

Draco U-Switch

U-Switch Module B476-4U4T



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 0, page 7) and additional notice in the respective chapters. Read carefully through the User Manual before you switch on the product.

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 12, page 57).

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 6. Please note the change log for this manual in chapter 0, page 67.

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.

For information about the firmware and software described in this user manual, please refer to chapter 1.1, page 6).

Copyright

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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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1 Important Information

The manual is updated when firmware or software changes affect user behavior or system behavior. Please refer to the change log (see chapter 0, page 67) for user manual updates.

1.1 Firmware and Software

The firmware and software version described in this user manual are listed below. If you are operating your U-Switch with older firmware versions, some of the contents of the manual may not apply.

Firmware	Version from	Release date
HUSWMSD	B01.10	2021-04-22
HUSWITCH	F01.08	2021-08-19
HIDxCON	V04.03	2021-05-21
HIDCPUx	V04.03	2021-05-21
MODGPIOx	F01.03	2021-02-01


“x” is a placeholder for firmware with similar name.

Software	Version from	Release date
Tera Tool	V 5.0.0.0	2021-07-20

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:

 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 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 Terms and Spellings

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

The following terms are used for products and system descriptions:

Term	Description
Management software	Tera Tool
Source	Computer, graphic card
Sink	Console (monitor, keyboard, mouse)

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
<i>Config.txt</i>	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 device firmware or 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.

1.4 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.

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 due to freely accessible power connections when the chassis is open **Risk of bruising, abrasion or shearing of fingertips due to rotating fan when the chassis is open**

If the chassis 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 while the case is open, bruises, abrasions or shearing of fingertips may occur.

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

- ➡ 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 chassis after a long period of operation.
- ➡ Ensure that there is sufficient distance from the operator, e.g., for mounting under a table.
- ➡ Do NOT install the device in environments where children are likely to be present.

Installation Location

While operating, the device and the power supply units 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.
- ➡ Existing ventilation openings on the device must always be free.
- ➡ For rack-mount installations, at least 0.5 RU (rack unit) is required above the device for ventilation.
- ➡ Do not place the power supply units directly on top of the device.
- ➡ If installing the device under the table, place the device at a sufficient distance from the operator.
- ➡ Place all power sockets including the sockets for the supplied external power supply units easily accessible and directly next to each other.

Connection

- ➡ Check the device and the power supply units for visible damage before connecting it.
- ➡ Only use the device or power supply units without any visible damage at the chassis or the cable.
- ➡ Only use power supply units originally supplied with the product or manufacturer-approved replacements.
- ➡ Connect all power supply units to grounded outlets.
- ➡ 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 Description

3.1 Intended Use

The U-Switch product line is designed to seamlessly control multiple sources as one using just a single set of keyboard and mouse while the sources video outputs are connected straight to the monitors.

Keyboard and mouse control then is being switched amongst the attached sources by simply moving the mouse over the borders of the displays according to their predefined arrangement.

The U-Switch is designed to be operated as a stand-alone device as well as in combination with the complete Draco KVM extender and switch family.

To use an external switching solution via push button or dry-contact, the U-Switch can be used with the optional GPIO module R474-BGX which offers an interface to switch the USB-HID signal and to indicate the switching status (see chapter 12.1.4, page 57).

NOTICE

Interferences when the immunity limit values are exceeded

If the limit values listed in EN55024 are exceeded by the customers environment, reliable and fault-free functioning of the devices cannot be guaranteed.

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.

3.2 System Overview with Installation Examples

3.2.1 Direct Connection

The U-Switch is connected to sources using the cables supplied. Keyboard and mouse are connected to the U-Switch.

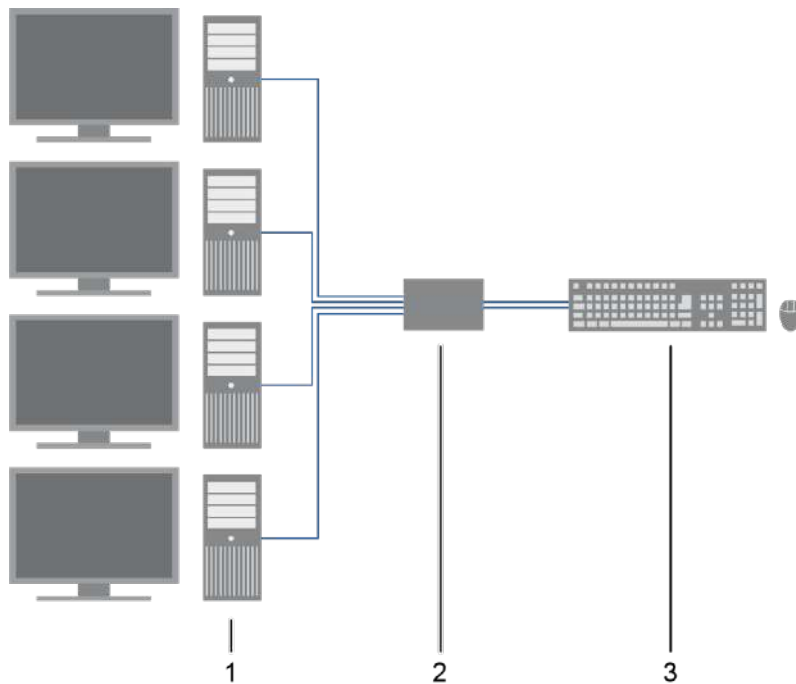


Fig. 1 System overview - Example direct source connection

- | | |
|-----------------------------------|-------------------|
| 1 Sources with connected monitors | 2 U-Switch |
| | 3 Keyboard, mouse |

3.2.2 Direct Connection with external Switching Solution

The U-Switch is connected to sources using the cables supplied. Keyboard and mouse are connected to the U-Switch. An external switching solution is connected to the optional GPIO module.

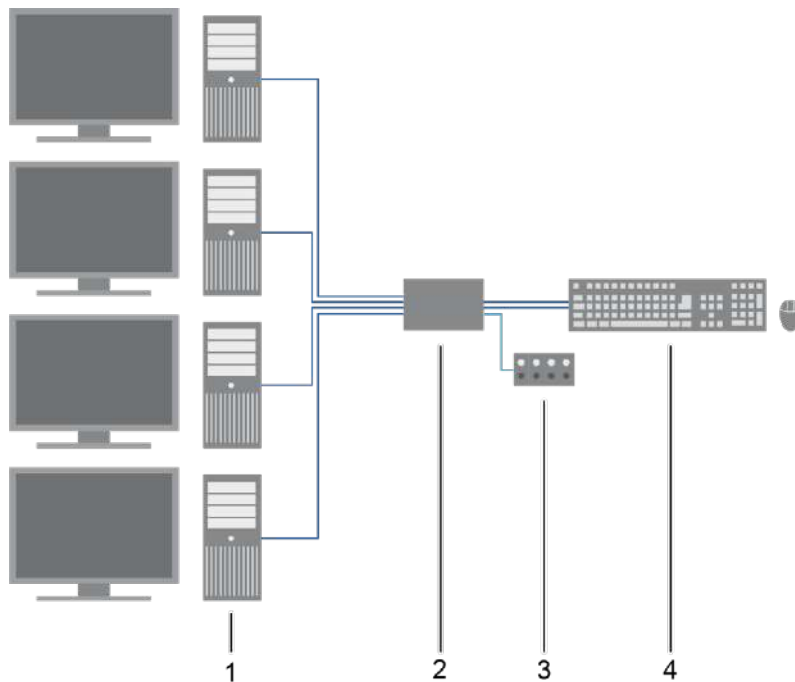


Fig. 2 System overview - Example direct source connection with external switching solution

- | | |
|------------|-------------------------------|
| 1 Sources | 3 Keyboard, mouse |
| 2 U-Switch | 4 External switching solution |

3.2.3 Connection to a Draco KVM Matrix System with external Switching Solution

The U-Switch is connected to KVM extender CON Units using the cables supplied. Keyboard and mouse are connected to the U-Switch. An external switching solution is connected to the optional GPIO module.

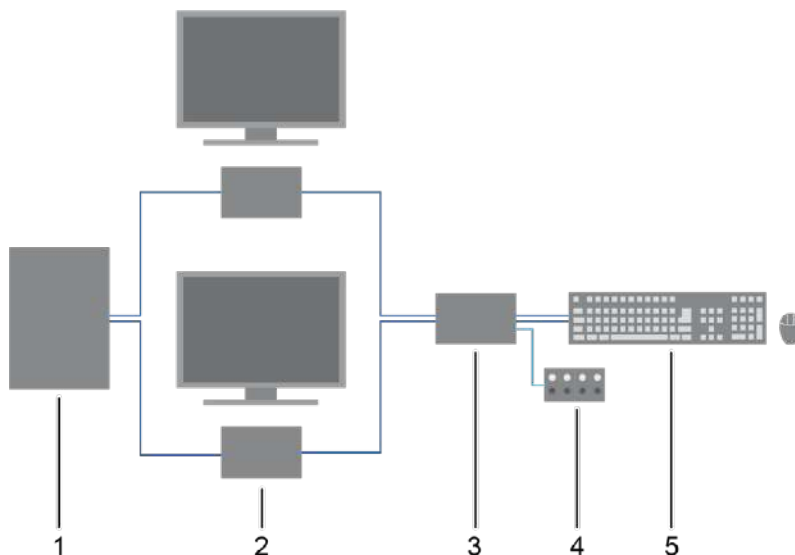


Fig. 3 System overview - Example U-Switch in combination with KVM matrix switch

- | | |
|---------------------------|-------------------------------|
| 1 KVM Matrix switch | 4 Keyboard, mouse |
| 2 CON Units with monitors | 5 External switching solution |
| 3 U-Switch | |

3.3 Chassis

Mounting Chassis

Type	Chassis			Power supply unit		
	Slots	Active backplane	Current input	Internal	External	Setup for redundant power supply voltage
474-BODY2	2	No	Interface side	-	1x	-
474-BODY2R	2	No	Interface side	-	1x	1x (external)
474-BODY2N	2	No	Interface side	1x	-	1x (external)
474-BODY4	4	No	Interface side	-	1x	-
474-BODY4R	4	No	Interface side	-	1x	1x (external)
474-BODY6R-R1	6	No	Interface side	1x	-	1x (external)

Slide-in Chassis

Type	Chassis			Power supply unit		
	Slots	Active backplane	Current input	Internal	External	Setup for redundant power supply voltage
474-BODY2BPF	2	Yes	Interface side	1x	-	1x (external)
474-BODY6BP	6	Yes	Rear view	2x	-	-
474-BODY6BPF	6	Yes	Interface side	2x	-	-
474-BODY21/4U	21	Yes	Rear view	1x	-	1x (internal)
474-BODY21/4UR	21	Yes	Rear view	2x	-	-



All external power supply units are separately certified to the relevant major international safety standards.

3.4 Product Types

Type	Description
B476-4U4T	Draco vario U-Switch Module 4-Port USB HID + 2.0

3.5 Add-on Module

Type	Description
R474-BGX	Add-on module for CON Units with up to 8 configurable GPIO in-/outputs

3.6 Accessories for the Chassis

Part. No.	Description
474-2RMK	19"-Rackmount Ears for Draco vario 2-Slot chassis
474-2NRMK	19"-Rackmount Ears for Draco vario 2-slot chassis w/ built-in PSU
474-4RMK	19"-Rackmount Ears for Draco vario 4-Slot chassis
474-6RMK	19"-Rackmount Ears for Draco vario 6-slot chassis
474-VPLATE	Mounting plate for 2-/4-/6-slot chassis
474-VSNAP	Mounting plate w/ DIN Rail Snap On for 2-slot chassis
474-BRACKET	Wall-/Tablemount L-Brackets for all 2-/4-/6-Slot chassis
474-PSU2	Spare ext. PSU for 2-slot chassis
474-PSU2BPF	Spare ext. PSU for 474-BODY2-BPF, lockable connector
474-PSU4	Spare ext. PSU for 474-BODY2N and 474-BODY4/4R
474-PSU6	Spare ext. PSU for 474-BODY6R-R1
474-PSU21	Spare PSU for 474-BODY21/4U, slide-in, hot-swap
474-BLND1	Blanking plate with IHSE Logo, 1-slot for Draco vario chassis
474-6FAN	Optional fan for Draco vario 2-slot and 6-slot chassis with backplane
260-5G	International power supply unit 100...240VAC/5VDC/3A
260-5M	International power supply unit 100...240VAC/5VDC/5A
PC-TYP-E/C13-020	Power cord IEC Schuko 90° Type-E/C13 2.0 m lockable
PC-TYP-B/C13-020	Power cord IEC US Type-B/C13 2.0 m lockable



All external power supplies are separately certified according to all relevant safety standards.

