant network connection is activated (default)
DHCP	Y	The network settings are automatically supplied by a DHCP server. **Note:** If DHCP is activated and there is no physical network connection available, the boot times might increase.
	N	Function not active (default)
IP Address	Byte	Input of the IP address if DHCP is not active (default: 192.168.100.99)
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
MAC Address	Byte	Cannot be changed, is retrieved automatically
Multicast	Byte	Input of the Multicast address if there is a Matrix Grid in use within a Multicast group (default: 255.255.255.255)

Network Services

Field	Entry	Description
API Service #1	Y	LAN interface at the matrix activated for access via management software (default, API service port 5555/5565)
	N	Function not active
Grid Service #1	Y	Activate Grid interface at the matrix for access via management software (Grid Service Port 5557/5567)
	N	Function not active (default)
SSL Services #1	Y	Activate SSL encryption for API, management software (API), and Matrix Grid communication.
	N	Function not active (default)
Syslog #1/#2	Y	Syslog server for status request is active
	N	Function not active (default)
Syslog Server #1/#2	Byte	Input of the IP address of the Syslog servers in the form "192.168.1.1" and of the Syslog port (default: 514)

ℹ️ The LDAP settings are explained in the chapter 7.3.6, page 79.

Log Levels

Field	Entry	Description
Trace	DEB	Activate debug messages in Trace (default: N) **Note:** The debug messages are exclusively for matrix diagnostics. They only should be activated after consultation with the manufacturer. Otherwise, an increased traffic of data might limit the performance of the controller board.

Field	Entry	Description
	INF	Activate information messages in Trace (default: N)
	NOT	Activate notification messages in Trace (default: Y)
	WAR	Activate warning messages in Trace (default: Y)
	ERR	Activate error messages in Trace (default: Y)
Syslog #1/#2	DEB	Activate debug messages in Syslog (default: N) **Note:** The debug messages are exclusively for matrix diagnostics. They only should be activated after consultation with the manufacturer. Otherwise, an increased traffic of data might limit the performance of the controller board.
	INF	Activate information messages in Syslog (default: N)
	NOT	Activate notification messages in Syslog (default: Y)
	WAR	Activate warning messages in Syslog (default: Y)
	ERR	Activate error messages in Syslog (default: Y)

To set parameters for the network configuration, proceed as follows:

1. Select **Configuration > Network** in the task area.
2. Modify the desired settings.
3. Click the **Okay** button to confirm your entries.

7.3.6   Setting LDAP Configuration (Active Directory)

NOTICE
To initialize the LDAP configuration changes, the matrix must be restarted. Restarting the matrix can take several minutes and the matrix is not available during the restart.

The KVM matrix can be synchronized with the directory service Active Directory with regard to user authentication. This allows the user to login at the KVM matrix using login information from the Active Directory service and to contact the Active Directory Server for each authentication that does in fact the proper authentication.

The connection between KVM matrix and the Active Directory server is established via OpenLDAP and periodically synchronized every 5 minutes.

The search of users to be synchronized and automatically added to the KVM matrix configuration can either be based on a **group** or **organizational unit (OU)**. In both cases a user requires to be at least assigned to one group:

- In case of the group, all users belonging to a previously defined group on the active directory server are added to the KVM matrix and synchronized. In this alternative, the organizational structure of the organizational units (OUs) is added as matrix user group to the KVM matrix configuration. This means that the organizational unit (OU) that includes the user can be found as a matrix user group in the KVM matrix configuration after the synchronization. A user can be member of up to 8 groups.

- In case of the organizational unit, all users belonging to groups that are located directly under this organizational unit are added and synchronized. The groups can also include subgroups. The structure of the groups is added to the KVM matrix configuration as user group. Each group will be represented in the KVM matrix as a user group after the synchronization. Groups that are located in sub organizational units will be ignored.

*Fig. 68   OSD Menu **Configuration - Network***

The following parameters can be configured:

Field	Entry	Description
LDAP	Y	LDAP for the request of information from a user administration is active
	N	Function not active (default)
LDAP TLS/SSL	Y	Enable a secured transmission (transport layer security) for the Active Directory access.
	N	Function not active (default)
LDAP Server	Byte	Input of the IP address for the LDAP-Servers in the form "192.168.1.1" and the LDAP port (Default: 389/636)
LDAP Base DN	Text	Input of the LDAP Base DN according to the existing structure of the user directory

A matrix configuration should only include one LDAP user and one LDAP group at the same time. The LDAP user and the LDAP group can be created, changed, or deleted during ongoing operation: no restart of the matrix is required.

To configure and enable the synchronization to the Active Directory server, there are three steps required:

- Configuring the LDAP settings.
- Creating an LDAP User (see page 89).
- Creating an LDAP Group (see page 94).

To configure the LDAP settings, proceed as follows:

1. Select **System Settings > Network** in the task area.
2. Set the **LDAP** option to **Y** (Yes) within **Network Services**.
3. Optionally set the **LDAP TLS/SSL** option to **Y** (Yes) within **Network Services**.
4. Enter the appropriate IP address and the port number in the field **LDAP Server** (default port number: 389 (636 for SSL)).
5. Enter the **LDAP Base DN** into the appropriate field (e.g., dc=example, dc=com).
6. Click the **Okay** button to confirm the settings.
7. Restart the matrix.

Changes done in step 2 to 7 only come into effect after a restart of the matrix.

8. Create an LDAP User (see page 89).
9. Create an LDAP Group (see page 94).

7.3.7   Setting SNMP Function

The SNMP function allows all function-critical and safety-critical elements of the matrix to be monitored and queried. This function complies with the RFC 1157 conformal standard. Two SNMP servers can be used at the same time. Enabling the SNMP function, the unencrypted SNMP monitoring (SNMPv2) is activated. An SNMPv3 User for encrypted SNMP monitoring (SNMPv3) can be set in the user settings (see chapter 8.5.1, page 165) and the login data for an SNMPv3 User at the SNMP server can be set in the default settings (see section on page 159).

NOTICE
When using SNMP monitoring, for reasons of access security, the use of a dedicated network according to the IT-Grundschutz catalog is recommended. The read only community for the MIB file is **draco**.

NOTICE
For an activation of the SNMP agent function or the SNMP server function, a restart of the matrix or the CPU board is necessary. Restarting the matrix or the CPU board can take several minutes, and the matrix is not available during the restart.

The settings for the SNMP monitoring are set in this menu:

*Fig. 69   OSD Menu **Configuration - SNMP***

The following parameters can be configured:

SNMP Agent

Traps	Description
Enable	Permission for an active query of the SNMP agent for traps is granted. This activation is a prerequisite for using the SNMP server.
Read Community	The read only community for the MIB file is **draco**.

SNMP Server

The SNMP agent must be activated to activate the SNMP traps.

Traps	Description
Enable Traps	Activates the active sending of trap messages from the SNMP agent to the SNMP server
Server Address	Input of the IP address of the SNMP server in the form "192.168.1.1" and of the SNMP port (default: 162)
Status	Notification about matrix status
Temperature	Notification about temperature within the matrix
Insert Board*	Notification about insertion of a new I/O board into a slot
Remove Board*	Notification about removal of an I/O board out of a slot
Invalid Board*	Notification about a faulty I/O board
Insert Extender	• Notification about a newly connected extender to the matrix, notification about a switched-on extender • Notification about a newly established link between extender and matrix
Remove Extender	• Notification about a removed extender from the matrix • Notification about a switched off extender • Notification about an interrupted link between extender and matrix
Fan Tray #1	Notification about the fan status on the left side of the matrix (interface view)
Fan Tray #2	Notification about the fan status on the right side of the matrix (interface view)
Power Supply #1	Notification about the status of power supply unit #1
Power Supply #2	Notification about the status of power supply unit #2
Power Supply #3*	Notification about the status of power supply unit #3
Power Supply #4*	Notification about the status of power supply unit #4

*   Only for Draco tera enterprise

Activating the SNMP Agent

To activate the SNMP agent, proceed as follows:

1. **Select Configuration > SNMP** in the main menu.
2. Set the **Enable** option to **Y** (Yes) within **SNMP Agent**.

   By activating this option, the permission for an active query of the SNMP agent is granted.
3. Click the **Okay** button to confirm your changes.

Activate SNMP Traps

To activate active reporting of the SNMP traps, proceed as follows:

1. 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.

2. Set the IP address of the SNMP server within **Server Address**.

3. Activate the requested traps by enabling them to **Y** (Yes).

4. Click the **Okay** button to confirm your changes.

7.3.8   Date and Time

The parameters for the system configuration are set in this menu, based on Simple Network Time Protocol (SNTP):
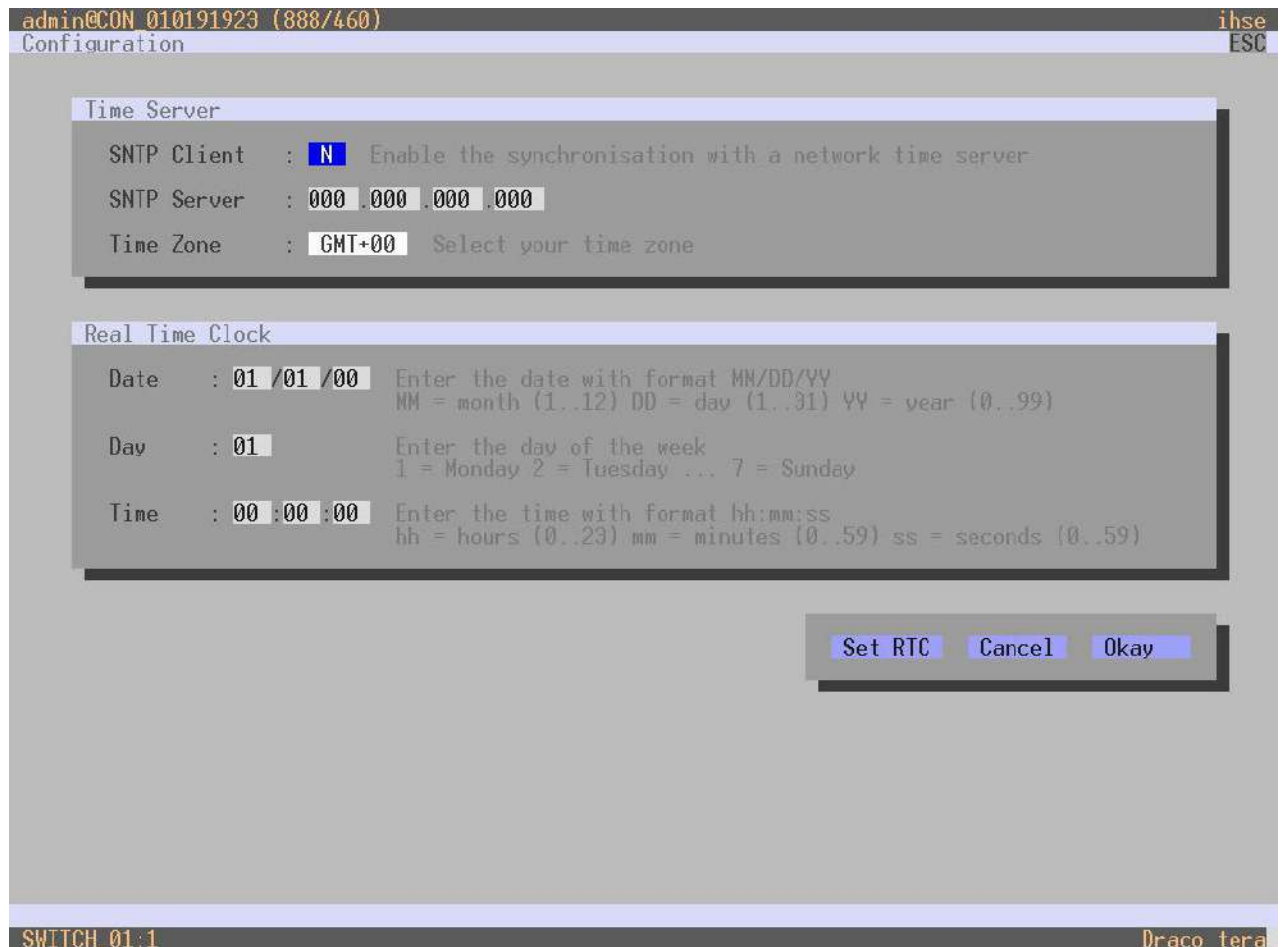
Fig. 70   OSD Menu **Configuration - Date+Time**

The following parameters can be configured:

Time Server

Field	Entry	Description
SNTP Client	Y	Enable network time server synchronization
	N	Function not active (default)
SNTP Server	Byte	Input of the SNTP server IP address (default: 000.000.000.000)
Time Zone	Region	Set your specific time zone

Real Time Clock

Field		Entry	Description
Date*	**MM**	1 to 12	Enter month
	DD	1 to 31	Enter date
	YY	1 to 99	Enter year
Day		1 to 7	Enter day of the week
Time	**hh**	0 to 23	Enter hour
	mm	0 to 59	Enter minute
	dd	0 to 59	Enter second

* Date format according to the English notation.

Configuring the Time Server

To configure a time server, proceed as follows:

1. Select **Configuration > Date+Time** in the main menu.
2. Set the SNTP Client option to **Y** (Yes).
3. Enter the IP address of your SNTP server into the **SNTP Server** field.
4. Select your time zone in the **Time Zone** field.
5. Click the **Okay** button to confirm your settings.
6. Restart the matrix.

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

Configuring the Real Time Clock without Time Server

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

1. Select **Configuration > Date+Time** in the main menu.
2. Set the current date in the **Date** field.
3. Set the current Day in the **Day** field.
4. Set the current time in the **Time** field.
5. Click the **RTC** button to confirm your settings.

   The real time clock is now provided.

7.4   User Settings

You have the option to configure the following user settings:

7.4.1   User Settings

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

Fig. 71   OSD Menu **Configuration - User Data**

The following functions are available:

Button	Function
New U.	Create a new user
Edit	Edit an existing user
Delete	Delete an existing user
Cancel	Reject changes
Okay	Confirm the changes of an existing user or the creation of a new user account

The following keyboard commands are available:

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

The following parameters can be configured:

Field	Entry	Description
ID/Priority	Numerical	User ID / User priority
Name	Text	For standard users it is the login name (case sensitive, input of minimum 1 character up to 16 characters). Can be used to log in to the OSD.
		For LDAP Users it is the name (case sensitive, input of minimum 1 character up to 16 characters). Can be used to log in to the OSD.
		For users synchronized via LDAP, it is the sAMAccountName, automatically retrieved from the LDAP server. Can be used to log in to the OSD.
Full Name / Login Name / AD CN=	Text	For standard users it is the full name (optional input of up to 32 characters). Can be used to log in to the OSD.
		For LDAP Users it is the login name (case sensitive, input of minimum 1 character up to 32 characters). Can be used to log in to the OSD.
		For users synchronized via LDAP, it is the userPrincipalName, automatically retrieved. Can be used to log in to the OSD.
Password	Text	For standard users (optional input of up to 16 characters). Can be used to log in to the OSD.
		For LDAP Users (case sensitive, input of minimum 1 character up to 16 characters). Can be used to log in to the OSD.
Repeat Password	Text	Repeat user password (case sensitive)
Member of Group	Selection	Define the assignment to a user group
Administrator	Y	• Permission for system configuration and all switching operations • User has administrator rights
	N	Function not active
Super User	Y	Permission to switch any CON Device to any CPU Device in **Extended Switching**
	N	Function not active
Power User	Y	• User has user rights • Permission to switch CON Devices to CPU Devices s in **Extended Switching** according to the **CON** or **User ACL**, but not in Private Mode.
	N	Function not active
SNMP User	Y	Permission to use SNMPv3 (encrypted)
	N	Function not active
Auto Connect	Y	Re-establish the previous user connection after login
	N	Function not active
AD group locked	Y	Lock synchronization of group attribute for an Active Directory user. This setting is required for a manual change of user groups for a specific Active Directory user.
	N	Function not active (default)

Creating a new Standard User Account

To create a new user, proceed as follows:

1. Select **Configuration > User Data** in the main menu.
2. Click the **New U.** button.
3. Enter a name.
4. Optionally enter a full name and a password.
5. Set user permissions for CPU access.
6. Click the **Okay** button to confirm the new user settings.

Creating a new LDAP User Account

To modify settings, proceed as follows:

1. Select **Configuration > User Data** in the main menu.
2. Click the **New LU** button to create a new LDAP user. This user functions as a bind user.
3. Enter the name of the bind user from the Active Directory into the field **Name**.
4. Enter the Common Name (CN) of the bind user from the Active Directory into the field **Login Name**.
5. Enter the password of the bind user from the Active Directory into the fields **Password** and **Repeat Password**.
6. Click the **Okay** button to confirm the creation of the user.

> A matrix configuration should only include one LDAP user and one LDAP group at the same time. The LDAP user and the LDAP group can be created, changed, or deleted during ongoing operation: No restart of the matrix is required.

Changing a User Account

To modify user settings, proceed as follows:

1. Select **Configuration > User Data** in the main menu.
2. Select a user in the **User List**.
3. Click the **Edit** button.
4. Modify the desired settings.
5. Click the **Okay** button to confirm your changes.

7.4.2   User Favorite List

Individual favorite lists of CPUs that will be switched frequently can be created for different users in this menu. A favorite list can contain up to 32 different CPU Devices (from firmware V3.05).

The switching of the favorites is done via keyboard commands (see chapter 9.1.1, page 258).
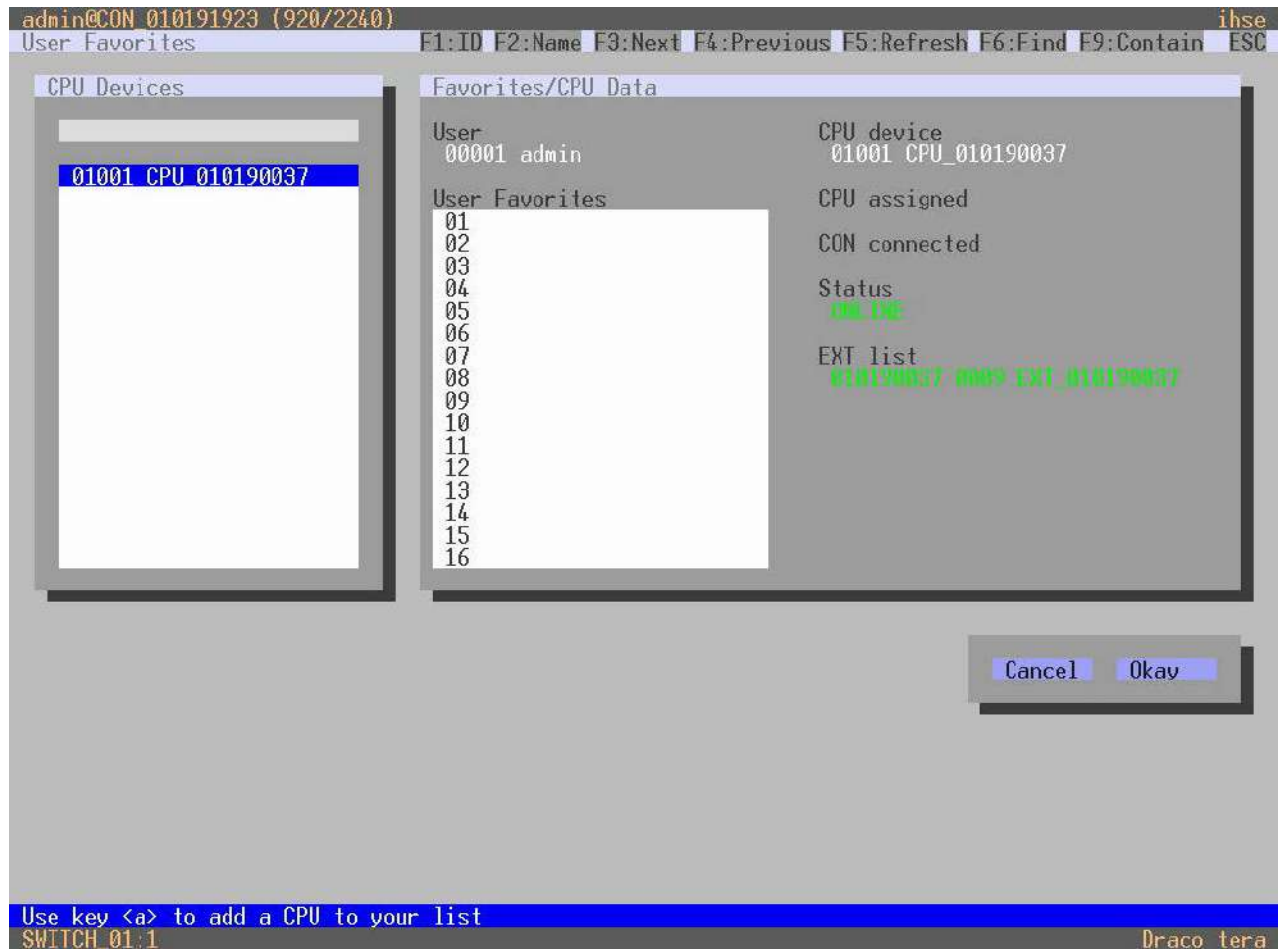

*Fig. 72   OSD Menu **Assignments - User Favorites***

To create a favorites list for your own user, proceed as follows:

1.   Select **Assignments > User Favorites** in the main menu.

2.   Select a CPU Device to be moved to the favorites list on the **User Favorites** list.

3.   Press the `<a>` key to move a CPU Device to the favorites list.
     To remove a CPU Device from the favorite list, press the `<r>` key.

4.   Optional: press the `<+>` or `<->` key to change the order of the CPU Devices within the favorites list.

5.   Click the **Okay** button to confirm the settings.

7.4.3   User Macros

In this menu macro commands for switching, disconnection or user administration can be created. Macro commands are created for each user separately.

A macro can execute up to 16 switching commands successively.

The execution of the macros is done via Hot Key and the `<F1>` to `<F16>` function keys (see chapter 9.1.3, page 260).

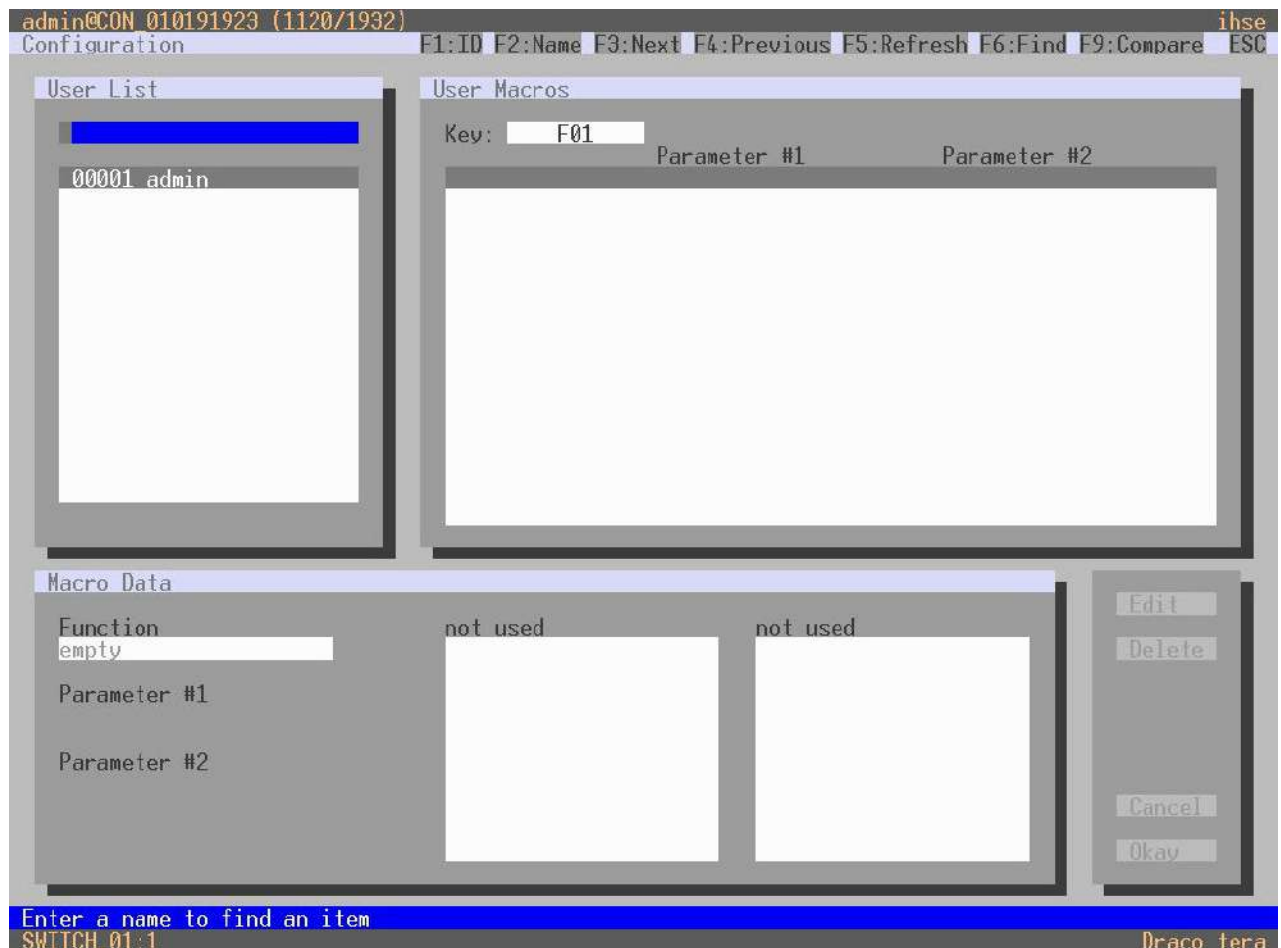ℹ️   To execute user macros the user has to be logged in to the matrix.

*Fig. 73   OSD Menu **Configuration - User List - User Macros***

The following parameters can be configured:

Field	Selection	Description
Function (01 to 16)	**Connect (P1=CON, P2=CPU)**	Set a bidirectional connection from CON Device P1 to CPU Device P2
	Connect Video (P1=CON, P2=CPU)	Set a Video Only connection from CON Device P1 to CPU Device P2
	Disconnect (P1=CON)	Disconnect the CON Device P1
	Logout User	Logout the current user
	Assign CPU (P1=VCPU, P2=RCPU)	Assign a Virtual CPU Device to a Real CPU Device

Field	Selection	Description
Function (01 to 16)	**Assign CON (P1=RCON, P2=VCON)**	Assign a Real CON Device to a Virtual CON Device
	Push (P1=CON)	The user's Full Access connection is forwarded to CON Device P1 and is changed into a Video Only connection.
	Push Video (P1=CON)	The video signal of the current connection (Full Access or Video Only) is forwarded to CON Device P1. The user's connection remains unchanged (Full Access or Video Only).
	Get (P1=CON)	The user's CON Device gets a Full Access connection to the CPU Device that is currently connected to CON Device P1. The connection of CON Device P1 is changed into a Video Only connection.
	Get Video (P1=CON)	The user's CON Device gets a Video Only connection to the CPU Device that is currently connected to CON Device P1. The connection of CON Device P1 remains unchanged (Full Access or Video Only).
	Login User console P2	Login a certain user P1 at CON Device P2
P1	**CON or CPU Device**	Name of CON Device or CPU Device
P2	**CON or CON Device**	Name of CON Device or CPU Device

ℹ️ The macros can also be used to switch to CPU groups.

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

1. Select via **Configuration > User Macros** in the main menu the user for which a user macro has to be created.
2. Select in the **Key** field the function key for which a macro has to be created.
3. Select the position in the **Key** list where a macro command is to be inserted.
4. Select a macro command in the **Macro Data** field.
5. Set the necessary parameters **P1** and **P2** (e.g., CON Devices or CPU Devices) for the selected macro command.
6. Click the **Okay** button to confirm your selection.
7. Repeat the process for further macro commands if necessary.

7.4.4   User Groups

The KVM matrix allows to bundle the users of a configuration into User Groups. The groups can be used to subdivide the users logically or thematically. As an application example you can group all power users together. The configuration of User Groups at the same times increases the clarity of the configuration.

*Fig. 74   OSD Menu **Configuration - User Data***

The following functions are available:

Button	Function
New G.	Create a new group
Edit	Edit an existing user
Delete	Delete an existing user
Cancel	Reject changes
Okay	Apply changes

The following keyboard commands are available:

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

Creating and Configuring a Standard User Group

To create and configure a Standard User Group, proceed as follows:

1. Select **Configuration > User Data** in the main menu.
2. Click the **New G.** button.
3. Enter a group name into the field **Name**.
4. Click the **Okay** button to confirm the group creation.

Creating and Configuring an LDAP Group

1. Select **Configuration > User Data** in the main menu.
2. Click the **Groups** tab in the working area.
3. Click the **New LG** button to create a new LDAP group.

   The group determines which users of the Active Directory server should be synchronized.
4. Enter a name into the field **Name**.
5. Enter either the Common Name (CN) of a group or the Common Name (CN) of an organizational unit into the field **LDAP OU=/CN=** as shown below:

   - OU= name of the organizational unit
   - CN= name of the group

   Note: The field entry must include either OU= or CN=.
6. Click the **Okay** button to confirm the creation of the group.

   The Active Directory synchronization can be used now.

> ℹ️ A matrix configuration should only include one LDAP user and one LDAP group at the same time. The LDAP user and the LDAP group can be created, changed or deleted during ongoing operation: No restart of the matrix is required.

Assigning a User to a Group

To assign a user to a group, proceed as follows:

1. Select **Configuration > User Data** in the main menu.
2. Select the user to be assign to a User Group.
3. Select the User Group for the assignment in the field **Member of Group** using the cursor up and down keys.
4. Click the **Okay** button to confirm the group creation.

7.5   Extender Settings

The matrix automatically recognizes every extender module, physically connected to the matrix with a direct cable connection, reads out its serial number and creates EXT Units automatically. This is the Flex Port function of the matrix. Dual-Head extender modules will be recognized as two independent EXT Units.

Add-on modules are not created as independent EXT Units. The data of add-on modules is included in one EXT Unit together with the associated extender module.

All EXT Units are managed in this menu. This includes the creation of new EXT Units and the deletion of existing EXT Units.

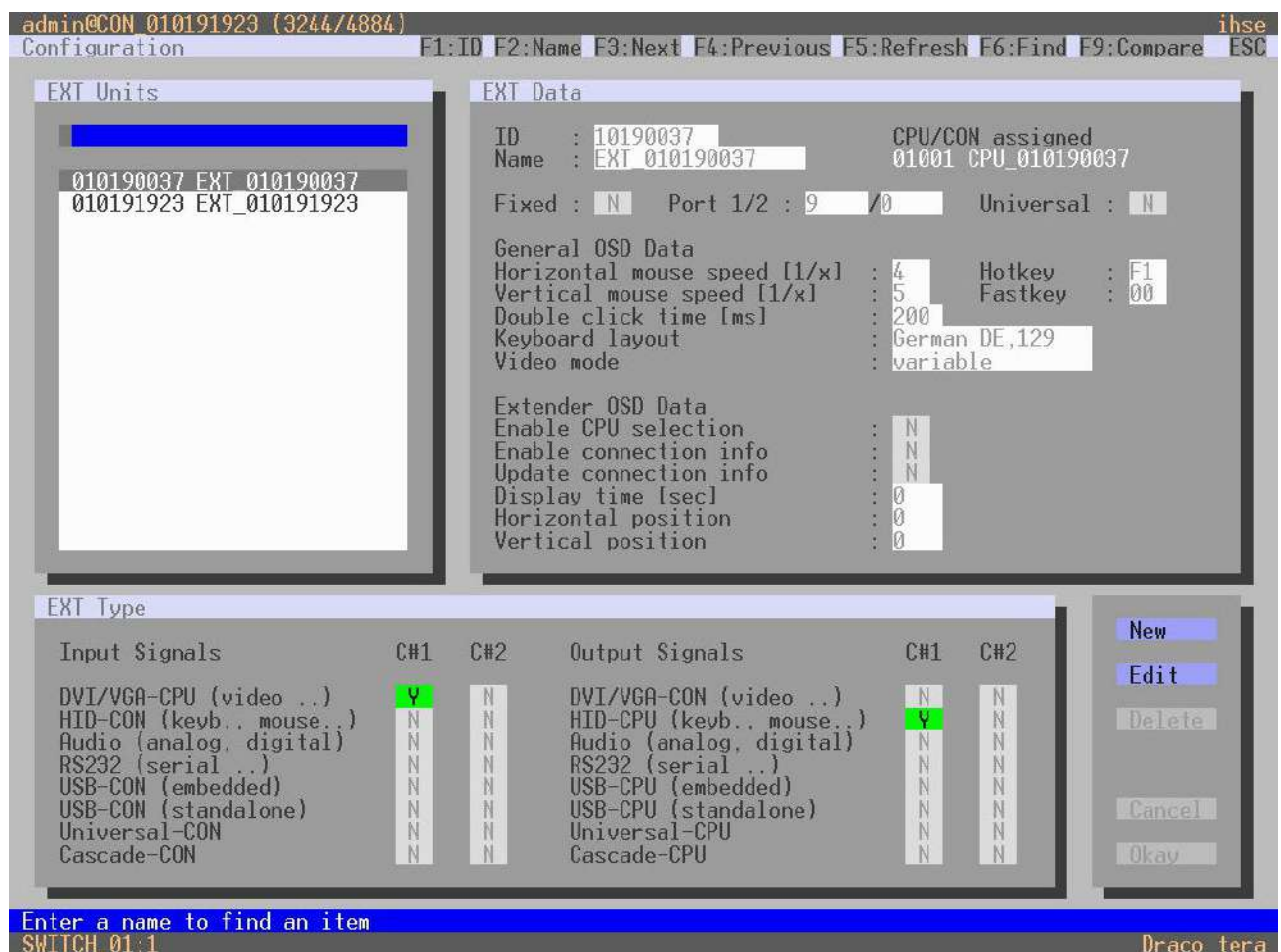| NOTICE |
| --- |
| The connection of a fixed port extender module (e.g., USB 2.0) to a Flex Port can cause unintended results. EXT Units for USB 2.0 extender modules have to be created manually (see chapter 7.6, page 96). |

Fig. 75   OSD Menu **Configuration - EXT Units**

The following functions are available:

Button	Function
New	Create a new EXT Unit
Edit	Edit an existing EXT Unit
Delete	Delete an existing EXT Unit
Cancel	Reject changes
Okay	Apply changes

The following parameters can be configured:

Field	Entry	Description
ID	-	Numerical value of the KVM extender module ID. The ID is provided by the extender module (serial number) and cannot be changed.
Name	Text	Name of the EXT Unit
Fixed	Y	Create an EXT Unit with a fixed port assignment (default)
	N	Function not active (default)
Port 1/2	1 to 160 (depending on the matrix)	• Port 1: port number of the matrix the extender module is currently connected • Port 2: redundant port number of the matrix the extender module is currently connected

ℹ The settings for the **General OSD Data** are described in chapter 7.8.2, page 107.

7.6   Configuring an USB 2.0 Extender

This chapter helps you to configure and use your USB 2.0 EXT Units. USB 2.0 EXT Units can be configured for independent switching or can be assigned to already existing CON Devices or CPU Devices

*Fig. 76   OSD Menu **Configuration - EXT Units***

To configure a USB 2.0 EXT Unit, proceed as follows:

1. Select **Configuration > EXT Units** in the main menu.

2. Click the **New** button.

    An EXT Unit with an eight-digit ID will be created, starting with digit **9**.

3. Enter an appropriate name for the EXT Unit in the **Name** field.

4. Enter the port number of the matrix the USB 2.0 extender module is currently connected into the **Port** field.

5. To configure the created extender as a CON Unit:

    5.1. Set the **USB-CON** (**standalone**) option to **Y** (**C#1** in the **Input Signals** column).

    5.2. Click the **Okay** button to confirm the setting.

6. To configure the created extender as a CPU Unit:

    6.1. Set the **USB-CPU** (**standalone**) option to **Y** (**C#1** in the **Output Signals** column).

    6.2. Click the **Okay** button to confirm the setting.

7. Click the **Okay** button to confirm the settings.

8. Restart the I/O board to activate the USB fixed port for the new EXT Unit.

    After restart of the I/O board, the parameters and settings of the USB 2.0 extender module are shown in the respective EXT Unit.

9. The USB 2.0 CPU/CON EXT Unit has to now be either assigned to an existing CPU/CON Device or a new CPU/CON Device has to be created for the assignment:

    -   for a **CPU Device** see chapter 7.7.1, page 98,

    -   for a **CON Device** see chapter 7.8.3, page 109

10. If you use parallel operation within the matrix, set the **Release Time** in the **System Settings > Switch** menu to **10 s** or more (see chapter 8.4.5, page 146).

11. Restart all I/O boards on which USB 2.0 EXT Units have been configured or alternatively restart the matrix.

    The USB 2.0 EXT Units are now configured and can be used.

Manually created EXT Units are always set as fixed port EXT Units. This configuration is necessary if you want to switch, e.g., USB 2.0 connections via the matrix.

To make a fixed port available again for Flex Port EXT Units after deleting a fixed port EXT Unit, a restart of the I/O board is necessary.

7.7 Configuring CPU Settings

7.7.1 Setting CPU Devices

New CPU Devices are configured in this menu including their assignment to EXT Units.

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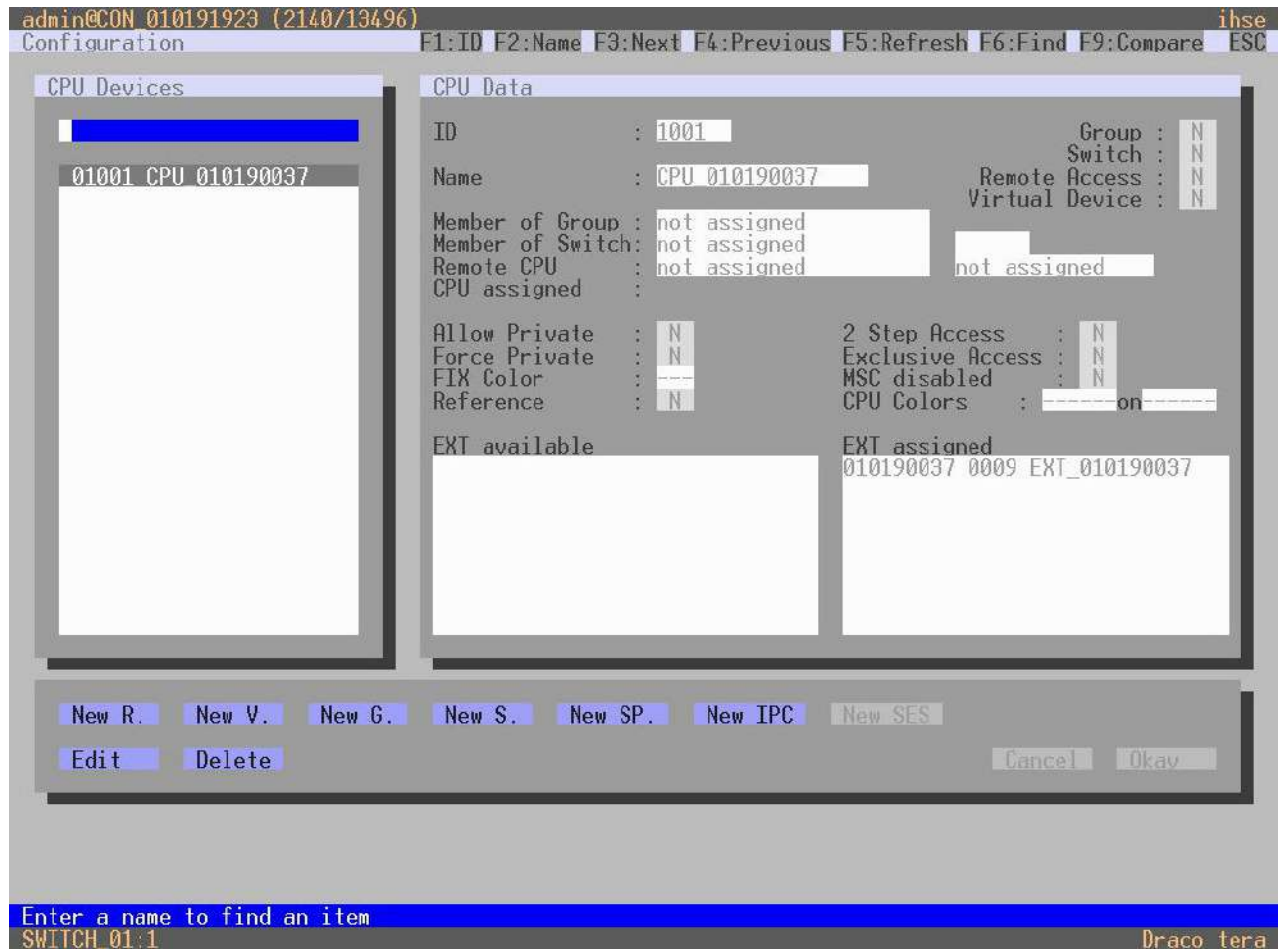

*Fig. 77   OSD Menu **Configuration - CPU Devices***

The following functions are available:

Button	Function
New R.	Create a new real CPU Device
Edit	Edit an existing CPU Device
Delete	Delete an existing CPU Device
Cancel	Reject changes
Okay	Apply changes

The following parameters can be configured:

Field	Entry	Description
ID	Text	Ident number of the CPU Device
Name	Text	Name of the CPU Device
Member of Group	Selection	Assign the CPU Device to a group
Member of Switch	Selection	Assign the CPU input to the respective CPU Switch

Field	Entry	Description
Remote CPU	Selection	Assign an IP CPU Device to the respective IP CPU EXT Unit
CPU assigned	-	ID and name of the assigned Virtual CPU Device, cannot be changed, is retrieved automatically
Group	Y	Automatically set if the CPU Device is assigned to a CPU Group
	N	Function not active (default)
Switch	Y	Automatically set for a CPU Switch (484 Series)
	N	Function not active (default)
Remote Access	Y	Automatically set for an IP CPU Device
	N	Function not active (default)
Virtual Device	Y	Automatically set for a Virtual CPU Device
	N	Function not active (default)
Allow Private	Y	Allow switching to the respective CPU Device in Private Mode
	N	Function not active (default)
Force Private	Y	Force switching to the respective CPU only in Private Mode
	N	Function not active (default)
Fix Color	Selection list	Show a colored frame at the CPU Device. You can select between 7 colors.
Reference	Y	Activate a reference CPU Device that inherits both Device and EXT Unit settings to any CPU Unit that is connected to the matrix for the first time. **Note**: It is recommended to activate the reference setting for one single CPU Device only.
	N	Function not active (default)
2 Step Access	Y	Open a pop-up window after switching to the particular CPU Device. In the background a Video Only connection will be established. A confirmation in the pop-up window is required to establish a Full Access connection to the CPU Device.
	N	Function not active (default)
Exclusive Access	Y	Activate an access limitation for the case that a CPU Device is already connected via Full Access connection. When having the same priorities, any additional access to the CPU Device can only be established with a Video Only connection. Having a lower priority any additional connection is not possible. Only when having a higher priority, an additional Full Access connection can be established, and K/M control can be taken over.
	N	Function not active (default)
MSC disabled	Y	Deactivate Multi-Screen Control function
	N	Activate Multi-Screen Control function
CPU Colors	Selection list	The CPU Device name will be highlighted according to the color setting for text and background. You can select between 16 colors.

To create a CPU Device, proceed as follows:

1. Select **Configuration > CPU Devices** in the main menu.
2. Click the **New R.** button to create a new real CPU Device or click the **New V.** button to create a new virtual CPU Device.
3. Enter a CPU Device name into the field **Name**.
4. Click the **Okay** button.

    The CPU Device is created now.

To assign an EXT Unit to a CPU Device, proceed as follows:

1. Select **Configuration > CPU Devices** in the main menu.
2. Select the CPU Device you want to assign an EXT Unit.
3. Select the EXT Unit for the assignment in the **EXT available** list.
4. Click the **Okay** button.

    The EXT Unit is assigned to the CPU Device now.

7.7.2   Setting CPU Groups

The KVM matrix allows to bundle the CPU Devices of a configuration into CPU groups. The groups can be used to subdivide the CPU Devices logically or thematically. As an application example you can group all CPU Devices together that are connected to a specific matrix in a matrix grid. The configuration of CPU groups at the same times increases the clarity of the configuration.
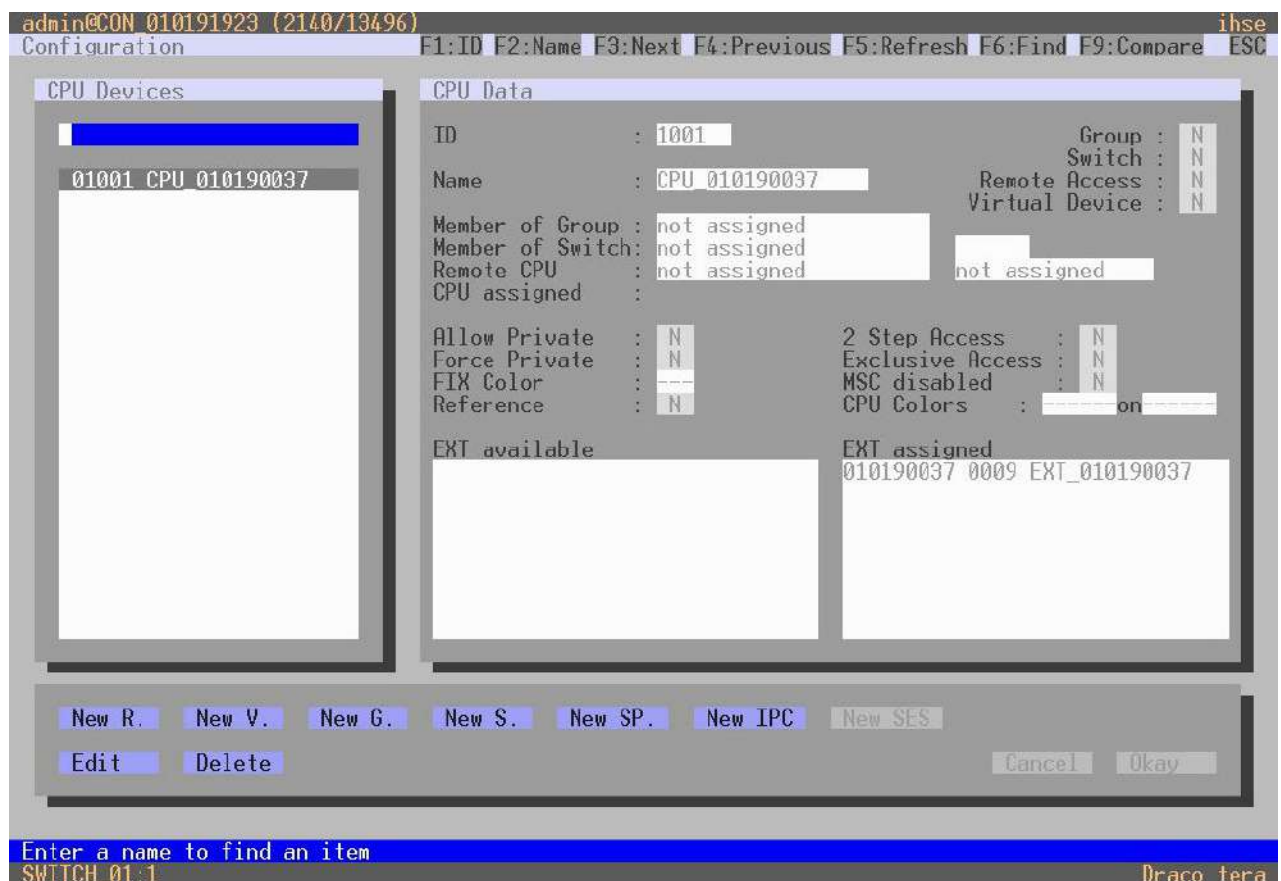

*Fig. 78   OSD Menu **Configuration - CPU Devices***

The following functions are available:

Button	Function
New G.	Create a new CPU Group
Edit	Edit an existing CPU Group
Delete	Delete an existing CPU Group
Cancel	Reject changes
Okay	Apply changes

The following parameters can be configured:

Field	Entry	Description
ID	Text	Ident number of the CPU Group
Name	Text	Name of the CPU Group
Member of Group	Selection	Assign the CPU Device to a group
Group	Y	Automatically set if the CPU Device is assigned to a CPU Group
	N	Function not active (default)

Further parameters are described in chapter 7.7.1, page 98.

To create a CPU Group, proceed as follows:

1. Select **Configuration > CPU Devices** in the main menu.
2. Click the **New G.** button.
3. Enter a CPU Group name into the field **Name**.
4. Click the **Okay** button.

    The CPU Group is created now.

To assign a CPU Device to a group, proceed as follows:

1. Select **Configuration > CPU Devices** in the main menu.
2. Select the CPU Device you want to assign to a CPU group.
3. Select the CPU Group for the assignment in the field **Member of Group** using the cursor up and down keys.
4. Click the **Okay** button.

    The CPU Device is assigned to the CPU Group now.

7.7.3   Configuring CPU Switch (484 Series)

The CPU Switch (484 Series) is an 8:1 port concentrator for up to eight sources (computer, CPU) attached via VGA and USB-HID (K/M).

This CPU Switch can be specifically configured for a use with a KVM matrix. The configuration allows to individually switch the up to eight input signals via OSD.
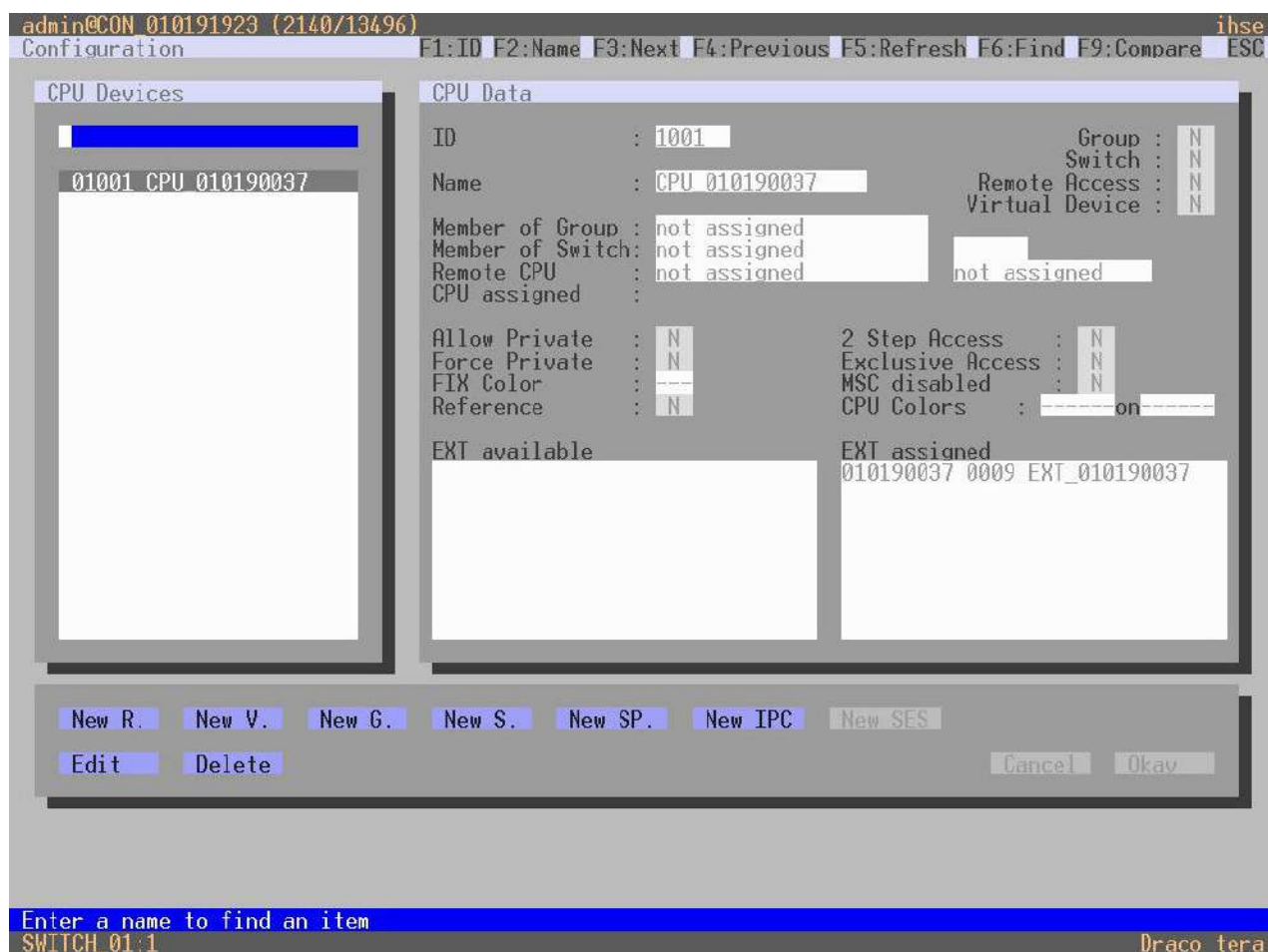

*Fig. 79   OSD Menu **Configuration - CPU Devices***

The following functions are available:

Button	Function
New S.	Create a new CPU Switch (484 series)
New SP.	Create a CPU EXT Unit for a CPU Switch
Edit	Edit an existing CPU Device
Delete	Delete an existing CPU Device
Cancel	Reject changes
Okay	Apply changes

The following parameters can be configured:

Field	Entry	Description
ID	Text	Ident number of the CPU Device
Name	Text	Name of the CPU Device
Member of Switch	Selection	Assign the CPU input to the respective CPU Switch
Switch	Y	Automatically set for a CPU Switch (484 Series)
	N	Function not active (default)

Further parameters are described in chapter 7.7.1, page 98.

To configure the CPU Switch for an individual switching of the single inputs, proceed as follows:

1. Select **Configuration > CPU Devices** in the main menu.
2. Click the **New S.** button.

   A new CPU Switch will be created.
3. Enter a CPU Switch name into the field **Name**.
4. Assign an EXT Unit to the CPU Switch into the field **EXT assigned**.
5. Click the **New SP.** button.

   A new CPU (input) for a CPU Switch will be created (Port 1).
6. Assign the created CPU input to a CPU switch in the field **Member of Switch**.
7. Repeat the steps 5. and 6. for each input port in use at the CPU Switch.
8. Click the **Okay** button.

   The CPU Switch is now configured and can be individually switched via OSD.

7.7.4   Assigning Virtual CPU Device

In this menu, either one or more Virtual CPU Devices can be assigned to a Real CPU Device.

With a Virtual CPU Device, the effort of switching several CON Devices to the same CPU Device can be reduced. If several CON Devices are connected to a Virtual CPU Device that is assigned to a Real CPU Device, you only have to change the Real CPU Device once and all consoles will receive the video signal of the new Real CPU Device.

> One Real CPU Device can be assigned to several Virtual CPU Devices.
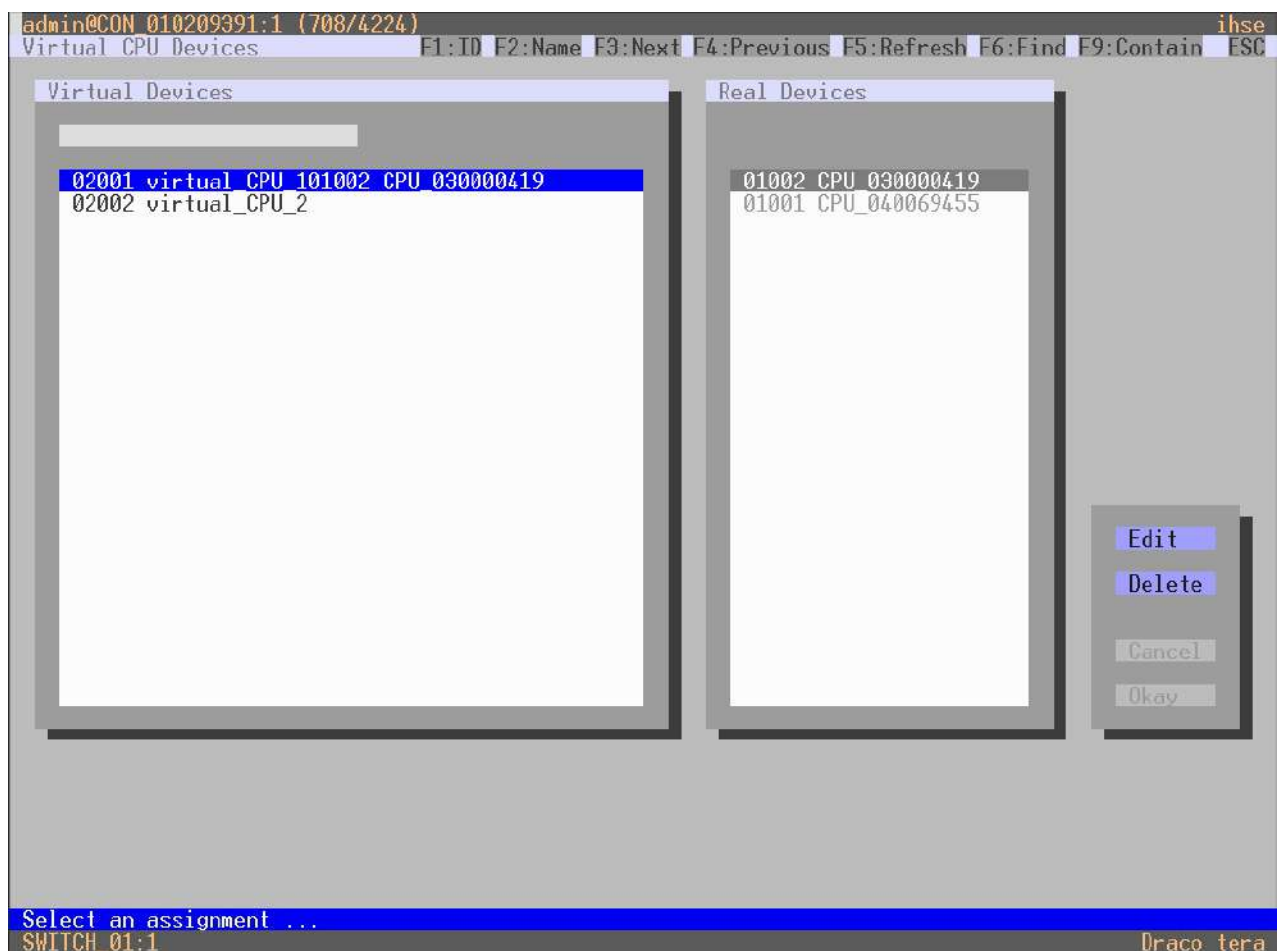
*Fig. 80   OSD Menu **Assignments - Virtual CPU Devices***

The following functions are available:

Button	Function
New V.	Create a new virtual CPU Device
Edit	Edit an existing CPU Device
Delete	Delete an existing CPU Device
Cancel	Reject changes
Okay	Apply changes

To assign Virtual CPU Devices to Real CPU Devices, proceed as follows:

1. Select **Assignments > Virtual CPU Devices** in the main menu.
2. Select the Virtual CPU Device in the **Virtual Devices** list that has to be assigned to a Real CPU Device.
3. Click the **Edit** button.
4. Select the Real CPU Device in the **Real Devices** list that has to be assigned to the selected Virtual CPU Device.
5. Click the **Okay** button to confirm the assignment.

   The selected Virtual CPU Device is assigned to the Real CPU Device.

7.8   Configuring Console Settings

Connecting a CON Unit to the matrix creates an EXT Unit in the matrix, reading the serial number of the CON Unit. An EXT Unit has to be assigned to a CON Device. Switching operation is only possible between CON Device and CPU Device. All steps to create switchable CON Devices are described in this chapter. Several Real CON Devices can be assigned to a Virtual CON Device to reduce operation efforts (see chapter 7.8.6, page 115).

7.8.1   OSD Configuration for Mouse and Keyboard

The OSD configuration for mouse and keyboard is made in this menu. The settings for mouse and keyboard are console-specific and can be set separately for each console.
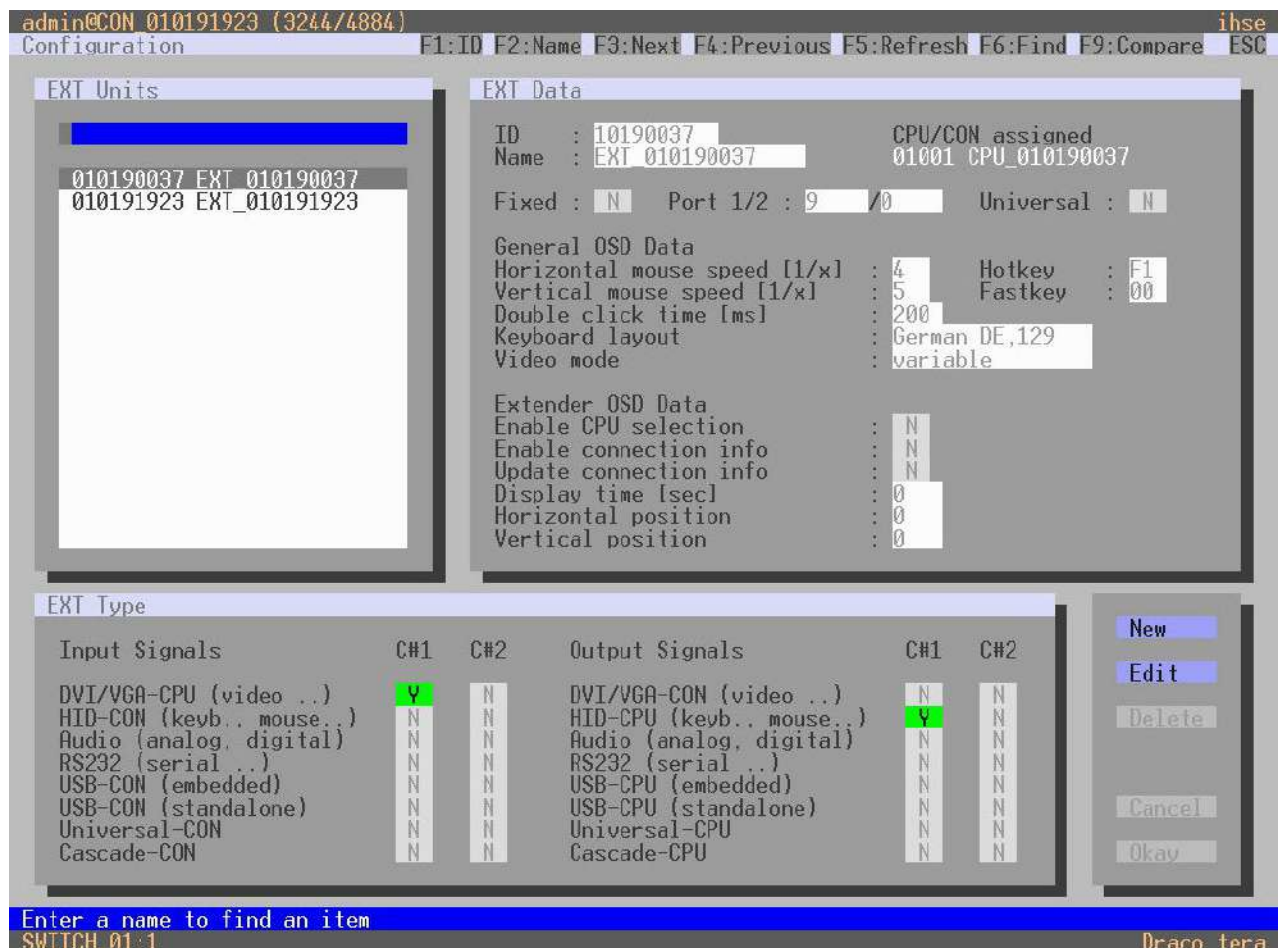
*Fig. 81   OSD Menu **Configuration - EXT Units***

The following parameters can be configured:

Field	Entry	Description
Hor. Speed 1/x	1 to 9	Adjustment of the horizontal mouse speed, 1 = slow, 9 = fast (default: 4)
Ver. Speed 1/x	1 to 9	Adjustment of the vertical mouse speed, 1 = slow, 9 = fast (default: 5)
Double-click	100 to 800	Adjustment of the time slot for a double-click (default: 200 ms)
Keyboard layout	Region	Set the OSD keyboard layout according to the used keyboard (default: German (DE))
Video Mode	Variable or specific resolution	Resolution that is used when opening OSD

To change the settings for mouse and keyboard, proceed as follows:

1. Select **Configuration > EXT Units** in the main menu.

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

3. Click the **Edit** button or press the <Enter> key to confirm the selection.

4. Modify the desired settings.

5. Click the **Okay** button to confirm your changes.

7.8.2   Setting Extender OSD

In this menu the parameters for the Extender OSD can be set. The settings for mouse and keyboard are console-specific and can be set separately for each console.

> When setting the horizontal OSD position, a prefixed minus describes the orientation to the right edge of the monitor, e.g., -2 means 2 x 10 = 20 pixels to this edge. When setting a vertical position, a prefixed minus describes the orientation to the bottom edge of the monitor.
>
> If the **Update connection info** function is deactivated, the Extender OSD only appears when switching via OSD.

Fig. 82   OSD Menu Configuration - EXT Units

The following parameters can be configured:

Field	Entry	Description
Enable CPU selection	Y	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 `<F7>` key within the selection list opens the standard OSD.
	N	Function not active (default)
Enable connection info	Y	Enable Extender OSD (default: Y)
	N	Function not active
Update connection info	Y	Update connection changes during fade-in of Extender OSD (default: Y)
	N	Function not active
Display Time [sec]	0 to 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)

To change the Extender OSD settings, proceed as follows:

1. Select **Configuration > EXT Units** in the main menu.
2. Select the console extender in the **EXT Units** list whose Extender OSD settings has to be adjusted.
3. Click the **Edit** button or press the `<Enter>` key to confirm the selection.
4. Modify the desired settings.
5. Click the **Okay** button to confirm your changes.

7.8.3   Setting CON Devices

New CON Devices are created in this menu including access rights and assignment to EXT Units.
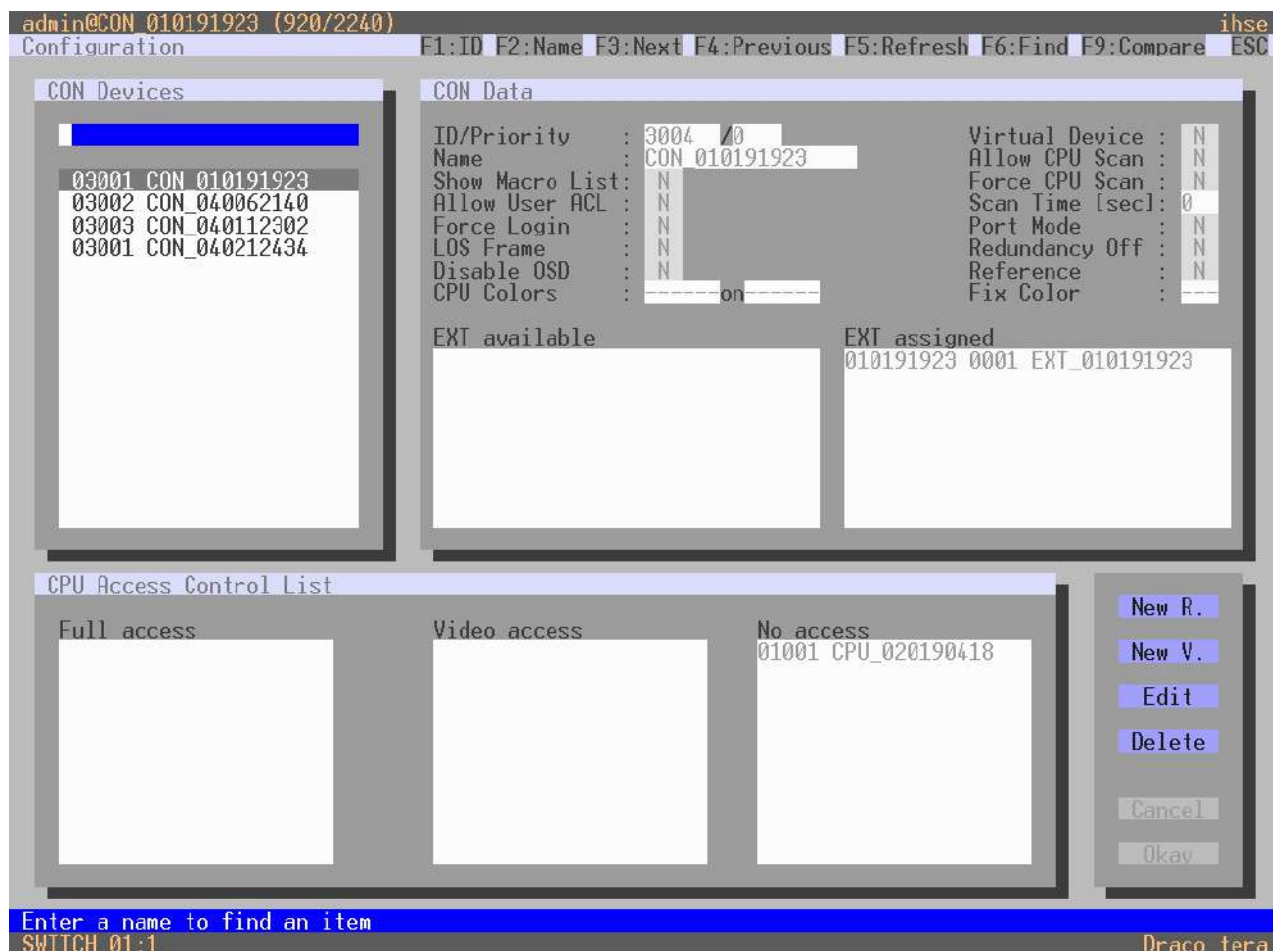

Fig. 83   OSD Menu Configuration - CON Devices

The following functions are available:

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
Okay	Apply changes

The following parameters can be configured:

Field	Entry	Description
ID	Text	ID of the CON Device
Priority	0 to 999	Priority of the CON Device **Note:** There is no K/M sharing between CON Devices with a different priority and the release time does not come into account. CON Devices only have Video Only access to a CPU Device if a CON Device with a higher priority is already switched to it.
Name	Text	Name of the CON Device
Show Macro List	Y	Show the macro list instead of the CPU Device selection list
	N	Function not active (default)
Allow User ACL	Y	Allow activation of the User ACL at the local CON Device
	N	Function not active (default)
Force Login	Y	The user has to login with a username and a password once to enter OSD. Thereafter the user remains logged in until he explicitly logs out or an auto logout is affected. **Note:** When using the **Force Login** function, Console ACL are still active. When the **Force Login** function is activated and a user is logged in, only the user favorites are available. The CON favorites are not accessible.
	N	Function not active (default)
LOS Frame	Y	• When the video signal between source (computer, CPU) and the CPU Unit or the connection between matrix and the CON Unit is lost, an orange frame will be displayed. • When switching to a CPU without video signal, a blank screen will appear surrounded by an orange frame.
	N	Function not active (default)
Disable OSD	Y	Disable OSD access for the respective CON Device
	N	Function not active (default)
CPU Colors	Selection list	The CPU Device name will be highlighted according to the color setting for text and background. You can select between 16 colors.
Virtual Device	Y	Automatically set for a Virtual CON Device
	N	Function not active (default)
Allow CPU Scan	Y	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.
	N	Function not active (default)
Force CPU Scan	Y	Force 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. **Note:** An active scanner can be stopped by a mouse or keyboard event. You gain Full Access for the currently switched CPU Device if Force Connect is activated.
	N	Function not active (default)
Scan Time [sec]	0 to 99 seconds	Retention period until switching to the next CPU Device

Field	Entry	Description
Port Mode	Y	The favorite list will be replaced by a port list where the ports from 1-999 can be directly selected at each matrix or Matrix Grid. **Note:** The selection only works for CPU Devices and has to be made according to the switching of favorites. When using the Port Mode, CON and User favorites will be deactivated.
	N	Function not active (default)
Redundancy Off	Y	Function is not active
	N	Automatically switch to the second link of a connected redundant CON Unit when losing the primary link of a CPU Unit (default).
Reference	Y	Activate a reference CON Device that inherits both Device and EXT Unit to any CON Unit that is connected to the matrix for the first time. **Note**: It is recommended to activate the reference setting for one single CON Device only.
	N	Function not active (default)
Fix Color	Selection list	Show a colored frame when being connected to the respective CPU Device. You can select between seven colors. The colored frame of the CPU device is displayed with priority to the one of the CON Device.

To create a CON Device, proceed as follows:

1. Select **Configuration > CON Devices** in the main menu.
2. Click the **New R.** button to create a new Real CON Device or click the **New V.** button to create a new Virtual CON Device.
3. Enter a CON Device name into the field **Name**.
4. Click the **Okay** button.

   The CON Device is created now.

To assign an EXT Unit to a CON Device, proceed as follows:

1. Select **Configuration > CON Devices** in the main menu.
2. Select the CON Device you want to assign an EXT Unit.
3. Select the EXT Unit for the assignment in the **EXT available** list.
4. Click the **Okay** button.

   The CON Device is assigned to the EXT Unit now.

7.8.4   Setting CON Device Favorites

Individual favorite lists of CPUs to be switched frequently can be created for all consoles in this menu. A favorite list can contain up to 32 different CPU Devices (from firmware V3.05).

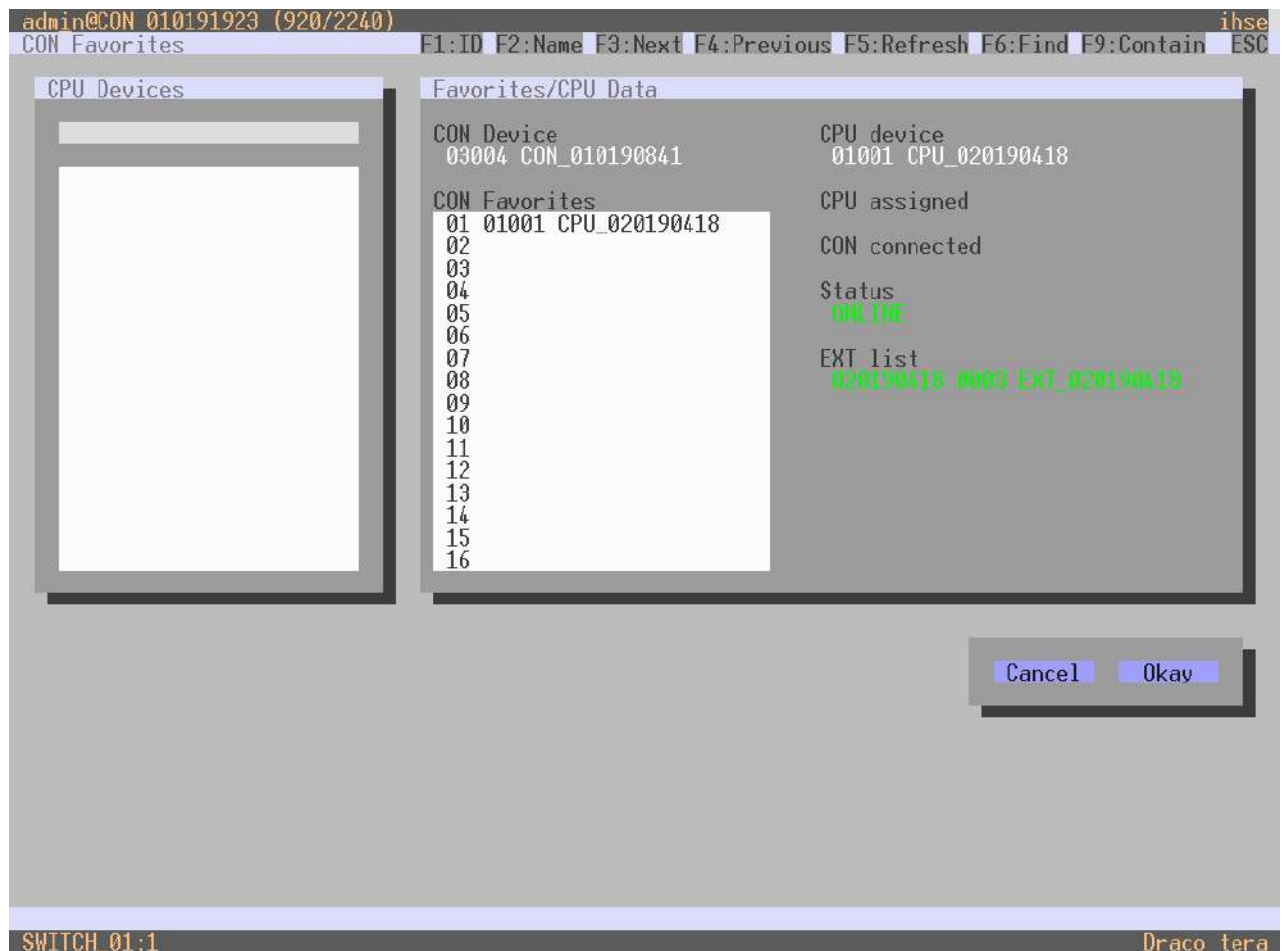The switching of the favorites is done via Hot Key using the keyboard (see chapter 9.1.1, page 258).

Fig. 84   OSD Menu Assignments - CON Favorites

To create a favorite list for your own CON Device, proceed as follows:

1.   Select **Assignments > CON Favorites** in the main menu.

2.   Select a CPU Device to be moved to the favorite list on the **CPU Devices** list.

3.   Click the `<a>` key to move a CPU Device to the favorites list.
     To remove a CPU Device from the favorite list, click the `<r>` key.

4.   Optional: press the `<+>` or `<->` key to change the order of the CPU Devices within the favorites list.

5.   Click the **Okay** button to confirm the settings.

7.8.5   Setting CON Device Macros

In this menu macro commands for switching, disconnection or user administration can be created. The macro commands are created for each console separately. Up to 32 macros can be configured for each CON Device. A macro can execute up to 16 switching commands successively.

The execution of the macros is done via Hot Key and the function keys <F1> to <F16> (see chapter 9.1.3, page 260).

ℹ️   The macros can also be used to switch to CPU groups.

*Fig. 85   OSD Menu **Configuration - CON Macros***

The following parameters can be configured:

Field	Selection	Description
Function (01 to 16)	**Connect (P1=CON, P2=CPU)**	Set a bidirectional connection from CON Device P1 to CPU Device P2
	Connect Video (P1=CON, P2=CPU)	Set a Video Only connection from CON Device P1 to CPU Device P2
	Disconnect (P1=CON)	Disconnect the CON Device P1
	Logout User	Logout the current user
	Assign CPU (P1=VCPU, P2=RCPU)	Assign a Virtual CPU Device to a Real CPU Device

Field	Selection	Description
Function (01 to 16)	**Assign CON (P1=RCON, P2=VCON)**	Assign a Real CON Device to a Virtual CON Device
	Push (P1=CON)	The user's Full Access connection is forwarded to CON Device P1 and is changed into a Video Only connection.
	Push Video (P1=CON)	The video signal of the current connection (Full Access or Video Only) is forwarded to CON Device P1. The user's connection remains unchanged (Full Access or Video Only).
	Get (P1=CON)	The user's CON Device gets a Full Access connection to the CPU Device that is currently connected to CON Device P1. The connection of CON Device P1 is changed into a Video Only connection.
	Get Video (P1=CON)	The user's CON Device gets a Video Only connection to the CPU Device that is currently connected to CON Device P1. The connection of CON Device P1 remains unchanged (Full Access or Video Only).
	Login User console P2	Login a certain user P1 at CON Device P2
P1	**CON or CPU Device**	Name of CON Device or CPU Device
P2	**CON or CPU Device**	Name of CON Device or CPU Device

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

1. Select **Configuration > CON Macros** in the main menu.
2. Select the CON Device for which a console macro is to be created.
3. Select in the **Key** field the function key (`<F1>` to `<F32>`) for which a macro should be created.
4. Select the respective place on the list (1 to 16) for the key that should be set with a macro key.
5. Select for the highlighted position on the list a macro command in the **Macro Data** field.
6. Set the necessary parameters **P1** and **P2** (e.g., CON Devices or CPU Devices) for the selected macro command.
7. Confirm your inputs by pressing `<Enter>` and repeat the process for further macro commands if necessary.

7.8.6   Assigning Virtual CON Devices

In this menu, several Real CON Devices can be assigned to a Virtual CON Device.

This function reflects changes in permission made to Virtual CON Devices onto Real CON Devices. Virtual CON Devices can be switched in the same way as Real CON Devices. Real CON Devices that are assigned to a Virtual CON Devices that is connected to a CPU Device will receive the video signal. The last assigned CON Device will also have control of the keyboard and mouse.

> ℹ️ A Virtual CON Device can be assigned to more than one Real CON Devices.
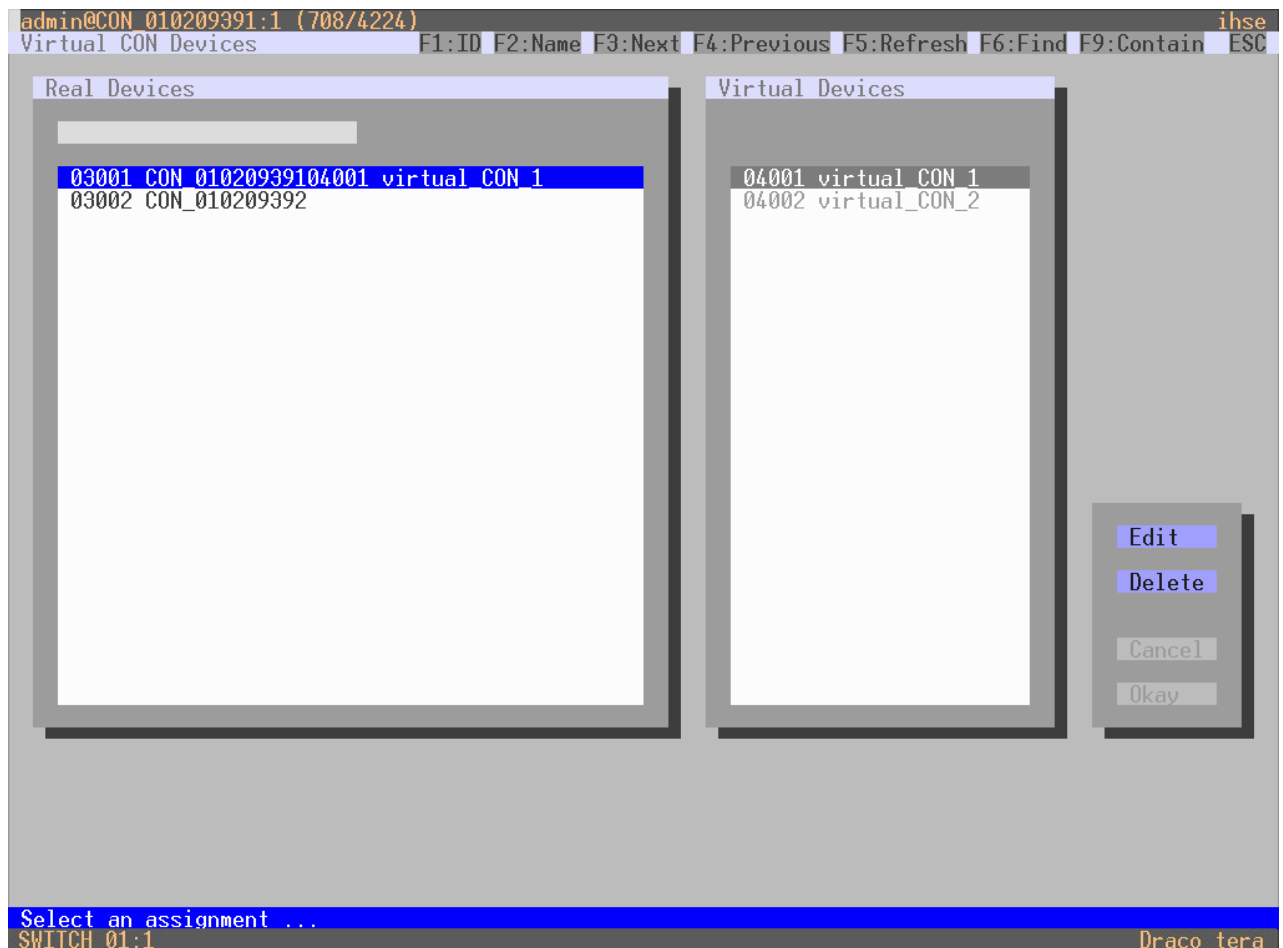
*Fig. 86   OSD Menu **Assignments - Virtual CON Device***

For an assignment, proceed as follows:

1.   Select **Assignments > Virtual CON Devices** in the main menu.

2.   Select the Real CON Device in the **Real Devices** list that has to be assigned to a Virtual CON Device.

3.   Click the **Edit** button.

4.   Select the virtual console in the **Virtual Devices** list that has to be assigned to the selected Real CON Device.

5.   Click the **Okay** button to confirm the assignment.

The selected Virtual CON Device is assigned to the Real CON Device.

