Draco tera IP Gateway

Functional Quick Setup Guide Series 480

Introduction

This manual contains important safety instructions as well as instructions for setting up the product and operating it. Read carefully through the User Manual before you switch on the product. Observe the general safety instructions (see chapter 2, page 8) and additional instructions in the respective chapters.

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 distributor or the support of IHSE GmbH (see chapter 11, page 42).

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 Draco tera IP Gateway. Please note the change log for this manual in chapter 15, page 46.

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.

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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   Purpose of this manual

This manual describes the settings for using Draco tera IP Gateways with Draco vario IP Gateway CONs. This manual serves as a supplement to the Draco tera manuals. For comprehensive information about IHSE matrix systems, please refer to the Draco tera manuals.

1.2   Firmware and Software

The information in this manual refers to the latest extender firmware available at the date of manual release. Please refer to the change log (see chapter 15, page 46) for user manual updates.

1.3   Symbols for Warnings and Helpful Information

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

⚠ WARNING
WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION
CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

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

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

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

1.4   Terms and Spellings

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

The following spellings are used for products and system descriptions:

Term	Description
Tera Tool	Management software
Source	Computer, graphics card (USB, video, audio, data)
Sink	Console (monitor, keyboard, mouse, video, audio, data)
CPU Unit	Encoder to connect to the source.
CON Unit	Decoder to connect at the peripherals.
IP Gateway	Draco tera IP Gateway, a Draco tera matrix containing an IP Gateway board
IP Gateway CON	Draco vario IP Gateway CON, a Draco vario extender module (decoder) containing the IP Gateway technology

The following spellings are used for keyboard commands:

Keyboard command	Description
key	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 spelling is used for, e.g., descriptions of editing files or updating firmware:

Keyboard command	Description
Config.txt	E.g., file name
#CFG	E.g., file content

The following spellings are used for software descriptions:

Spelling	Description
Bold print	Description of terms that are used in the management software, e.g., menus and buttons
Bold print > Bold print	Management software: selection of a menu item in the menu bar or the toolbar, e.g., **Extras > Options**

Mouse button	Description
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 the used operating system.

Descriptions containing "click", "mouse click" or "double-click" each means a click with the primary (left) mouse button. If the right mouse button has to be used, this is explicitly declared in the description.

1.5   Intended Use

The IP Gateway is used to establish connections via IP from consoles (monitor, keyboard, mouse, and other peripheral devices) to various sources.

The 10G IP Gateway board, available for Draco tera enterprise and Draco tera flex can be configured for eight 1G KVM channels to connect to other IP Gateways or to IP Gateway CONs for transmitting KVM, audio and data signals.

The connection between the IP Gateways or between an IP Gateway CON and a network switch can be made by 10G fiber cables.

NOTICE
Interferences when the immunity limit values are exceeded
If the limit values listed in EN55024 are exceeded, reliable and fault-free functioning of the devices cannot be guaranteed.

NOTICE
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.

1.6   Certificates/Directives

1.6.1   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.

1.6.2   EU Declaration of Conformity

Please find the EU Declaration of Conformity for the device 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.

1.6.3   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.

2   Safety instructions

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

➡   Read this user manual carefully.

➡   Read the manual for the chassis in which the extender modules are installed. The instructions, safety and warning notes contained therein must also be observed.

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

➡   Take any required ESD precautions.

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.

➡   Place the device at a sufficient distance from the operator.

Connection

➡   Check the device for visible damage before connecting it.

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

➡   Only use cables supplied by the manufacturer or cables that comply with the technical specification, see chapter 10, page 39.

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

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.

➡ Lisez le manuel d'utilisation du châssis dans lequel les modules d'extension sont installés. Les instructions, les consignes de sécurité et les avertissements qu'il contient doivent également être respectés.

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

➡ Prenez toutes les précautions nécessaires contre les décharges électrostatiques.

Emplacement de l'installation

Pendant le fonctionnement, le périphérique peut chauffer. Le périphérique 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.

➡ Placez le périphérique à une distance suffisante de l'opérateur.

Connexion

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

➡ Seulement connectez le périphérique que si le périphérique et les ports ne sont pas endommagés.

➡ Seulement utilisez des câbles fournis par le fabricant ou des câbles conformes aux spécifications techniques, voir chapitre 10, page 39.

➡ 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.

4   Description

4.1   System Overview IP Gateway

The current Draco tera flex allows to configure one of the two 10G interfaces for using as IP Gateway with eight IP KVM channels per rack unit.

4.1.1   Installation Example - Matrix System with IP Gateway Board
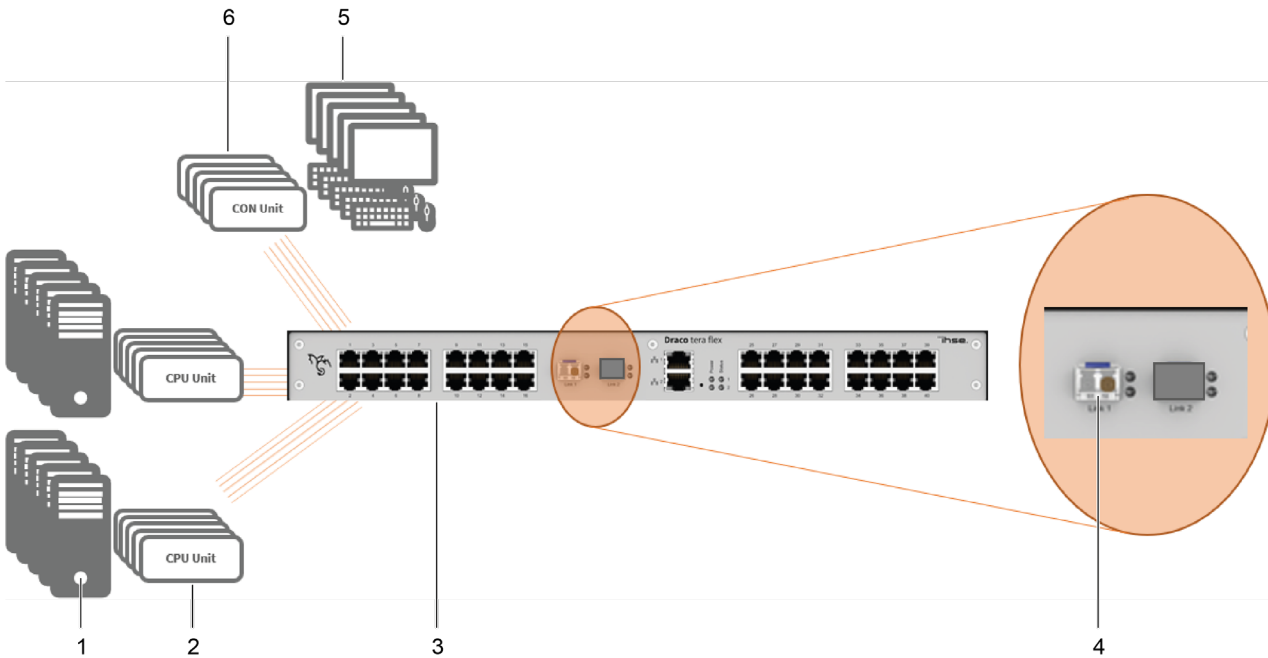
Fig. 1   Example 1 - Matrix system installation with IP Gateway board

1 Sources	4 Single-Mode Fiber LC Duplex for up to eight
2 CPU Units	1G KVM channels
3 Draco tera flex, with 10G IP Gateway board, configurable for eight 1G KVM channels	

4.1.2 Installation Example - Matrix Grid with two Matrices connected via IP Gateway Board

Fig. 2   Example - Matrix Grid Installation with two Matrices connected via IP Gateway Board