3.7 Accessories for the U-Switch Module

Part. No.	Description	Interface
247-U1	USB cable Type A-B, 1.8 m	USB/USB-HID
247-U2	USB cable Type A-B, 3.0 m	USB/USB-HID
436-USB20	USB extension cable Type A-A, 3.0 m	USB/USB-HID
476-CTRL4-GPIO	Remote Control for Draco vario GPIO module with 4 push buttons/LEDs (cable length approx. 3.0 m)	GPIO

3.8 Scope of Delivery

Depending on the order, the scope of delivery contains the following items:

Product type	Scope of delivery	
B476-4U4T	<ul style="list-style-type: none"> • 4x USB cable 1.8 m (type A-B) • Quick Setup 	
Per each Draco vario chassis	474-BODY2, 474-BODY2R	<ul style="list-style-type: none"> • 1x 5 V DC / 3 A international power supply unit • 1x country-specific power cord
	474-BODY4, 474-BODY4R	<ul style="list-style-type: none"> • 1x 5 V DC / 5 A international power supply unit • 1x country-specific power cord
	474-BODY2N, 474-BODY2BPF 474-BODY6R-R1	<ul style="list-style-type: none"> • 1x IEC country-specific power cord C13, 2.0 m
	474-BODY6BP, 474-BODY6BPF 474-BODY21/4UR	<ul style="list-style-type: none"> • 2x IEC country-specific power cord C13, 2.0 m lockable
	474-BODY21/4U	<ul style="list-style-type: none"> • 1x IEC country-specific power cord C13, 2.0 m lockable

3.9 Device Views Draco vario Chassis

NOTICE

Exceeding the maximum permissible power consumption

In addition to the power consumption of the used modules, the power consumption of the connected peripherals must be added.

- ➔ Note the maximum power consumption of the chassis (see chapter 12.3.1, page 59 and chapter 12.3.2, page 59).



The device status of a module is displayed via LED on the front side of following chassis: 474-BODY2, 474-BODY2R, 474-BODY2N, 474-BODY4, 474-BODY4R and 474-BODY6R-R1.

3.9.1 2-Slot-Chassis Draco vario 474-BODY2

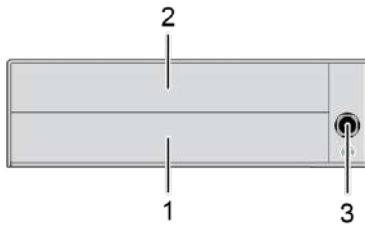


Fig. 4 Interface side chassis 474-BODY2

- 1 Slot 1
- 2 Slot 2

- 3 Power supply voltage, DC

3.9.2 2-Slot-Chassis Draco vario 474-BODY2R

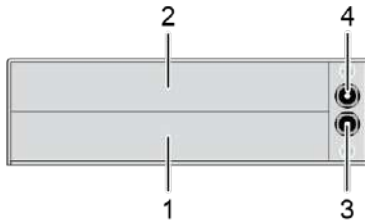


Fig. 5 Interface side chassis 474-BODY2R

- 1 Slot 1
- 2 Slot 2

- 3 Power supply voltage 1, DC
- 4 Power supply voltage 2, DC

3.9.3 2-Slot Chassis Draco vario 474-BODY2N

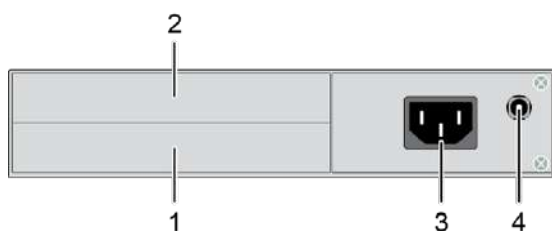


Fig. 6 Interface side chassis 474-BODY2N

- | | |
|----------|------------------------------|
| 1 Slot 1 | 3 Power supply voltage 1, AC |
| 2 Slot 2 | 4 Power supply voltage 2, DC |

NOTICE

Excessive current draw

The 2-slot Draco vario chassis with an internal power supply unit is not equipped with a fuse on its primary side.

- ➔ The protection against excessive current draw has to be provided by the electrical installation of the building.

3.9.4 2-Slot Chassis Draco vario 474-BODY2BPF

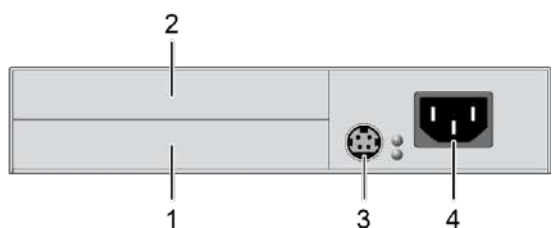


Fig. 7 Interface side chassis 474-BODY2BPF

- | | |
|----------|------------------------------|
| 1 Slot 1 | 3 Power supply voltage 2, DC |
| 2 Slot 2 | 4 Power supply voltage 1, AC |

3.9.5 4-Slot-Chassis Draco vario 474-BODY4

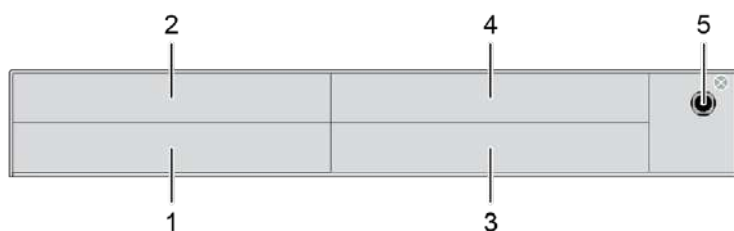


Fig. 8 Interface side chassis 474-BODY4

- | | |
|----------|----------------------------|
| 1 Slot 1 | 5 Power supply voltage, DC |
| 2 Slot 2 | |
| 3 Slot 3 | |
| 4 Slot 4 | |

3.9.6 4-Slot Chassis Draco vario 474-BODY4R

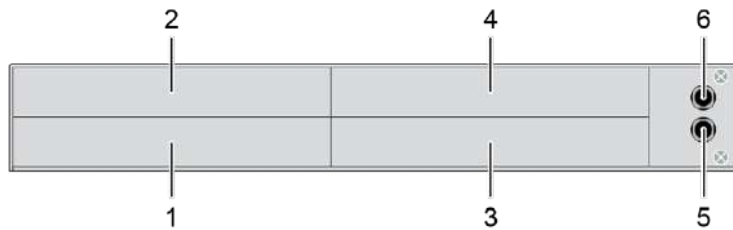


Fig. 9 Interface side chassis 474-BODY4R

- | | |
|----------|------------------------------|
| 1 Slot 1 | 5 Power supply voltage 2, DC |
| 2 Slot 2 | 6 Power supply voltage 1, DC |
| 3 Slot 3 | |
| 4 Slot 4 | |

3.9.7 6-Slot Chassis Draco vario 474-BODY6R-R1

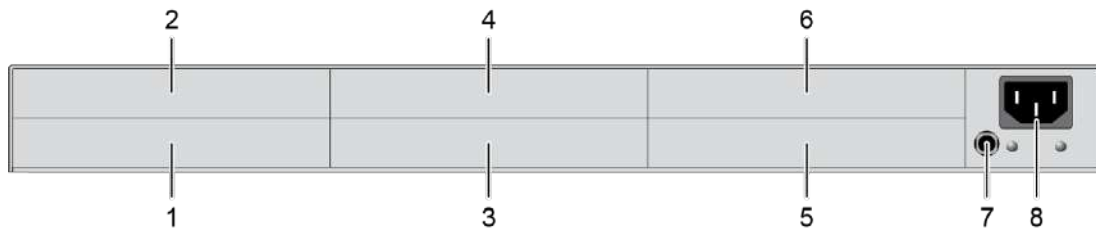


Fig. 10 Interface side chassis 474-BODY6R-R1

- | | |
|----------|------------------------------|
| 1 Slot 1 | 5 Slot 5 |
| 2 Slot 2 | 6 Slot 6 |
| 3 Slot 3 | 7 Power supply voltage 2, DC |
| 4 Slot 4 | 8 Power supply voltage 1, AC |

NOTICE

Too low power supply voltage

With Draco vario chassis 474-BODY6R-R1 a redundant power supply voltage is possible up to a current of maximum 5 A (modules inclusive connected periphery). If the power supply voltage of the internal power supply unit fails, the device's power supply voltage is secured via the 5 V external power supply unit.

If there is no redundant power supply voltage and the current is above 5 A, the device is not supplied with sufficient power supply voltage and fails.

- ➔ Note the maximum current draw of the chassis (see from chapter 12.3, page 59).
- ➔ With a current of more than 5 A, use an external power supply unit. In this case, redundancy is inapplicable.

NOTICE

Excessive currents

The 6-slot Draco vario chassis with an internal power supply is not equipped with a fuse on its primary side.

- ➔ The protection against excessive currents has to be provided by the electrical installation of the building.

3.9.8 6-Slot Chassis Draco vario 474-BODY6BP

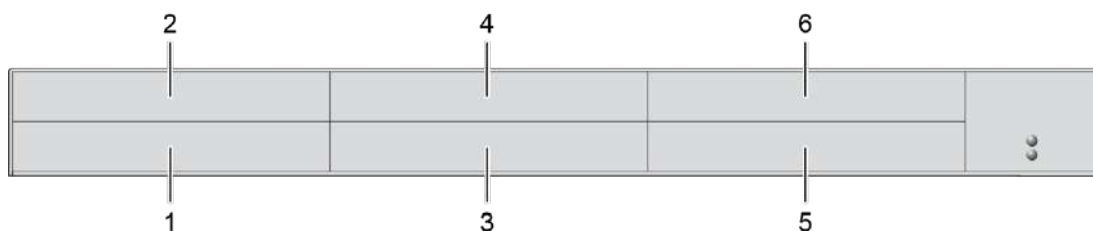


Fig. 11 Interface side chassis 474-BODY6BP

- | | |
|----------|----------|
| 1 Slot 1 | 4 Slot 4 |
| 2 Slot 2 | 5 Slot 5 |
| 3 Slot 3 | 6 Slot 6 |



Fig. 12 Rear view chassis 474-BODY6BP

- | | |
|------------------------------|-------------|
| 1 Power supply voltage 1, AC | 3 Grounding |
| 2 Power supply voltage 2, AC | |

3.9.9 6-Slot Chassis Draco vario 474-BODY6BPF

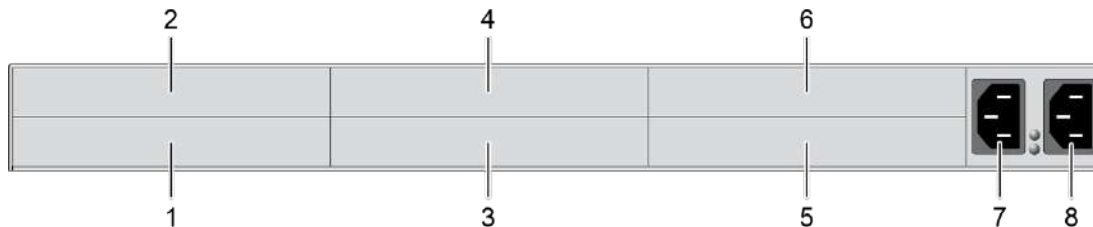


Fig. 13 Interface side chassis 474-BODY6BPF

- | | |
|----------|------------------------------|
| 1 Slot 1 | 5 Slot 5 |
| 2 Slot 2 | 6 Slot 6 |
| 3 Slot 3 | 7 Power supply voltage 1, AC |
| 4 Slot 4 | 8 Power supply voltage 2, AC |

3.9.10 21-Slot Chassis Draco vario 474-BODY21/4U and 474-BODY21/4U

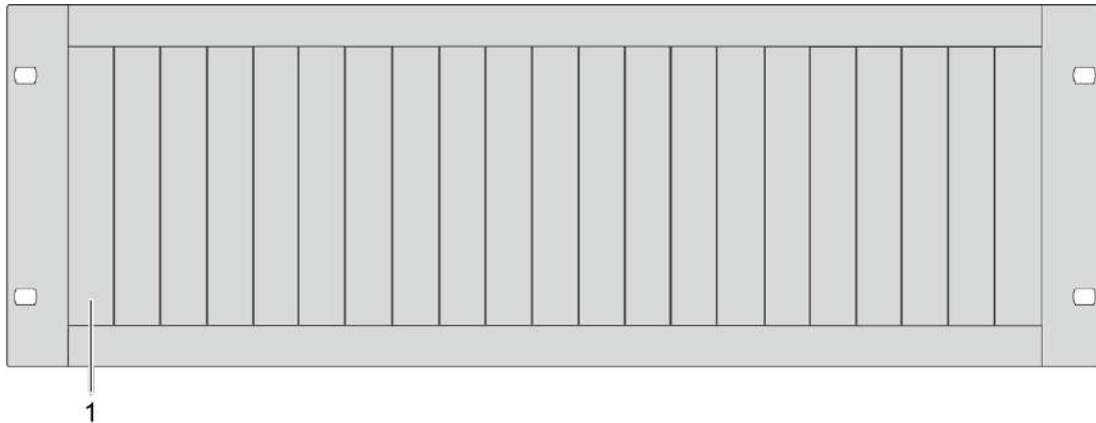


Fig. 14 Interface side chassis 474-BODY21/4U and 474-BODY21/4U

1 Slots 1 to 21 (from left to right)



The chassis 474-BODY21/4U is supplied with one power supply unit (Pos. 3). A second power supply unit can be optionally installed.