7.8.7   Enabling Multi-Screen Control

✅ Due to limited options via OSD, we recommend configuring the Multi-Screen Control only via management software to carry out the extended configuration options (from firmware V03.08), see chapter 8.9.7, page 223.

When using Multi-Screen Control, switching up to eight connected sources (computers, CPUs) can be performed at one sink with only one connected mouse and/or keyboard. The sink can consist of up to eight CON Units and accordingly up to eight monitors, or up to sixteen monitors when using Dual-Head extender modules. In a matrix system, Multi-Screen Control can be set up at multiple sinks. The CON Units of a sink with Multi-Screen Control must all be physically connected to the same block of 8 ports on the I/O board.

One of the CON Devices is designated for USB-HID control of the connected sources, below referred to as "Control CON Device". Control CON Devices are referred to the extender modules/EXT Units within the Multi-Screen Control that are connected to keyboard and mouse for operation. If the control has to be performed via several USB-HID devices, several CON Devices have to be defined as Control CON Device.

Smooth switching of sources with the mouse is performed by dragging the mouse pointer beyond the respective display to an adjacent display in an arrangement of displays. The displays can be arranged side by side, in a grid layout, or completely freely. Alternatively, switching can be performed via keyboard commands according to the ID number in the Multi-Screen Control setup.

NOTICE
When using CON Units with the possibility to connect a local source (computer, CPU) in a Multi-Screen Control environment, the local switching will be disabled.

ℹ️ When configuring Multi-Screen Control via OSD, the number of supported displays is limited to four.
➡ To configure more than four displays (up to eight with Single-Head and up to sixteen with Dual-Head installation), you have to configure the Multi-Screen Control only via management software.

ℹ️ The connected sources (computer, PC) need to support absolute mouse mode. Else a specific mouse driver needs to be installed.

✅ CON Units that have been already configured for Multi-Screen Control can be connected all together to other blocks of 8 ports. In this case any further configuration is not necessary, their functionality will remain as set previously.

*Fig. 87   OSD Menu **Assignments - Multi-Screen Control***

The following parameters can be configured:

Field	Entry	Description
Enable	Y	Activate the respective display for Multi-Screen Control
	N	Function not active (default)
Control	Y	Enable the CON Device for USB-HID control of other CON Devices if access is permitted
	N	Function not active (default)
Owner	Selection	• Shared (default) permits the access from a Control CON Device to all other CON Devices except to another Control CON Device • Name of the own Control CON Device to restrict access to other CON Devices
Frame	0 to 999 seconds	Time for fading in a red frame at the display with current mouse/keyboard control

> **ℹ** Configure the Multi-Screen Control at a CON Device that should be used to control USB-HID in the setup. To change or delete a Multi-Screen Control setup, you have to open the OSD of the defined Control CON Device.

Configuring Multi-Screen Control

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

1. Open the OSD of a CON Unit connected to an I/O board for which the connected CON Units are to be configured for Multi-Screen Control.

2. Select **Assignments > Multi-Screen Control** in the main menu.

   Only the CON EXT Units connected to the selected I/O board are visible.

3. In the **Arrangement** field, select the layout for 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.

4. Activate **Manual** option if the USB-HID switching is to be restricted to keyboard commands (see chapter 9.1.5, page 261). Manual switching allows the use of multi-head consoles.

5. Set the **Enable** option to **Y** on all CON Devices to activate the respective display for Multi-Screen Control.

6. Set the **Control** function to **Y** on one or more CON Devices to be enabled as Control CON Device.

7. Use the **Frame** function to configure a red frame that shows the display with current mouse control, for the duration of a specified time by flashing briefly. The frame can be activated individually for each screen by using a timer > 0 seconds.

> **ℹ** All Control CON Devices are enabled to control USB-HID of all other CON Devices in the setup except of another Control CON Device. To restrict the access to other CON Devices, see following section.

> **ℹ** To configure Multi-Screen Control for further I/O boards via OSD, connect to the I/O board at a CON Device that should be used to control USB-HID in the setup.

Access Restriction when using Multiple Control CON Devices

Dragging the mouse pointer over the display border is only permitted for those displays whose CON Device is enabled for access by the owner of the respective Control CON Device.

To enable access to a display for only one Control CON Device, proceed as follows:

1. Click in the **Owner** field of a Control CON Device and select the name of the Control CON Device.

2. Click in the **Owner** field of all Control CON Device whose display should be accessible and select the name of the respective Control CON Device.

   The mouse can now be used to access those displays whose CON Device is permitted for access by the enabled Control CON Device.

No simultaneous USB HID sharing of multiple Control CON devices.

Example: In a setup of 4 CON Devices, if CON Device 1 and 2 are each Control CON Devices and two other "non-Control CON Devices" are configured, both Control CON Devices can access the displays of CON Device 3 to 4 if they are configured with **Owner = Sharing**.

However, Control CON Device 1 and 2 cannot access the display of a "non-Control CON Device" at the same time. The Control CON Device that first had USB-HID control is reset to its "own" display when the second Control CON Device takes over.

Changing Multi-Screen Control

To change the Multi-Screen Control for a setup of a specific I/O board, proceed as follows:

1. Open the OSD of a Control CON Device of the specific I/O board.

2. Select **Assignments > Multi-Screen Control** in the main menu.

   Only the CON EXT Units connected to the selected I/O board are visible.

3. Make any edits at the configuration.

4. Click the **Okay** button to confirm the changes.

Deleting Multi-Screen Control

To delete the Multi-Screen Control for a setup of a specific I/O board, proceed as follows:

1. Open the OSD of a Control CON Device of the specific I/O board.

2. Select **Assignments > Multi-Screen Control** in the main menu.

   Only the CON EXT Units connected to the selected I/O board are visible.

3. Set the **Enable** option to **N** on all CON Devices.

   The Multi-Screen Control is disabled for all CON Devices of the selected I/O board.

4. Click the **Okay** button to confirm the changes.

7.9   Configuring Matrix Cascading

This simple method of cascading allows a switchable connection between two matrices via so called **Tie Lines**. The Matrix Cascading does not require **Bundle 4**.

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 due to reasons of redundancy.

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

To connect Tie Lines to the matrices, you have to create intended **Cascade CON Devices** and **Cascade CPU Devices** that have to be switched within the cascaded environment.

> Define a Master Matrix. All further matrices will be configured as Sub Matrices in the configuration process. Ensure that the Tie Lines will only be connected after finishing the configuration.

7.9.1   Directing a Tie Line from the Sub to the Master

To configure settings for using Matrix Cascading and to direct the Tie Line from the Sub to the Master, proceed as follows:

1. Open the OSD of the Master Matrix.

2. Select **Configuration > EXT Units** in the main menu of the Master Matrix.

   2.1. Click the **New** button.

      A new EXT Unit will be created.

*Fig. 88   OSD Menu **Configuration - EXT Units***

2.2. Enter an appropriate name for the Cascading CPU Unit into the **Name** field.

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

2.4. Set the **Cascade-CPU** option to **Y** (**C#1**) in the **Output Signals** column.

2.5. Click the **Okay** button to confirm the creation of a Cascading CPU Unit.

3. Select **Configuration > CPU Devices** in the main menu of the Master Matrix.

    3.1. Click the **New R.** button.

       A switchable CPU Device will be created.
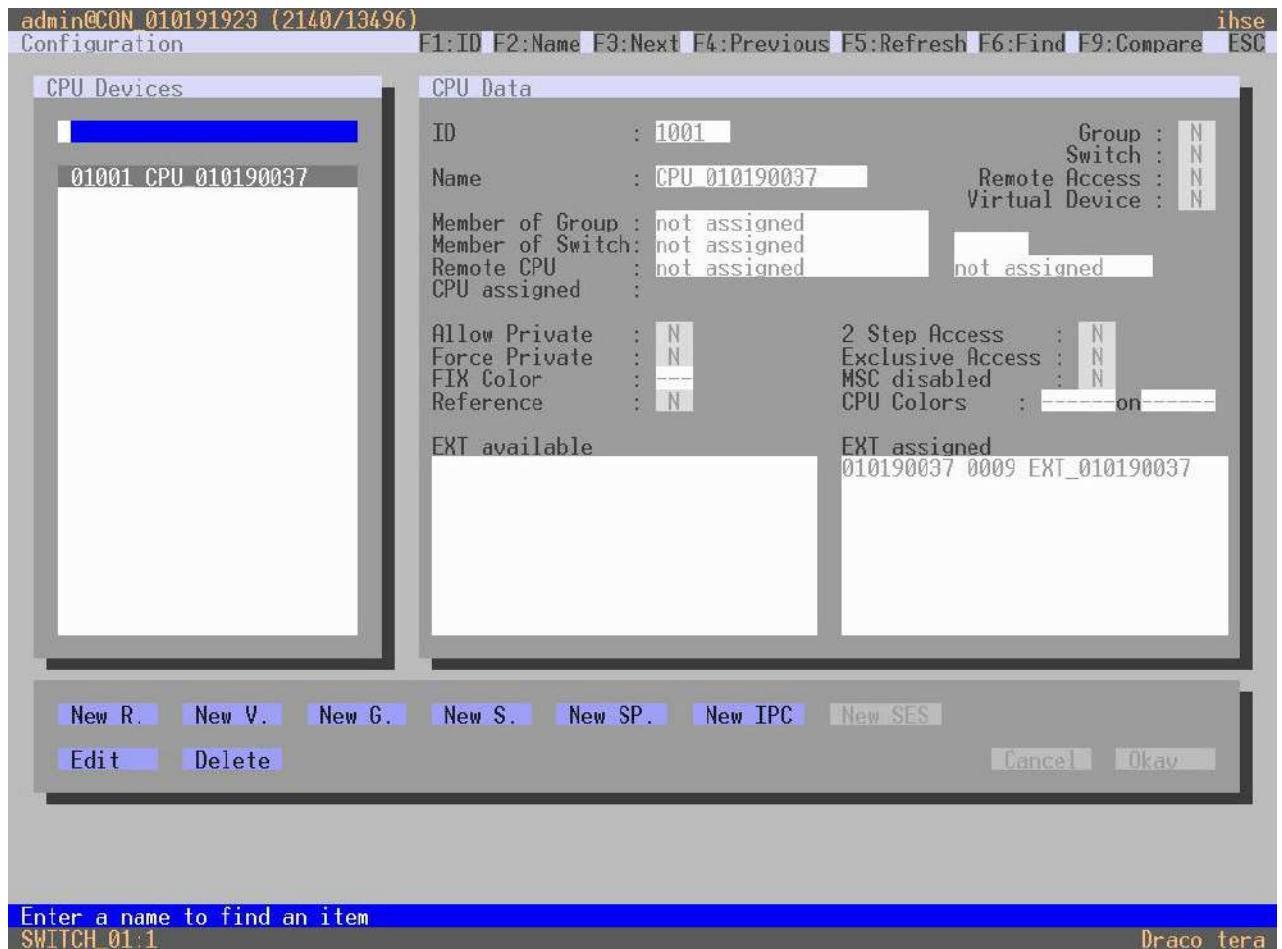
*Fig. 89   OSD Menu **Configuration - CPU Devices***

3.2. Enter an appropriate Cascading CPU Device into the Name field.

3.3. Select the previously configured Cascading CPU Unit in the Extender available list.

3.4. Press the <a> key to move the Cascading CPU Unit to the EXT assigned list.

    The assignment is displayed in the **Extender assigned** list.

3.5. Click the Okay button to confirm the assignment.

4. Open the OSD of the Sub Matrix.

5. Select **Configuration > EXT Units** in the main menu of the Sub Matrix.

    5.1. Click the **New** button.

        A new EXT Unit will be created.

*Fig. 90   OSD Menu **Configuration - EXT Units***

    5.2. Enter an appropriate name for the Cascading CON Unit into the **Name** field.

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

    5.4. Set the **Cascade-CON** option to **Y** (**C#1**) in the **Input Signals** column.

    5.5. Click the **Okay** button to confirm the creation of a Cascading CON Unit.

6.   Select **Configuration > CON Devices** in the main menu of the Sub Matrix.

   6.1.   Click the **New R.** button.
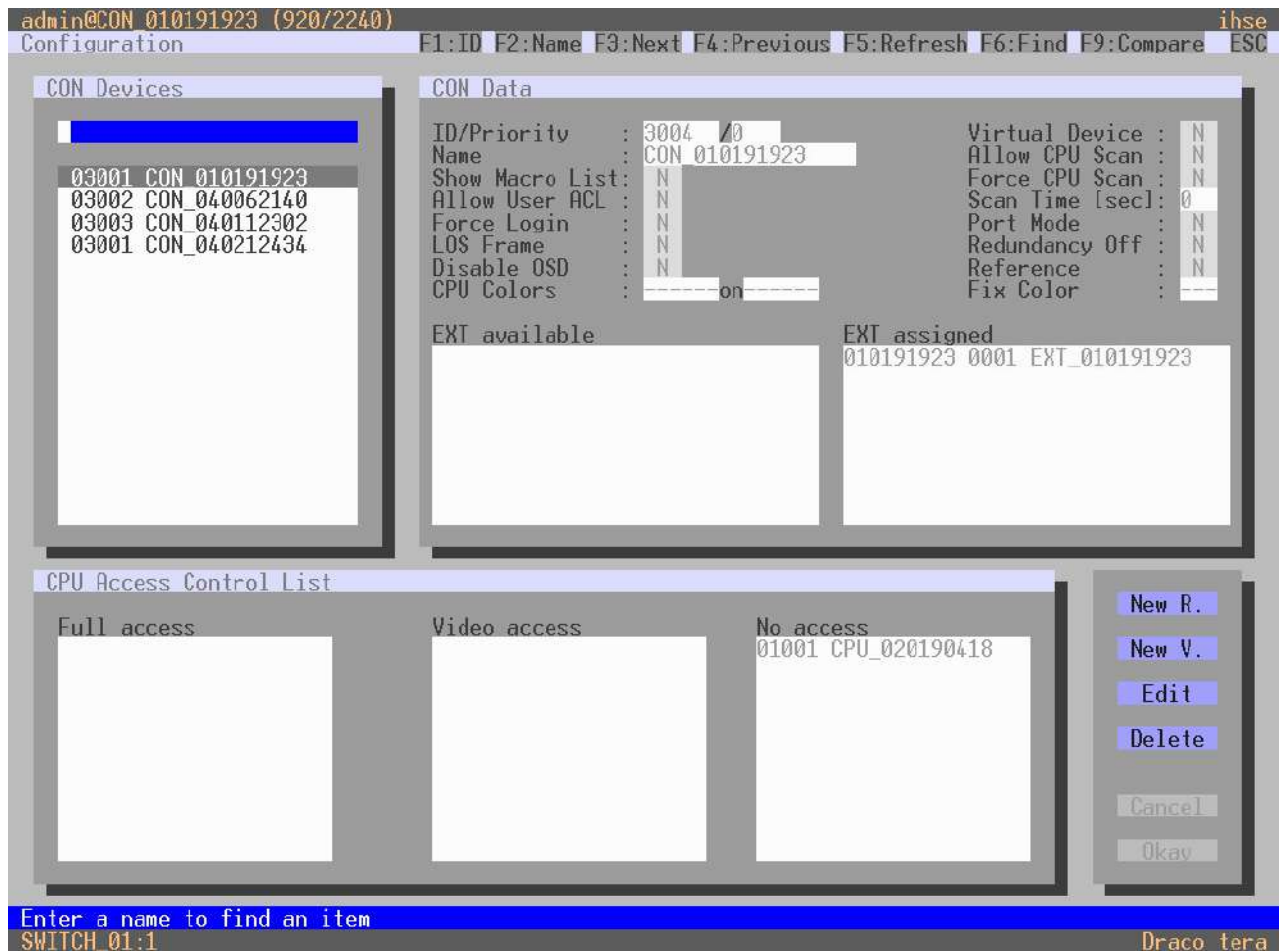
   A switchable CON Device will be created.

Fig. 91   OSD Menu **Configuration - CON Devices**

6.2.   Enter an appropriate name for the Cascading CON Device into the **Name** field.

6.3.   Press the <a> key to move the Cascading CON Unit to the **EXT assigned** list.

   The assignment is displayed in the **Extender assigned** list.

6.4.   Click the **Okay** button to confirm the assignment.

7. Select **Configuration > System** in the main menu of the Sub Matrix.

   7.1. Set the **Sub Matrix** option to **Y**.

   7.2. Click the **Okay** button to confirm the Sub Matrix option.

ℹ️ The OSD of the Sub Matrix will immediately freeze and will be only accessible by using the keyboard command `<Hot Key>, <s>, <o>`.
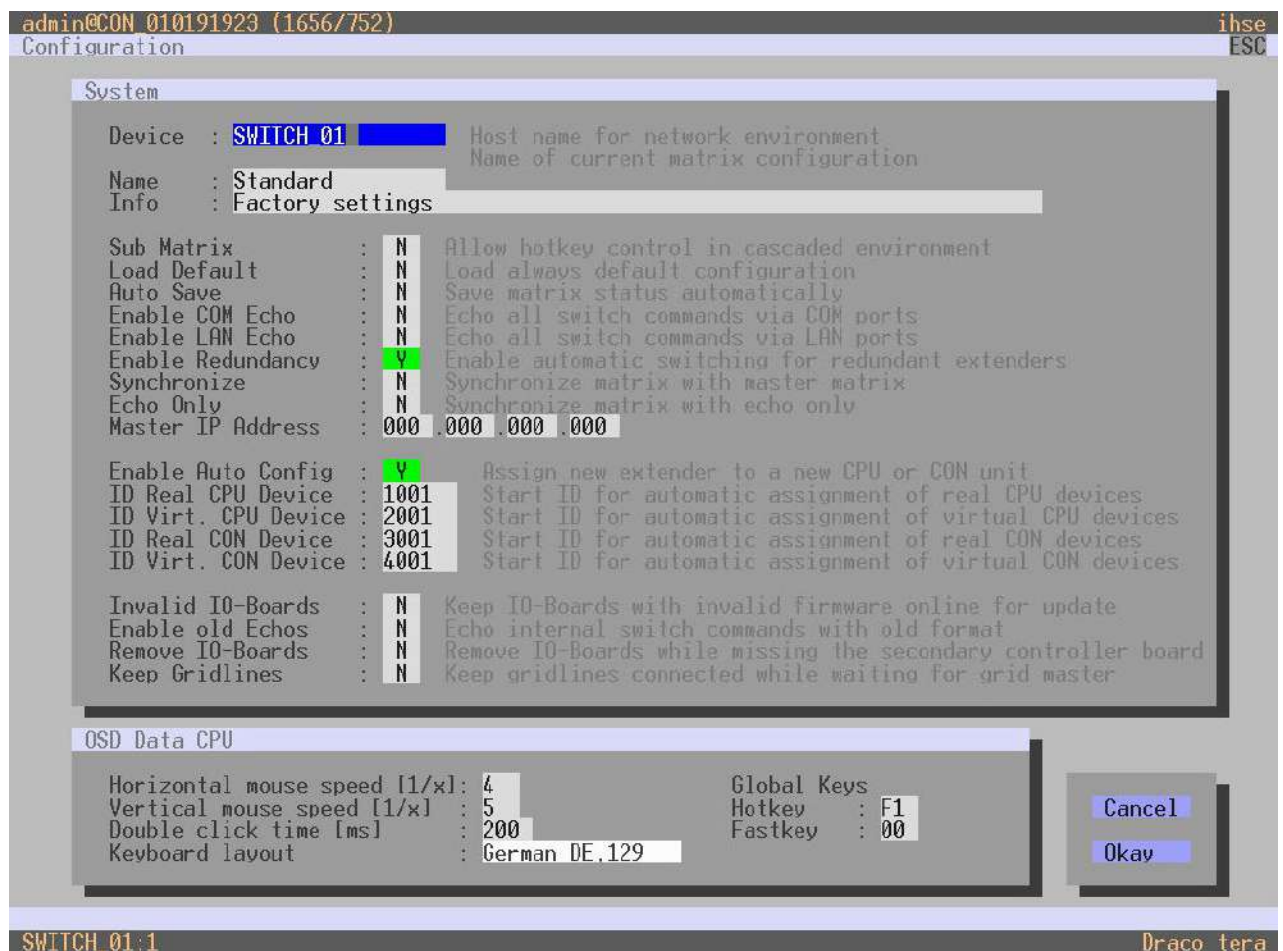
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*Fig. 92   OSD Menu **Configuration - System***

8. Restart all I/O boards (see chapter 9.9.2, page 300) on which any Master/Sub CON Units or CPU Units have been configured or alternatively restart the matrix (see chapter 9.9.1, page 300).

9. Connect the Tie Lines to the matrices. Ensure that each **Cascade CON Device** on one matrix is connected to **Cascade CPU Device** on the other matrix to achieve switch ability 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 chapter 9.2.7, page 269.

7.9.2   Directing a Tie Line from the Master to the Sub

To configure settings for using Matrix Cascading and to direct the Tie Line from the Master to the Sub, proceed as follows:

1.   Open the OSD of the Master Matrix.

2.   Select **Configuration > EXT Units** in the main menu of the Master Matrix.

 2.1.   Click the **New** button.

  A new EXT Unit will be created.

*Fig. 93   OSD Menu **Configuration - EXT Units***

 2.2.   Enter an appropriate name for the Cascading CON Unit into the **Name** field.

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

 2.4.   Set the **Cascade-CON** option to **Y** (**C#1**) in the **Input Signals** column.

 2.5.   Click the **Okay** button to confirm the creation of a Cascading CON Unit.

3. Select **Configuration > CON Devices** in the main menu of the Master Matrix.

   3.1. Click the **New R.** button.

   A switchable CON Device will be created.
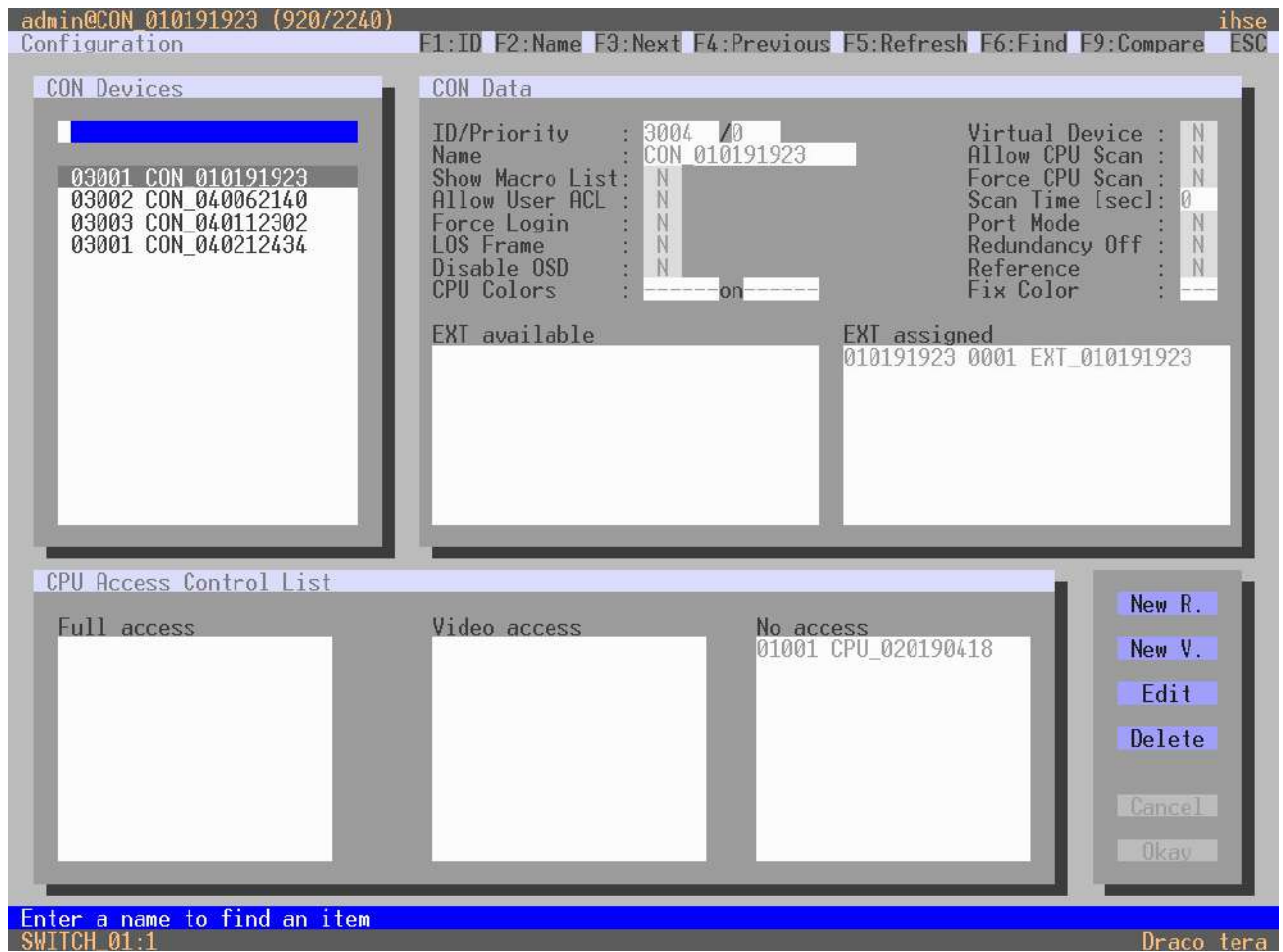
Fig. 94   OSD Menu Configuration - CON Devices

   3.2. Enter an appropriate name for the Cascading CON Device into the **Name** field.

   3.3. Select the previously configured Cascading CON Unit in the **Extender available** list.

   3.4. Press the `<a>` key to move the Cascading CON Unit to the **EXT assigned** list.

   The assignment is displayed in the **Extender assigned** list.

   3.5. Click the **Okay** button to confirm the assignment.

4. Open the OSD of the Sub Matrix.

5. Select **Configuration > EXT Units** in the main menu of the Sub Matrix.

    5.1. Click the **New** button.

    A new EXT Unit will be created.

Fig. 95   OSD Menu **Configuration - EXT Units**

    5.2. Enter an appropriate name for the Cascading CPU Unit into the **Name** field.

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

    5.4. Set the **Cascade-CPU** option to **Y** (**C#1**) in the **Output Signals** column.

    5.5. Click the **Okay** button to confirm the creation of a Cascading CPU Unit.

6. Select **Configuration > CPU Devices** in the main menu of the Sub Matrix.

6.1. Click the **New R.** button.

A switchable CPU Device will be created.
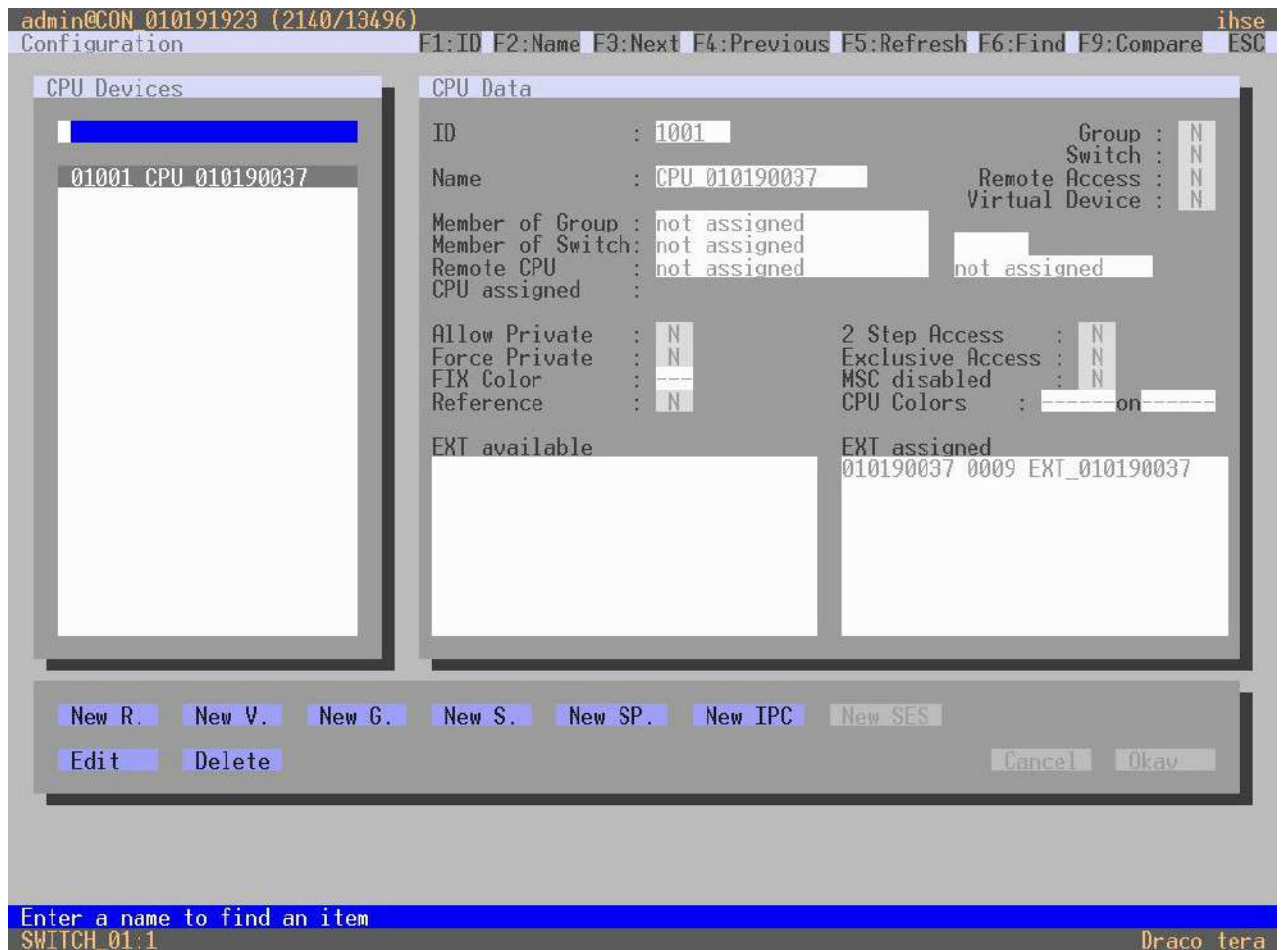
Fig. 96   OSD Menu **Configuration** *-* **CPU Devices**

6.2. Enter an appropriate name for the Cascading CPU Device into the **Name** field.

6.3. Press the <a> key to move the Cascading CPU Unit to the **EXT assigned** list.

The assignment is displayed in the **Extender assigned** list.

6.4. Click the **Okay** button to confirm the assignment.

7. Select **Configuration > System** in the main menu of the Sub Matrix.

  7.1. Set the **Sub Matrix** option to **Y**.

  7.2. Click the **Okay** button to confirm the Sub Matrix option.

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

*Fig. 97   OSD Menu **Configuration - System***

8. Restart all I/O boards (see chapter 9.9.2, page 300) on which any Master/Sub CON Units or CPU Units have been configured or alternatively restart the matrix (see chapter 9.9.1, page 300).

9. Connect the Tie Lines to the matrices. Ensure that each **Cascade CON Device** on one matrix is connected to **Cascade CPU Device** on the other matrix to achieve switching ability 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 chapter 9.2.7, page 269.

7.10   Saving and Activating a Configuration

NOTICE
By default, the last configuration that has been saved in the permanent matrix memory will be restored after a restart of the matrix.

First starting the matrix, the factory configuration will be copied into the current configuration. There are two possibilities to save configuration changes:

- Save the current configuration permanently in the matrix memory (**Save**) or
- Save the configuration in up to 8 predefined storage locations, as well as the default configuration in the memory of the matrix (**Save as…**)

7.10.1   Saving the Active Configuration

NOTICE
Changing or saving configurations blocks the matrix memory and leads to a freeze of all OSD menus for a few seconds. The switching connections are not affected by this freeze.

If you select **Auto Save** within the system settings an additional automatic saving of the configuration will be periodically performed (see chapter 7.3.1, page 67).

To save the current configuration permanently in the matrix storage, proceed as follows:

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

     The current configuration of the matrix is permanently saved to the matrix memory.
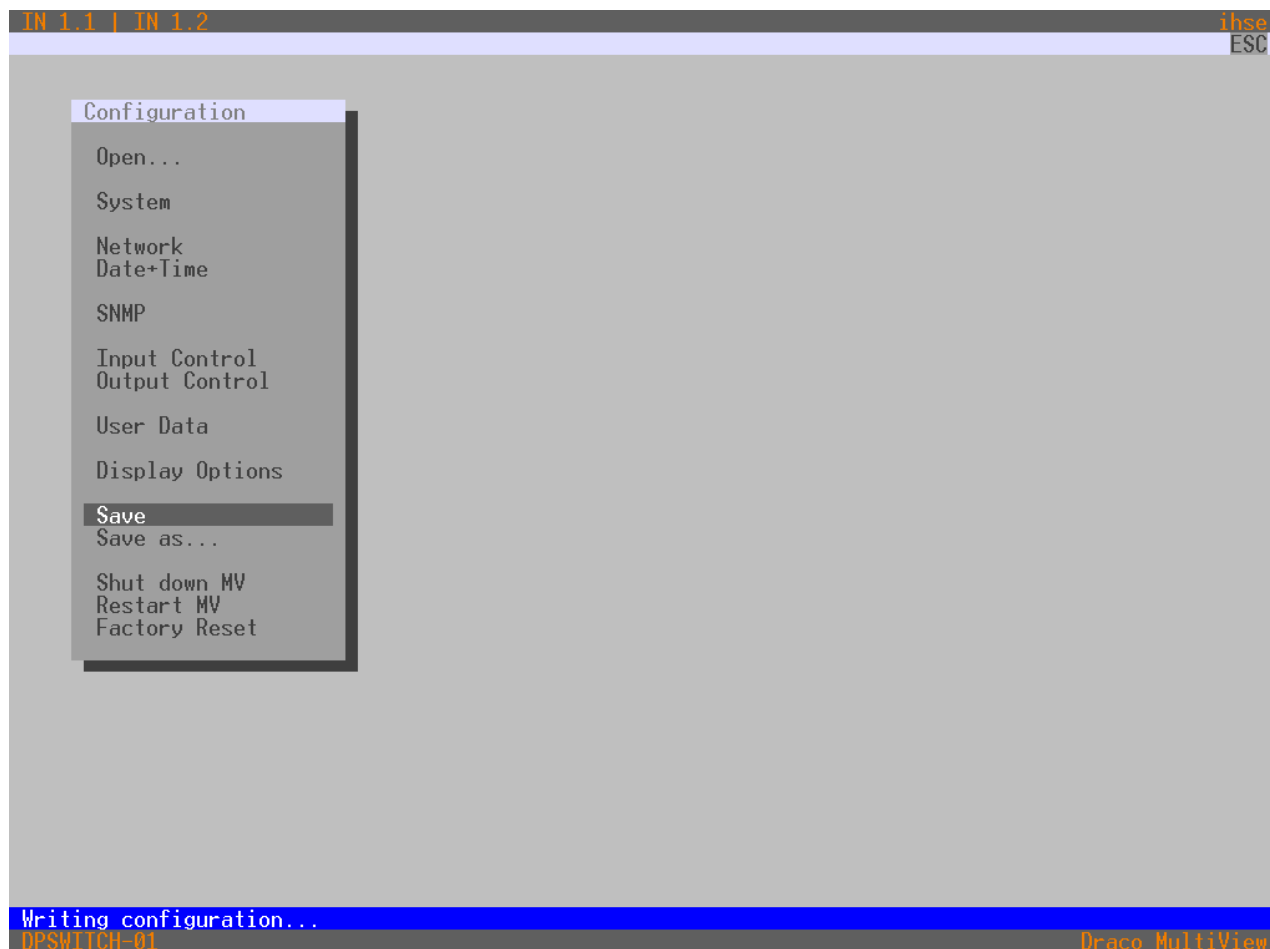
Fig. 98   OSD Menu Configuration - Save

7.10.2 Saving a Predefined Configuration

In this menu the current matrix configuration can be saved to predefined storage locations in the permanent memory of the matrix. You have the possibility to save the created configuration within eight storage locations in the matrix (**File #1** to **File #8**). Additionally, a configuration can also be saved as default configuration that is loaded each time the matrix is started (see chapter 7.3.1, page 67). However, it does not replace the buffering of configuration (see chapter 7.10.1, page 129).

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

The current configuration will be saved to this storage location and will be shown immediately in the menu. The previously saved configuration saved to this storage location is overwritten.
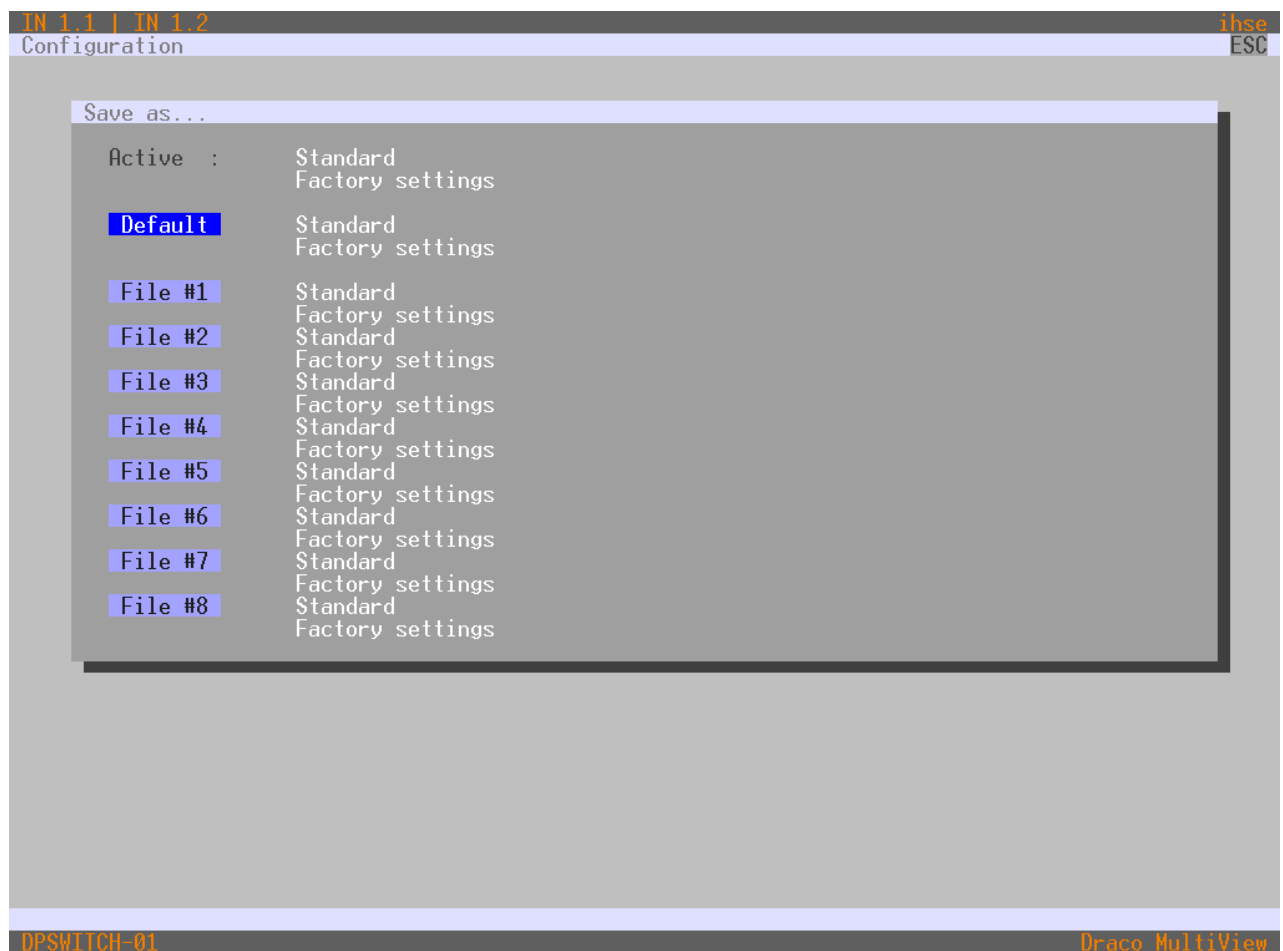
*Fig. 99   OSD Menu **Configuration - Save as…***

Saving position	Name and detailed information
Active	Name and detailed information of the current configuration are shown. This configuration can be saved (function **Save**, see chapter 7.10.1, page 129).
Default	Name and detailed information of the respective saved configuration are shown. This storage location can be overwritten.
File #1 to **File #8**	Name and detailed information of the respective saved configuration are shown. These storage locations can be overwritten.

To save the created configuration to a specific memory location, proceed as follows:

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

2. Select the required storage location (**File #1** to **File #8**) or **Default**.

    The current configuration is saved to this storage location and is shown immediately in the menu. The previously saved configuration saved to this storage location is deleted.

7.10.3   Activating a Predefined Configuration

Previously saved configurations are displayed in this menu. In **Active**, the currently loaded configuration is displayed. To replace the current configuration by another configuration, in addition to the default configuration (**Default**), one out of eight further, customized configurations (**File #1** to **File #8**) can be activated.

NOTICE
Activating a configuration will immediately disconnect and restart the matrix. The selected configuration is loaded on restart and is shown in the menu as active configuration under **Active**. The previously active configuration is overwritten. The restart of the matrix may take several minutes, and the matrix is not available during the restart.
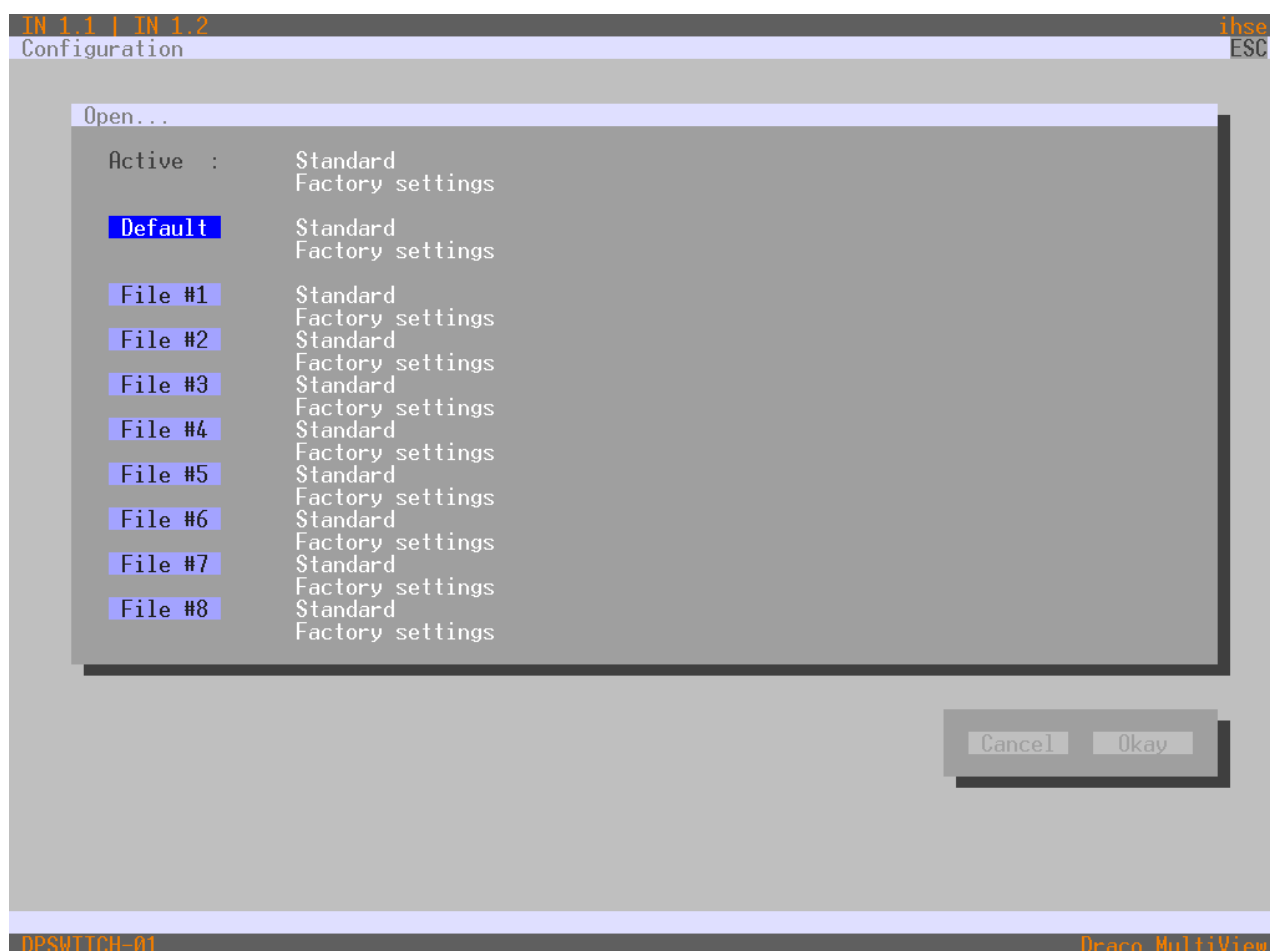
*Fig. 100   OSD Menu **Configuration - Open...***

To activate a previously saved configuration, proceed as follows:

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

2.   Select the desired configuration.

3.   Click the **Okay** button to activate the selected configuration.

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

8   Configuration via Management Software

NOTICE
Possible loss of configuration changes
By clicking the **Apply** button changes are applied to the active configuration and saved in the volatile memory of the matrix. In the event of a sudden power failure, these changes are lost. To save changes permanently:
➡ save the configuration changes into the active configuration (**Remote Save**, see chapter 8.11.1, page 238), save a predefined configuration (**Save as…**) (see from chapter 8.11.2, page 239), or perform a restart (see from chapter 9.10.1, page 305).

NOTICE
A change in system-relevant parameters (e.g., change in the IP address) is immediately displayed in the management software. To initialize system-relevant configuration changes on the matrix, the matrix must be restarted. The restart of the matrix may take several minutes, and the matrix is not available during the restart.

8.1   Configuring in Online Mode

Configurations and system settings can be edited via management software in online mode with an active connection between matrix and management software. Hereby, the following steps are necessary:

1. Click the **Connect** button to connect the management software with the matrix.

    The manufacturer-specific configuration (Factory Setting) saved on the matrix is loaded into management software.

2. Click the **Activate Edit Mode** menu item in the toolbar.

    The edit mode is active. A symbol is shown in the status bar.

3. Make any edits at the configuration and system settings.

4. Click the **Apply** button to confirm the changes.

    The changes apply immediately as current configuration in the volatile memory of the matrix.

5. Click the **Deactivate Edit Mode** menu item in the toolbar.

6. Click the **Remote Save** button to save the configuration into the active configuration to the matrix.

7. Optionally: restart the matrix (depending on the settings made).

8.2   Configuring in Offline Mode

Configuration and system settings via management software can be changed in offline mode without a direct connection between matrix and management software. Afterwards, the configuration must be uploaded to the matrix. Hereby, the following steps are necessary:

1. Connect the management software to the matrix.

    The manufacturer-specific configuration (Factory Settings) saved on the matrix is loaded into management software.

2. Click the **Download** button to download the configuration.

3. Click the **Disconnect** button to close the connection from the management software to the matrix.

4. Make any edits at the configuration and system settings.

5. Click the **Apply** button to confirm the changes.

    The changes apply immediately as current configuration in the volatile memory of the matrix.

6. Click the **Upload** button to upload to the configuration to the matrix and activate immediately (optional) or later.

7. Click the **Disconnect** button to close the connection from the management software to the matrix.

8. Optionally: restart the system (depending on the settings made).

8.3   Setting Management Software Options

The settings of the management software can be customized and optimized to support the configuration of your matrix. The settings can be set in the offline mode.

ℹ️ A restart of the management software is required to activate changes in the options menu.

8.3.1   Setting Program Default Settings

To avoid the repeated entry of data in the management software, this data can be saved in the default settings.

*Fig. 101   Management software menu **Extras - Options - Default Settings***

The following parameters can be configured:

Option	Description
IP / Hostname	Default IP address or host name of the matrix for establishing a connection
User	Default username for establishing a connection
Configuration Directory	Default directory for configuration files
Firmware Directory	Default directory for firmware files
Status Directory	Default directory for status files
Import / Export Directory	Default directory for import and export files
Presets Directory	Default directory for macro files

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

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

    The **Options** menu opens and shows the **Default Settings** tab.

2. Enter the appropriate data.

3. Click the **Ok** button to confirm your entries.

4. Close the management software and restart it.

8.3.2   Setting Font Size, Tooltip, and Theme

The font size can be set in this menu and the display of tooltips for the toolbar can be activated.

1. Select **Extras > Options** in the menu bar and open the **Style** tab.

2. Select the desired font size (**Normal** or **Large**).

3. Click the **Show Toolbar Button Text** checkbox.

    A tooltip is displayed when hovering over a menu item in the toolbar.

4. Select the color theme for the management software (**Dark** (default) or **Gray**).

5. Click the **Ok** button to confirm your changes.

6. Close the management software and restart it.
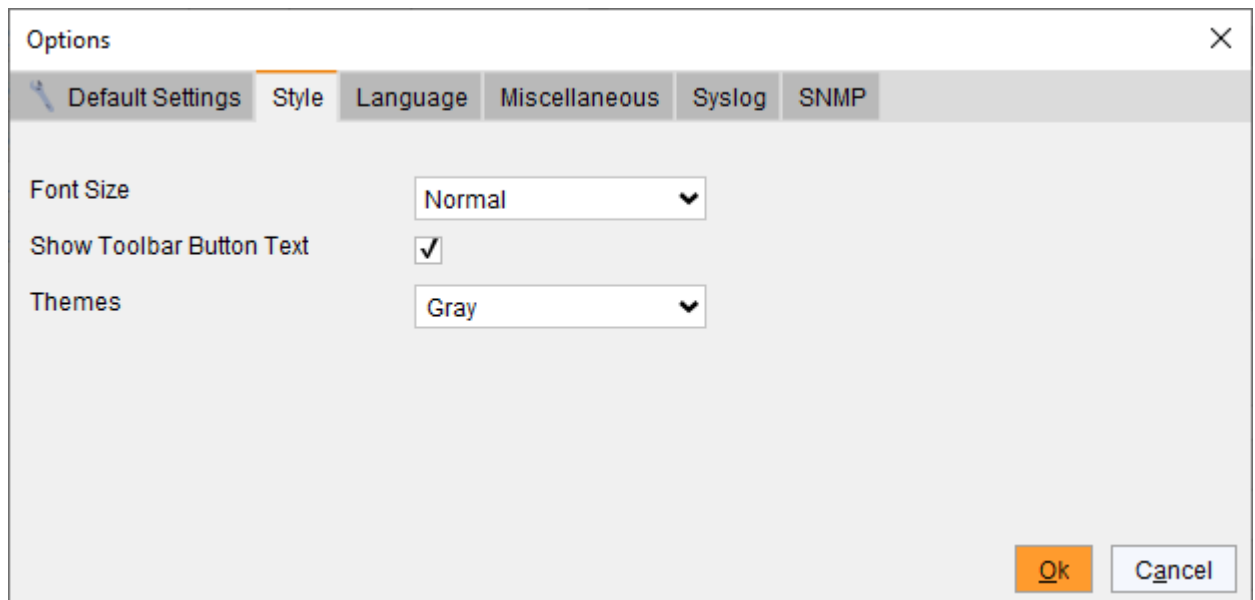
*Fig. 102   Management software menu **Extras - Options - Style***

8.3.3   Setting Language of the Management Software

The language within the management software is set in this menu. The charset must match the selected language to ensure correct representation.

1. Select **Extras > Options** in the menu bar and open the **Language** tab.

2. Select the desired language within the management software and the corresponding charset.

3. Click the **Ok** button to confirm your changes.

4. Close the management software and restart it.
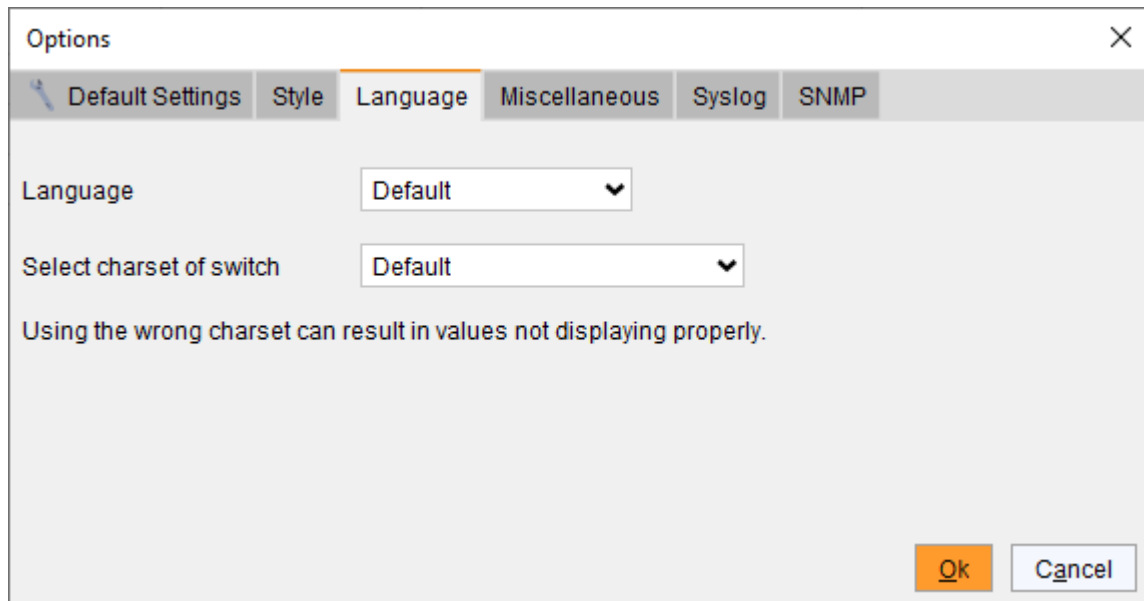
*Fig. 103   Management software menu **Extras - Options - Language***

8.3.4   Setting Autostart of the Device Finder

Additional options for the matrix can be enabled in this menu.
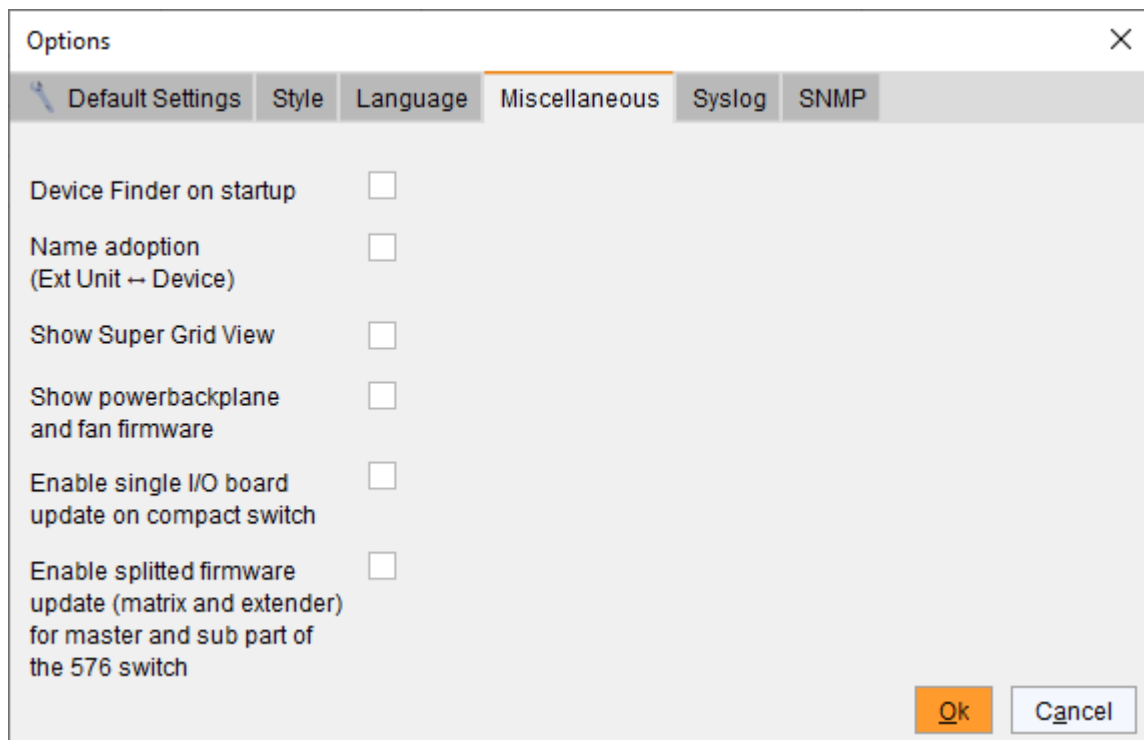
*Fig. 104   Management software menu **Extras - Options - Miscellaneous***

The following options can be enabled:

Option	Description
Device Finder on startup	Start the Device Finder automatically when starting the management software
Name adoption	Entered name for a device is also applied to the extender and vice versa
Show Super Grid View	Show the Super Grid option in the task area
Show power backplane and fan firmware	Show the firmware of the fans and the power backplane in the menu **Status & Updates > Status- Matrix Firmware**
Enable single I/O board update on compact switch	Option available only for Draco tera compact and Draco tera flex
Enable splitted firmware update (matrix and extender) for master and sub part of the 576 matrix	Option available only for Draco tera enterprise 576

To start the Device Finder automatically when starting the management software, proceed as follows:

1. Select **Extras > Options** in the menu bar and open the **Miscellaneous** tab.
2. Activate the **Device Finder on startup** checkbox.
3. Click the **Ok** button to confirm your changes.
4. Close the management software and restart it.

   After restarting the management software, the **Device Finder** appears.

8.4 System Settings

8.4.1 Setting System Configuration

The system configuration is set in this menu.
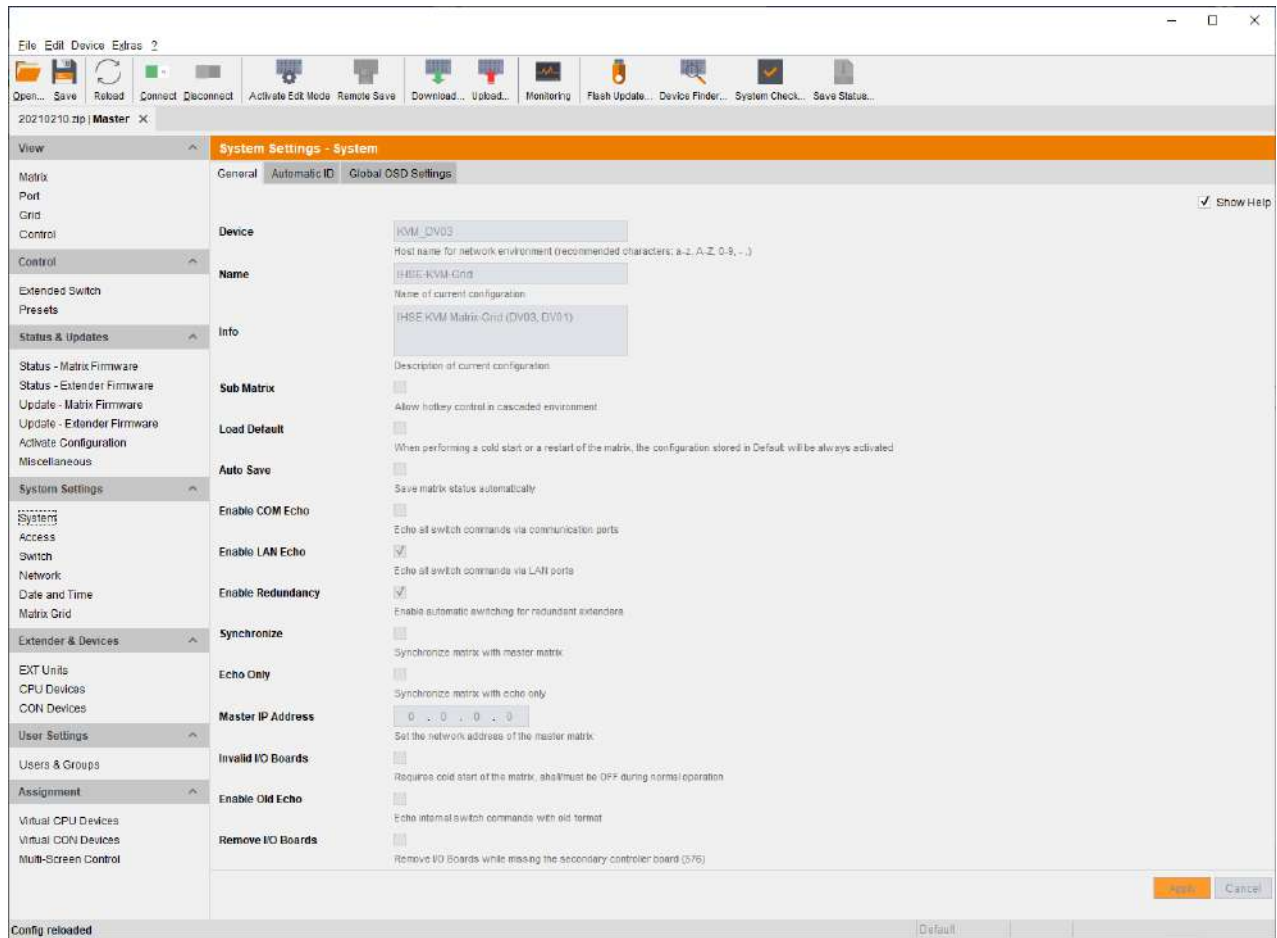
*Fig. 105   Management software menu **System Settings - System - General***

The following parameters can be configured:

System

Field	Entry	Description
Device	Text	Enter the device name of the matrix (default: SWITCH_01) The device name is used as the host name in the network.
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 sub matrix in the OSD, the user will lose control. Control can be recovered by using the keyboard command `<Hot Key>`, `<s>`, `<o>`. The OSD for the matrix that has been defined as sub matrix will be reopened.
	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).

Field	Entry	Description
Auto Save	Activated	Save the current configuration of the matrix in the flash memory periodically. **Note:** During the save operation, the matrix will not be operational. Saving takes place every 600 seconds if changes of the configuration or switching operations have been executed in the meantime.
	Deactivated	Function not active (default)
Enable COM Echo	Activated	Send all switching commands performed in the matrix as an echo via serial interface. **Note:** This function should be enabled when using a media controller via serial interface.
	Deactivated	Function not active (default)
Enable LAN Echo	Activated	Send all switching commands performed in the matrix as an echo via LAN connection. **Note:** This function should be enabled when using a media controller via LAN connection or when using stacking with two or more matrices.
	Deactivated	Function not active (default)
Enable Redundancy	Activated	Automatically switch to the second link of a connected redundant CON Unit when losing the primary link of a CPU Unit (default) **Note**: This function will have to be activated for both matrices in a fully redundant setup
	Deactivated	Function not active
Synchronize	Activated	Synchronize the sub matrix to the switch status of the master matrix.
	Deactivated	Function not active (default)
Echo Only	Activated	Synchronize the matrix according to the echo of a second matrix. **Note:** This is a bidirectional synchronization where both matrices have to be configured as **Synchronize** with the **Master IP** of the respective other matrix.
	Deactivated	Function not active (default)
Master IP Address	Byte	Set the network address of the master matrix (default: 000.000.000.000)
Invalid IO-Boards	Activated	Keep I/O boards with incorrect or invalid firmware online in the matrix. **Note**: To keep an I/O board with wrong or damaged firmware online in the matrix, the maintenance mode of the matrix will be activated.
	Deactivated	Shut down I/O boards with incorrect or invalid firmware automatically (default).
Enable old Echo	Activated	Translate current switching command (implemented since V02.09) internally into the old, already known switching commands and send them as echo.
	Deactivated	Function not active (default)

Field	Entry	Description
Remove IO-Boards	Activated	**Note:** Only for Draco tera enterprise 576: Shut down of I/O boards if the second controller board is not available. Connections will be disconnected.
	Deactivated	Function not active (default)

To set parameters for the system configuration, proceed as follows:

1. Select **System Settings > System** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Modify the desired settings.
4. Click the **Apply** button to confirm your entries.
5. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.4.2   Enabling Automatic Creation of CPU and CON Devices

Settings for automatic creation of CPU and CON Devices when a new CON extender module or CPU extender module is connected to the matrix are set in this menu.
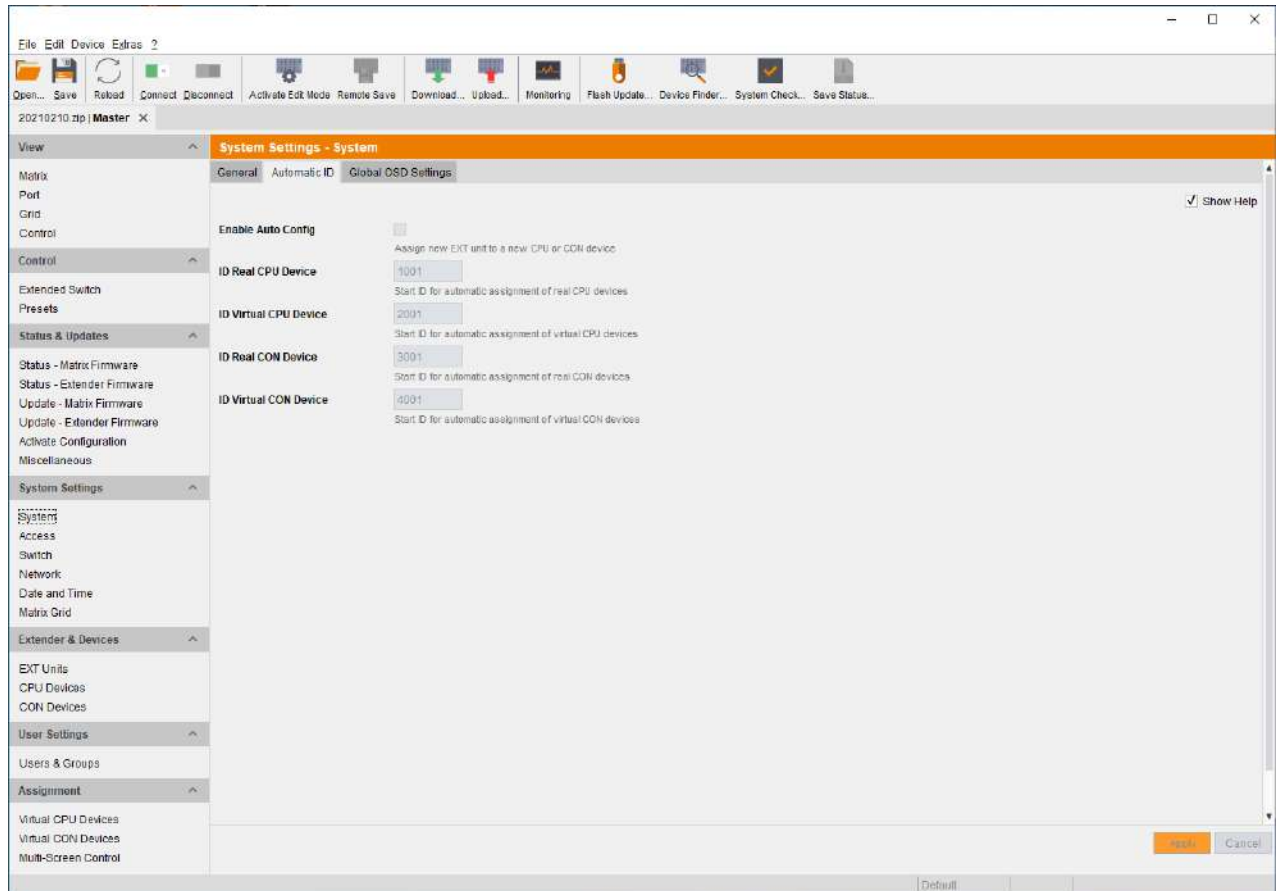
*Fig. 106   Management software menu **System Settings - System - Automatic ID***

To set up the automatic creation of CPU Devices or CON Devices, proceed as follows:

1. Select **System Settings > System** in the task area.

2. Select the **Automatic ID** tab in the working area.

3. Click the **Activate Edit Mode** menu item in the toolbar.

4. Modify the desired settings.

5. Click the **Apply** button to confirm your entries.

6. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.4.3   Configuring the Matrix OSD Access

The Hot Key for accessing the command mode and the Fast Key to open the matrix OSD are configured in this menu.

*Fig. 107   Management software menu **System Settings - System - Global OSD Settings***

The following parameters can be configured:

Field	Entry	Description
Hot Key	Keyboard command	Calling the command mode via keyboard sequence
Fast Key	Keyboard command	Open the OSD via direct access (default: 00) How often the shortcut key has to be pressed depends on the specified key: 1x for function keys or print key, 2x for all other keys

Settings for Global Hot Key and Fast Key

Field	Entry	Description
Hot Key / Fast Key	00	No global Hot Key / Fast Key defined, no modification of the extender module.
	01 to FE	Overwrite the Hot Key / Fast Key of the extender module with the entered value of the global Hot Key / Fast Key.
	FF	Deactivate the Hot Key / Fast Key of the extender module

Valid values for the Hot Key and the Fast Key are USB-HID keyboard scan codes according to US keyboard layout.

To set modifier keys for the Hot Key and the Fast Key use the following values:

Entry	Modifier Key
F0	Left CTRL
F1	Left SHIFT
F2	Left ALT
F4	Right CTRL
F5	Right SHIFT
F6	Right ALT

ℹ️ Hot Key or Fast Key set in the CON EXT Units have priority over the global settings.

To configure global OSD settings, proceed as follows:

1. Select **System Settings > System** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the **Global OSD Settings** tab in the working area.
4. Modify the desired settings.
5. Click the **Apply** button to confirm your entries.
6. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.4.4 Setting Access Configuration
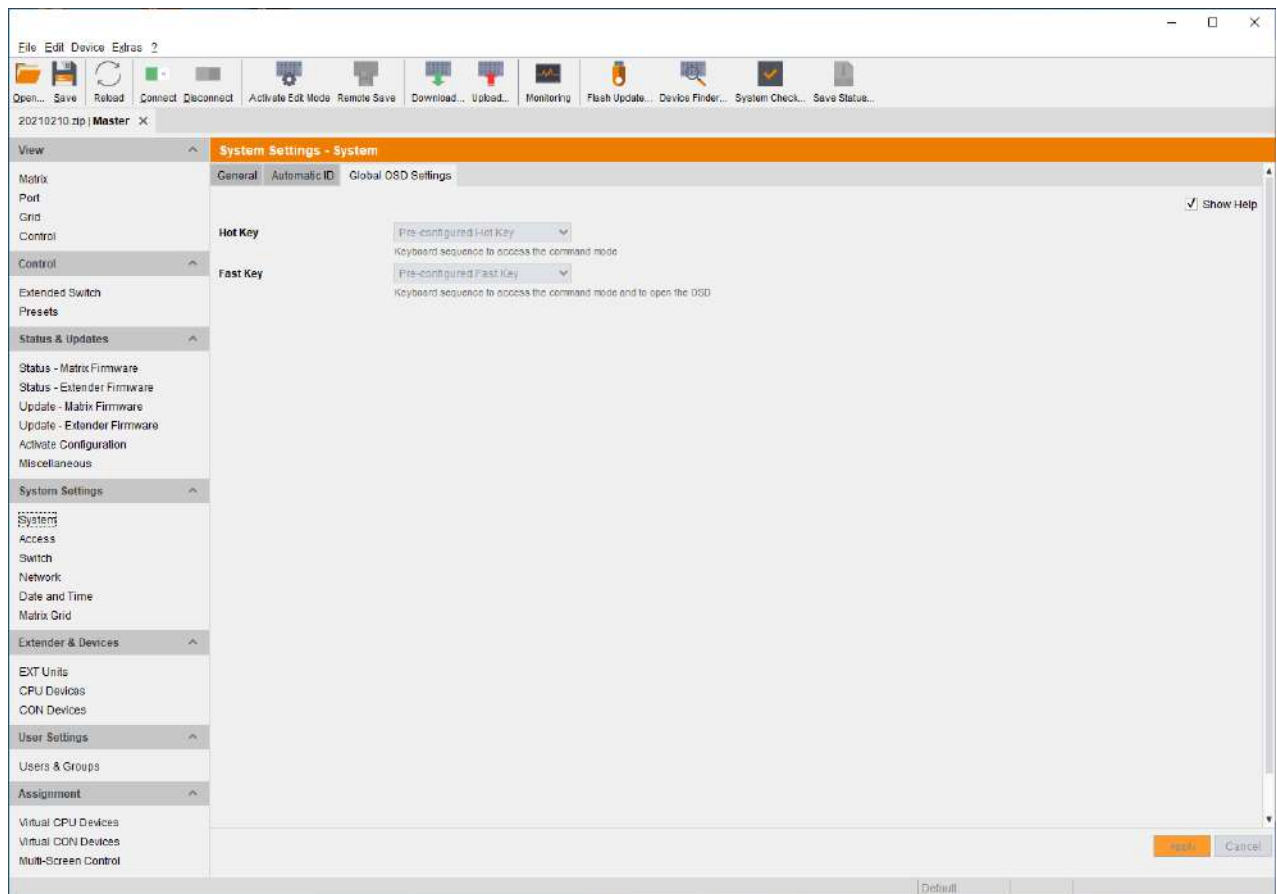
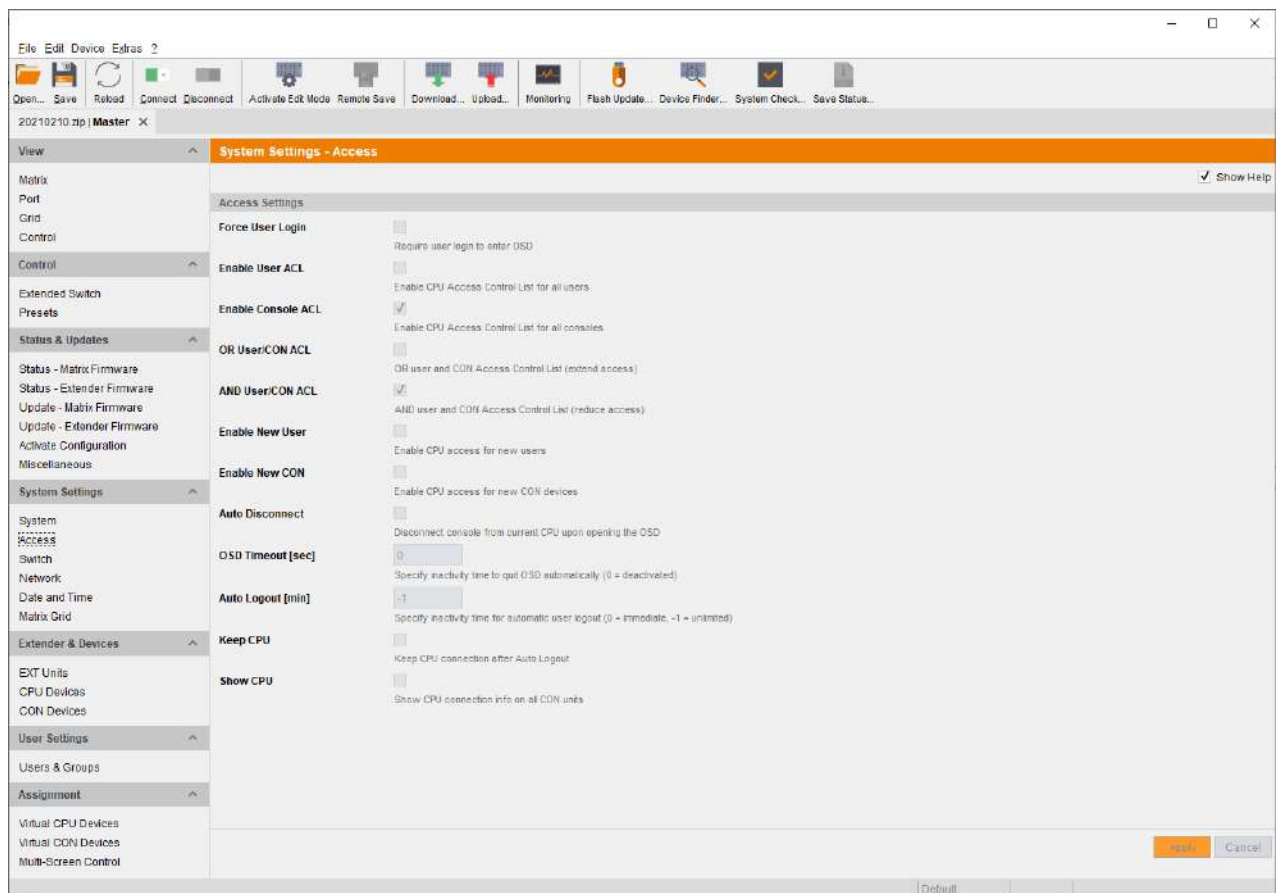The access configuration is set in this menu.

Fig. 108   Management software menu ***System Settings - System - Access***

The following parameters can be configured:

Field	Entry	Description
Force User Login	Activated	The user has to login with a username and a password once to enter OSD. Thereafter the user remains logged in until he explicitly logs out or an auto logout is affected.
		Note: When using the **Force User Login** function, Console ACL are still active. When the **Force User Login** function is activated and a user is logged in, only the user favorites are available. The CON favorites are not accessible.
	Deactivated	Function not active (default)
Enable User ACL	Activated	CPU Device access is restricted according to the permissions in the ACL (Access Control List).
		• User login is required.
		• Switching by keyboard Hot Keys requires a prior login.
	Deactivated	Function not active (default)
Enable CON ACL	Activated	CPU Device access is restricted according to the permissions in the respective CON Device ACL (Access Control List). No login required
	Deactivated	Function not active (default)
OR User/CON ACL	Activated	The user obtains the sum of access rights from the console and his personal access rights after logging in (extended access)

Field	Entry	Description
	Deactivated	Function not active (default)
AND User/CON ACL	Activated	The user obtains the common divisor of access rights from the console and his personal access rights after logging in (reduced access)
	Deactivated	Function not active (default)
Enable new User	Activated	Newly created users automatically receive access to all CPU Devices
	Deactivated	Function not active (default)
Enable new CON	Activated	Newly created CON Devices automatically receive access to all CPU Devices
	Deactivated	Function not active (default)
Auto Disconnect	Activated	Upon opening the OSD, the console will be automatically disconnected from the current CPU Device.
	Deactivated	Function not active (default)
OSD Timeout [sec]	0 to 999 seconds	Period of inactivity after which OSD will be closed automatically. • Select 0 seconds for no timeout • (default: 0 seconds)
Auto Logout [min]	0 to 999 minutes	Period of inactivity of a logged-in user at a console after which he will be automatically logged out. In addition to the logout process, a complete disconnection from the connected CPU Device occurs under **Full Access** and **Private Mode**. • Select 0 minutes for an automatic user 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).
Keep CPU	Activated	Keep the connection to the CPU Device active in the background after Auto Logout. After a new login there is no need to re-connect to the CPU Device.
	Deactivated	Function not active (default)
Show CPU	Activated	Permanently show the name of the currently connected CPU Device in the **Connection Info** box.
	Deactivated	Function not active (default)

To set the access configuration, proceed as follows:

1. Select **System Settings > Access** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Modify the desired settings.
4. Click the **Apply** button to confirm your entries.
5. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.4.5   Setting Switch Configuration

This menu enables shared operation of a CPU Device by two or more CON Devices. A CPU Device can be controlled by only one CON Device at a time but can be taken over successively by other CON Devices. Control of a CPU Unit by a CON Unit is relinquished after the expiration of an associated inactivity timer with the controlling CON Device. The mouse or keyboard may also be used to take over control.

To allow a smooth and accurate function of the shared 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 9.11, page 312).

When taking over control within 10 s, any assigned USB 2.0 EXT Unit if available, will not be switched due to security and stability aspects.

The shared operation will be deactivated between CON Devices with a different priority as well as the Release Time.
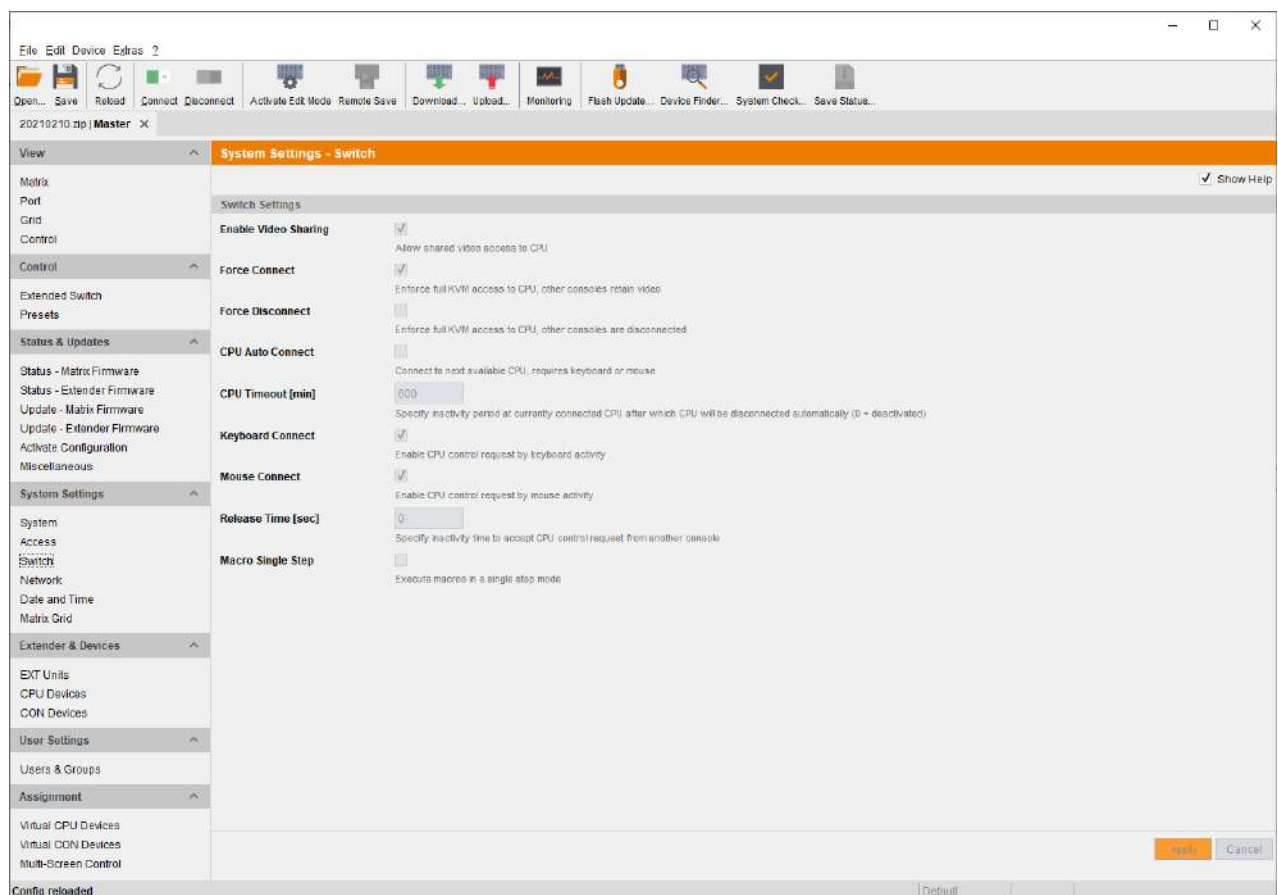
The switching parameters are set in this menu.