1   Draco tera flex, with 10G IP Gateway board, configured for eight 1G KVM channels

2   10G straight fiber cable with eight 1G KVM channels

3   Draco tera flex, with 10G IP Gateway board, configured for eight 1G KVM channels

4.1.3   Installation Example - Matrix System with IP Gateway CONs connected via IP Gateway

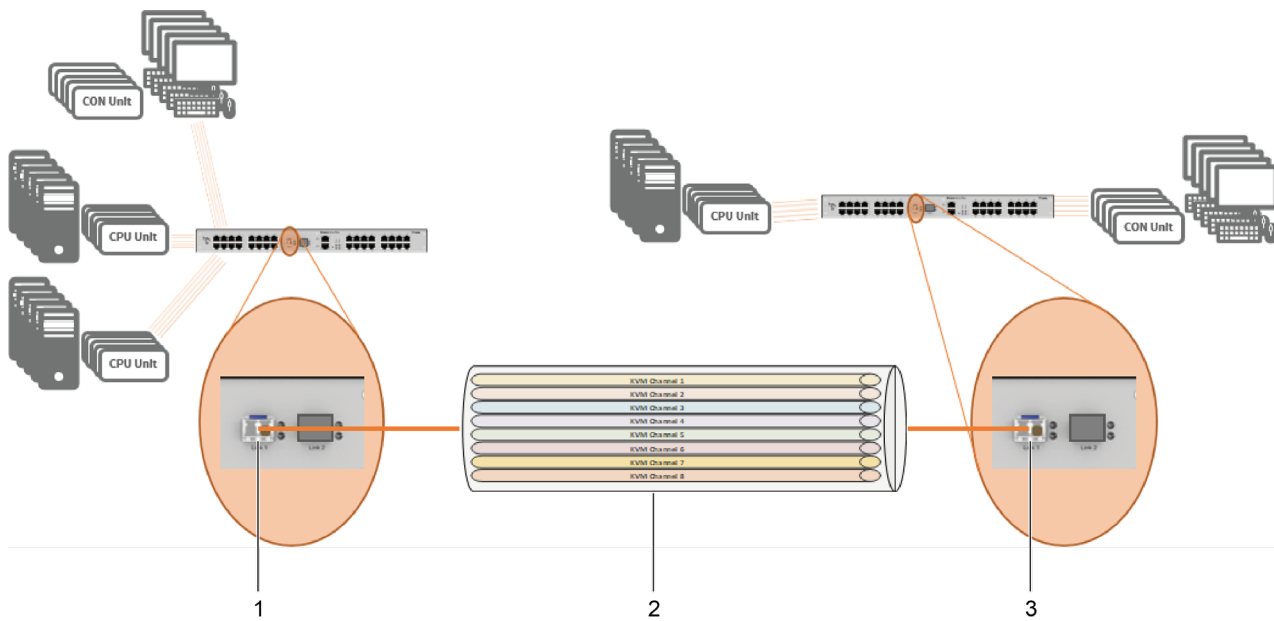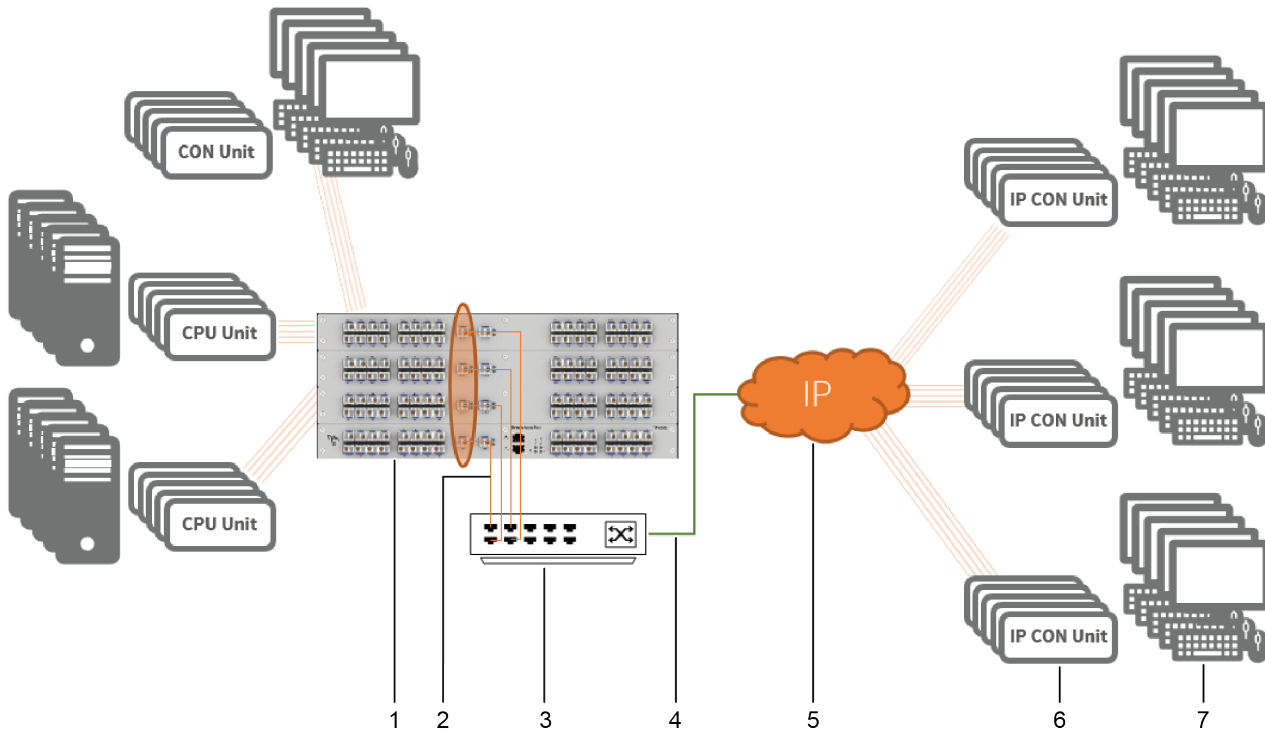*Fig. 3   Example - Matrix system with IP Gateway CONs connected via IP Gateway*

1	Draco tera flex, with 10G IP Gateway board, configured for eight 1G KVM channels	4	4x 10G network cable
2	10G straight fiber cable with eight 1G KVM channels	5	Distributed network
3	Network switch	6	IP Gateway CONs
		7	Consoles

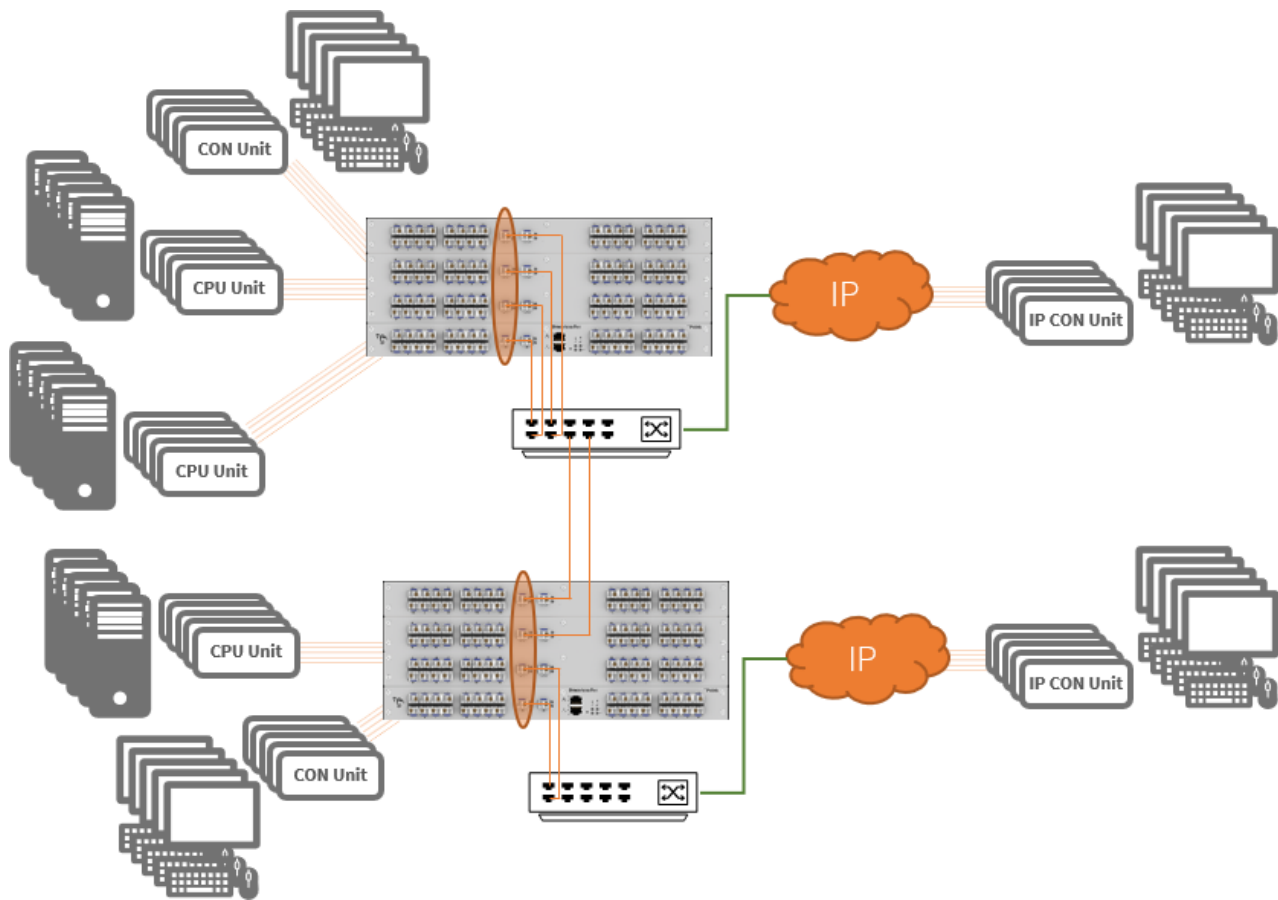### 4.1.4   Installation Example - Matrix Grid with two Matrices and IP Gateway CONs connected via IP Gateway

Fig. 4   Matrix Grid with two matrices and IP Gateway CONs connected via IP Gateway

4.2   Product Types

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

Part No.	Description
K480-C32G	Draco tera flex KVM Matrix 32 Ports + Grid, Cat X 1G, from October 2022
K480-F32G	Draco tera flex KVM Matrix 32 Ports + Grid, Fiber 1G, from October 2022
F480-G	Draco tera flex IP Gateway Module Fiber 10G

4.2.2   IP Gateway Board for Draco tera enterprise

Please contact the sales team for availability (estimated October 2022).

Product type	Description
480-IPG	Draco tera enterprise IP Gateway board - for transmission of up to 8 KVM connections @ 1G - configurable for Grid und IP console connectivity via IP L3 - backward compatible to L1 Grid using separate FW - 2x SFP+ interface - 1x 10G SFP+ Single-Mode LC ≤ 10 km

4.3   Accessories

Part. No.	Description	Interface
459-1C	SFP, bidirectional, 1G	Cat X, 1G
459-1S	SFP single-mode, LC duplex, bidirectional, 1G	Fiber, 1G
459-10X	SFP single-mode, LC duplex, bidirectional, 10G, compatible with 3G fiber extender modules	Fiber, 10G

5   Access Options

You have following options to configure and/or operate extender modules:

Access option	Description
Command Mode and Keyboard commands	The command mode allows several functions to be controlled by keyboard commands during normal use.
Tera Tool	Firmware updates for extender modules and settings for IP Gateway connection can be performed via the management software.
	The management software is available as a single executable program file that does not require an 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   Command Mode

To start the command mode, use a keyboard sequence (Hot Key) at the keyboard of a CON Unit plugged in a KVM device. The command mode can also be called up using a keyboard with USB HID interface connected to the R474-BXH add-on module.