The chassis 474-BODY21/4UR is supplied with two power supply units (Pos. 2 and 3).

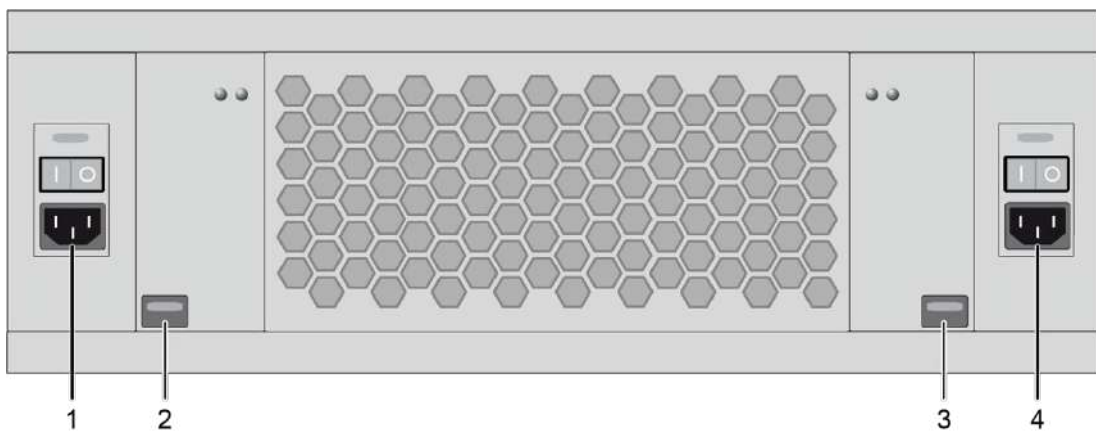


Fig. 15 Rear view chassis 474-BODY21/4U and 474-BODY21/4U

- | | |
|---|------------------------------|
| 1 Power supply voltage 2, AC (redundancy) | 3 Power supply unit 1 |
| 2 Power supply unit 2 (redundancy) | 4 Power supply voltage 1, AC |

3.10 Device View U-Switch Module B476-4U4T

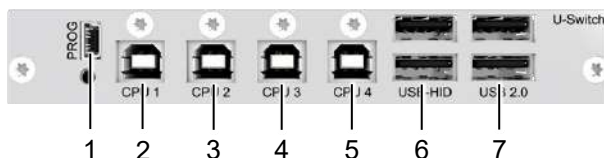


Fig. 16 Interface side U-Switch module B476-4U4T

- | | |
|-------------------------------------|---|
| 1 Input Mini-USB (service) | 5 CPU 4: Output USB-HID and USB 2.0 |
| 2 CPU 1: Output USB-HID and USB 2.0 | 6 Input / Output USB-HID |
| 3 CPU 2: Output USB-HID and USB 2.0 | 7 Input / Output USB 2.0 (up to 480 Mbit/s) |
| 4 CPU 3: Output USB-HID and USB 2.0 | |

3.11 Device Views Add-on Module GPIO R474-BGX

Console side (CON module)



Fig. 17 Interface side R474-BGX

- 1 Input GPIO (D-Sub 9, male socket) for an external switching solution via push button or dry-contact

3.12 Status Indication of the Chassis

3.12.1 Status LED 2-Slot-Chassis Draco vario 474-BODY2




Fig. 18 Interface side chassis 474-BODY2 - Status LED

- 1 Status LED supply voltage 1

Status LED for Power Supply Voltage

The following table shows the LED states/colors for the power supply voltage (see chapter 3.9.1, page 16).

Pos.	LED	Beschreibung
1	 Grün	Power supply voltage available
2	Aus	No power supply voltage available

3.12.2 Status LEDs 2-Slot-Chassis Draco vario 474-BODY2R









Fig. 19 Interface side chassis 474-BODY2R - Status LEDs

- 1 Status LED power supply voltage 1 2 Status LED power supply voltage 2

Status LEDs for Power Supply Voltage

The following tables show the LED states/colors for the power supply voltage (see chapter 3.9.2, page 16).

Pos.	LED	Description
1	 Green	Redundant power supply voltage available
2	 Green	
1	 Green	No redundant power supply voltage available
2	 Red	
1	 Red	No redundant power supply voltage available
2	 Green	
1	Off	No power supply voltage available
2	Off	

3.12.3 Status LEDs 2-Slot-Chassis Draco vario 474-BODY2N

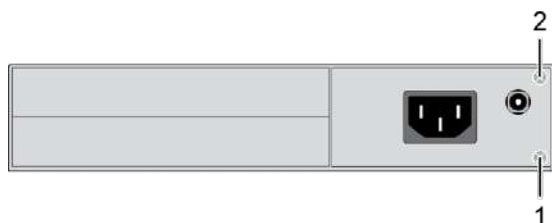


Fig. 20 Interface side chassis 474-BODY2N - Status LEDs

1 Status LED power supply voltage 1

2 Status LED power supply voltage 2

Status LEDs for Power Supply Voltage

The following tables show the LED states/colors for the power supply voltage (see chapter 3.9.3, page 17).

Pos.	LED	Description
1	Green	Redundant power supply voltage available
2	Green	
1	Green	No redundant power supply voltage available
2	Red	
1	Red	No redundant power supply voltage available
2	Green	
1	Off	No power supply voltage available
2	Off	

3.12.4 Status LEDs 2-Slot-Chassis Draco vario 474-BODY2BPF

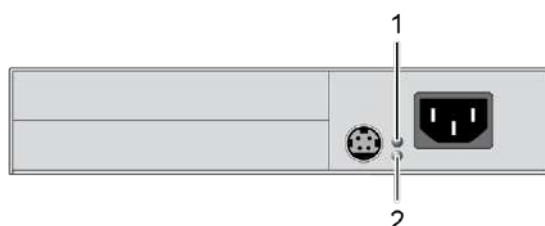








Fig. 21 Interface side chassis 474-BODY2BPF - Status LEDs

1 Status LED power supply voltage 1

2 Status LED power supply voltage 2

Status LEDs for Power Supply Voltage

The following tables show the LED states/colors for the power supply voltage (see chapter 3.9.4 page 17).

Pos.	LED	Description
1	 Green	Redundant power supply voltage available
2	 Green	
1	 Green	No redundant power supply voltage available
2	 Red	
1	 Red	No redundant power supply voltage available
2	 Green	
1	Off	No power supply voltage available
2	Off	

3.12.5 Status LED 4-Slot-Chassis Draco vario 474-BODY4




Fig. 22 Interface side chassis 474-BODY4 - Status LEDs

- 1 Status LED power supply voltage 1

Status LED for Power Supply Voltage

The following table shows the LED states/colors for the power supply voltage (see chapter 3.9.5, page 17).

Pos.	LED	Beschreibung
1	 Grün	Power supply voltage available
2	Aus	No power supply voltage available

3.12.6 Status LEDs 4-Slot-Chassis Draco vario 474-BODY4R

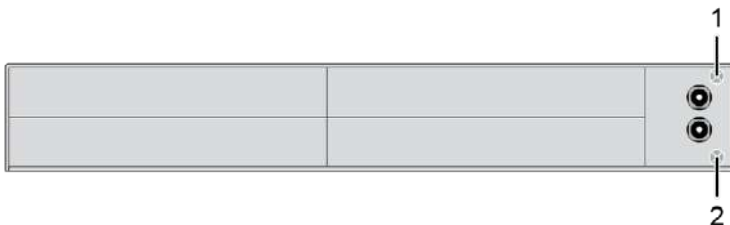








Fig. 23 Interface side chassis 474-BODY4R - Status LEDs

- 1 Status LED power supply voltage 1 2 Status LED power supply voltage 2

Status LEDs for Power Supply Voltage

The following tables show the LED states/colors for the power supply voltage (see chapter 3.9.6 page 18).

Pos.	LED	Description
1	 Green	Redundant power supply voltage available
2	 Green	
1	 Green	No redundant power supply voltage available
2	 Red	
1	 Red	No redundant power supply voltage available
2	 Green	
1	Off	No power supply voltage available
2	Off	

3.12.7 Status-LEDs 6-Slot-Chassis Draco vario 474-BODY6R-R1

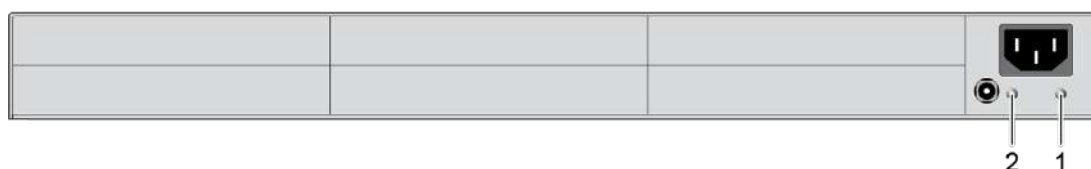


Fig. 24 Interface side chassis 474-BODY6R-R1 - Status LEDs

1 Status LED power supply voltage 1

2 Status LED power supply voltage 2

Status LEDs for Power Supply Voltage

The following tables show the LED states/colors for the power supply voltage (see chapter 3.9.7 page 18).

Pos.	LED	Description
1	Green	Redundant power supply voltage available
2	Green	
1	Green	No redundant power supply voltage available
2	Red	
1	Red	No redundant power supply voltage available
2	Green	
1	Off	No power supply voltage available
2	Off	

3.12.8 Status LEDs 6-Slot Chassis Draco vario 474-BODY2BPF/474-BODY6BP

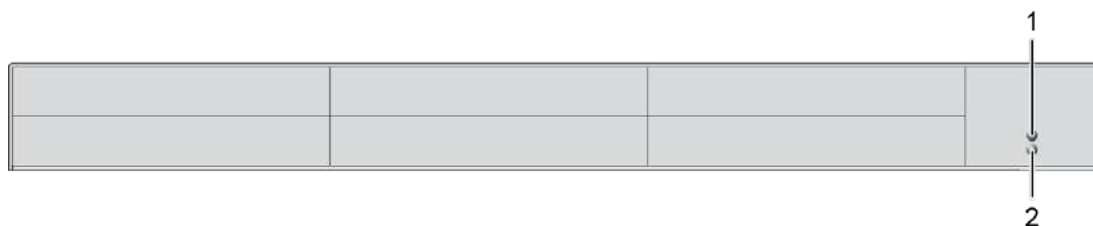


Fig. 25 Interface side chassis 474-BODY6BP - Status LEDs

1 Status LED power supply voltage 1

2 Status LED power supply voltage 2

Status LEDs for Power Supply Voltage

The following tables show the LED states/colors for the power supply voltage (see chapter 3.9.8 page 19).

Pos.	LED	Description
1	Green	Redundant power supply voltage available
2	Green	
1	Green	No redundant power supply voltage available
2	Red	
1	Red	No redundant power supply voltage available
2	Green	
1	Off	No power supply voltage available
2	Off	

3.12.9 Status LEDs 6-Slot-Chassis Draco vario 474-BODY6BPF



Fig. 26 Interface side chassis 474-BODY6BPF - Status LEDs

- 1 Status LED power supply voltage 1 2 Status LED power supply voltage 2









Fig. 27 Rear view chassis 474-BODY6BPF - Status LEDs

- 1 Status LED power supply voltage 1 2 Status LED power supply voltage 2

Status LEDs for Power Supply Voltage

The following tables show the LED states/colors for the power supply voltage (see chapter 3.9.9 page 19).

Pos.	LED	Description
1	 Green	Redundant power supply voltage available
2	 Green	
1	 Green	No redundant power supply voltage available
2	 Red	
1	 Red	No redundant power supply voltage available
2	 Green	
1	Off	No power supply voltage available
2	Off	

3.12.10 Status LEDs 21-Slot Chassis Draco vario 474-BODY21/4U and 474-BODY21/4UR

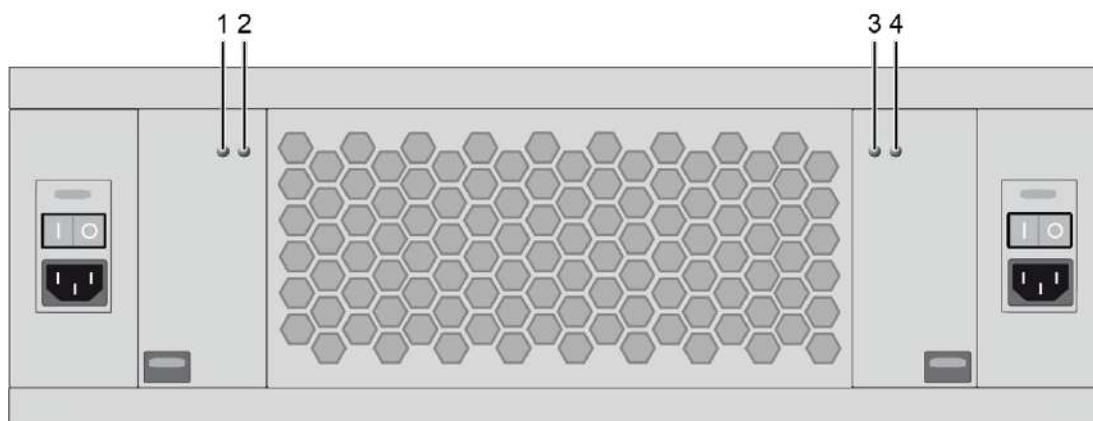





Fig. 28 Rear side chassis 474-BODY21/4U und 474-BODY21/4UR - Status LEDs




- | | | | |
|---|--|---|-----------------------------------|
| 1 | Status LED power supply voltage 2 (redundancy) | 3 | Status LED power supply voltage 1 |
| 2 | Fault LED power supply voltage 2 (redundancy) | 4 | Fault LED power supply voltage 1 |

The following tables show the LED states/colors for the power supply voltage (see chapter 3.9.10 page 20).