*Fig. 109   Management software menu **System Settings - System - Switch***

The following parameters can be configured:

Field	Entry	Description
Enable Video Sharing	Activated	The user can switch to any CPU Device as an observer, including ones that are already assigned to another user (observer without keyboard/mouse access). **Note:** Switching with the `<Space>` key, not with the `<Enter>` key. The operator only will be informed if further users connect as an observer to the CPU Device that is connected to his CON Device, if the option **Update Connection Info** is activated for his CON EXT Unit.
	Deactivated	Function not active (default)
Force Connect	Activated	The user can connect to every single CPU Device as an operator, including ones that are related to another user. **Note:** The previous user is set to Video Only status. To share K/M control, **Force Connect** has to be activated.
	Deactivated	Function not active (default)
Force Disconnect	Activated	Extension of **Force Connect**: If the user connects as an operator to a CPU Device already related to another user, the previous user will be disconnected. **Note:** To share K/M control **Force Disconnect** has to be deactivated and **Enable Video Sharing** has to be activated.
	Deactivated	Function not active (default)
CPU Auto Connect	Activated	If a CON Device is not connected to a CPU Device, you can establish an automatic connection to the next available CPU Device by hitting any key or mouse button.
	Deactivated	Function not active (default)
CPU Timeout [min]	0 to 999 minutes	Period of inactivity after which a console will be automatically disconnected from its current CPU Device (default: 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)
Release Time [sec]	0 to 999 seconds	Period of inactivity of a connected CON Device after which K/M control can be requested by other CON Devices connected to the CPU Device. **Note:** Set "0" for an immediate transfer in real-time. Only one CON Device can have keyboard and mouse control at a time. The other consoles that are connected to the same CPU Device have a Video Only status (default: 10 sec.)
Macro Single Step	Activated	Execute macro commands sequentially
	Deactivated	Function not active (default)

To configure shared operation, proceed as follows:

1. Select **System Settings > Switch** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Activate the **Enable Video Sharing** function.

4. Activate the **Force Connect** function.

5. Activate the **Keyboard Connect** function if taking over control by a keyboard event is to be permitted.

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

7. Define a **Release Time** of inactivity (0 to 999 seconds) after which control can be taken over.

8. Click the **Apply** button to confirm the changes.

9. Click the **Deactivate Edit Mode** menu item in the toolbar.

Keyboard Connect and / or **Mouse Connect** are only effective if **Force Connect** and / or **CPU Auto Connect** are activated.

If the **Keyboard Connect** and / or **Mouse Connect** options are enabled, the **Keyboard Connect** and/or **Mouse Connect** will not take effect until the time interval entered in the **Release Time** has elapsed.

8.4.6   Setting Network Configuration

NOTICE
To initialize system-relevant configuration changes, the matrix must be restarted. Restarting the matrix can take several minutes and the matrix is not available during the restart.

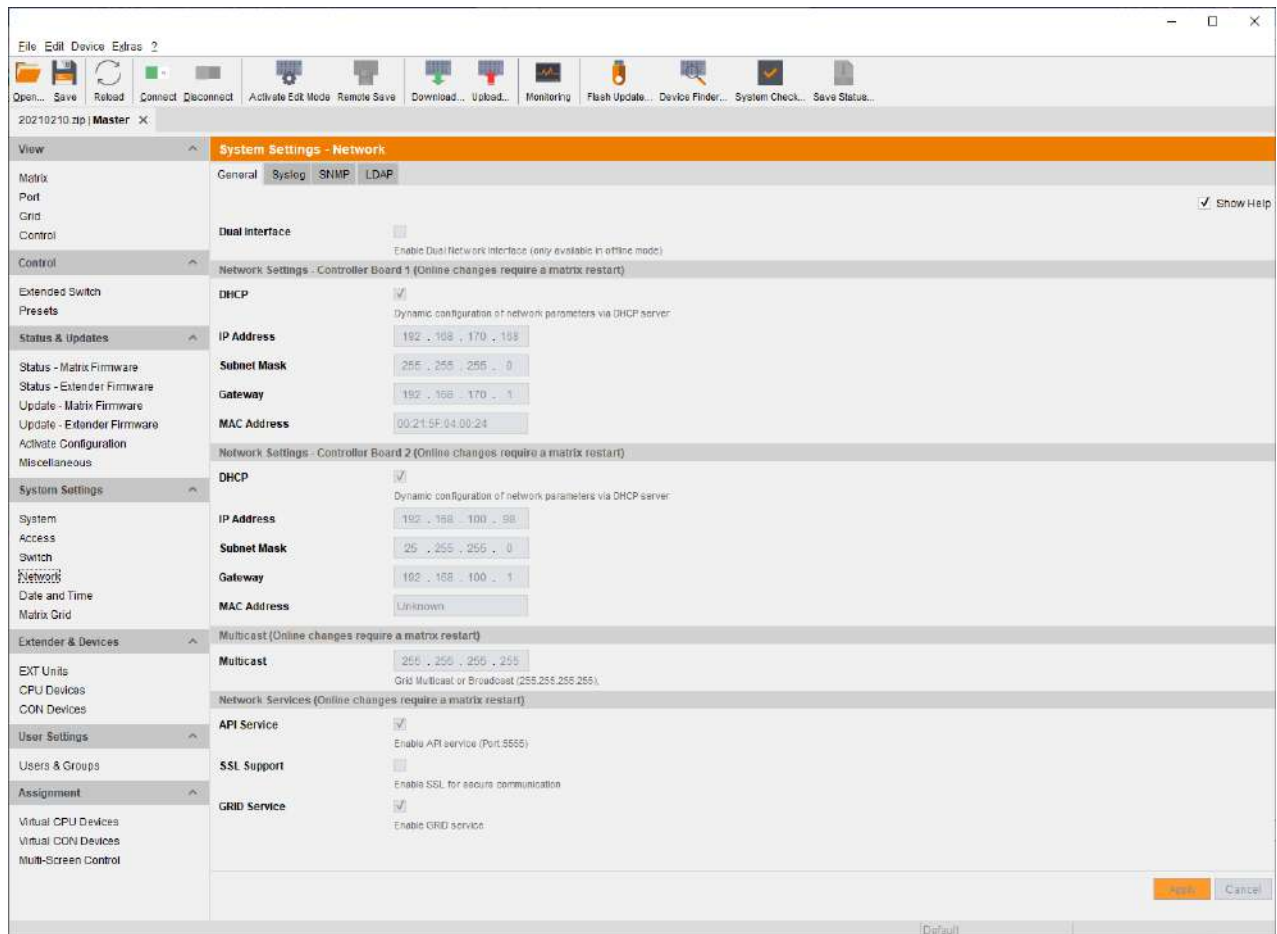| NOTICE |
|---|
| Consult your system administrator before modifying the network parameters. Otherwise, unexpected results and failures can occur in combination with the network. |

The parameters for the network configuration are set in this menu.

*Fig. 110   Management software menu **System Settings - Network - General***

The following parameters can be configured:

Field	Entry	Description
Dual Interface	Activated	Redundant network connection is deactivated **Note:** This option can be changed only in offline mode.
	Deactivated	Redundant network connection is activated (default)

Network Settings - Controller Board

Field	Entry	Description
DHCP	Activated	The network settings are automatically supplied by a DHCP server. **Note:** If DHCP is activated and there is no physical network connection available, the boot times might increase.
	Deactivated	Function not active (default)
IP Address	Byte	Input of the IP address if DHCP is not active (default: 192.168.100.99)
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
MAC Address	Byte	Cannot be changed, is retrieved automatically

Multicast

Field	Entry	Description
Multicast	Byte	Input of the Multicast address if there is a Matrix Grid in use within a Multicast group (default is broadcast: 255.255.255.255)

Network Services

Field	Entry	Description
API Service	Activated	LAN interface at the matrix activated for access via management software (API service port 5555)
	Deactivated	Function not active
SSL Support	Activated	Activate SSL encryption for API, management software (API), and Matrix Grid communication
	Deactivated	Function not active (default)
Grid Service	Activated	Activate Grid interface at the matrix for access via management software (Grid Service Port 5557)
	Deactivated	Function not active (default)

To set parameters for the network configuration, proceed as follows:

1. Select **System Settings > Network** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Modify the desired settings.
4. Click the **Apply** button to confirm your entries.
5. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.4.7   Setting Syslog Function

NOTICE
For an activation of the Syslog function or changes of the IP address, a restart of the matrix or the CPU board is necessary. Restarting the matrix or the CPU board can take several minutes, and the matrix is not available during the restart.

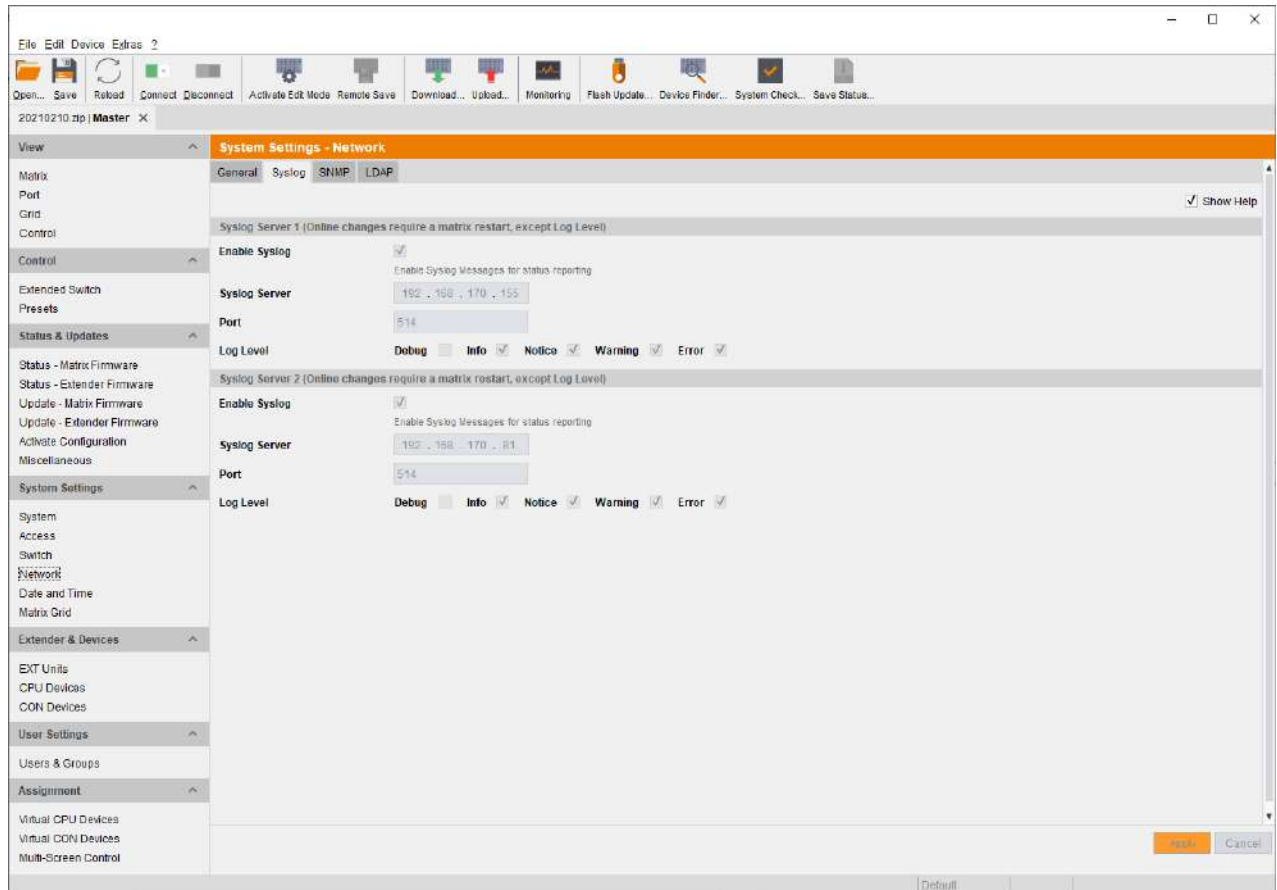The parameters for the Syslog function are set in this menu:

*Fig. 111   Management software menu **System Settings - Network - Syslog***

The following parameters can be configured:

Field	Entry	Description
Enable Syslog	Activated	Syslog server to query status is active
	Deactivated	Function not active (default)
Syslog Server	Byte	Input of the IP address of the syslog servers in the form "192.168.1.1"
Port	Byte	Input of the syslog port (default: 514)
Log Level	Debug	Activate debug messages in syslog (default: deactivated) **Note:** The debug messages are exclusively for matrix diagnostics. Only use this function for concrete debug cases as it is not intended for normal operation.
	Info	Activate information messages in syslog (default: deactivated)
	Notice	Activate notification messages in syslog (default: activated)
	Warning	Activate warning messages in syslog (default: activated)
	Error	Activate error messages in syslog (default: activated)

To set parameters for the syslog function, proceed as follows:

1. Select **System Settings > Network** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the **Syslog** tab in the working area.

4. Modify the desired settings.

5. Click the **Apply** button to confirm your entries.

6. Click the **Deactivate Edit Mode** menu item in the toolbar.

Setting the Syslog Options

To set or activate the presetting, proceed as follows:

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

2. Enter the appropriate data.

3. Click the **Ok** button to confirm your entries.

4. Close the management software and restart it.

*Fig. 112   Management software menu **Extras - Options - Syslog***

The following options are available:

Option	Description
Log File Directory	Default directory to store the log files
Log File Name	Default name of the log file
Log File Extension	Default extension for the log file
Daily Log Files	Log files are stored every 24 hours (daily)

Option	Description
Maximum Log File Size [KB]	Allowed maximum size of log file When reaching the maximum log file size, a new log file will be created.
Maximum Number of Log Files	Allowed maximum number of log files When the maximum number of log files is exceeded, the oldest logfile will be overwritten with the new information (log rotate).
Acoustic Notification	Enables acoustic notification for errors
Autostart	When starting the management software, the syslog function will be started in the background
Open Monitoring Tab	When starting the management software, the monitoring tab will be opened

Activating I/O Board Diagnosis

For dedicated trouble shooting, Syslog can be enabled for selected I/O board in this menu.
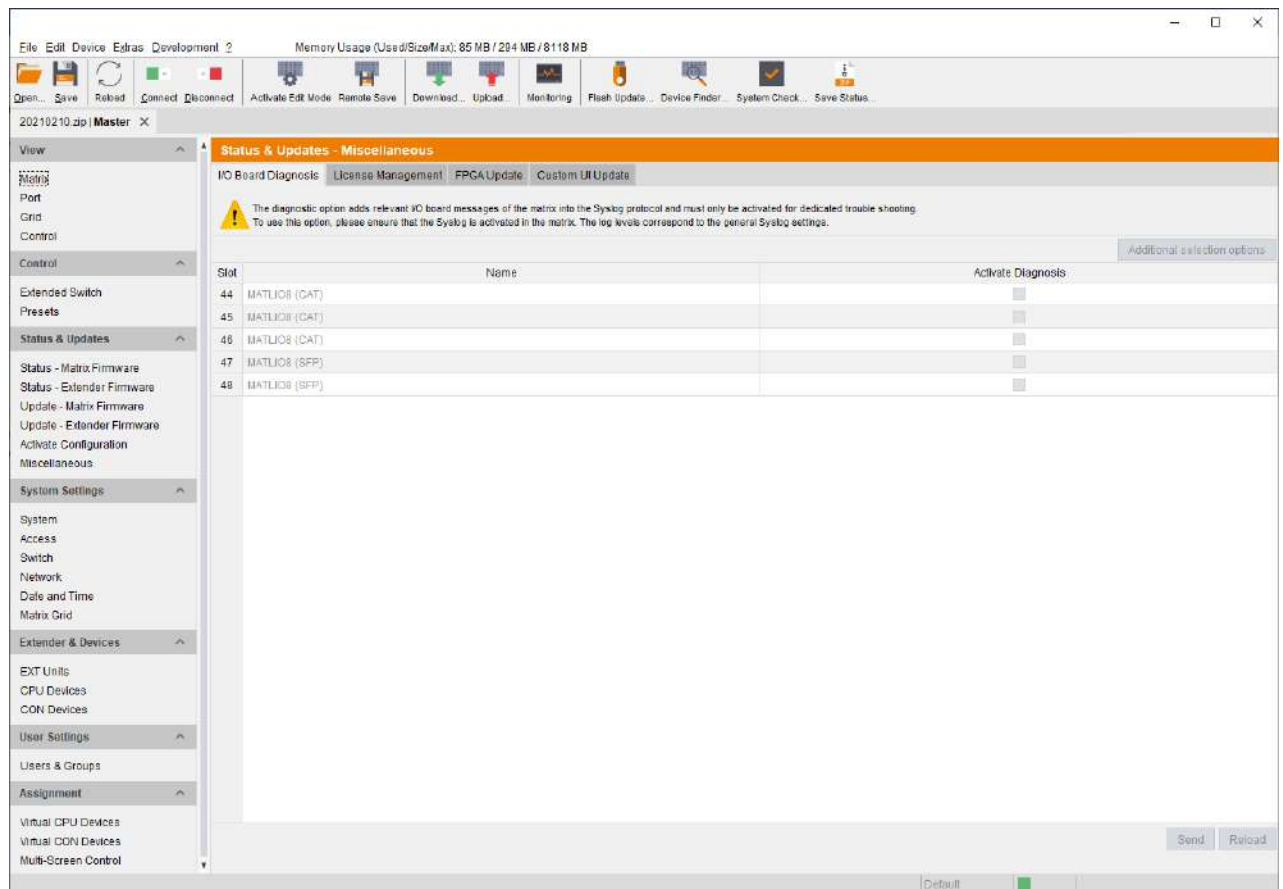
*Fig. 113   Management software menu **Status & Updates - Miscellaneous - I/O Board Diagnosis***

The following functions are available:

Button	Function
Send	Send settings to the matrix to activate the Syslog protocol for the selected I/O boards
Reload	Reload settings

The following options are available in the **Additional selection options** drop-down menu on the right upper side in the working area:

Option	Description
Select All	Select all I/O boards
Deselect All	Deselect all selected I/O boards

To activate the diagnostic option for individual I/O board messages, proceed as follows:

1. Select **Status & Updates > Miscellaneous** in the task area.

   The **I/O Board Diagnostic** tab opens in the working area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the desired I/O boards to activate the additional diagnosis.

   Messages of the selected I/O boards will be added to the Syslog protocol.

4. Click the **Send** button to send your settings to the matrix.

5. Click the **Deactivate Edit Mode** menu item in the toolbar.

Settings made in this menu will not be saved in the configuration. When restarting the matrix, these settings have to be set again, if necessary.

8.4.8   Setting SNMP Function

The SNMP function allows all function-critical and safety-critical elements of the matrix to be monitored and queried. This function complies with the RFC 1157 conformal standard. Two SNMP servers can be used at the same time. Enabling the SNMP function, the unencrypted SNMP monitoring (SNMPv2) is activated. An SNMPv3 User for encrypted SNMP monitoring (SNMPv3) can be set in the user settings (see chapter 8.5.1, page 165) and the login data for an SNMPv3 User at the SNMP server can be set in the default settings (see section on page 159).

NOTICE
When using SNMP monitoring, for reasons of access security, the use of a dedicated network according to the IT-Grundschutz catalog is recommended. The read only community for the MIB file is **draco**.

NOTICE
For an activation of the SNMP agent function or the SNMP server function, a restart of the matrix or the CPU board is necessary. Restarting the matrix or the CPU board can take several minutes, and the matrix is not available during the restart.

The settings for the SNMP monitoring are set in this menu:

*Fig. 114   Management software menu **System Settings - Network - SNMP***

The following parameters can be configured:

SNMP Agent

Traps	Description
SNMP Agent	Permission for an active query of the SNMP agent for traps is granted. This activation is a prerequisite for using the SNMP server.
Port	The SNMP port is called up automatically (default: 161).
Configured SNMPv3 User	Name of the SNMP user (default: snmp)
Read-Only Community String	The read-only community string for the MIB file is **draco**.

SNMP Trap

The SNMP agent must be activated to activate the SNMP traps.

Traps	Description
Enable Traps	Activates the active sending of trap messages from the SNMP agent to the SNMP server
SNMP Server	Input of the IP address of the SNMP server in the form "192.168.1.1"
Port	Input of the SNMP port (default: 162)
Select All	Select all traps
Status	Notification about matrix status
Temperature	Notification about temperature within the matrix
Insert I/O Board	Not available*
Remove I/O Board	Not available*
Invalid I/O Board	Notification about a wrong firmware installed on the I/O board
Insert Extender	• Notification about a newly connected extender to the matrix, notification about a switched-on extender • Notification about a newly established link between extender and matrix
Remove Extender	• Notification about a removed extender from the matrix • Notification about a switched off extender • 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 fan status on the left side of the matrix (interface view)
Fan Tray #2	Notification about the fan status on the right side of the matrix (interface view)
Power Supply #1	Notification about the status of power supply unit #1
Power Supply #2	Notification about the status of power supply unit #2
Power Supply #3	Not available*
Power Supply #4	Not available*

*   Only for Draco tera enterprise matrices

Activating the SNMP Agent

To activate the SNMP agent, proceed as follows:

1. Select **System Settings > Network** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the **SNMP** tab in the working area.
4. Click the **SNMP Agent** checkbox within the **SNMP Agent** area.

    By activating this option, the permission for an active query of the SNMP agent is granted.
5. Click the **Apply** button to confirm your changes.
6. Click the **Deactivate Edit Mode** menu item in the toolbar.

Activating SNMP Traps

To activate active reporting of the SNMP traps, proceed as follows:

1. Select **System Settings > Network** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the **SNMP** tab in the working area.
4. Click the **Enable Traps** checkbox within the **SNMP Trap** area.
5. Enter the IP address of the SNMP server under **SNMP Server**.
6. Click the checkboxes of the desired traps to activate them.
7. Click the **Apply** button to confirm your changes.
8. Click the **Deactivate Edit Mode** menu item in the toolbar.

Setting up SNMP Options

Presets for an SNMPv3 user can be set up for the computer on which the management software is operated are set in this menu.

To set or activate the presetting, proceed as follows:

1. Select **Extras > Options** in the menu bar and open the **SNMP** tab.

2. Enter the appropriate data.

3. Click the **Ok** button to confirm your entries.

4. Close the management software and restart it.

*Fig. 115   Management software menu **Extras - Options - SNMP***

The following options are available:

Option	Description
Port	Input of the SNMP port (default: 162)
Log File Directory	Default directory to store the log files
Log File Name	Default name of the log file
Log File Extension	Default extension for the log file
Daily Log Files	Log files are stored every 24 hours (daily)
Maximum Log File Size [KB]	Allowed maximum size of log file When reaching the maximum log file size, a new log file will be created.
Maximum Number of Log Files	Allowed maximum number of log files When the maximum number of log files is exceeded, the oldest logfile will be overwritten with the new information (log rotate).
Acoustic Notification	Enables acoustic notification for errors
Autostart	When starting the management software, the SNMP function will be started in the background
Open Monitoring Tab	When starting the management software, the monitoring tab will be opened

Creating an SNMPv3 User for the SNMP Server

In the following menu, the login data for an SNMPv3 user can be set up for the computer on which the management software is operated (SNMP server). The SNMP server authenticates itself with the agent using this login data.

NOTICE
Failed SNMP logging
If the login data differs between the matrix (set up in the **User** menu) and the SNMP server, no SNMP traps are transmitted.
➡ Ensure the login data (username and password) in both settings are identical (see chapter 8.5.1, page 165).

To configure the login data for an SNMPv3 User at the SNMP server, proceed as follows:

1. Select **Extras > Options** in the menu bar and open the **SNMP** tab.
2. Click the **Manage SNMPv3 Users** button.

    A list appears with already created SNMPv3 users.
3. Click the **Add User** button.

    A dialog window appears.
4. Enter the required data and click the **Ok** button to confirm your entries.
5. Click the **Close** button to close the users list.
6. Click the **Ok** button in the **SNMP** tab to confirm your settings.
7. Close the management software and restart it.

Fig. 116   Management software menu ***Extras - Options - SNMP - Manage SNMPv3 Users - Add User***

The following parameters are required to create a new SNMPv3 user on the SNMP server:

Option	Description
Username	SNMPv3 username
Authentication Protocol	Only SHA protocol, no selection available
Authentication Password	Authentication password for the SNMPv3 user (case sensitive, input of minimum 8 characters up to 16 characters)
Privacy Protocol	Only DES protocol, no selection available
Privacy Password	Must be identical to the password of the authentication password

Option	Description
Username	SNMPv3 username

8.4.9   Setting LDAP Configuration (Active Directory)

NOTICE
To initialize the LDAP configuration changes, the matrix must be restarted. Restarting the matrix can take several minutes and the matrix is not available during the restart.

The KVM matrix can be synchronized with the directory service Active Directory regarding user authentication. This allows the user to login at the KVM matrix using login information from the Active Directory service and to contact the Active Directory Server for each authentication that does in fact the proper authentication.

The connection between KVM matrix and the Active Directory server is established via OpenLDAP and periodically synchronized every 5 minutes.

The search of users to be synchronized and automatically added to the KVM matrix configuration can either be based on a **group** or **organizational unit (OU)**. In both cases a user requires to be at least assigned to one group:

- In case of the group, all users belonging to a previously defined group on the active directory server are added to the KVM matrix and synchronized. In this alternative, the organizational structure of the organizational units (OUs) is added as matrix user group to the KVM matrix configuration. This means that the organizational unit (OU) that includes the user can be found as a matrix user group in the KVM matrix configuration after the synchronization. A user can be member of up to 8 groups.

- In case of the organizational unit, all users belonging to groups that are located directly under this organizational unit are added and synchronized. The groups can also include subgroups. The structure of the groups is added to the KVM matrix configuration as user group. Each group will be represented in the KVM matrix as a user group after the synchronization. Groups that are located in sub organizational units will be ignored.

The general LDAP settings for the synchronization with the directory service Active Directory are set in this menu.
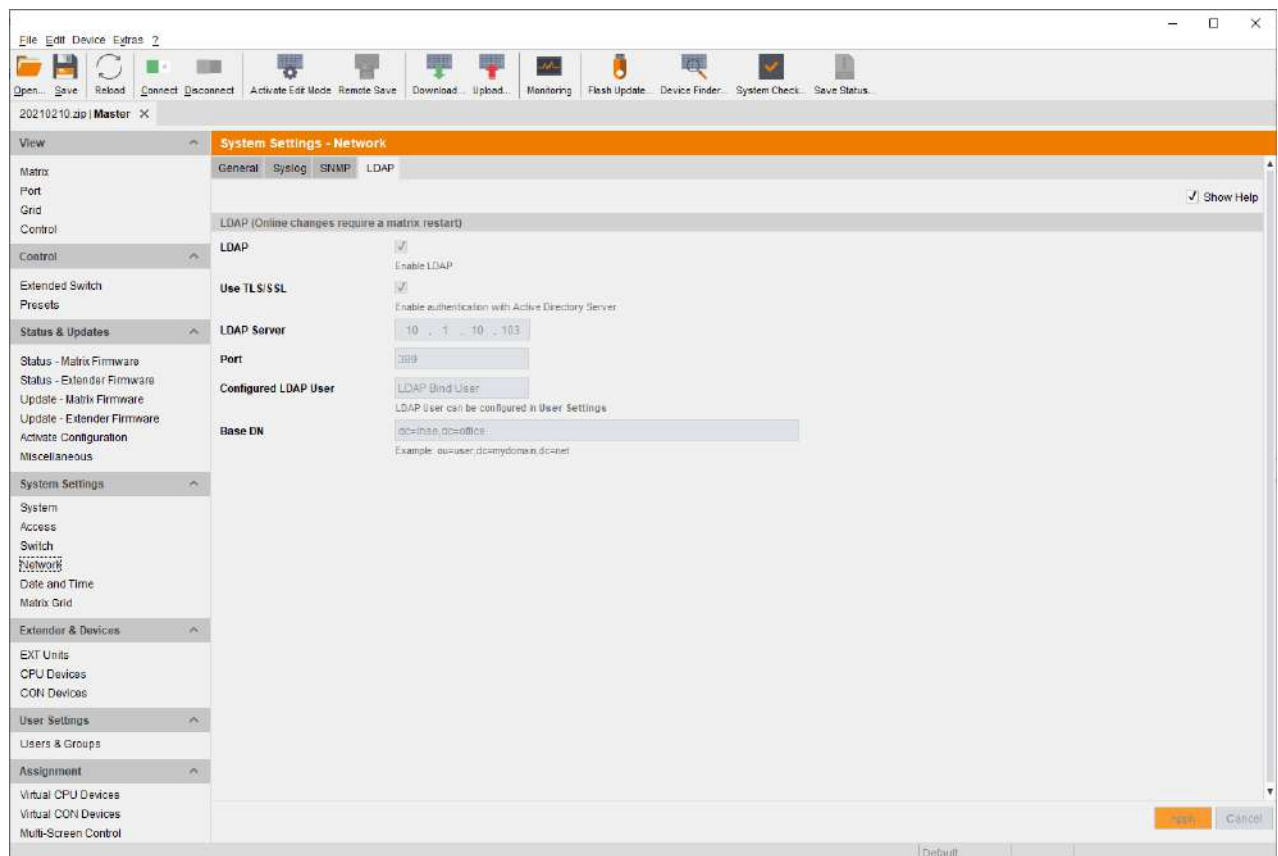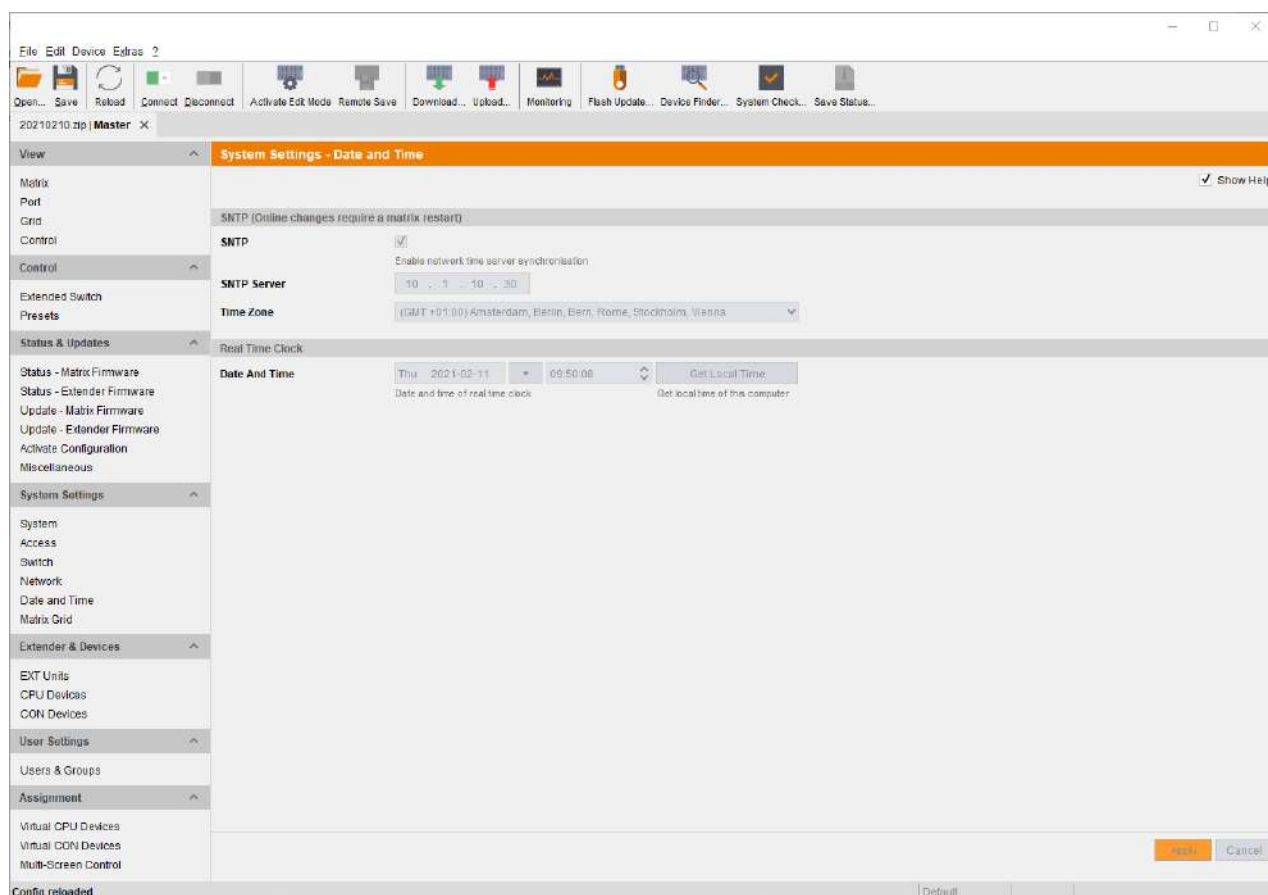

Fig. 117   Management software menu **System Settings - Network - LDAP**

The following parameters can be configured:

Field	Entry	Description
LDAP	Activated	LDAP for the request of information from a user administration is active
	Deactivated	Function not active (default)
Use TLS/SSL	Activated	Enable a secured transmission (transport layer security) for the Active Directory access.
	Deactivated	Function not active (default)
LDAP Server	Byte	Input of the IP address for the LDAP-Servers in the form "192.168.1.1" and the LDAP port (Default: 389/636)
Configured LDAP User	Text	Name of the configured LDAP user
LDAP Base DN	Text	Input of the LDAP Base DN according to the existing structure of the user directory

ℹ️ A matrix configuration should only include one LDAP user and one LDAP group at the same time. The LDAP user and the LDAP group can be created, changed, or deleted during ongoing operation: no restart of the matrix is required.

To configure and enable the synchronization to the Active Directory server, there are three steps required:

- Configuring the LDAP settings.
- Creating an LDAP User (see page 167).
- Creating an LDAP Group (see page 176).

To configure the LDAP settings, proceed as follows:

1. Select **System Settings > Network** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the **LDAP** tab in the working area.
4. Click the **LDAP** checkbox**.**
5. Optionally click the **Use TLS/SSL** checkbox to activate these functions.
6. Enter the respective IP address and port number into the field **LDAP Server** (default port number: 389 (636 for SSL)).
7. Enter the LDAP **Base DN** into the respective field (e.g., dc=example, dc=com).
8. Click the **Apply** button to confirm the settings.
9. Restart the matrix.

ℹ️ Changes done in step 4 to 8 only come into effect after a restart of the matrix.

10. Create an LDAP User settings (see page 167).
11. Create an LDAP Group (see page 176).

8.4.10 Setting Date and Time

The parameters for the system configuration are set in this menu, based on Simple Network Time Protocol (SNTP):

*Fig. 118   Management software menu **System Settings - Date and Time***

The following parameters can be configured:

SNTP

Field	Entry	Description
SNTP	Checkmark	Enable network time server synchronization
SNTP Server	Byte	Input of the SNTP server IP address (default: 000.000.000.000)
Time Zone	Region	Set your specific time zone

Real Time Clock

Field	Description
Date*	Date and time of real time clock
Get Local Time	Get local time of this computer

Configuring the Time Server

To configure a time server, proceed as follows:

1. Select **System Settings > Date and Time** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Click the **SNTP** checkbox to enable the SNTP option.
4. Enter the IP address of your SNTP server into the **SNTP Server** field.
5. Select your time zone in the **Time Zone** field.
6. Click the **Apply** button to confirm your settings.
7. Restart the matrix.

   After the restart, the system time is now provided by the SNTP server.
8. Click the **Deactivate Edit Mode** menu item in the toolbar.

Configuring the Real Time Clock without Time Server

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

1. Select **System Settings > Date and Time** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Set the current date in the **Date and Time** section.
4. Set the current time in the **Date and Time** section.

   The entered time is set immediately in the settings.
5. Option: if you want to receive the time from your currently used computer, click the **Get Local Time** button.
6. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.5   Configuring User Settings

8.5.1   Setting User Access

New users and their user settings and permissions are set in this menu.
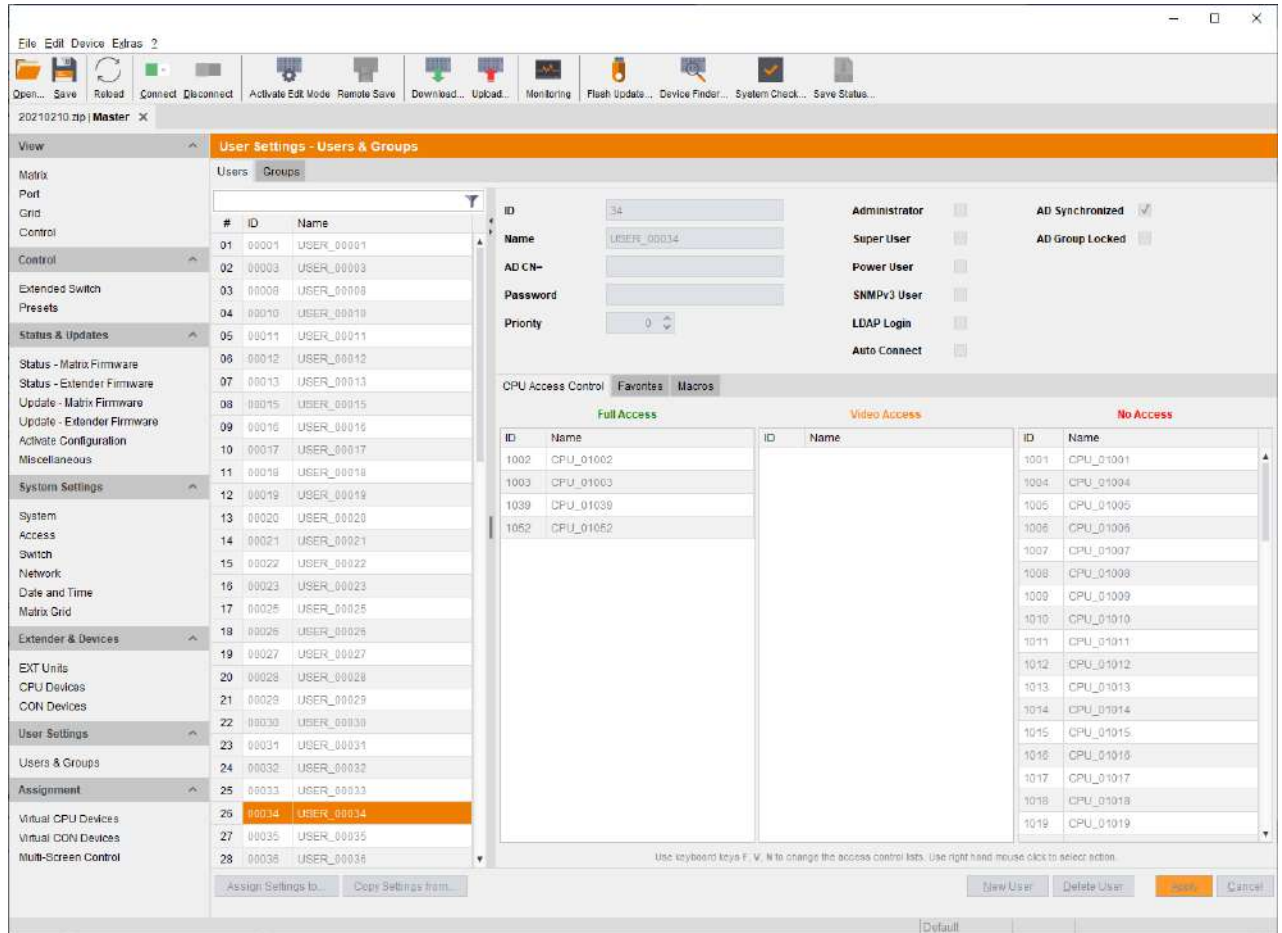
*Fig. 119   Management software menu **User Settings - Users & Groups - Users***

The following functions are available:

Button	Function
New User	Open a new user configuration
Delete User	Delete an existing user
Apply	Confirm the changes of an existing user or the creation of a new user account
Cancel	Reject changes

The following keyboard commands are available:

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

The following parameters can be configured:

Field	Entry	Description
ID	Numerical	Ident number of the user
Name	Text	For standard users it is the login name (case sensitive, input of minimum 1 character up to 16 characters). Can be used to log in to the OSD.
		For LDAP Users it is the name (case sensitive, input of minimum 1 character up to 16 characters). Can be used to log in to the OSD.
		For users synchronized via LDAP, it is the sAMAccountName, automatically retrieved from the LDAP server. Can be used to log in to the OSD.
Full Name / Login Name / AD CN=	Text	For standard users it is the full name (optional input of up to 32 characters). Can be used to log in to the OSD.
		For LDAP Users it is the login name (case sensitive, input of minimum 1 character up to 32 characters). Can be used to log in to the OSD.
		For users synchronized via LDAP, it is the userPrincipalName, automatically retrieved. Can be used to log in to the OSD.
Password	Text	For standard users (optional input of up to 16 characters). Can be used to log in to the OSD.
		For LDAP Users (case sensitive, input of minimum 1 character up to 16 characters). Can be used to log in to the OSD.
Priority	Value	Priority of the user
Administrator	Activated	• User has administrator rights • Permission for system configuration and all switching operations
	Deactivated	Function not active
Super User	Activated	Permission to switch any CON Device to any CPU Device in **Extended Switching**
	Deactivated	Function not active
Power User	Activated	• User has user rights • Permission to switch CON Devices to CPU Devices in **Extended Switching** according to the **CON Device ACL** or **User ACL**, but not in Private Mode
	Deactivated	Function not active
SNMPv3 User	Activated	Permission to use SNMPv3 (encrypted)
	Deactivated	SNMPv3 is not enabled
LDAP Login	Activated	Bind User for accessing the Active Directory
	Deactivated	Function not active (default)
Auto Connect	Activated	Re-establish the previous user connection after login
	Deactivated	Function not active
AD Synchronized	Activated	Enable synchronization with the Active Directory **Note:** LDAP Login has to be activated to use the synchronization
	Deactivated	Function not active

Field	Entry	Description
AD Group Locked	Activated	Lock synchronization of group attribute for an Active Directory user. This setting is required for a manual change of user groups for a specific Active Directory user.
	Deactivated	Function not active (default)

NOTICE

Failed SNMP logging

If the login data of the SNMPv3 user differs between the matrix and the SNMP server, no SNMP loggings are transmitted.

➡ Ensure the login data (username and password) in both settings are identical (see section on page 159).

Creating a new Standard User Account

To create a new user, proceed as follows:

1. Select **User Settings > Users & Groups** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Click the **New User** button.

   A selection dialog appears.
4. Select a template of an existing user if applicable (**Choose template**) in the selection box.
5. Click the **Ok** button.
6. Enter a name.
7. Optionally enter a full name and a password.
8. Enter general access permissions.
9. Set user permissions for CPU access (paste function).
10. Set user favorites for OSD access.
11. Click the **Apply** button to confirm the new user settings.
12. Click the **Deactivate Edit Mode** menu item in the toolbar.

Creating a new LDAP User Account

1. Select **User Settings > Users & Groups** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Click the **New User** button.

   A selection dialog appears.
4. Select **Create a LDAP User** in the selection box to create a new LDAP user (bind user).
5. Click the **Ok** button.
6. Enter the name of the bind user from the Active Directory into the field **Name**.
7. Enter the Common Name (CN) of the bind user from the Active Directory into the field **Login Name**.
8. Enter the password of the bind user from the Active Directory into the field **Password**.
9. Click the **Apply** button to confirm the creation of the user.
10. Click the **Deactivate Edit Mode** menu item in the toolbar.

A matrix configuration should only include one LDAP user and one LDAP group at the same time. The LDAP user and the LDAP group can be created, changed, or deleted during ongoing operation: No restart of the matrix is required.

Changing a User Account

To modify user settings, proceed as follows:

1. Select **User Settings > Users & Groups** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select a user in the Users list.
4. Modify the desired settings.
5. Click the **Apply** button to confirm the creation of the user.
6. Click the **Deactivate Edit Mode** menu item in the toolbar.

Configuring User Access Rights

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

1. Select **User Settings > Users & Groups** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select a user in the **Users** list.
4. By clicking with the right mouse button once on a CPU in one of the respective access lists (**Full Access**, **Video Access** and **No Access**), a context menu for selection appears in which the respective CPU can be moved, and the access rights can be changed. Alternatively, you can type the key commands `<F>`, `<V>` or `<N>` to set the respective access rights.
5. Click the **Apply** button to confirm the changes.
6. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.5.2   Setting User Favorites

Individual favorite lists of CPU Devices that will be switched frequently can be created for different users in this menu. A favorite list can contain up to 32 different CPU Devices (from firmware V3.05).

The switching of the favorites is done via keyboard command (see chapter 9.1.1, page 258).
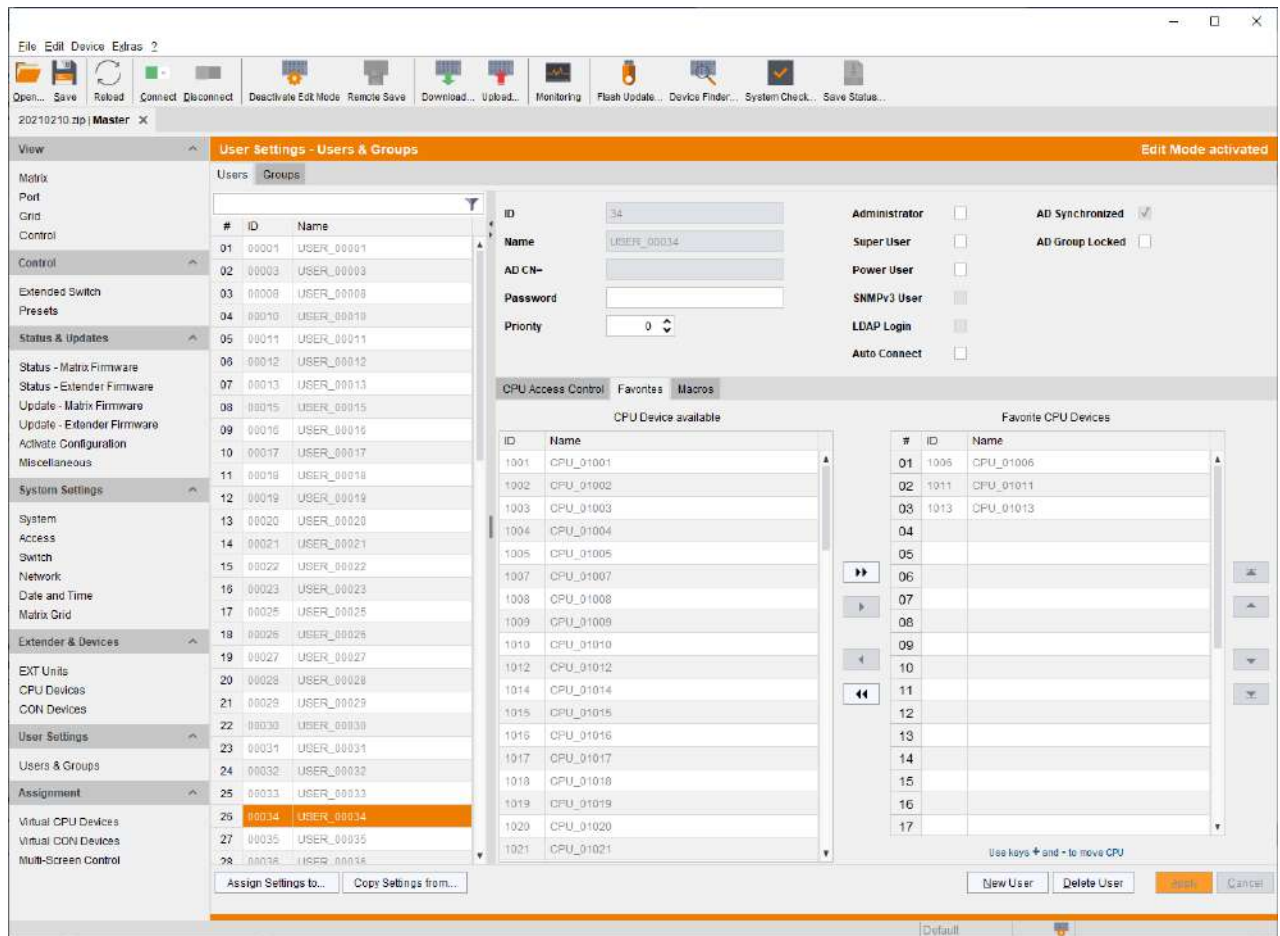
*Fig. 120   Management software menu **User Settings - Users & Groups - Users - Favorites***

Creating a Favorites List for Users

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

1. Select **User Settings> Users & Groups** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the respective user for the favorites list in the **Users** list.

4. Click the **Favorites** tab in the working area.

5. Select the CPU Devices in the **CPU Device available** list that should be added to the favorites list (**Favorite CPU Devices**). By pressing and holding down the <Ctrl> key at the same time, more than one CPU Device can be highlighted.

6. Click the ▶ button to move the highlighted CPU Devices to the favorites list. By clicking the ▶▶ button, all CPU Devices from the **CPU Device available** list will be moved to the favorites list (**Favorite CPU Devices**).

7. To remove highlighted CPU Devices from the favorites list, click the ◀ button. If you click the ◀◀ button, all CPU Devices will be removed from the favorites list.

8. Click the ▼ or ▲ button to change the order of the CPU Devices within the favorites list.
   Or press the `<+>` or `<->` key to change the order of the CPU Devices within the favorites list.

9. Click the **Apply** button to confirm the changes.

10. Click the **Deactivate Edit Mode** menu item in the toolbar.

Assigning Settings to other Users

To assign settings of a user to other users, proceed as follows:

1. Select **User Settings> Users & Groups** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Click the **Favorites** tab in the working area.

4. Select the user whose settings are to be assign to another user.

5. Click the **Assign Settings to** button below the user list.

   A query to select the settings appears.

6. Click the checkboxes for the desired settings.

7. Click the **Next** button.
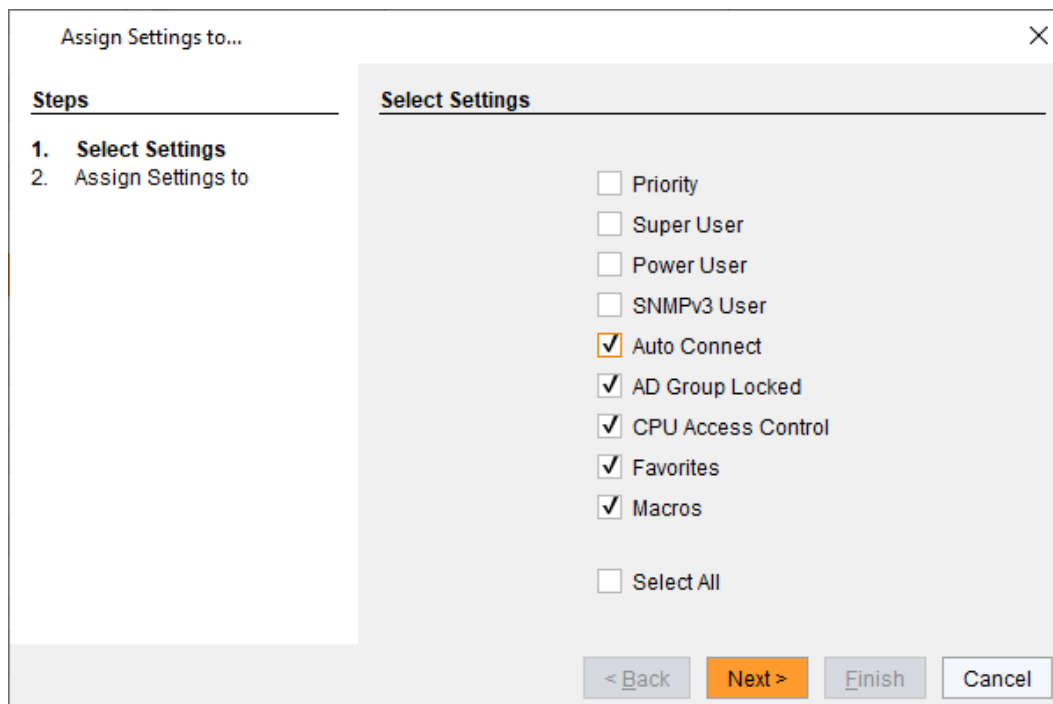
*Fig. 121   Management software menu **Users & Groups - Users - Select Settings***

   A query to start the assignment appears.

8. Select the user in the **Available to assign settings to** list to which the settings are to be assigned. By pressing and holding down the `<Ctrl>` key at the same time, more than one user can be highlighted.

9. Click the ▶ button to move the highlighted user to the **Assign settings to** list. By clicking the ▶▶ button, all users will be moved to the **Assign settings to** list.

10. To remove highlighted user from the **Assign settings to** list, click the ◀ button. If you click the ◀◀ button, all users will be removed from the **Assign settings to** list.

11. Click the **Finish** button.

   The settings are immediately assigned to the selected users.

12. Click the **Deactivate Edit Mode** menu item in the toolbar.
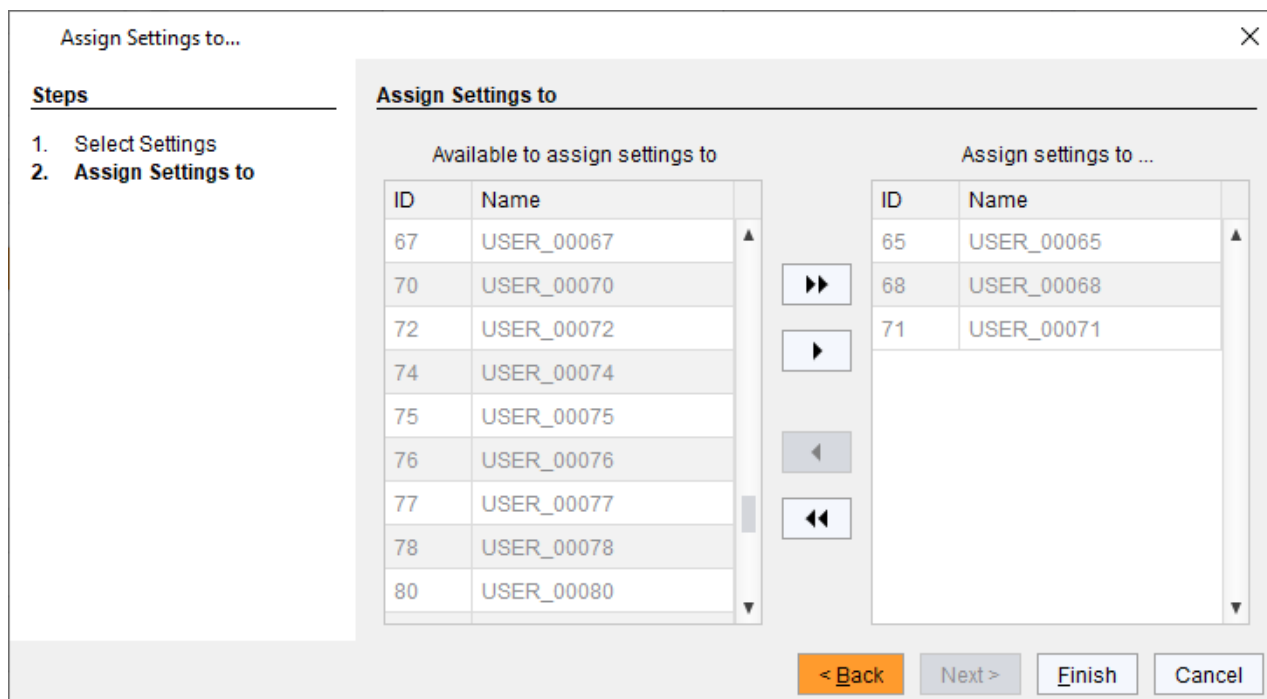
*Fig. 122   Management software menu **Users & Groups - Users - Assign Settings***

Copying Settings from another User

To copy settings from a user to another user, proceed as follows:

1. Select **Extender & Devices > EXT Units in the task area**.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the user to copy the settings to. By pressing and holding down the `<Ctrl>` key at the same time, more than one user can be highlighted.
4. Click the **Copy Settings from** button below the user list.

   A query to select the settings appears.
5. Click the checkboxes for the desired settings.
6. Click the **Next** button.
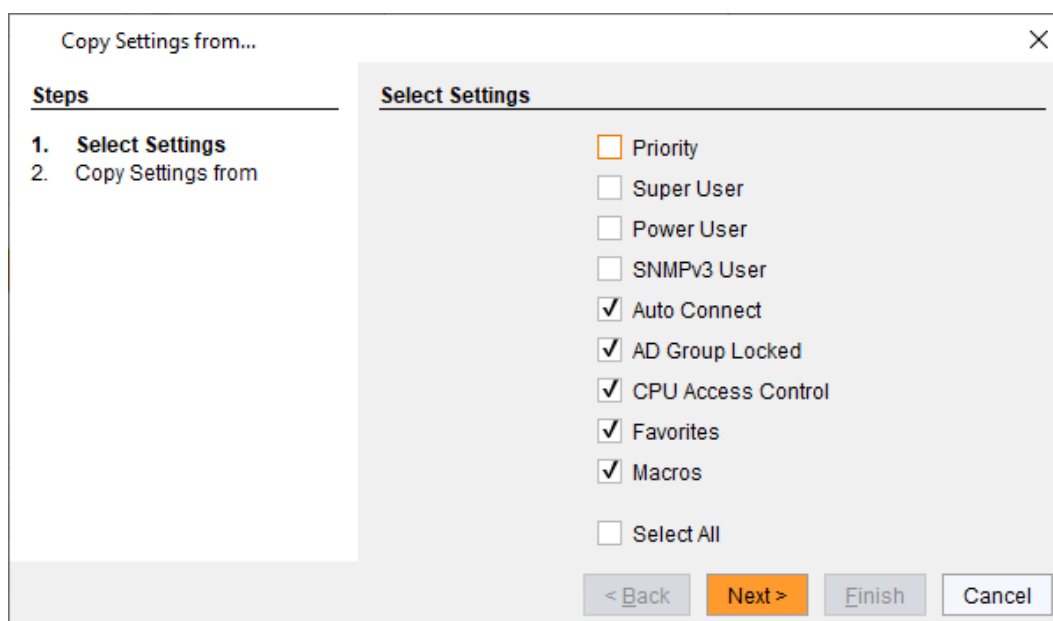
*Fig. 123   Management software menu **Users & Groups - Users - Select Settings***

A query to start the assignment appears.

7. Select the user in the selection list from which the settings are to be copied.

8. Click the **Finish** button.

The settings are immediately copied to the selected user.
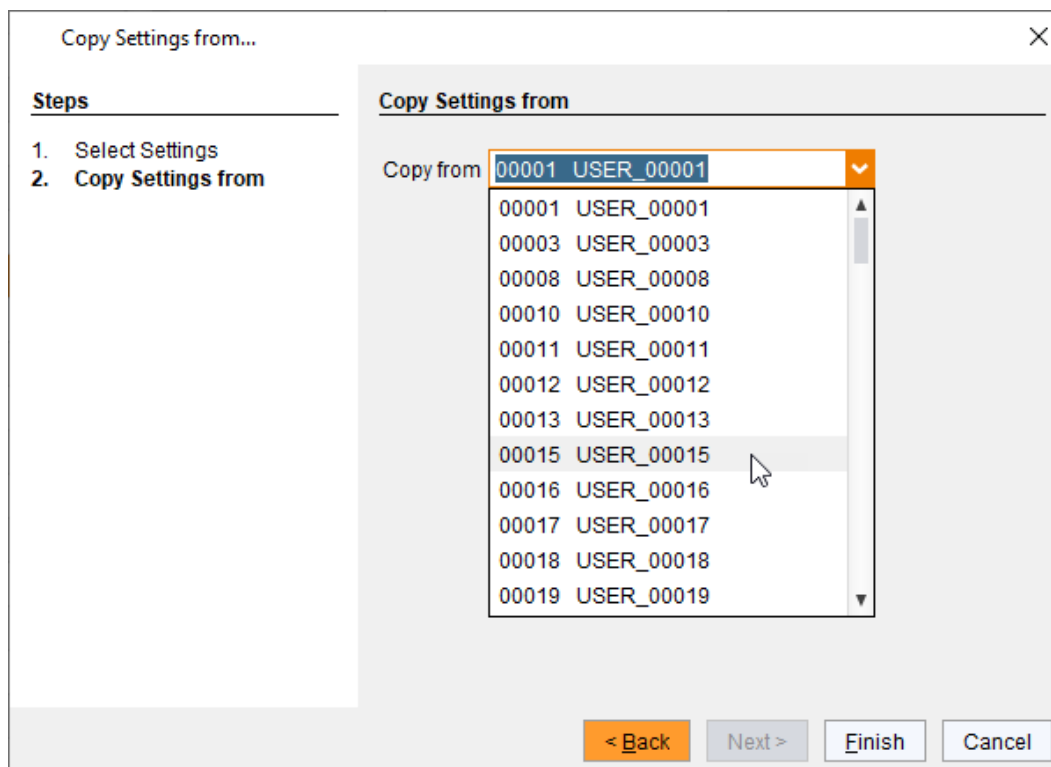
*Fig. 124   Management software menu **Users & Groups - Users - Copy Settings***

8.5.3   Setting User Macros

In this menu macro commands for switching, disconnection or user administration can be created. Macro commands are created for each user separately. A macro can execute up to 16 commands successively. The execution of the macros is done via Hot Key and the `<F1>` to `<F16>` function keys (see chapter 9.1.3, page 260).

ℹ To execute user macros the user has to be logged in to the matrix.
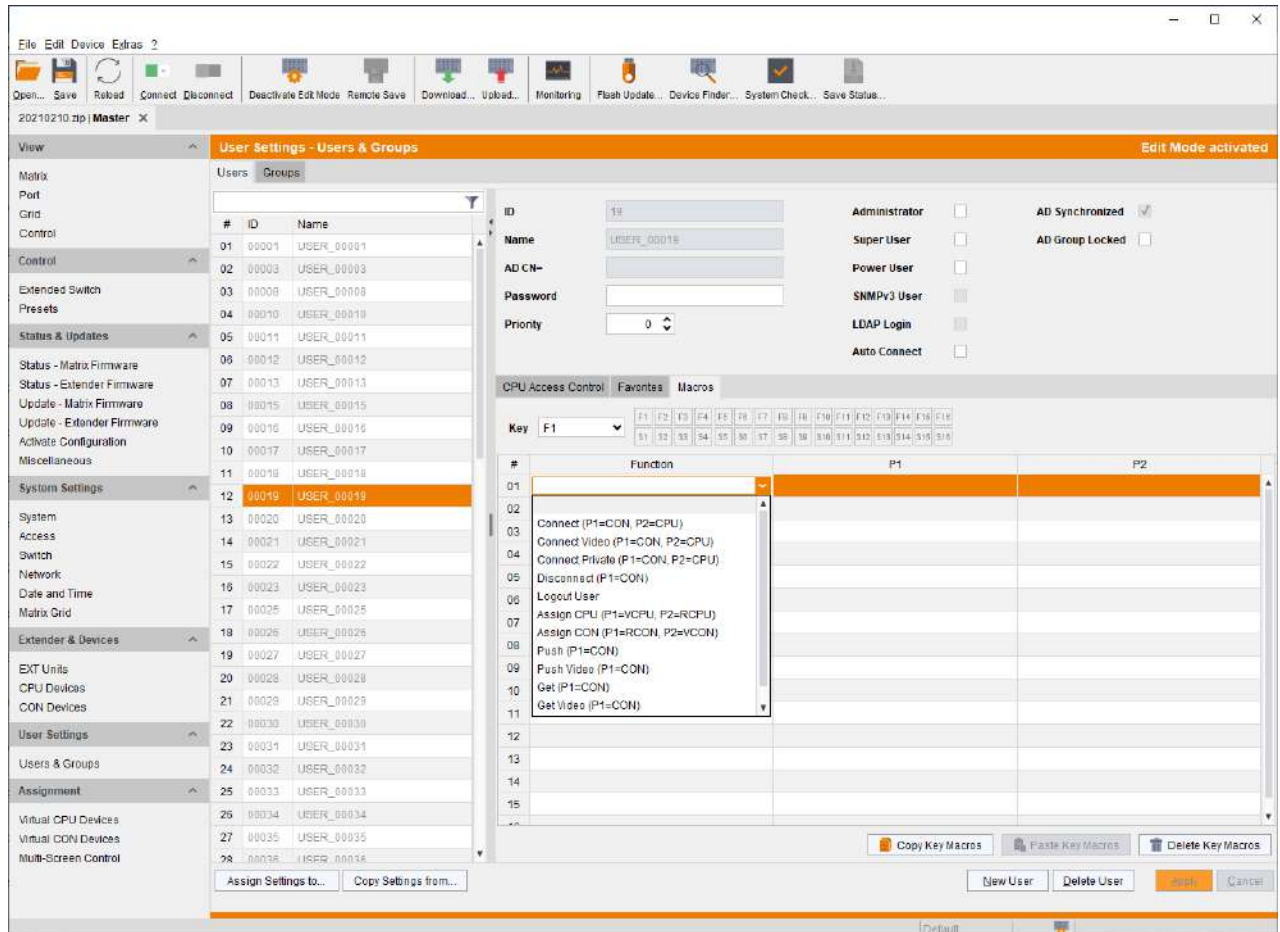
*Fig. 125   Management software menu **User Settings - Users & Groups - Users - Macros***

The following parameters can be configured:

Field	Selection	Description
Function (01 to 16)	**Connect (P1=CON, P2=CPU)**	Set a bidirectional connection from CON Device P1 to CPU Device P2
	Connect Video (P1=CON, P2=CPU)	Set a Video Only connection from CON Device P1 to CPU Device P2
	Disconnect (P1=CON)	Disconnect the CON Device P1
	Logout User	Logout the current user
	Assign CPU (P1=VCPU, P2=RCPU)	Assign a Virtual CPU Device to a Real CPU Device

Field	Selection	Description
	Assign CON (P1=RCON, P2=VCON)	Assign a Real CON Device to a Virtual CON Device
	Push (P1=CON)	The user's Full Access connection is forwarded to CON Device P1 and is changed into a Video Only connection.
	Push Video (P1=CON)	The video signal of the current connection (Full Access or Video Only) is forwarded to CON Device P1. The user's connection remains unchanged (Full Access or Video Only).
	Get (P1=CON)	The user's CON Device gets a Full Access connection to the CPU Device that is currently connected to CON Device P1. The connection of CON Device P1 is changed into a Video Only connection.
	Get Video (P1=CON)	The user's CON Device gets a Video Only connection to the CPU Device that is currently connected to CON Device P1. The connection of CON Device P1 remains unchanged (Full Access or Video Only).
	Login User console P2	Login a certain user P1 at CON Device P2
P1	**CON or CPU Device**	Name of CON Device or CPU Device
P2	**CON or CPU Device**	Name of CON Device or CPU Device

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

1. Select **User Settings > Users & Groups** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the user for which macros are to be created.
4. Open the **Macros** tab.
5. Select in the **Key** field the function key for which a macro has to be created.
6. Double-click in the **Function** column to display a list of all available commands that should be part of the macro.
7. Select the desired command in the selection list.
8. Select in the **P1** and **P2** columns the respective parameters for the macro functions (e.g., corresponding CON Devices and CPU Devices).
9. Click the **Apply** button to confirm the changes.
10. Click the **Deactivate Edit Mode** menu item in the toolbar.

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

➡ When clicking on the **Macros** tab, macros can be assigned to other users by using the **Assign Settings to...** function (see description on page 170) and can be copied from other users by using the **Copy Settings from...** function (see description on page 171).

➡ When clicking on the macro list, macros of the selected key can be copied into the cache by using the **Copy Key Macros** function. You can paste the macros from the cache into another key by using the **Paste Key Macros** function and you can reset all macros of the selected key by using the **Delete Key Macros** function.

8.5.4   Setting User Groups

The KVM matrix allows to bundle the users of a configuration into User Groups. The groups can be used to subdivide the users logically or thematically. As an application example you can group all power users together. The configuration of User Groups at the same time increases the clarity of the configuration.
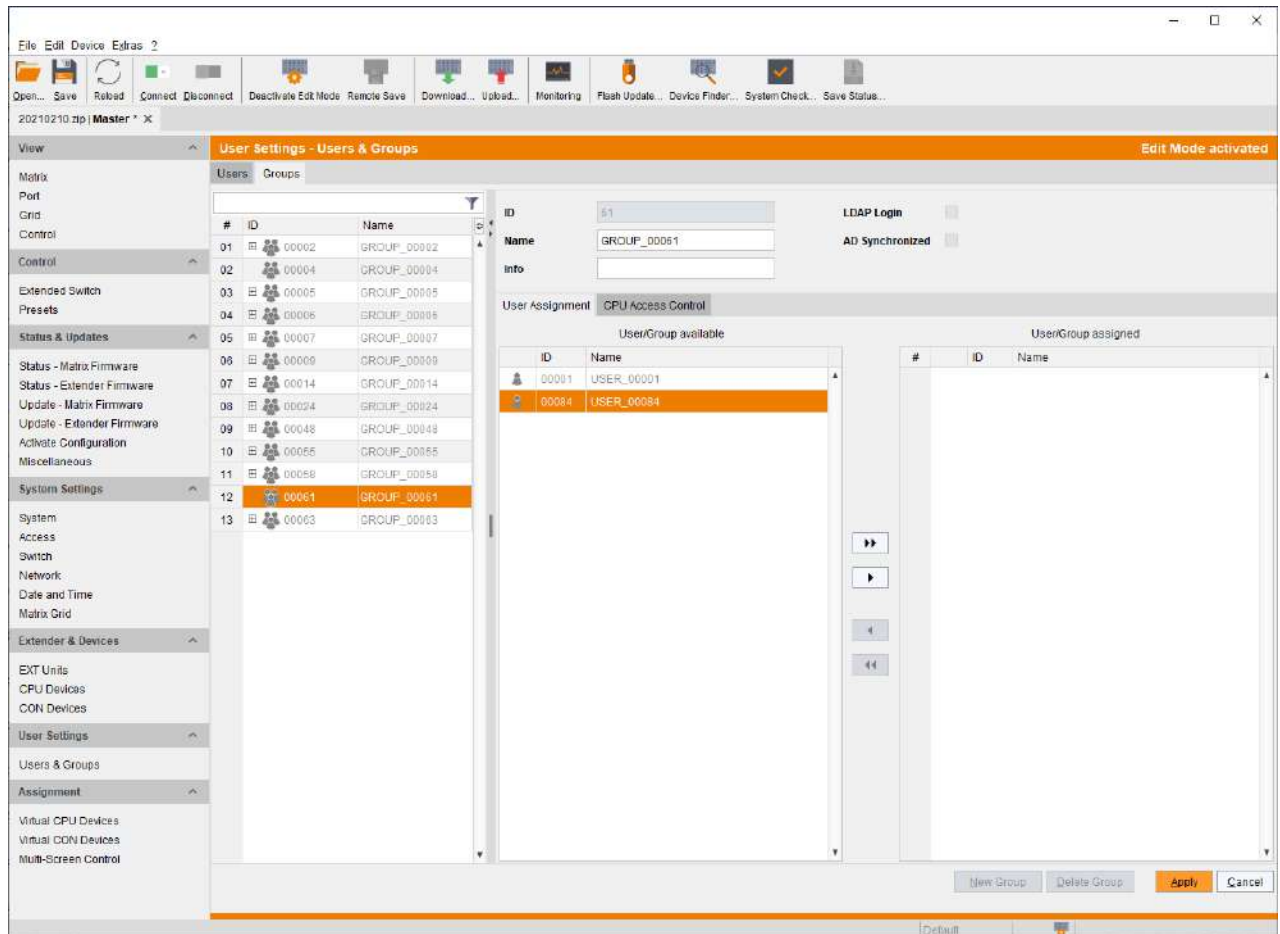
*Fig. 126   Management software menu **User Settings - Users & Groups - Groups***

The following functions are available:

Button	Function
New Group	Create a new group
Delete Group	Delete an existing group
Apply	Apply changes
Cancel	Reject changes

Button	Function
▶	Assign the selected user to a user group
▶▶	Assign all available users to a user group
◀	Remove the selected user from a user group
◀◀	Remove all users from a user group

Creating a Standard User Group

To create and configure a User Group, proceed as follows:

1. Select **User Settings > Users & Groups** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Click the **Groups** tab in the working area.
4. Click the **New Group** button.

   A selection dialog appears.

   Select **Create a standard Group** in the selection box.
5. Click the **Apply** button.
6. Enter a group name into the field **Name**.
7. Click the **Apply** button to confirm the group creation.
8. Click the **Deactivate Edit Mode** menu item in the toolbar.

Creating an LDAP Group

1. Select **User Settings > Users & Groups** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Click the **Groups** tab in the working area.
4. Click the **New Group** button to create a new LDAP group.

   A selection window appears.
5. Select **Create a LDAP Group** in the selection box.

   The group determines which users of the Active Directory server should be synchronized.
6. Enter a name into the field **Name**.
7. Enter either the Common Name (CN) of a right group or the Common Name (OU) of an organizational unit into the field **LDAP OU=/CN=** as shown below:

   - OU= name of the organizational unit
   - CN= name of the right group
8. Click the **Apply** button to confirm the creation of the group.

   The Active Directory synchronization can be used now.
9. Click the **Deactivate Edit Mode** menu item in the toolbar.

ℹ️ A matrix configuration should only include one LDAP user and one LDAP group at the same time. The LDAP user and the LDAP group can be created, changed or deleted during ongoing operation: No restart of the matrix is required.

Assigning a User to a Group

To assign a user to a group, proceed as follows:

1. Select **User Settings > Users & Groups** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Click the **Groups** tab in the working area.

4. Select the User Group to be assigned with a user.

5. Select a user in the list **User/Group available** that should be assigned to the User Group. By pressing and holding down the `<Ctrl>` key at the same time, more than one user can be highlighted.

6. Click the ▶ button to move the highlighted user to the User Group list (**User/Group assigned**). By clicking the ▶▶ button, all users from the list **User/Group available** will be moved to the list **User/Group assigned**.

7. To remove highlighted users from the User Group list, click the ◀ button. If you click the ◀◀ button, all Users will be removed from the User Group list.

8. Click the **Apply** button to confirm the group creation.

9. Click the **Deactivate Edit Mode** menu item in the toolbar.

    The user is assigned to the User Group now.

8.6 Main Extender Settings

8.6.1 Extender Settings

The matrix automatically recognizes every extender module, physically connected to the matrix with a direct cable connection, reads out its serial number and creates EXT Units automatically. This is the Flex Port function of the matrix. Dual-Head extender modules will be recognized as two independent EXT Units.

Add-on modules are not created as independent EXT Units. The data of add-on modules is included in one EXT Unit together with the associated extender module.

All EXT Units are managed in this menu. This includes the creation of new EXT Units and the deletion of existing EXT Units.

NOTICE
The connection of a fixed port EXT Unit (e.g., USB 2.0) to a Flex Port can cause unintended results. EXT Units for USB 2.0 extender modules have to be created manually (see chapter 8.7, page 186).
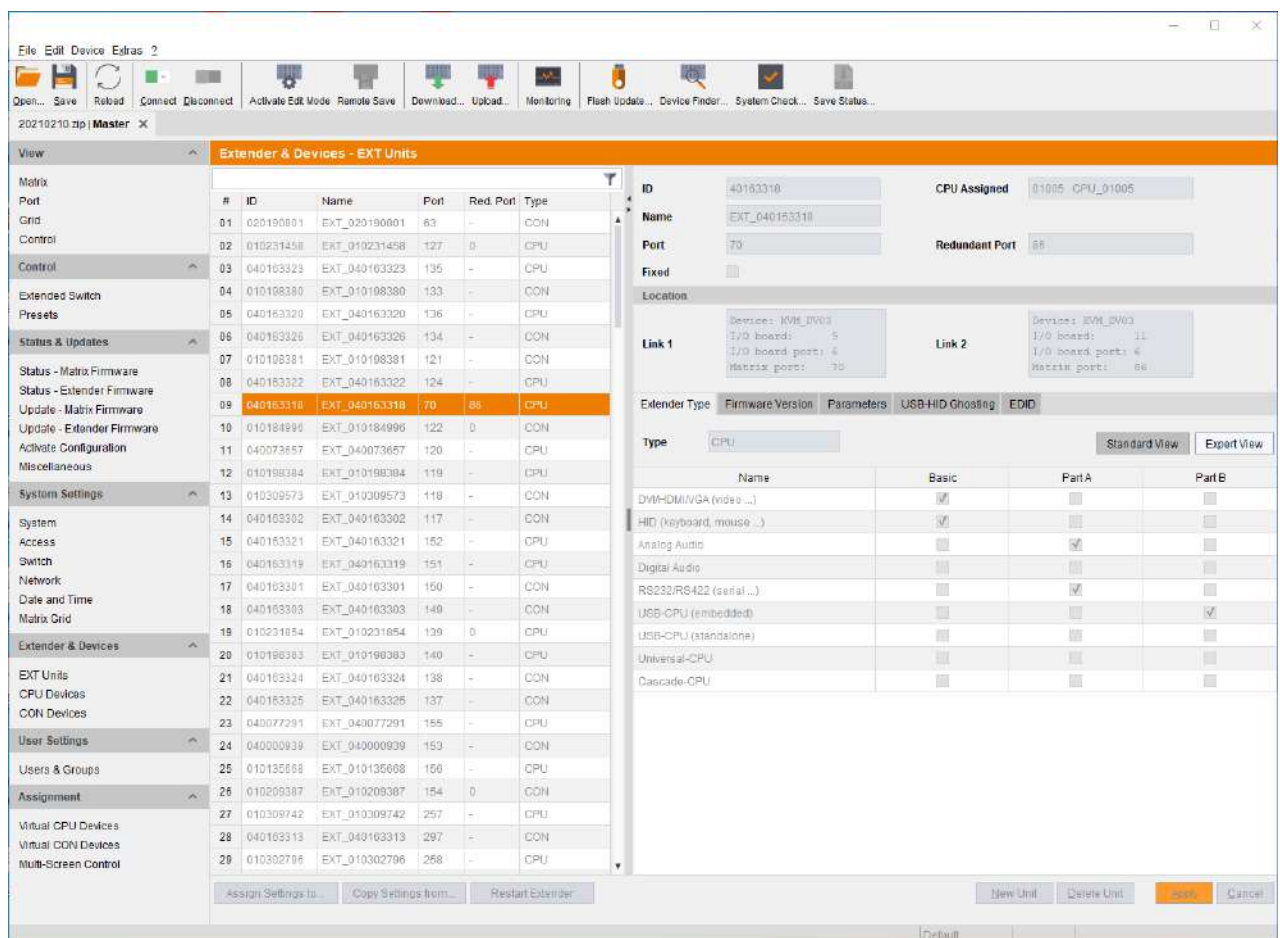
*Fig. 127   Management software menu **Extender & Devices - EXT Units***

The following parameters are recognized automatically:

Field	Entry	Description
ID	Text	Numerical value of the KVM extender module ID. The ID is provided by the extender module (serial number) and cannot be changed.
Name	Text	Name of the EXT Unit

Field	Entry	Description
Port	0 or 1 to 160 (depending on the matrix)	• **0** if the primary interconnect port of the extender module is currently not connected to the matrix. • **1 to 160** if the primary interconnect port of the extender module is currently connected to the matrix.
Fixed	Activated	Extender was created as a fixed port extender (e.g., USB2.0 CON, USB2.0 CPU)
	Deactivated	Function not active
CPU/CON Assigned	-	Assigned CPU Device or CON Device
Redundant Port	0, 1 to 160 or - (depending on the matrix)	• **0** if the redundant interconnect port of the extender module is currently not connected to the matrix. • **1 to 160** if the redundant interconnect port of the extender module is currently connected to the matrix. • **-** if the extender module does not have a redundant interconnect port.

8.6.2   Extender Type

To display the extender type data of an extender module, proceed as follows:

1.   Select **Extender & Devices > EXT Units** in the task area.

2.   Select the EXT Unit of the extender module whose type is to be displayed.

      The extender type is displayed on the right side of the working area.

      –   The **Basic** column stands for the extender module of the selected EXT Unit.

      –   The **Part A** and **Part B** column stand for the add-on module of the selected EXT Unit.
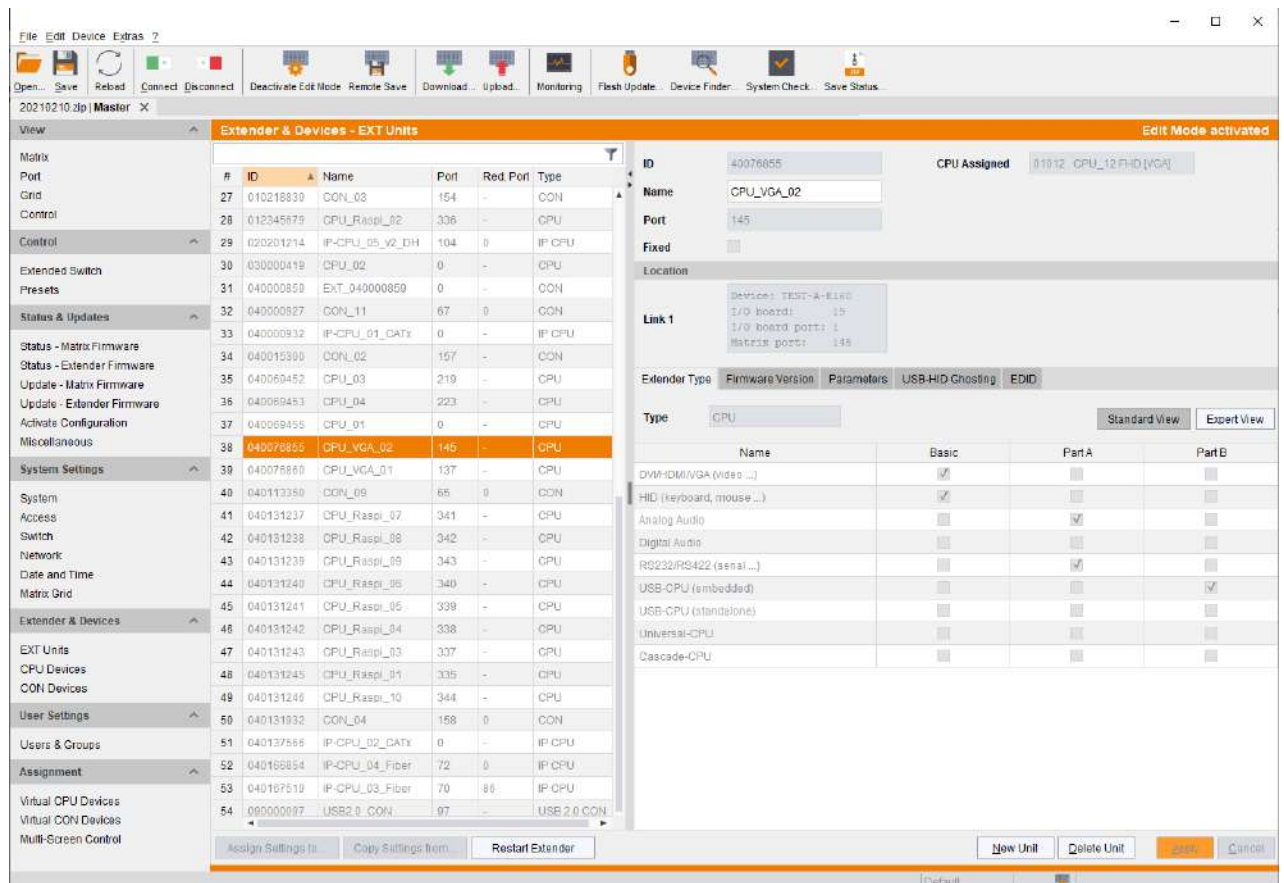
*Fig. 128   Management software menu **Extender & Devices - EXT Units - Expert View - Extender Type***

8.6.3   Extender Firmware Version

To display the firmware version of an extender module, proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.