To exit the command mode, press Esc.

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 entered within 10 seconds after activating the command mode, it will be deactivated automatically.

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

Function	Keyboard command
Start the command mode	2x Left Shift (Hot Key, factory setting)
Exit the command mode	Esc and also Left Shift + Esc, if necessary
Change the Hot Key	current Hot Key, c, new Hot Key Code, Enter

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

ℹ Hot Keys currently can only be changed at the console and only for that console.

Hot Key Code

The Hot Key to start 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, except Esc, Del and Enter
2	2x Scroll
3	2x Left Shift (default)
4	2x Left Ctrl
5	2x Left Alt
6	2x Right Shift
7	2x Right Ctrl
8	2x Right Alt

Change the current Hot Key via Hot Key Code (exemplary)

To change the current Hot Key to, e.g., 2x Left Alt, enter Hot Key, c, 5, Enter.

Set a freely selectable Hot Key (exemplary)

To set a freely selectable Hot Key (e.g., 2x Space), enter Hot Key, c, 0, Space, Enter.

ℹ Keyboard commands are fixed to the position of the keys on the keyboard. Keyboard mapping tables may vary for country-specific layouts.

➡ Note the key position of a freely defined Hot Key when changing the keyboard layout, e.g., from QWERTZ to AZERTY. E.g., if defining 2x a as Hot Key on a German or US keyboard layout, the French keyboard layout (AZERTY) requires then 2x q as Hot Key to be pressed instead

Reset the Hot Key

To set a Hot Key back to default settings, press Right Shift + Del within 5 s after switching on the CON Unit or plugging in a keyboard.

The Hot Key is set back to Left Shift.

5.2   Control Options via Management Software

5.2.1   Management Software Menu Structure

☑ The main user interface elements for options and functions of the management software are described in this chapter. This allows to keep the user manual clear. Further options and functions are explicitly declared in the respective chapters.

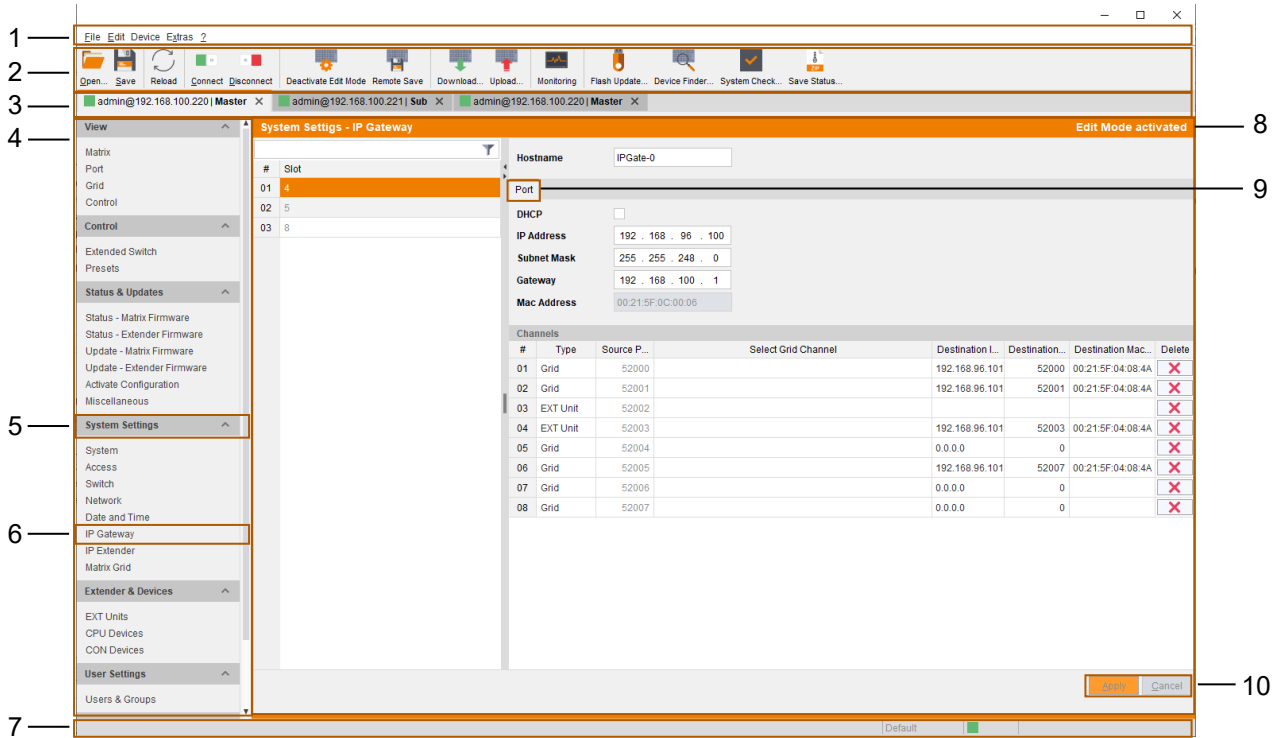The menu structure of the management software is subdivided into several sections:

Fig. 5   Management software **Menu structure**

1   Menu bar
2   Toolbar
3   Tab bar (shows connections or configurations)
4   Task area
5   Task menu
6   Task menu item

7   Status bar (shows config version, activated Edit Mode and online mode)
8   Working area
9   Tab bar (for additional menus)
10   Buttons

The following control element is included in the menus:

Designation	Element	Description
Checkbox	☐	Function is not active, disabled by default or by mouse click
	☑	Function is active, enabled by default or by mouse click

The following actions 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.

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.

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 ticking the checkbox in the upper right corner. Auxiliary names (tooltips) for the menu items can be activated under **Extras > Options** on the **Style** tab.

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.
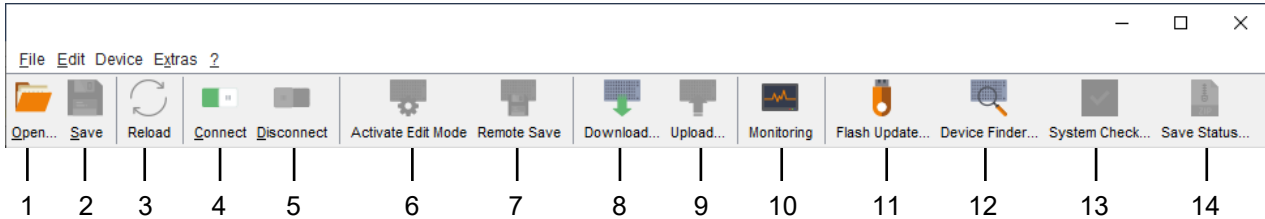

*Fig. 6   Management software **Toolbar***

1   Load a locally saved configuration
2   Save a configuration locally
3   Reload the current configuration
4   Connect to the matrix
5   Disconnect from the matrix
6   Activate/deactivate the edit mode
7   Save the active configuration on the matrix (online)
8   Download and show a predefined configuration saved on the matrix (online)

9   Upload a predefined configuration on the matrix (online)
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	Select menu, select function, open drop-down menus, enter input field, activate/deactivate option checkboxes, etc.
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
Left Arrow	Cursor to the left
Right Arrow	Cursor to the right
Up Arrow	Line up
Down Arrow	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: previous field
Left Shift + Tab	In input menus: next field
Spacebar	• Switch in selection fields between two conditions (check mark or not). • Open already marked 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

ℹ Several 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 about the current configuration of the matrix, shown in the management software, can be reloaded in different ways:

• Press F5 on the used keyboard.

• Click **Reload** in the toolbar.

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

• To activate the automatic reload option, tick 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	Results
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 sorting 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 sorting 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 displayed arrow 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 the 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. It is possible to search a combination of two words with space between.	• The filter results are shown immediately. • The filter symbol is displayed in green.
Clear the 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.

    A selection dialog appears.

2. Select contents that should be included in the report (**Matrix View**, **EXT Units**, **CPU Devices**, **CON Devices** and **Users**, etc.).