Status LEDs for Power Supply Voltage of the Standard Power Supply Unit

Pos.	LED	Description
3	 Green	Power supply voltage available.
4	Off	
3	 Green	<ul style="list-style-type: none"> The input voltage of the power supply unit is too low. The output voltage of the power supply unit too high. Permissible power supply temperature exceeded.
4	 Red	
3	Off	No power supply voltage available.
4	Off	

Status LEDs for Power Supply Voltage of the Redundant Power Supply Unit

Pos.	LED	Description
1	 Green	Power supply voltage available.
2	Off	
1	 Green	<ul style="list-style-type: none"> The input voltage of the power supply unit is too low. The output voltage of the power supply unit too high. Permissible power supply temperature exceeded.
2	 Red	
1	Off	<ul style="list-style-type: none"> No power supply voltage available. No redundant power supply unit installed.
2	Off	

3.13 Status Indication of the U-Switch Module B476-4U4T

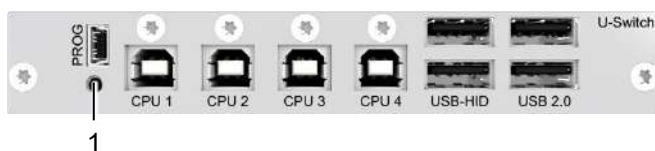


Fig. 29 Interface side U-Switch module B476-4U4T - Status LED

1 Status LED for switching status

Status LED for the Switching Status

Pos.	LED	Status	Description
1	Status (green)	1x flashing	Switched to CPU 1
		2x flashing	Switched to CPU 2
		3x flashing	Switched to CPU 3
		4x flashing	Switched to CPU 4

4 Access Options

You have following options to configure and/or operate the U-Switch:

Access option	Description
Command mode	Connected CON extender modules include a command mode that enables access to several functions of connected KVM devices, e.g., Draco U-Switch when using additional keyboard commands.
Management software	<p>Connecting the U-Switch to the Tera Tool (below referred to as “management software”) allows to configure the Multi-Screen Control (referred to as “MSC” below) of the U-Switch and to perform firmware updates.</p> <p>The management software is available as a single executable program file (desktop and app version) that does not require an installation. The management software can be downloaded from the link https://www.ihse.com/software.</p> <p>Advanced settings can be configured on the Draco tera operating system using the management software:</p> <p>Advanced configuration</p> <p>System update (firmware update)</p>

4.1 Command Mode

To start the command mode, use a keyboard sequence (Hot Key) at the keyboard of a CON Unit plugged in the U-Switch.

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 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)

NOTICE

In command mode, USB-HID devices will cease. 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 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 (default)	<code>2x Left Shift</code> (Hot Key, factory setting)
Exit the command mode	<code>Esc</code>
Change the Hot Key	<code>current Hot Key, c, new Hot Key code, Enter</code>

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 <code>Esc</code> , <code>Del</code> and <code>Enter</code>
2	<code>2x Scroll</code>
3	<code>2x Left Shift</code> (default)
4	<code>2x Left Ctrl</code>
5	<code>2x Left Alt</code>
6	<code>2x Right Shift</code>
7	<code>2x Right Ctrl</code>
8	<code>2x Right Alt</code>

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`).

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`.



Keyboard commands are fixed to the position of the keys on the keyboard. Keyboard mapping tables may vary for country-specific layouts. E.g., `Hot Key, x, a, Enter` enables the automatic switching with activated MSC on a German or US keyboard layout. The French keyboard layout (AZERTY) requires for the same command `Hot Key, x, q, Enter` to be pressed instead.

- Note the key position of a freely defined Hot Key when changing the keyboard layout, e.g., from QWERTZ to AZERTY.

Reset the Hot Key

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

The Hot Key is set back to `Left Shift`.

4.2 Management Software

The menu structure of the management software is subdivided into various sections.

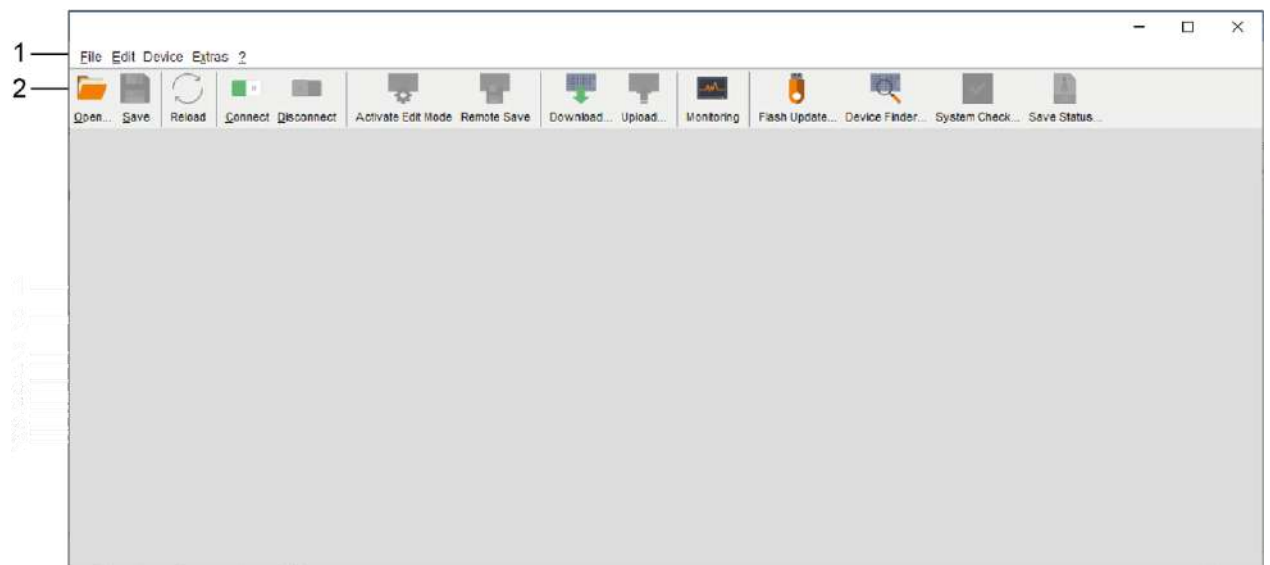


Fig. 30 Management software **Menu structure**

1 Menu bar (top line)

2 Toolbar (second line)

5 Installation

NOTICE

Please verify that interconnect cables, interfaces, and handling of the devices comply with the requirements (see chapter 0, page 48).



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.

5.1 Setting up the System

5.1.1 Setting up the U-Switch

1. Switch off all devices.
2. Connect the USB cables to the CPUs (or CON Units when using a KVM matrix system) and to the U-Switch.
3. Connect mouse and keyboard to the U-Switch.
4. Connect the 5 V DC power supply unit to the U-Switch.
5. Power up the system.

When powering the U-Switch, a boot process will be enabled (duration approx. 30 s).

Only after completion of the boot process, the U-Switch can be used, and keyboard and mouse will be enabled.

5.1.2 Setting up the GPIO Interface (optional)

The GPIO interface can be hot plugged.

The GPIO interface is configured via DIP switches. In the delivery states, all DIP switches are set to the bottom = input. The DIP switches belong to the pins listed below:

	Pin 1	Pin2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
DIP Switch	1	2	-	3	4	5	6	7	8

To set up the GPIO add-on module for an external keypad with up to four buttons and one associated LED each, proceed as follows:

- ➡ Move the DIP switches of the pins up (ON = output) to which you want to connect LEDs.

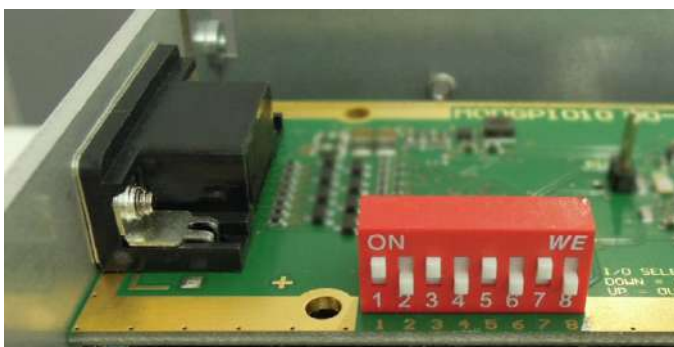


Fig. 31 Example of DIP switch settings

5.2 Connecting to the U-Switch via Management Software

5.2.1 Installing the Management Software

The management software is available as a single executable program file (desktop) that does not require installation. The management software can be used to configure the U-Switch and to update the firmware of the U-Switch.

Requirements

If you want to use the management software with integrated Java Runtime on Windows operating systems, 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

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/adoptopenjdk/adoptopenjdk)
Management software	Tera Tool	Downloaded from https://www.ihse.com/software



Contact your system administrator concerning JRE and network connection.

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.

5.2.2 Connecting the U-Switch to the Computer

- Connect the Mini-USB cable to the Mini-USB port of the U-Switch and the USB-A port of the computer.

5.2.3 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.

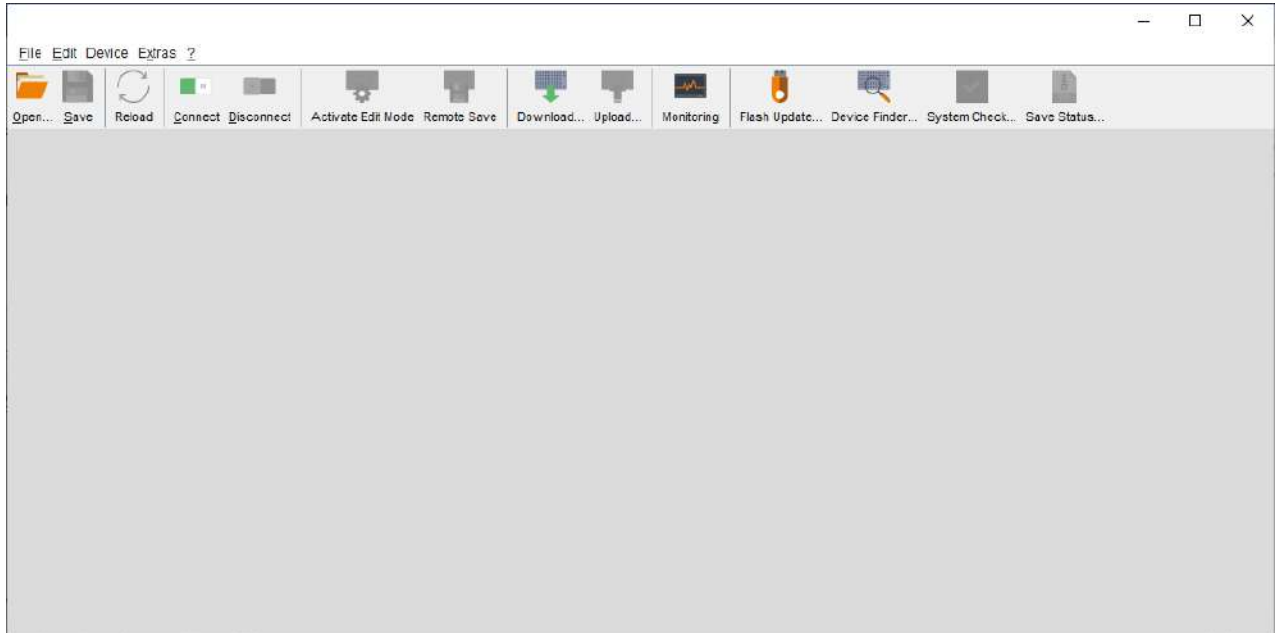


Fig. 32 Management software

6 Configuration

6.1 Configuring the Multi-Screen Control

The U-Switch can be flexibly configured for the use of MSC via management software, also the possibility of switching via mouse panning.