3. Select the EXT Unit of an extender module to be displayed.

4. Click the **Firmware Version** tab on the right side of the working area.

    The **Firmware Version** overview is displayed on the right side of the working area.

Fig. 129   Management software menu Extender & Devices - EXT Units - Firmware Version

Add-on modules are shown together with the associated extender module in one EXT Unit.

8.6.4   Extender Parameters

To read out and display parameters of an extender module, proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the EXT Unit of the extender module whose parameters are to be displayed.

4. Click the **Parameter** tab on the right side of the working area.

5. Click the **Read** button in the symbol bar of the tab.

    A query to read the parameters appears.

6. Click the **Yes** button to confirm the reading.

    The parameters of the extender module are read out and displayed on the right side of the working area. At the same time, the connection will be disconnected for a few seconds.
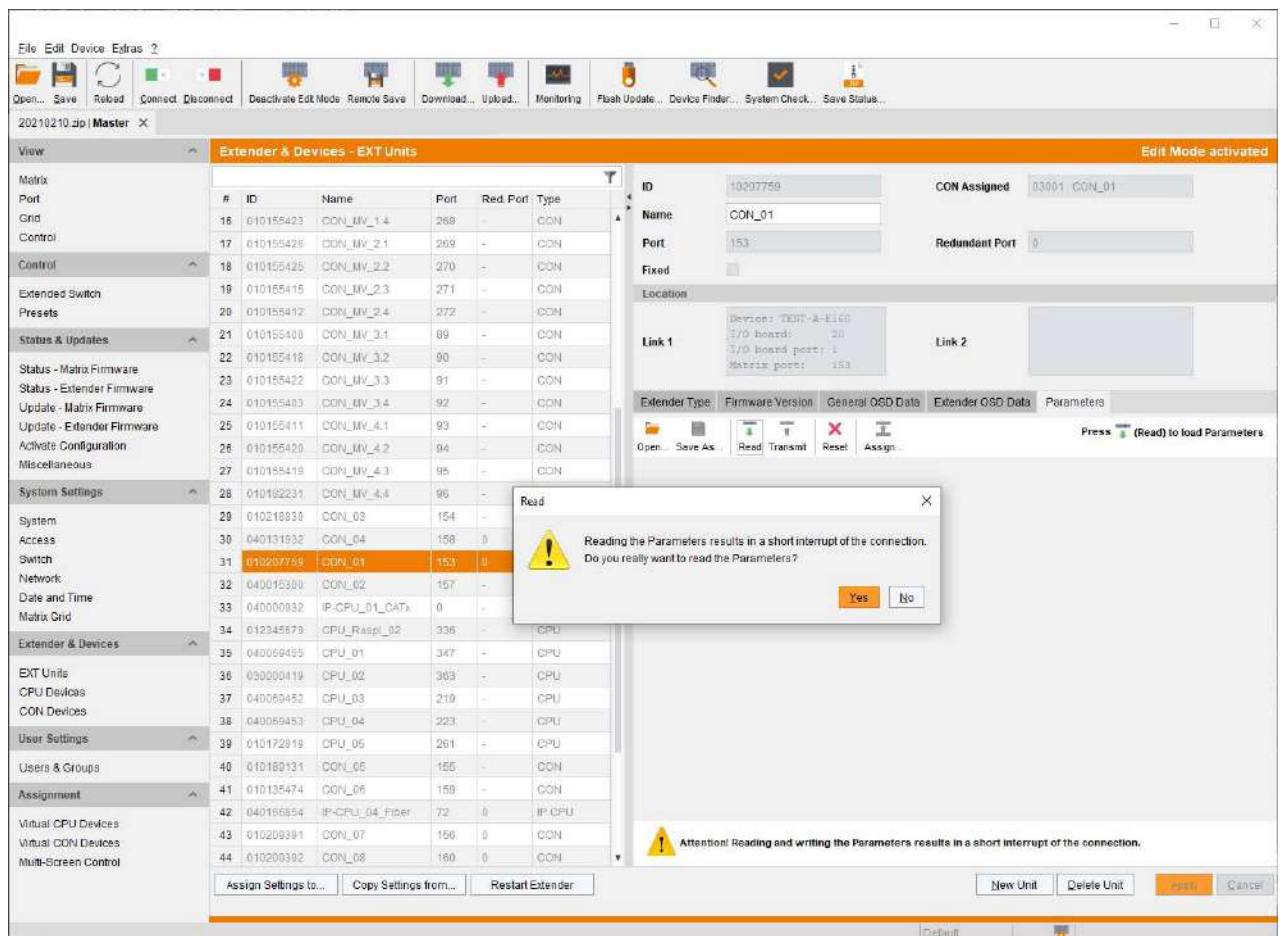
*Fig. 130   Management software menu **Extender & Devices - EXT Units - Read parameters***

The parameters of the extender module are displayed on the right side of the working area.
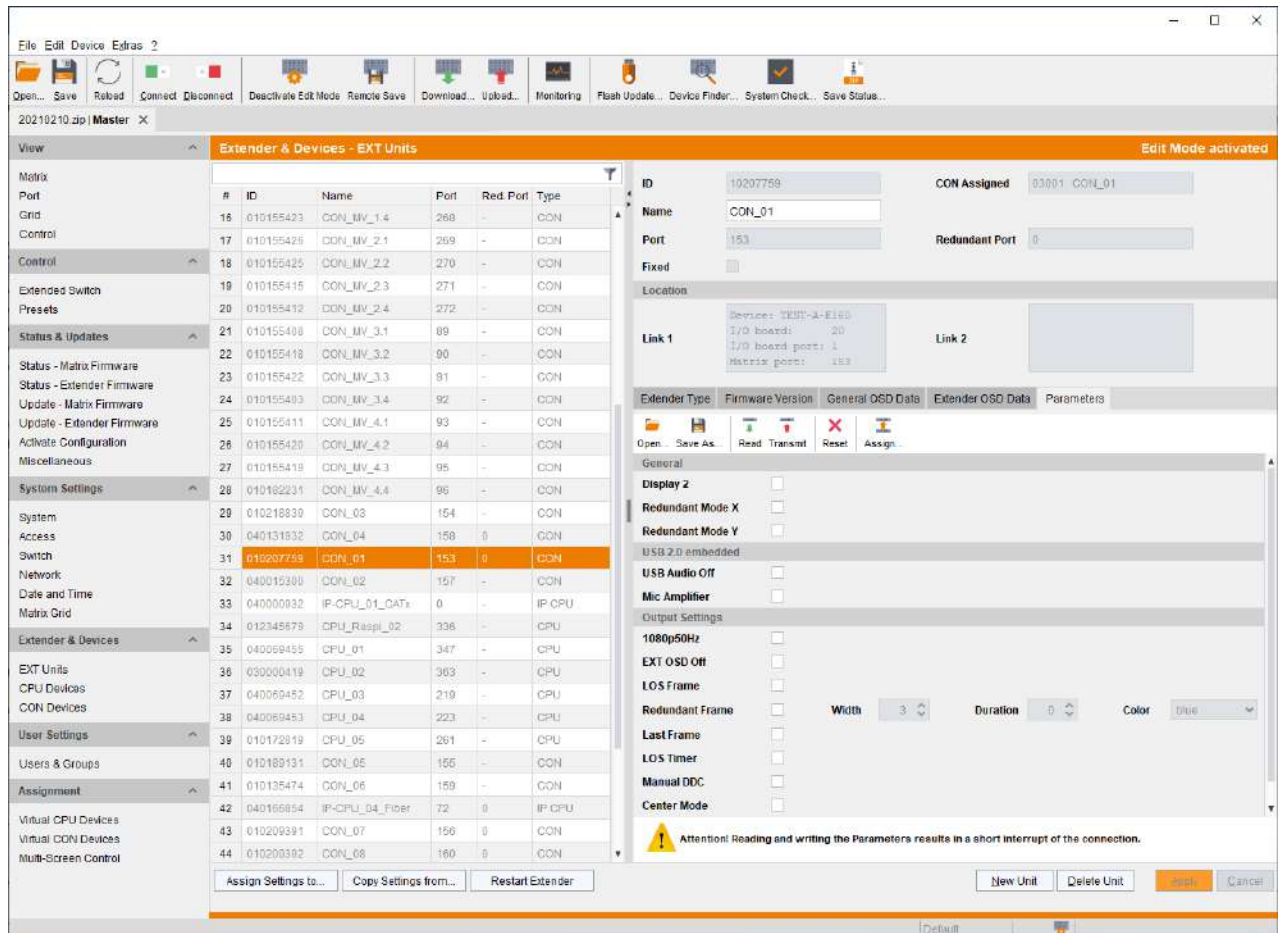
*Fig. 131   Management software menu **Extender & Devices - EXT Units - Displayed parameters***

The following functions are available:

Button	Function
Open…	Open locally saved parameters
Save As…	Save the parameters locally (file `Config.txt`)
Read	Read the parameters of the extender module
Transmit	Transmit the parameters to the extender module and activate
Reset	Reset the parameters of the extender module to factory settings
Assign	Assign the parameters to several extender modules at the same time

Modifying Parameters

To modify parameters of an extender module, proceed as follows:

1. Select **Extender & Devices > EXT Units in the task area**.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the EXT Units of the extender module whose parameters are to be displayed.
4. Click the **Parameter** tab on the right side of the working area.
5. Click the **Read** button in the symbol bar of the tab.

   A query to read the parameters appears.
6. Click the **Yes** button to confirm the reading.

   The parameters of the extender module are read out and displayed on the right side of the working area. At the same time, the connection will be disconnected for a few seconds.
7. Modify the parameters.
8. Click the **Transmit** button.

   A query for transmission appears.
9. Click the **Yes** button to transmit the modified parameters to the extender module.

   The progress of the parameter transmission is displayed.
10. Click the **Close** button when the parameter transmission is completed (green).

Parameters Transmission	
Progress	100%

2021-02-04T09:29:08.395	Parameters transmission started
2021-02-04T09:29:12.726	Parameters transmission to EXT_010190938 completed
2021-02-04T09:30:46.571	Restart extender
2021-02-04T09:31:26.872	Refresh Parameters information
2021-02-04T09:31:28.904	Parameters transmission completed

Close
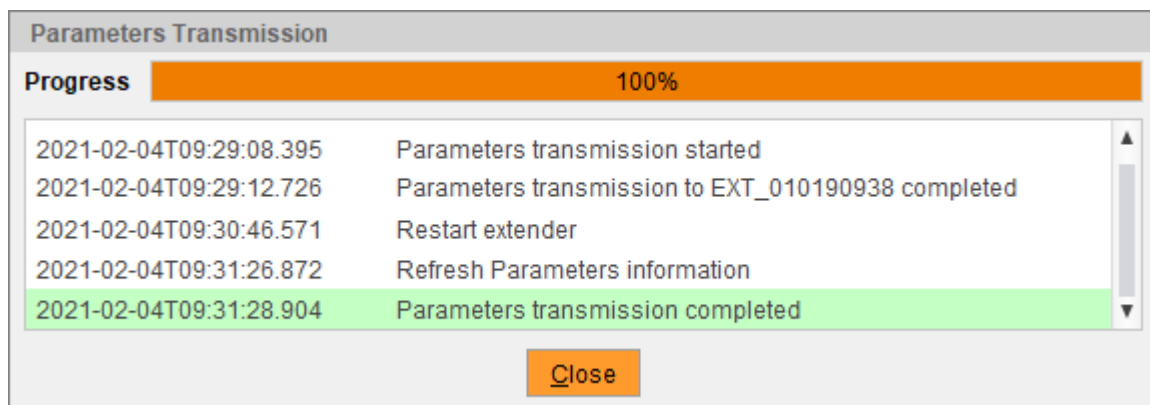
*Fig. 132   Management software menu **Extender & Devices - EXT Units - Transmission finished***

The parameter transmission is finished.

11. Click the **Deactivate Edit Mode** menu item in the toolbar.

Assigning Parameter

To assign parameters of an extender module to another one, proceed as follows:

1. Select **Extender & Devices > EXT Units in the task area**.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the EXT Units of the extender module whose parameters are to be displayed.
4. Click the **Parameter** tab on the right side of the working area.
5. Click the **Read** button in the symbol bar of the tab.

    A query to read the parameters appears.
6. Click the **Yes** button to confirm the reading.

    The parameters of the extender module are read out and displayed on the right side of the working area. At the same time, the connection will be disconnected for a few seconds.
7. Click the **Assign** button.

    A query to assign the parameters appears.
8. Select the EXT Units of those extender modules the currently displayed parameters should be assign to. By pressing and holding down the `<Ctrl>` key at the same time, more than one EXT Unit can be highlighted.
9. Click the ▶ button to move the highlighted EXT Units to the **Assign settings to** list. By clicking the ▶▶ button, all EXT Units will be moved to the **Assign settings to** list.
10. To remove highlighted EXT Units from the **Assign settings to** list, click the ◀ button. If you click the ◀◀ button, all EXT Units will be removed from the **Assign settings to** list.
11. Click the **Next** button.
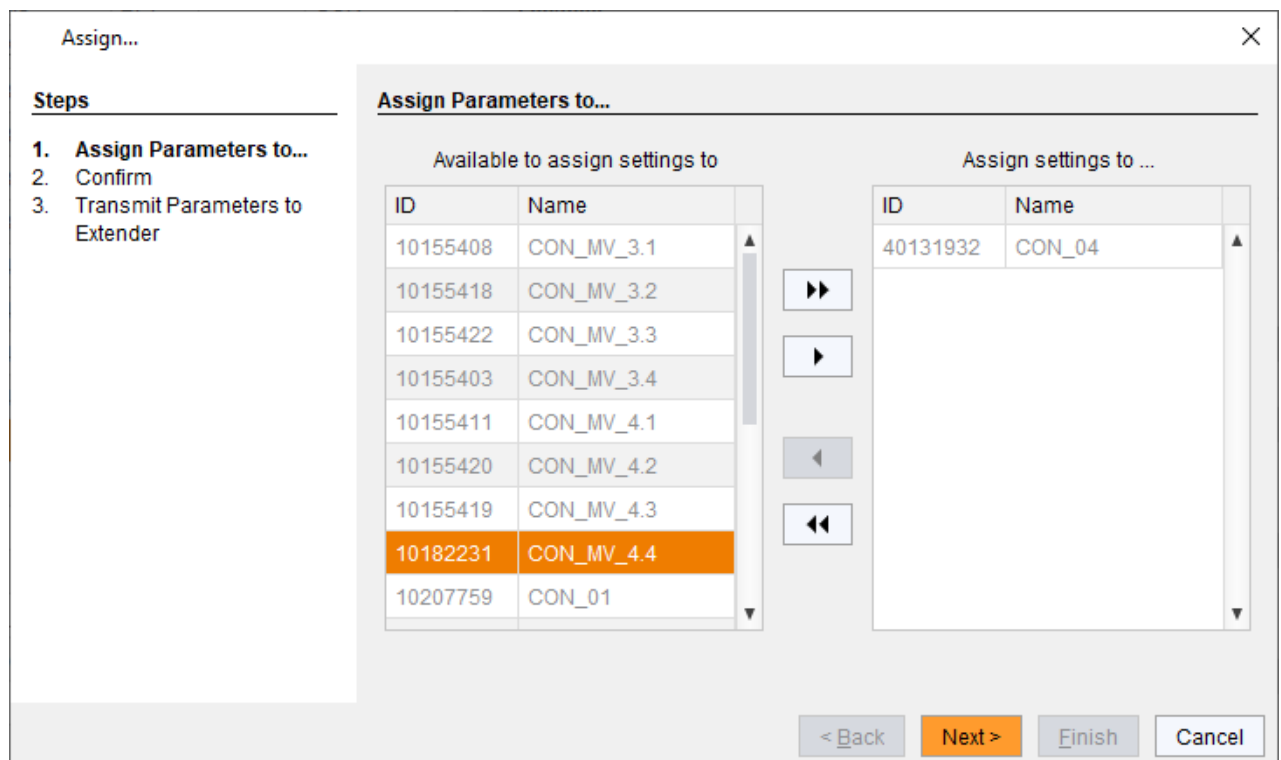
*Fig. 133   Management software menu **Extender & Devices - EXT Units - Select EXT Units***

A query to start the assignment appears.

12. Click the **Confirm to continue** checkbox to confirm the start of the assignment.

13. Click the **Next** button to start of the assignment.
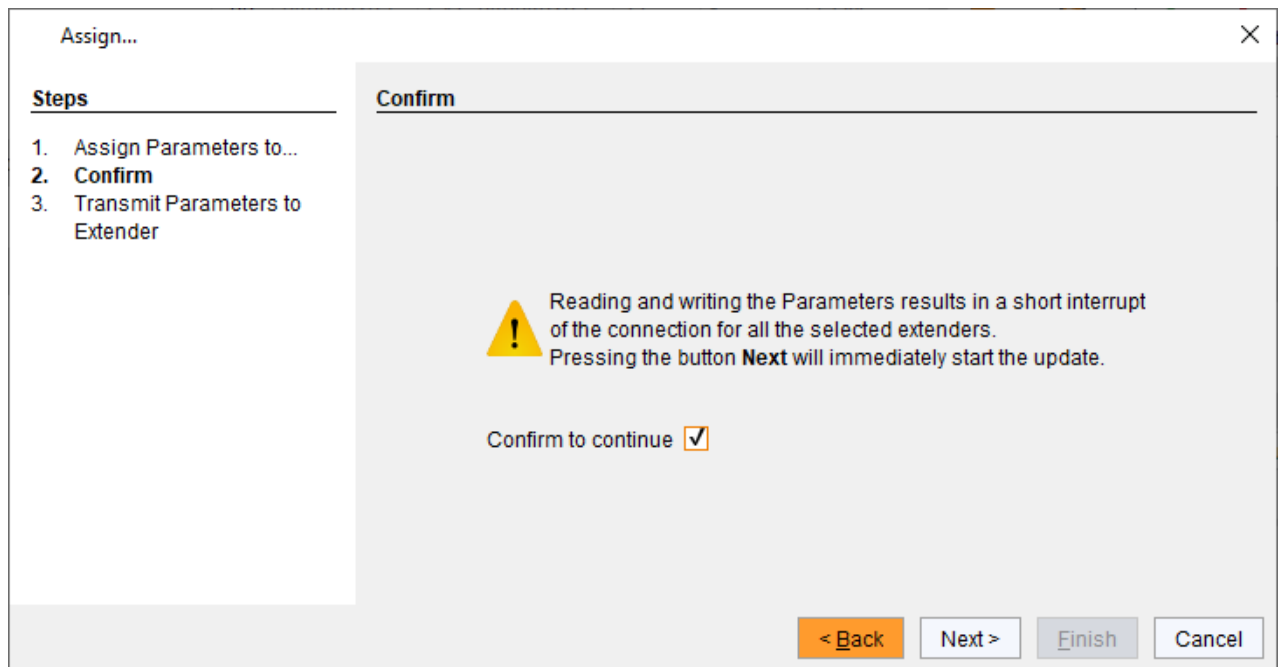
*Fig. 134   Management software menu **Extender & Devices - EXT Units - Start parameter assignment***

The progress of the parameter assignment is displayed.

14. Click the **Finish** button when the parameter assignment is completed (green).
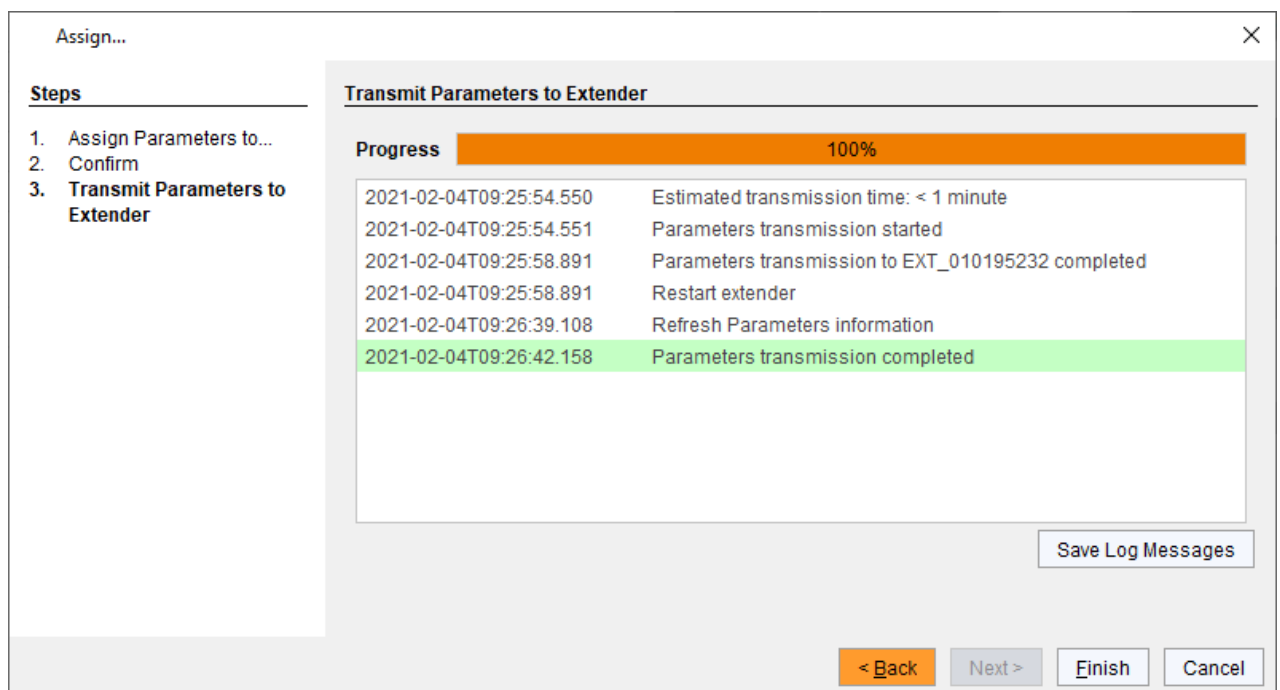
*Fig. 135   Management software menu **Extender & Devices - EXT Units - Assignment finished***

The parameter assignment is finished.

15. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.7   Configuring an USB 2.0 Extender

This chapter helps you to configure and use your USB 2.0 EXT Units. USB 2.0 EXT Units can be configured for independent switching or can be assigned to already existing CON Devices or CPU Devices.
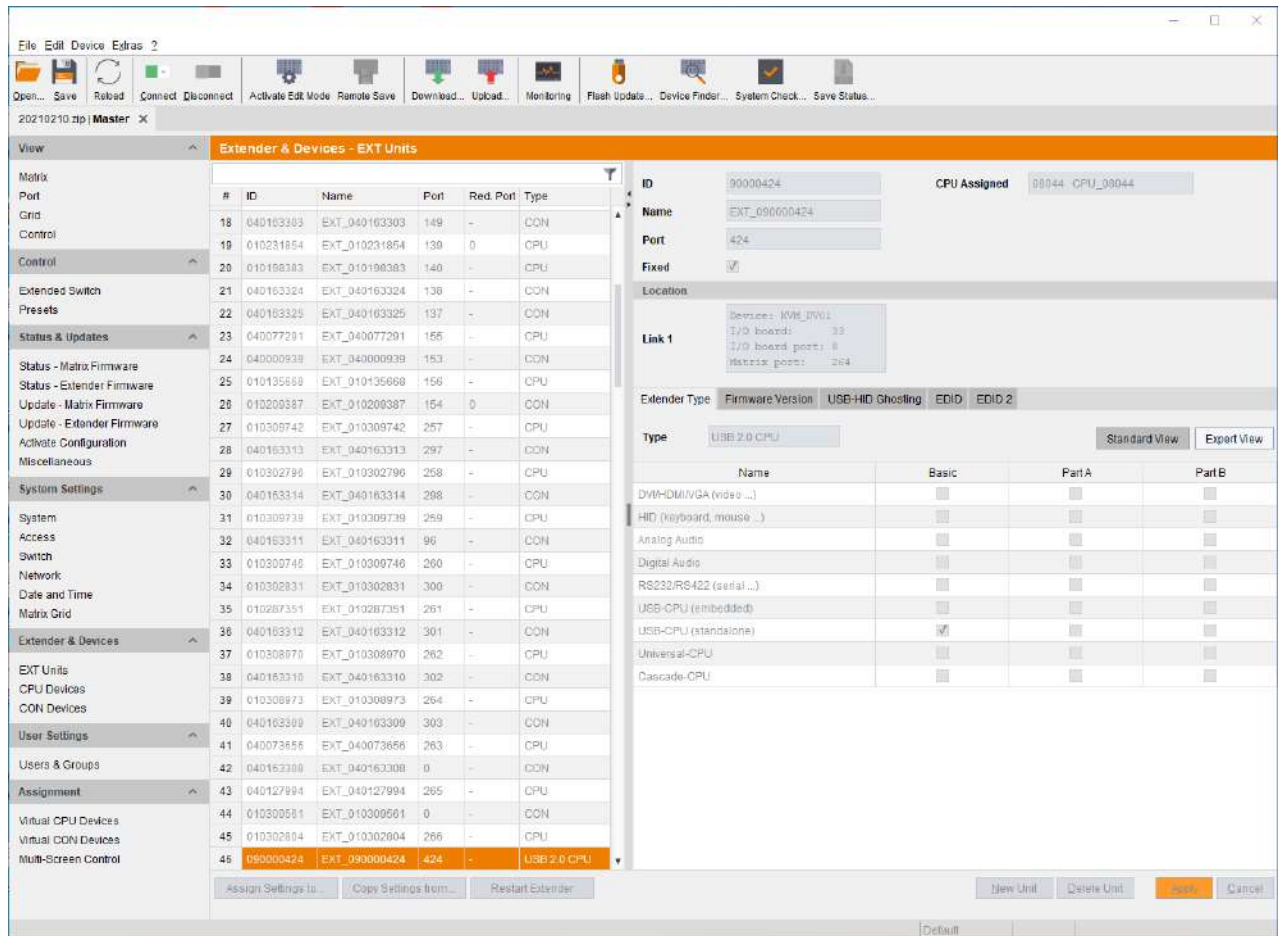
*Fig. 136   Management software menu **Extender & Devices - EXT Units - Extender Type - USB 2.0***

To configure a USB 2.0 EXT Unit, proceed as follows:

1.   Select **Extender & Devices > EXT Units** in the task area.

2.   Click the **Activate Edit Mode** menu item in the toolbar.

3.   Click the **New Unit** button.

     A selection dialog appears.

4.   Select **Choose template** in the selection box if you want to use a template for a **USB 2.0 CON Unit** or a **USB 2.0 CPU Unit**.

     An EXT Unit with an eight-digit ID will be created, starting with digit **9**.

5.   Enter an appropriate name for the EXT Unit in the **Name** field.

6.   Enter the port number of the matrix physically connected to the USB 2.0 extender module into the **Port** field.

7.   Click the **Apply** button to confirm the settings.

     A dialog appears to restart the I/O board.

8.   Click the **Yes** button to restart the I/O board to activate the USB fixed port for the new EXT Unit.
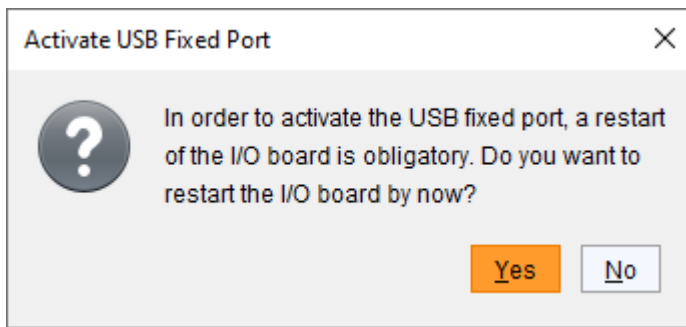
*Fig. 137   Management software dialog **Activate USB Fixed Port***

After restart of the I/O board, the parameters and settings of the USB 2.0 extender module are shown in the working area of the respective EXT Unit.

9. The USB 2.0 CPU/CON EXT Unit has to now be either assigned to an existing CPU/CON Device or a new CPU/CON Device has to be created for the assignment:

    - for a **CPU Device** see chapter 8.8.1, page 188,

    - for a **CON Device** see chapter 8.9.1, page 204

10. If you use parallel operation within the matrix, set the **Release Time** in the **System Settings > Switch** menu to **10 s** or more (see chapter 8.4.5, page 146).

11. Restart all I/O boards on which USB 2.0 EXT Units have been configured or alternatively restart the matrix.

    The USB 2.0 EXT Units are now configured and can be used.

Manually created EXT Units are always set as fixed port EXT Units. This configuration is necessary if you want to switch, e.g., USB 2.0 connections via the matrix.

To make a fixed port available again for Flex Port EXT Units after deleting a fixed port EXT Unit, a restart of the I/O board is necessary.

8.8   Configuring CPU Settings

8.8.1   Managing Extender USB-HID Ghosting

This function allows specific keyboard and mice descriptors (device descriptions) to be permanently stored in the CPU Unit. This eliminates the need to register and deregister the keyboard and mouse on an operating system each time there is a shared use of a source (computer, CPU) by two or more consoles within a matrix.

Next to the use of keyboard commands (see chapter 9.11, page 312), the activation and management of the USB-HID Ghosting information can also be handled centrally via matrix to reach all connected extender modules at the same time.

General Preparation

To use the USB-HID Ghosting management via management software, it is required that USB-HID Ghosting has been already activated at a CPU Unit via keyboard command or the USB-HID Ghosting information is already available as a file with the file extension `.dhg`.

Several general options are available. For these options, select the menu **Extender & Devices > EXT Units** in the task area, select a CPU EXT Unit and select the **USB-HID Ghosting** tab in the working area.
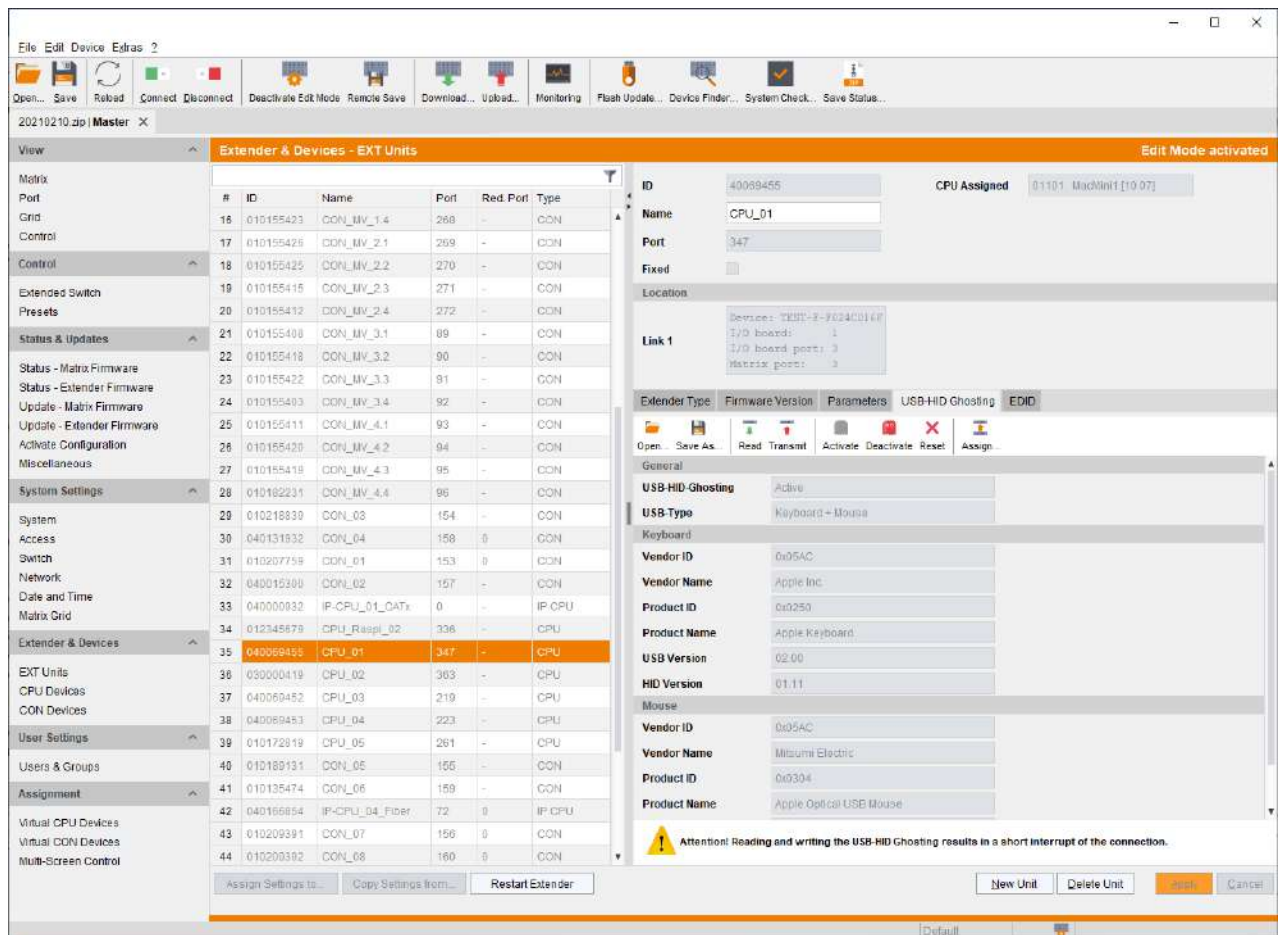
*Fig. 138   Management software menu **Extender & Devices - EXT Units - USB-HID Ghosting***

The following functions are available:

Button	Function
Open…	Open the locally saved USB-HID Ghosting
Save As…	Save the USB-HID Ghosting locally (file `EXT_ID-Nr.dhg`)
Read	Read the USB-HID Ghosting of the extender module

Button	Function
Transmit	Transmit the USB-HID Ghosting to the extender module and activate
Activate	Activate the USB-HID Ghosting
Deactivate	Deactivate the USB-HID Ghosting
Reset	Reset the USB-HID Ghosting of the extender module to factory settings
Assign	Assign the USB-HID Ghosting to several extender modules at the same time

ℹ️ During reading and writing USB-HID Ghosting information, there will be a short interrupt of the USB-HID and video signal.

To read out and display the USB-HID Ghosting of CPU extender modules, proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the EXT Unit of the CPU extender module with active USB-HID Ghosting to be displayed.
4. Click the **USB-HID Ghosting** tab on the right side of the working area.
5. Click the **Read** button in the symbol bar of the tab.

   A query to read the USB-HID Ghosting appears.
6. Click the **Yes** button to confirm the reading.

   The current USB-HID Ghosting information of the CPU extender module is read out and displayed on the right side of the working area. At the same time, the connection will be disconnected for a few seconds.

To load a USB-HID Ghosting template (file extension `.dhg`) for a further distribution proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the EXT Unit of the CPU extender module to transmit the USB-HID Ghosting to.
4. Click the **USB-HID Ghosting** tab on the right side of the working area.
5. Click the **Open** button in the symbol bar of the tab.
6. Navigate to the respective template with the file extension `.dhg` and click the **Select** button.
7. Click the **Transmit** button in the symbol bar of the tab.

   A query for transmission appears.
8. Click the **Yes** button to transmit the loaded USB-HID Ghosting to the CPU extender module.

   The progress of the parameter transmission is displayed.
9. Click the **Close** button when the USB-HID Ghosting transmission is completed (green).
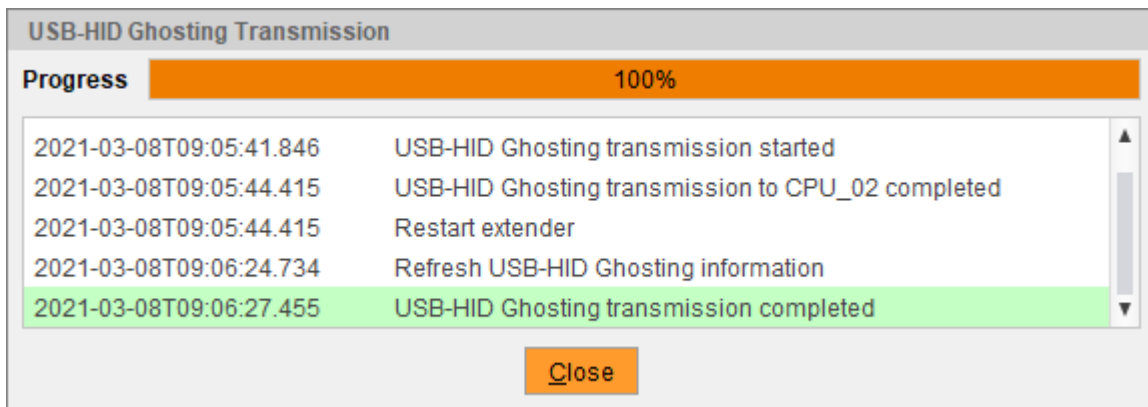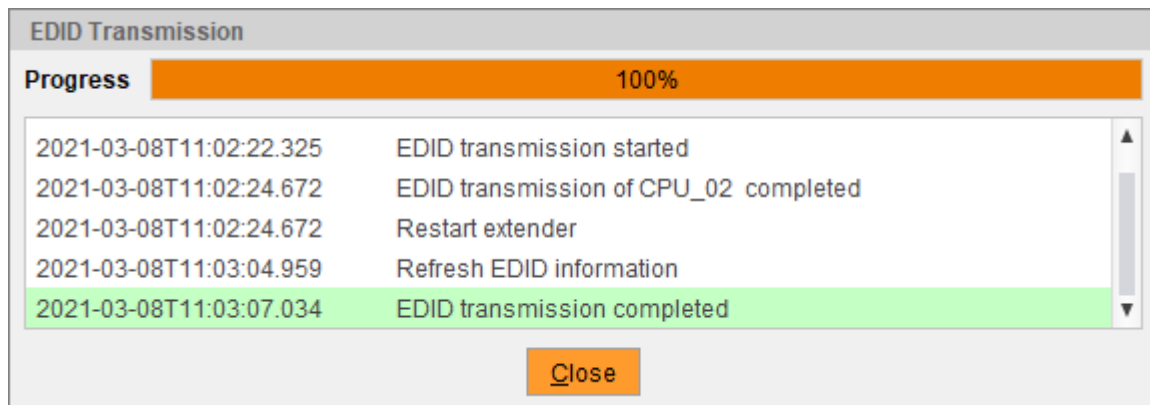
*Fig. 139   Management software menu **Extender & Devices - EXT Units - Transmission finished***

10. Click the **Deactivate Edit Mode** menu item in the toolbar.

To assign any manually activated USB-HID Ghosting of an extender module to any connected extender module, proceed as follows:

1. Select **Extender & Devices > EXT Units in the task area**.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the EXT Unit of the CPU extender module with active USB-HID Ghosting to be displayed.

4. Click the **USB-HID Ghosting** tab on the right side of the working area.

5. Click the **Read** button in the symbol bar of the tab.

    A query to read the USB-HID Ghosting appears.

6. Click the **Yes** button to confirm the reading.

    The current USB-HID Ghosting information of the CPU extender module is read out and displayed on the right side of the working area. At the same time, the connection will be disconnected for a few seconds.

7. Click the **Assign** button in the symbol bar of the tab.

    A query to assign the USB-HID Ghosting appears.

8. Select those EXT Units in the **Available to assign settings to** field that are intended to receive the USB-HID Ghosting information. By pressing and holding down the <Ctrl> key at the same time, more than one EXT Unit can be highlighted.

9. Click the ▶ button to move the highlighted EXT Units to the **Assign settings to** list. By clicking the ▶▶ button, all EXT Units will be moved to the **Assign settings to** list.

10. To remove highlighted EXT Units from the **Assign settings to** list, click the ◀ button. If you click the ◀◀ button, all EXT Units will be removed from the **Assign settings to** list.

11. Click the **Next** button.
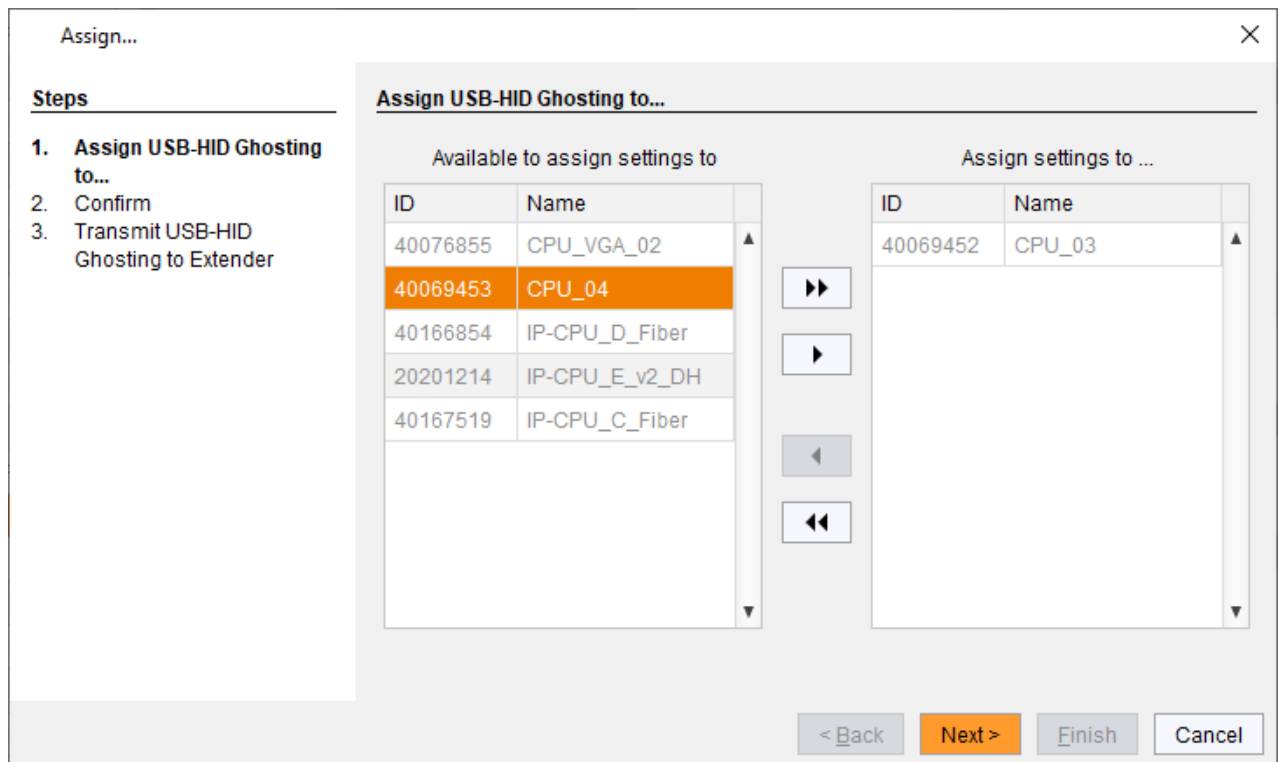
*Fig. 140   Management software menu **Extender & Devices - EXT Units - Assign to***

A query to start the assignment appears.

12. Click the **Confirm to continue** checkbox to confirm the start of the assignment.

13. Click the **Next** button to start of the assignment.
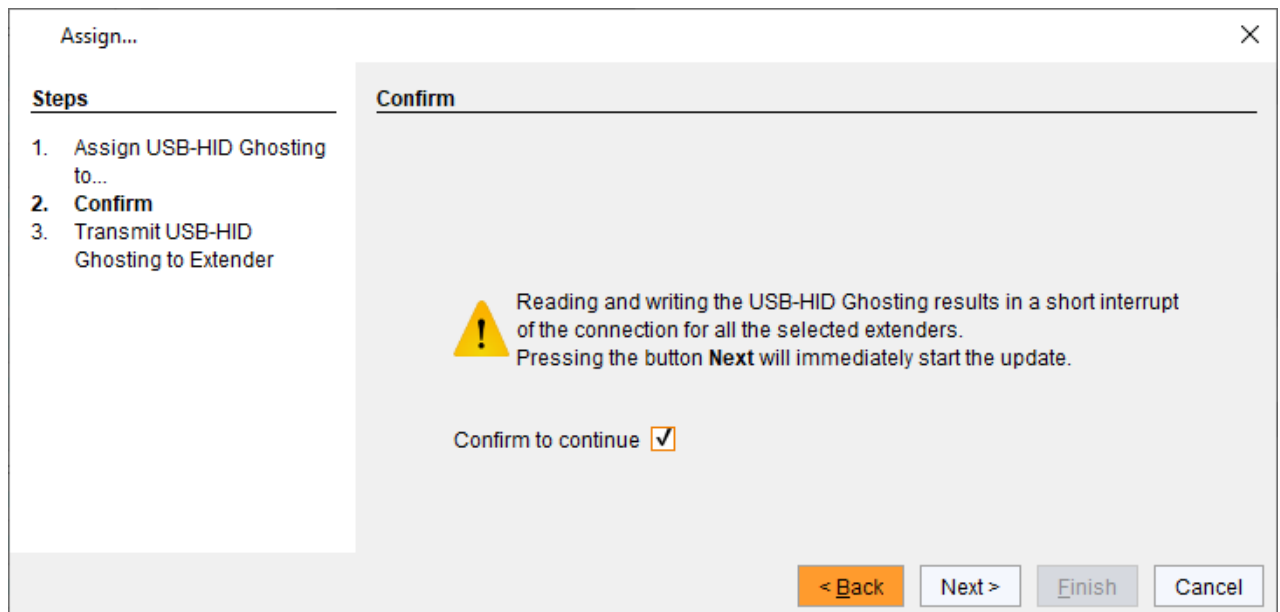
*Fig. 141   Management software menu **Extender & Devices - EXT Units - Confirm assignment***

The progress of the USB-HID Ghosting assignment is displayed.

14. Click the **Finish** button when the USB-HID Ghosting assignment is completed (green).
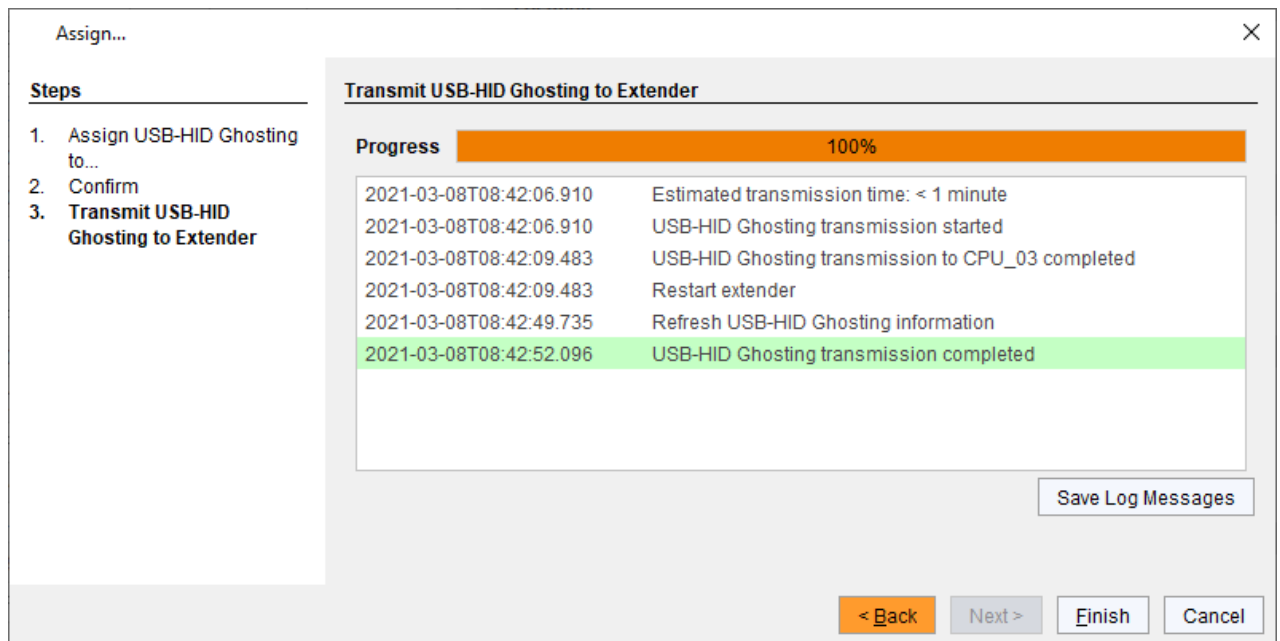
*Fig. 142   Management software menu **Extender & Devices - EXT Units - Assignment finished***

The USB-HID Ghosting assignment is finished.

15. Click the **Deactivate Edit Mode** menu item in the toolbar.

Further options:

- To locally store existing USB-HID Ghosting information of a selected CPU EXT Unit, click the **Save As…** button.

- To delete existing USB-HID Ghosting information of a selected CPU EXT Unit, click the **Reset** button.

8.8.2   Managing Extender EDID

By default, the extender modules transmit the factory preset EDID to the sources (computer, CPU). This information is suitable in most cases. The EDID can be retrieved and uploaded as a binary file to the CPU Unit.

Next to the use of keyboard commands (see chapter 9.11, page 312), the activation and management of the EDID can also be handled centrally via matrix to reach all connected extender modules at the same time.

General Preparation

To use the EDID management via management software it is required that the EDID has been already transmitted at a CPU Unit via keyboard command or the EDID is already available as a file with the extension .bin.

Several general options are available. For these options, select the menu **Extender & Devices > EXT Units** in the task area, select the EXT Unit of an extender module and select the **EDID** tab in the working area.
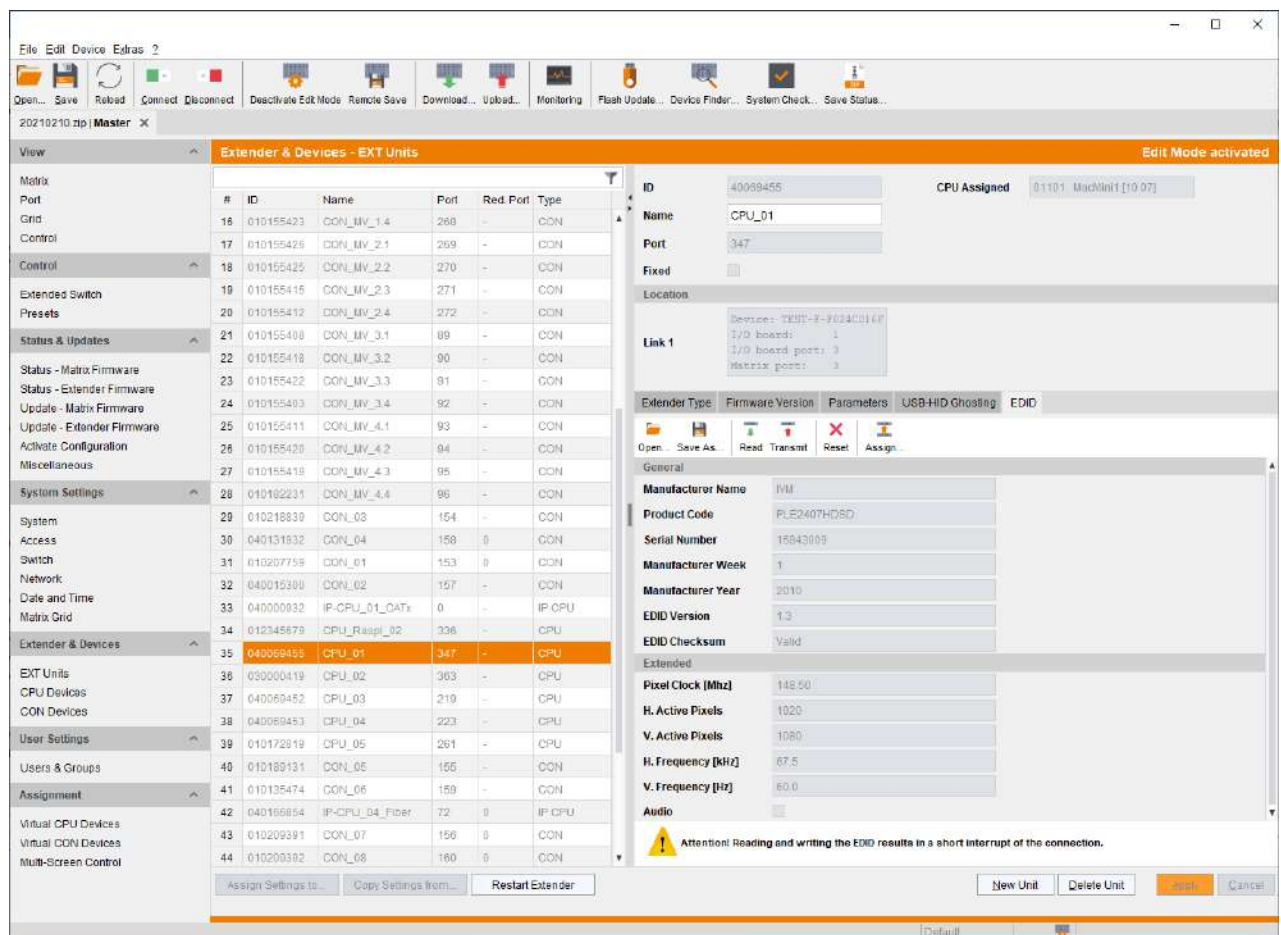
*Fig. 143   Management software menu **Extender & Devices - EXT Units - EDID***

Button	Function
Open…	Open the locally saved EDID
Save As…	Save the EDID locally (file extension `.bin`)
Read	Read the EDID of the extender module
Transmit	Transmit the EDID to the extender module and activate
Reset	Reset the EDID of the extender module to factory settings
Assign	Assign the EDID to several extender modules at the same time

To read out and display the EDID of an extender module, proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the EXT Unit of the extender module whose EDID is to be displayed.

4. Click the **EDID** tab on the right side of the working area.

5. Click the **Read** button in the symbol bar of the tab.

   A query to read out the EDID appears.

6. Click the **Yes** button to confirm the reading.

   The transmitted EDID of the extender module is read out and displayed on the right side of the working area. At the same time, the connection will be disconnected for a few seconds.

To assign any manually transmitted EDID of an extender module to another one, proceed as follows:

1. Select **Extender & Devices > EXT Units in the task area**.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the EXT Unit of the extender module with the already transmitted EDID.

4. Click the **EDID** tab on the right side of the working area.

5. Read out and display the EDID (see description in section before).

6. Click the **Assign** button in the symbol bar of the tab.

   A query to assign the EDID appears.

7. Select the EXT Units of those extender modules in the **Available to assign settings to** field that are intended to receive the EDID. By pressing and holding down the `<Ctrl>` key at the same time, more than one EXT Unit can be highlighted.

8. Click the ▶ button to move the highlighted EXT Units to the **Assign settings to** list. By clicking the ▶▶ button, all EXT Units will be moved to the **Assign settings to** list.

9. To remove highlighted EXT Units from the **Assign settings to** list, click the ◀ button. If you click the ◀◀ button, all EXT Units will be removed from the **Assign settings to** list.

10. Click the **Next** button.
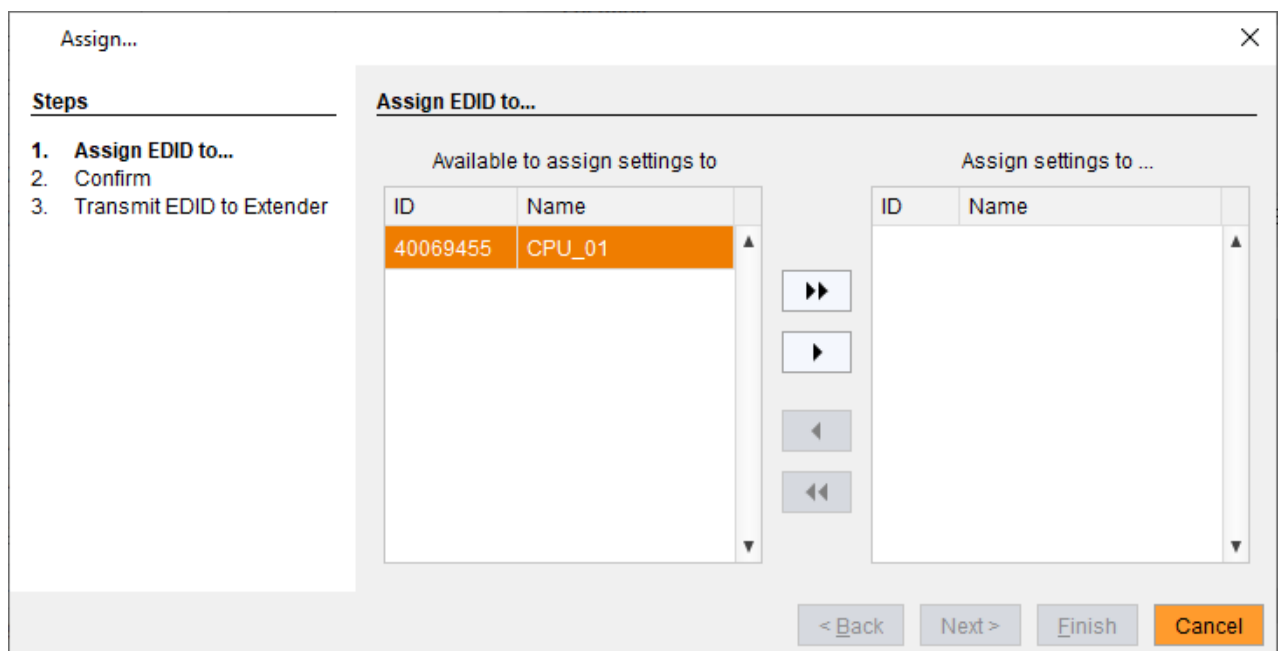
*Fig. 144   Management software menu **Extender & Devices - EXT Units - Assign EDID to***

A query to start the assignment appears.

11. Click the **Confirm to continue** checkbox to confirm the start of the assignment.

12. Click the **Next** button to start of the assignment.
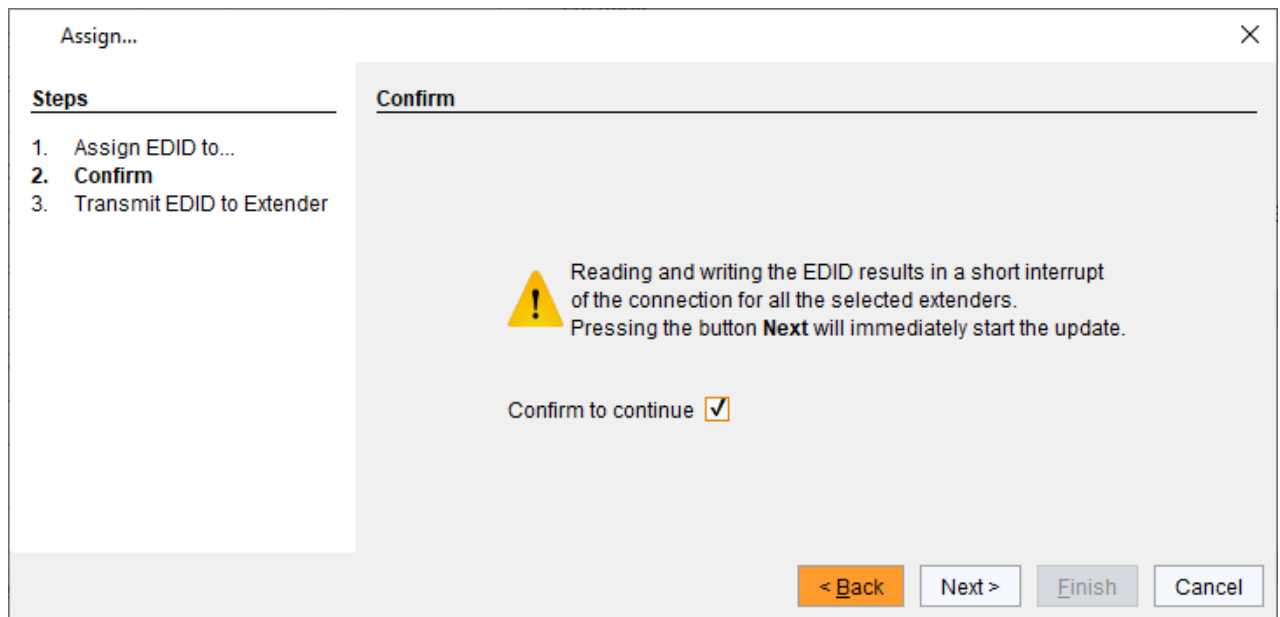
*Fig. 145   Management software menu **Extender & Devices - EXT Units - Confirm assignment***

The progress of the USB-HID Ghosting assignment is displayed.

13. Click the **Finish** button when the USB-HID Ghosting assignment is completed (green).
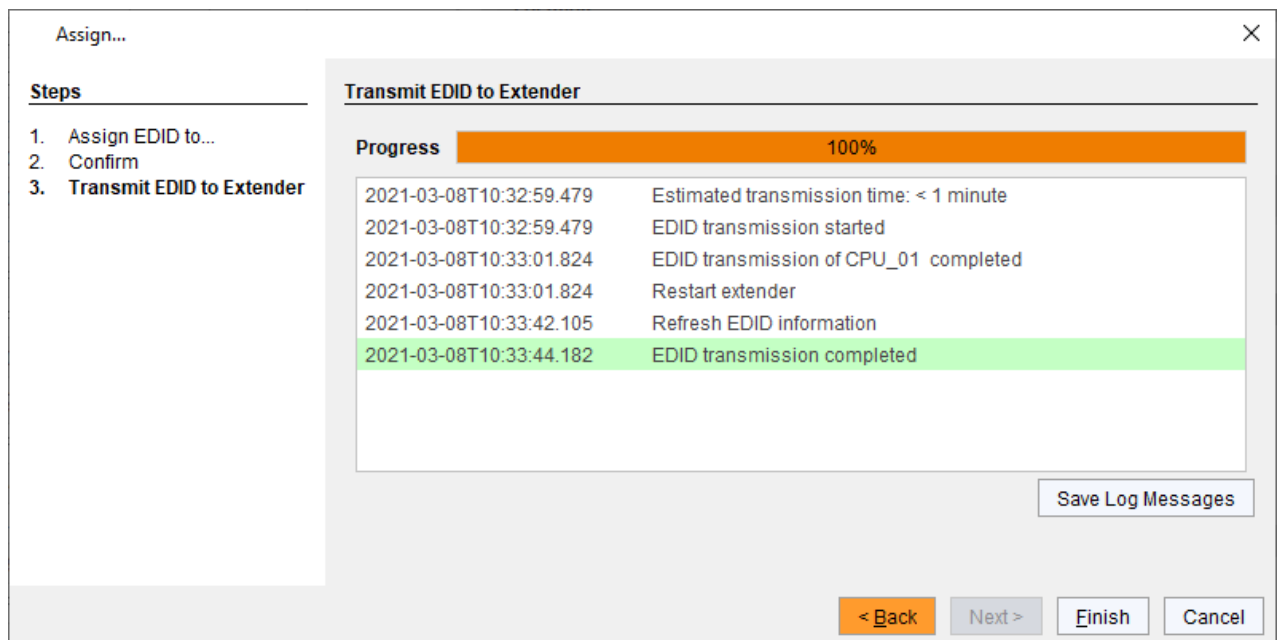
*Fig. 146   Management software menu **Extender & Devices - EXT Units - Assignment finished***

The EDID assignment is finished.

14. Click the **Deactivate Edit Mode** menu item in the toolbar.

To load a EDID template (file extension `.bin`) for a further distribution, proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Click the **EDID** tab on the right side of the working area.

4. Select the EXT Unit of a CPU extender module to transmit the EDID to.

5. Click the **Open** button in the symbol bar of the tab.

6. Navigate to the respective template with the file extension `.bin` and click the **Select** button.

7. Click the **Transmit** button in the symbol bar of the tab.

   A query for transmission appears.

8. Click the **Yes** button to transmit the loaded EDID to the CPU extender module.

   The progress of the parameter transmission is displayed.

9. Click the **Close** button when the EDID transmission is completed (green).

EDID Transmission

Progress	100%

2021-03-08T11:02:22.325	EDID transmission started
2021-03-08T11:02:24.672	EDID transmission of CPU_02 completed
2021-03-08T11:02:24.672	Restart extender
2021-03-08T11:03:04.959	Refresh EDID information
2021-03-08T11:03:07.034	EDID transmission completed

Close

*Fig. 147   Management software menu **Extender & Devices - EXT Units - Transmission finished***

10. Click the **Deactivate Edit Mode** menu item in the toolbar.

Further options:

- To locally store existing EDID of a CPU extender module whose EXT Unit is selected, click the **Save As…** button.

- To set existing the EDID of a CPU extender module whose EXT Unit is selected back to factory settings, click the **Reset** button.

8.8.3   Setting CPU Devices

New CPU Devices are configured in this menu including their assignment to EXT Units.

The assignment helps to describe and switch more complex computer configurations (e.g., Quad-Head with USB 2.0) in the matrix.
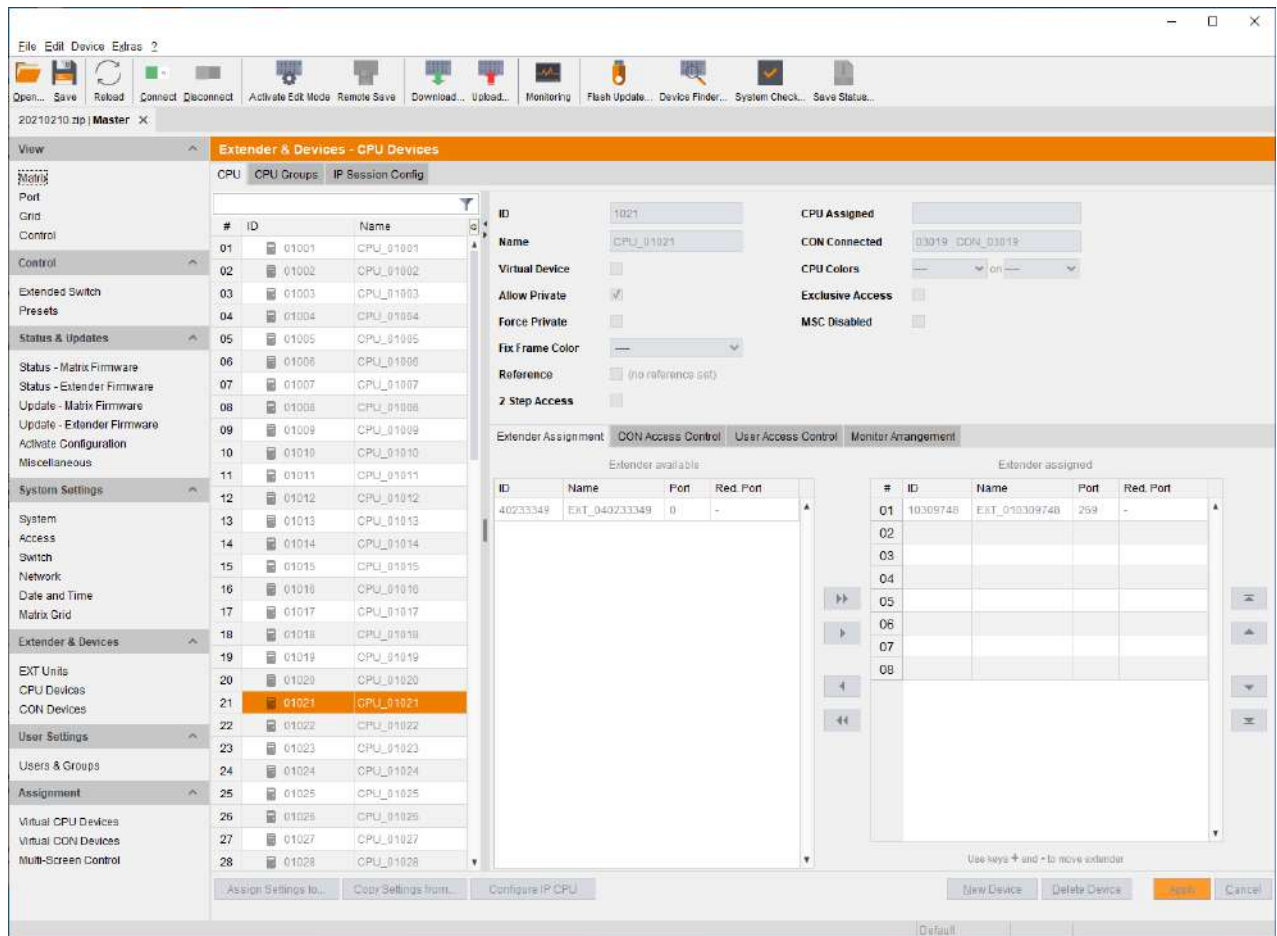
*Fig. 148   Management software Menu **Extender & Devices - CPU Devices - Extender Assignment***

The following functions are available:

Button	Function
New Device	Create a new CPU Device
Delete	Delete a new CPU Device
Apply	Confirm a created CPU Device
Cancel	Reject changes
▶	Assign the selected EXT Units to a CPU Device
▶▶	Assign all available EXT Units to a CPU Device
◀	Remove the selected EXT Units from a CPU Device
◀◀	Remove all EXT Units from a CPU Device
▼	Change the assignment number of EXT Unit upwards
▲	Change the assignment number of EXT Unit downwards
⊼	Change the assignment number of EXT Unit to first position
⊻	Change the assignment number of EXT Unit to last position

Keyboard Command	Function
<+>	Change the assignment number of EXT Unit upwards
<->	Change the assignment number of EXT Unit downwards

The following parameters can be configured:

Field	Entry	Description
ID	Text	Ident number of the CPU Device
Name	Text	Name of the CPU Device
Virtual Device	Activated	The CPU Device was created as a Virtual CPU Device.
	Deactivated	Function not active (default)
Allow Private	Activated	Allow switching to the respective CPU Device in Private Mode
	Deactivated	Function not active (default)
Force Private	Activated	Force switching to the respective CPU Device only in Private Mode
	Deactivated	Function not active (default)
Fix Frame Color	Selection list	Activate a colored frame when switching to the respective CPU Device. You can select between 7 colors.
Reference	Activated	Activate a reference CPU Device that inherits both CPU Device and EXT Unit settings to any CPU Unit that is connected to the matrix for the first time. **Note**: It is recommended to activate the reference setting for one single CPU Device only.
	Deactivated	Function not active (default)
2 Step Access	Activated	Open a pop-up window after switching to the particular CPU Device. In the background a Video Only connection will be established. A confirmation in the pop-up window is required to establish a Full Access connection to the CPU Device.
	Deactivated	Function not active (default)
CPU Assigned	-	ID and name of the assigned Virtual CPU Device, cannot be changed, is retrieved automatically
CON Connected	-	ID and name of the connected CON Device, cannot be changed, is retrieved automatically
CPU Colors	Selection list	The CPU Device name will be highlighted according to the color setting for text and background. You can select between 16 colors.
Exclusive Access	Activated	Activate an access limitation for the case that a CPU Device is already connected via Full Access connection. When having the same priorities, any additional access to the CPU Device can only be established with a Video Only connection. Having a lower priority any additional connection is not possible. Only when having a higher priority, an additional Full Access connection can be established, and K/M control can be taken over.
	Deactivated	Function not active (default)
MSC disabled	Activated	Multi-Screen Control function deactivated
	Deactivated	Multi-Screen Control function activated

Creating a new CPU Device

To create a new CPU Device, proceed as follows:

1. Select **Extender & Devices > CPU Devices** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Click the **New Device** button.

    A selection dialog appears.

4. Select a real CPU (**Create a standard CPU**) or a virtual CPU (**Create a virtual CPU**) or a template of an existing CPU (**Choose template**) in the **Choose template** selection box.
    Note: A template is only available if there is at least one existing CPU Device.

5. Click the **OK** button.

    A new CPU Unit will be created.

6. Determine all parameters that are relevant for the CPU Device.

7. Click the **Apply** button to confirm the creation of the CPU Device.

8. Click the **Deactivate Edit Mode** menu item in the toolbar.

Accessing a new CPU via Matrix

To access a new CPU Device via matrix, an assignment of one or more CPU EXT Units is required. Proceed as follows:

1. Select **Extender & Devices > CPU Devices** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the new CPU Device in the **CPU Devices** list.

4. Select an EXT Unit in the **Extender available** list that you want to assign to the CPU Group. By pressing and holding down the `<Ctrl>` key at the same time, more than one EXT Unit can be highlighted.

5. Click the ▶ button to move the highlighted EXT Units to the **Extender assigned** list. By clicking the ⏩ button, all available EXT Units from the **Extender available** list will be moved to the **Extender assigned** list.

    The assignments are displayed in the **Extender assigned** list.

6. Click the ▼ or ▲ button to change the order of the EXT Units within the **Extender assigned** list.
    Or press the `<+>` or `<->` key to change the order of the EXT Units within the **Extender assigned** list.

7. Click the **Apply** button to confirm the assignment.

8. Click the **Deactivate Edit Mode** menu item in the toolbar.

Removing an EXT Unit Assignment

To remove an EXT Unit assignment, proceed as follows:

1. Select **Extender & Devices > CPU Devices** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select a CPU Device in the **CPU Devices** list.

4. Select one or more EXT Units in the **Extender assigned** list.

5. To remove highlighted EXT Units from the **Extender assigned** list, click the ◀ button. If you click the ⏪ button, all CPU Devices will be removed from the **Extender assigned** list.

6. Click the **Apply** button to confirm the removal.

7. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.8.4   Setting CPU Groups

The KVM matrix allows to bundle the CPU Devices of a configuration into CPU groups. The groups can be used to subdivide the CPU Devices logically or thematically. As an application example you can group all CPU Devices together that are connected to a specific matrix within a matrix grid. The configuration of CPU groups at the same time increases the clarity of the configuration.
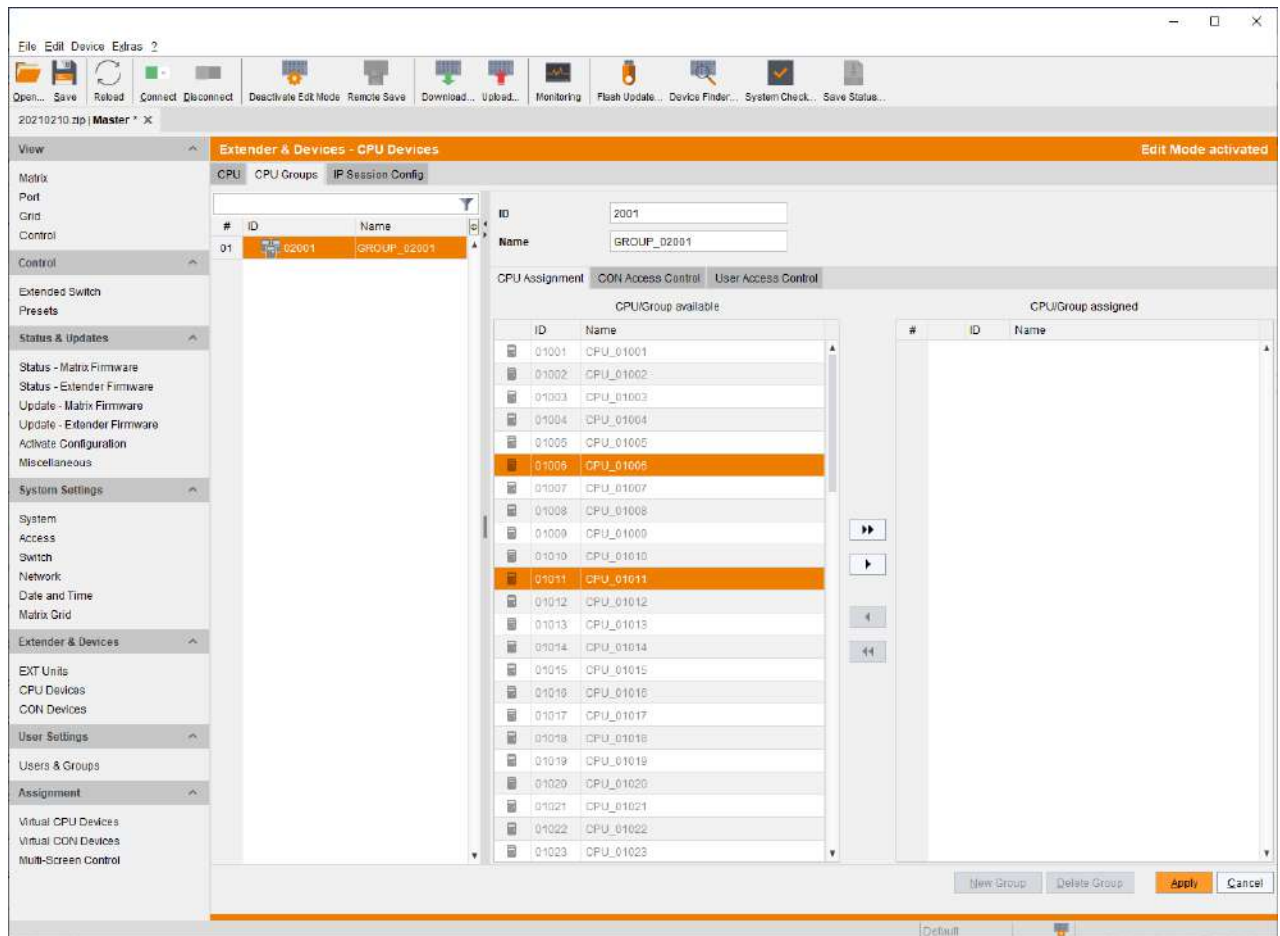
Fig. 149   Management software Menu **Extender & Devices - CPU Devices - CPU Groups**

Creating a new CPU Group

To create a CPU Group, proceed as follows:

1.   Select **Extender & Devices > CPU Devices** in the task area.

2.   Click the **Activate Edit Mode** menu item in the toolbar.

3.   Select the **CPU Groups** tab in the working area.

4.   Click the **New Group** button.

       A selection dialog appears.

5.   Select a standard Group (**Create a standard Group**) or a LDAP Group (**Create a LDAP Group**) or a template of an existing Group (**Choose template**) in the **Choose template** selection box.
       Note: A template is only available if there is at least one existing Group.

6.   Click the **OK** button.

7.   Enter a group name into the field **Name**.

8.   Click the **Apply** button to confirm the creation of the group.

9.   Click the **Deactivate Edit Mode** menu item in the toolbar.

Assigning a CPU Group

To assign a CPU Device to a CPU Group, proceed as follows:

1. Select **Extender & Devices > CPU Devices** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the **CPU Groups** tab in the working area.

4. Select the CPU Group to be assigned with a CPU Device.

5. Select a CPU Device in the list **CPU/Group available** that you want to assign to the CPU Group. By pressing and holding down the `<Ctrl>` key at the same time, more than one CPU Device can be highlighted.

6. Click the ▶ button to move the highlighted CPU Devices to the **CPU/Group assigned** list. By clicking the ▶▶ button, all CPU Devices from the **CPU Device available** list will be moved to the **CPU/Group assigned** list.

7. To remove highlighted CPU Devices from the **CPU/Group assigned** list, click the ◀ button. If you click the ◀◀ button, all CPU Devices will be removed from the **CPU/Group assigned** list.

8. Click the **Apply** button to assign the CPU Device to the CPU Group.

9. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.8.5   Assigning Virtual CPU Devices

In this menu, either one or more Virtual CPU Devices can be assigned to a Real CPU Device.

With a Virtual CPU Device, the effort of switching several CON Devices to the same CPU Device can be reduced. If several CON Devices are connected to a Virtual CPU Device that is assigned to a Real CPU Device, you only have to change the Real CPU Device once and all consoles will receive the video signal of the new Real CPU Device.

> One Real CPU Device can be assigned to several Virtual CPU Device.

NOTICE

When the **Auto Send** function in the left lower corner of the work area is ticked, switching operations will be completed immediately without user confirmation by means of the **Send** button.

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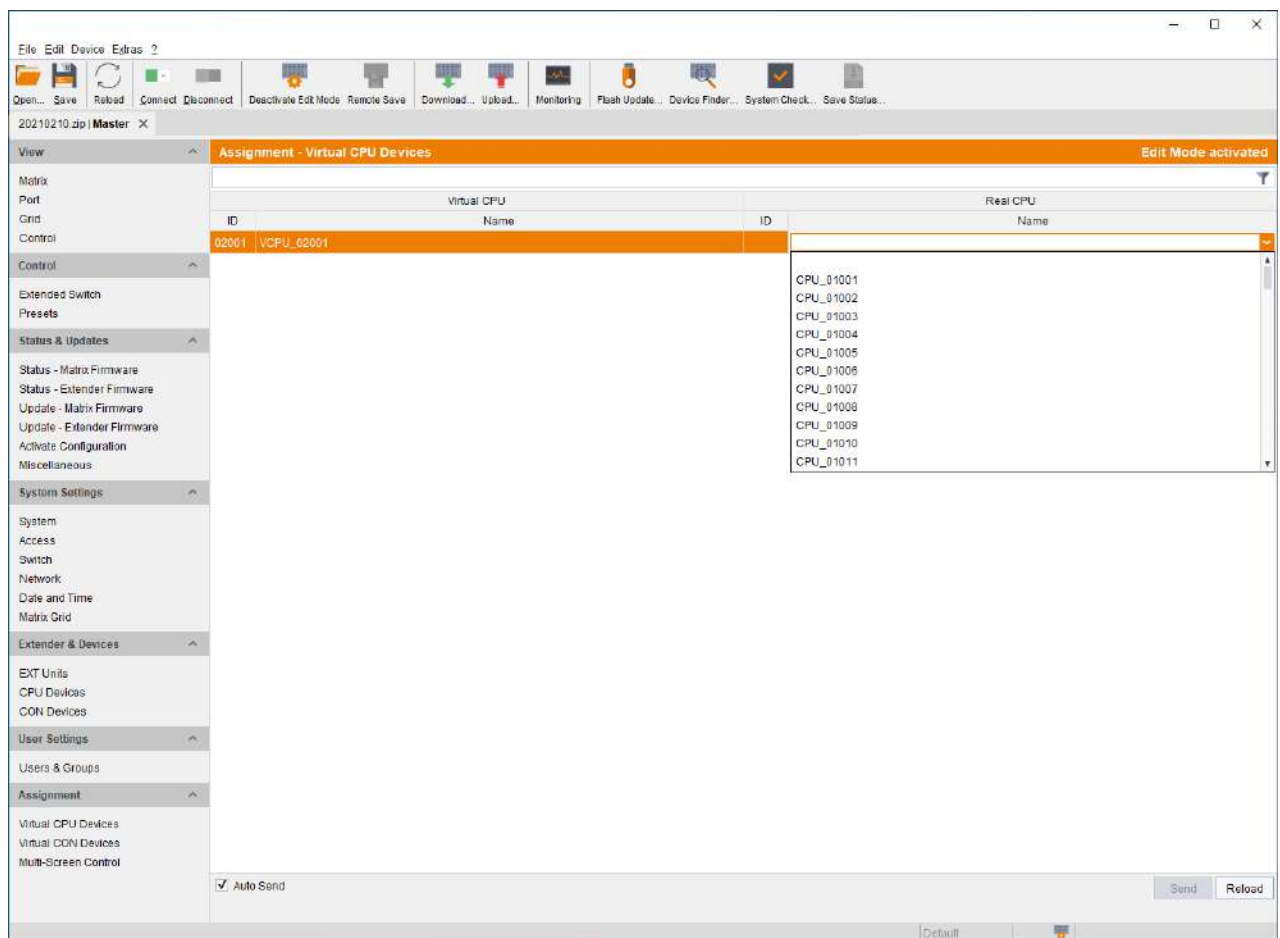
*Fig. 150   Management software menu **Assignment - Virtual CON Devices***

The following functions are available:

Button	Function
Send	Send assignments to the matrix
Reload	Reload changes

For an assignment, proceed as follows:

1. Select **Assignment > Virtual CPU Devices** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select a Virtual CPU Device in the **Virtual CPU** list.
4. Double-click in the **Real CPU** column to display a list of all available Real CPU Devices.
5. Select a Real CPU Device in the selection list.
6. Click the **Send** button to send the assignment to the matrix.
7. Click the **Deactivate Edit Mode** menu item in the toolbar.