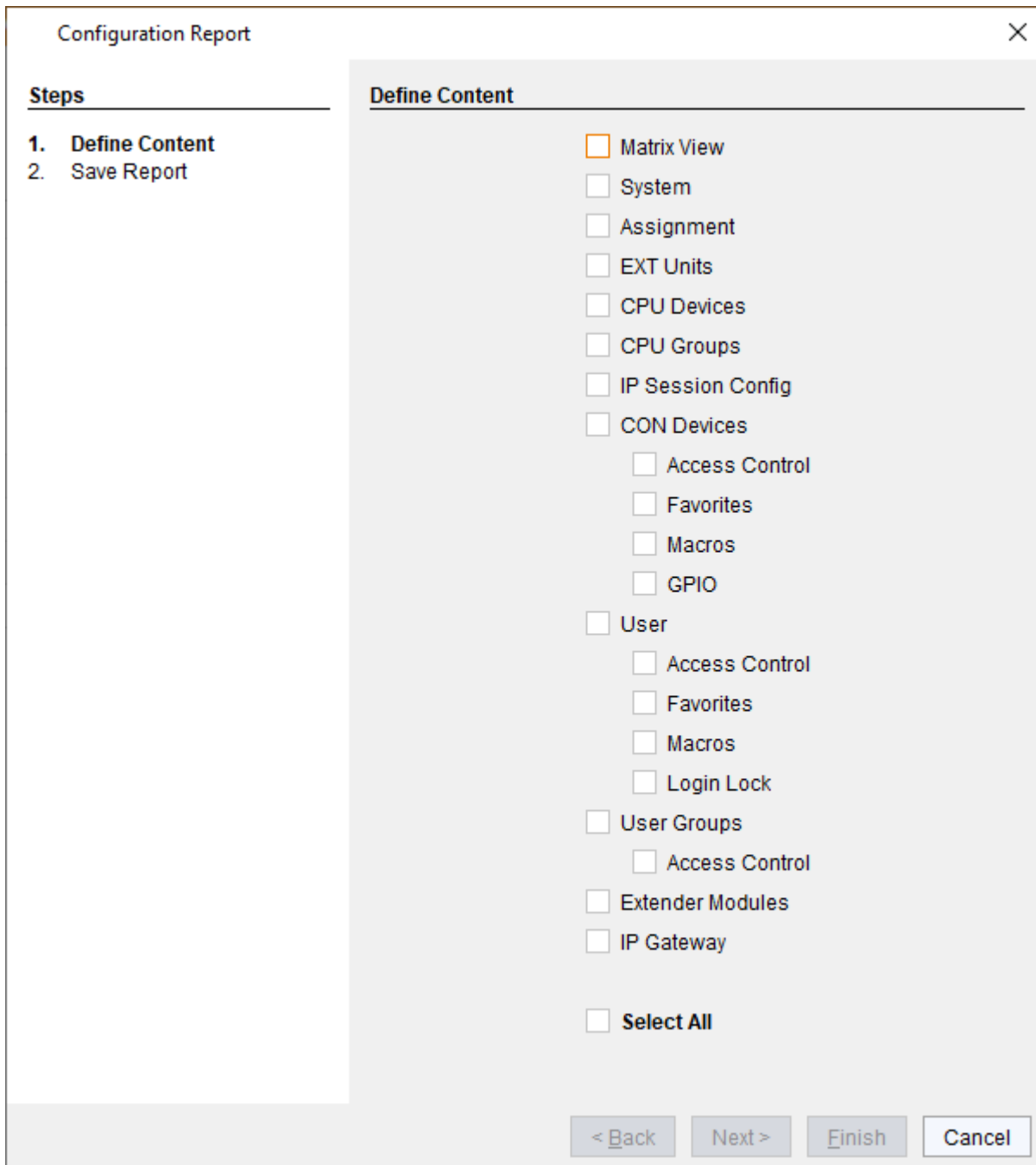3. Click **Next > >** to confirm the selection.

*Fig. 7   Management software **File - Report - Define Content***

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

5. Click **Finish** to confirm the report.
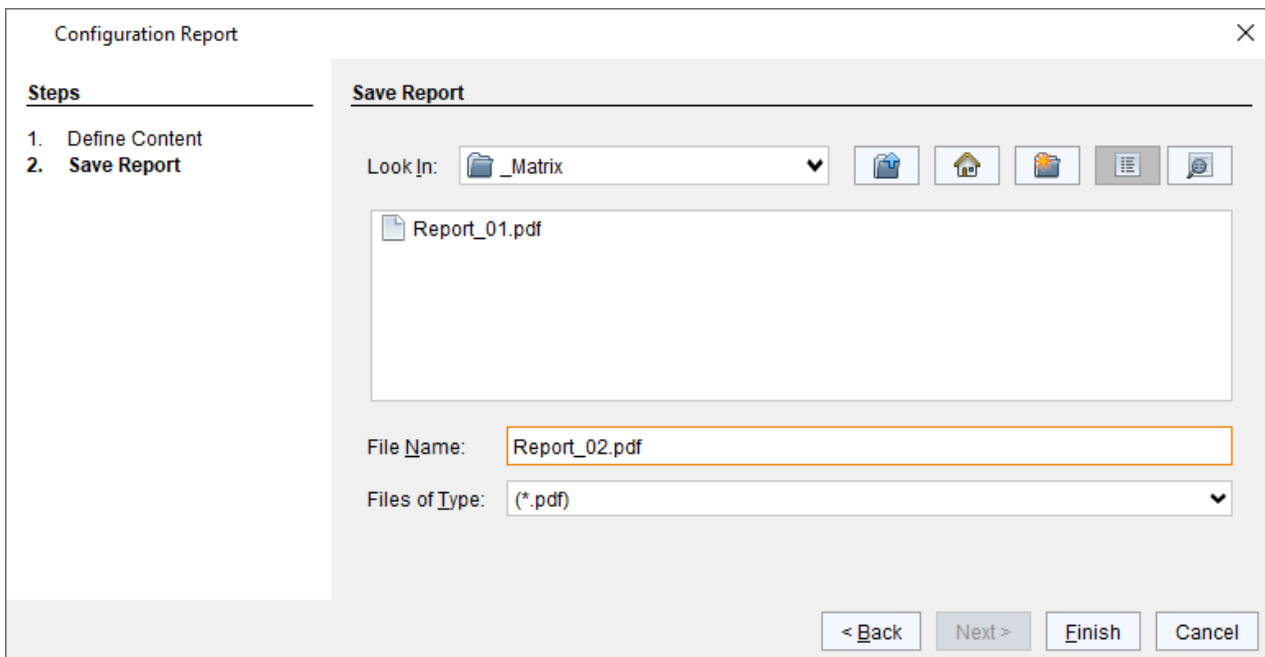
   The report will be created as a PDF file.

*Fig. 8   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 8, page 35).

☑ 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   Setting up the Hardware

Requirements

The matrix system has been connected and basically configured according to the Draco tera user manual:

- The hardware of the matrix system has been physically connected (matrix, controller board(s), I/O boards, CON Units, CPU Units, sources, and sinks, etc.).
- The initial configuration has been set (system settings, e.g., network settings).
- The logical devices have been created and configured (EXT Units and CON/CPU Devices, etc.).
- A status of the matrix configuration has been stored as backup file.

6.1.1   Connecting two Matrices via IP Gateway Board

➡ Connect the IP Gateway board of the matrices via 10G fiber cable.

To set up the IP Gateway connection see chapter 7.1, page 30.

6.1.2   Connecting an IP Gateway CON via Network Switch to the IP Gateway

1. Connect a network switch via via 10G fiber cable to an IP Gateway.
2. Note the network settings (see chapter 8.3, page 37) and set the network connection.
3. To set up the IP Gateway connection see the user manual for the Draco vario IP Gateway CON.

6.2   Connecting the Management Software with the Matrix

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.

6.2.1   Installing the Management Software

The management software is available as a single executable program file that does not require an installation.

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: 1 GB
Operating system	Microsoft	Windows 8, Windows 8.1, Windows 10, Windows 11
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: 1 GB
Operating system	Microsoft	Windows 8, Windows 8.1, Windows 10, Windows 11
	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

ℹ️ Contact your system administrator concerning JRE and network connection.

6.2.2 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
Communication	52000 to 52100
API	5555/TCP (5565 for SSL)
Broadcast	5556/UDP (5566 for SSL)
Matrix Grid	5557/TCP (5567 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, a request of the operating system could appear, e.g., if opening the Device Finder.

6.2.3 Connecting the Matrix to the Computer

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 the computer and the controller board of the matrix.

6.2.4   Starting the Management Software

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

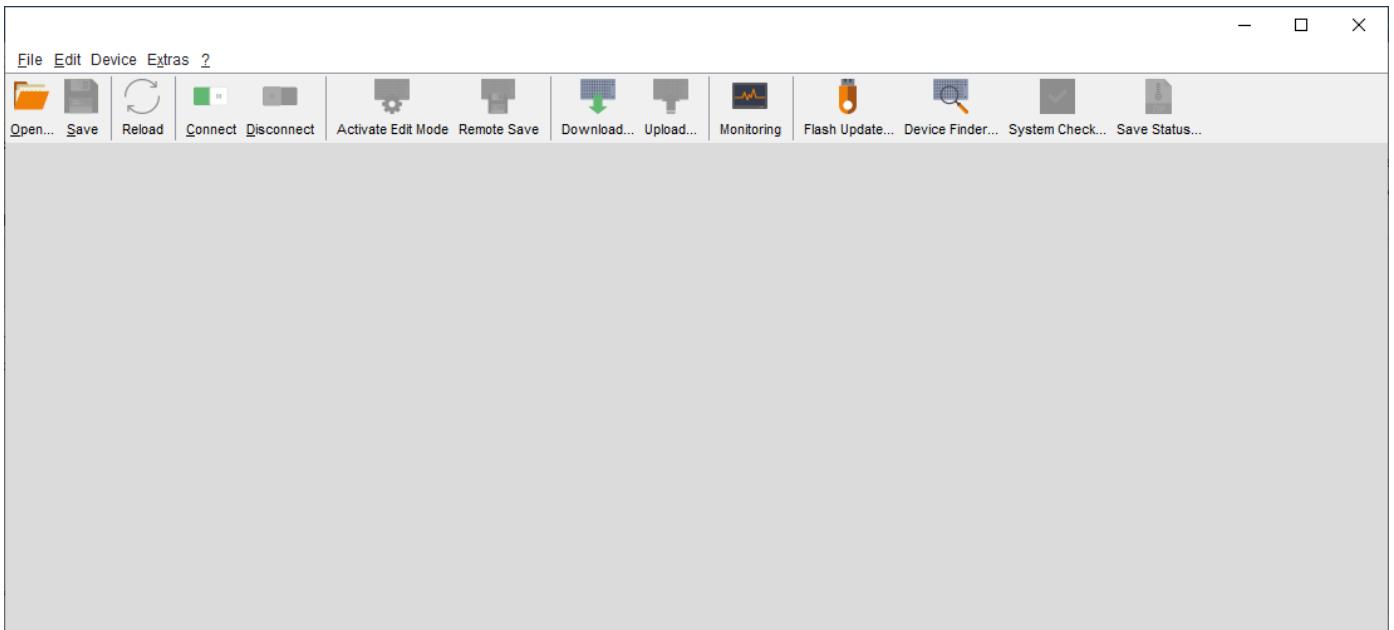The management software starts in offline mode.