To configure the U-Switch, proceed as follows:

1. Execute the management software on your computer.
2. Select **Extras > KM-Switch MSC Configurator** in the menu bar.
3. Power up the U-Switch.
4. Connect the U-Switch via Mini-USB cable to your computer.
5. Click **Search KM-Switch**.
6. Select your U-Switch from the list and click **Next >**.

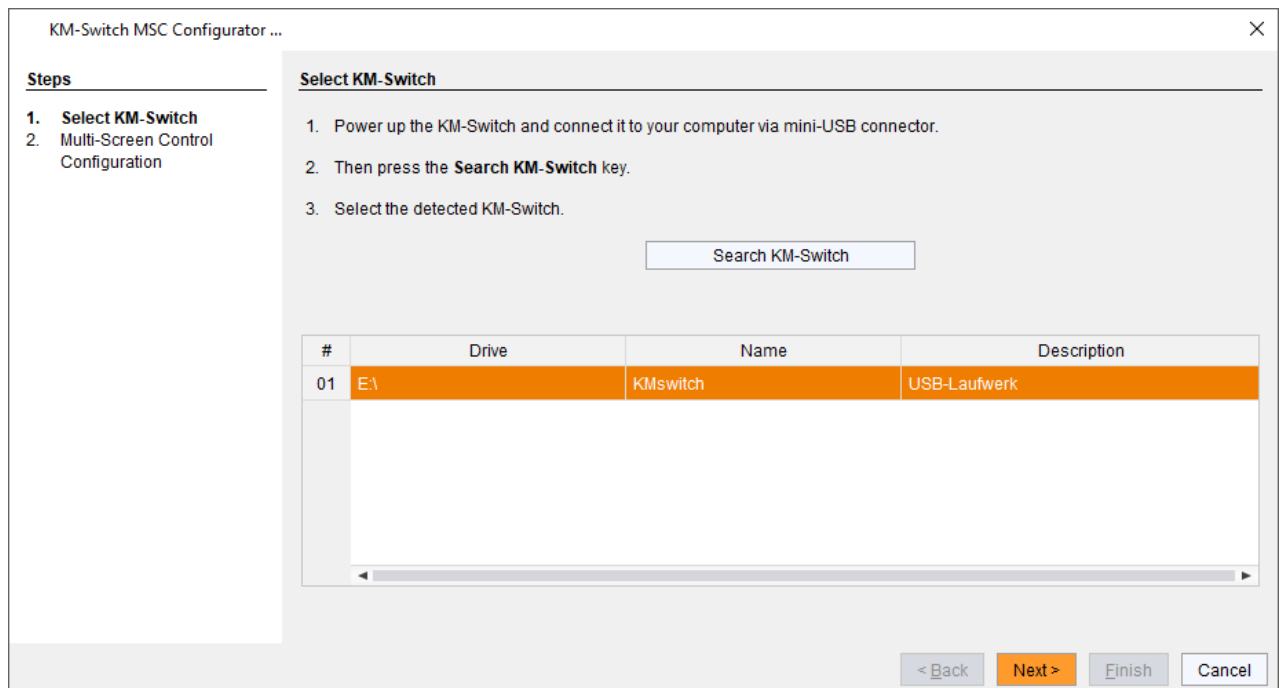


Fig. 33 Management software **KM-Switch MSC Configuration - Select KM-Switch**

7. Select the requested layout in the **Arrangement** selection box or select **Free Layout** for a flexible layout. Select as follows:
 - **Horizontal**: horizontal arrangement (e.g., 4x1)
 - **Vertical**: vertical arrangement (e.g., 1x4)
 - **Block**: block arrangement (e.g., 2x2)
 - **Free Layout**: free arrangement
The free arrangement allows a flexible positioning of the screens for diverse applications.
8. If you have selected **Free Layout**, move the screens from the **Available Screens** field into the grid and arrange them according to your requirements.
The fields for the configuration of the individual displays will be arranged accordingly.



The displays have to be connected side-by-side without space between. Otherwise, you cannot switch.

9. The displays can be adjusted in terms of size, if required. Therefore, use the mouse and drag the monitors into the appropriate size by using the selection points. See examples for display sizing on the following page.
10. If you use Dual-Head sources, click the **Dual-Head** checkbox to activate the option.
An additional display appears in the **Available Screens** field.

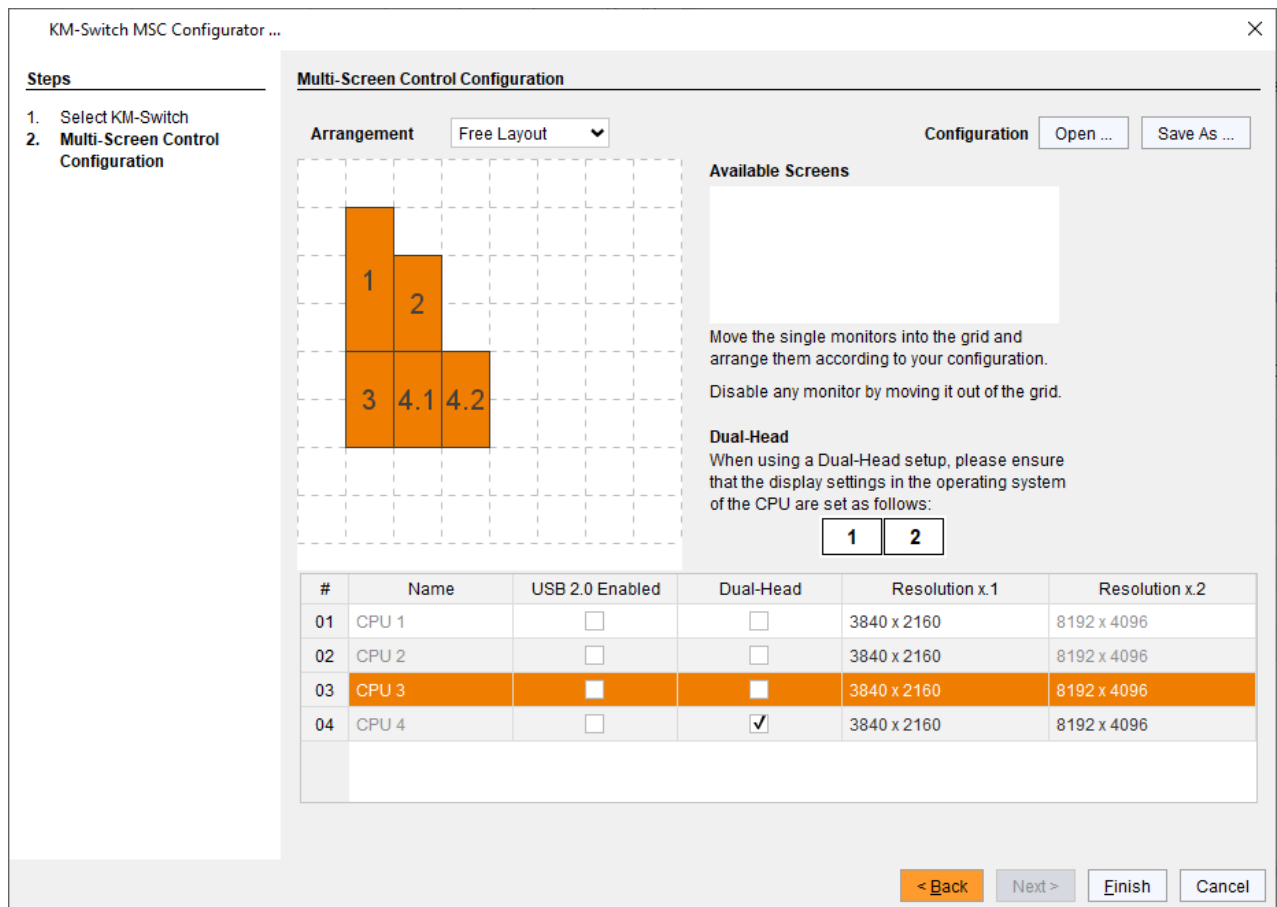


Fig. 34 Management software **KM-Switch MSC Configuration - Multi-Screen Control Configuration**

Arrangement example if using different display sizes

If the used displays have different sizes, the display size should be set in the grid according to the real size of the displays.

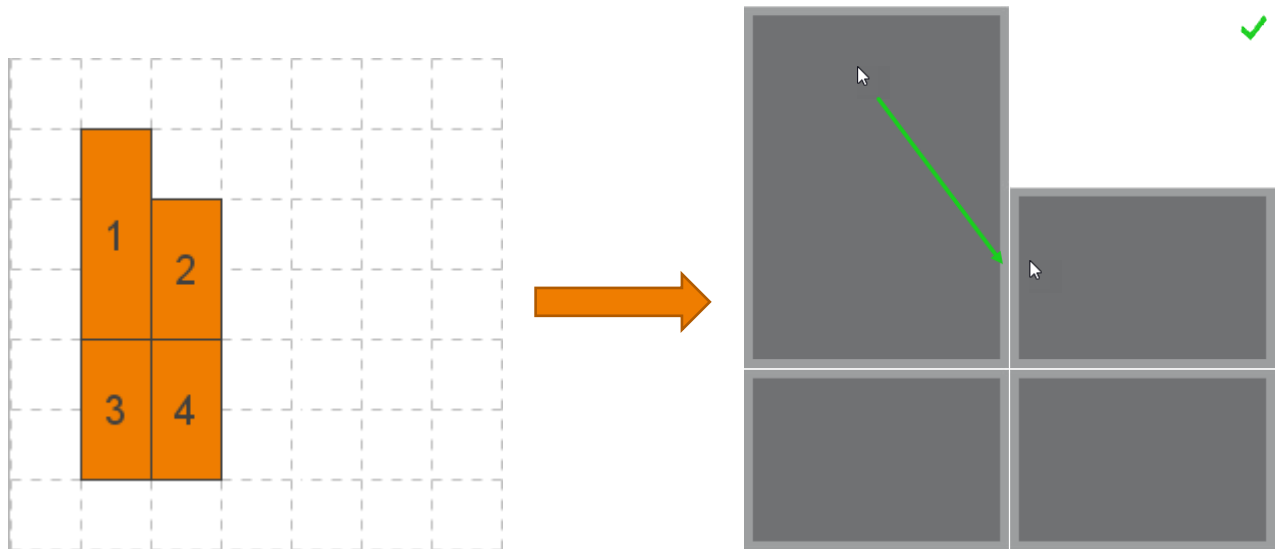


Fig. 35 **Multi-Screen Control Configuration - Correct display arrangement**

If the used displays have different sizes and the displays in the grid are all set in the same display size, the mouse appears in the next display in the same relation as it disappears from the previous display when it is moved over the border of a display.

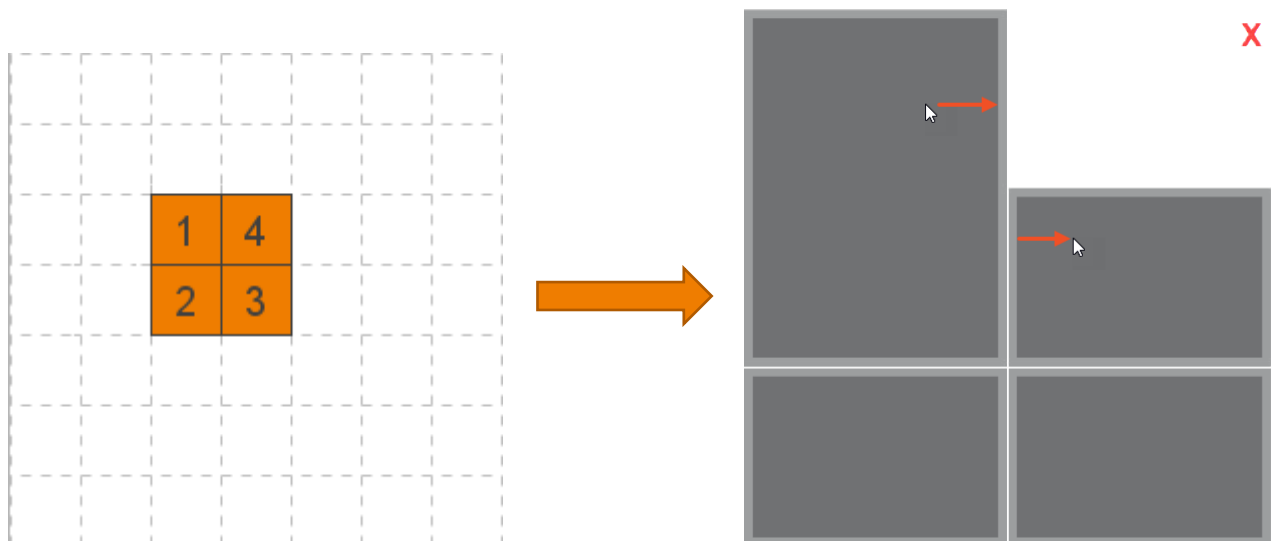


Fig. 36 **Multi-Screen Control Configuration - Wrong display arrangement**

11. Click **Finish** to confirm your configuration.
The configuration will be transferred to the U-Switch and stored.
After storing, the U-Switch will be restarted.
12. Remove the power cord from the U-Switch.
13. Remove the Mini-USB cable from the U-Switch.
14. Reconnect the power cord to the U-Switch.
The U-Switch is ready for operation.