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

The management software offers the option to switch directly from the **Assignment** menu to the definition menu to check specific settings for the respective Real CPU Device or Virtual CPU Device.

➡ Click with the right mouse button on the respective Real CPU Device or Virtual CPU Device and select **Open CPU Device** in the context menu.

   The definition menu for the CPU Device settings is opened (see chapter 8.8.1, page 188).

8.9   Configuring Console Settings

Connecting a CON Unit to the matrix creates an EXT Unit in the matrix, reading the serial number of the CON Unit. An EXT Unit has to be assigned to a CON Device. Switching operation is only possible between CON Device and CPU Device. All steps to create switchable CON Devices are described in this chapter. Several Real CON Devices can be assigned to a Virtual CON Device to reduce operation efforts (see chapter 8.9.6, page 221).

8.9.1   Configuring Mouse and Keyboard used in the Extender OSD

The OSD configuration for mouse and keyboard is made in this menu.
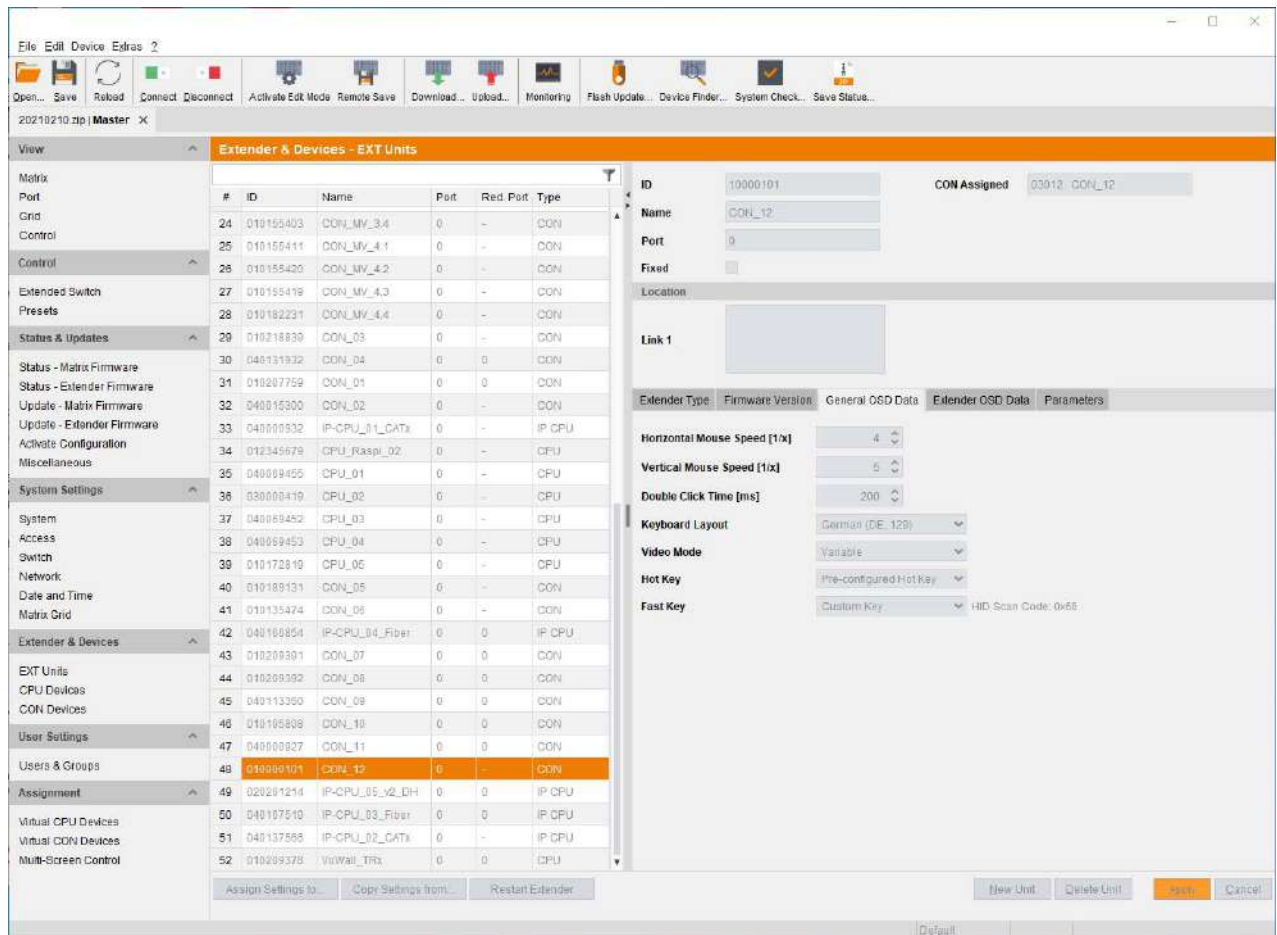
*Fig. 151   Management software menu **Extender & Devices - EXT Units - General OSD Data***

The following parameters can be configured:

Field	Entry	Description
Horizontal Mouse Speed [1/x]	1 to 9	Adjust the horizontal mouse speed, 1 = slow, 9 = fast (default: 4)
Vertical Mouse Speed [1/x]	1 to 9	Adjust the vertical mouse speed, 1 = slow, 9 = fast (default: 5)
Double Click Time [sec]	100 to 800	Adjust the time slot for a double-click (default: 200 ms)
Keyboard Layout	Region	Set the OSD keyboard layout according to the used keyboard (default: German (DE))
Video Mode	Variable or specific resolution	Set the resolution that is used when opening the OSD

Field	Entry	Description
Hot Key	Keyboard command	Calling the command mode via keyboard sequence
Fast Key	Keyboard command	Open the OSD via direct access How often the shortcut key has to be pressed depends on the specified key: 1x for function keys or print key, 2x for all other keys

ℹ The settings for mouse and keyboard are console-specific and can be set separately for each console.

Changing Settings for Mouse and Keyboard

To change the settings for mouse and keyboard, proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the CON EXT Unit in the **EXT Units** list whose extender OSD settings has to be adjusted.
4. Select the **General OSD Data** tab.
5. Modify the desired settings.
6. Click the **Apply** button to confirm your entries.
7. Click the **Deactivate Edit Mode** menu item in the toolbar.

Assigning Settings to other EXT Units

To assign settings of an extender module to another one, proceed as follows:

1. Select **Extender & Devices > EXT Units in the task area**.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the CON EXT Unit of the extender module whose settings are to be assign to another extender module.
4. Click the **Assign Settings to** button below the EXT Units list.
   A query to select the settings appears.
5. Click the checkboxes for the desired settings.
6. Click the **Next** button.
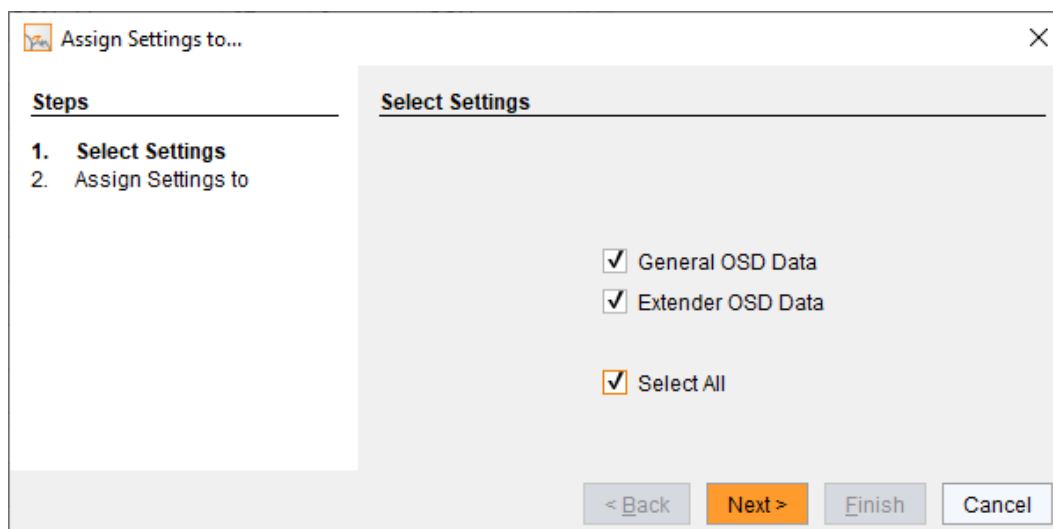
*Fig. 152   Management software menu **Extender & Devices - EXT Units - Select Settings***

A query to start the assignment appears.

7. Select the EXT Units of the extender modules in the **Available to assign settings to** list to assign the settings to. By pressing and holding down the `<Ctrl>` key at the same time, more than one EXT Unit can be highlighted.

8. Click the ▶ button to move the highlighted EXT Units to the **Assign settings to** list. By clicking the ▶▶ button, all EXT Units will be moved to the **Assign settings to** list.

9. To remove highlighted EXT Units from the **Assign settings to** list, click the ◀ button. If you click the ◀◀ button, all EXT Units will be removed from the **Assign settings to** list.

10. Click the **Finish** button.

    The settings are immediately assigned to the extender modules of the selected EXT Units.

11. Click the **Deactivate Edit Mode** menu item in the toolbar.
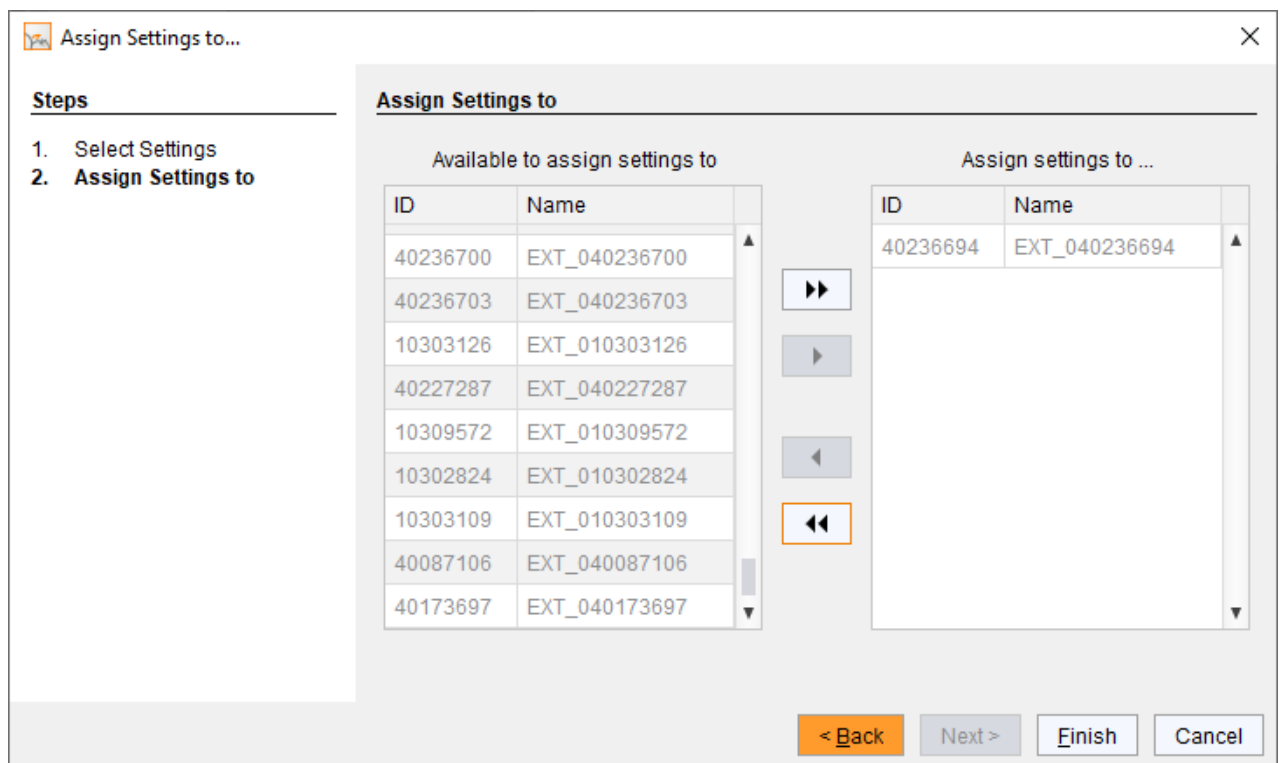
*Fig. 153   Management software menu **Extender & Devices - EXT Units - Assign Settings to***

Copying Settings from an Extender Module

To copy settings from an extender module to another one, proceed as follows:

1. Select **Extender & Devices > EXT Units in the task area**.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the EXT Units of the extender modules to copy the settings to. By pressing and holding down the `<Ctrl>` key at the same time, more than one EXT Unit can be highlighted.

4. Click the **Copy Settings from** button below the EXT Units list.

    A query to select the settings appears.

5. Click the checkboxes for the desired settings.

6. Click the **Next** button.
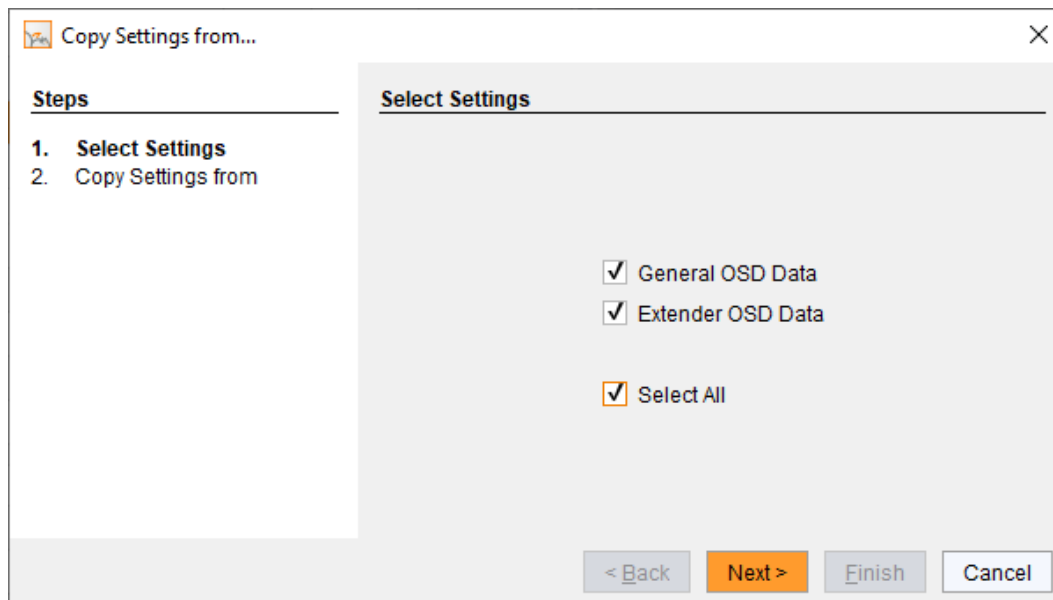
*Fig. 154   Management software menu **Extender & Devices - EXT Units - Select Settings***

A query to start the assignment appears.

7. Select the EXT Units of the extender module in the selection list from which the settings are to be copied.

8. Click the **Finish** button.

The settings are immediately copied to the extender modules of the selected EXT Units.
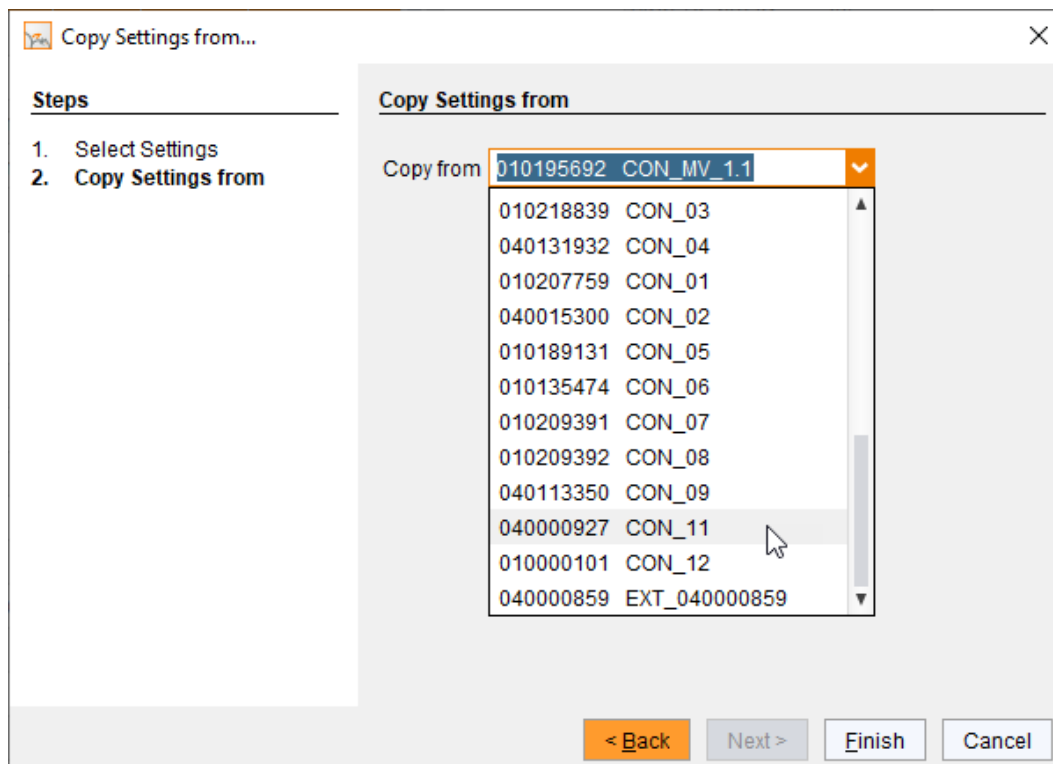
*Fig. 155   Management software menu **Extender & Devices - EXT Units - Copy Settings***

8.9.2   Setting Extender OSD

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

> When setting the horizontal OSD position, a prefixed minus describes the orientation to the right edge of the monitor, e.g., -2 means 2 x 10 = 20 pixels to this edge. When setting a vertical position, a prefixed minus describes the orientation to the bottom edge of the monitor.
>
> If the **Update connection info** function is deactivated, the Extender OSD only appears when switching via OSD.
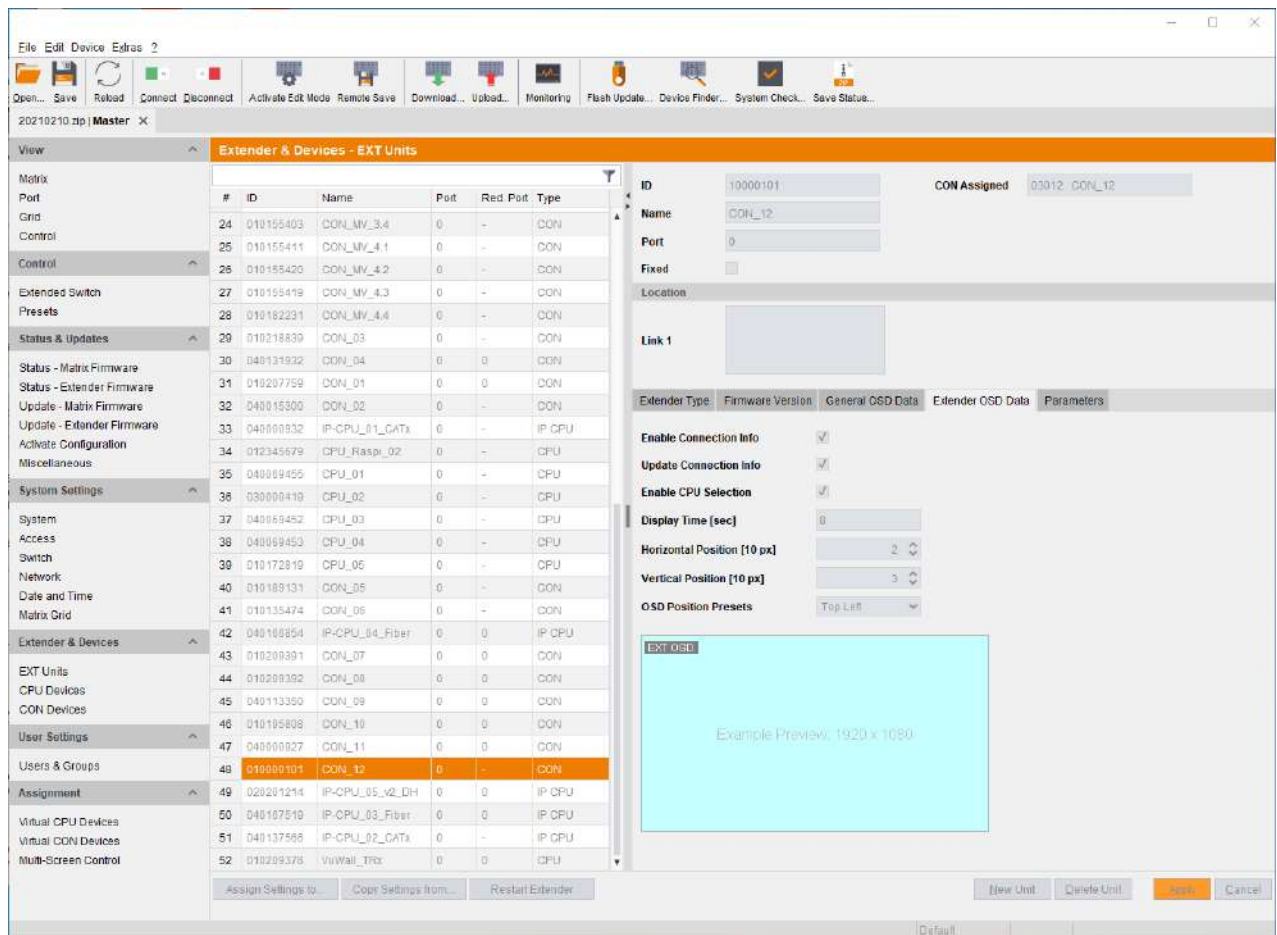
*Fig. 156   Management software menu **Extender & Devices - EXT Units - Extender OSD Data***

The following parameters can be configured:

Field	Entry	Description
Enable CPU Selection List	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 `<F7>` key within the selection list opens the standard OSD.
	deactivated	Function not active (default)
Enable Connection Info	activated	Enable Extender OSD (default)
	deactivated	Function not active
Update Connection Info	activated	Every change of the connection status is shown by fade-in of the extender OSD (e.g., sharing situation)
	deactivated	Function not active (default)

Field	Entry	Description
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)

Changing the Extender OSD Settings

To change the extender OSD settings, proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the EXT Unit of the CON extender module whose extender OSD settings have to be changed.
4. Select the **Extender OSD Data** tab.
5. Modify the desired settings.
6. Click the **Apply** button to confirm your entries.
7. Click the **Deactivate Edit Mode** menu item in the toolbar.

For an efficient extender OSD configuration, OSD settings can be assigned to extender modules (see description on page 205) or can be copied from an extender module (see description on page 206).

8.9.3   Setting CON Devices

New CON Devices are created in this menu including access rights and assignment to EXT Units.
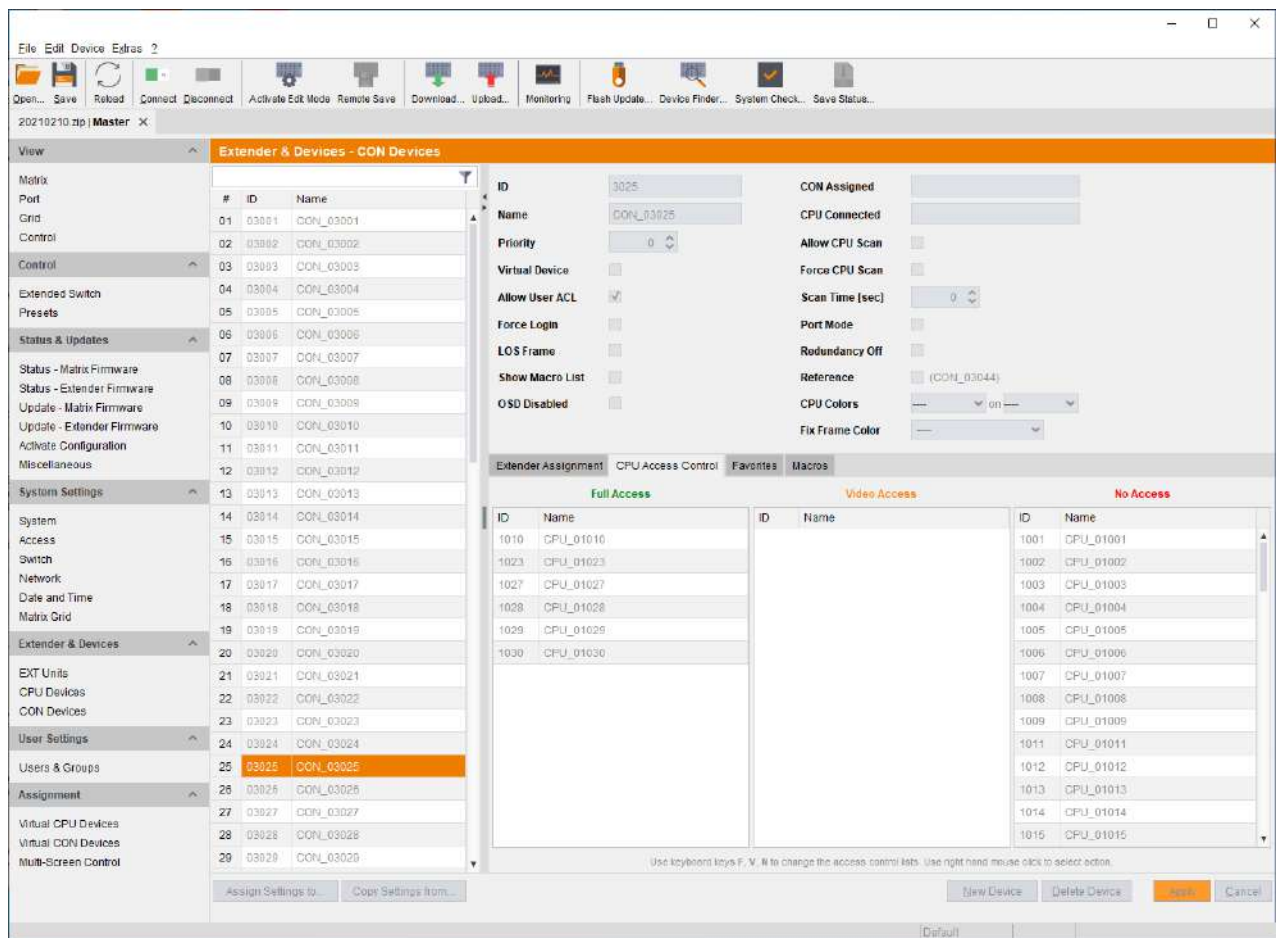
*Fig. 157   Management software menu **Extender & Devices - CON Devices***

The following functions are available:

Button	Function
New Device	Open a new CON Device
Delete Device	Delete a new CON Device
Apply	Confirm a created CON Device
Cancel	Reject changes

The following keyboard commands are available:

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

The following parameters can be configured:

Field	Entry	Description
ID	Text	Ident number of the CON Device
Name	Text	Name of the CON Device
Priority	0 to 999	Priority of the CON Device **Note:** There is no K/M sharing between CON Devices with a different priority and the release time does not come into account. CON Devices only have Video Only access to a CPU Device if a CON Device with a higher priority is already switched to it.
Virtual Device	Activated	The CON Device was created as a Virtual CON Device.
	Deactivated	Function not active (default)
Allow User ACL	Activated	Allow activation of the User ACL at the local console
	Deactivated	Function not active (default)
Force Login	Activated	The user has to login with a username and a password once to enter OSD. Thereafter the user remains logged in until he explicitly logs out or an auto logout is affected. **Note:** When using the **Force Login** function, Console ACL are still active. When the **Force Login** function is activated and a user is logged in, only the user favorites are available. The CON favorites are not accessible.
	Deactivated	Function not active (default)
LOS Frame	Activated	• When the video signal between source (computer, CPU) and the CPU Unit or the connection between matrix and the CON Unit is lost, an orange frame will be displayed. • When switching to a CPU Unit without video signal, a blank screen will appear surrounded by an orange frame.
	Deactivated	Function not active (default)
Show Macro List	Activated	Show the macro list instead of the CPU Device selection list
	Deactivated	Function not active (default)
OSD Disabled	Activated	Disable OSD access for the respective CON Device (executing macros and favorite switching is still possible)
	Deactivated	Function not active (default)
CON Assigned	-	ID and name of the assigned Virtual CPU Device, cannot be changed, is retrieved automatically
CPU Connected	-	ID and name of the connected CON Device, cannot be changed, is retrieved automatically
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 a logged in user. **Note:** An active scanner can be stopped by a mouse or keyboard event. You gain Full Access for the currently switched CPU Device if Force Connect is activated.
	Deactivated	Function not active (default)

Field	Entry	Description
Scan Time [sec]	0 to 99 seconds	Retention period until switching to the next CPU Device
Port Mode	Activated	The favorite list will be replaced by a port list where the ports from 1 to 999 can be directly selected at each matrix or Matrix Grid. **Note:** The selection only works for CPU Devices and has to be made according to the switching of favorites. When using the Port Mode, CON and User favorites will be deactivated.
	Deactivated	Function not active (default)
Redundancy Off	Activated	Function is not active
	Deactivated	Automatically switch to the second link of a connected redundant CON Unit when losing the primary link of a CPU Unit (default).
Reference	Activated	Activate a reference CON Device that inherits both Device and EXT Unit settings to any CON Unit that is connected to the matrix for the first time. **Note**: It is recommended to activate the reference setting for one single CON Device only.
	Deactivated	Function not active (default)
CPU Colors	Selection list	The CPU Device name will be highlighted according to the color setting for text and background. You can select between 16 colors.
Fix Frame Color	Selection list	Show a colored frame at the CPU Device. You can select between 7 colors. The colored frame of the CPU device is displayed with priority to the one of the CON Device.

Creating a new CON Device

To create a new CON Device, proceed as follows:

1. Select **Extender & Devices > CON Devices** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Click the **New Device** button.

    A selection dialog appears.
4. Select a Real CON Device (**Create a real Console**) or a Virtual CON Device (**Create a virtual Console**) or a template of an existing CPU (**Choose template**) in the **Choose template** selection box.
    Note: A template can only be used if there is at least on existing CON Device.
5. Click the **OK** button.

    A new CON Device will be created.
6. Determine all parameters that are relevant for the CON Device.
7. Click the **Apply** button to confirm the creation.
8. Click the **Deactivate Edit Mode** menu item in the toolbar.

Assigning Settings to other CON Devices

To assign settings of a CON Devices to other CON Devices, proceed as follows:

1. Select **Extender & Devices > CON Devices** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the CON Device whose settings are to be assign to another CON Devices.
4. Click the **Assign Settings to** button below the CON Device list.

   A query to select the settings appears.
5. Click the checkboxes for the desired settings.
6. Click the **Next** button.
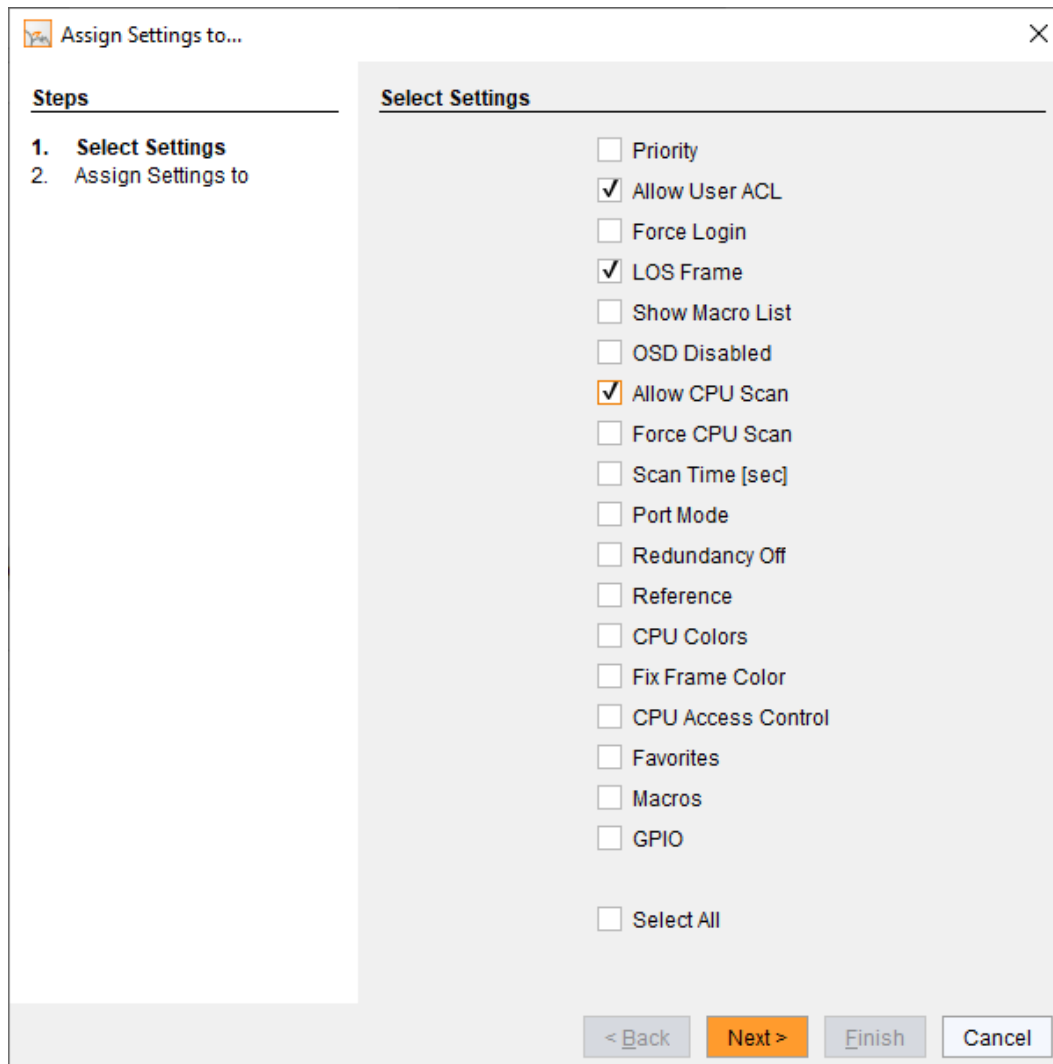
*Fig. 158   Management software menu **Extender & Devices - CON Devices - Select Settings***

A query to start the assignment appears.

7. Select the CON Device in the **Available to assign settings to** list to which the settings are to be assigned. By pressing and holding down the `<Ctrl>` key at the same time, more than one CON Device can be highlighted.

8. Click the ▶ button to move the highlighted CON Device to the **Assign settings to** list. By clicking the ▶▶ button, all CON Devices will be moved to the **Assign settings to** list.

9. To remove highlighted CON Devices from the **Assign settings to** list, click the ◀ button. If you click the ◀◀ button, CON Devices will be removed from the **Assign settings to** list.

10. Click the **Finish** button.

    The settings are immediately assigned to the selected CON Devices.

11. Click the **Deactivate Edit Mode** menu item in the toolbar.
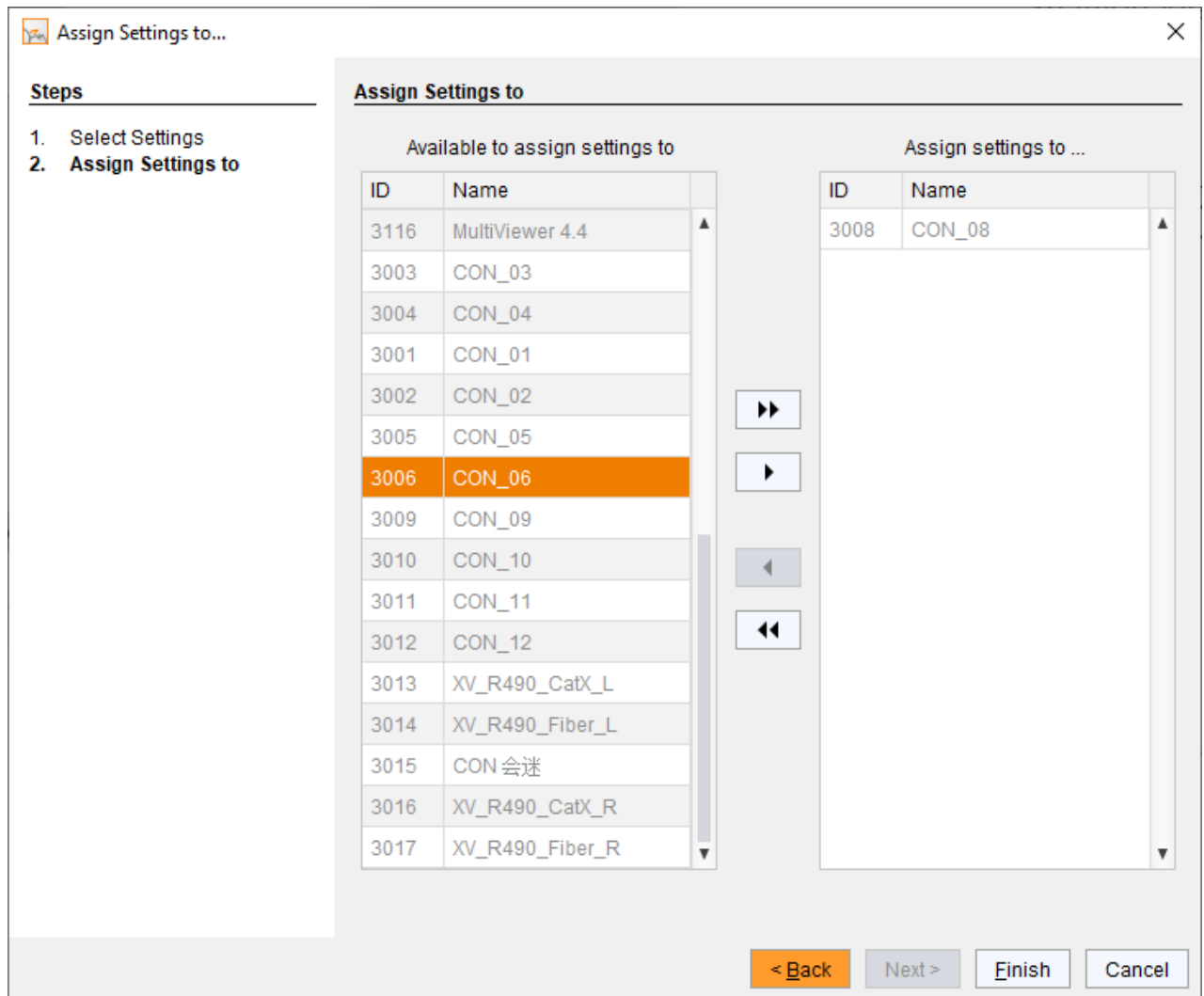
*Fig. 159   Management software menu **Extender & Devices - CON Devices - Assign Settings***

Copying Settings from another CON Device

To copy settings from a CON Device to another CON Device, proceed as follows:

1. Select **Extender & Devices > EXT Units** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the CON Device to copy the settings to. By pressing and holding down the `<Ctrl>` key at the same time, more than one CON Device can be highlighted.

4. Click the **Copy Settings from** button below the CON Device list.

    A query to select the settings appears.

5. Click the checkboxes for the desired settings.

6. Click the **Next** button.
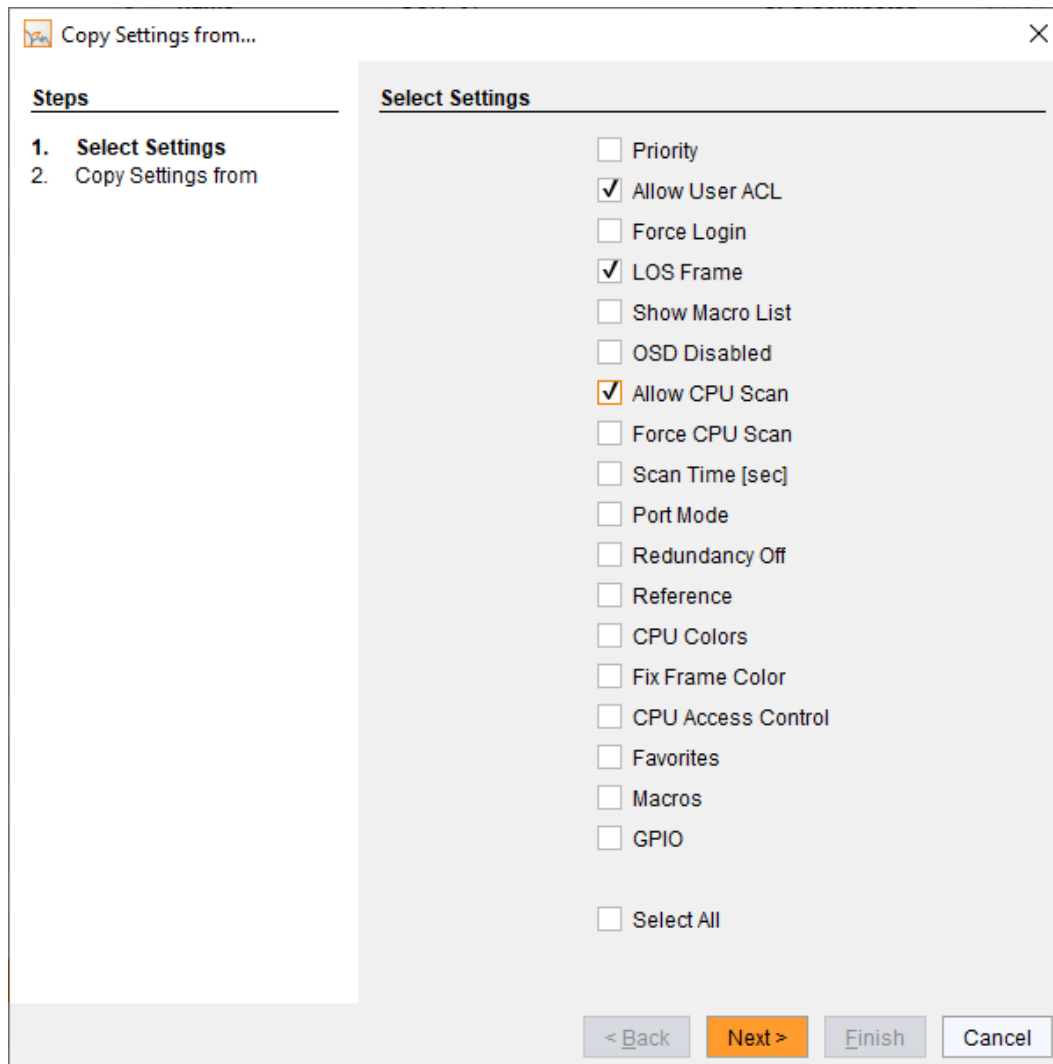
*Fig. 160   Management software menu **Extender & Devices - CON Devices - Select Settings***

A query to start the assignment appears.

7. Select the CON Device in the selection list from which the settings are to be copied.

8. Click the **Finish** button.

    The settings are immediately copied to the selected CON Devices.
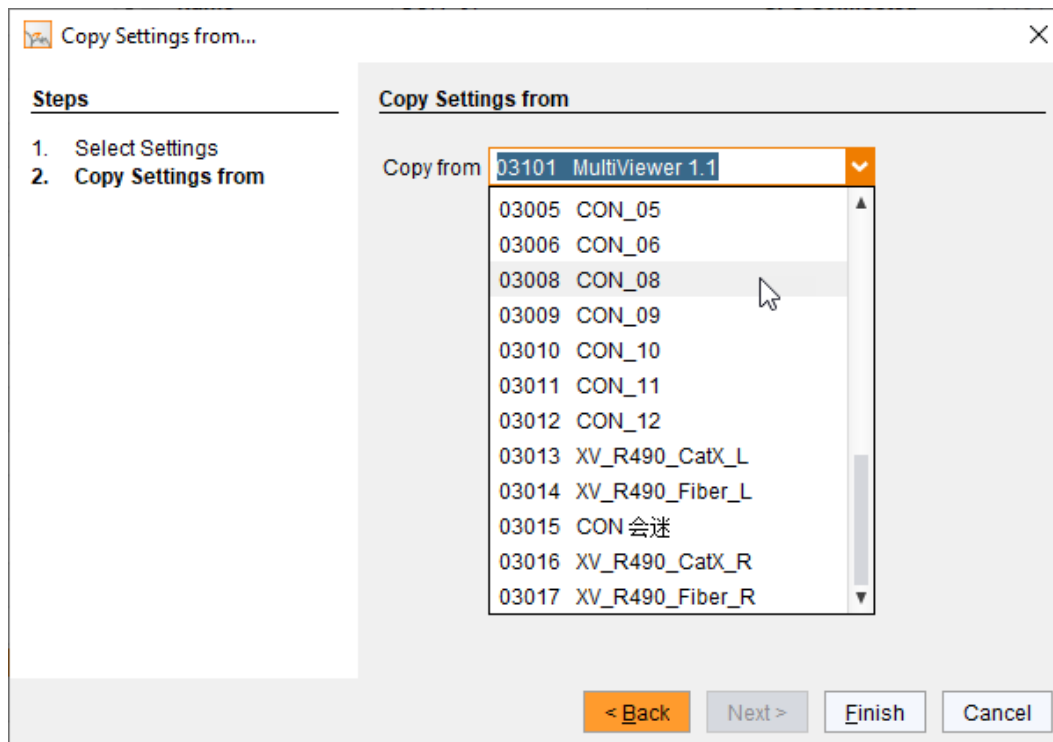
*Fig. 161   Management software menu **Extender & Devices - CON Devices - Copy Settings***

Assigning a CON Device to an EXT Unit

To run a CON Device via a matrix, one or more CON EXT Units must be assigned. To do an assignment, proceed as follows:

1. Select **Extender & Devices > CON Devices** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the CON Device in the **CON Devices** list that has to be assigned to an EXT Unit.

4. Select the EXT Unit in the **Extender available** list that should be assigned to the CON Device.

5. By clicking with the right mouse button once on a CON Device in one of the respective access lists (**Full Access**, **Video Access** and **No Access**), a context menu for selection appears in which the respective CON Device can be moved, and the access rights can be changed. Alternatively, you can type the key commands `<F>`, `<V>` or `<N>` to set the respective access rights.

6. Click the **Apply** button to confirm the assignment.

7. Click the **Deactivate Edit Mode** menu item in the toolbar.

Removing an EXT Unit Assignment

To remove an EXT Unit assignment, proceed as follows:

1. Select **Extender & Devices > CON Devices** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the CON Device in the **CON Devices** list to be modified.
4. Select the EXT Unit(s) in the **Extender assigned** list to be removed.
5. By clicking with the right mouse button once on a CON Device in one of the respective access lists (**Full Access** or **Video Access**), a context menu for selection appears in which the respective CON Device can be moved to the **No Access** list. Alternatively, you can enter the `<N>` key command to remove the access rights.
6. Click the **Apply** button to confirm the changes.
7. Click the **Deactivate Edit Mode** menu item in the toolbar.

Configuring CPU Access Rights of CON Devices

To configure CPU access rights of CON Devices, proceed as follows:

1. Select **Extender & Devices > CON Devices** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select a CON Device in the **CON Devices** list.
4. Select the **CPU Access Control** tab.
5. Click with the right mouse button once on a CON Device to or the respective keyboard commands (cf. below) to assign new access rights. Type the key commands `<F>`, `<V>` or `<N>`.
6. Click the **Apply** button to confirm the configuration.
7. Click the **Activate Edit Mode** menu item in the toolbar.

8.9.4   Setting CON Device Favorites

Individual favorite lists of CPUs to be switched frequently can be created for all consoles in this menu. A favorite list can contain up to 32 different CPU Devices (from firmware V3.05).

The switching of the favorites is done via keyboard commands (see chapter 9.1.1, page 258).
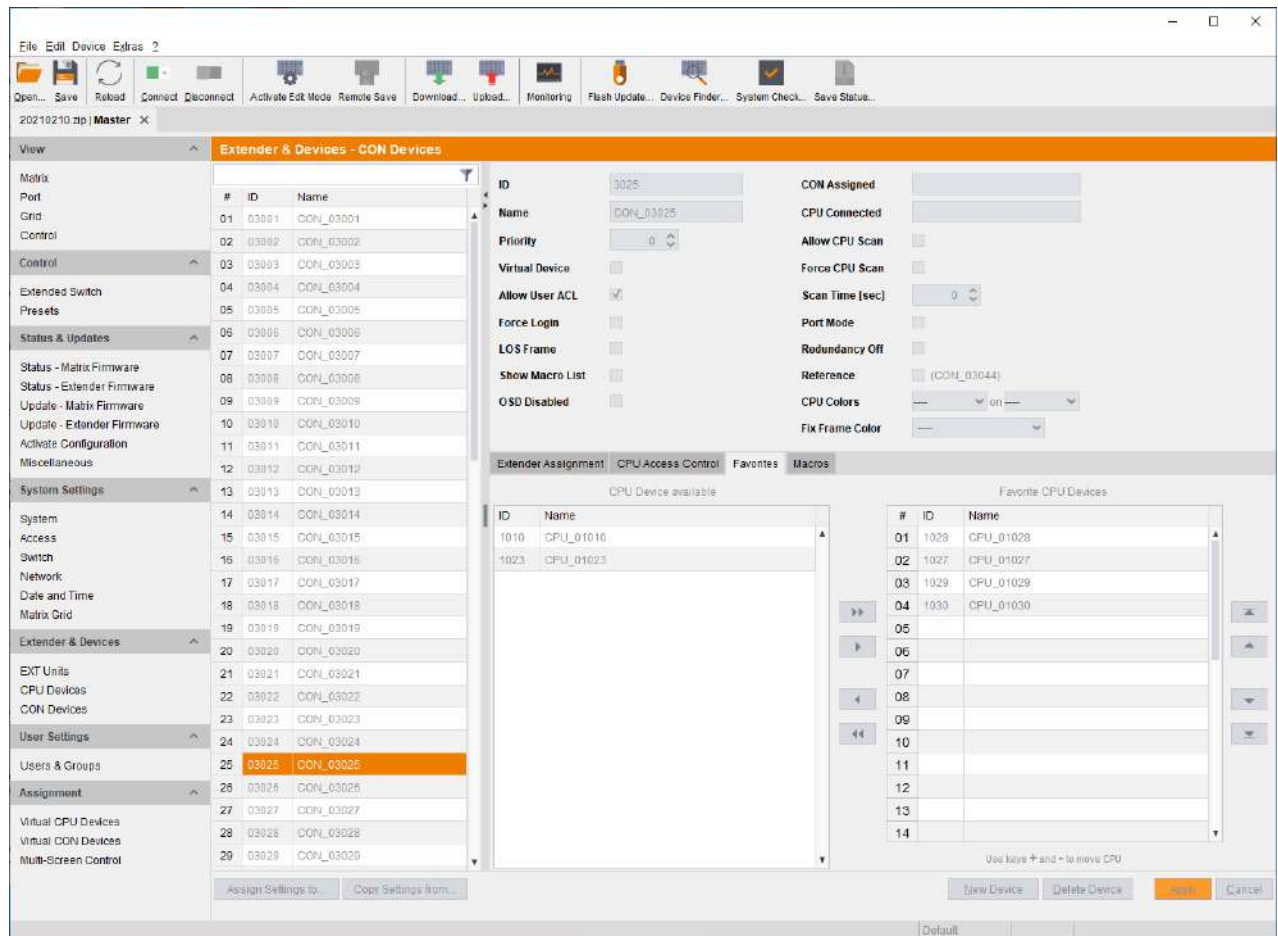
*Fig. 162   Management software menu **Extender & Devices - CON Devices - Favorites***

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

1.   Select **Extender & Devices > CON Devices** in the task area.

2.   Click the **Activate Edit Mode** menu item in the toolbar.

3.   Select the CON Device for which a favorites list is to be created.

4.   Select the **Favorites** tab.

5.   Select the CPU Devices in the **CPU Device available** list that should be added to the favorites list (**Favorite CPU Devices**). By pressing and holding down the `<Ctrl>` key at the same time, more than one CPU Device can be highlighted.

6.   Click the ▶ button to move the highlighted CPU Devices to the favorites list. By clicking the ▶▶ button, all CPU Devices from the **CPU Device available** list will be moved to the favorites list (**Favorite CPU Devices**).

7.   To remove highlighted CPU Devices from the favorites list, click the ◀ button. If you click the ◀◀ button, all CPU Devices will be removed from the favorites list.

8.   Optional: Click the ▼ or ▲ button to change the order of the CPU Devices within the favorites list. Or press the `<+>` or `<->` key to change the order of the CPU Devices within the favorites list.

9.   Click the **Apply** button to confirm the changes.

10. Click the **Deactivate Edit Mode** menu item in the toolbar.

✅ For an efficient favorite configuration, favorite settings can be assigned to CON Devices (see description on page 213) or can be copied from a CON Device (see description on page 215).

8.9.5   Setting CON Device Macros

In this menu macro commands for switching, disconnection or user administration can be created. The macro commands are created for each console separately.

A macro can execute up to 16 switching commands successively.

The execution of the macros is done via Hot Key and the function keys `<F1>` to `<F16>` (see chapter 9.1.3, page 260).

ℹ️ The macros can also be used to switch to CPU groups.
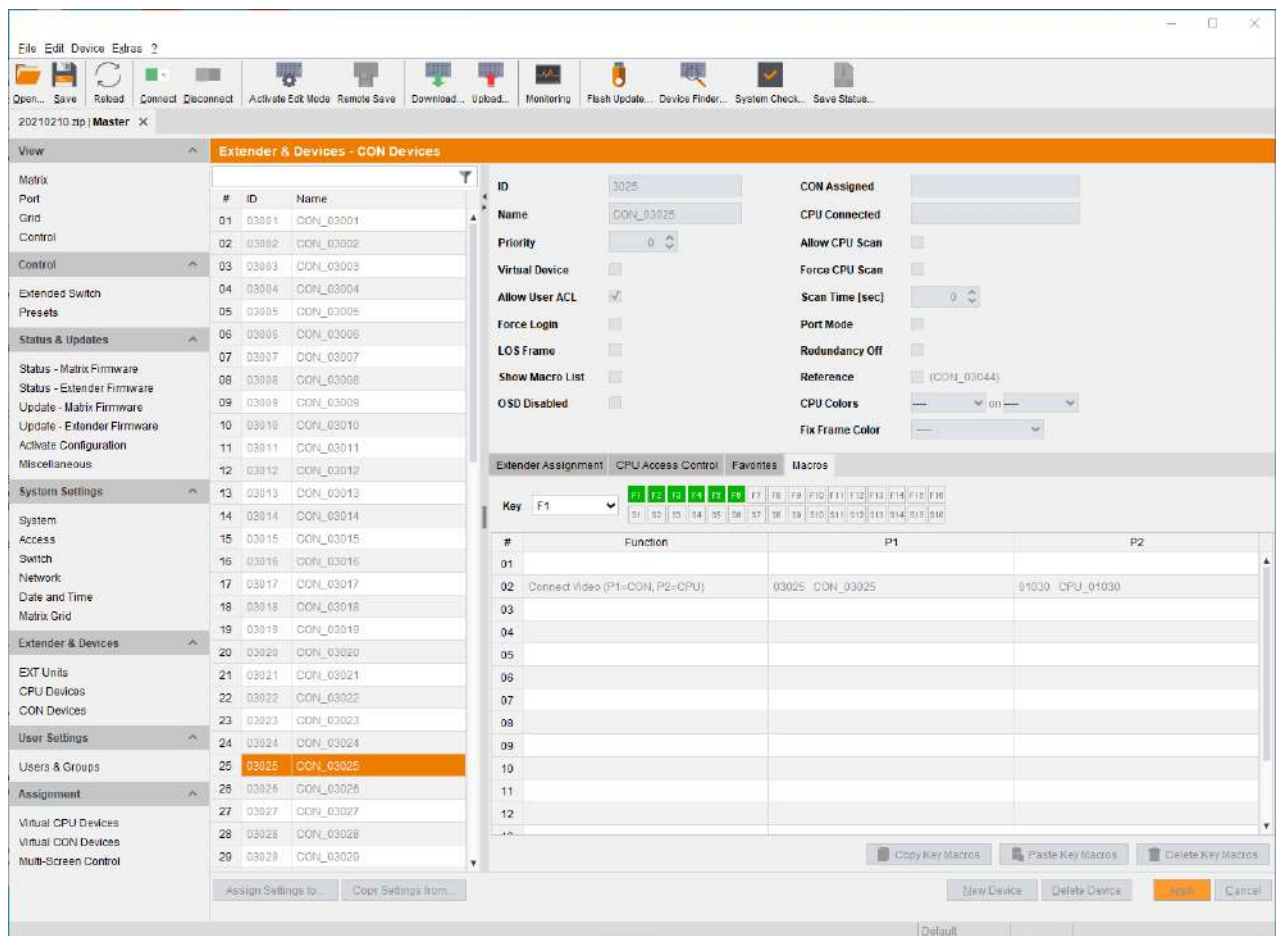
*Fig. 163   Management software menu **Extender & Devices - CON Devices - Macros***

The following parameters can be configured:

Field	Selection	Description
Function (01 to 16)	**Connect (P1=CON, P2=CPU)**	Set a bidirectional connection from CON Device P1 to CPU Device P2
	Connect Video (P1=CON, P2=CPU)	Set a Video Only connection from CON Device P1 to CPU Device P2
	Disconnect (P1=CON)	Disconnect the CON Device P1

Field	Selection	Description
Function (01 to 16)	**Logout User**	Logout the current user
	Assign CPU (P1=VCPU, P2=RCPU)	Assign a Virtual CPU Device to a Real CPU Device
	Assign CON (P1=RCON, P2=VCON)	Assign a Real CON Device to a Virtual CON Device
	Push (P1=CON)	The user's Full Access connection is forwarded to CON Device P1 and is changed into a Video Only connection.
	Push Video (P1=CON)	The video signal of the current connection (Full Access or Video Only) is forwarded to CON Device P1. The user's connection remains unchanged (Full Access or Video Only).
	Get (P1=CON)	The user's CON Device gets a Full Access connection to the CPU Device that is currently connected to CON Device P1. The connection of CON Device P1 is changed into a Video Only connection.
	Get Video (P1=CON)	The user's CON Device gets a Video Only connection to the CPU Device that is currently connected to CON Device P1. The connection of CON Device P1 remains unchanged (Full Access or Video Only).
	Login User console P2	Login a certain user P1 at CON Device P2
P1	**CON or CPU Device**	Name of CON Device or CPU Device
P2	**CON or CPU Device**	Name of CON Device or CPU Device

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

1. Select **Extender & Devices > CON Devices** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the CON Device for which a CON Device macro is to be created.
4. Select the **Macros** tab.
5. Select in the **Key** field the function key (**<F1>** to **<F32>**) for which a macro is to be created.
6. Select in the **Function** column the commands that should be part of the macro. The selection list will be opened by a double-click on the empty fields.
7. Select the respective parameters for the macro functions (e.g., corresponding CON Devices or CPU Devices) in the **P1** and **P2** columns.
8. Click the **Apply** button to confirm your entries.
9. Click the **Deactivate Edit Mode** menu item in the toolbar.

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

➡ When clicking on the **Macros** tab, macros can be assigned to other CON Devices by using the **Assign Settings to...** function (see description on page 213) and can be copied from other CON Devices by using the **Copy Settings from...** function (see description on page 215).
➡ When clicking on the macro list, macros of the selected key can be copied into the cache by using the **Copy Key Macros** function. You can paste the macros from the cache into another key by using the **Paste Key Macros** function and you can reset all macros of the selected key by using the **Delete Key Macros** function.

8.9.6   Assigning Virtual CON Devices

In this menu, several Real CON Devices can be assigned to a Virtual CON Device.

This function reflects changes in permission made to Virtual CON Devices onto Real CON Devices. Virtual CON Devices can be switched in the same way as Real CON Devices. Real CON Devices that are assigned to a Virtual CON Devices that is connected to a CPU Device will receive the video signal. The last assigned CON Device will also have control of the keyboard and mouse.

> A Virtual CON Device can be assigned to more than one Real CON Devices.

NOTICE

When the **Auto Send** function in the lower left corner of the work area is ticked, switching operations will be completed immediately without user confirmation by means of the **Send** button.

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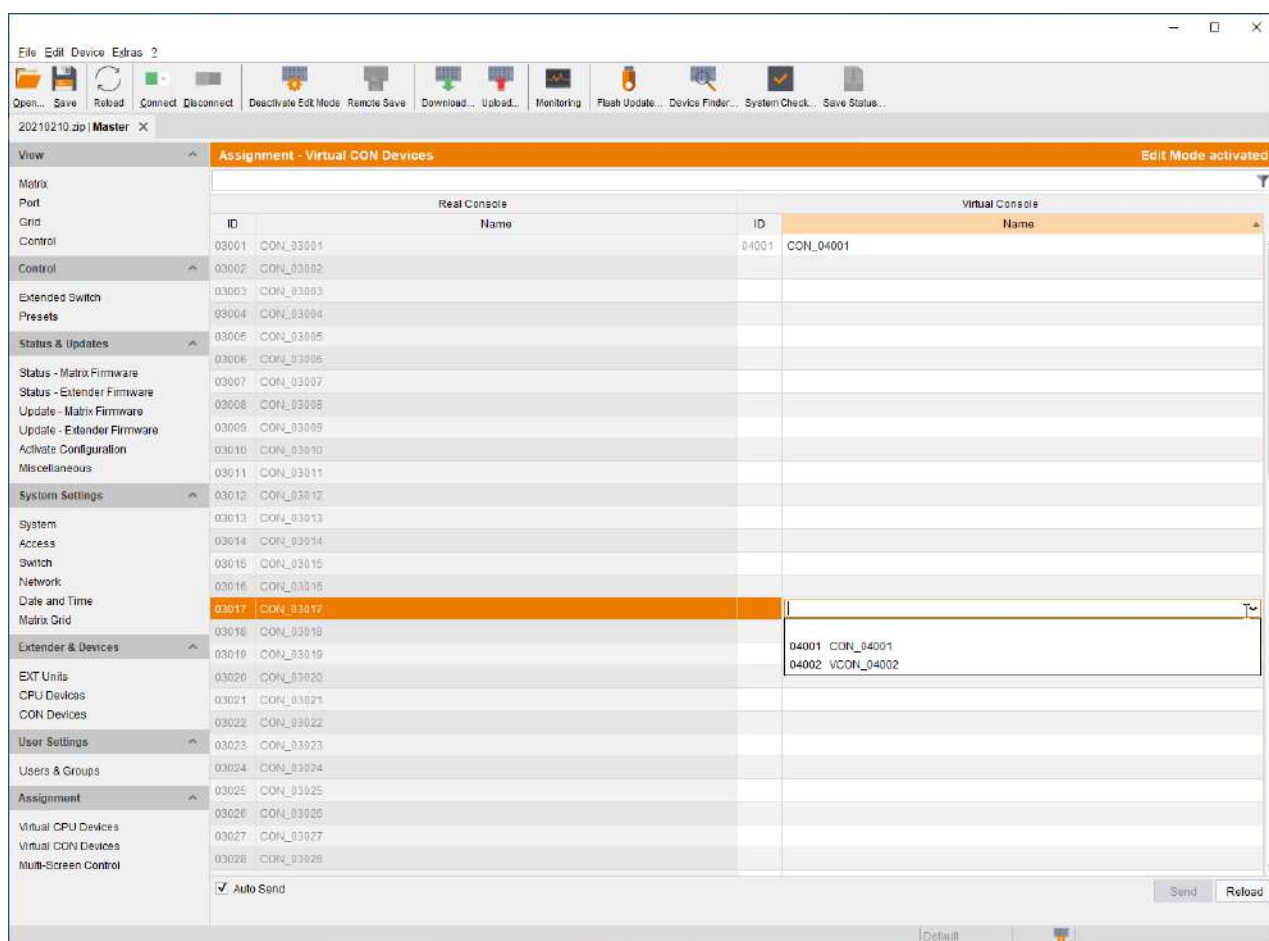
*Fig. 164   Management software menu **Assignment - Virtual CON Devices***

The following functions are available:

Button	Function
Send	Send assignments to the matrix
Reload	Reload changes

Configuring EXT Unit Assignments

To assign a Real CON Device to a Virtual CON Device, proceed as follows:

1. Select **Assignment > Virtual CON Devices** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the required Real CON Device in the **Real Console** list.

4. Double-click in the **Virtual Console** column to display a list of all available Virtual CON Devices.

5. Select the required Virtual CON Device in the selection list.

6. Click the **Send** button to send the assignment to the matrix.

7. Click the **Deactivate Edit Mode** menu item in the toolbar.

The selection boxes in the **Virtual Console** column contain a filter function for an easy selection of a single CON Device from a larger pool of CON Devices.

The management software offers the option to switch directly from the **Assignment** menu to the definition menu to check specific settings for the respective Real CON Device or Virtual CON Device.

➡ Click with the right mouse button on the respective Real CON Device or Virtual CON Device and select **Open CON Device** in the context menu.

   The definition menu for the CON Device settings is opened (see chapter 8.9.1, page 204).

8.9.7   Configuring Multi-Screen Control

When using Multi-Screen Control, switching up to eight connected sources (computers, CPUs) can be performed at one sink with only one connected mouse or keyboard. The sink can consist of up to eight CON Units and accordingly up to eight monitors, or up to sixteen monitors when using Dual-Head extender modules. In a matrix system, Multi-Screen Control can be set up at multiple sinks. The CON Units of a sink with Multi-Screen Control must all be physically connected to the same block of 8 ports on the I/O board.

One of the CON Devices is designated for USB-HID control of the connected sources, below referred to as "Control CON Device". Control CON Devices are referred to the extender modules/EXT Units within the Multi-Screen Control that are connected to keyboard and mouse for operation. If the control has to be performed via several USB-HID devices, several CON Devices have to be defined as Control CON Device.

Smooth switching of sources with the mouse is performed by dragging the mouse pointer beyond the respective display to an adjacent display in an arrangement of displays. The displays can be arranged side by side, in a grid layout, or completely free. Alternatively, switching can be performed via keyboard commands according to the ID number in the Multi-Screen Control setup.

NOTICE
When using CON Units with the possibility to connect a local source (computer, CPU) in a Multi-Screen Control environment, the local switching will be disabled.

ℹ️ The connected sources (computer, PC) need to support absolute mouse mode. Else a specific mouse driver needs to be installed.

✅ CON Units that have been already configured for Multi-Screen Control can be connected all together to other blocks of 8 ports at another I/O board. In this case any further configuration is not necessary, their functionality will remain as set previously.
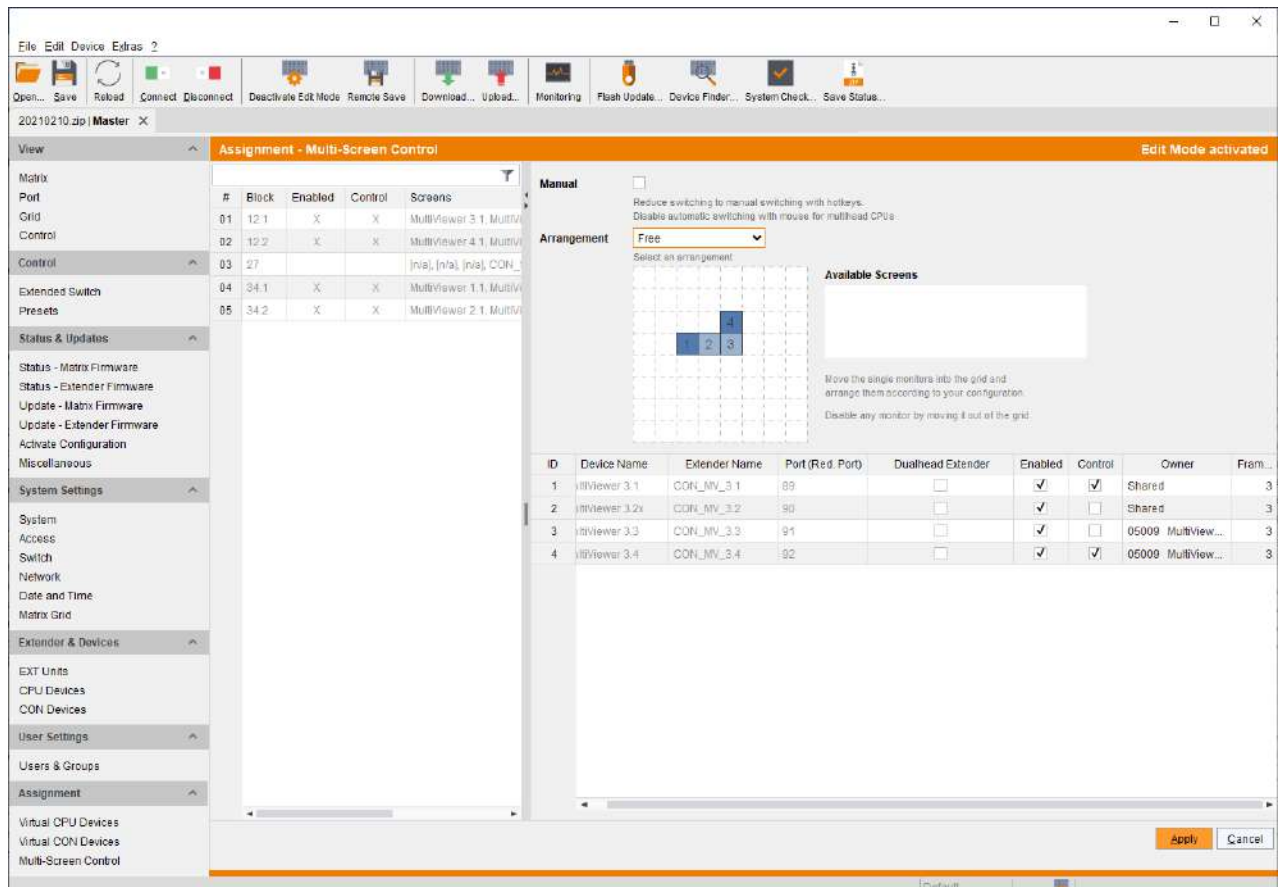
*Fig. 165   Management software menu **Assignment - Multi-Screen Control***

The following parameters can be configured:

Field	Entry	Description
Dual-Head Extender	Y	Enable configuring two displays for the Dual-Head extender
	N	Function not active (default)
Enable	Y	Activate the respective display for Multi-Screen Control
	N	Function not active (default)
Control	Y	Enable the CON Device for USB-HID control of other CON Devices if access is permitted
	N	Function not active (default)
Owner	Selection	• Shared (default) permits the access from a Control CON Device to all other CON Devices except to another Control CON Device • Name of the own Control CON Device to restrict access to other CON Devices
Frame	0 to 999 seconds	Set the keyboard/mouse inactivity timer after which a red frame is faded in at the display with current mouse/keyboard control. This frame remains active for a fixed period of time and disappears thereafter.

Configuring Multi-Screen Control

To configure more than four CON Devices for Multi-Screen Control, the free layout has to be used.

If the horizontal or block layout is used for up to four CON Devices, the CON Units have to be connected to the ports 1 - 4 or 5 - 8 of the respective I/O board. E.g., if connecting four CON Units to ports 1, 2, 5, and 6 of an I/O board, configuring Multi-Screen Control for these CON Devices will not be possible.

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

1. Select **Assignment > Multi-Screen Control** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the block of four or eight ports in the list of the working area that should be configured for Multi-Screen Control.

   Only blocks of four or eight ports that contain at least one CON Unit are shown.
4. Activate **Manual** option if the USB-HID switching is to be restricted to keyboard commands (see chapter 9.1.5, page 261). Manual switching allows the use of multi-head consoles.
5. In the **Arrangement** field, select the layout for the CON Devices you want to configure. Select as follows:
   - **Horizontal**: horizontal arrangement for a maximum of four CON Units
   - **Block**: block arrangement for a maximum of four CON Units
   - **Free**: free arrangement for a maximum of eight CON Units (The free arrangement allows a flexible positioning of the screens for diverse applications.) Move the displays from the **Available Screens** field to the arrangement field.
     The fields for the configuration of the individual displays will be arranged accordingly.
6. If the CON Unit to be configured is a Dual-Head extender, click the **Dual-Head Extender** checkbox to activate the option.

   An additional display appears in the **Available Screens** field.
7. Click the **Enable** checkboxes for all CON Devices to be enabled for Multi-Screen Control.

   Enabled Control CON Devices are shown as light blue screens in the arrangement field.

8. Click the **Control** checkbox for one or more CON Devices to be enabled as Control CON Device.

    Enabled Control CON Devices are shown as dark blue screens in the arrangement field.

9. Use the **Frame** function to configure a red frame that shows the display with current mouse control, for the duration of a specified time by flashing briefly. The frame can be activated individually for each screen by using a timer > 0 seconds.

    9.1. Double-click in the respective CON Device in the **Frame** column.

    9.2. Select the keyboard/mouse inactivity time, after which the red frame should be faded in at the display with current mouse/keyboard control.

10. Click the **Deactivate Edit Mode** menu item in the toolbar.

> ℹ️ All Control CON Devices are enabled to control USB-HID of all other CON Devices in the setup except of another Control CON Device. To restrict the access to other CON Devices, see following section.

Access Restriction when using Multiple Control CON Devices

Dragging the mouse pointer over the display border is only permitted for those displays whose CON Device is enabled for access by the owner of the respective Control CON Device.

To enable access to a display for only one Control CON Device, proceed as follows:

1. To enable a Control CON Device for access for a CON Device, double-click on the corresponding selection box within the **Owner** column and select the name of the respective Control CON Device.

2. Double-click on the corresponding selection box within the **Owner** column of all Control CON Device whose display should be accessible and select the name of the respective Control CON Device.

    The mouse can now be used to access those displays whose CON Device is enabled for access by the assigned Control CON Device.

No simultaneous USB HID sharing of multiple Control CON devices

> ℹ️ Example: In a setup of 8 CON Devices, if CON Device 1 and 2 are each Control CON Devices and six other "non-Control CON Devices" are configured, both Control CON Devices can access the displays of CON Device 3 to 8 if they are configured with **Owner = Sharing**.
>
> However, Control CON Device 1 and 2 cannot access the display of a "non-Control CON Device" at the same time. The Control CON Device that first had USB-HID control is reset to its "own" display when the second Control CON Device takes over.

Changing Multi-Screen Control

> ℹ️ Changes of the Multi-Screen Control are permitted only if the control is switched to the Control CON Device.

To change the Multi-Screen Control for a setup, proceed as follows:

1. Switch control to the Control CON Device.

2. Select **Assignment > Multi-Screen Control** in the task area.

3. Click the **Activate Edit Mode** menu item in the toolbar.

4. Select the setup in the list of the working area the Multi-Screen Control should be changed.

5. Make any edits at the configuration and system settings.

6. Click the **Apply** button to confirm the changes.

7. Click the **Deactivate Edit Mode** menu item in the toolbar.

Deleting Multi-Screen Control

ℹ️ Changes of the Multi-Screen Control are permitted only if the control is switched to the Control CON Device.

To delete the Multi-Screen Control for a setup, proceed as follows:

1. Switch control to the Control CON Device.
2. Select **Assignment > Multi-Screen Control** in the task area.
3. Click the **Activate Edit Mode** menu item in the toolbar.
4. Select the setup in the list of the working area the Multi-Screen Control should be deleted.
5. Click the **Enable** checkboxes for all CON Devices to remove the checkmarks.
   The disabled Control CON Devices are shown as gray screens in the arrangement field and the Multi-Screen Control is disabled.
6. Click the **Control** checkbox for all CON Devices to remove the checkmarks.
7. Click the **Deactivate Edit Mode** menu item in the toolbar.

Configuring Multi-Head sources for Multi-Screen Control

NOTICE
A Multi-Head configuration for Apple Mac sources is not supported due to limitations of the macOS.

For the use of Multi-Head sources (computer, CPU), an additional configuration of the CPU Devices is mandatory. The configuration of CPU Devices, which are connected to Single-Head sources (computer, CPU) is not mandatory.
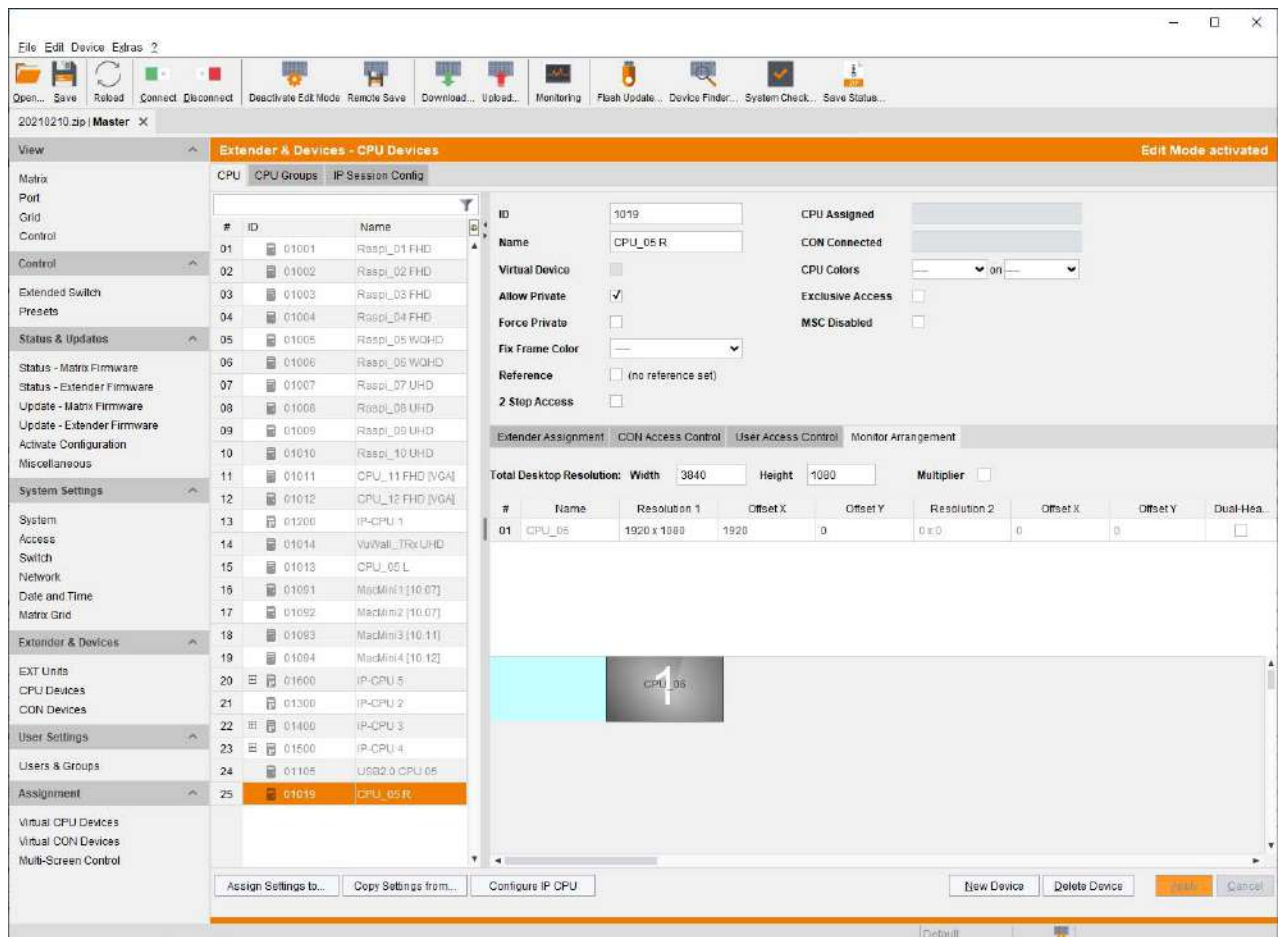
Fig. 166   Management software menu Extender & Devices - CPU Devices - Monitor Arrangement

For an additional configuration of the CPU Devices for the use of Multi-Head sources (computer, CPU), proceed as follows.

1. Select **Extender & Devices > CPU Devices** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the CPU Device to be configured.

4. Select the **Monitor Arrangement** tab.

5. Enter the resolution of the total desktop area into the fields **Total Desktop Resolution**. For instance, if there are 4 graphic card outputs with a resolution of 1920x1080 each, you have to enter 7680 under **Width** and 1080 under **Height**.

6. Select the individual resolution of the graphic card output from the selection list in the field **Resolution 1** (e.g., 1920x1080). This is the graphic card output the CPU Device is connected to.

7. Enter the respective pixel coordinates that particular screen in the Multi-Screen Control arrangement into the fields **Offset X** and **Offset Y**.
    Note: Offset: X=0 / Y=0 defines the upper left corner.
    For instance, you have to enter 1920 for a shift of 1920 pixels to the right into the field Offset X.

    The corresponding screen will be positioned accordingly within the light blue grid.

8. If the CPU Device to be configured is a Dual-Head extender, click the **Dual-Head Extender** checkbox to activate the option. Enter the resolution of the 2nd graphic card output and the offset information in the field **Resolution 2**.

9. For some operating systems it is necessary to activate the option **Multiplier**. This is mandatory if you cannot reach all areas of the desktop with your mouse cursor.

10. Click the **Apply** button to confirm the settings.

A dialog appears to restart the extender module.

11. Click the **Yes** button to restart the extender module to with the new configuration.

The CPU Device is now configured for the Multi-Head operation.
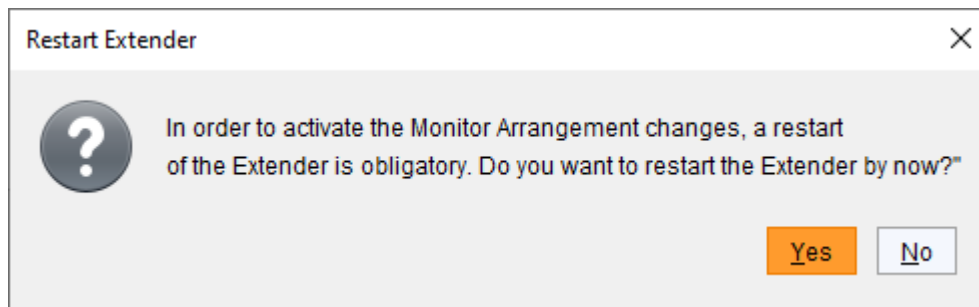
*Fig. 167   Management software dialog **Monitor Arrangement - Restart Extender***

12. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.10   Configuring Matrix Cascading

This simple method of cascading allows a switchable connection between two matrices via so called **Tie Lines**. The Matrix Cascading does not require **Bundle 4**.

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 due to reasons of redundancy.

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

To connect Tie Lines to the matrices, you first have to create intended **Cascade CON Devices** and **Cascade CPU Devices** that have to be switched within the cascaded environment.