*Fig. 9   Management software **Landing page in offline mode***

There are two options to connect to a matrix.

- Via a known IP address
- Via Device Finder

6.2.5   Connecting to the Matrix with known IP Address

ℹ️ At least power user rights are required, and the API function have to be enabled.

ℹ️ Up to 16 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. Run the management software.
2. Click **Connect** in the tool bar.

    A login dialog appears.
3. Enter the IP address according to the network configuration of the matrix.

    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.

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

*Fig. 10   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**.

6.2.6   Connecting to the Matrix via Device Finder

ℹ️ At least power user rights are required, and the API function have to be enabled.

ℹ️ Up to 16 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, e.g., if the IP address of a specific matrix is unknown and should be accessed via IP.
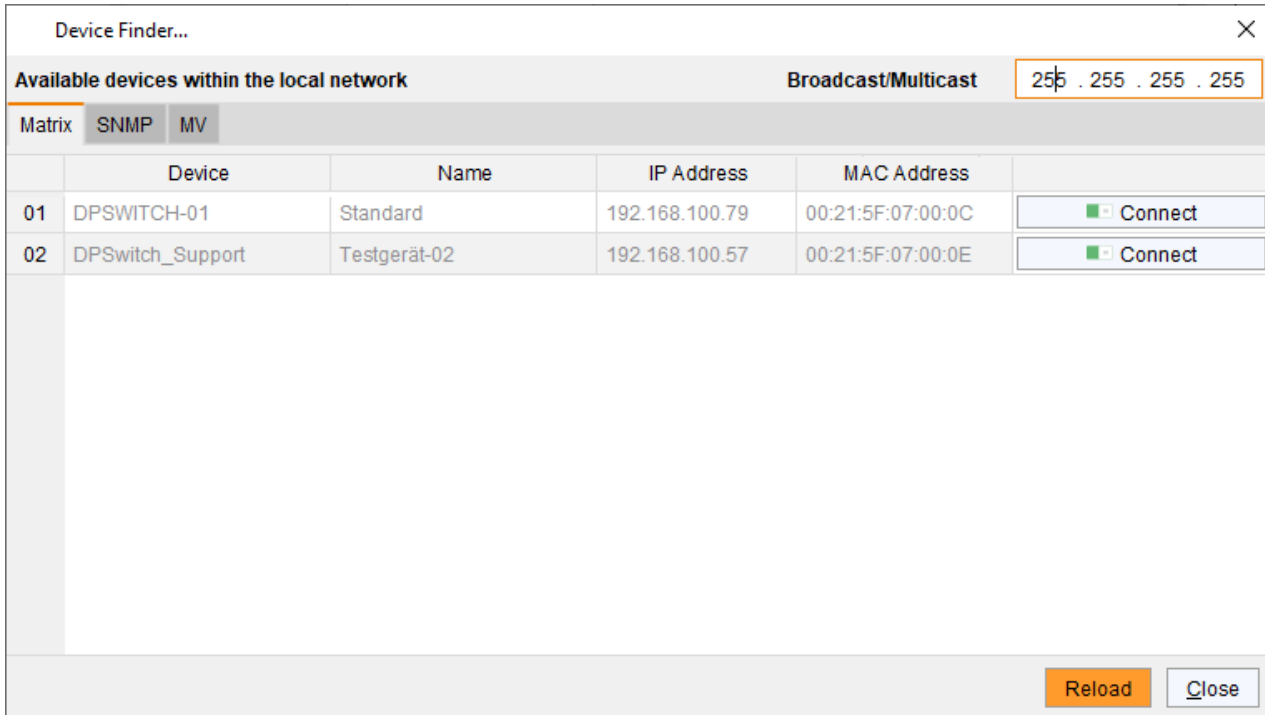

*Fig. 11   Management software menu **Device Finder***

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
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 connect to the respective matrix directly clicking **Connect**.

To find and connect a device, proceed as follows:

1. Click **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 **Connect** in the last column of the Device Finder to establish direct connection to the respective device within the same subnet.

4. Enter the username and password of the administrator.

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

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

7 Configuration

The configuration of the IP Gateway board is saved on the IP Gateway board and is available after installation in another matrix.

7.1 Configuring IP Gateway Connections

The configuration of IP Gateways and the connection via IP to another IP Gateway is set in this menu. Each IP Gateway board is internally managed with eight ports for up to eight connections over a 1G channel to establish connections to another IP Gateway boards or to an IP Gateway extender. To set an IP Gateway connection between two matrices, it is necessary to configure both matrices.
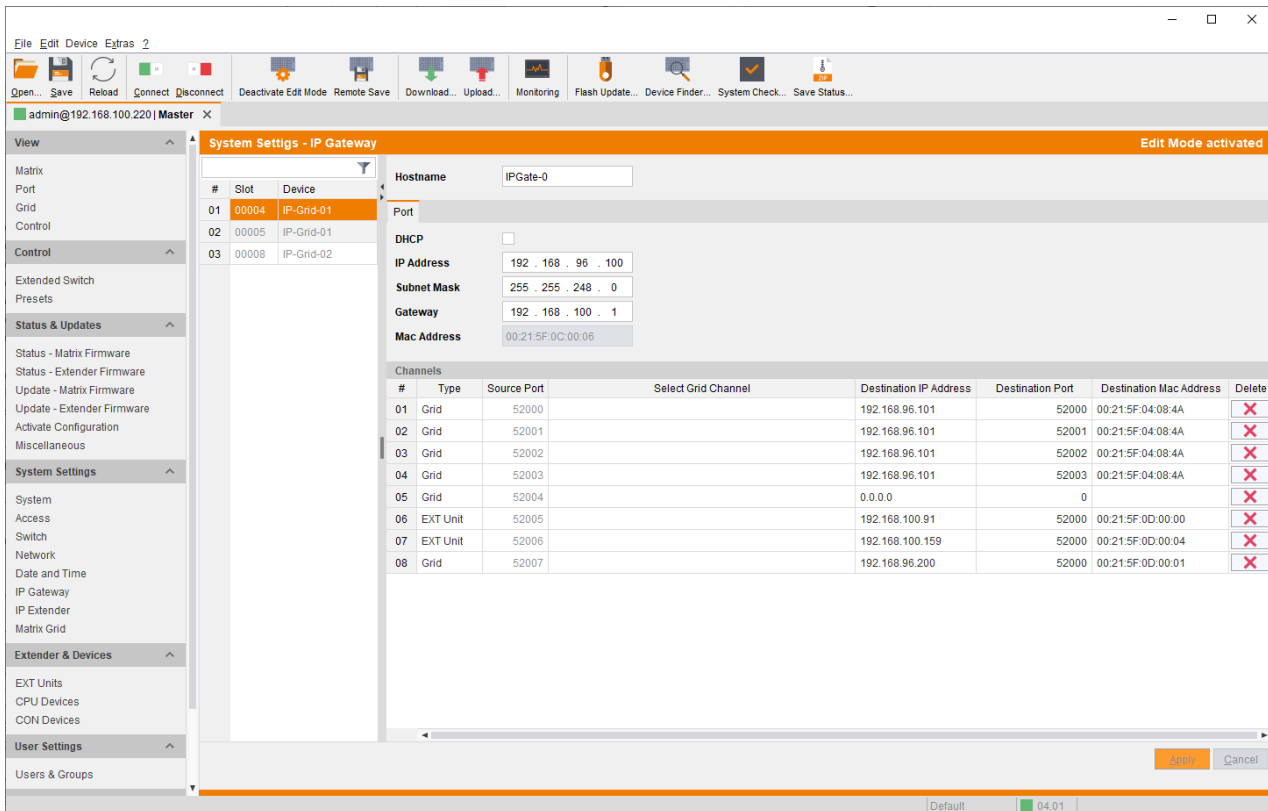

*Fig. 12   Management software menu **System Settings - IP Gateway***

7.1.1 Setting an IP Gateway Connection

We strongly recommend setting IP Gateway connections only via Master Matrix.

To set a new IP Gateway connection, proceed as follows:

1. Connect to the Master Matrix.
2. Click **System Settings > IP Gateway** in the task area.
3. Click **Activate Edit Mode** in the toolbar.
4. Click the slot with the IP Gateway board under **Slot** for which an IP Gateway connection has to be set.