Optionally: Open an already existing configuration by clicking **Open** or store the current configuration before finishing by clicking **Save As** (file extension **.txt**).

6.2 Activating/Deactivating the Routing of USB-2.0-Ports

To activate or deactivate the routing of the USB 2.0 ports to the four USB-B ports, a parameter can be entered in the configuration file (*Config.txt*).

Configuration File

The U-Switch contains a configuration file (*Config.txt*) to set specific parameters. The configured display mode of the MSC is also saved in the *Config.txt*.

The *Config.txt* is located on the flash drive of the U-Switch. The flash drive can be opened by a Mini-USB connection to a computer. The configuration file can be edited with all common text editors.

NOTICE

To ensure the functionality of the parameterization:

The start command `#CFG` has to be written into the first line of the *Config.txt* file.

➔ The U-Switch needs to be restarted.

Firmware Requirements

The following firmware is required as a minimum:

Firmware	Version	Release date
HUSWMSD	B01.07	2020-11-27
HUSWITCH	F01.05	2020-12-16

Parameters

The following parameter settings are available:

Parameters	Functions
ENUSB20=1111	Activate all ports (default)
ENUSB20=1000	Activate the routing of port 1
ENUSB20=1100	Activate the routing of port 1 and port 2
ENUSB20=1010	Activate the routing of port 1 and port 3
ENUSB20=1001	Activate the routing of port 1 and port 4
ENUSB20=0100	Activate the routing of port 2
ENUSB20=0110	Activate the routing of port 2 and port 3
ENUSB20=0101	Activate the routing of port 2 and port 4
ENUSB20=0010	Activate the routing of port 3
ENUSB20=0011	Activate the routing of port 3 and port 4
ENUSB20=0001	Activate the routing of port 4
ENUSB20=0000	Deactivate the routing of all ports

NOTICE

For a successful setting of the USB 2.0 ports, the following sequence must be strictly observed.

Entering or Changing a Parameter in the Configuration File

To enter or change a parameter of the U-Switch, proceed as follows:

1. Connect the U-Switch to any source using a Mini-USB cable.

The U-Switch opens a flash drive containing the `Config.txt` file.

2. Open the `Config.txt` file in a text editor.
3. Ensure that `#CFG` is written in the first line of the file.
4. Add a line break directly behind `#CFG`.
5. Add the desired parameter in capitals in the line below `#CFG`.
6. Save the `Config.txt` file.
7. Manually power off the U-Switch.
8. Power on the U-Switch.

The U-Switch starts automatically with the respective setting for the USB 2.0 ports.

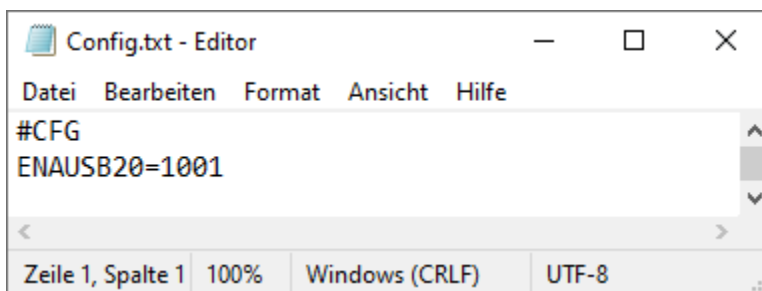


Fig. 37 Example - `Config.txt` with parameter to activate the routing of USB ports 1 and 4

7 Operation

7.1 Switching via Keyboard

The MSC function contains a switching of the USB-HID control between different statically connected sources and displays and can be performed via keyboard or mouse (see chapter 7.2, page 43).

To perform a switching operation via keyboard command, proceed as follows:

1. Enter the **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 **Enter** 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.



When using the numeric keypad for switching, a confirmation of the switching operation by pressing **Enter** is not necessary.

The following keyboard commands are available for switching operations (e.g., using the numeric keypad):

Keyboard command	Function
Hot Key, Num0	Switch the USB-HID control to the own display (CON Unit with keyboard and mouse)
Hot Key, Num1	Switch the USB-HID control to display 1
Hot Key, Num2	Switch the USB-HID control to display 2
Hot Key, Num3	Switch the USB-HID control to display 3
Hot Key, Num4	Switch the USB-HID control to display 4

7.2 Switching via Multi-Screen Control



When using sources in multi-head operation (e.g., Dual-Head), the switching is only working manually via keyboard commands. Any non-observance may have a negative influence on the stability of the system. The function cannot be guaranteed when using wireless keyboards and mice.

When moving the mouse cursor over the edge of a display, you can switch from your console to displays located horizontally or vertically. Therefore, the respective mode has to be activated before.

Mode	Activate/deactivate switching via mouse	Keyboard command
Mode 0	Deactivate switching via mouse	Hot Key, o, x, 0, Enter
Mode 1	Activate horizontal mode	Hot Key, o, x, 1, Enter
Mode 2	Activate vertical mode	Hot Key, o, x, 2, Enter
Mode 3	Activate block mode	Hot Key, o, x, 3, Enter
Mode 4*	Activate free mode	Hot Key, o, x, 4, Enter

* Mode 4 can only be activated via keyboard commands if this mode have been configured via management software during initial installation or after a factory reset.



When switching via mouse is deactivated (mode 0), only switching via keyboard sequences is possible (see chapter 7.1, page 42).



Additional software for calibrating and positioning of the mouse pointer is not necessary.

7.2.1 Activating and Deactivating the Switching via Mouse

Example 1

With, e.g., mode 2 set in the `Config.txt`, the U-Switch starts with a setting for a vertical display arrangement and enabled modes for switching via mouse in the horizontal or block display arrangements.

To activate another display arrangement or deactivate the switching via mouse, proceed as follows:

1. Activate the switching via mouse by entering one of the following keyboard sequences:
 - Horizontal mode: `Hot Key, o, x, 1, Enter`
 - Block mode: `Hot Key, o, x, 3, Enter`
2. Move the mouse pointer beyond the border of the display to the adjacent horizontal or vertical displays. Switching to the new displays will occur instantly.
3. To deactivate the switching via mouse, enter the following keyboard sequence:
`Hot Key, o, x, 0, Enter`



The U-Switch will not react to the keyboard command `Hot Key, o, x, 4, Enter`.

- To get in mode 4, you need to change the configuration (`Config.txt`) in the management software.

Example 2

With, e.g., mode 4 set in the `Config.txt`, the U-Switch starts with a setting for a freely display arrangement and enabled mode for switching via mouse in freely configured displays.

To deactivate or reactivate the switching via mouse in freely configured displays, proceed as follows:

- Deactivate the switching via mouse by entering `Hot Key, o, x, 0, Enter`.
- Reactivate the switching via mouse in freely configured displays by entering
`Hot Key, o, x, 4, Enter`.
- Move the mouse pointer beyond the border of the display to the adjacent horizontal or vertical displays. Switching to the new displays will occur instantly.



Note: The mouse can only be moved to displays that are arranged side-by-side. If there is a gap between the displays, you have to take the way back over displays that are arranged side-by-side.

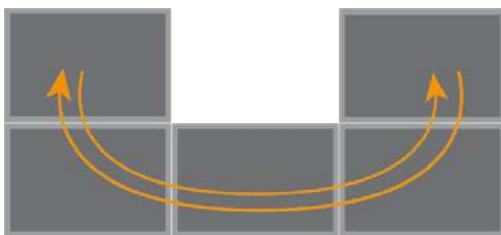


Fig. 38 Example - Display arrangement with gap between the displays



The U-Switch will not react to the keyboard commands `Hot Key, o, x, 1, Enter`, `Hot Key, o, x, 2, Enter` and `Hot Key, o, x, 3, Enter`.

- To get in mode 1, 2, or 3, please change the configuration (`Config.txt`) in the management software.

7.2.2 Setting and Using the restricted Automatic Mode of Switching via Mouse



Setting the Manual Mode is only available in the modes 1, 2, 3, and 4.

Activating the restricted Automatic Mode

If you want to avoid unintentional switching via mouse while MSC is activated, proceed as follows:

1. Enter `Hot Key, x, m, Enter`.

The automatic switching of the MSC is restricted, and the mouse cannot cross the display borders.

2. To enable the mouse to cross the display borders, press `Shift` while moving the mouse over the border of the display.

Deactivating the restricted Automatic Mode

- ➔ Enter the `Hot Key, x, a, Enter` keyboard sequence.

The automatic mode of switching via mouse is enabled.

7.2.3 Deactivating and Reactivating unused or non-connected Ports



The port deactivation for unused or non-connected ports via keyboard commands is intended in modes 1, 2, and 3. The port deactivation in mode 4 is still intended to be done via management software as mode 4 is totally optimized for a configuration via management software.

Unused or non-connected ports should be deactivated, if switching via mouse is in use.

The U-Switch remembers if a port is enabled or disabled in the following cases:

- power cycle
- switch between modes 0, 1, 2, 3, 4 in any combinations

The keyboard command to enable all ports works both when you are switched to an enabled port and when you are switched to a disabled port.

To deactivate ports, proceed as follows:

1. Switch to the port to be deactivated (manual switching).
Enter the `Hot Key, o, x, d, Enter` to deactivate the port:

To reactivate one port, proceed as follows:

1. Switch to the port to be reactivated (manual switching).
2. Enter the `Hot Key, o, x, e, Enter` to reactivate the port.

To reactivate all ports, proceed as follows:

1. Switch to the port to be reactivated (manual switching).
2. Enter the `Hot Key, o, x, c, Enter` to reactivate all ports at the same time.



When switching to a deactivated port, the respective port flashes periodically. After booting the U-Switch, you will be switched by default to the first available port that is activated.

7.3 Switching via External Switching Solution (optional)

Optionally, you can connect an external switching solution (dry contact) with a GPIO interface to switch to the respective source. Via GPIO interface each source connected to a CPU USB port can be switched.

7.4 Using a USB 2.0 Device

When connecting a USB 2.0 device, e.g., a media control to the transparent USB 2.0 interfaces, the media control cannot interact with the U-Switch. The media control will just be routed through to the target computer.

To route the USB 2.0 device through to the desired target computer, proceed as follows:

1. Switch the USB-HID control to the desired target computer.
2. Wait until the target operating system has initiated the USB 2.0 device.



Note the settings for routing through the USB 2.0 ports (see chapter 6.2, page 40).

8 Summary of Keyboard Commands



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 keys when changing the keyboard layout, e.g., from QWERTZ to AZERTY with the French keyboard layout.

In the following you find a summary of keyboard commands that can be used in conjunction with the U-Switch.

8.1 Command Mode

8.1.1 Starting and Exiting the Command Mode

Keyboard command	Function
2x Left Shift	Start the command mode (Hot Key, factory setting)
Esc	Exit the command mode

8.1.2 Changing, Resetting, and Deleting the Hot Key

Keyboard Command	Function
Hot Key, c, new Hot Key code, Enter	Change the Hot Key according to the predefined Hot Key Code table.
Hot Key, c, 0, new Hot Key, Enter	Define a freely selectable Hot Key.
Right Shift + Del within 5 s after switching on the CON Unit or plugging in a keyboard	Reset the Hot Key back to default settings.

Hot Key Code

Hot Key Code	Hot Key
0	Freely selectable, except Esc, Del and Enter
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

8.2 Switching

8.2.1 Restricting the Automatic Switching with activated MSC

Keyboard command	Function
Hot Key, x, m, Enter	With activated MSC restrict the automatic switching and enable the manual mode. The mouse cannot be moved over the edge of a screen.
Hot Key, x, a, Enter	With activated MSC enable the automatic MSC function. The mouse can be moved over the edge of a screen.

8.2.2 Activate/Deactivate Switching via Mouse

Keyboard Command	Mode	Activate/deactivate switching via mouse
Hot Key, o, x, 0, Enter	Mode 0	Deactivate switching via mouse, mouse in absolute mode
Hot Key, o, x, 1, Enter	Mode 1	Activate the horizontal mode 4x1
Hot Key, o, x, 2, Enter	Mode 2	Activate the vertical mode 1x4
Hot Key, o, x, 3, Enter	Mode 3	Activate the block mode 2x2
Hot Key, o, x, 4, Enter	Mode 4	Activate the free mode, individual layout, mouse in absolute mode

8.2.3 Switching the USB-HID Control

Keyboard command	Switching function
Hot Key, Num0	Switch the USB-HID control to the own display (CON Unit with keyboard and mouse)
Hot Key, Num1	Switch the USB-HID control to display 1
Hot Key, Num2	Switch the USB-HID control to display 2
Hot Key, Num3	Switch the USB-HID control to display 3
Hot Key, Num4	Switch the USB-HID control to display 4

8.2.4 Deactivating and Reactivating unused or non-connected Ports

Keyboard Command	Mode
Hot Key, x, d, Enter	Deactivate unused or non-connected ports
Hot Key, x, e, Enter	Reactivate unused or non-connected ports
Hot Key, x, c, Enter	Reactivate all unused or non-connected ports

9 Maintenance

9.1 Maintening the Hardware

NOTICE

Possible damage to the mechanical and electronic components

The chassis contains no serviceable parts inside. If the chassis is nevertheless opened and damaged in the process, the manufacturer's warranty is voided.