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

Activating the Sub Matrix Option

1. Connect to the defined Sub Matrix and click the **Activate Edit Mode** menu item in the toolbar.

2. Select **System Settings > System** in the task area of the Sub Matrix.

3. Activate the **Sub Matrix** option in the working area.

4. Click the **Apply** button to confirm the Sub Matrix option.

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

5. Click the **Deactivate Edit Mode** menu item in the toolbar.
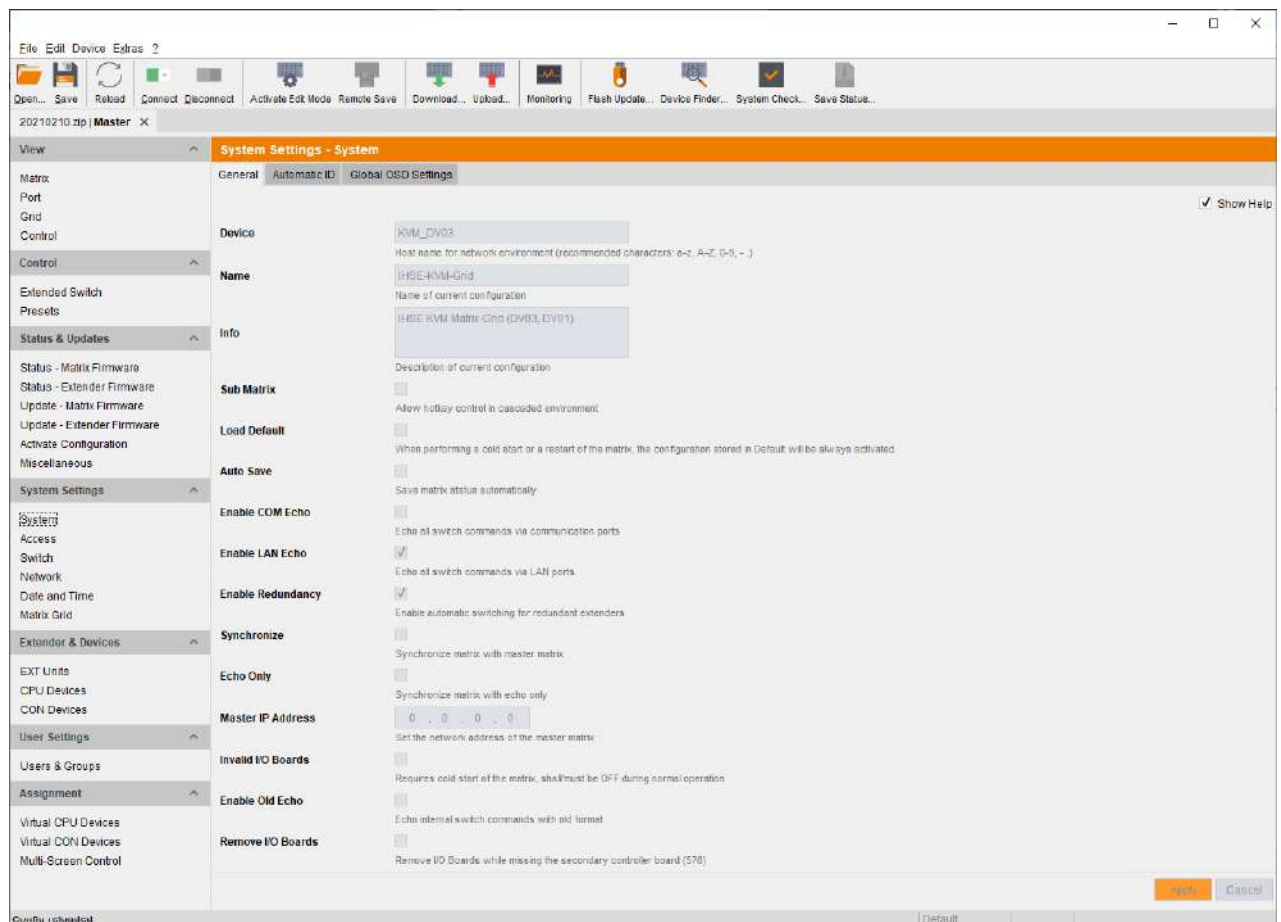
*Fig. 168   Management software menu **System Settings > System***

8.10.1 Directing a Tie Line from the Sub to the Master

To configure settings for using Matrix Cascading and to direct the Tie Line from the Sub to the Master, proceed as follows:

1. Connect to the Master Matrix.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the menu **Extender & Devices > EXT Units** in the task area.

   3.1. Click the **New Unit** button.

   A selection dialog appears.

   3.2. Select **Cascading CPU Unit** in the **Choose template** selection box.

   3.3. Click the **OK** button.

   A new Cascading CPU Unit will be created.
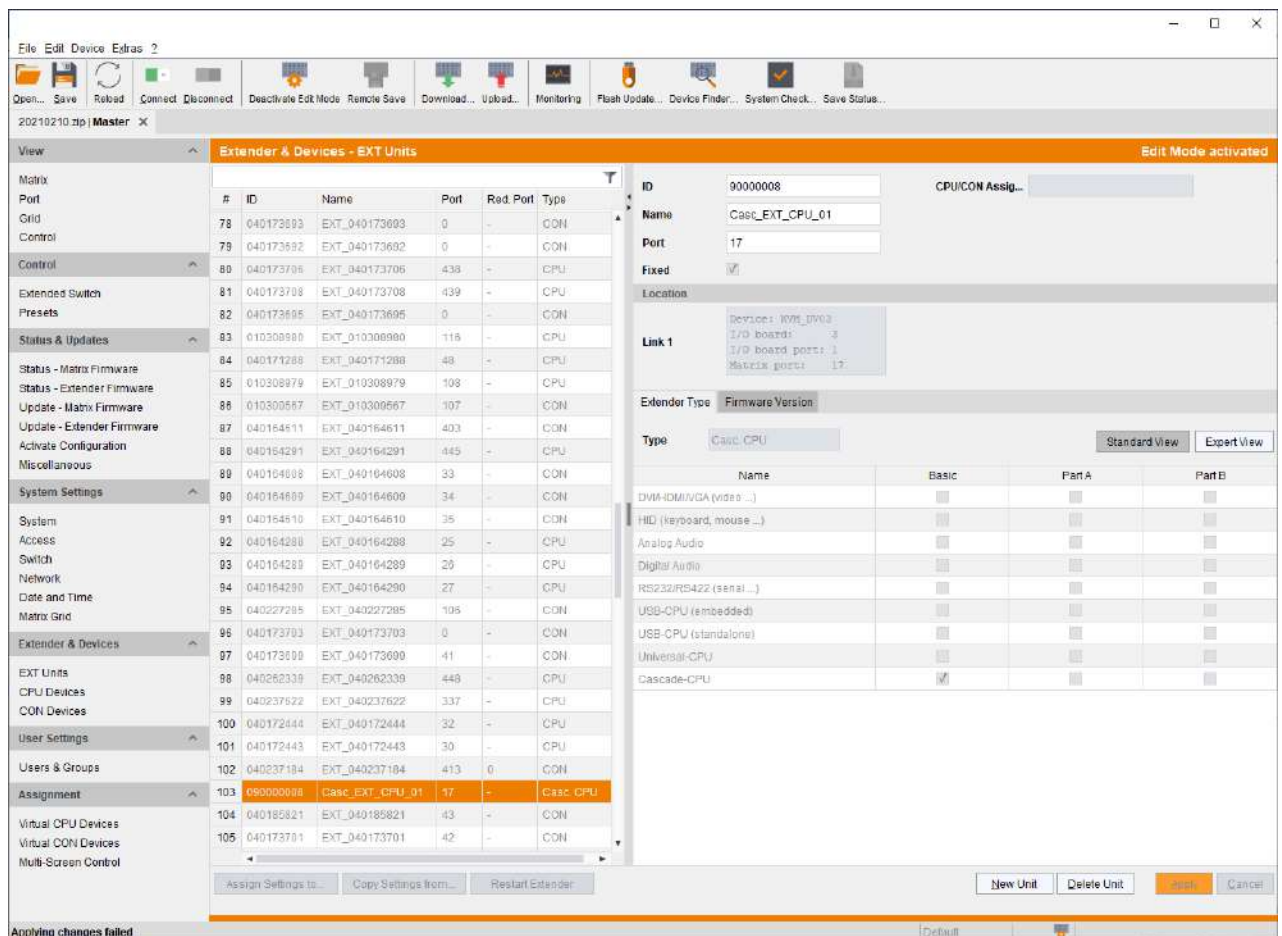
*Fig. 169   Management software menu **Extender & Devices - EXT Units - Cascading CPU Unit***

   3.4. Enter an appropriate name for the Cascading CPU Unit into the **Name** field.

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

   3.6. Click the **Apply** button to confirm the creation of a Cascading CPU Unit.

4. Select **Extender & Devices > CPU Devices** in the task area of the Master Matrix.

    4.1. Click the **New Device** button.

        A switchable CPU Device will be created.

    4.2. Enter an appropriate name for the Cascading CPU Device into the **Name** field.
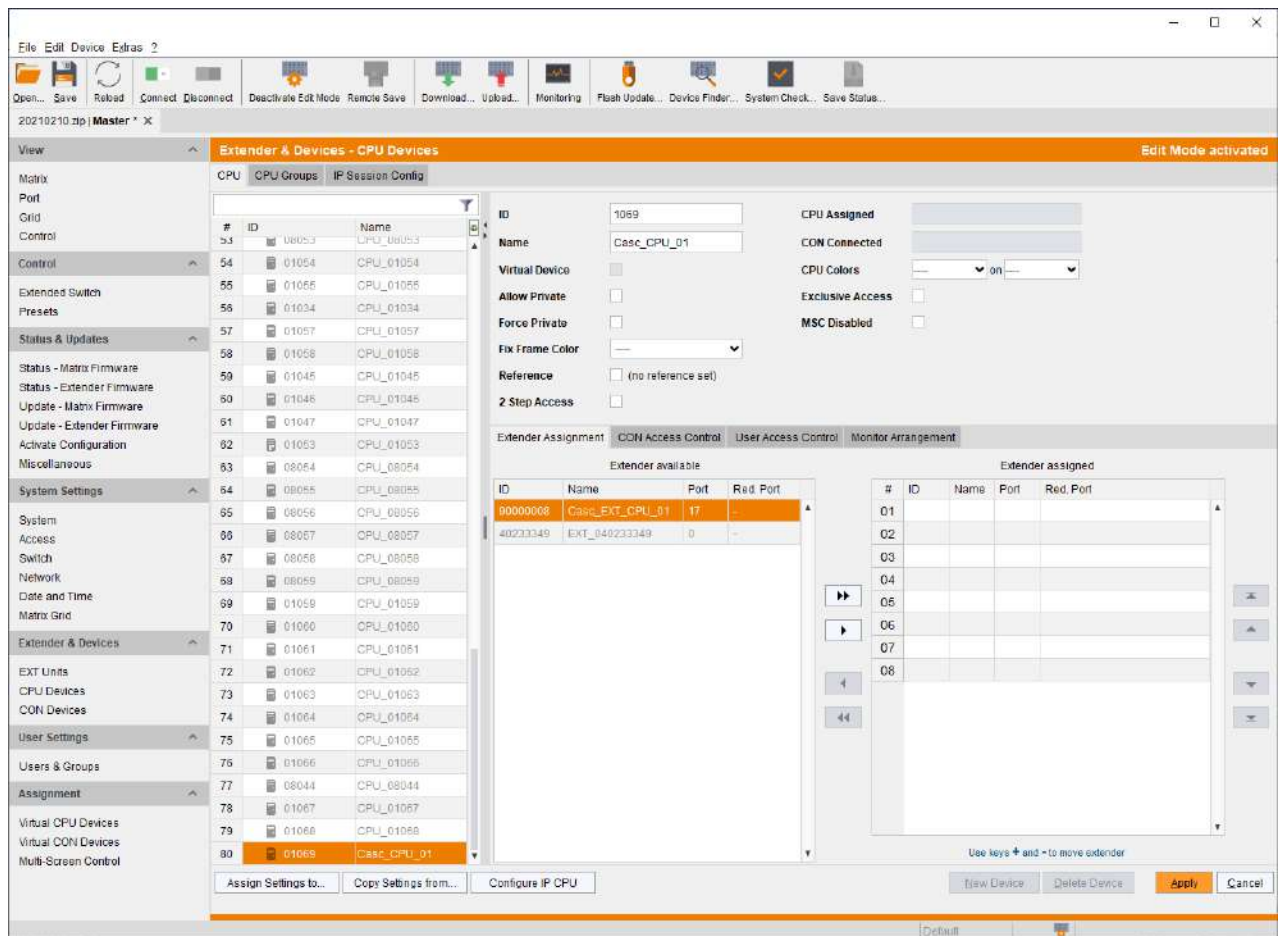
Fig. 170   Management software menu Extender & Devices > CPU Devices - Cascading CPU Device

    4.3. Select the previously configured Cascading CPU Unit in the **Extender available** list.

    4.4. Click the ▶ button to move the highlighted Cascading CPU Unit to the **Extender assigned** list.

        The assignment is displayed in the **Extender assigned** list.

    4.5. Click the **Apply** button to confirm the assignment.

5. Connect to the Sub Matrix.

6. Click the **Activate Edit Mode** menu item in the toolbar.

7. Select the menu **Extender & Devices > EXT Units** in the task area.

    7.1. Click the **New Unit** button.

        A selection dialog appears.

    7.2. Select **Cascading CON Unit** in the **Choose template** selection box.

    7.3. Click the **OK** button.

        A new Cascading CON Unit will be created.

*Fig. 171   Management software menu **Extender & Devices > EXT Units - Cascading CON Unit***

    7.4. Enter an appropriate name for the Cascading CON Unit into the **Name** field.

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

    7.6. Click the **Apply** button to confirm the creation of a Cascading CON Unit.

8. Select **Extender & Devices > CON Devices** in the task area of the Sub Matrix.

    8.1. Click the **New Device** button.

        A switchable CON Device will be created.

    8.2. Enter an appropriate name for the Cascading CON Device into the **Name** field.
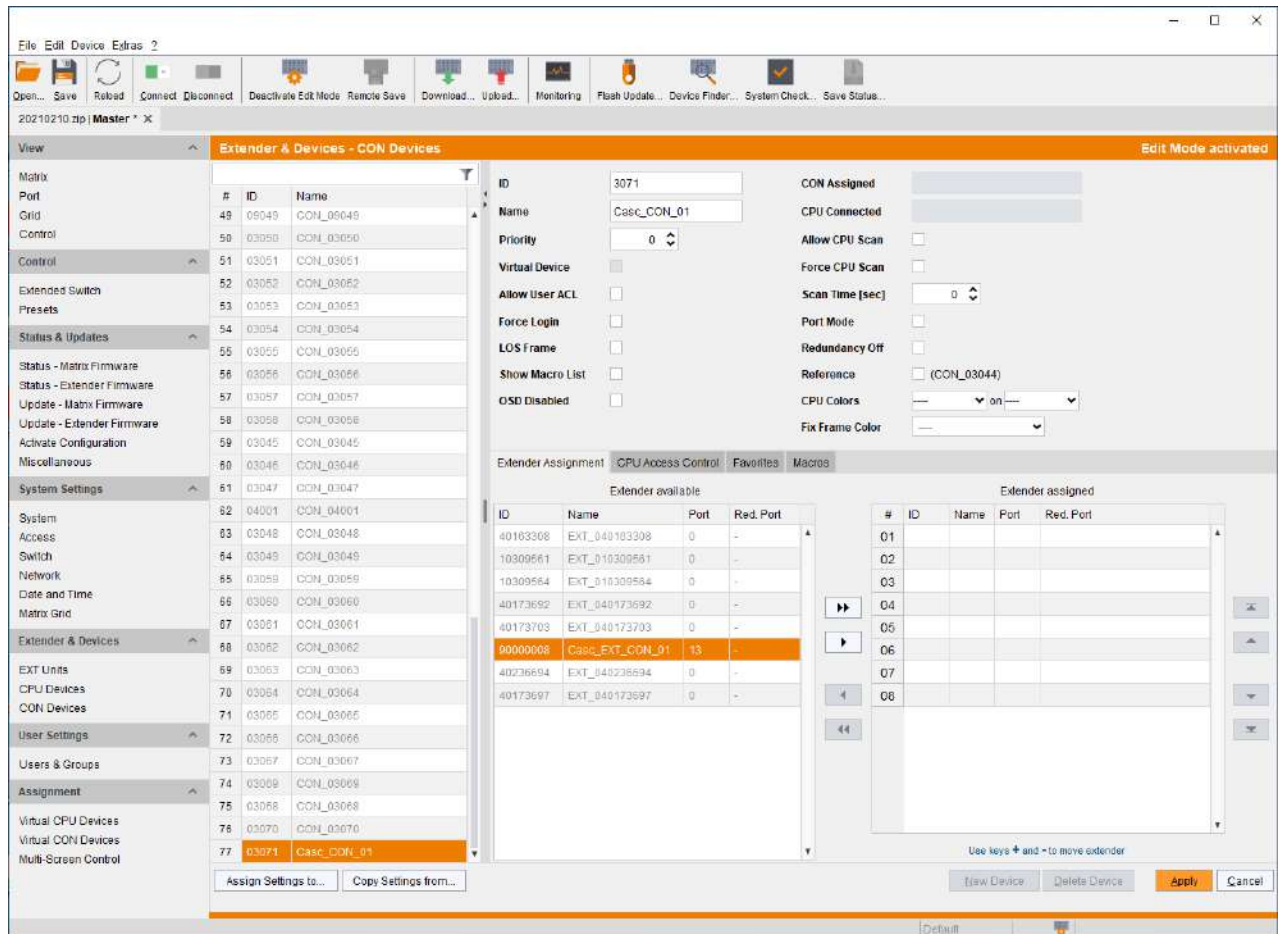
*Fig. 172   Management software menu **Extender & Devices > CON Devices - Cascading CON Device***

    8.3. Select the previously configured Cascading CON Unit in the **Extender available** list.

    8.4. Click the ▶ button to move the highlighted Cascading CON Unit to the **Extender assigned** list.

        The assignment is displayed in the **Extender assigned** list.

    8.5. Click the **Apply** button to confirm the assignment.

9. Click the **Deactivate Edit Mode** menu item in the toolbar.

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

10. Restart all I/O boards on which any Master/Sub CON Units or CPU Units have been configured (see chapter 9.10.3, page 307) or alternatively restart the matrix (see chapter 9.10.1, page 305).

11. Connect the Tie Lines to the matrices. Ensure that each **Cascade CON Device** on one matrix is connected to **Cascade CPU Device** on the other matrix to achieve switching ability 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 chapter 9.2.7, page 269.

8.10.2 Directing a Tie Line from the Master to the Sub

To configure settings for using Matrix Cascading and to direct the Tie Line from the Master to the Sub, proceed as follows:

1. Connect to the Master Matrix.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the menu **Extender & Devices > EXT Units** in the task area.

    3.1. Click the **New Unit** button.

        A selection dialog appears.

    3.2. Select **Cascading CON Unit** in the **Choose template** selection box.

    3.3. Click the **OK** button.

        A new Cascading CON Unit will be created.
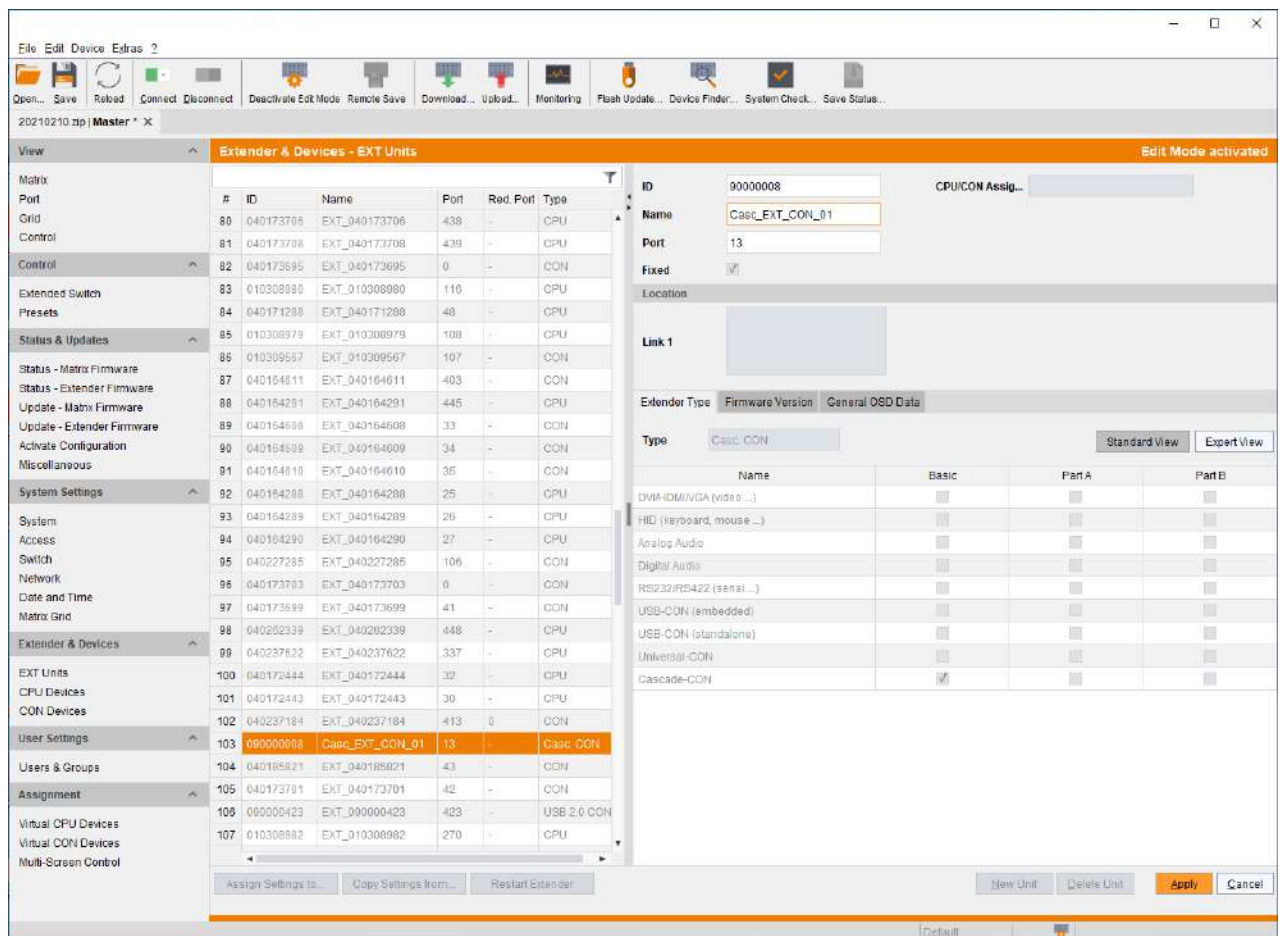
*Fig. 173   Management software menu **Extender & Devices - EXT Units - Cascading CON Unit***

    3.4. Enter an appropriate name for the Cascading CON Unit into the **Name** field.

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

    3.6. Click the **Apply** button to confirm the creation of a Cascading CON Unit.

4.   Select **Extender & Devices > CON Devices** in the task area of the Master Matrix.

   4.1.   Click the **New Device** button.

      A switchable CON Device will be created.

   4.2.   Enter an appropriate name for the Cascading CON Device into the **Name** field.
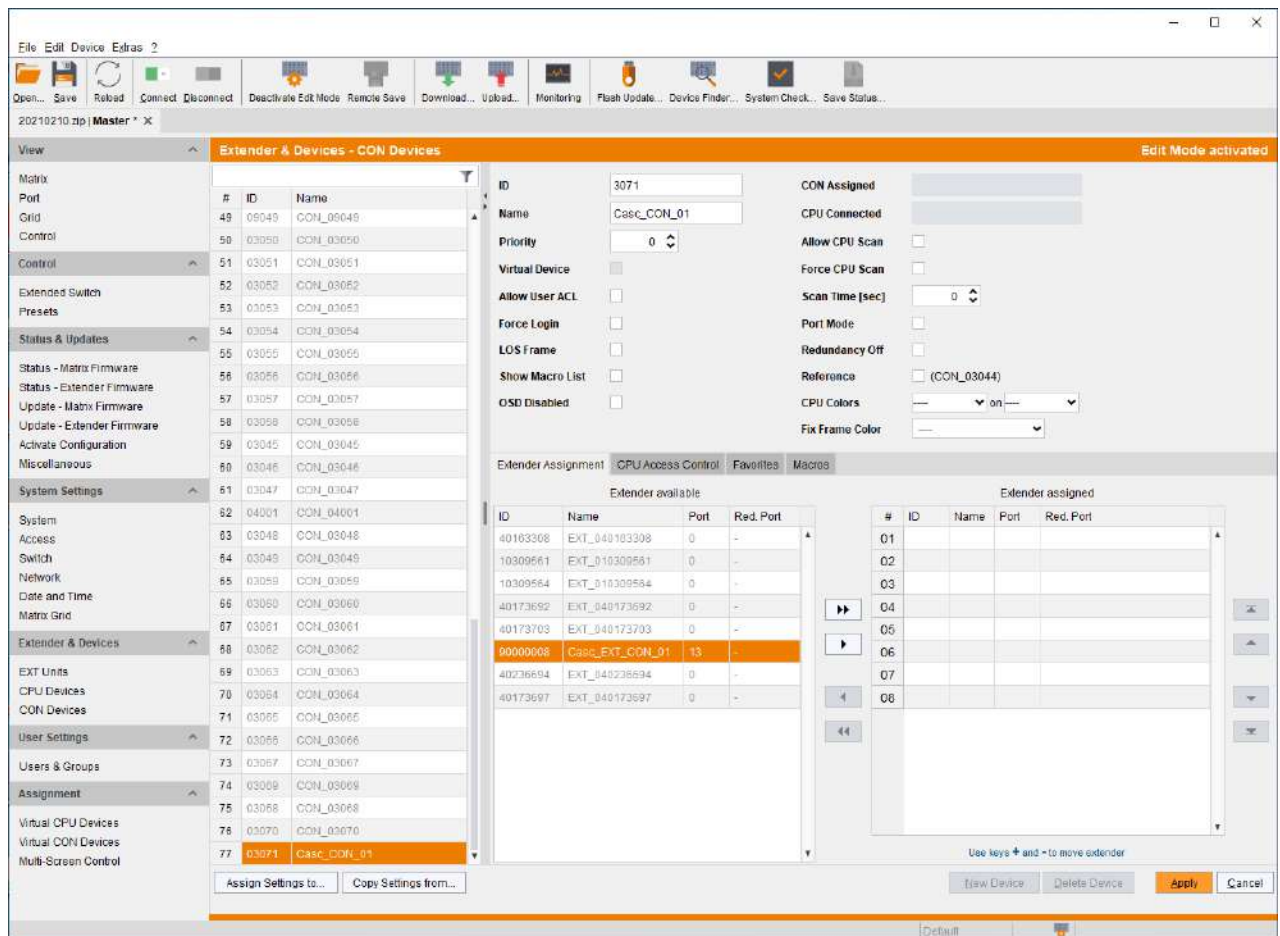
*Fig. 174   Management software menu **Extender & Devices > CON Devices - Cascading CON Device***

   4.3.   Select the previously configured Cascading CON Unit in the **Extender available** list.

   4.4.   Click the ▶ button to move the highlighted Cascading CON Unit to the **Extender assigned** list.

      The assignment is displayed in the **Extender assigned** list.

   4.5.   Click the **Apply** button to confirm the assignment.

5. Connect to the Sub Matrix.

6. Click the **Activate Edit Mode** menu item in the toolbar.

7. Select the menu **Extender & Devices > EXT Units** in the task area.

    7.1. Click the **New Unit** button.

        A selection dialog appears.

    7.2. Select **Cascading CPU Unit** in the **Choose template** selection box.

    7.3. Click the **OK** button.

        A new Cascading CPU Unit will be created.

*Fig. 175   Management software menu **Extender & Devices - EXT Units - Cascading CPU Unit***

    7.4. Enter an appropriate name for the Cascading CPU Unit into the **Name** field.

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

    7.6. Click the **Apply** button to confirm the creation of a Cascading CPU Unit.

8. Select **Extender & Devices > CPU Devices** in the task area of the Sub Matrix.

    8.1. Click the **New Device** button.

        A switchable CPU Device will be created.

    8.2. Enter an appropriate name for the Cascading CPU Device into the **Name** field.
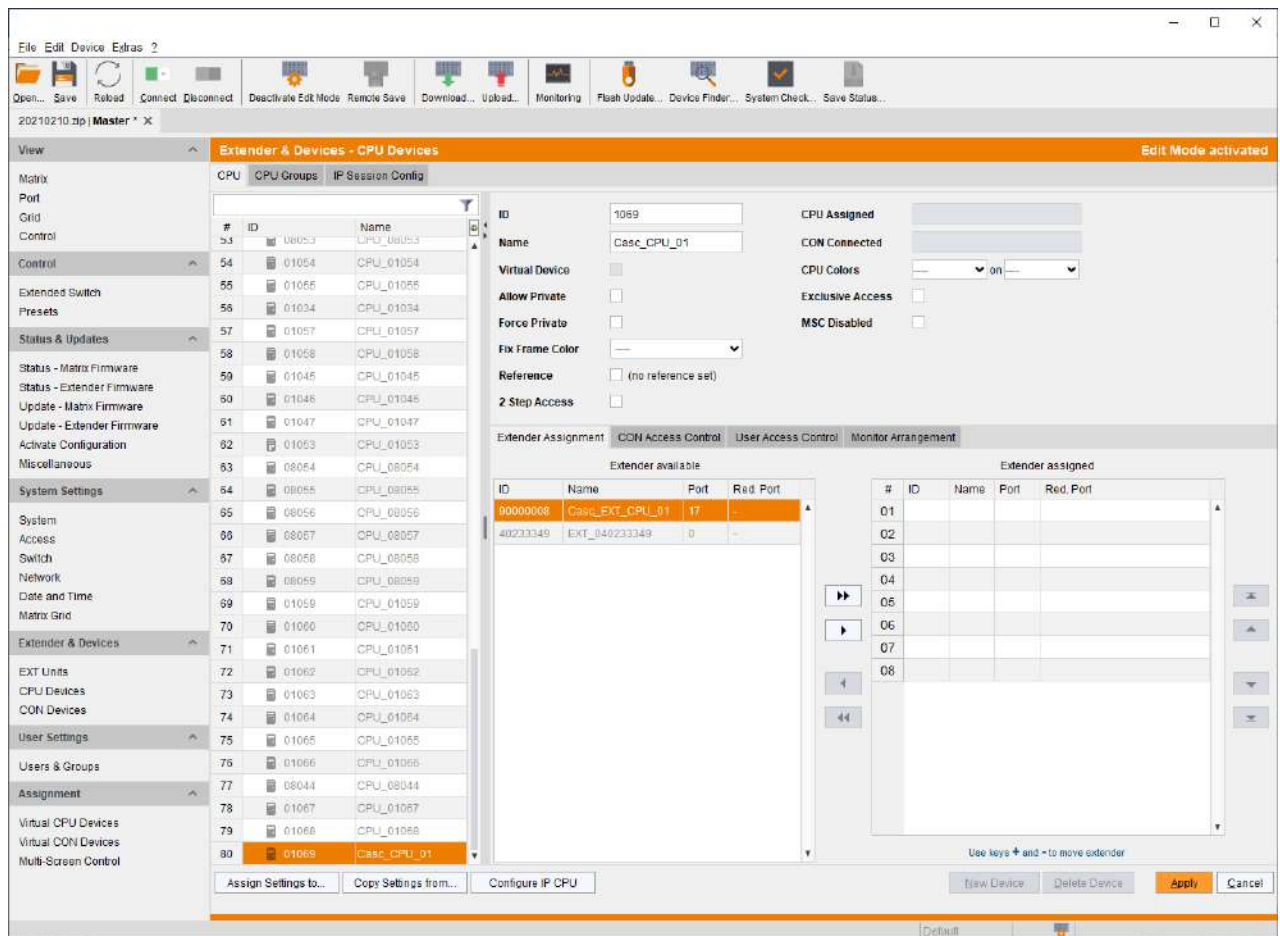
*Fig. 176   Management software menu **Extender & Devices > CPU Devices - Cascading CPU Device***

    8.3. Select the previously configured Cascading CPU Unit in the **Extender available** list.

    8.4. Click the ▶ button to move the highlighted Cascading CPU Unit to the **Extender assigned** list.

        The assignment is displayed in the **Extender assigned** list.

    8.5. Click the **Apply** button to confirm the assignment.

9. Click the **Deactivate Edit Mode** menu item in the toolbar.

10. Restart all I/O boards (see chapter 9.10.3, page 307) on which any Master/Sub CON Units or
    CPU Units have been configured or alternatively restart the matrix (see chapter 9.10.1, page 305).

11. Connect the Tie Lines to the matrices. Ensure that each **Cascade CON Device** on one matrix is
    connected to **Cascade CPU Device** on the other matrix to achieve switching ability 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 chapter 9.2.7,
page 269.

8.11   Saving and Activating Configurations

NOTICE
By default, the last configuration that has been saved in the permanent matrix memory will be restored after a restart of the matrix.

First starting the matrix, the factory configuration will be copied into the current configuration. There are three possibilities to save configuration changes:

- Save the current configuration permanently in the matrix memory (**Remote Save**)

- Save configuration on a local memory (**Save** or **Save as**)

- Upload the configuration in up to 8 predefined storage locations, as well as the default configuration in the memory of the matrix (**Upload**)

8.11.1   Saving the Current Configuration to the Matrix

> By default, the last configuration that has been saved in this way will be restored after a restart of the matrix.

To save the current configuration permanently in the matrix memory, proceed as follows:

1. Click the **Remote Save** menu item in the toolbar.

   A query to save the configuration appears.

2. Click the **Yes** button to confirm the saving.

   The previously active configuration is overwritten and saved in the permanent memory of the matrix.
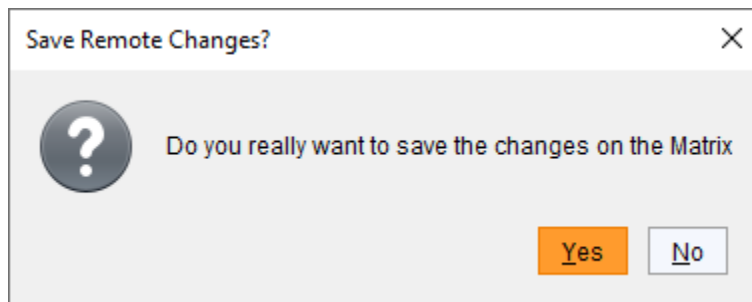
*Fig. 177   Management software dialog **Save Remote Changes***

8.11.2 Saving of Configurations Locally

Configurations can be saved as a file that can be stored independent of the matrix.

To save a configuration file locally, proceed as follows:

1. Select **File > Save** or **File > Save As** in the menu bar.

2. Enter a name for the configuration.

3. Select the directory of the configuration on your storage medium where the configuration is to be saved.

ℹ️ Configurations are always saved with the file extension `.dtc`.
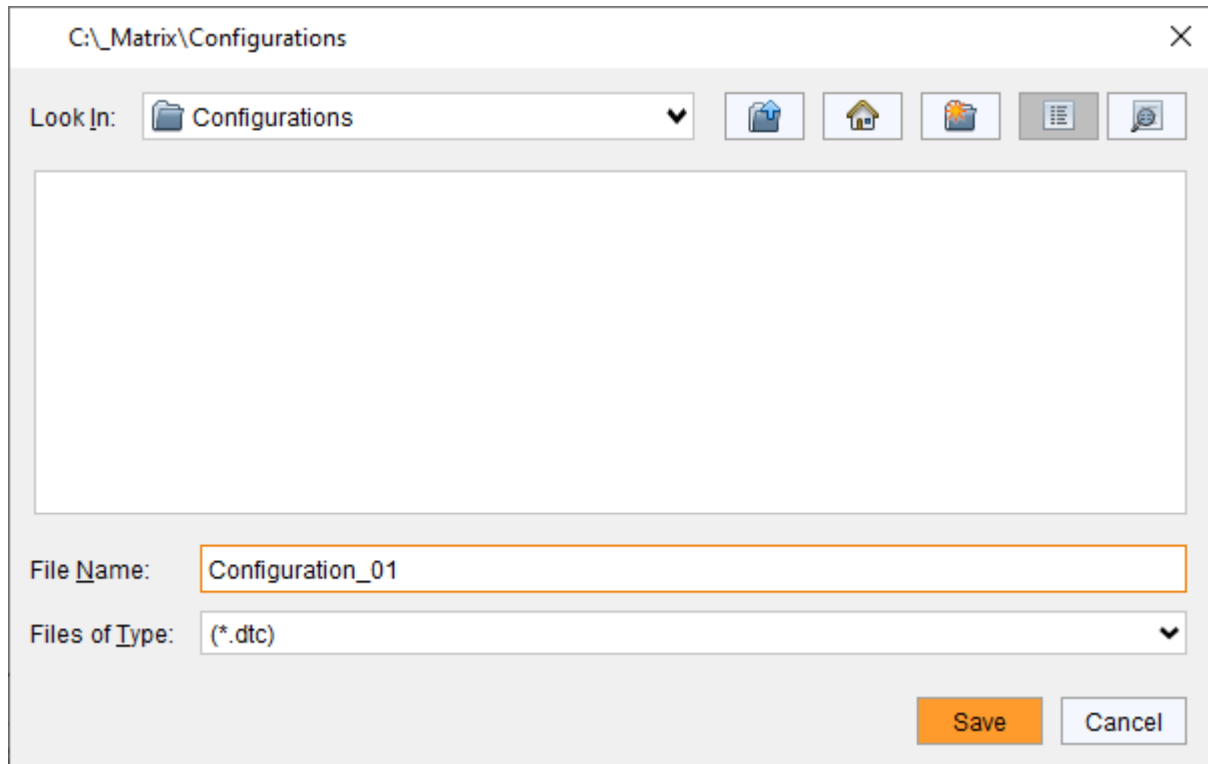
Fig. 178   Management software menu **File - Save As…**

Local saved configurations files can be opened in the management software (see chapter 8.11.3, page 240), be uploaded to the matrix (see chapter 8.11.4, page 241) and be used as active configuration (see chapter 8.11.5, page 243) in the system.

8.11.3 Opening a Locally Saved Configuration

To open a locally saved configuration, proceed as follows:

1. Click the **Open…** menu item in the toolbar.

2. Navigate to the location of the configuration file to be opened.

3. Click the configuration file to be opened.

4. Click the **Open** button, to open the configuration file.
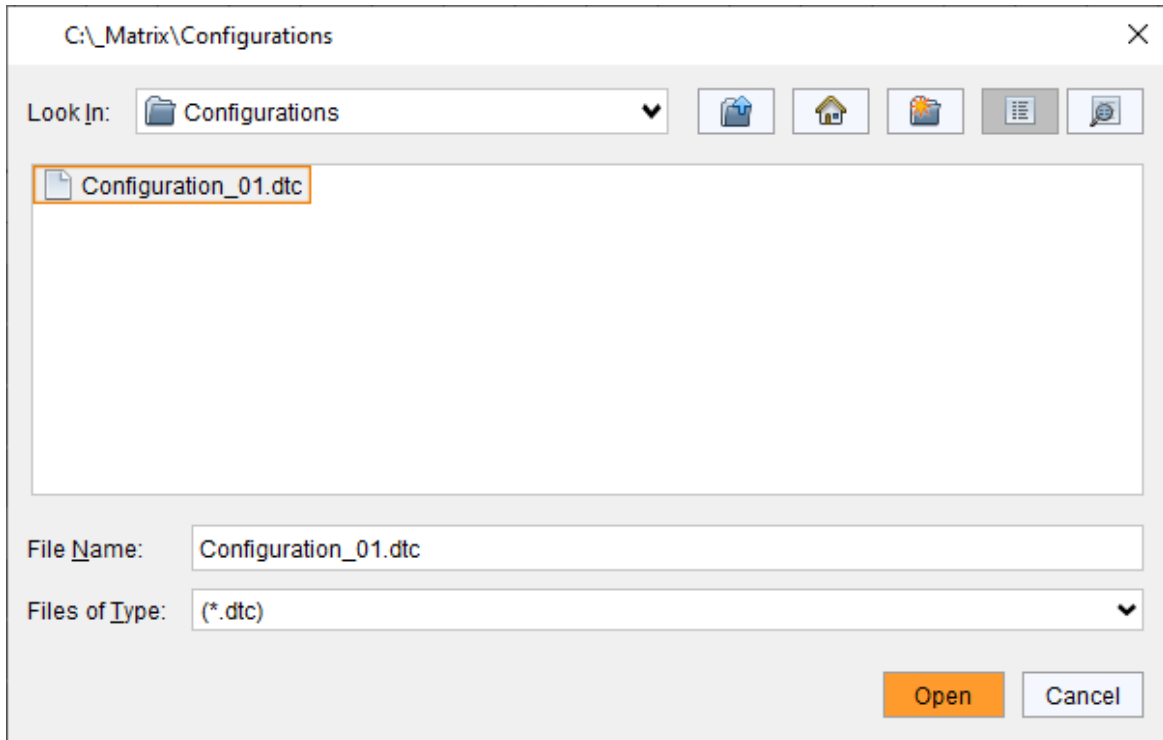
*Fig. 179   Management software menu **Open***

The configuration can also be opened via drag & drop. To do this, click on the configuration file, hold down the left mouse button and drag the configuration file into the management software.

8.11.4 Uploading a Predefined Configuration to the Matrix

Using the function **Upload**, the created configuration can be saved within eight storage locations in the matrix (**File#1** to **File#8**). However, it does not replace the buffering of configuration (see chapter 8.11.1, page 238).

Additionally, a configuration can also be saved as default configuration that can be automatically loaded with each start (for activation of this function see chapter 8.4.1, page 138).

To upload an opened configuration to the matrix, proceed as follows:

1. Click the **Upload** menu item in the toolbar.

    An access window appears.

2. Enter the IP address of the matrix .

3. Enter the username and password of the administrator.

4. Click the **Next** button to display the selection of storage slots.

*Fig. 180   Management software menu **Upload - Connect***

5. Under **Select Configuration Slot**, select the storage slot for the configuration (**default** or **config01** to **config08**).

6. Option: to activate the uploaded configuration immediately, click the **Activate configuration after upload** check box.

NOTICE
If you click the **Activate configuration after upload** option, the matrix will be restarted immediately after the save process has been completed. The restart of the matrix may take several minutes, and the matrix is not available during the restart.

7. Click the **Finish** button to save the configuration to the selected storage location.

A message appears to inform about successful upload.

*Fig. 181   Management software menu **Upload - Select Configuration Slot***

8.11.5 Activating a Predefined Configuration

Previously saved configurations are loaded in this menu. In **Active Configuration**, the name and detailed information of the currently loaded configuration is displayed. The selection of the configuration to be loaded can be made between eight customizable configurations and the default settings.

NOTICE
Activating a configuration will disconnect and restart the matrix. The selected configuration is loaded on restart and is shown in the menu as active configuration under **Active Configuration** in the working area. The previously active configuration is overwritten.
The restart of the matrix may take several minutes, and the matrix is not available during the restart.

To activate an uploaded configuration, proceed as follows:

1. Select **Status & Updates > Activate Configuration** during online-mode in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the configuration to be activated.
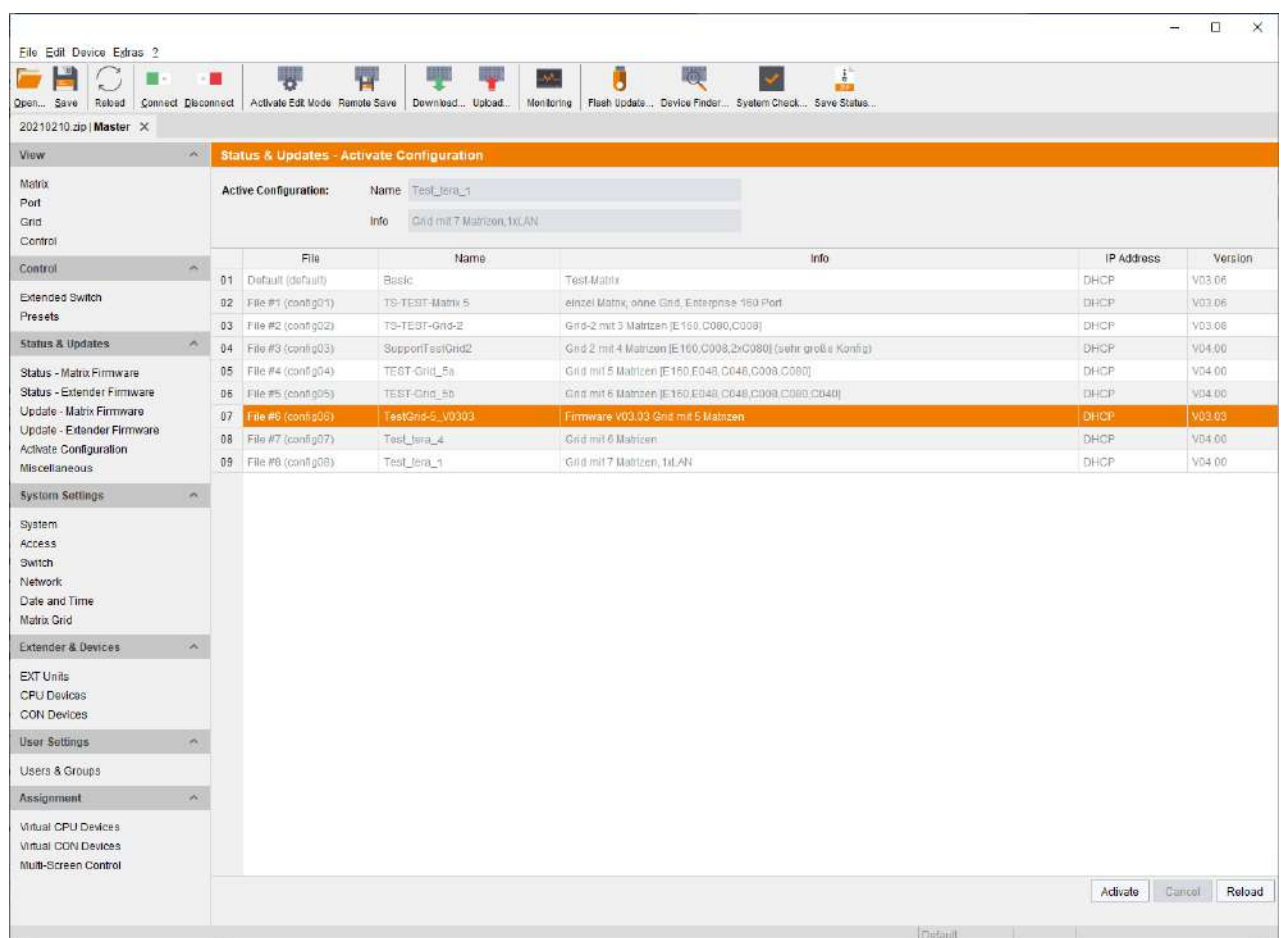
*Fig. 182   Management software menu **Status & Updates - Activate Configuration***

4. Click the **Activate** button to activate the selected configuration.

    A query to restart the matrix appears.

5. Click the **Yes** button to confirm the activation of the selected configuration.

    The connection is disconnected, and the matrix is restarted. The selected configuration is loaded on restart and is shown in the menu as active configuration under **Active Configuration** in the working area. The previously active configuration is overwritten.

6. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.11.6 Downloading a Predefined Configuration from the Matrix

Configurations saved in the matrix can be downloaded for offline editing in this menu.

To download a configuration from the matrix, proceed as follows:

1. Click the **Download** menu item in the toolbar.

   An access window appears.

2. Enter the IP address of the matrix .

3. Enter the username and password of the administrator.

4. Click the **Next** button to display the selection of storage location.

*Fig. 183   Management software menu **Download - Connect***

5. Under **Select Configuration**, select the storage location of the desired configuration (**default** or **config01** to **config08**).

6. Click the **Finish** button to download the desired configuration to management software.

*Fig. 184   Management software menu **Download - Select Configuration***

8.12   Export and Import Options

The matrix offers the ability to read out available configuration lists (e.g., extender modules, CPUs, consoles, users, etc.) for export and import via management software.

> Exported configuration lists are always saved in .csv format that allows offline editing with common spreadsheet applications.

8.12.1   Export Options

Configuration lists are exported in this menu.
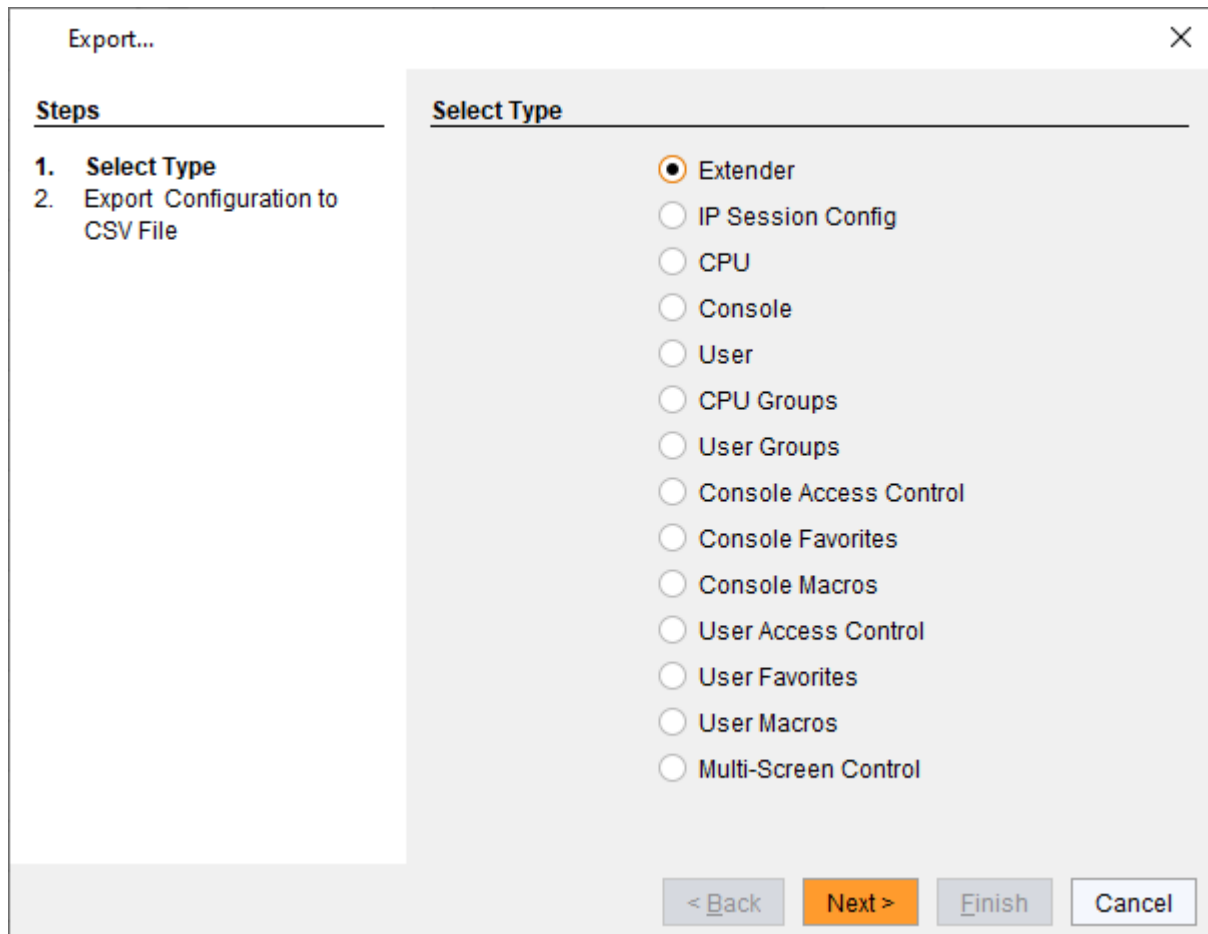
*Fig. 185   Management software menu **File - Export - Select Type***

To export, proceed as follows:

1.   Select **File > Export** in the menu bar.
2.   After opening the menu, select the configuration type to be exported.
3.   Click the **Next** button.
4.   Navigate to the location of the configuration file to be exported.
5.   Enter the name for the configuration file to be exported.
6.   Click the **Finish** button to confirm the export.
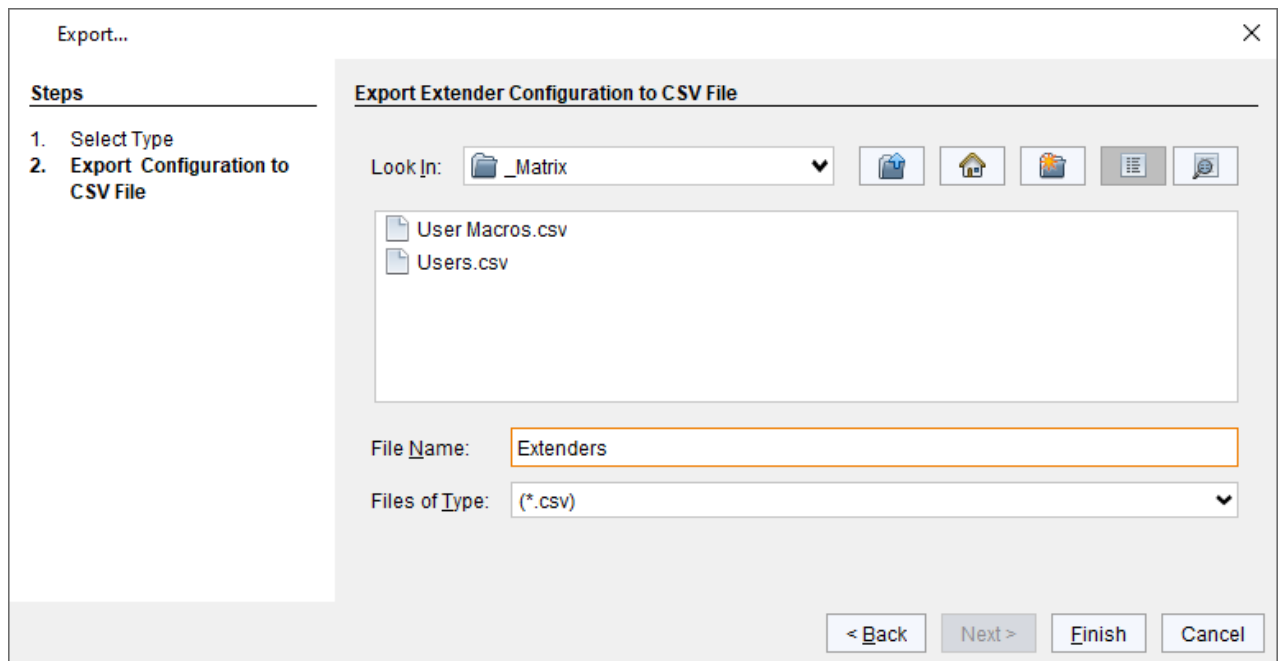
*Fig. 186   Management software menu **File - Export - Export Configuration to CSV File***

8.12.2 Import Options

Importing configuration lists is only possible in offline configurations.

Configuration lists are imported in this menu.
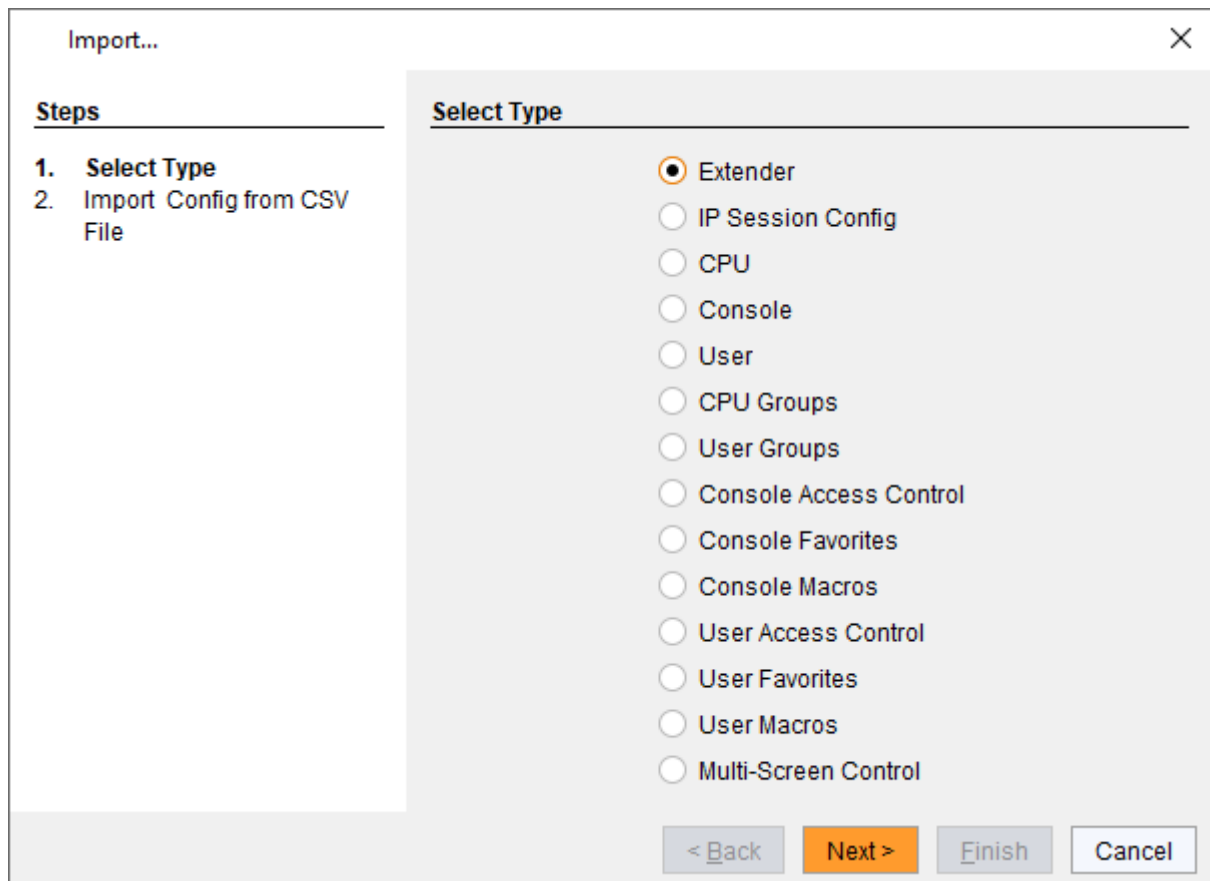
*Fig. 187   Management software menu **File - Import - Select Type***

To import configurations, proceed as follows:

1. Select **File > Import** in the menu bar of an offline configuration.

2. After opening the menu, select the configuration type to be imported.

3. Click the **Next** button.

4. Navigate to the location of the configuration file to be imported.

5. Select the configuration file to be imported.

6. Click the **Finish** button to confirm the import.
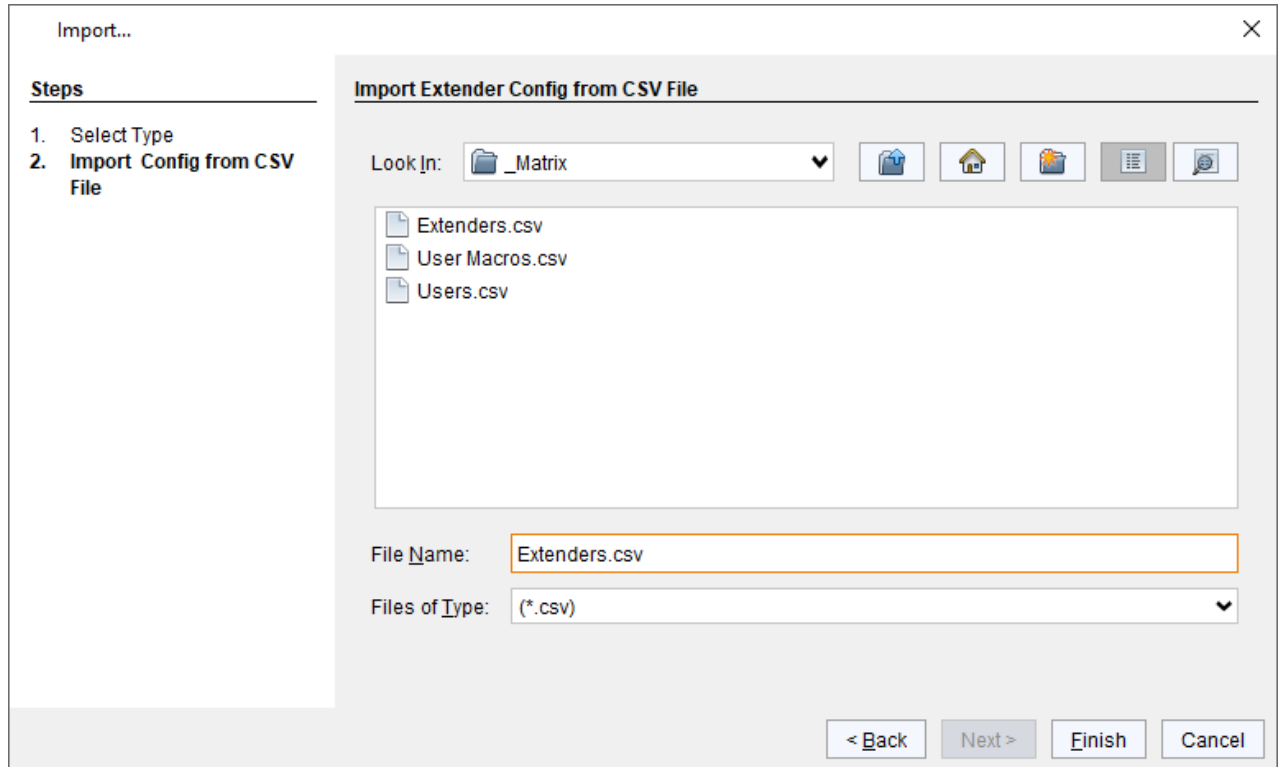
*Fig. 188   Management software menu **File - Import - Import Config to CSV File***

8.13   Updating the Matrix Firmware

NOTICE
To process successful firmware updates and avoid failures: ➡ Only use computers to update the matrix that are not integrated into the KVM system. ➡ Ensure that the computer used for the update is not set into standby mode or sleep mode during the update. ➡ Save your configuration locally before starting the update. ➡ Proceed an update via direct LAN connection for reasons of network stability.

NOTICE
Ensure that all USB 2.0 extender modules are only connected to the provided ports (fixed ports) before you start the matrix update. Non-compliance may affect the stability of the update.

The firmware update of MATLOS.tfw has to be performed step by step. After each firmware update, the matrix has to be restarted.

E.g., if you want to update your current firmware MATLOS version F01.05 to F01.08, proceed as follows:
➡ Then update with version F01.06 and restart the matrix.
➡ Then update with version F01.07 and restart the matrix.
➡ Then update with version F01.08 and restart the matrix.

If required, the update files can be requested from the TechSupport.

The firmware of the matrix can be updated in this menu.

Fig. 189   Management software menu Status & Updates - Update Matrix Firmware

The following information is displayed in the working area:

Option	Description
Name	• Name of the chassis or I/O board • Name of the chassis firmware or I/O board firmware
Type	Type of the chassis firmware or I/O board firmware
Current Version	Installed firmware version
Update Version	Firmware version available for the update
Status	Module availability
Update	Selected / deselected for firmware update The deselection is only available if the **Enable single I/O board update on compact switch** option is activated in the default settings.

The following options are available in the **Additional selection options** drop-down menu on the right upper side in the working area:

Option	Description
Expand Tree View	Expand the tree view to show detailed information. This allows to select or deselect individual firmware to be updated.
Collapse Tree View	Collapse the tree view to hide detailed information. An individual selection of firmware to be updated is not possible.
Select All	Select all available firmware to be updated
Deselect All	Deselect all selected firmware

Preparation

✅ If the syslog function has not been set yet, we recommend activating the syslog function (see chapter 8.4.7, page 151) before updating the firmware to log the update in case of update errors.

To be prepared for a firmware update, proceed as follows:

1. Save the matrix configuration locally (see chapter 8.11.2, page 239).

2. If the options settings for the management software have not yet been set:

   2.1. Open **Extras > Options** in the menu bar.

   2.2. Under **Firmware Directory** insert in the directory from which the update files should be standardly sourced.

3. Save the update files in the **Firmware Directory**.

Performing the Update

To update the matrix firmware, proceed as follows:

1. Select **Status & Updates > Update - Matrix Firmware** in the task area.

    All updateable components of the matrix will be automatically selected and highlighted in green.

2. Deselect updateable components of the matrix if not all components should be updated.

    A query dialog appears, asking which update variant should be executed.

3. Click the **Update** button in the lower part of the working area to start the update.

    A query to save the matrix status appears.

4. Click the **Save Matrix Status** button to save the matrix status locally or click the **Skip** button, if the status is already saved.
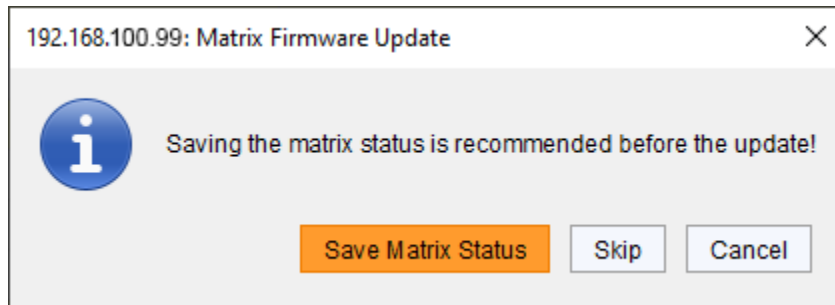
Fig. 190   Management software dialog ***Save matrix status***

5. The progress of the update is displayed in the working area.

    After the update, a query to restart the matrix appears.

6. Click the **Yes** button to restart the matrix.

    Restarting the matrix can take several minutes, and the matrix is not available during the restart.
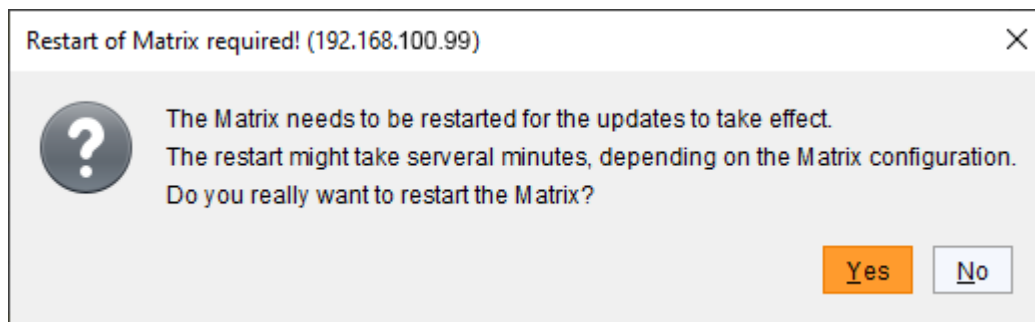
Fig. 191   Management software dialog ***Restart matrix***

The updated firmware is displayed in the working area.

8.14   Updating the Extender Firmware

The firmware of the extender modules connected to the matrix can be updated in this menu, except for the xxxMSD firmware type that has to be updated via Mini-USB service port if necessary.

The firmware type is part of the file name such as the MSD firmware the file extension `.pfw`, e.g., `EXTMSD.pfw`.

ℹ	An update of the xxxMSD firmware is usually not necessary. In rare cases, an update may only be necessary to expand the functionality of certain extender modules for specific requirements. In this case, please contact the manufacturer's technical support in advance.
ℹ	If required, the update files can be requested from the manufacturer's technical support.
✅	Please refer to the user manual of the respective extender module if a manually firmware update of extender modules has to be performed.

Preparation

✅	If the syslog function has not been set yet, we recommend activating the syslog function (see chapter 8.4.7, page 151) before updating the firmware to log the update in case of update errors.

To be prepared for a firmware update, proceed as follows:

1. Save the matrix configuration locally (see chapter 8.11.2, page 239).
2. If the options settings for the management software have not yet been set:
    2.1. Open **Extras > Options** in the menu bar.
    2.2. Under **Firmware Directory** insert in the directory from which the update files should be standardly sourced.
3. Save the update files in the **Firmware Directory**.

NOTICE
Possible failures when updating the extender firmware
In case the xxxMSD firmware part of one or more extender modules require an update, there may be dependencies between the new contents of xxxMSD firmware files and other extender firmware files. In this case, installing other firmware files before updating xxxMSD firmware files could lead to failed updates.
To process successful firmware updates:
➡ Please check the release notes of the firmware package for dependencies between the extender firmware files.
➡ If you got information from the manufacturer's technical support that an update of xxxMSD firmware files of certain extender modules is required, please update these firmware files via Mini-USB service port of the respective extender module (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**, page **Fehler! Textmarke nicht definiert.**).

There are two possibilities to update the extender modules via matrix:

- **Parallel Mode:**
  By default, used for parallel updates of several extender modules.
  The extender modules of all selected I/O boards are updated in parallel.
  Advantage: The Parallel Mode offers the fastest method for updating the extender modules.

- **Sequential Mode:**
  Option to update extender modules sequentially, extender module by extender module, after the update of the previous extender module is completed.
  Advantage: The Sequential Mode offers the possibility to select/deselect individual firmware to be updated.

✅ We recommend updating the firmware of the extender modules via the Parallel Mode.

Performing the Update in Parallel Mode (Standard Update)
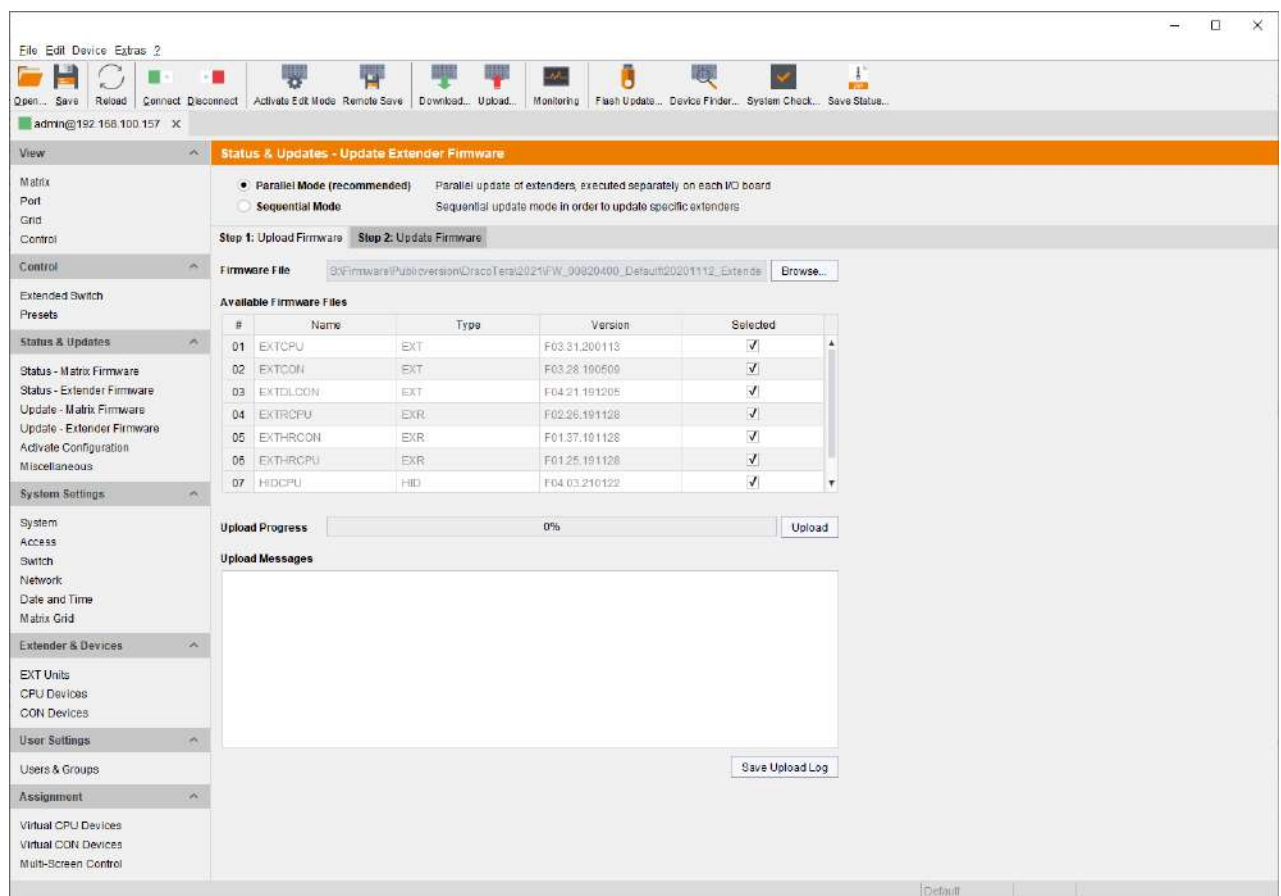
*Fig. 192   Management software menu **Status & Updates - Update Extender Firmware - Parallel Mode -
Upload***

Uploading the Extender Firmware to the Memory on the I/O Board

To upload the extender firmware to be currently stored in the memory on the I/O board to be passed to the extenders if necessary, proceed as follows:

1. Select **Status & Updates > Update - Extender Firmware** in the task area.

   The **Parallel Mode** for the standard update will be selected by default and the **Upload Firmware** tab will be opened.

2. Before the actual update process, all firmware files have to be uploaded to the respective I/O boards to which the extender modules to be updated are connected. If a newer firmware is available, appropriate I/O boards will be automatically selected for the upload in the **Selected** column and highlighted in green.

3. Click the **Upload** button to start the upload and distribution of the update files.

> By performing the upload process, no update files will be installed. The update process can be performed later. If there are not all extender firmware files selected, the upload of the extender firmware files will be performed in sequence.

A query to update the extender firmware appears finishing the upload process successful.

4. Click the **Yes** button if you want to directly start the actual update process.

The **Update Firmware** tab will open immediately.
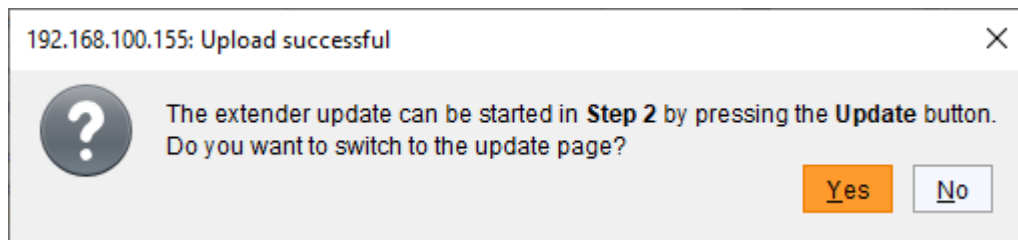
*Fig. 193   Management software dialog **Status & Updates - Update Extender Firmware - Parallel Mode - Update***

Updating the Extender Firmware by passing the Extender Firmware from the Memory of the I/O Board

> ℹ️ When updating an identical or an older firmware version than the version currently installed, the **Enable Downgrade** option in the upper part of the working area must be enabled.

To update the extender firmware via standard update, proceed as follows:

1. Click the **Update** button to start the update.

> ℹ️ Just before the update process, all I/O boards will be set into the **Service Mode** and retrieved gradually after finishing the respective updates. During Service Mode, 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 connected to those CON Units that are connected to the matrix.

2. The progress of the update is displayed in the working area.
3. Check the update messages in the message field after the update if the updates for all extender modules have been installed correctly.
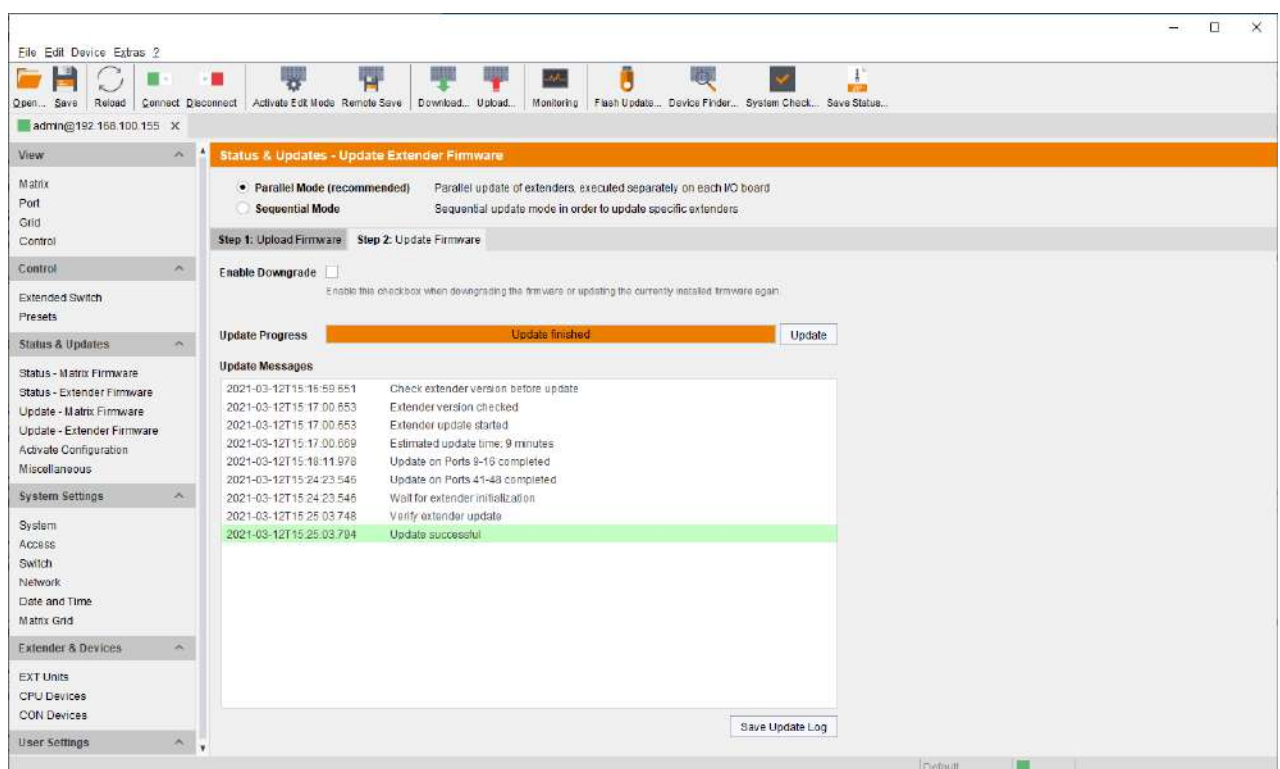
*Fig. 194   Management software menu **Status & Updates - Update Extender Firmware - Parallel Mode - Update***

Performing the Update in Sequential Mode (Expert Update)

In the Sequential Mode, individual firmware to be updated can be selected / deselected in this menu.
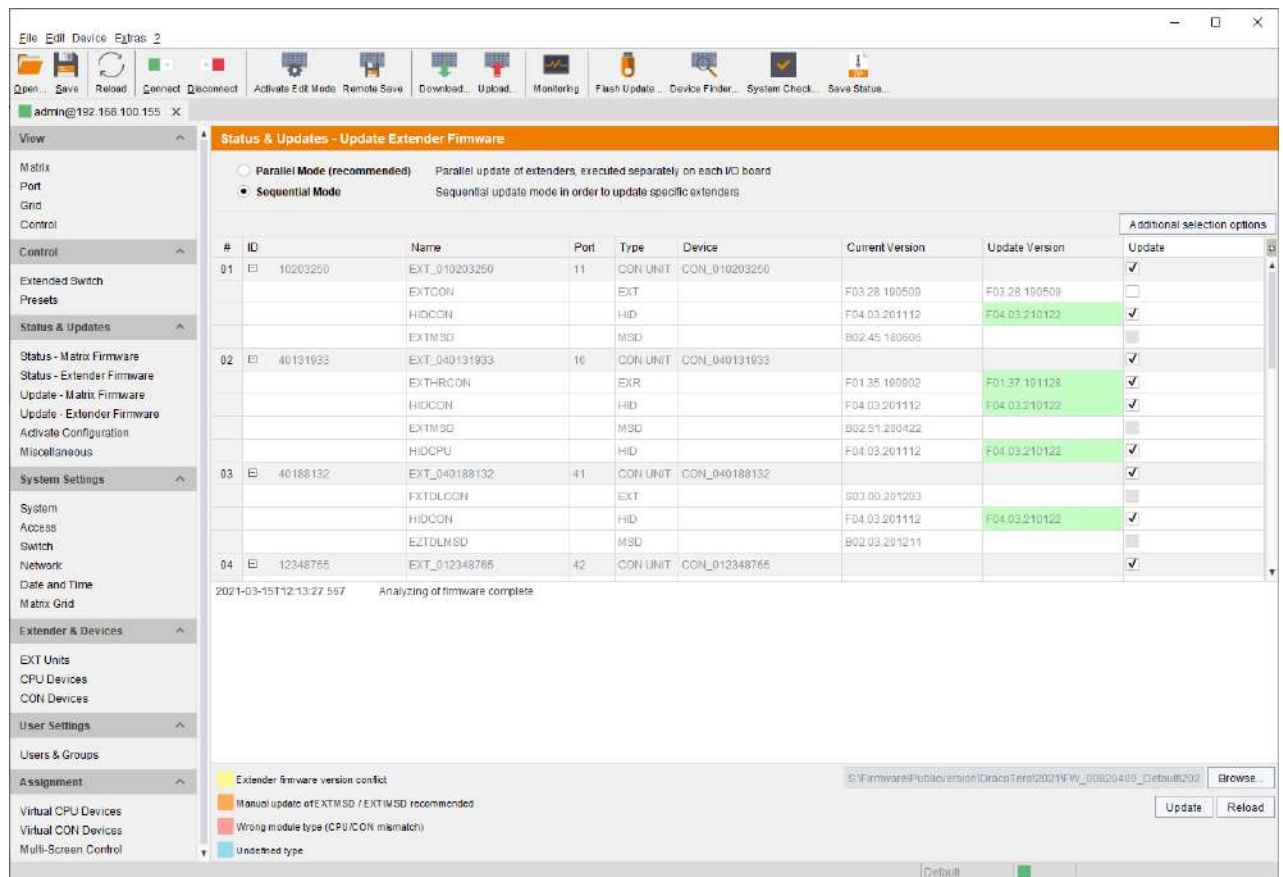
*Fig. 195   Management software menu **Status & Updates - Update Extender Firmware - Sequential Mode***

The following information is displayed in the working area:

Option	Description
ID	Numerical value of the extender module ID
Name	Name of the EXT Unit and the extender module firmware
Port	Port number of the matrix, the extender module is physically connected
Type	Type of the CON / CPU Unit and firmware type
Device	Name of the CON Device / CPU Device the EXT Unit is assigned to
Current Version	Installed firmware version
Update Version	Firmware version available for the update
Update	Selected / deselected for firmware update

Firmware types to be updated or firmware conflicts are highlighted in color:

- Extender firmware version conflict
- Manual update of EXTMSD / EXTIMSD recommended*
- Wrong module (CPU/CON mismatch)
- Undefined type

*Updating of EXT*MSD is only required, if explicitly stated within the release notes or advised by the manufacturer's technical support. EXT*MSD requires manual update via the Mini-USB service port at the extender modules.

Option	Description
Expand Tree View	Expand the tree view to show detailed information. This allows to select or deselect individual firmware to be updated.
Collapse Tree View	Collapse the tree view to hide detailed information. An individual selection of firmware to be updated is not possible.
Select All	Select all available firmware to be updated
Deselect All	Select all selected firmware

To update the extender module firmware via sequential update, proceed as follows:

1. Select **Status & Updates > Update - Extender Firmware** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Select the **Sequential Mode** option in the upper part of the working area.

   All updateable firmware will be automatically selected and highlighted in green.

4. Click the **Update** button in the lower part of the working area to start the update.

> In Sequential Mode the extender module that is being updated is set into the Service Mode, all others continue to run and can be used. The I/O boards are not affected and continue to run. An OSD picture indicates the activation of the Service Mode and is displayed on the monitor connected to the CON Unit that is currently updated.

   After update completion of the respective extender module, the Service Mode of the extender module will be quit.

5. After the update, check the messages in the message box to ensure that the updates for all extender modules were installed correctly.

*Fig. 196   Management software menu **Status & Updates - Update Extender Firmware - Sequential Mode***

6. Click the **Deactivate Edit Mode** menu item in the toolbar.

8.15   License Management

In this menu the matrix can be upgraded with new function bundles by installation of license keys.