5. By default, the channel type is set to Grid. If the channel type in the line of a source port that has to be used for Matrix Grid connection via IP Gateway is set to EXT Unit, double-click on the corresponding selection box of the port to be configured within the **Type** column and select **Grid**.
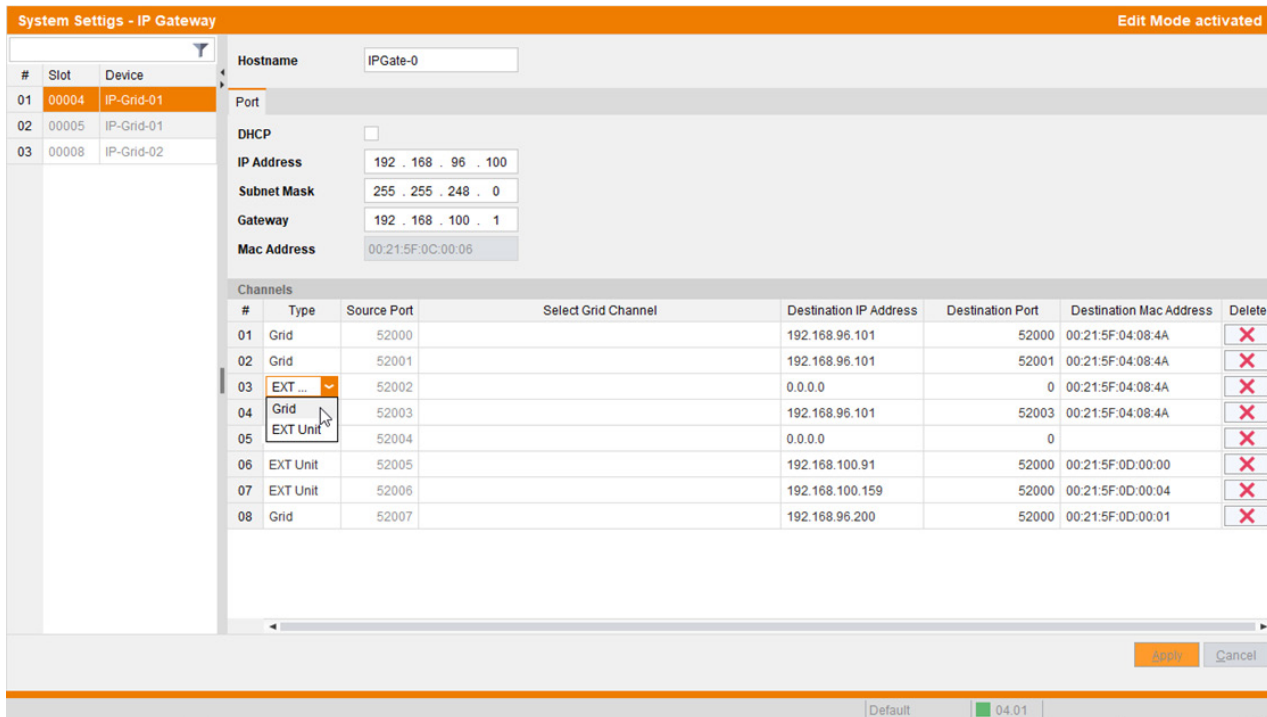

*Fig. 13   Management software menu **System Settings - IP Gateway - Select Channel Type***

6. Double-click in the respective **Select Grid Channel** field.

    A drop-down menu is opened listing all available ports that are configured for use as grid line.

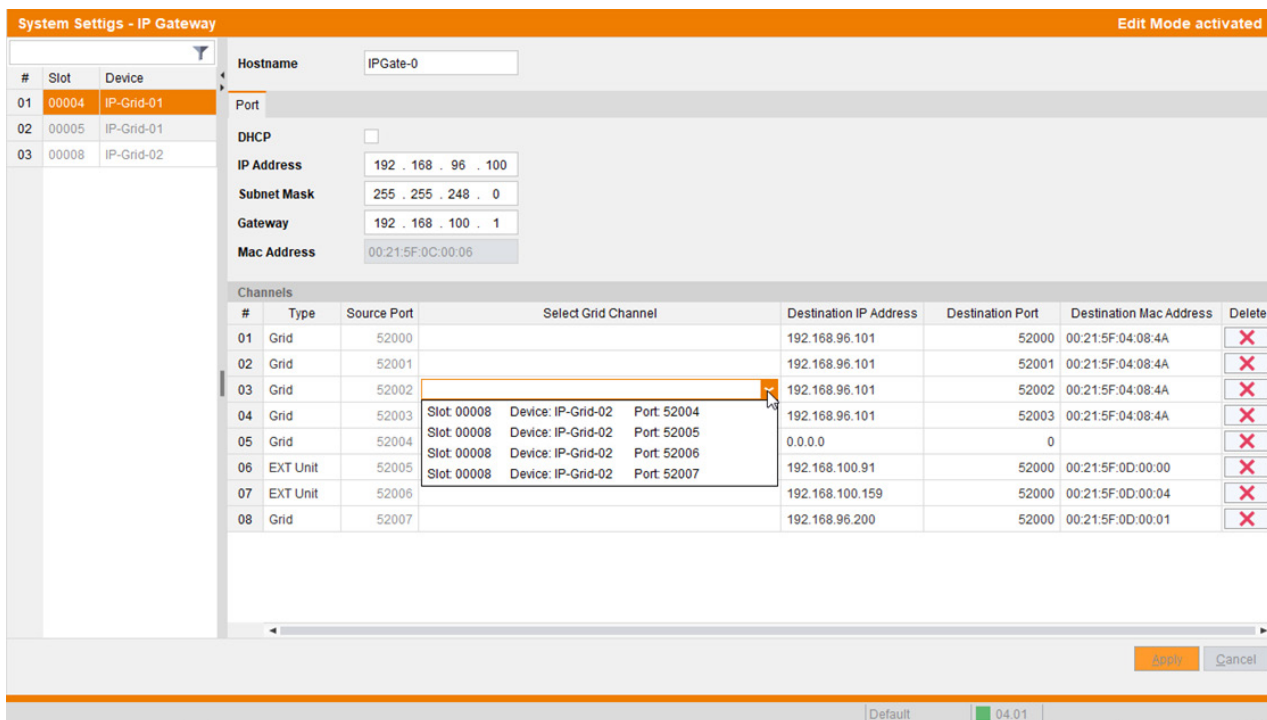7. Click on the desired port in the list.

*Fig. 14   Management software menu **System Settings - IP Gateway - Select Grid Channel***

8. The data of the selected grid port is read and automatically entered in the selected channel line in this menu.
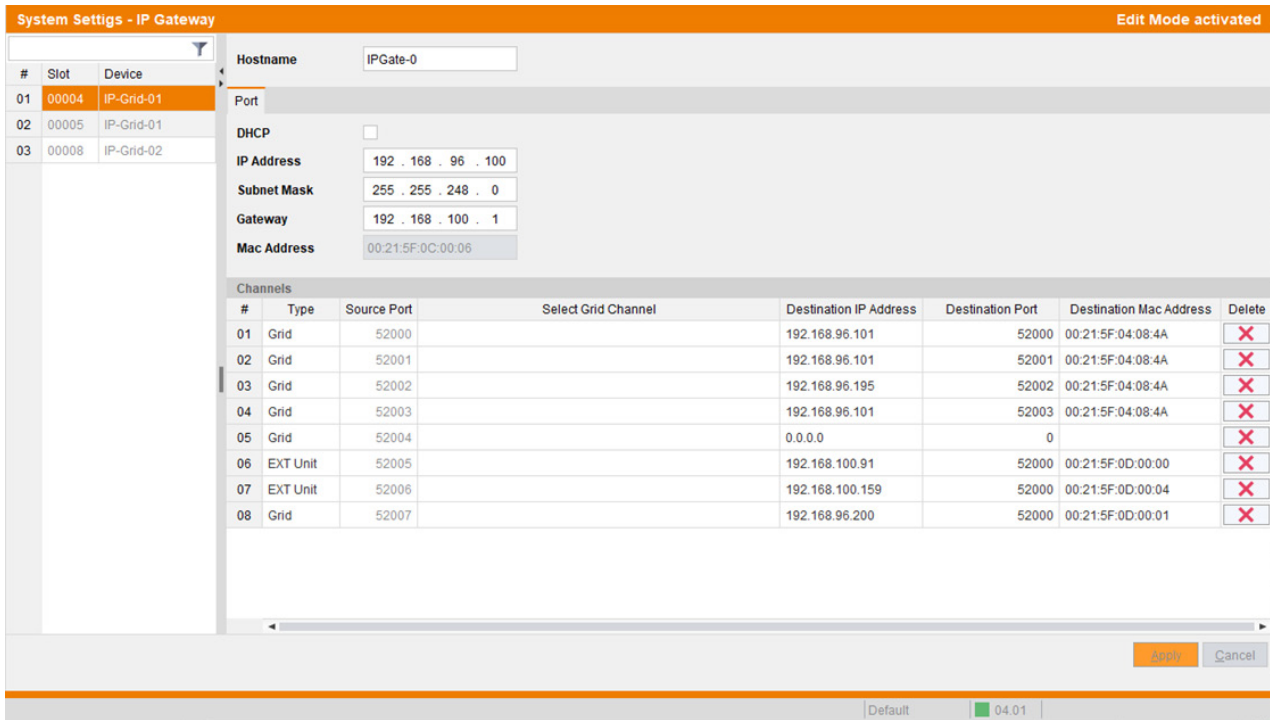

*Fig. 15   Management software menu **System Settings - IP Gateway - Selected Grid Channel***

9. Click **Apply** to confirm the selection.

    The data of the selected Master Matrix channel is read and send to the selected channel of the IP Gateway board to be connected. The data of the Master Matrix channel is automatically entered in the line of the selected grid port.