The chassis, the extender modules and add-on modules as well as the accessories can be damaged by cleaning with damp or aggressive cleaning agents. If the chassis is nevertheless cleaned with damp or aggressive cleaning agents and damaged in the process, the manufacturer's warranty will be voided.

- ➔ DO NOT open the chassis.
- ➔ DO NOT open the supplied power supply unit.
- ➔ In case of failure, contact the supplier or manufacturer.
- ➔ Remove dust deposits from the device with a dry, antistatic cloth.

9.2 Updating the U-Switch Firmware via Mini-USB Service Port

There are two possibilities to update the extender firmware via Mini-USB service port:

- Via management software (see following chapter),
- Via copy & paste (see chapter 9.2.2, page 53).



If required, the update files can be requested from the manufacturer's technical support.



Updating the firmware via copy & paste is usually not necessary. We recommend using the efficient flash update via management software and to manually copy & paste if only a single firmware file should be updated. Using the flash update via management software, parameters set in the `Config.txt` file are preserved.

Preparation



We recommend using a central location for firmware files, e.g., by using the management software's option menu under **Extras > Options > Default Settings > Firmware Directory**.

9.2.1 Updating the U-Switch Firmware via Management Software

The U-Switch can be updated via service port using the management software. To perform an update via management software, proceed as follows:

1. Remove all USB cables from the CPU ports of the U-Switch.
2. Execute the management software on your computer.
3. Select **Flash Update** in the toolbar.

4. Click **KM-Switch Update via Mini-USB flash drive**.

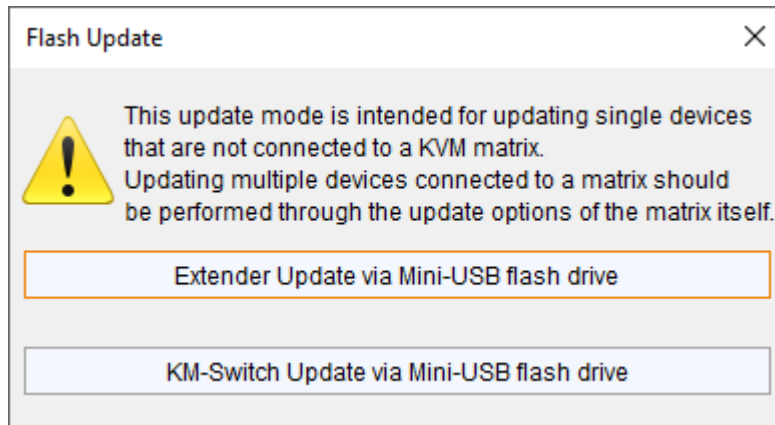


Fig. 39 Management software **Flash Update**

The update dialog appears.

5. Connect the U-Switch to your computer via Mini-USB cable.
6. Power up the U-Switch.
7. Click **Search KM-Switch**.
8. Select the KM-Switch to be updated.

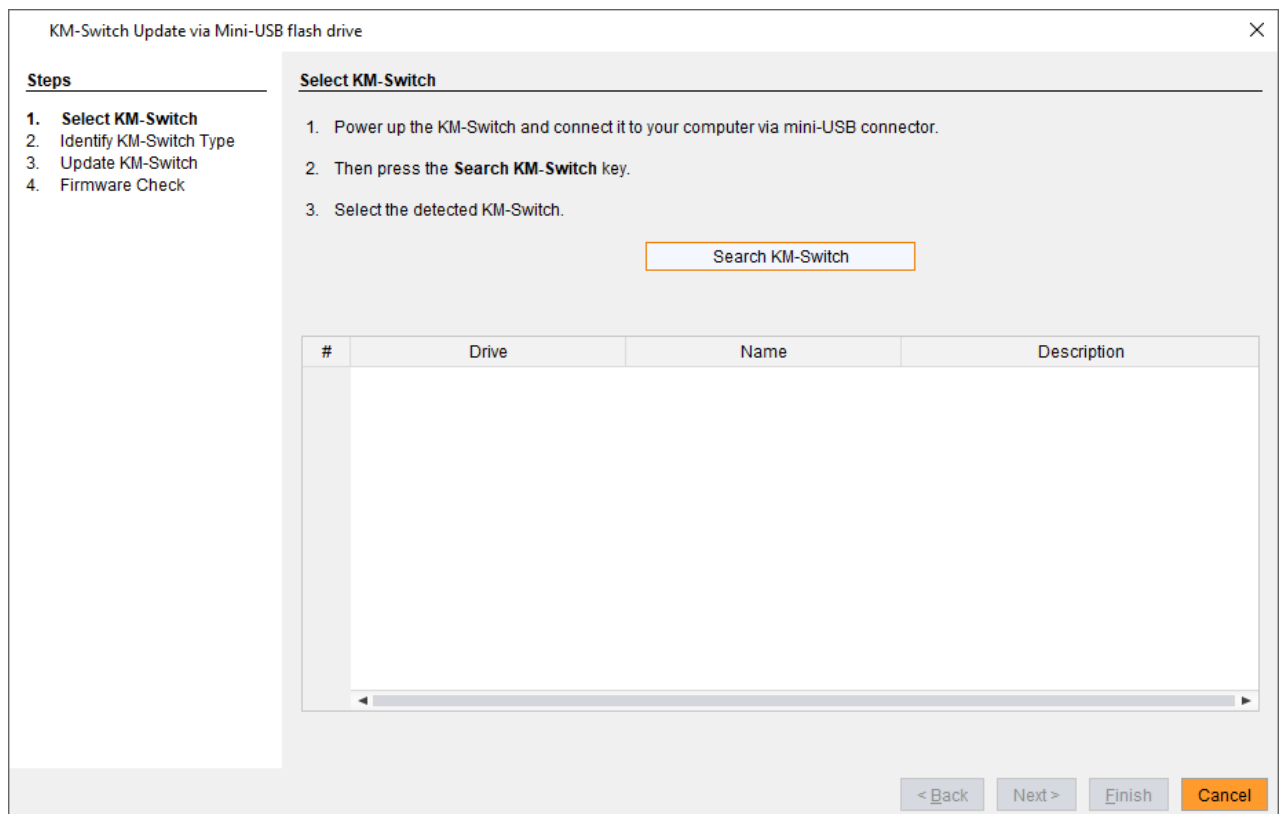


Fig. 40 Management software **Flash Update - Select KM-Switch**

The identification of the U-Switch type automatically starts.

After successful identification, the U-Switch firmware is displayed in the message area.

9. Click **Next >** after successful identification.

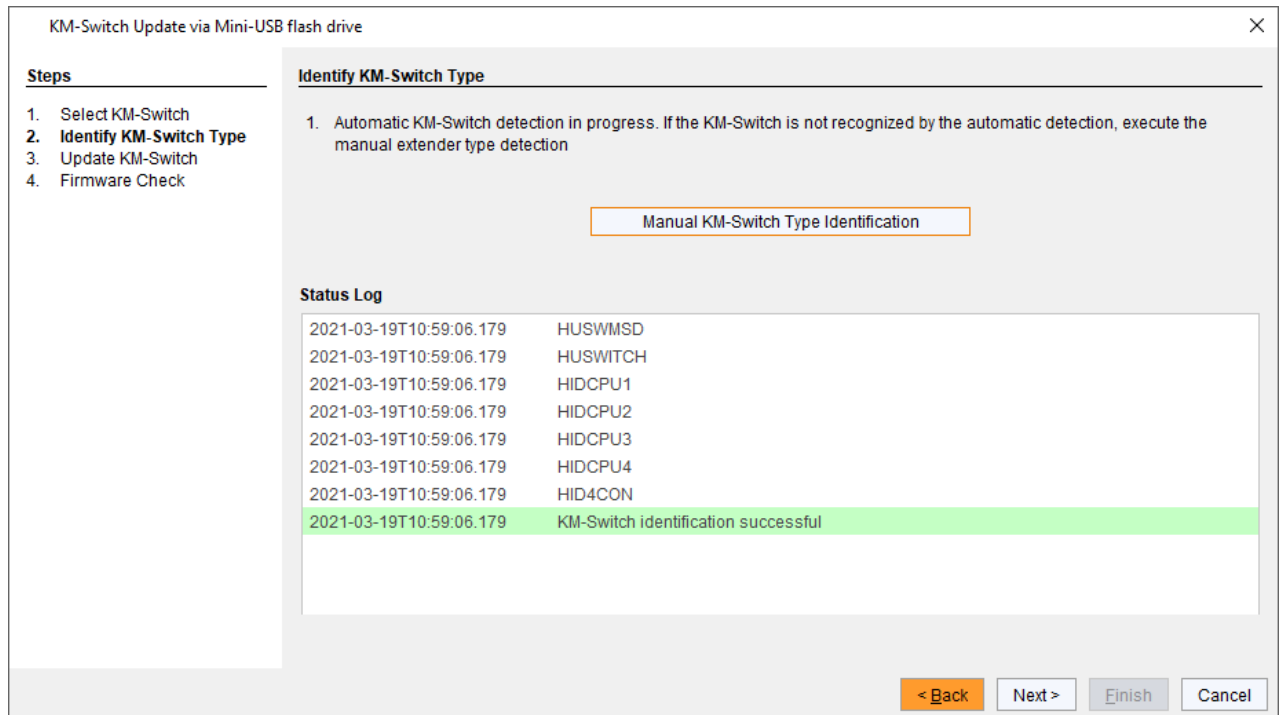


Fig. 41 Management software **Flash Update - Identify KM-Switch Type**

10. Click **Browse...** to navigate to the location the update files are saved.
 11. Select the update files and click **Select** in the selection dialog.
 12. Click **Update** to start the update process.

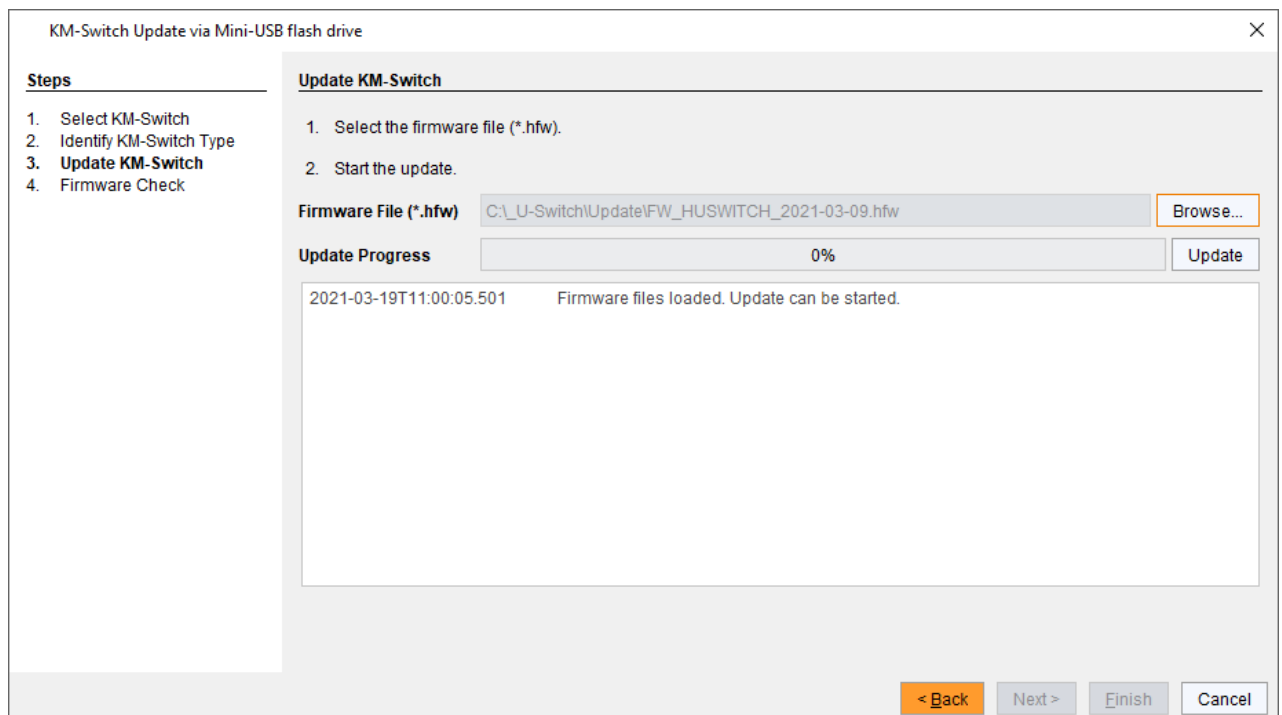


Fig. 42 Management software **Flash Update - Update KM-Switch**

A green highlighted message will appear when the firmware update has been completed.