ℹ️   To obtain license keys to upgrade matrix functions, contact your distributor
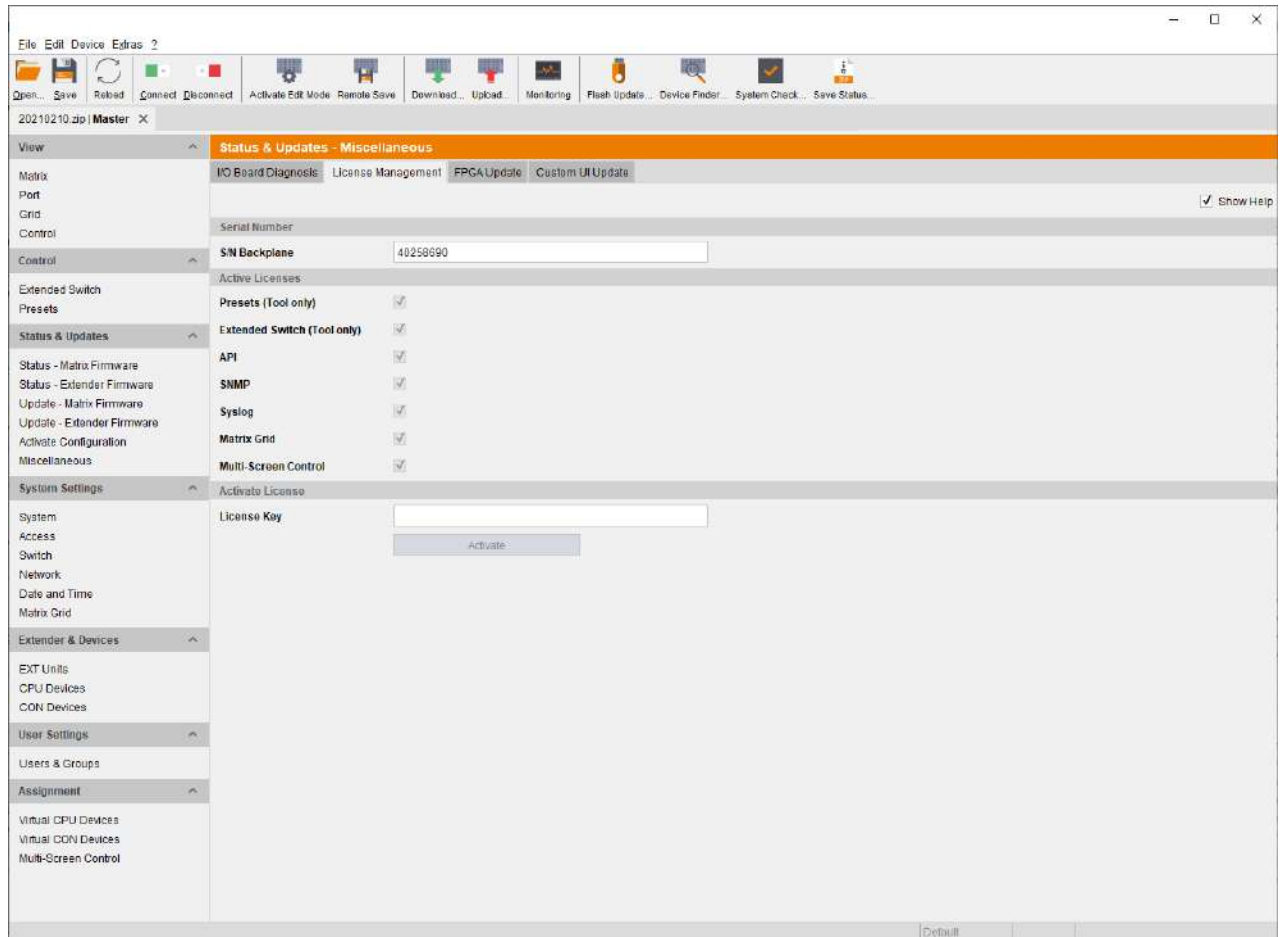
*Fig. 197   Management software menu **Status & Updates - Miscellaneous - License Management***

To activate a function bundle, proceed as follows:

1.   Select **Status & Updates > Miscellaneous** in the task area.

2.   Select the **Miscellaneous** tab.

3.   Enter your license key in the working area under **Activate License** in the **License Key** field.

4.   To activate the license key, click the **Activate** button.

     The new functions will be immediately enabled, a restart of the matrix will not be necessary.

9   Operation

The matrix can be operated in three different ways:

1. Direct Switching

- via a keyboard connected to a CON Unit port and the CON Device favorites
- by a macro keyboard connected to a CON Unit port

2. OSD

- via keyboard/mouse connected to a CON Unit and the OSD

3. External Switching Commands

- via an external computer via management software (network connection required)
- via a media controller (network connection required)

9.1   Switching Operation via Keyboard

9.1.1   Direct Switching

The direct switching by favorites on a keyboard is the fastest possibility for a user to switch at his sink (console) between different sources (computer, CPUs). This offers the option to switch video, keyboard, and mouse, or Video Only.

Direct Switching of Video, Keyboard and Mouse

1. Start the command mode with the Hot Key.

   The **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing.

2. Enter the index number of the new source (computer, CPU) from the list of favorites.

3. Press the `<Enter>` key to confirm.

   At the same time the command mode is closed, and the sink (console) is connected to the new source (computer, CPU) with complete KVM control.

   Example: switching to favorite source (computer, CPU) number 7 with video, keyboard, and mouse

   `<current Hot Key>, <7>, <Enter>`

✅ Fastest switching time can be achieved by using identical mice, keyboards, and monitors. This contributes to a smooth and seamless direct switching of the matrix.

Switching in Private Mode

1. Start the command mode by entering the Hot Key.

   The **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing.

2. Enter the index number of the new source (computer, CPU) from the list of favorites.

3. Press the `<left Shift> + <Enter>` keys at the same time to confirm.

   At the same time the command mode is closed, and the sink (console) is connected to the new source (computer, CPU) with complete control in **Private Mode**.

   Example: switching to favorite source (computer, CPU) number 3 in **Private Mode**

   `<current Hot Key>, <3>, <left Shift> + <Enter>`

ℹ To switch in Private Mode do NOT use the numeric keypad.

Direct Switching of Video

1. Start the command mode by entering the Hot Key.

   The **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing.

2. Enter the index number of the new source (computer, CPU) from the list of favorites.

3. Press the `<Space>` key to confirm.

   At the same time command mode is closed, and the sink (console) is connected to the new source (computer, CPU) with Video Only.

   Example: switching to favorite source (computer, CPU) number 1 with Video Only

   `<current Hot Key>, <1>, <Space>`

Switching to previous Sources (Computer, CPUs)

> If you switch to a source (computer, CPU) that was previously connected with Video Access only, you will be connected to this source (computer, CPU) with full KVM access.

> You can only switch to valid, unused sources (computer, CPUs) using Hot Keys. The options **Force Connect** and **Force Disconnect** as well as the restrictions of the User ACL and CON ACL are taken into account.
>
> Hot Keys are only supported if neither **Enable User Login** nor the **Enable User ACL** is selected, and the user is logged in the OSD.

1. Start the command mode by entering the Hot Key.

   The **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing.

2. Press the `<p>` key of your keyboard.

   At the same time command mode is closed, and the sink (console) is connected to the previous source (computer, CPU) with full KVM access.

Disconnecting the current Connection

1. Start the command mode by entering the Hot Key.

   The **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing.

2. Press the `<Backspace>` key of your keyboard.

   The command mode is closed, and the sink (console) is disconnected from the previous connected source (computer, CPU).

9.1.2   Scan Mode

The scan mode enables fast switching between video signals from different sources (computer, CPUs) registered as favorites without continuously using the Hot Key. Switching between two video signals can even take place within one frame.

1. Start the command mode by entering the Hot Key.

   The **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing.

2. Press the `<Left Shift>` key and hold it down. You can now enter the index numbers of the various sources (computer, CPUs) from the list of favorites with the keyboard and immediately switch to the video signal of the respective source (computer, CPU) after entering the index number.

3. Press the `<Left Shift> + <Esc>` keys to leave the scan mode.

> Optimal results can be achieved by using identical resolutions as far as possible. This contributes to a smooth and seamless function of the scan mode.

9.1.3   Function Keys <F1> to <F16>

In the command mode you can retrieve the macros 1 to 32 with the `<F1>` to `<F16>` function keys on the connected standard keyboard instead of the special macro keyboard.

Executing macros 17 to 32 is realized by the simultaneous use of the `<left Shift>` key.

The stored command sequence for the appropriate function key is executed and the command mode is left immediately.

It is not necessary to press `<Enter>` to confirm the selection of macros.

9.1.4   Switching a CON Unit to a local Source

KVM CON Unit extender modules 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 keyboard commands or OSD (see chapter 9.2.4, page 266).

If you switch to the local source, the KVM connection will be automatically disconnected.

> When using CON Units with the possibility to connect a local source (computer, CPU) in a Multi-Screen Control environment, the local switching will be disabled.

The following keyboard commands are available to switch to the local source:

Keyboard command	Function
`<Hot Key>, <k>, <1>, <Enter>`	Switch to the extender connection 1
`<Hot Key>, <k>, <2>, <Enter>`	Switch to extender connection 2 (only with redundant CON Units)
`<Hot Key>, <l>, <Enter>`	Switch to the local source (computer, CPU)

9.1.5   Multi-Screen Control Switching via Keyboard

The Multi-Screen Control function contains a switching of the USB-HID signal between different statically connected sources (computer, CPUs) within a CON Device and can be performed via keyboard (configuration see chapter 8.9.7, page 223) or mouse (see chapter 9.4, page 274).

To perform a switching operation via keyboard command, proceed as follows:

1. Enter the `<current Hot Key>` to start the command mode.

   The **Caps Lock** and **Scroll Lock** LEDs on the keyboard are flashing.

2. Enter the number of the specific source or display.

3. Press the `<Enter>` key to confirm.

   At the same time the command mode is closed, the switching operation will be performed, and keyboard and mouse are connected to the specified source or display.

> ℹ️ When using the numeric keypad for switching, a confirmation of the switching operation by pressing the `<Enter>` key is not necessary.

The following keyboard commands are available for switching operations (e.g., using the numeric keypad):

Keyboard command	Function
`<current Hot Key>, <Num 0>`	Switch the USB-HID signal to the own display (CON Unit with keyboard and mouse)
`<current Hot Key>, <Num 1>`	Switch the USB-HID signals to display 1
`<current Hot Key>, <Num 2>`	Switch the USB-HID signals to display 2
`<current Hot Key>, <Num 3>`	Switch the USB-HID signals to display 3
`<current Hot Key>, <Num 4>`	Switch the USB-HID signals to display 4

9.2   Switching via OSD

9.2.1   KVM Switching
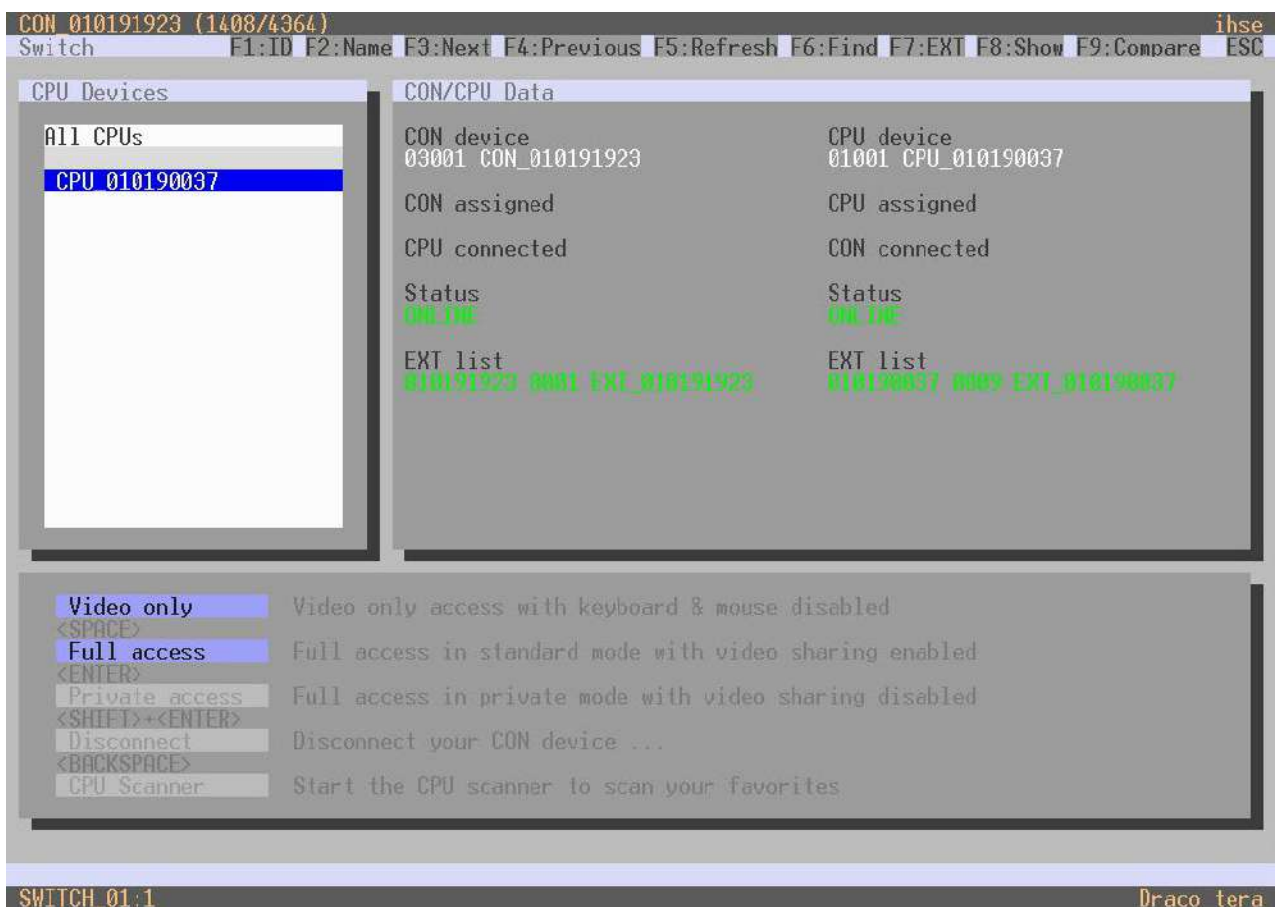
Fig. 198   OSD Menu Switch

To switch the CON Device to any available CPU Device, proceed as follows:

1. Select **Switch** in the main menu.

2. Select in the **CPU Devices** list on the left-hand side that CPU Device that should be connected to the CON Device.

3. Press the appropriate keyboard command to confirm desired connection type.

Switching operations from the own CON Device can only be performed to CPU Devices that are available in the **CPU Devices** list.

Listed CPU Devices highlighted in red color are currently connected in Private Mode and are blocked by the connected CON Device.

Press the `<F8>` key to expand the current view to show inactive CPU Devices.

Switching via Selection List for CPU Devices

The matrix offers the ability to execute KVM switching operations by means of a selection list for CPU Devices next to the OSD in full screen.

To use the selection list for CPU Devices, proceed as follows:

1. Activate the **Enable CPU Selection List** option in the **Configuration > EXT Units** menu for those consoles where the selection list for CPU Devices should be available.

2. Start the command mode by entering the Hot Key and press `<o>` to open OSD.

   The selection list immediately appears in the preset position of the extender OSD.

✅ Press the `<F8>` key to hide inactive CPU Devices to provide a clearer overview.

---

3. Press the respective key (see chapter 9.2.1, page 262) to execute the desired switching operation.
   To prevent a switching operation and access OSD, press `<F7>` key.
   To close the selection list, press `<Esc>` key.
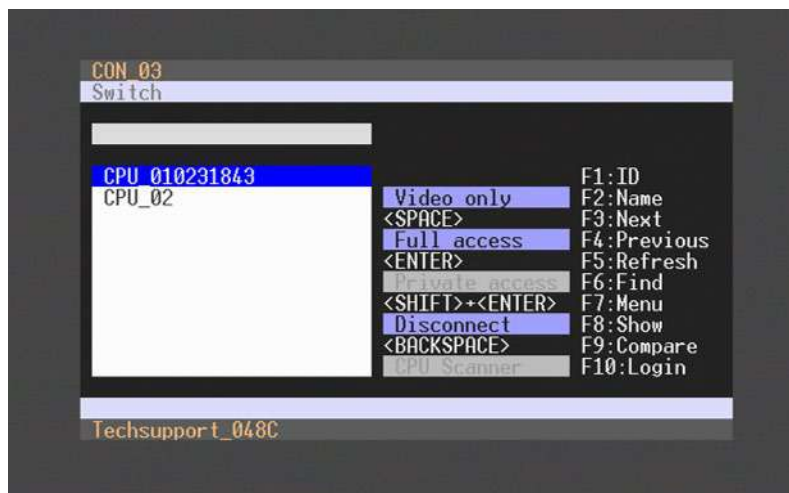
*Fig. 199   Example view **Selection list CPU Devices***

Activating the Automatic Scan Mode for CPU Devices

The matrix offers the ability to use a scan mode based on the favorite list of each CON Device or user. 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, refer to chapter 7.8.3, page 109.

To activate the scan mode, proceed as follows:

1. Define a favorite list for the respective CON Device (see chapter 7.8.4, page 112) or users (see chapter 7.4.2, page 90).

2. Start the command mode by entering the Hot Key and press `<o>` to open OSD.

3. Select one of the CPU Devices in the CPU selection list that are defined in your favorite list.

4. Confirm your selection by pressing the **CPU Scanner** button. The scan will automatically start.

ℹ️ If you have enabled the **Force CPU Scan** option (see chapter 7.8.3, page 109), the scan will automatically start after switching the respective CON Device to any CPU Device from the favorite list without the need to press the **CPU Scanner** button.

9.2.2   Extended Switching
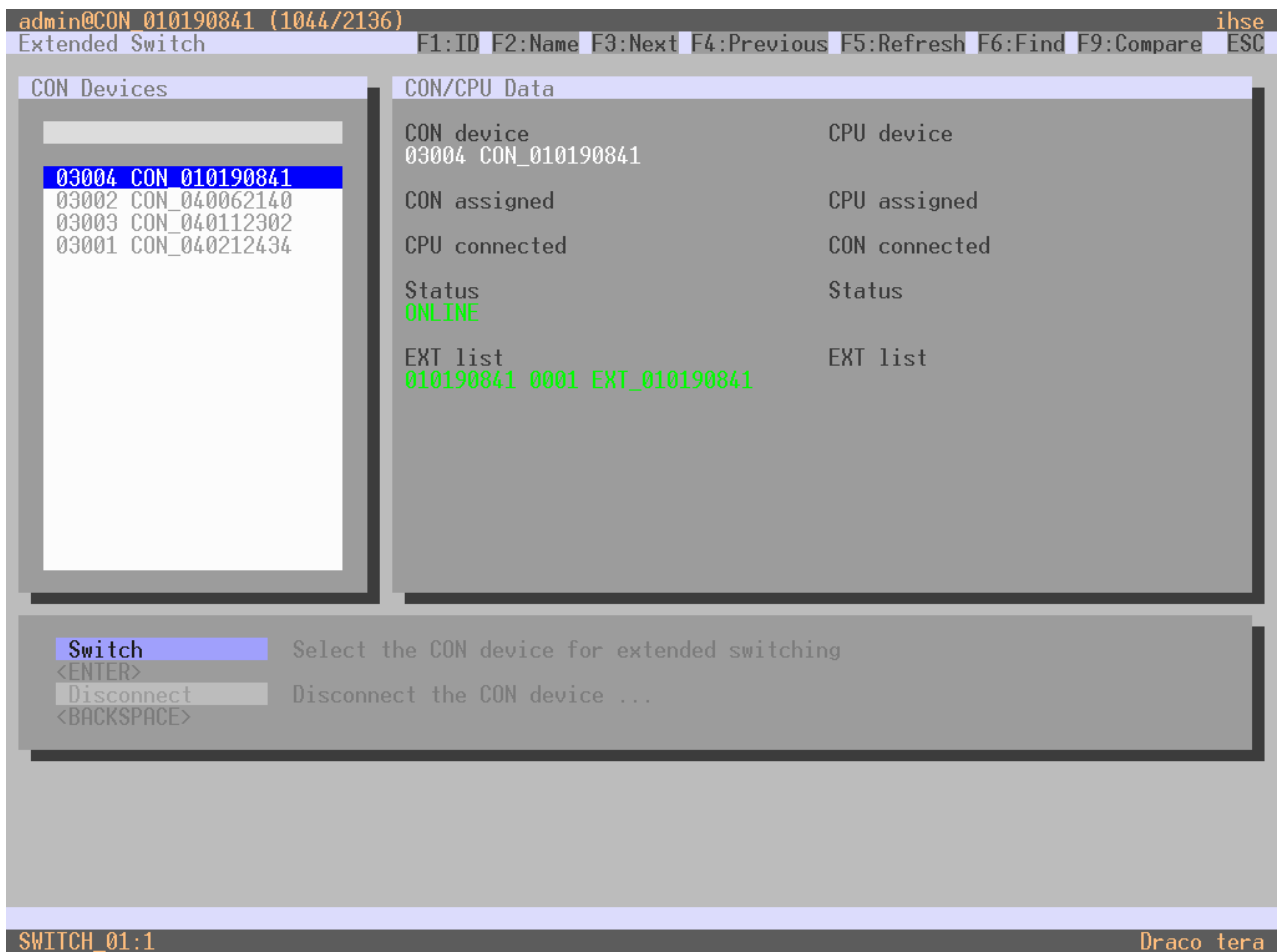
*Fig. 200   OSD Menu **Extended Switch***

The following information is shown in this menu:

Field	Description
CON device	Real CON Device with assigned CON EXT 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 EXT Units
CPU device	Assigned physical CPU EXT 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 EXT Units

The following keyboard commands are available for switching operations:

Keyboard command	Function
<Space>	Set a Video Only connection.
<Enter>	Set a KVM connection.
<Shift> + <Enter>	Set a KVM connection in Private Mode (video sharing disabled).
<Backspace>	Disconnect the own CON Device from CPU Device.

To switch any CON Device to any available CPU Device, proceed as follows:

1. Select **Switch** in the main menu.
2. Select in the **CON Devices** list on the left-hand side that one that should be switched to a CPU Device.
3. Press the <Enter> key.

   The connection types and their corresponding keyboard commands are listed in the lower working area.

4. Press the appropriate keyboard command to confirm the desired connection type.

Switching operations from the user's CON Device can only be performed on CPU Devices that are available in the **CPU Devices** list.

Press the <F8> key to expand the current view to show inactive CPU devices.

9.2.3 USB 2.0 Switching

Switching of USB 2.0 extender modules basically works like switching of KVM extender modules. The following scenarios to switch USB 2.0 extender modules are possible.

1. An EXT Unit with USB 2.0 will be created and assigned to an already existing device with existing KVM EXT Units (see chapter 7.7.1, page 98 or chapter 7.8.3, page 109).

2. A separate device for the EXT Unit with USB 2.0 will be created without assigning a KVM EXT Unit to that device. This possibility offers a separate switching of the USB 2.0 signal (see chapter 7.7.1, page 98 or chapter 7.8.3, page 109).

Switching of USB 2.0 signals uses Extended Switching functionality (see chapter 9.2.2, page 264).

When using parallel operation within the matrix, set the **Release Time** in the **System Settings > Switch** menu to 10 s or more (see chapter 7.3.4, page 74). Otherwise, the connection of the USB 2.0 extender module will not be established due to security and stability reasons.

9.2.4 Switching a CON Unit to a local Source

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 OSD or keyboard command (see chapter 9.1.4, page 260).

If you switch to the local source, the KVM connection will be automatically disconnected.

When using CON Units with the possibility to connect a local source (computer, CPU) in a Multi-Screen Control environment, the local switching will be disabled.
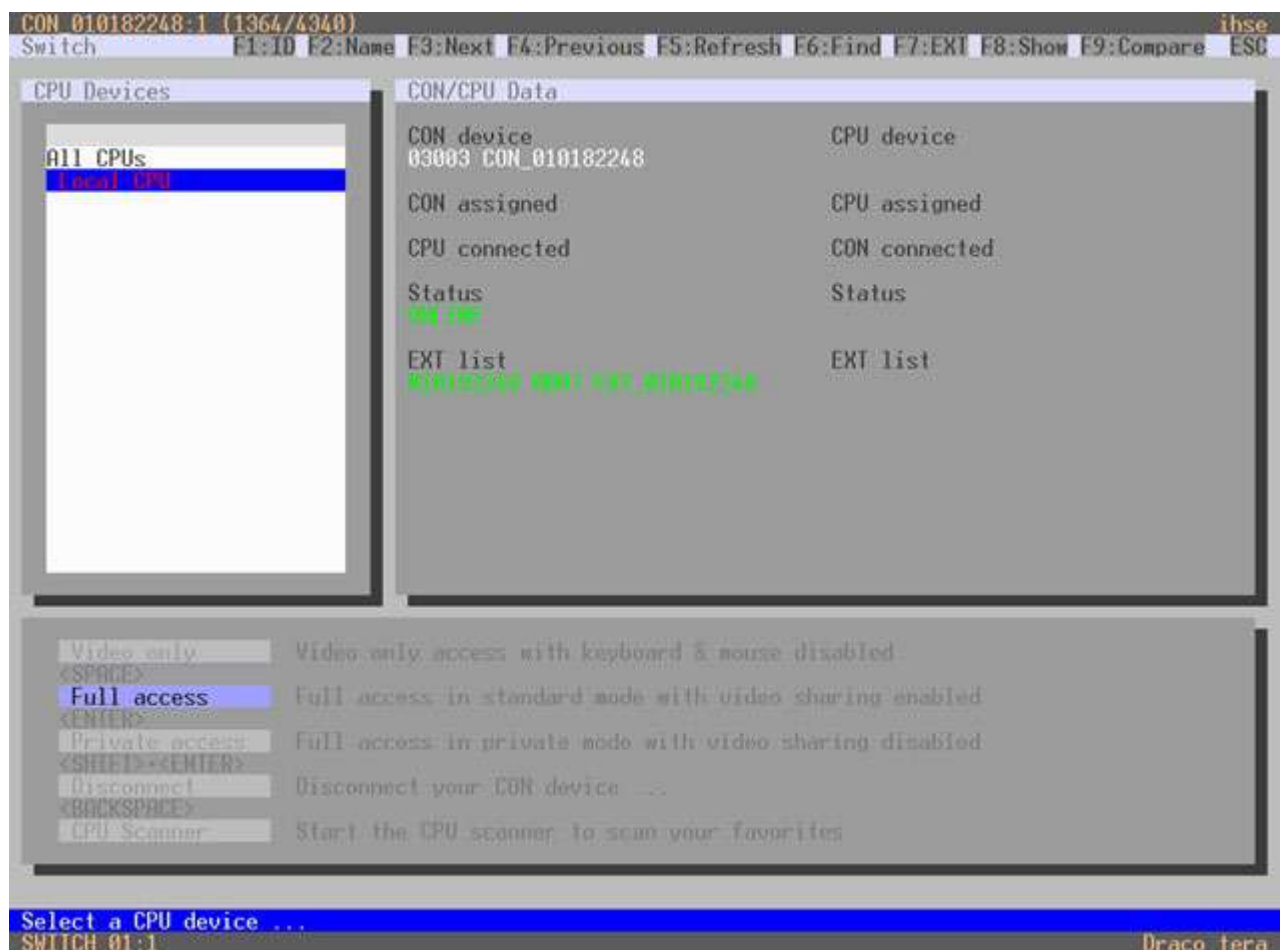
*Fig. 201   OSD Menu **Switch - Local Source***

To switch to a local source, proceed as follows:

1. Select **Switch** in the main menu.
2. If you are not in the **Switch** menu of the OSD, enter the `<Hot Key>` to start the command mode.
3. Press the `<o>` key to open OSD.

   You will see a list of all available CPUs as a start menu.
4. Switch to the local source in the **Local CPU** list.

   The switching operation to the local source will be performed immediately.

> The local source (computer, CPU) will be only shown in the OSD if the connected CON Unit includes the option for a local connection.

9.2.5   Switching via Macro List

Next to executing macros via function keys `<F1>` to `<F16>`, they can also be executed via Macro List in the OSD. At the same time this specific list offers the possibility to see the content of the various macros including the single commands before executing them. There are displayed 16 of the total 32 macros per page.
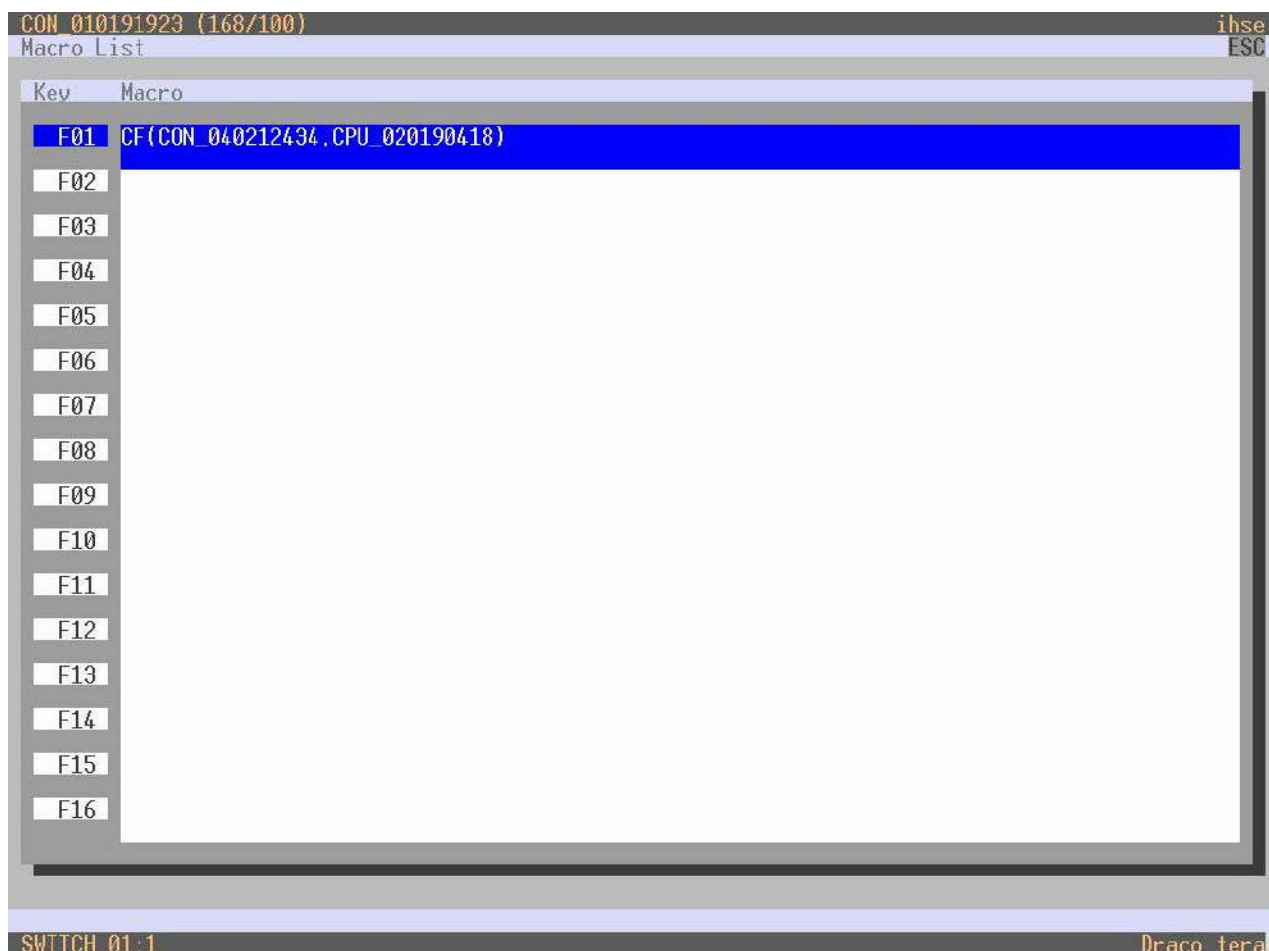
*Fig. 202   OSD Menu **Macro List***

1. Select **Macro List** in the main menu.
2. Make sure that you have already configured CON or user macros.
3. Select the respective macro in the list that you want to execute.
4. If you want to execute a macro 17-32 (`<Shift>` + `<F1>` to `<F16>`), press the `<Page Down>` key and select the macro afterwards.

5. Press the <Enter> key to execute the macro.

   The macro will be immediately executed.

✅ If the Macro List should be directly displayed upon opening OSD, activate the option **Show Macro List** in the menu **Configuration > CON Devices** for the respective CON Devices.

9.2.6   Switching of single EXT Units within Devices

You can independently switch CON Devices and CPU Devices with single EXT Units within configurations consisting of CON Devices and CPU Devices with multiple EXT Units.
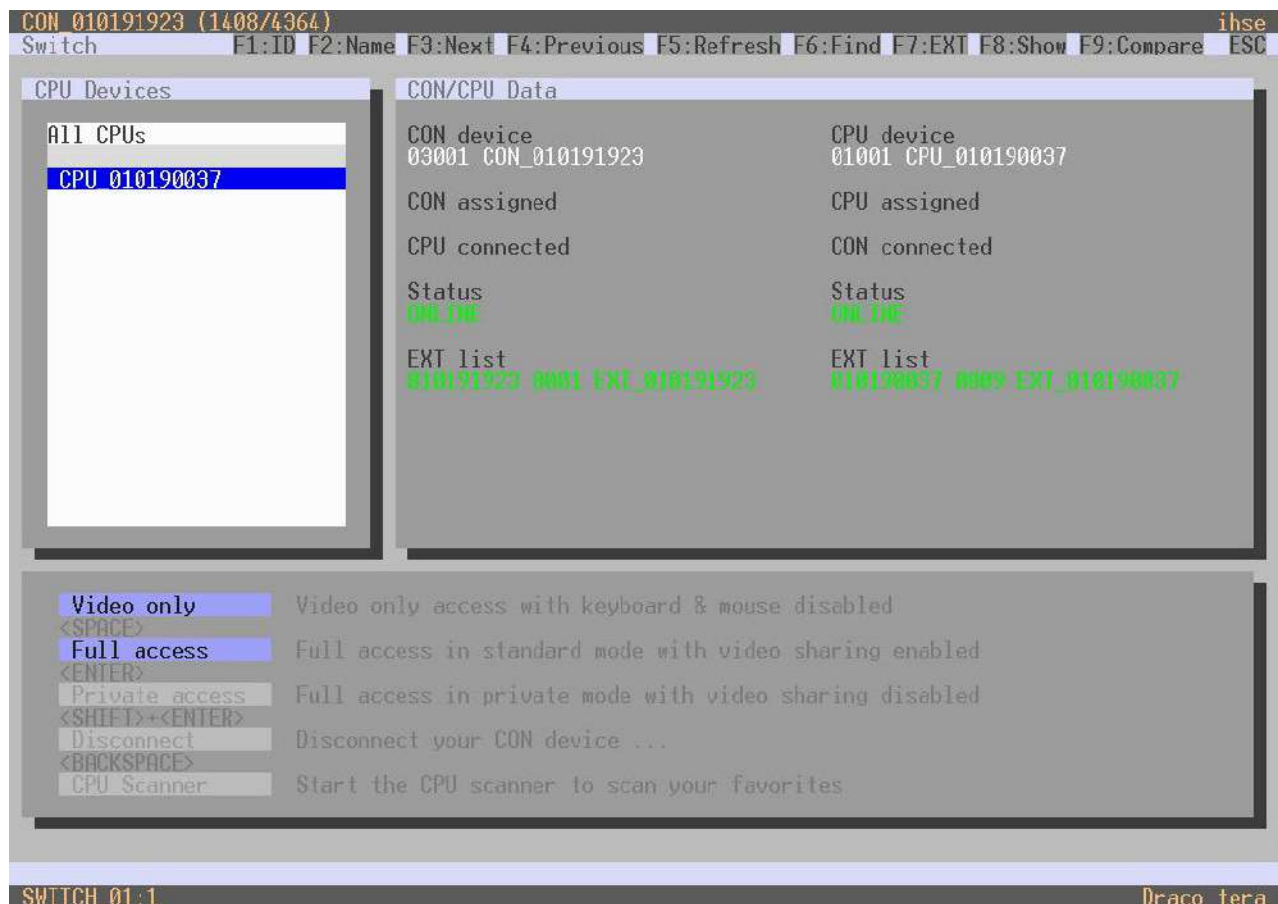
*Fig. 203   OSD Menu **Switch***

To switch a CON Device with a single EXT Unit to a CPU Device with multiple EXT Units, proceed as follows:

1. Select **Switch** in the main menu.

2. Select the respective CPU Device in the CPU Devices list containing the EXT Unit you want to have access to.

3. Press the <F7> function key on the keyboard. The standard will change into the switching mode for CON Devices with a single EXT Unit.

4. Select the EXT Unit you want to switch within your CON Device.

5. Press the <Tab> key to access the EXT Unit list of the selected CPU Device.

6. Select the CPU EXT Unit you want to switch to.

7. Press the <Space> key to execute the switching operation.

ℹ️ Switching of single EXT Units from a Device is only possible in **Video Only** mode. Single EXT Units of a Device that are already switched will be highlighted with "**!**".

9.2.7   Addressing of Master and Sub Matrices

The matrix can be cascaded over two levels. You can either send the commands (including opening the OSD) to the master or the sub matrix.

When in the command mode, you can select whether commands should be handled in the master or the sub matrix.

OSD Access

- OSD access to the master matrix:

  `<Hot Key>, <o>`

- OSD access to the sub matrix:

  `<Hot Key>, <s>, <o>`

To do a cross-matrix switching, proceed as follows:

1. Open the OSD of the master matrix with the following keyboard sequence:
   `<Hot Key>, <o>`

2. Select the CPU Device configured as Tie Line in the CPU selection list and press the `<Enter>` key to switch onto.

3. Open the OSD of the sub matrix with the following keyboard command:
   `<Hot Key>, <s>, <o>`

4. Select your target CPU Device in the CPU selection list of the sub matrix.

The selected master matrix / sub matrix mode is permanently activated until the other mode will be manually activated. This means that if you press the `<s>` key, all prospective commands will be sent to the sub matrix, but not if the command mode is left in the meantime.

9.3   Switching Operation via Management Software

9.3.1   Extended Switching

ℹ️   Switching operations can only be performed in online mode. That means an active network connection is required between the matrix and the management software.

You have two options to perform switching operations for the matrix via management software:

Possibility 1

All connected CON Devices and the associated CPU Device connections are shown in columns in the working area in this menu.

1.   Select **Control > Extended Switch** in the task area.

2.   Click the **Activate Edit Mode** menu item in the toolbar.
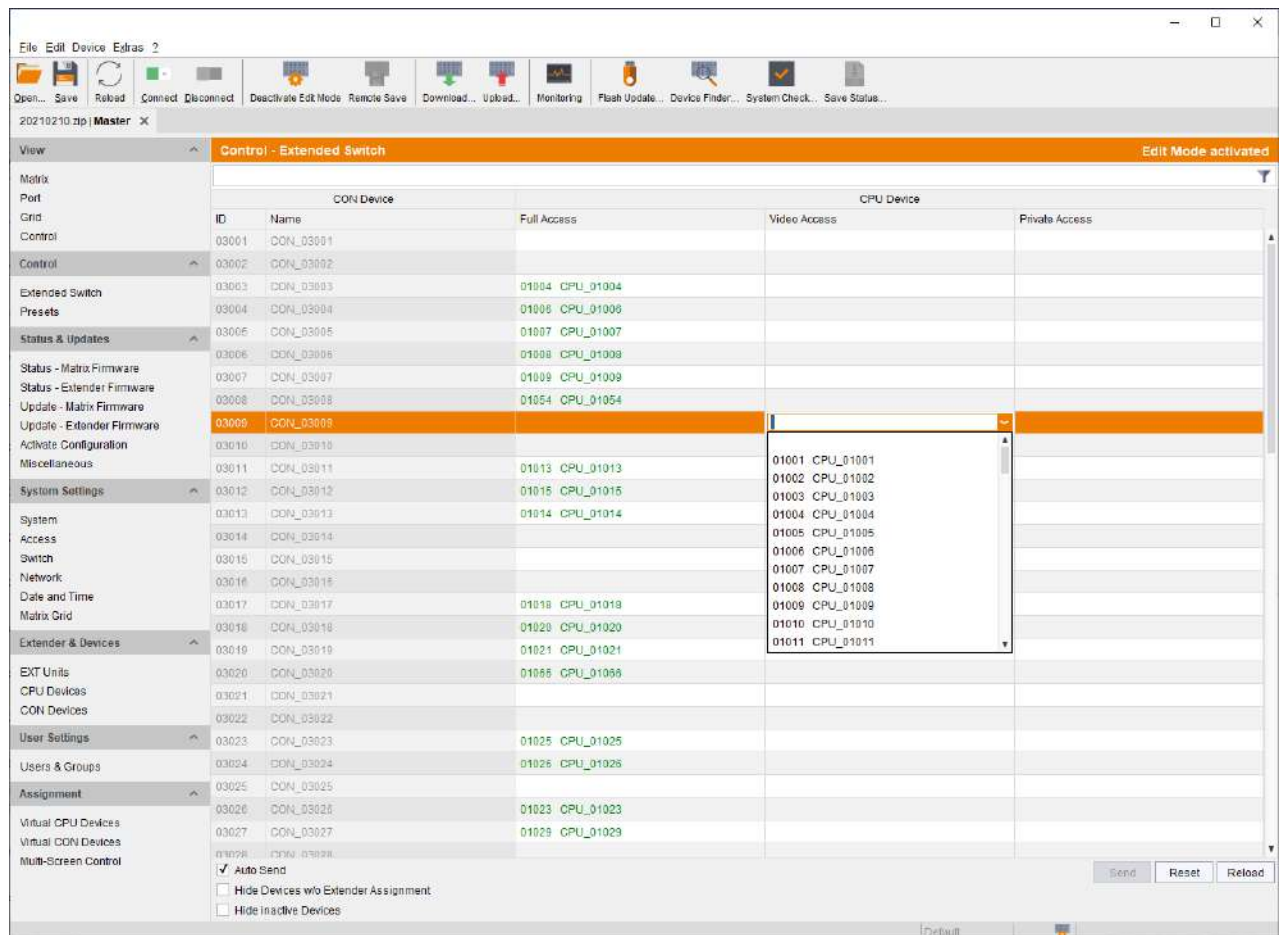
*Fig. 204   Management software menu **Control - Extended Switch***

The following functions are available to perform a switching operation:

Button	Function
Send	Send effected switching operations to the matrix
Reset	Disconnect all existing connections within the matrix
Reload	Reload switching status

To perform a switching operation, proceed as follows:

➥   To set a **KVM connection** between a CON Device and a CPU Device, double-click on the corresponding selection box within the **Full Access** column and select the requested CPU Device.

➡ To set a **video connection** between a CON Device and a CPU Device, double-click on the corresponding selection box within the **Video Access** column and select the requested CPU Device.

➡ To set a **Private Mode** connection between a CON Device and a CPU Device, double-click on the corresponding selection box within the **Private Access** column and select the requested CPU Device.

> ℹ️ If a CPU Device does not have access rights, it will not appear in the list.

> ℹ️ When the **Auto Send** function in the left lower corner of the work area is ticked, switching operations will be completed immediately without user confirmation by means of the **Send** button.
>
> When the **Hide Devices w/o Extender Assignment** function in the left lower corner of the work area is ticked, only CON Devices and CPU Devices that are assigned to EXT Units are shown.

Possibility 2
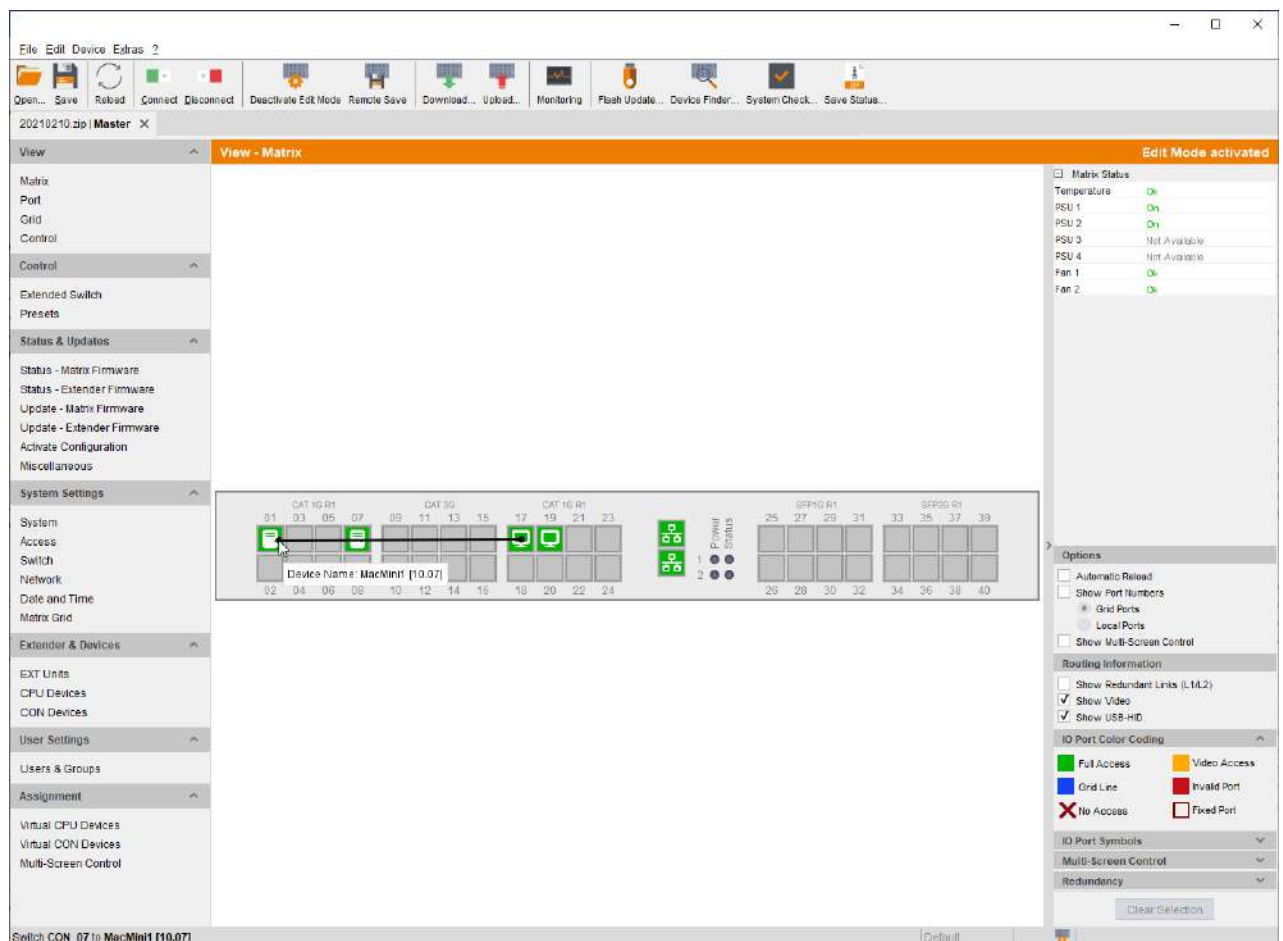
*Fig. 205   Management software menu **View - Matrix***

The following symbols may be shown in the connection overview:

Symbol	Description
	CON Device is connected via **Shared Access** with at least one further CON Device to the same CPU Device. The CON Device has Full Access at the moment.
	CON Device is connected via **Shared Access** with at least one further CON Device to the same CPU Device. The CON Device has a Video Access connection at the moment.

To perform switching operations between CON and CPU Devices proceed as follows:

1. Select **View > Matrix** in the task area or select **View > Port** when using a Matrix Grid.

2. Move the mouse cursor to the port that has to be switched.

3. 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.

4. Release the left mouse button.

   A selection menu to select the available switching type (**Full Access**, **Video Access** or **Private Mode**) will be opened.

5. Select the desired switching type.

   The switching operation will be immediately executed. At the same time all EXT Units that are assigned to the involved devices will be switched.

> ℹ️ If a port is shown with a red cross on **Matrix View**, the CON Device does not have access rights to the CPU Device connected to that port.

To disconnect existing connection between CON Device and CPU Device, proceed as follows:

1. Click with the right mouse button on the port that is to be disconnected.

2. Select the **Disconnect** function in the popup that appears.

   The connected ports will be immediately disconnected. At the same time all further connections of the extenders assigned to the involved devices will be disconnected.

9.3.2   USB 2.0 Switching

Switching of USB 2.0 extender modules basically works like switching of KVM extender modules. The following scenarios to switch USB 2.0 extender modules are possible.

1. An EXT Unit with USB 2.0 will be created and assigned to an already existing device with existing KVM EXT Units (see chapter 8.8.2, page 193 or chapter 8.9.3, page 210).

2. A separate device for the EXT Unit with USB 2.0 will be created without assigning a KVM EXT Unit to that device. This possibility offers a separate switching of the USB 2.0 signal (see chapter 8.8.2, page 193 or chapter 8.9.3, page 210).

> ℹ️ Switching of USB 2.0 signals uses Extended Switching functionality (see chapter 9.3.1, page 270).
>
> When using parallel operation within the matrix, set the **Release Time** in the **System Settings > Switch** menu to 10 s or more (see chapter 8.4.5, page 146). Otherwise, the connection of the USB 2.0 extender will not be established due to security and stability reasons.

9.3.3 Predefining Macros

Predefined macros to switch the matrix without loading a new configuration can be created and activated in this menu. This is a function of the management software, not of the matrix. The predefined macros are locally saved on your computer.
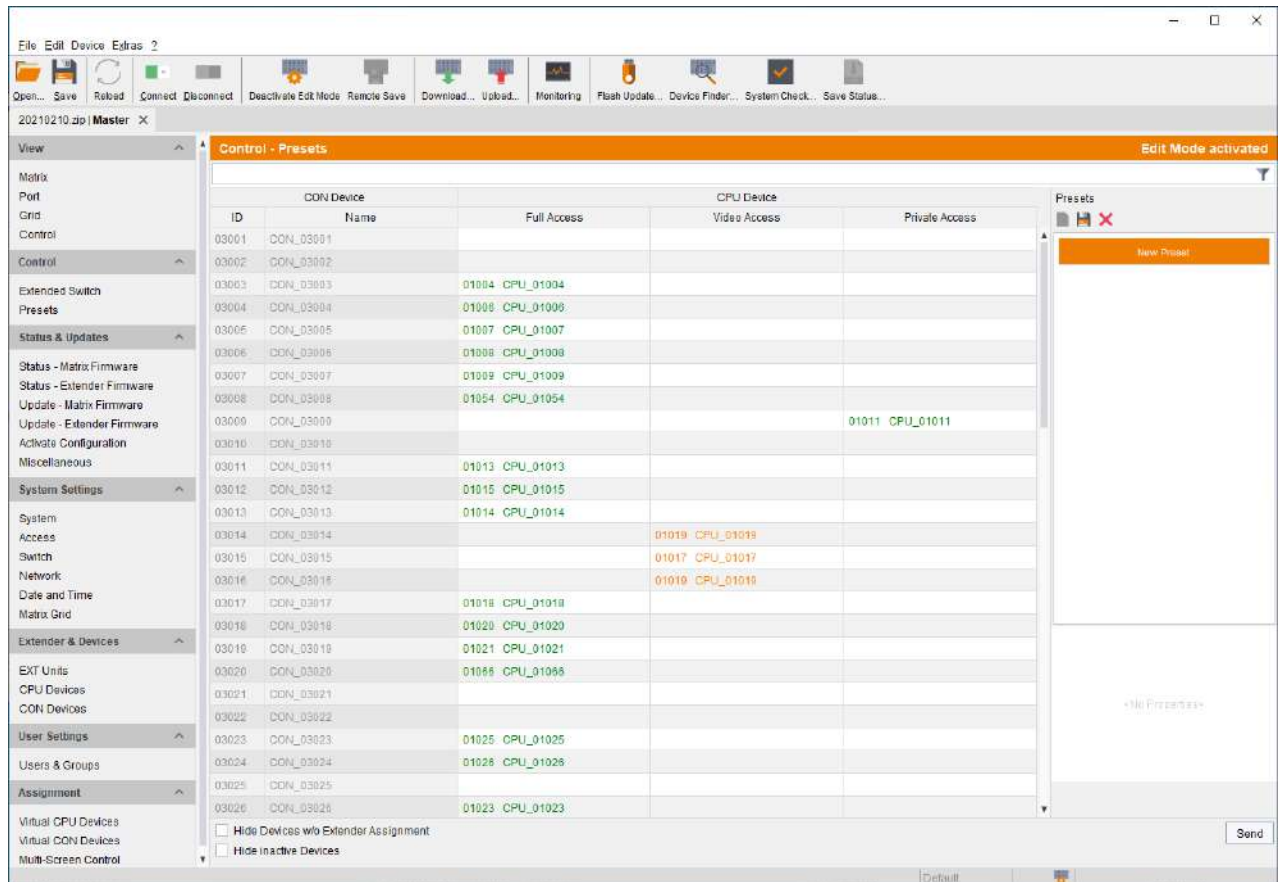
Fig. 206   Management software menu Control - Presets

Creating a new Switch Macro

To create a new switch macro, proceed as follows:

1. Select **Control > Presets** in the task area.

2. Click the **Activate Edit Mode** menu item in the toolbar.

3. Click on the (**New**) symbol in the right column of the working area to open a new switch macro.

    You are asked if the existing connections should be taken over for the new switch macro.

4. Click on a device in the corresponding columns (**Full Access**, **Video Only** or **Private Mode**) to drop down the appropriate selection to set the desired switching operations or use the function for a disconnect (**Disconnect CPU**).

5. Click the (**Save**) symbol in the right column of the working area to save the created switch macro.

    A save dialog appears.

6. Enter a name for the new switch macro.

7. Click the **Ok** button in the save dialog to confirm the new preset.

    The new switch macro is listed in the right column.

8. Click the **Activate Edit Mode** menu item in the toolbar.

Copying a Switch Macro

To copy a switch macro, proceed as follows:

1. Select **Control > Presets** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Click with the right mouse button on a selected switch macro in the right column to copy the current switch macro when using the **Save as...** option.
4. Click the **Activate Edit Mode** menu item in the toolbar.

Deleting a Switch Macro

To delete a switch macro, proceed as follows:

1. Select **Control > Presets** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
1. Select a switch macro to be deleted.
2. Click the ✖ (**Delete**) symbol in the right column of the working area to delete the current switch macro or click with the right mouse button on a selected switch macro using the **Delete...** option.
3. Click the **Activate Edit Mode** menu item in the toolbar.

Loading a Switch Macro

To load a predefined switching, proceed as follows:

1. Select **Control > Presets** in the task area.
2. Click the **Activate Edit Mode** menu item in the toolbar.
3. Select the switch macro in the right column of the working area that has to be loaded.
4. Press the **Send** button on the bottom right of the working area to activate the selected switch macro.
5. Click the **Activate Edit Mode** menu item in the toolbar.

> A predefined switch macro can only be activated in online mode.
>
> When loading presets, only those switching operations that are compliant with the hardware and the configuration of the currently used matrix are taken into account.

9.4   Multi-Screen Control Switching via Mouse (Panning)

The Multi-Screen function contains a switching of the USB-HID signal between different statically connected sources (computer, CPU) within a CON Device. The switching of the USB-HID signal can be made by a movement of the mouse pointer beyond the edge of the current display to a neighboring display (see chapter 8.9.7, page 223).

To perform a switching operation by movement of the mouse pointer, proceed as follows:

1. Move the mouse pointer to that edge of the display which borders vertically or horizontally to the neighboring display.
2. Move the mouse pointer beyond the edge of the display.

   The mouse pointer appears on the adjacent display. The switching operation has been performed and the USB-HID signal will be now available at the target display.

> The switching operation can also be performed via keyboard (see chapter 9.1.5, page 261).

9.5   Querying a Status for Diagnosis via OSD

Various statuses can be queried for diagnosis:
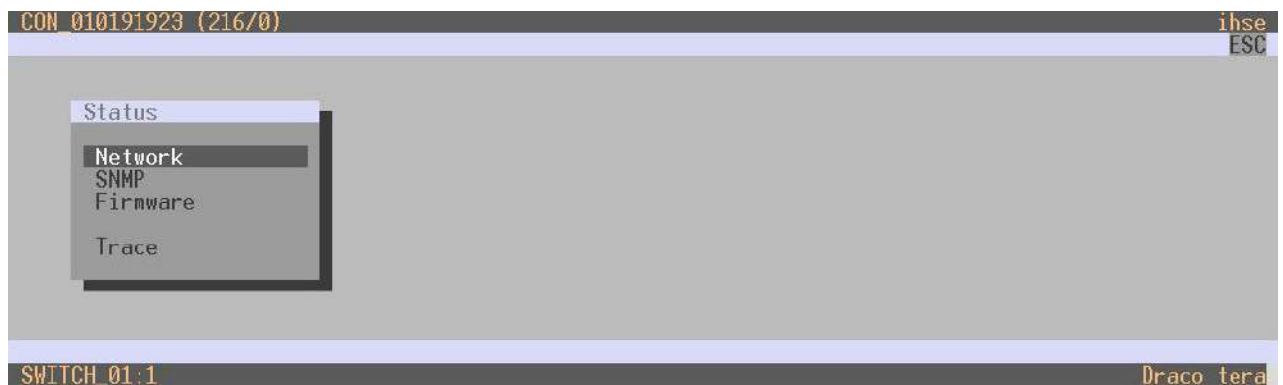
*Fig. 207   OSD Menu **Status***

9.5.1   Network Status

The current network configuration is displayed in this menu.

➡ Select **Status > Network** in the main menu to query the network configuration.
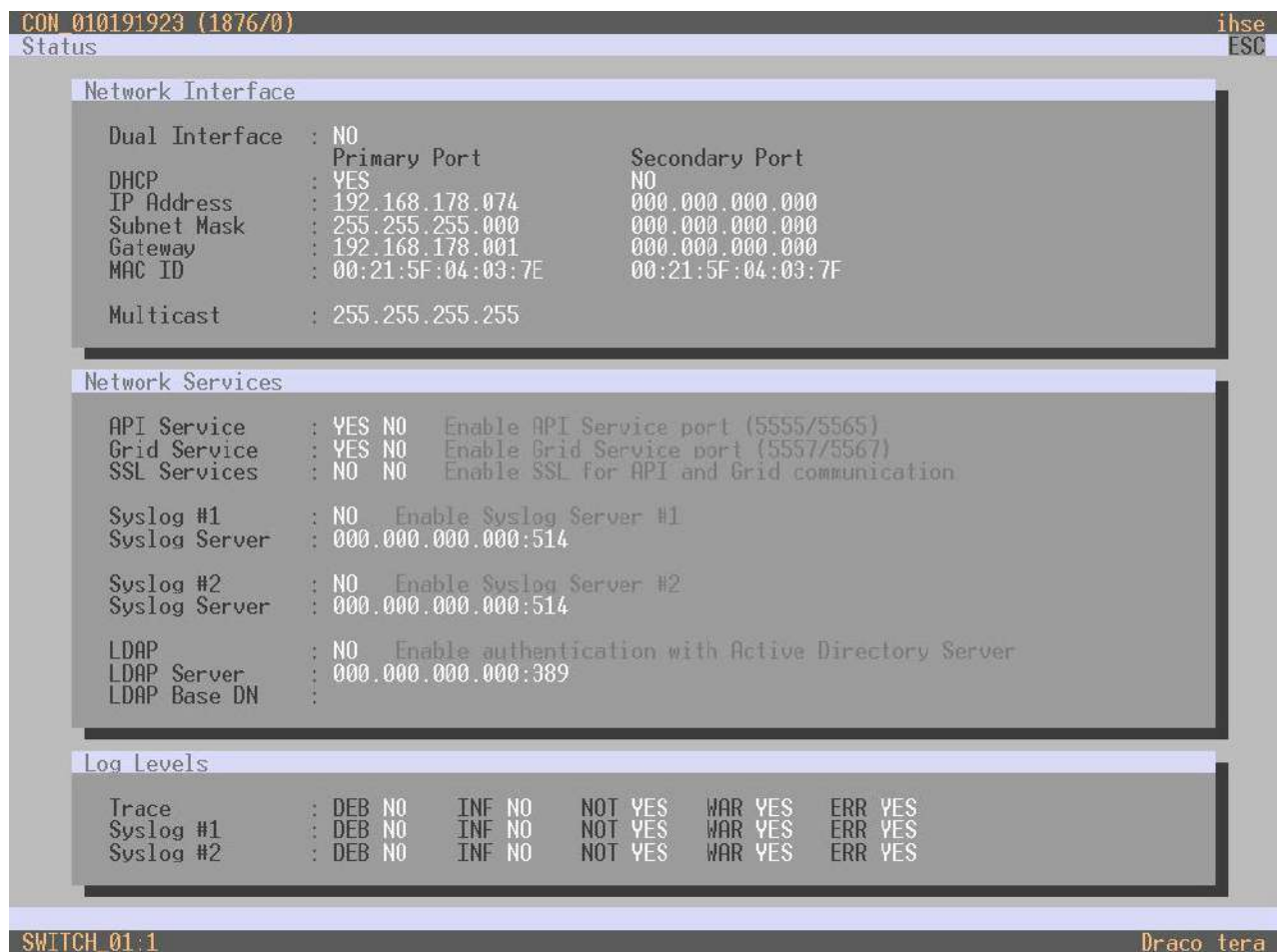
*Fig. 208   OSD Menu **Status - Network***

For information about the parameters, please refer to chapter 7.3.5, page 76.

9.5.2   SNMP Status

The current SNMP status is displayed in this menu.

➡   Select **Status > SNMP** in the main menu to query the SNMP status.

```
CON_010190841 (1560/0)                                                      ihse
 Status                                                                     ESC

     SNMP Agent

        Enable          : NO    Enable SNMP Agent (license key required)


     SNMP Server

        Enable Traps    : NO    Server #1              NO    Server #2

        Server Address  : 000.000.000.000              000.000.000.000

        Status          : NO                           NO
        Temperature     : NO                           NO

        Insert Board    : NO                           NO
        Remove Board    : NO                           NO
        Invalid Board   : NO                           NO

        Insert Extender : NO                           NO
        Remove Extender : NO                           NO

        Switch Command  : NO                           NO

        Fan Tray #1     : NO                           NO
        Fan Tray #2     : NO                           NO

        Power Supply #1 : NO                           NO
        Power Supply #2 : NO                           NO
        Power Supply #3 : NO                           NO
        Power Supply #4 : NO                           NO




 SWITCH_01:1                                                          Draco tera
```

Fig. 209   OSD Menu Status - SNMP

ℹ   The procedure for activating the SNMP agent or configuring an SNMP server is described in chapter 7.3.6, page 79.

9.5.3   Firmware Status

The current firmware status is displayed in this menu.

➡ Select **Status > Firmware** in the main menu to query the firmware status.
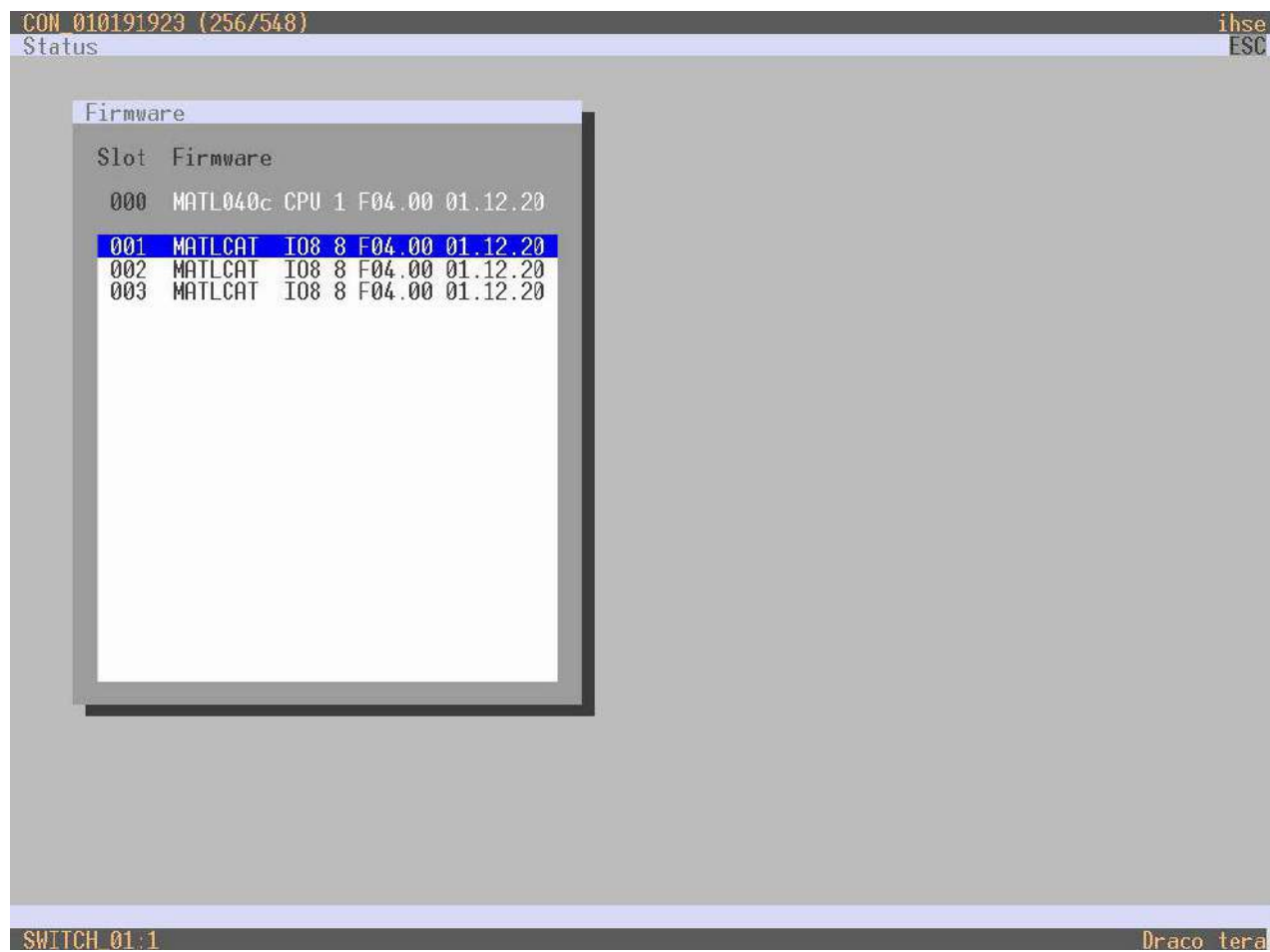
*Fig. 210   OSD Menu **Status - Firmware***

9.5.4 Trace

The trace function is used for diagnostic purposes. All recorded events for activities and switching operations of the matrix are displayed in this menu.

To display the recorded events of an I/O board, proceed as follows:

1. Open the OSD of a CON Unit of the I/O board you want to display the recorded events.

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

    The recorded events of the I/O board the CON Unit is connected are displayed.

*Fig. 211   OSD Menu **Status - Trace***

The following information is shown in this menu:

Field	Description
Date	Date stamp
Time	Time stamp
Message	Detailed description of the event

The procedure for activating the SNMP agent or configuring an SNMP server is described in chapter 7.3.6, page 79.

9.5.5   Redundancy Function

Extender modules with redundant connectors for interconnect cables can be simultaneously operated with both connectors at a single Matrix or a Matrix Grid (from firmware version V04.00).

The connector labeled with **Link 1** at the extender module is meant for the primary connection. If the connection on CON Unit or CPU Unit side is interrupted due to any problem, the connection will be automatically re-established through the second connector labeled with **Link 2**.

For this kind of redundancy function, there is no need for any configuration of the matrix or the extender modules.

If needed, you can manually switch between **Link 1** and **Link 2** at the CON Unit (see chapter 9.2.4, page 266).
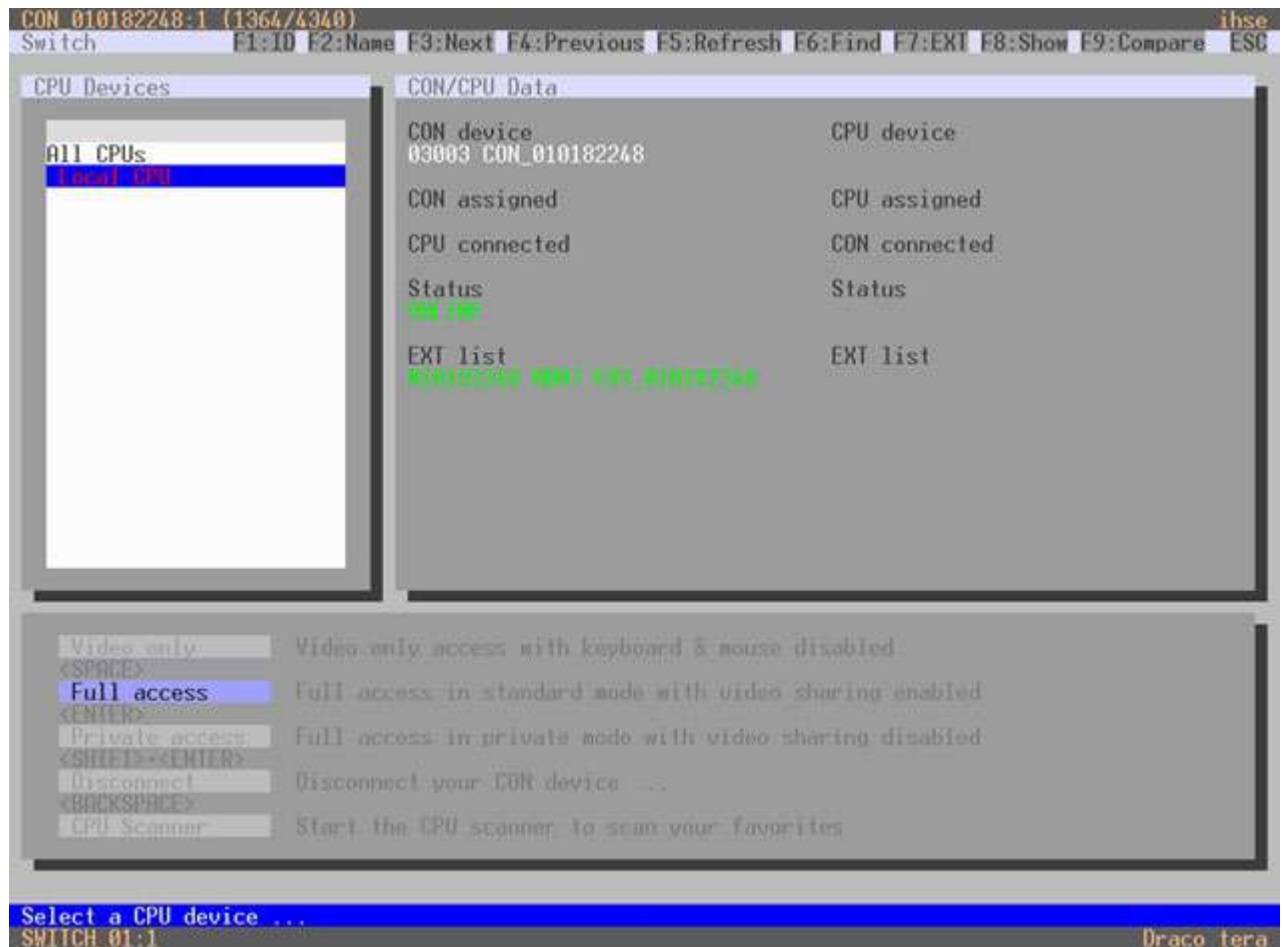
*Fig. 212   OSD Menu **Switch***

➡ Select **Switch** in the main menu.

When using redundant extender modules, the respectively active connector is shown in this view under **EXT list** in the field **CON/CPU Data**. If the first connector (**Link 1**) is active, it will be highlighted with **:1** behind the respective extender. If the second connector (**Link 2**) is active, this will be highlighted with **:2**.

9.6 Querying a Status via Management Software

9.6.1 Device Status

The connections to the matrix are displayed in this menu.

➡ Select **View > Matrix** in the task area to display the current connections.
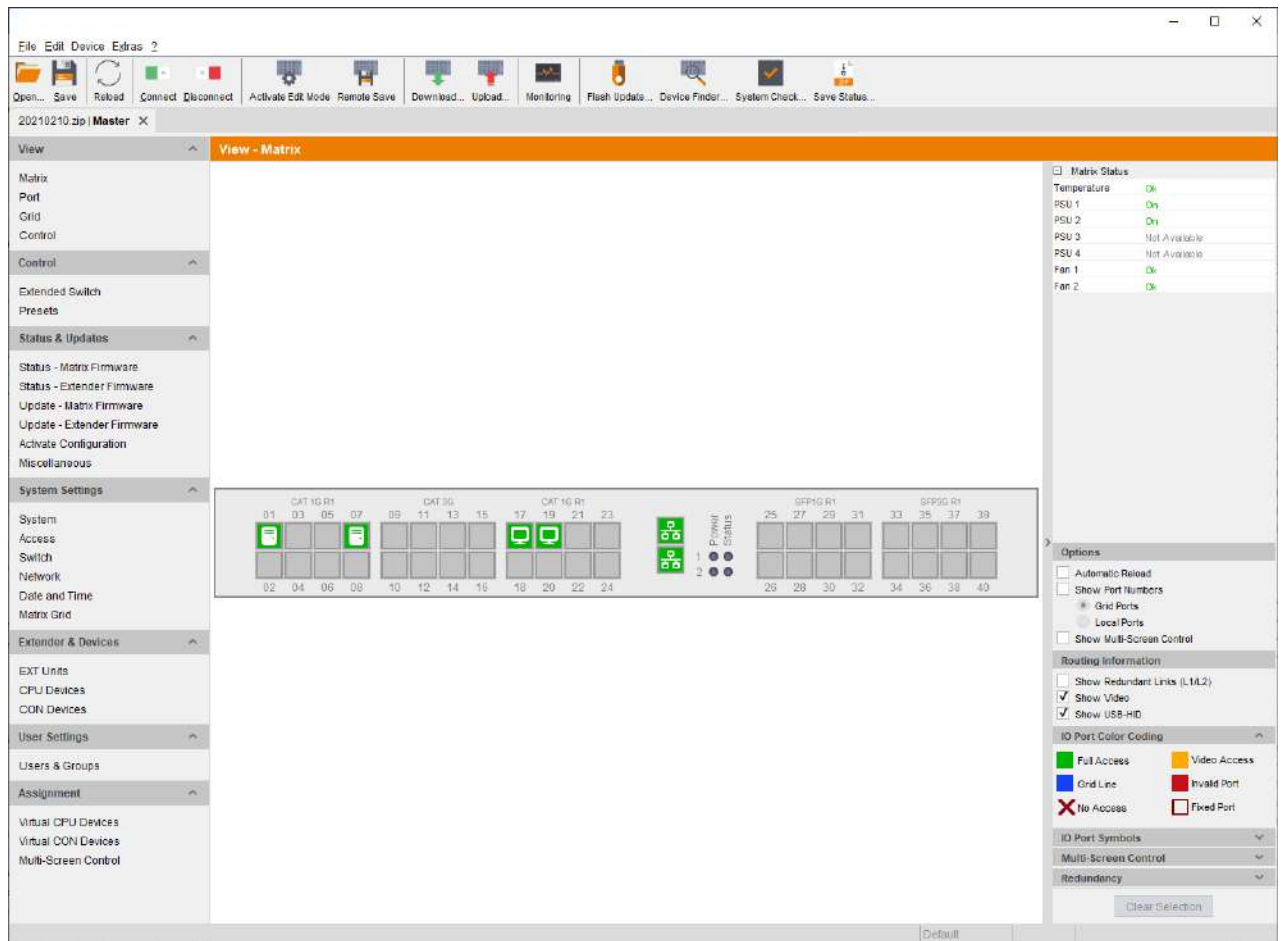
*Fig. 213   Management software menu **View - Matrix***

Network port color	Description
Green	Port is connected
Red	Port is not connected or not available

9.6.2   Network Status

The current network configuration is displayed in this menu.

➡ Select **System Settings > Network** in the task area to query the network configuration.
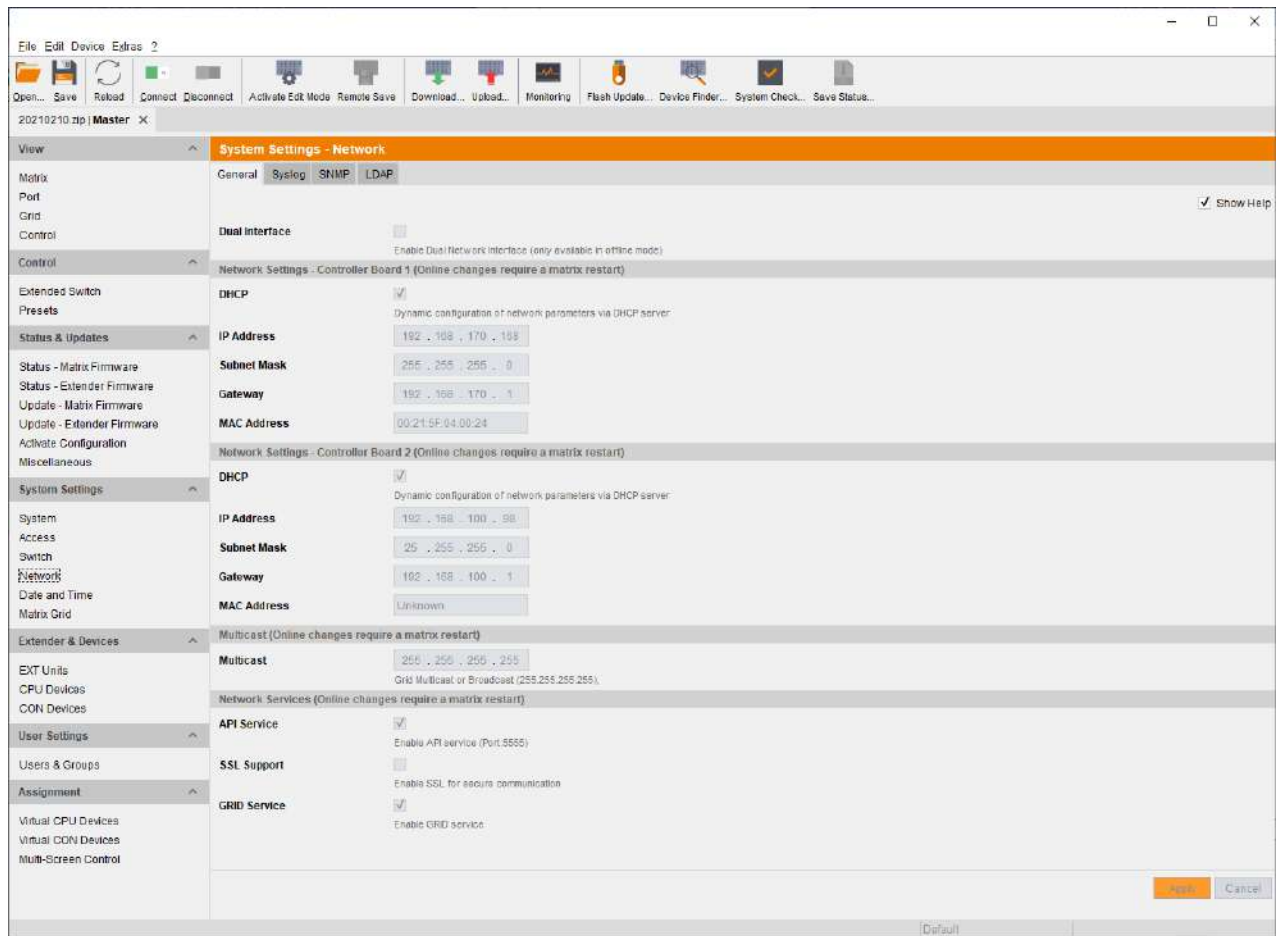
*Fig. 214   Management software menu **System Settings - Network - General***

For information about the parameters, please refer to chapter 8.4.6, page 149.

9.6.3 Matrix Firmware Status

The firmware status of the extender modules is displayed in this menu.

➡ Select **Status & Updates > Status - Matrix Firmware** in the task area to query the current firmware status of the extender modules.

*Fig. 215   Management software menu **Status & Updates - Status - Matrix Firmware***

The following information is displayed in the working area:

Column	Description
Slot	Slot number of the I/O board or CPU extender module
Name	• Name of the chassis or I/O board • Name of the chassis firmware or I/O board firmware
Type	Type of the chassis firmware or I/O board firmware
Ports	Number of ports
Serial Number	Serial number of the I/O board or CPU extender module
Version	Installed firmware version
Status	Status of the chassis or I/O board

The tree view can be expanded and collapsed by clicking with the left mouse button once on the **+** and **-** symbols in the **Name** column to show and hide detailed information.
By clicking with the left mouse button once on the **+** and **-** symbol in the upper right corner of the working area, you can expand and collapse all information in the tree view.

9.6.4   Extender Firmware Status

The firmware status of the extender modules with its name, type, and version is displayed in this menu.

➜   Select **Status & Updates > Status - Extender Firmware** in the task area to query the current firmware status of the extender modules.

*Fig. 216   Management software menu **Status & Updates - Status Extender Firmware - Firmware***

The following information is displayed in the working area:

Column	Description
ID	Numerical value of the extender module ID
Name	Name of the EXT Unit and the extender module firmware
Port	Port number of the matrix, the extender module is physically connected
Type	Type of the CON / CPU Unit and firmware
Device	Name of the CON Device / CPU Device the EXT Unit is assigned to
Version	Installed firmware version

Firmware types to be updated or firmware conflicts are highlighted in color:
- Extender firmware version conflict
- Manual update of EXTMSD / EXTIMSD recommended*
- Wrong module (CPU/CON mismatch)
- Undefined type

* Updating of EXT*MSD is only required, if explicitly stated within the release notes or advised by the manufacturer's technical support. EXT*MSD requires manual update via the Mini-USB service port at the extender modules.

The tree view can be expanded and collapsed by clicking with the left mouse button once on the **+** and **-** symbols in the **ID** column to show and hide detailed information.
By clicking with the left mouse button once on the **+** and **-** symbol in the upper right corner of the working area, you can expand and collapse all information in the tree view.

9.6.5   Extender Firmware Status on I/O Board

The extender modules firmware currently stored in the memory on the I/O board via extender firmware update in Parallel Mode is displayed with its name, type, and version in this menu. The firmware can be passed to the extenders if necessary, using the update step of the Parallel Mode (see page 254).

1. Select **Status & Updates > Status - Extender Firmware** in the task area to query the current firmware status of the extender modules.

2. Select the **Extender Firmware Status on I&O Board** tab in the working area.

*Fig. 217   Management software menu **Status & Updates - Status Extender Firmware - Extender Firmware on IO Board***

The following information is displayed in the working area:

Column	Description
Slot	Slot number of the I/O board
Name	Name of the I/O board and the extender module firmware
Type	Type of the I/O board and the extender module firmware
Mem Usage / Version	• Free memory on the I/O board (in MB) • Firmware version of the I/O board

The tree view can be expanded and collapsed by clicking with the left mouse button once on the **+** and **-** symbols in the **Name** column to show and hide detailed information.

By clicking with the left mouse button once on the **+** and **-** symbol in the upper right corner of the working area, you can expand and collapse all information in the tree view.

9.6.6   Syslog Monitoring

The syslog function offers a complete logging of the matrix activities and switching operations in this menu. During logging the activities are written continuously into log files and stored locally.

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

The procedure for activating the Syslog function is described in chapter 8.4.7, page 151.

Fig. 218   Management software menu Monitoring - Syslog

To open the Syslog monitoring, proceed as follows:

➡ Click the **Monitoring** menu item in the toolbar.

The logged Syslog messages are displayed in the working area.