Manual connection

To establish connection by manually entering the required data, proceed as follows:

1. Connect to the Sub Matrix.
2. Click **System Settings > IP Gateway** in the task area.
3. Click **Activate Edit Mode** in the toolbar.
4. Select the slot to be connected and note the data of the IP Gateway in the **Port** section (IP address and MAC address) and the port of the desired channel in the **Channels** section.
5. Connect to the Master Matrix.
6. Click **System Settings > IP Gateway** in the task area.
7. Select the slot to be connected and note the data of the required channel: IP address, MAC address and what ports are available.

System Settigs - IP Gateway								Edit Mode activated

Hostname: IPGate-0

Port

DHCP ☐
IP Address: 192 . 168 . 96 . 100
Subnet Mask: 255 . 255 . 248 . 0
Gateway: 192 . 168 . 100 . 1
Mac Address: 00:21:5F:0C:00:06

Channels

#	Type	Source Port	Select Grid Channel	Destination IP Address	Destination Port	Destination Mac Address	Delete
01	Grid	52000		192.168.96.101	52000	00:21:5F:04:08:4A	✕
02	Grid	52001		192.168.96.101	52001	00:21:5F:04:08:4A	✕
03	Grid	52002		0.0.0.0	0		✕
04	Grid	52003		192.168.96.101	52003	00:21:5F:04:08:4A	✕
05	Grid	52004		0.0.0.0	0		✕
06	EXT Unit	52005		192.168.100.91	52000	00:21:5F:0D:00:00	✕
07	EXT Unit	52006		192.168.100.159	52000	00:21:5F:0D:00:04	✕
08	Grid	52007		192.168.96.200	52000	00:21:5F:0D:00:01	✕

#	Slot	Device
01	00004	IP-Grid-01
02	00005	IP-Grid-01
03	00008	IP-Grid-02

Apply   Cancel

Default   ■ 04.01

*Fig. 16   Management software menu **System Settings - IP Gateway - Enter destination data***

8. Double-click in the respective **Destination IP Address** field and enter the destination IP address of the IP Gateway board of the Sub Matrix.
9. Press Enter to confirm the destination IP address.
10. Double-click in the respective **Destination Port** field and enter the destination port of the IP Gateway board of the Sub Matrix.
11. Press Enter to confirm the destination port.
12. Double-click in the respective **Destination MAC Address** field and enter the destination MAC address of the IP Gateway board of the Sub Matrix.
13. Press Enter to confirm the destination port.
14. Click **Apply** to confirm entries.
15. Return to the Sub Matrix IP Gateway menu and enter the data of the Master Matrix by repeating the steps 8 to 14.
16. Click **Deactivate Edit Mode** in the toolbar.

☑ After entering the destination IP address and destination port, the MAC Address can be retrieved automatically by clicking **Apply** and clicking **Reload**.

7.1.2   Deleting an IP Gateway Connection

ℹ️ We strongly recommend deleting IP Gateway connections only via Master Matrix.

To delete an IP Gateway connection, proceed as follows:

1. Connect to the Master Matrix.

2. Click **System Settings > IP Gateway** in the task area.

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

4. Click the slot with the IP Gateway board under **Slot** of which an IP Gateway connection has to be deleted.

5. Click the red cross ❌ in the respective line to delete the connection of an IP Gateway board.

    The connection settings has been deleted on both IP Gateways.

☑ It is necessary to delete the connection in both matrix configurations. We recommend connecting to the second matrix to check if the data of the connection has been removed. If not, click the red cross ❌ in the respective line to delete the data of the connection.

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

8 Maintenance

8.1 Querying the Device Status via Management Software

The connections to the matrix are displayed in this menu.

➡ Click **View > Matrix** in the task area to display the current connections.

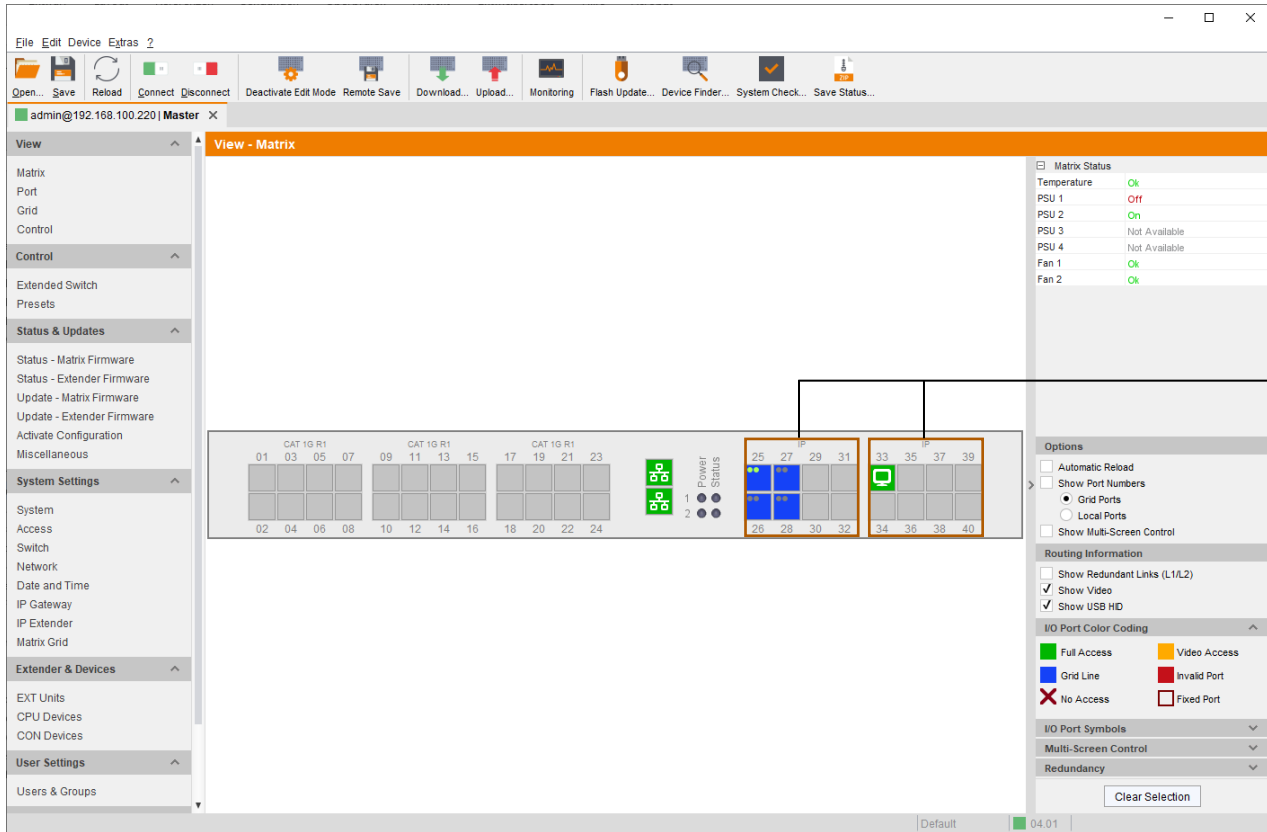Slots with IP Gateway boards are designated in the matrix view (1).

Fig. 17   Management software menu **View - Matrix**

✅ Functions, colors, and symbols used in the Grid Port View are explained in the matrix user manual.

8.2   Querying the Port Status of a Matrix Grid

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

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

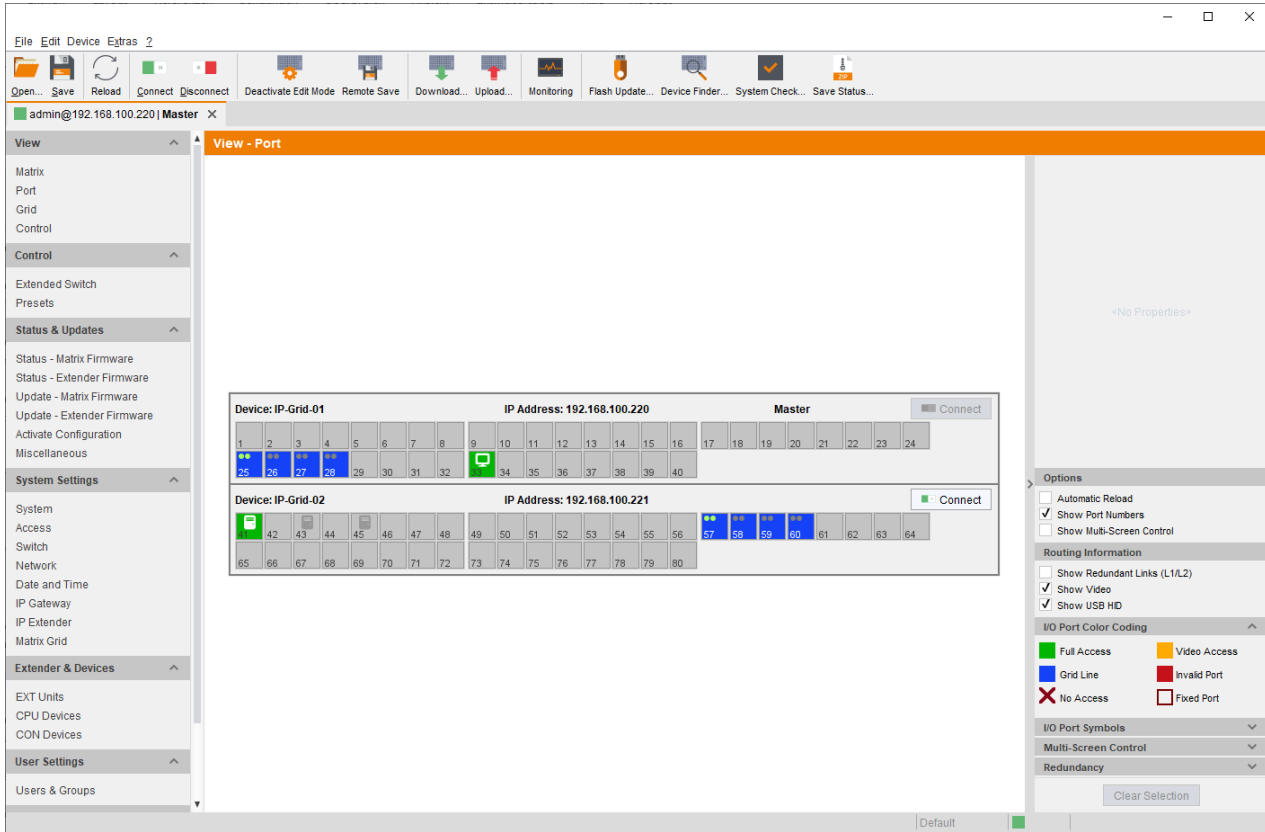➡ Click **View > Port** in the task area to display the current connections.