Filter Function

To filter relevant messages from the multitude of logged activities of the matrix, the extender modules and the chassis, the Syslog monitoring offers various filter options.

To set and activate a filter, proceed as follows:

1. Activate the respective checkbox(es) to activate the desired filter option(s).
2. Click the **Filter** button to activate the filter settings.
3. Click the **Clear** button to deactivate an activated filter setting.

The following filter options are available:

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

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

Recording Function

Various options are available for the messages displayed in the Syslog file.

➡ To save the displayed messages (filtered or unfiltered), click the **Save trace** button.

   The messages are saved in a Syslog file (extension .csv).

➡ To clear the view with the displayed messages, click the **Clear trace** button.

   The recorded messages will be kept.

➡ To pause the display of messages, click the **Pause** button.

   During the pause, the messages will be recorded continuously.

➡ To display the messages recorded in the background during the pause, click the **Pause** button again.

   All messages recorded in the background will be displayed immediately.

Find Function

The find function can be used to find specific Syslog messages from a variety of logged activities and relevant messages from the matrix, extender modules, and chassis.

*Fig. 219   Management software menu **Monitoring - Syslog - Example for search result***

To find specific Syslog messages, proceed as follows:

1. Click the monitoring menu item in the toolbar.

2. Click the **Find tab** in the working area.

    The recorded Syslog messages are displayed in the working area.

3. Enter a search term in the **Find Message** search field.

4. Click the **Find Next** button.

    The first message with the entered search term is highlighted.

5. Click the **Find Next** button again to find another message with this search term.

    The next message with the entered search term is highlighted.

Possible search terms would be, e.g., the port ID (e.g., Port=160), API, etc.

To go back to the previous search result, click the **Find Previous** button.

9.6.7   SNMP Monitoring

The SNMP function allows all function-critical and safety-critical elements of the matrix, the extender modules, and the chassis to be monitored and queried. This function complies with the RFC 1157 conformal standard.

NOTICE
When using SNMP monitoring, for reasons of access security, the use of a dedicated network according to the IT-Grundschutz catalog is recommended. The read only community for the MIB file is **draco**.

The procedure for activating the SNMP agent or configuring an SNMP server is described in chapter 8.4.7, page 151.

*Fig. 220   Management software menu **Monitoring - SNMP***

To open the SNMP monitoring, proceed as follows:

1. Click the **Monitoring** menu item in the toolbar.

2. Click the **SNMP** button in the task area.

    The logged SNMP messages are displayed in the working area.

Filter Function

To filter relevant messages from the multitude of logged activities of the matrix, the extender modules and the chassis, the SNMP monitoring offers various filter options.

To set and activate a filter, proceed as follows:

1. Activate the respective checkbox(es) to activate the desired filter option(s).

2. Click the **Filter** button to activate the filter settings.

3. Click the **Clear** button to deactivate an activated filter setting.

The following filter options are available:

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

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

Recording Function

Various options are available for the messages displayed in the SNMP log.

➡ To save the displayed messages (filtered or unfiltered), click the **Save trace** button.

The messages are saved in a SNMP file (extension .csv).

➡ To clear the view with the displayed messages, click the **Clear trace** button.

The recorded messages will be kept.

➡ To pause the display of messages, click the **Pause** button.

During the pause, the messages will be recorded continuously.

➡ To display the messages recorded in the background during the pause, click the **Pause** button again.

All messages recorded in the background will be displayed immediately.

Find Function

The find function can be used to find specific SNMP messages from a variety of logged activities and relevant messages from the matrix, extender modules, and chassis.

*Fig. 221   Management software menu **Monitoring - SNMP - Example for search result***

To find specific SNMP messages, proceed as follows:

1.   Click the monitoring menu item in the toolbar.

2.   Click the **Find tab** in the working area.

     The recorded SNMP messages are displayed in the working area.

3.   Enter a search term in the **Find Message** search field.

4.   Click the **Find Next** button.

     The first message with the entered search term is highlighted.

5.   Click the **Find Next** button again to find another message with this search term.

     The next message with the entered search term is highlighted.

Possible search terms would be, e.g., temperature, fan, or the serial number of an extender (e.g., 40131237). To go back to the previous search result, click the **Find Previous** button.

9.6.8   Redundancy Function

Extender modules with redundant connectors for interconnect cables can be simultaneously operated with both connectors at a single matrix or a matrix Grid (from firmware version V04.00).

The connector labeled with **Link 1** at the KVM extender is meant for the primary connection. If the connection on CON Unit or CPU Unit side is interrupted due to any problem, the connection will be automatically re-established through the second connector labeled with **Link 2**.

For this kind of redundancy function, there is no need for any configuration of the matrix or the extender modules.
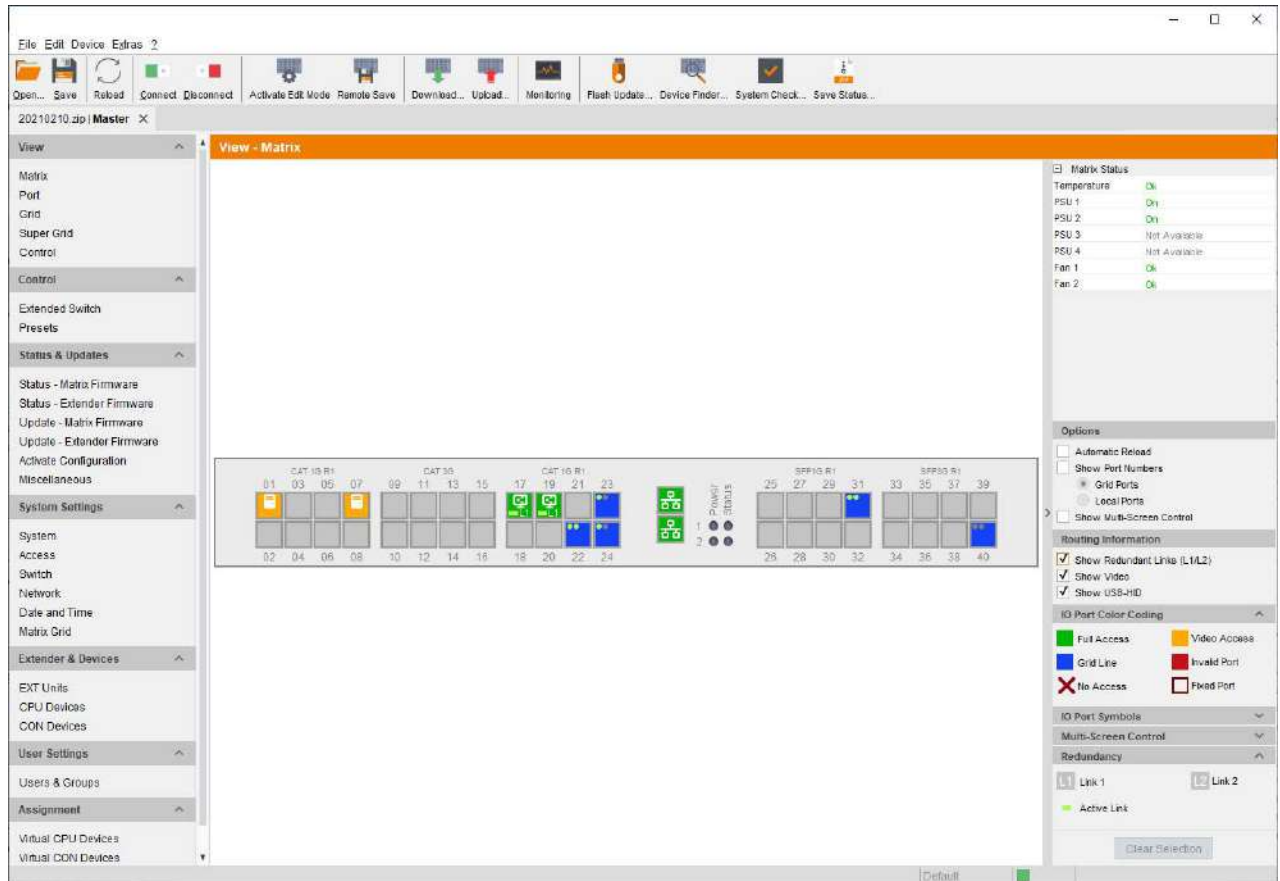
*Fig. 222   Management software menu **View - Matrix***

To check the connection status of the redundant extender modules, proceed as follows:

1.   Select **View > Matrix** in the task area.

2.   Activate the checkbox **Show Redundant Links (L1/L2)** under **Routing Information** on the right side of the working area.

3.   Open the menu **Redundancy** on the right side of the working area to receive the respective legend information.

4.   Redundant connectors are highlighted in the matrix view with L1 and L2. The respectively active link is highlighted with a light green label.

9.6.9   System Check

The system check offers a diagnostic function for checking the device configuration. The feature indicates non-optimal as well as incorrect settings and displays issues instructions. The system check is only used to check plausibility and does not make any active configuration changes.

The following configuration parts are checked:

- Matrix Firmware
- Extender Firmware
- Multi-Screen Control
- EXT Units
- CPU Devices
- CON Devices
- Users
- Macros
- System Configuration
- Matrix Grid

The following notification levels can be shown:

Level	Description
OK (green)	System checks completed without any abnormalities.
WARNING (yellow)	System checks revealed abnormalities in the configuration that point to incomplete parts of the configuration, firmware differences, duplications, or unconnected extender modules, but without being system critical.
ERROR (red)	System checks revealed errors in the configuration that can have both functional and system critical influences on the system.

NOTICE
If the messages "WARNING" or "ERROR" are generated by the system check function, the respective problem will be described, and an issue instruction will be provided.

NOTICE
The system check of the matrix may take several minutes, and the matrix is not available during this time.

To start the system check, proceed as follows:

1. Click the menu item **System Check** in the tool bar.

   A query appears to check the system.

2. Click the **Yes** button to start the system check.
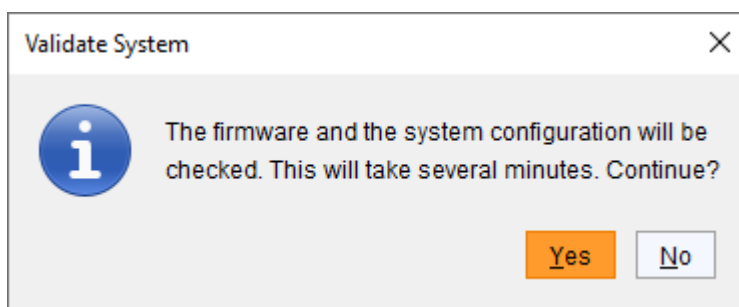
*Fig. 223   Management software dialog **Validate System***

A report is displayed after the system check.

System Check - TEST-F-F024C016F   ×

System Check

The System Check helps to disclose possible sources of error within the configuration. Test results are listed as recommendations in order to support your personal check of the configuration.

Matrix Firmware	Warning	Matrix OSD firmware version conflict
		⇒ Check matrix OSD firmware in **Status - Matrix Firmware.**
Extender Firmware	Warning	Extender firmware version conflict
		⇒ Check extender firmware in **Status - Extender Firmware.**
Extender Firmware	Warning	Extender (ID = 10195808, Name = CON_10, Port = 66) includes an old FPGA firmware which does not support the ENAREDFRM parameter
		⇒ Check extender firmware in **Status - Extender Firmware.**
Extender Firmware	Warning	Extender (ID = 40000927, Name = CON_11, Port = 67) includes an old FPGA firmware which does not support the ENAREDFRM parameter
		⇒ Check extender firmware in **Status - Extender Firmware.**
Macros	Info	442 / 8192 active macros
System Configuration	Warning	Invalid I/O Boards is activated
		⇒ Must be OFF during operation, enable during matrix updates only
Multi-Screen Control	Ok	
Ports	Ok	

Close

Fig. 224   Management software report **System Check**

9.6.10 Network Check

The network check checks the firewall settings for the ports available in the network.
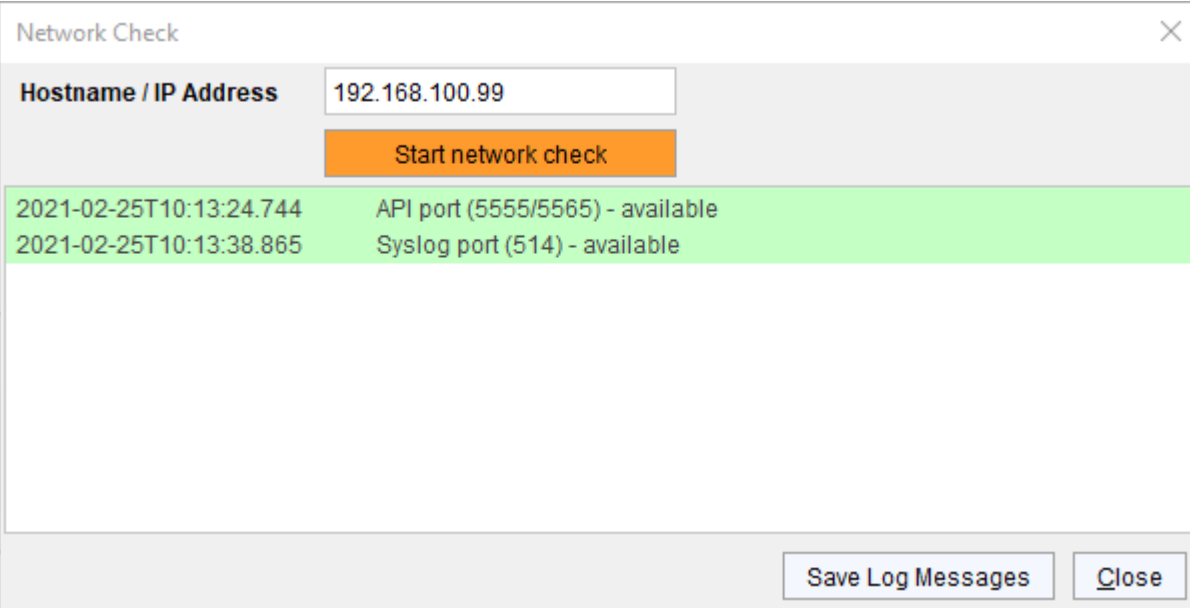
NOTICE
Available ports are shown in green. If a port is not available, the corresponding entry appears in red, and instructions are displayed.

To start the network check, proceed as follows:

1. Select **Extras > Network Check** in the menu bar.

   A query appears with an input field for the IP address of the matrix to be queried.

2. Enter the IP address of the matrix.

3. Click the **Start network check** button to start the network check.

   The availability of the ports is shown after a short moment.

*Fig. 225   Management software report **Network Check - Available ports***

9.7   Saving a Status via Management Software

1. Click the **Save Status** menu item in the toolbar to read out the overall status of the device and store it locally (file extension `.zip`).

    A dialog appears.

2. Choose the status option.

3. Click the **Next** button.
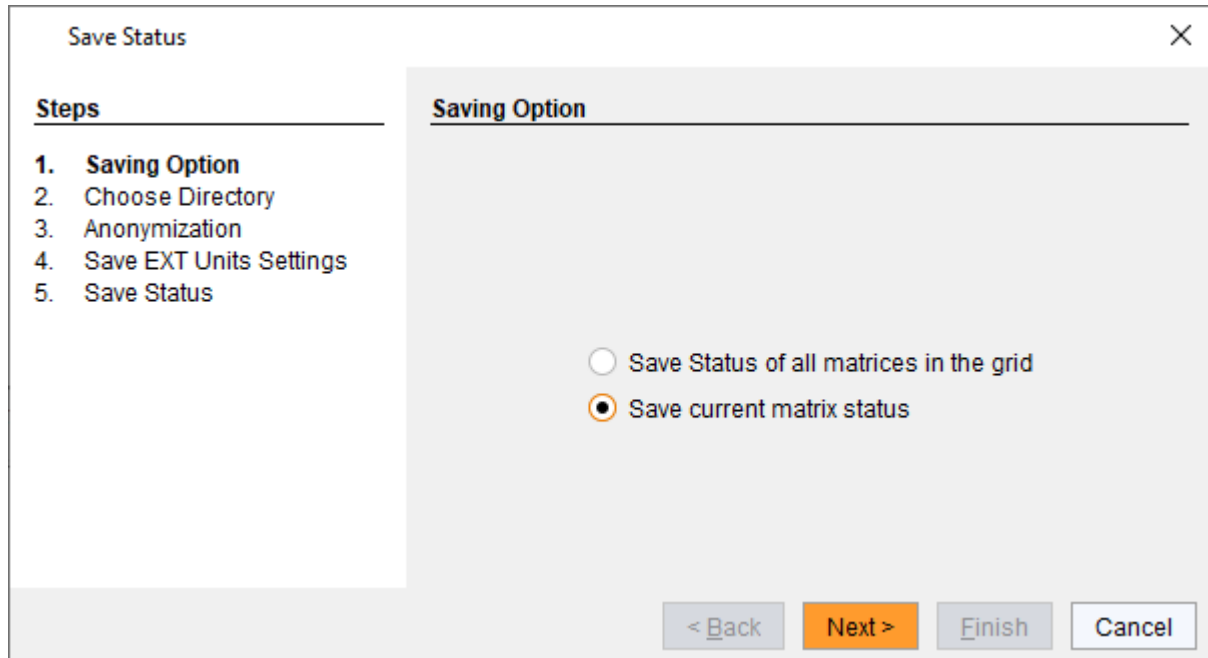
*Fig. 226   Management software menu **Save Status - Saving Option***

4. Navigate to the directory you want to save the status file.

5. Click the **Next** button.
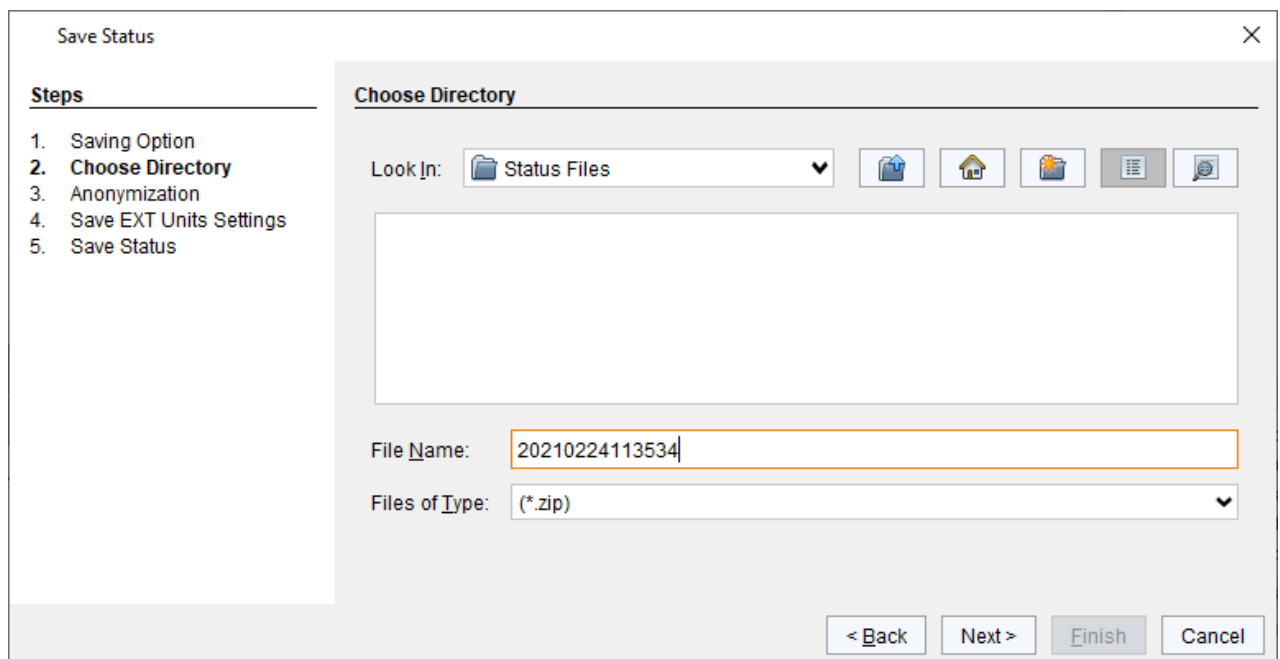
*Fig. 227   Management software menu **Save Status - Choose Directory***

6. Click the **Anonymize** checkbox to anonymize your personal data when saving the status file if necessary (not recommended for trouble shooting).

   If you want to use the status file as a backup, do not click the **Anonymize** checkbox.

7. Click the **Next** button.
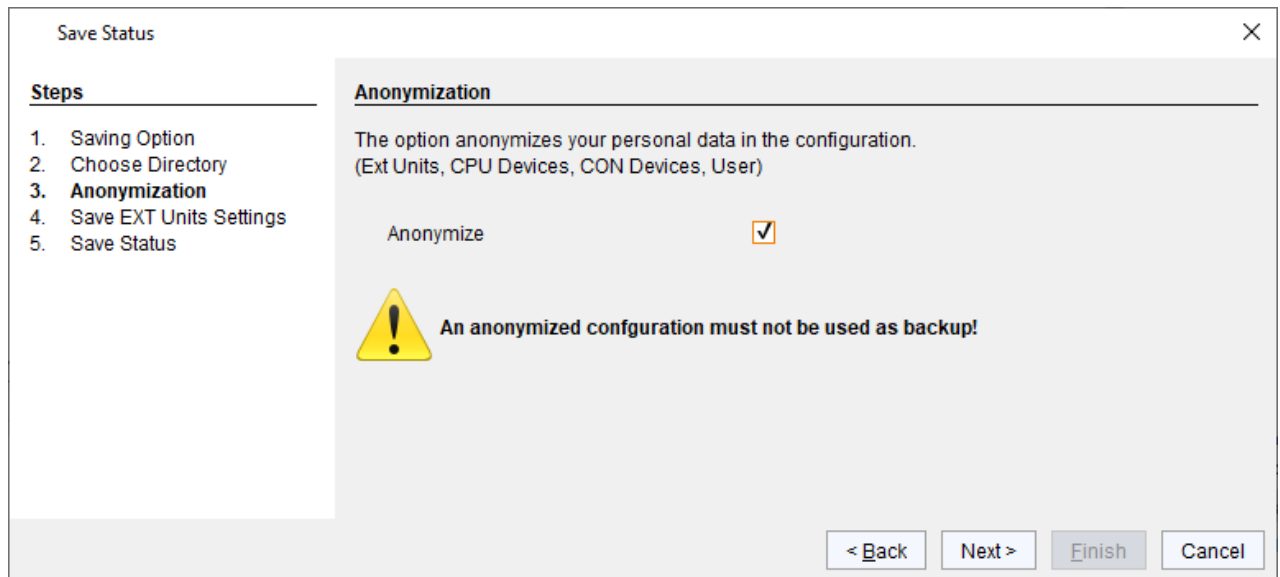
*Fig. 228   Management software menu **Save Status - Anonymization***

8. Click the **Save EXT Units Settings** checkbox to save your extender settings.

9. Click the **Next** button.
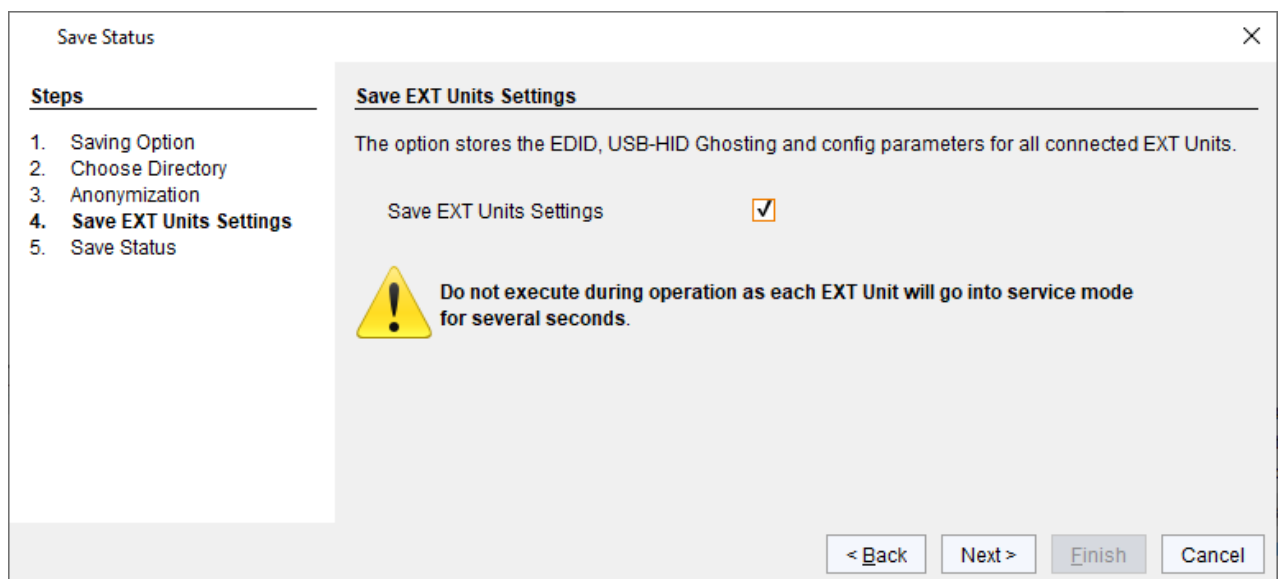
*Fig. 229   Management software menu **Save Status - Save EXT Unit Settings***

10. Wait until all steps show green checkmarks and the **"Saving status successful"** message is displayed.

11. Click the **Finish** button to finish the saving.
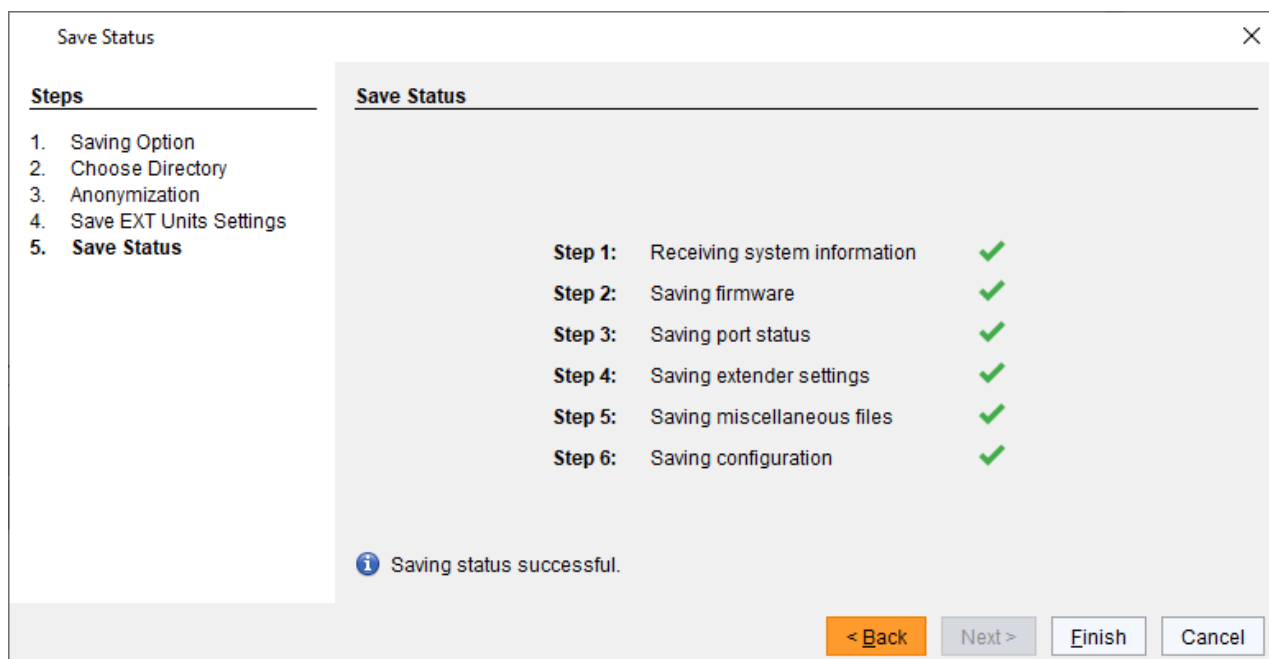
*Fig. 230   Management software menu **Save Status - Save Status***

9.8   Opening a Locally Saved Status via Management Software

To load a locally saved status, proceed as follows:

1. Select **Device > Load Status…** in the menu bar.
2. Navigate to the storage location of the status file to be opened.
3. Click the status file to be opened.
4. Click the **Open** button to open the status file.
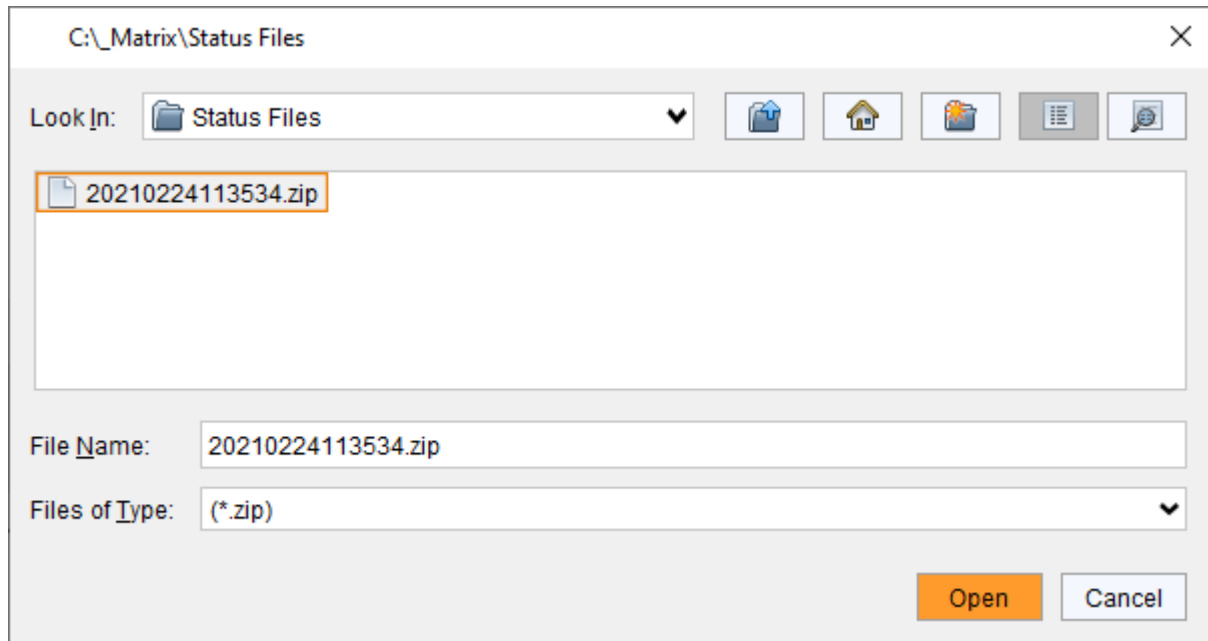
*Fig. 231   Management software menu **Device - Load Status***

The status can also be opened via drag & drop. To do so, open the file browser, navigate to the storage location of the status file, click on the status file, hold down the left mouse button and drag and drop the status file into the management software.

9.9 Restarting, Resetting, and Powering down Functions via OSD

9.9.1 Restarting the Matrix

To perform a restart of the matrix, proceed as follows:

➡ Select **Configuration > Restart Matrix** in the main menu.

The current configuration is saved in the permanent memory of the matrix and matrix will be restarted with the current configuration.

*Fig. 232 OSD Menu **Configuration - Restart Matrix***

9.9.2 Restarting the I/O Board

To perform a restart of the I/O board, the user's CON Unit is connected, proceed as follows:

➡ Select **Configuration > Restart IO Board** in the main menu.

The I/O board will be restarted.

*Fig. 233 OSD Menu **Configuration - Restart I/O Board***

> ℹ To restart I/O boards with CPU extender modules, use the restart option of the management software (see chapter 9.10.3, page 307)

9.9.3   Restarting the Controller Board

To perform a restart of the controller board, proceed as follows:

➡ Select **Configuration > Restart CPU Board** in the main menu.

The current configuration of the controller board is saved in the permanent memory of the matrix and the controller board will be restarted with the current configuration.

*Fig. 234   OSD Menu **Configuration - Restart CPU Board***

9.9.4   Resetting the Matrix to the Factory Settings

NOTICE
If you perform 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 default IP-address) and the admin password.

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

To perform a reset of the matrix to the factory settings, proceed as follows:

1. Select **Configuration > Factory Reset** in the main menu.
2. Confirm the selection with the **Okay** button.

   The current configuration in the memory of the matrix is deleted and the matrix is reset to the factory settings.

*Fig. 235   OSD Menu **Factory Reset***

9.9.5   Powering Down the Matrix

To shut down the system, proceed as follows:

1. Select **Configuration > Shut down Matrix** in the main menu.

2. Click the **Okay** button to confirm the selection.

    The current configuration of the matrix is saved in the permanent memory of the matrix and the matrix will be shut down.

> ℹ️ The fans will be switched to maximum speed after the shutdown. Then the matrix can be disconnected from the power supply.
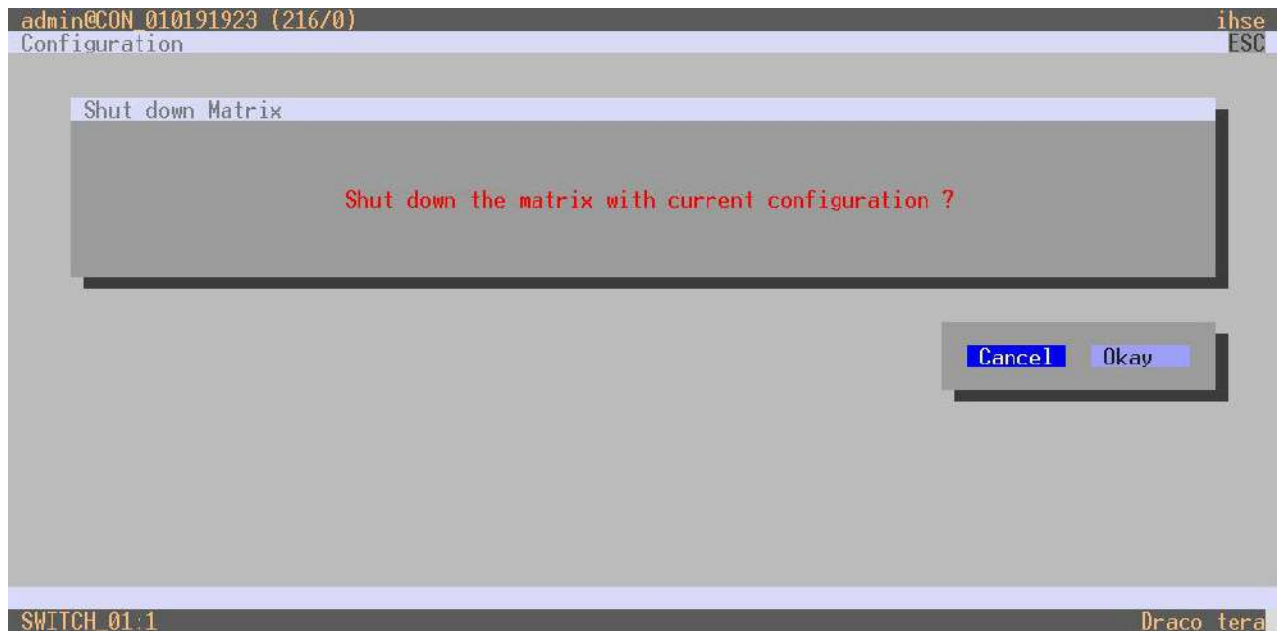
*Fig. 236   OSD Menu **Configuration - Shut down Matrix***

9.9.6   Powering Down the I/O Board

To shut down the I/O board, proceed as follows:

1. Select **Configuration > Shut down IO Board** in the main menu.

2. Click the **Okay** button to confirm the selection.

    The current configuration of the I/O boards is saved in the permanent memory of the matrix and the I/O board will be shut down.

Fig. 237   OSD Menu Configuration - Shut down I/O Board

9.10   Restarting, Resetting, and Powering down Functions via Management Software

9.10.1 Restarting the Matrix

NOTICE
When restarting the matrix, the current configuration is saved in the permanent memory of the matrix and the matrix will be restarted with the active configuration.

To perform a restart of the matrix, proceed as follows:

1. Select **Device > Advanced Service > Restart Device** in the menu bar.

    An access window appears.

2. Enter the username and password of the administrator.

3. Click the **Ok** button.
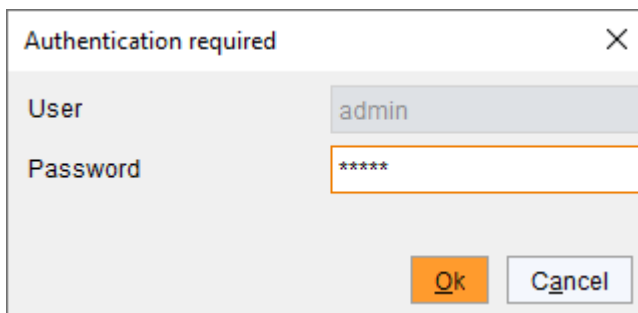
*Fig. 238   Management software dialog **Log in administrator***

A query to restart the matrix appears.

4. Click the **Yes** button to restart the matrix.
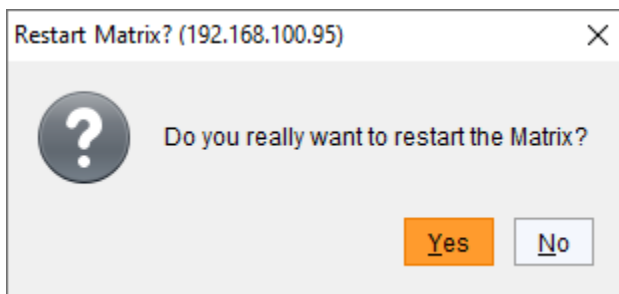
*Fig. 239   Management software dialog **Restart Matrix***

The current configuration is saved in the permanent memory of the matrix and the matrix will be restarted.

9.10.2 Restarting the Controller Board

To perform a restart of the controller board, proceed as follows:

1. Select **View > Matrix** in the task area.

2. Click with the right mouse button on the symbol of a network port of the controller board to be restarted.

    A context menu appears.

3. Select the **Restart CPU Board** function in the context menu.

    Note: The controller board will be restarted immediately without user confirmation. The symbols of the network ports are red for a short time in the overview. When the symbols of the network ports are green again, the restart of the controller board was successful.
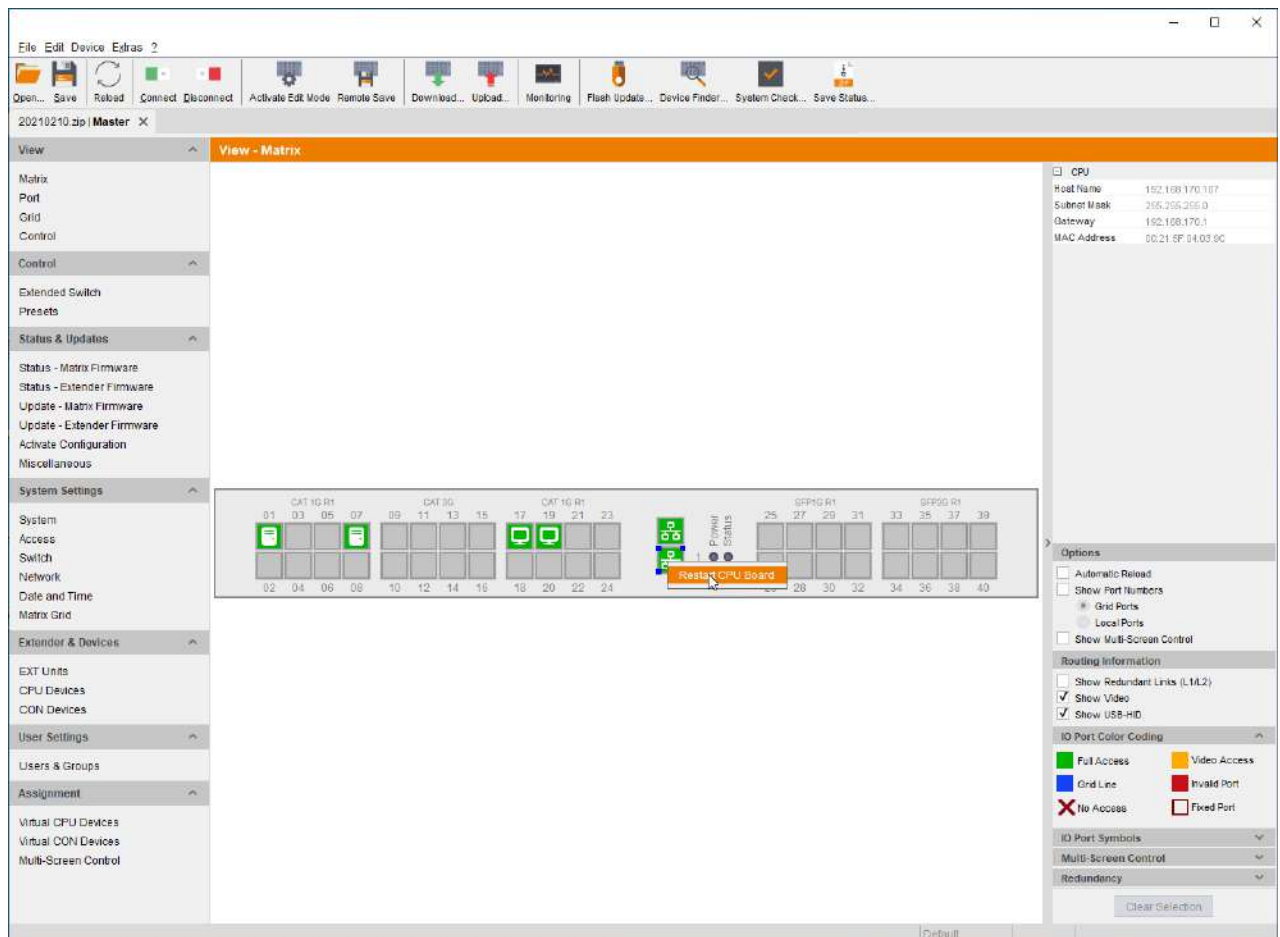
Fig. 240   Management software **View - Matrix - Restart I/O Board**

9.10.3 Restarting an I/O Board

To perform a restart of the I/O board, proceed as follows:

1. Select **View > Matrix** in the task area.

2. Click with the right mouse button on the symbol of the extender of the I/O board to be restarted.

   A context menu appears.

3. Select the **Restart I/O Board** function in the context menu.

   Note: The I/O board will be restarted immediately without user confirmation. The I/O board will disappear for a short time in the overview. When the I/O board is visible again, the restart of the I/O board was successful.
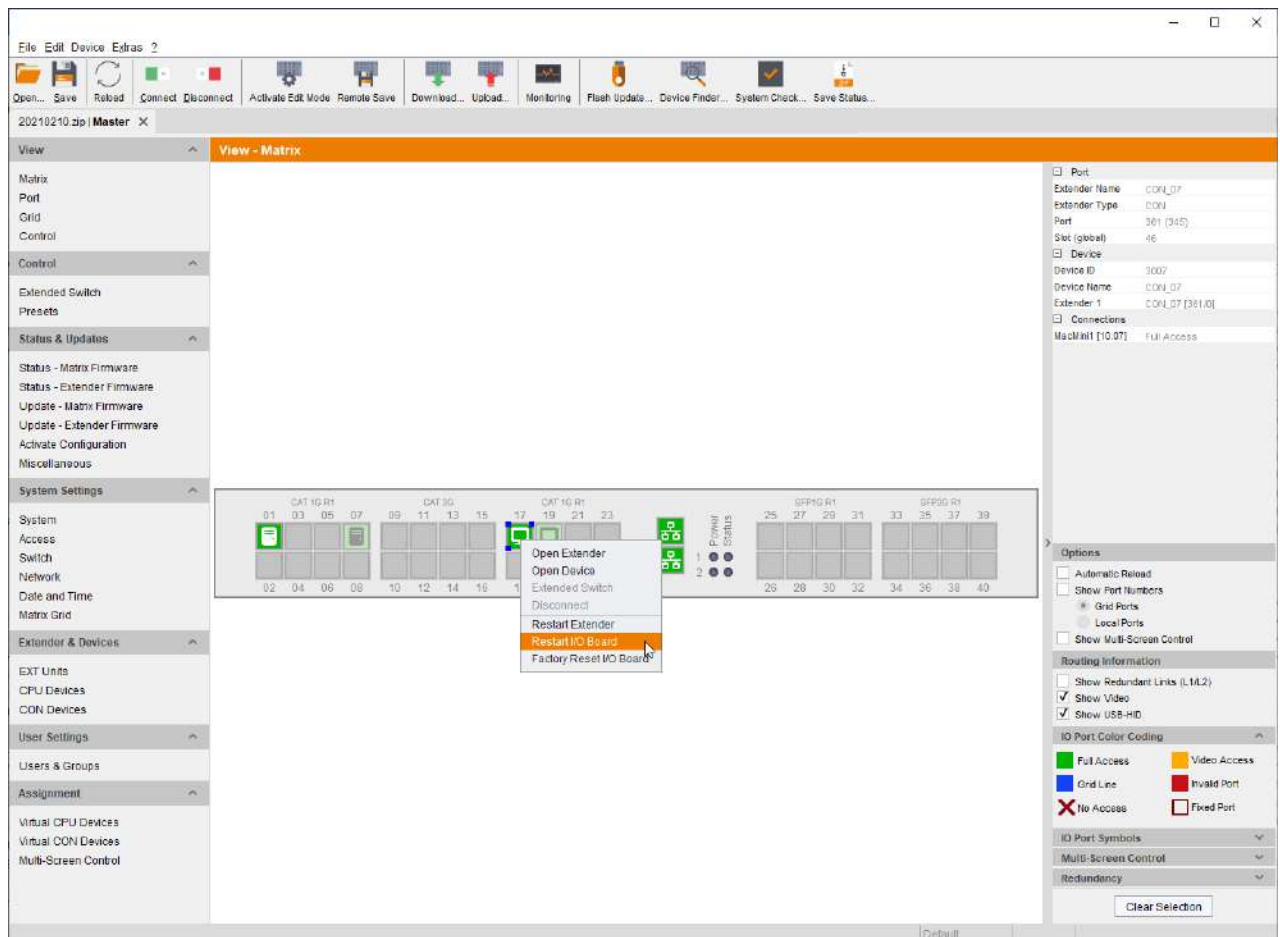
*Fig. 241   Management software **View - Matrix - Restart I/O Board***

9.10.4   Restarting an Extender Module

To perform a restart of an extender module, proceed as follows:

1.   Select **View > Matrix** in the task area.

2.   Click with the right mouse button on the symbol of the extender to be restarted.

     A context menu appears.

3.   Select the **Restart Extender** function in the context menu.

     Note: The extender module will be restarted immediately without user confirmation. The extender symbol will disappear for a short time in the overview. When the symbol is visible again, the restart of the extender module was successful.
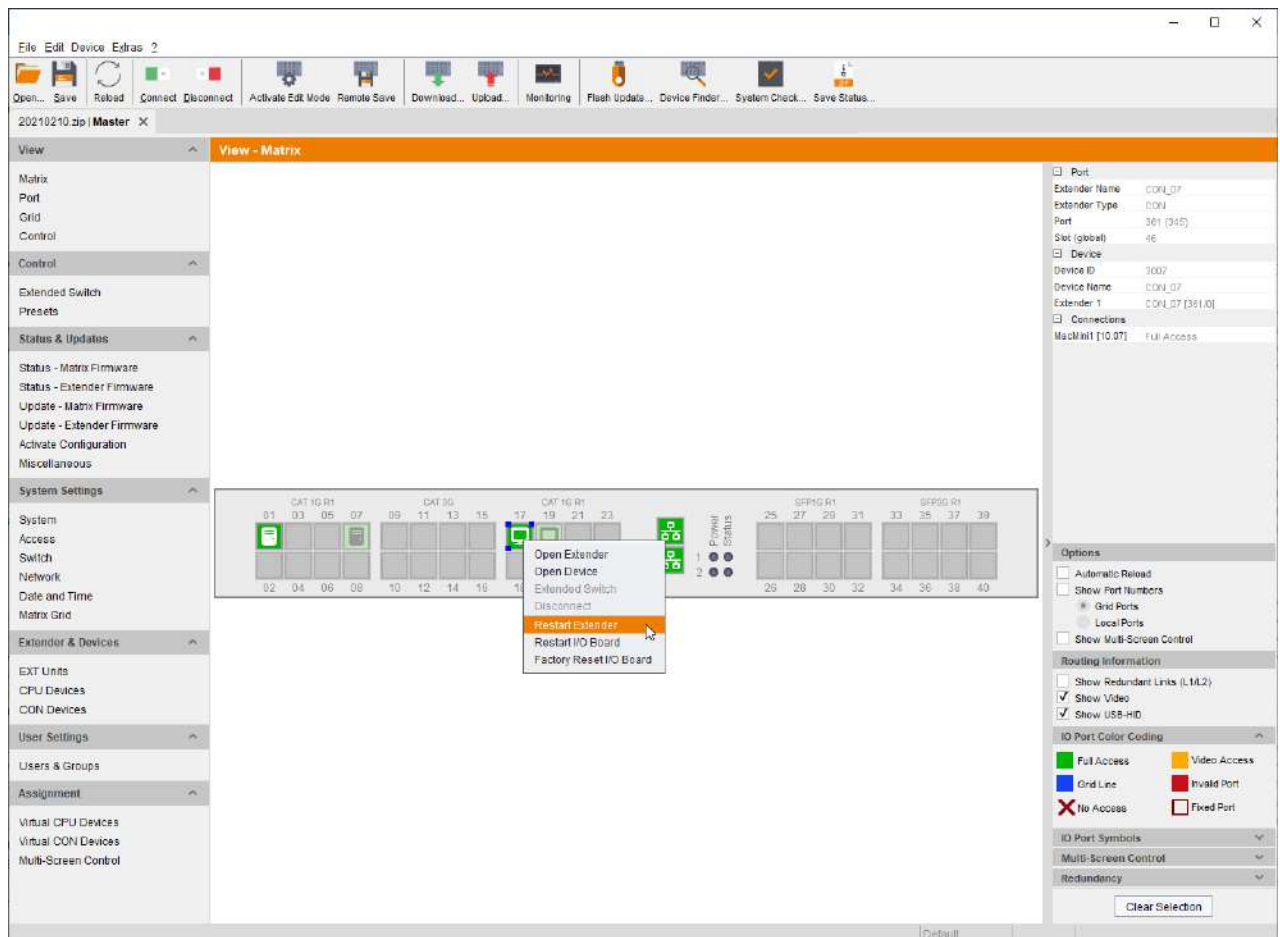
Fig. 242   Management software **View - Matrix - Restart Extender**

9.10.5 Powering Down the Matrix

NOTICE
After shutting down, the matrix can be disconnected from the power supply.

To shut down the matrix, proceed as follows:

1. Select **Device > Advanced Service > Shut down Matrix** in the menu bar.

    An access window appears.

2. Enter the username and password of the administrator.

3. Click the **Ok** button.
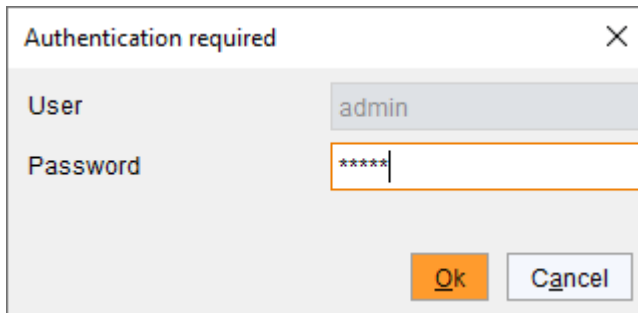
*Fig. 243   Management software dialog **Log in administrator***

A query to shut down the matrix appears.

4. Click the **Yes** button to start the shutdown.
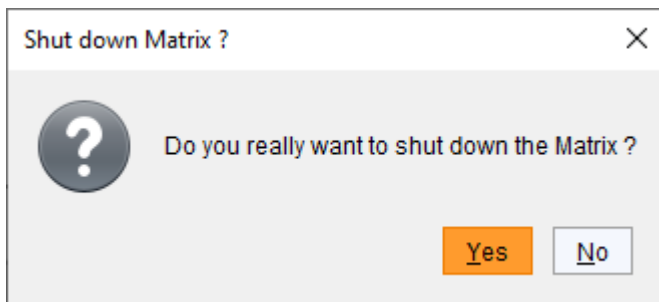
*Fig. 244   Management software dialog **Shut down Matrix***

The current configuration is saved in the permanent memory of the matrix and the matrix will be shut down.

After shutting down, a notification to power off the matrix appears.
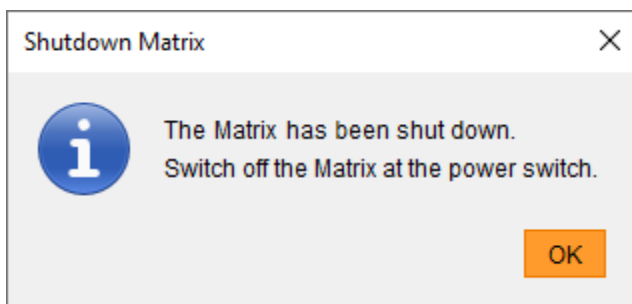
*Fig. 245   Management software notification **Switch off Matrix***

9.10.6 Resetting the Matrix to the Factory Settings
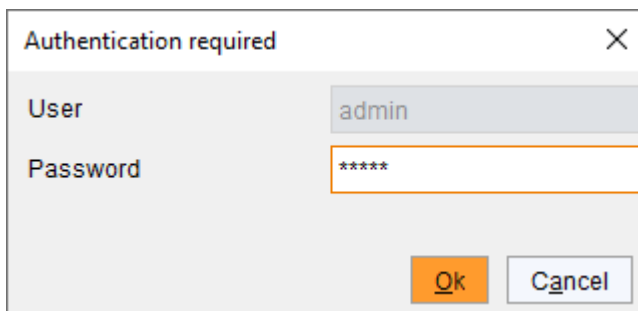
NOTICE
If you perform a (factory) reset, all current settings and all configurations stored in the matrix will be lost. This also applies to the network parameters (reset to default IP-address) and the admin password.

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

To perform a reset of the matrix, proceed as follows:

1. Select **Device > Advanced Service > Factory Reset > Factory Reset** in the menu bar.

   An access window appears.

2. Enter the username and password of the administrator.

3. Click the **Ok** button to confirm your entries.
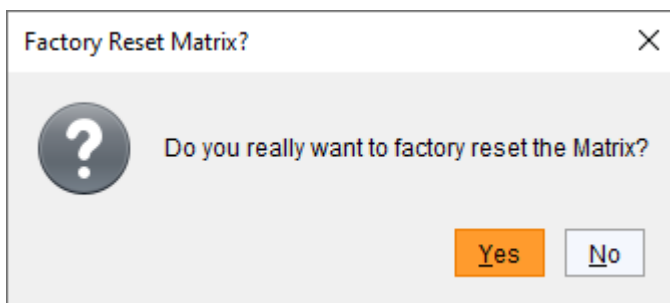
*Fig. 246   Management software dialog **Log in administrator***

A query to reset the matrix appears.

4. Click the **Yes** button to reset the device.

*Fig. 247   Management software dialog **Factory Reset Matrix***

The matrix is reset to factory settings.

9.10.7 Resetting an I/O Board to the Factory Settings

NOTICE
If you perform a (factory) reset, all current settings and all configurations of the I/O board will be lost.

ℹ️ If a firmware update has been installed since the delivery, the I/O boards will be set to the state defined there.

To perform a reset of an I/O board, proceed as follows:

1. Select **View > Matrix** in the task area.
2. Click with the right mouse button on the symbol of an extender of the I/O board to be reset.

    A context menu appears.
3. Select the **Factory Reset I/O Board** function in the context menu.

    Note: The I/O board will be restarted immediately without user confirmation. The I/O board will disappear for a short time in the overview. When the I/O board and the extender modules are visible again, the reset of the I/O board was successful.
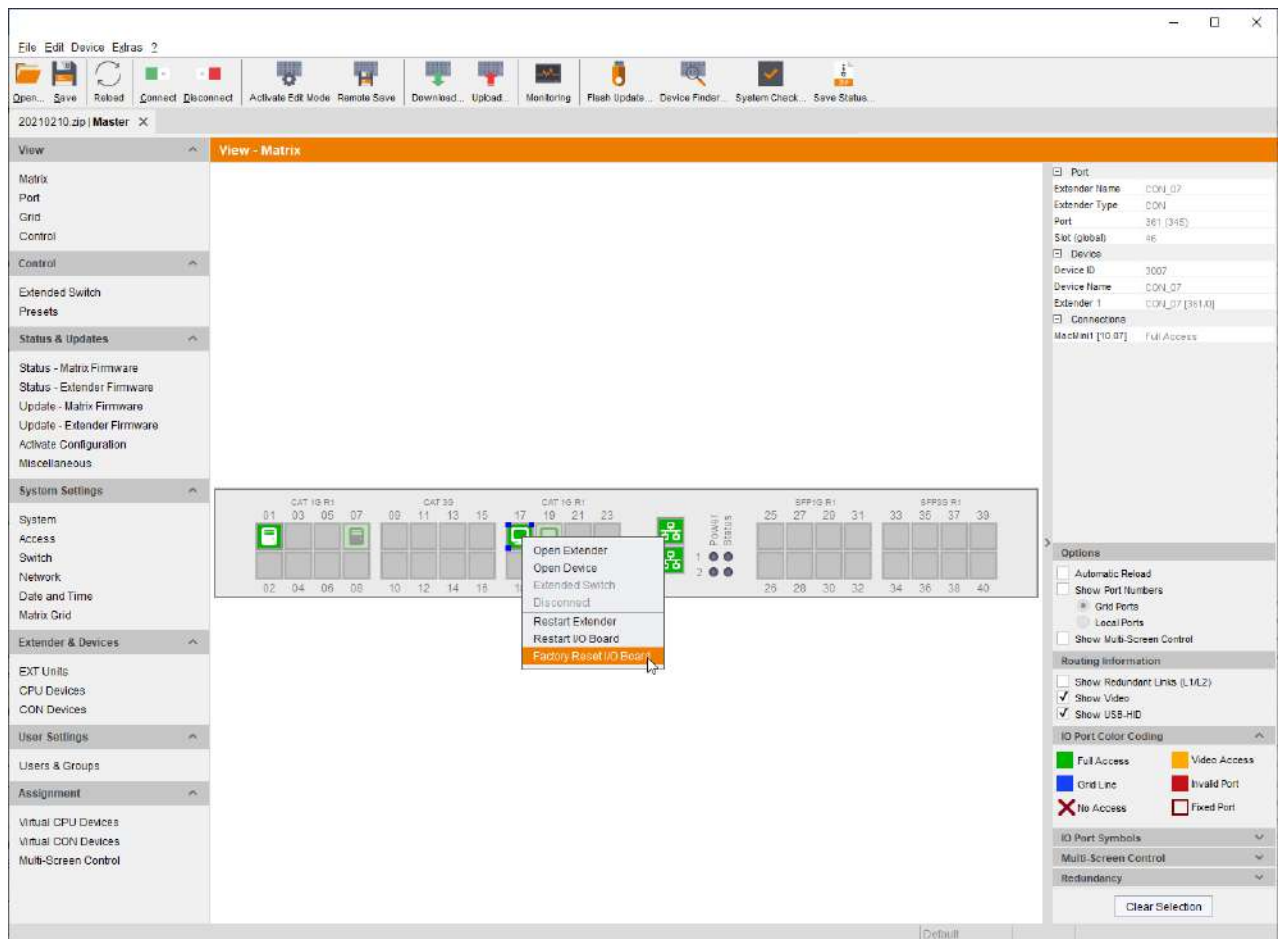
*Fig. 248   Management software **View - Matrix - Context menu***

9.11   Summary of Keyboard Commands

In the following you find a summary of keyboard commands that can activate extender and matrix functions after executing the Hot Key.

Extender

Keyboard Command	Description
`<Hot Key>, <a>`	Download of an EDID for the monitor connected to the CON Unit into the CPU Unit
`<Hot Key>, <k>, <1>, <Enter>`	Switch to the KVM connection 1 (only with HDMI CON Units with available connection for a local source)
`<Hot Key>, <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)
`<Hot Key>, <l>, <Enter>`	Switch to local source (computer, CPU) (only with HDMI CON Units with available connection for a local source)
`<Hot Key>, <h>, <w>, <Enter>`	USB-HID Ghosting: Write device descriptions of the input devices connected to the CON Unit into the CPU Unit. Activate the emulation in the CPU Unit.
`<Hot Key>, <h>, <e>, <Enter>`	Activate the emulation of already stored device descriptions in the CPU Unit
`<Hot Key>, <h>, <d>, <Enter>`	Deactivate the emulation of active device descriptions in the CPU Unit. The input devices connected to the CON Unit will be passed transparently to the source (computer, CPU).
`<Hot Key>, <h>, <r>, <Enter>`	Deactivate the emulation of active device descriptions in the CPU Unit. Delete the descriptions out of the CPU Unit. The input devices connected to the CON Unit will be passed transparently to the source (computer, CPU).
`<Hot Key>, <d>, <1>, <Enter>`	Switch to video channel 1 of the Dual-Head CPU Unit (482 series only)
`<Hot Key>, <d>, <2>, <Enter>`	Switch to video channel 2 of the Dual-Head CPU Unit (482 series only)

Matrix

Keyboard Command	Description
`<Hot Key>, <o>`	Open OSD
`<Hot Key>, <s>, <o>`	Open OSD of the sub matrix in a cascaded environment
`<Hot Key>, <Backspace>`	Close the current connection of the own CON Device
`<Hot Key>, <p>`	Switch back to the previous connected source (computer, CPU) with a KVM connection
`<Hot Key>, <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)
`<Hot Key>, <F1> ... <F16>`	Execute a predefined macro (macro 1 to 16)
`<Hot Key>, <Left Shift> + <F17> ... <F32>`	Execute a predefined macro (macro 17 to 32)

Keyboard Command	Description
`<Hot Key>, <c>, <new Hot Key code>, <Enter>`	Change the Hot Key according to the predefined Hot Key table
`<Hot Key>, <c>, <0>, <new Hot Key>, <Enter>`	Define a freely selectable Hot Key
`<Hot Key>, <f>, <new Hot Key Code>, <Enter>`	Change the Hot Key for direct OSD access according to the predefined Hot Key table
`<Hot Key>, <f>, <0>, <new Hot Key>, <Enter>`	Define a freely selectable Hot Key for direct OSD access
`<Hot Key>, <Num 0>`	Switch the USB-HID signal to the user's display (CON Unit with keyboard and mouse)
`<Hot Key>, <f>, <0>, <Del>, <Enter>`	Delete Hot Key for direct OSD access
`<Right Shift> + <Del>` within 5 s after plugging in a keyboard	Reset Hot Key back to default settings
`<Hot Key>, <Num 1>`	Switching of the USB-HID signals to display 1
`<Hot Key>, <Num 2>`	Switching of the USB-HID signals to display 2
`<Hot Key>, <Num 3>`	Switching of the USB-HID signals to display 3
`<Hot Key>, <Num 4>`	Switching of the USB-HID signals to display 4

10   Specifications

10.1   Interfaces

10.1.1   RJ45 (Network)

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

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

10.1.2   RJ45 (Interconnect)

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

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

10.1.3   Fiber SFP Type LC (Interconnect)

The communication of fiber devices is performed via Gigabit SFPs that are connected to suitable fibers fitted with connectors type LC (see (chapter 10.2.2, page 316).

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

NOTICE
SFP modules can be damaged by electrostatic discharge (ESD).
➨ Please consider ESD handling specifications.

10.2   Interconnect Cable

10.2.1   Cat X

NOTICE
Transmission problems
Routing over an active network component, such as an Ethernet Hub, Router or Matrix, is not allowed. Operation with several patch fields is possible.
➡ Establish a point-to-point connection.
➡ Avoid routing Cat X cables along power cables.

NOTICE
Exceeding the limit of the device class
The use of unshielded Cat X cables with higher electromagnetic emissions / radiation can exceed the limit values for the specified device class.
➡ Correctly install shielded Cat X cable throughout interconnection, to maintain regulatory EMC compliance.

NOTICE
Exceeding limit values for electromagnetic radiation
The limit values for the electromagnetic radiation of the device are complied with if ferrites are mounted on both sides of all Cat X cables near the device. With installed ferrites, the devices meet the EU guidelines for electromagnetic compatibility. The operation of the devices without mounted ferrites leads to a loss of conformity with the EU directives.
➡ Mount ferrites on both sides of all Cat X cables near the device to maintain regulatory EMC compliance.

Type of Interconnect Cable

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

Type of cable	Specification
Cat X installation cable AWG24	S/UTP (Cat 5e) cable according to EIA/TIA-568-B. Four pairs of wires AWG24. Connection according to EIA/TIA-568-B (1000BASE-T).
Cat X patch cable AWG26/8	S/UTP (Cat 5e) cable according to EIA/TIA-568-B. Four pairs of wires AWG26/8. Connection according to EIA/TIA-568-B (1000BASE-T).

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

Maximum Acceptable Cable Length

Type of cable	Maximum acceptable cable length
Cat X installation cable AWG24	140 m (460 ft)
Cat X patch cable AWG26/8	70 m (230 ft)

10.2.2 Fiber

NOTICE
Transmission problems
Routing over an active network component, such as an Ethernet Hub, Router or Matrix, is not allowed. Operation with several patch fields is possible.
➡ Establish a point-to-point connection.
➡ Avoid routing Cat X cables along power cables.

Type of Interconnect Cable*

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

* Cable notations according to VDE

Maximum Acceptable Cable Length

Type of cable	Maximum acceptable cable length
Single-mode 9 µm	10,000 m (32,808 ft)
Single-mode 9 µm XV	5,000 m (16,404 ft)
Multi-mode 50 µm (OM3)	1,000 m (3,280 ft)
Multi-mode 50 µm	400 m (1,312 ft)
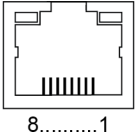
ℹ Using single-mode SFPs with multi-mode fibers, the ranges can be increased.

Type of Connector
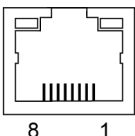
Connector	Type
Plug-in connector	LC-Connector

10.3 Connector Pinouts

10.3.1 RJ45 (Network)

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

10.3.2 RJ45 (Interconnect)

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

10.3.3 Fiber SFP Type LC

Connector	Diode	Signal
	1	Data OUT
1 2	2	Data IN

10.4 Power Supply, Current Draw and Power Consumption

10.4.1 Power Supply, Current Draw and Power Consumption Draco tera flex Cat X 1G

Product type	Maximum current	Maximum voltage (AC)	Frequency	Power consumption
K480-C16	3,918 mA	100 to 240 V	50/60 Hz	53.7 W
K480-C24	5,057 mA	100 to 240 V	50/60 Hz	69.3 W
K480-C32	6,196 mA	100 to 240 V	50/60 Hz	85.0 W
K480-C40	7,334 mA	100 to 240 V	50/60 Hz	100.6 W
K480-C48	9,600 mA	100 to 240 V	50/60 Hz	126.6 W
K480-C64	11,933 mA	100 to 240 V	50/60 Hz	157.4 W
K480-C80	14,267 mA	100 to 240 V	50/60 Hz	188.1 W
K480-C120	21,900 mA	100 to 240 V	50/60 Hz	279.6 W
K480-C128	23,067 mA	100 to 240 V	50/60 Hz	294.5 W
K480-C144	25,400 mA	100 to 240 V	50/60 Hz	324.3 W
K480-C160	27,733 mA	100 to 240 V	50/60 Hz	354.0 W

10.4.2 Power Supply, Current Draw and Power Consumption Draco tera flex Cat X 3G

Product type	Maximum current	Maximum voltage (AC)	Frequency	Power consumption
K480-CX16	5,318 mA	100 to 240 V	50/60 Hz	72.9 W
K480-CX24	7,157 mA	100 to 240 V	50/60 Hz	98.1 W
K480-CX32	8,996 mA	100 to 240 V	50/60 Hz	123.4 W
K480-CX40	10,834 mA	100 to 240 V	50/60 Hz	148.6 W
K480-CX48	13,800 mA	100 to 240 V	50/60 Hz	182.0 W
K480-CX64	17,533 mA	100 to 240 V	50/60 Hz	231.2 W
K480-CX80	21,267 mA	100 to 240 V	50/60 Hz	280.4 W
K480-CX120	32,400 mA	100 to 240 V	50/60 Hz	413.6 W
K480-CX128	34,267 mA	100 to 240 V	50/60 Hz	437.4 W
K480-CX144	38,000 mA	100 to 240 V	50/60 Hz	485.1 W
K480-CX160	41,733 mA	100 to 240 V	50/60 Hz	532.8 W

10.4.3 Power Supply, Current Draw and Power Consumption Fiber 1G & 3G

Product type	Maximum current	Maximum voltage (AC)	Frequency	Power consumption
K480-F16 / -FX 16	3,918 mA	100 to 240 V	50/60 Hz	53.7 W
K480-F24 / -FX24	5,057 mA	100 to 240 V	50/60 Hz	69.3 W
K480-F32 / -FX32	6,196 mA	100 to 240 V	50/60 Hz	85.0 W
K480-F40 / -FX40	7,334 mA	100 to 240 V	50/60 Hz	100.6 W
K480-F48 / -FX48	9,600 mA	100 to 240 V	50/60 Hz	126.6 W
K480-F64 / -FX64	11,933 mA	100 to 240 V	50/60 Hz	157.4 W
K480-F80 / -FX80	14,267 mA	100 to 240 V	50/60 Hz	188.1 W
K480-F120 / -FX120	21,900 mA	100 to 240 V	50/60 Hz	279.6 W
K480-F128 / -FX128	23,067 mA	100 to 240 V	50/60 Hz	294.5 W
K480-F144 / -FX144	25,400 mA	100 to 240 V	50/60 Hz	324.3 W
K480-F160 / -FX160	27,733 mA	100 to 240 V	50/60 Hz	354.0 W

10.4.4 Power Supply, Current Draw and Power Consumption Hybrid 1G

Product type	Maximum current	Maximum voltage (AC)	Frequency	Power consumption
K480-C24F16	7,334 mA	100 to 240 V	50/60 Hz	100.6 W
K480-C24F40	11,933 mA	100 to 240 V	50/60 Hz	157.4 W
K480-C40F24	11,933 mA	100 to 240 V	50/60 Hz	157.4 W
K480-C40F40	14,267 mA	100 to 240 V	50/60 Hz	188.1 W
K480-C80F40	21,900 mA	100 to 240 V	50/60 Hz	279.6 W
K480-C80F80	27,733 mA	100 to 240 V	50/60 Hz	354.0 W
K480-C120F40	27,733 mA	100 to 240 V	50/60 Hz	354.0 W

10.4.5 Power Supply, Current Draw and Power Consumption Hybrid 3G

Product type	Maximum current	Maximum voltage (AC)	Frequency	Power consumption
K480-CX24FX16	9,434 mA	100 to 240 V	50/60 Hz	129.4 W
K480-CX24FX40	14,033 mA	100 to 240 V	50/60 Hz	185.1 W
K480-CX40FX24	17,433 mA	100 to 240 V	50/60 Hz	229.9 W
K480-CX40FX40	17,7677 mA	100 to 240 V	50/60 Hz	234.3 W
K480-CX80FX40	28,067 mA	100 to 240 V	50/60 Hz	358.3 W
K480-CX80FX80	33,067 mA	100 to 240 V	50/60 Hz	422.1 W
K480-CX120FX40	37,400 mA	100 to 240 V	50/60 Hz	477.4 W

10.5 Environmental Conditions and Emissions

Parameter	Value
Operating Temperature	5 to 45 °C (41 to 113 °F)
Storage Temperature	-25 to 60 °C (-13 to 140 °F)
Relative Humidity	Max. 80% non-condensing
Operating Altitude	Max. 2.500 m (7,500 ft)
Heat Dissipation	Corresponds to power consumption in Watt (W)

10.6 Dimensions

Product/ Packaging	Dimension	Dimension incl. shipping box
Draco tera flex 1RU chassis	442 x 449 x 44 mm (17.4" x 17.7" x 1.7")	602 x 526 x 154 mm (23.7" x 20.7" x 6.1")
Draco tera flex 2RU chassis	442 x 449 x 90 mm (17.4" x 17.7" x 3.5")	602 x 526 x 208 mm (23.7" x 20.7" x 7.9")
Draco tera flex 4RU chassis	442 x 449 x 177 mm (17.4" x 17.7" x 7.0")	640 x 570 x 360 mm (25.2" x 22.4" x 14.2")

10.7 Weight

Product	Max. weight in maximum equipment
Draco tera flex 1RU chassis	7.7 kg (17 lb)
Draco tera flex 2RU chassis	11 kg (24.3 lb)
Draco tera flex 4RU chassis	19 kg (41.9 lb)

10.8 MTBF

The following table contains the mean time between failure (MTBF) in power-on hours (POH). 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 (E_a) 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%.

Under these standard conditions, the MTBF for the components of the Draco tera flex matrices are estimated as follows:

Component	MTBF in POH
Draco tera flex 1RU chassis (incl. fans and PSUs)	71,900
Draco tera flex 2RU chassis (incl. fans and PSUs)	74,300
Draco tera flex 4RU chassis (incl. fans and PSUs)	65,400
I/O card Cat X 1G	899,200
I/O card Cat X 3G	474,800
I/O card fiber 1G & 3G (without SFP modules)	878,700

11 Maintenance

The device contains no user serviceable parts inside.

➡ Do not attempt to open or repair the device.
➡ Please contact your dealer or manufacturer if there is a fault.

12   Troubleshooting

The following chapters provide help in case of problems with the matrix. The content of this help is based on an already functioning extender section. Before operating your extender modules with the matrix, please make sure that the extender modules work via a direct point-to-point connection. A Cat X or fiber optic coupler can be used to support this. In case of problems in this regard, the manuals of the respective extender modules offer assistance if necessary.

12.1   External Failure

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

12.2   Video Interference

Diagnosis	Possible reason	Measure
Opening the OSD not possible	No OSD jumper set	➡ Set jumper 11 on the CON Unit.
Incorrect video display	Cable connection disturbed	➡ Check the connection, length, and quality of the interconnect cable to the units.

12.3   Malfunction of Fans

Diagnosis	Possible reason	Measure
Fans do not run	Fans defective	➡ Contact your dealer.

12.4   Malfunction of Power Supply Units

Diagnosis	Possible reason	Measure
Matrix cannot be started	No power supply available	➡ Check if power supply cables are connected correctly.
	Power supply units are not switched on	➡ Check switch on the power supply units.

12.5   Network Error

Diagnosis	Possible reason	Measure
Network settings are not assumed after editing.	Restart of the matrix not yet completed.	➡ Restart the matrix.

12.6   Failure at the Matrix

Diagnosis	Possible reason	Measure
Port definitions as USB 2.0 invalid.	Restart of the matrix not yet completed.	➡ Restart the matrix.
No OSD access possible.	Wrong Hot Key	➡ Reset Hot Key if necessary (see chapter 5.1.1, from page 46).

12.7   Failure at the Interconnection Port

12.7.1 Error Indication at the 1G Cat X Port
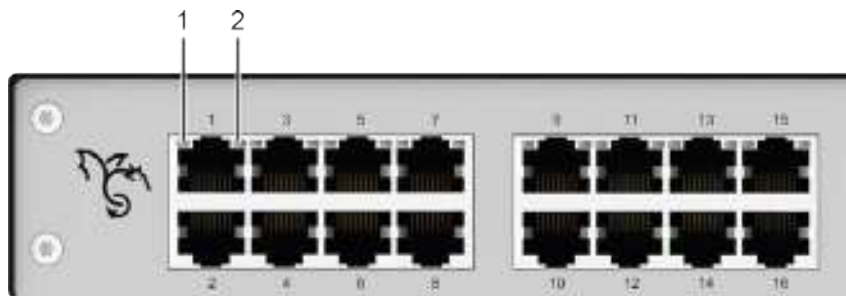
Fig. 249   LEDs of I/O module 1G Cat X

Diagnosis	Possible reason	Measure
LED 1 or LED 2 flashing orange	Connections CON Unit, matrix, and CPU Unit.	➡ Check connecting cables and connectors (cable break, CPU/CON Unit offline). ➡ Connect a 3G extender to a 3G port. ➡ Contact dealer if necessary.

12.7.2 Error Indication at the 3G Cat X Port
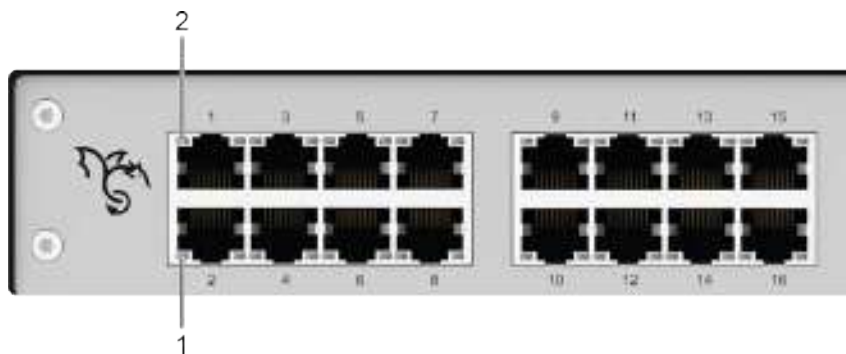
Fig. 250   LEDs of I/O module 3G Cat X

Diagnosis	Possible reason	Measure
LED 1 or LED 2 flashing orange	Connections CON Unit, matrix, and CPU Unit.	➡ Check connecting cables and connectors (cable break, CPU/CON Unit offline). ➡ Connect a 1G extender to a 1G port. ➡ Contact dealer if necessary.

12.7.3 Error Indication at the Fiber Port

Fig. 251   LEDs of I/O module fiber

Diagnosis	Possible reason	Measure
LED 1 or LED 2 flashing red	Connections CON Unit, matrix and CPU Unit.	➡ Check connecting cables and connectors (cable break, CPU/CON Unit offline). ➡ Connect a 3G extender to a 3G port. ➡ Contact dealer if necessary.

12.8   Blank Screen

Fig. 252   Status LEDs for power supply

1 Status LED for power supply 1	2 Status LED for power supply 2

Diagnosis	Possible reason	Measure
LED 1 and LED 2 off	Power supply	➡ Check the connection to the power network.
Monitors remains dark after switching operation	Switching to a port without connected source (computer, CPU).	➡ Switch to a Port with a connected source (computer, CPU).
	Connections CON Unit, matrix, and CPU Unit.	➡ Check connecting cables and connectors (no cable, cable break, CPU/CON Unit offline, CPU/CON Unit connected to the wrong port (see chapter 12.7, from page 322)).

✅ For further measures see user manual of the respective extender series.

13   Technical Support

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

13.1   Support Checklist

To efficiently handle your request, it is necessary that you complete a support request checklist (Download). Please ensure that you have the following information available before you call:

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

13.2   Shipping Checklist

1. To return your device, you need an RMA number (Return-Material-Authorization). Therefore, please contact your dealer.
2. Package your devices carefully. Add all pieces which you received originally. Preferably use the original box.
3. Note your RMA number visibly on your shipment.

Devices that are sent in without an RMA number will not be accepted. The shipment will be sent back without being opened; postage unpaid.

14   Certificates/Directives

14.1   North American Regulatory Compliance

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

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

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

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

14.2   WEEE

The manufacturer complies with the EU Directive 2012/19/EU on the prevention of waste electrical and electronic equipment (WEEE).

The device labels carry a respective marking.

14.3   RoHS

This device complies with the Directive 2011/65/EU of the European Parliament and of the council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (including the Commission Delegated Directive (EU) 2015/853 of 31 March 2015 amending Annex II to Directive 2011/65/EU).

The device labels carry a respective marking.

15   Glossary

The following terms are commonly used in this manual or in video and KVM technology.

Term	Description
Auto Disconnect	Matrix function that allows an automatic disconnect between a CON Device and a CPU Device, if the OSD is opened via this CON Device.
Auto Logout	Matrix function that describes the duration of inactivity after the user has been logged out from the OSD at this CON Device.
Cat X	Any Cat 5e (Cat 6, Cat 7) cable
CON Device	Logical term that summarizes several physical extender modules to switch more complex sink systems via matrix.
CON Timeout	Matrix function that allows an automatic disconnect of the own CON Device from the connected CPU Device after a predefined time.
CON Unit	Component of a KVM Extender or Media Extender to connect to the console (monitor(s), keyboard, and mouse; optionally also with USB 2.0 devices)
Console	Keyboard, video, and mouse
Console ACL	Console Access Control List is a list that shows the respective switching rights for the various CON Devices.
CPU Auto Connect	Matrix function that allows an automatic connection establishment between the own CON Device and a random CPU Device that is available.
CPU Device	Logical term that summarizes several physical extender modules to switch more complex source systems via matrix.
CPU Timeout	Matrix function that allows the user to disconnect after a predefined period of inactivity from the respective CPU Device.
Dual Access	A system to operate a source (computer, CPU) from two sinks (consoles)
Dual-Head	A system with two video connections
EXT Unit	Unit to manage an extender module physically connected to the matrix via direct cable connection. Add-on modules, if applicable, are included in the EXT Unit of the respective extender module. Dual-Head extender module will be managed as two independent EXT Units.
Fiber	Single-mode or multi-mode fiber cables
Force Connect	Matrix function that allows to switch with the own CON Device to a CPU Device that is already used and in doing so to take keyboard and mouse control. The connected CON Device so far loses K/M control but keeps video control.
Force Disconnect	Matrix function that allows to switch with the own CON Device to a CPU Device that is already used and in doing so to take KVM control. The connected CON Device so far loses complete KVM control.
KVM	Keyboard, video, and mouse
Keyboard Connect	Matrix function that allows taking over the keyboard control of an inactive CON Device.
Macro Keys	Programmable keys that can execute a stringing together of commands to the matrix.
Mouse Connect	Matrix function that allows taking the mouse control of an inactive CON Device.
MTBF	Mean Time Between Failure (MTBF) is measured in power-on hours.
Multi-mode	50 µm multi-mode fiber cable

Term	Description
Multi-Screen Control	Control of USB-HID of up to eight sources (computer, CPU) at one sink with only one connected mouse or keyboard. The sink can consist of up to eight monitors, or up to sixteen monitors when operating Dual-Head Sources. In a matrix system, Multi-Screen Control can be set up at multiple sinks.
Non-Blocking Access	Matrix configuration where no user can be disturbed by an activity of another user.
OSD	The On-Screen-Display is used to display information or to operate a device.
OSD Timeout	Matrix function that closes the OSD automatically after a predefined period of inactivity.
POH	Power-on hours corresponds to the average operating time
Quad-Head	A system with four video connections
Release Time	Matrix function that allows a CON Device that is connected with the same CPU Device to release the K/M control after a predefined time.
Service Mode	Defined maintenance condition that allows updating of extender modules that are connected to the matrix.
SFP	SFPs (Small Form Factor Pluggable) are pluggable interface modules for Gigabit connections. SFP modules are available for Cat X and fiber interconnect cables.
Single-Head	A system with one video connection
Single-mode	9 µm single-mode fiber cable
Tie Line	Communication connection to and between extension modules in a network environment.
USB-HID	USB-HID devices (Human Interface Device) allow for data input. There is no need for a special driver during installation; "New USB-HID device found" is reported. Typical USB-HID devices include keyboards, mice, graphics tablets and touch screens. Storage, video, and audio devices are **not** HID.
User ACL	User Access Control List is a list that shows the respective switching rights for the various users.
Video Sharing	Matrix function that allows switching from the user's CON Device to any CPU Device with video.

16   Table of Figures

17   Change log

This table offers an overview about the most important changes available through firmware updates, such as new functions, changed configuration or operation.

Edition	Date	Firmware version	Software version	Chapter	New functions / changes
REV01.00	2021-04-20	See chapter 1.1	See chapter 1.1	-	Initial user manual