*Fig. 18   Management software menu **View - Matrix***

✅ Functions, colors, and symbols used in the Grid Port View are explained in the matrix user manual.

8.3   Querying the Network Status

The current network status is displayed in this menu.

1.   Click **System Settings > Network** in the task area to query the network configuration.
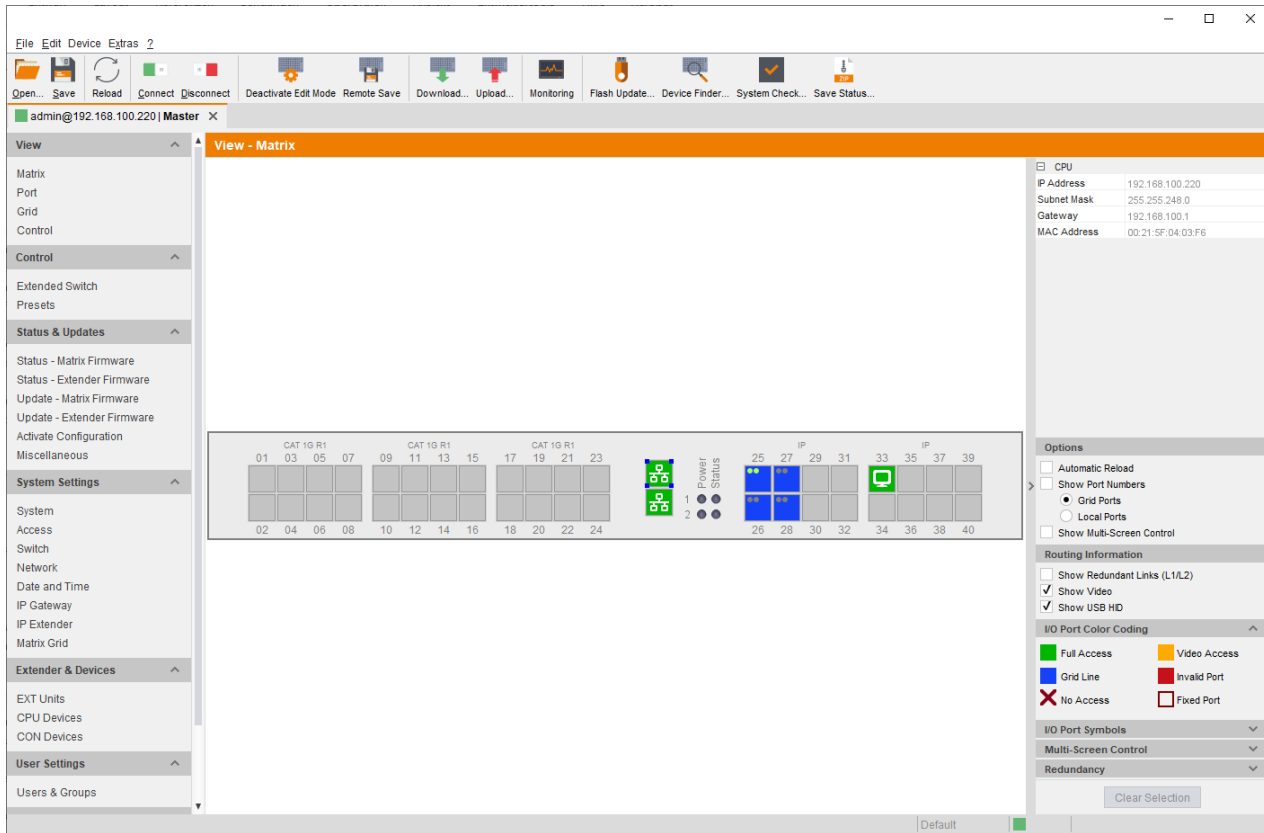

*Fig. 19   Management software menu **View - Matrix***

2.   Click a network port of the controller board with the left mouse button.

The corresponding network status will be displayed in the panel on the right side of the working area.
The available information can be faded in or hidden by pressing the left mouse button on the "plus" or "minus" icon.

The following information is available:

Port color	Description
IP Address	IP address if DHCP is not active.
Subnet Mask	Subnet mask if DHCP is not active.
Gateway	Gateway address if DHCP is not active.
MAC Address	MAC address.

9   Troubleshooting

For more help in case of problems with the matrix, please refer to the Draco tera user manual.

9.1   IP Connection Failure

Diagnosis	Possible reason	Measure
No Matrix Grid connection available.	The destination type is set to EXT Unit.	➡ Set the designation type to Grid.
	The destination data is wrong.	➡ Check the designation IP address of both IP Gateway boards.
		➡ Check the designation port of both IP Gateway boards.
		➡ Check the designation MAC address of both IP Gateway boards.
	The IP Gateway assignment is only set in one of two matrices.	➡ Set the IP Gateway assignment in both matrices.

10   Technical Data

10.1   Interfaces

10.1.1 RJ45 (Interconnect)

Cat X devices offer a 1000BASE-T interface to establish an interconnection between Cat X devices. All four wire pairs are used in both directions. The cabling is suitable for a full duplex operation.

10.1.2 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 40).

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 Cables

10.2.1 Cat X

NOTICE
Transmission problems Routing over an active network component, such as an ethernet hub, switch, or router 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 extender modules require 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, standard 568-A or 568-B. Four pairs of wires AWG24. We recommend using standard 568-A, but standard 568-B is also supported.
Cat X patch cable AWG26/8	S/UTP (Cat 5e) cable according to EIA/TIA-568, standard 568-A or 568-B. Four pairs of wires AWG26/8. We recommend using standard 568-A, but standard 568-B is also supported.

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

Maximum Transmission Range for Video and USB HID Signals (End-to-End Connection)

Type of cable	Maximum transmission range
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, switch, or router 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 Transmission Range for Video and USB HID Signals (End-to-End Connection)

NOTICE
Transmission ranges when using add-on modules with transparent USB
When using L474/R474 add-on modules with transparent USB, the binding specifications stated in the data sheets of the add-on modules apply.

Type of cable	Bandwidth	Maximum transmission range
Single-Mode 9 µm	1G	10,000 m (32,808 ft)
Single-Mode 9 µm	3G	5,000 m (16,404 ft)
Multi-Mode 50 µm (OM3)	1G/3G	1,000 m (3,280 ft)
Multi-Mode 50 µm	1G/3G	400 m (1,312 ft)

ℹ When using single-mode SFPs with multi-mode fiber optic cables, the maximum transmission range can usually be doubled.

Type of Connector

Connector	Type
Plug-in connector	LC-Connector

10.3   Connector Pinouts

10.3.1 RJ45 (Interconnect)

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

10.3.2 Fiber SFP Type LC (Interconnect)

Connector	Diode	Signal
1 2	1	Data OUT
	2	Data IN

11   Technical Support

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

11.1   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
- 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/CPU, OS, graphics card, monitor, USB HID/USB 2.0 devices, interconnect cable) including manufacturer and model number
- Results from any testing you have done

11.2   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.

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

12   Glossary

The following terms are commonly used in this manual or in video and KVM technology.

Term	Description
CON Device	Logical object that summarizes several EXT Units of physical extender modules (CON Units) to switch more complex sink systems via matrix.
CON Unit	Decoder extender module to connect to the console (monitor(s), keyboard, and mouse; optionally also with USB 2.0 devices).
Console	Monitor, keyboard, mouse, media control, external switching solution, etc.
CPU Device	Logical object that summarizes several EXT Units of physical extender modules (CPU Units) to switch more complex source systems via matrix.
CPU Unit	Encoder extender module to connect to a source.
Fiber	Single-mode or multi-mode fiber cables.
KVM	Keyboard, video, and mouse.
MTBF	Mean Time Between Failure (MTBF) is measured in power-on hours and describes the system reliability.
Multi-Mode	50 µm multi-mode fiber cable.
SFP	SFPs (Small Form Factor Pluggable) are pluggable interface modules for Gigabit connections. SFP modules are available for Cat X and fiber cables.
Single-Mode	9 µm single-mode fiber cable.
USB HID	USB HID devices (Human Interface Device) allow users to interact with computers. There is no need for a special driver during installation. When connecting, the message "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 USB HID devices.

13   Index

14   Table of Figures

15   Change Log

This table offers an overview about the most important changes available, such as new functions, changed configuration or operation.

Edition	Date	Firmware version	Software version	Chapter	New functions/changes
REV01.00	2022-11-22	Latest version	V 5.1.4.0, 2022-10-28	-	Initial user manual.