13. Click **Next >** to verify the update.

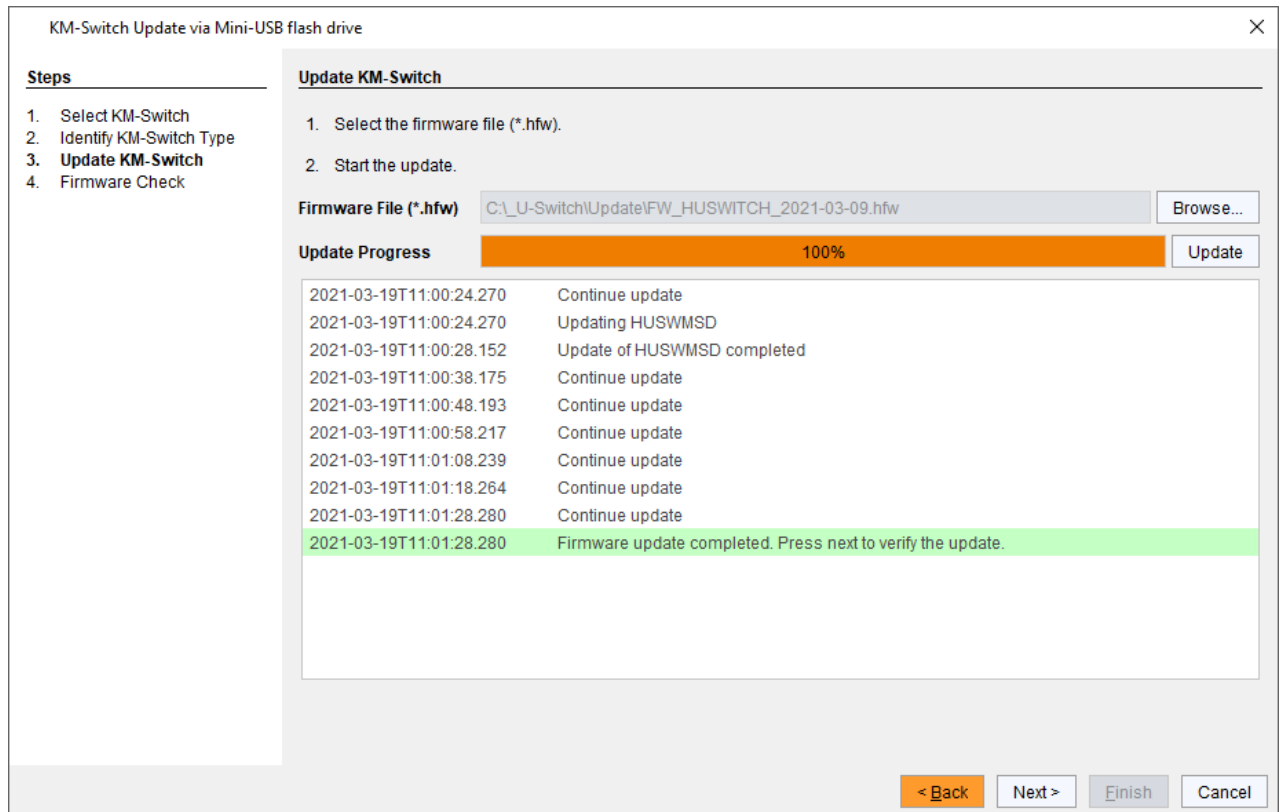


Fig. 43 Management software **Flash Update - Update KM-Switch - Update completed**

A green highlighted message will appear after the firmware update has been completed.

14. Click **Next >** to verify the update.

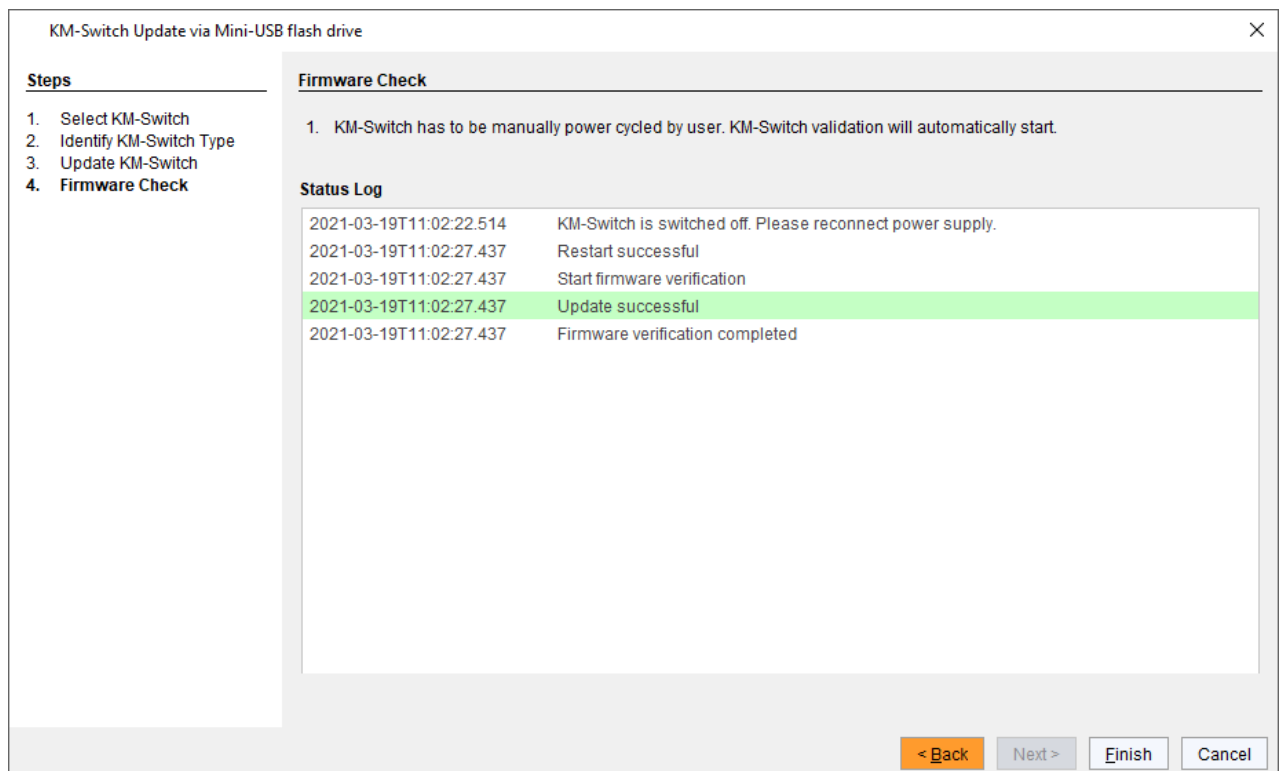


Fig. 44 Management software **Flash Update - Update KM-Switch - Update successful**

15. Remove the power cord of the U-Switch.

16. Remove the Mini-USB cable from the U-Switch.
17. Reconnect the USB cables to the U-Switch with the power switched off.
18. Reconnect the power cord of the U-Switch.

The U-Switch validation will start automatically.

19. Click **Finish**.

The firmware update of the U-Switch is completed.

9.2.2 Updating the U-Switch Firmware via Copy & Paste

The U-Switch can be updated via copy & paste using the Mini-USB service port of the U-Switch. The firmware type is part of the file name such as the MSD firmware the file extension `.pfw`, e.g., `HUSWMSD.pfw`.



Updating the firmware via copy & paste is usually not necessary. We recommend using the efficient flash update via management software and to manually copy & paste if only a single firmware file should be updated.

NOTICE

Possible failures when updating the firmware

In case the HUSWMSD and/or HUSWITCH firmware part of the U-Switch require an update, there may be dependencies between the new contents of HUSWMSD and/or HUSWITCH firmware files and other U-Switch firmware files. In this case, installing other firmware files before updating HUSWMSD and/or HUSWITCH firmware files could lead to failed updates.

To proceed successful firmware updates:

- Please check the release notes of the firmware package for dependencies between the U-Switch firmware files.
- If you got information from the manufacturer's technical support that an update of HUSWMSD and/or HUSWITCH firmware files of a U-Switch is required, please follow the instructions in this chapter.

By updating the HUSWMSD firmware via copy & paste, the `Config.txt` will be overwritten. If there are parameters set in the `Config.txt`, they are lost and have to be set again. To avoid resetting the parameters:



- Store the `Config.txt` before updating the HUSWMSD firmware and copy the stored `Config.txt` after updating the HUSWMSD firmware back to the flash drive of the U-Switch.

To achieve a successful firmware update, proceed as follows:



- Update all firmware files sequentially.
- First update the required HUSWMSD firmware.
- Then update the required HUSWITCH firmware.
- Then update all other firmware files one by one, file by file if necessary.
- Wait between each copy process until the respective copy process has been completed.
- Restart the U-Switch after all copy processes of other firmware files have been completed.



If required, the update files can be requested from the manufacturer's technical support.

Preparation



We recommend using a central location for firmware files, e.g., by using the management software's option menu under **Extras > Options > Default Settings > Firmware Directory**.

Preserving the Parameters of the Config.txt

To optionally store the `Config.txt` before updating `HUSWMSD.pfw` firmware, if the MSC has been configured and/or if parameters have been set, proceed as follows:

1. Connect the U-Switch to your computer using a Mini-USB cable.
The flash drive of the U-Switch opens.
2. Copy the `Config.txt` from the flash drive of the connected U-Switch and paste it to a local directory.

Performing a Firmware Update

To perform a firmware update of a U-Switch via manually copy & paste using the Mini-USB service port, proceed as follows.

1. Remove all USB cables from the CPU ports of the U-Switch.
2. Power up the U-Switch if the power is switched off.
3. Connect the U-Switch via Mini-USB cable to your computer.
The flash drive of the U-Switch opens.
4. Go to the firmware directory with the update files.
5. When instructed from the manufacturer's technical support to update the HUSWMSD firmware:
 - 5.1. Copy the `HUSWMSD.pfw` firmware file and paste it to the U-Switch flash drive.
 - 5.2. Wait until the copying process is complete.
The U-Switch will be restarted after the copy process of the `HUSWMSD.pfw` firmware file to the flash drive is completed.
6. When instructed from the manufacturer's technical support to update the HUSWITCH firmware:
 - 6.1. Copy the `HUSWITCH.pfw` firmware file and paste it to the U-Switch flash drive.
 - 6.2. Wait until the copying process is complete.
7. Afterwards update the other firmware files changed if required, regarding the following steps:
 - 7.1. Copy additional firmware files one by one and paste it to the U-Switch flash drive.
 - 7.2. Wait until the copying process is complete.
8. Optionally: copy the stored `Config.txt` from the local directory and paste it to the flash drive of the connected extender module.
9. Remove the power cord from the U-Switch after copying all required firmware files.
10. Reconnect the USB cables to the U-Switch with the power switched off.
11. Reconnect the power cord to the U-Switch.
The U-Switch validation will start automatically.
12. Restart the U-Switch after copying all required firmware files.



A restart is not sufficient, a cold start is mandatory.

9.3 Resetting the U-Switch to the Factory Settings

NOTICE

If a firmware update has been carried out since the delivery, this firmware version is retained.

To reset the U-Switch back to default settings, proceed as follows:

1. Connect the U-Switch to any source using a Mini-USB cable.
The U-Switch opens a flash drive containing the `Config.txt` file.
2. Delete the `Config.txt` file.
3. Manually power off the U-Switch.
4. Power on the U-Switch.
The U-Switch restarts.

11 Troubleshooting USB-HID

Diagnosis	Possible reason	Measure
The Caps Lock and Scroll Lock LEDs on the keyboard are flashing.	Keyboard in command mode	➔ Press ESC to leave the command mode.
USB device without function.	No USB-HID device	➔ Check the connection of the USB-HID cable to the USB-HID device. ➔ Connect a USB-HID device. ➔ Contact dealer if necessary.
	USB-HID device is not supported	➔ Check the compatibility. ➔ Contact your dealer if necessary.

12 Technical Data

12.1 Interfaces

12.1.1 USB-HID

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

Keyboard

Compatible with most USB keyboards. Certain keyboards with additional functions may require custom firmware to operate. Keyboards with an integral USB Hub (Mac keyboards e.g.) are also supported, however, a maximum of two devices is supported.

Mouse

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

Other USB-HID devices

The proprietary USB emulation supports certain other USB-HID devices, such as specific touch screens, graphic tablets, barcode scanners or special keyboards. However, support cannot be guaranteed for every USB-HID device.

Extension

If it is required to extend the USB-HID signals on CPU or console side (e.g., mounting requirement), the signals can be extended either via a 3.0 m A-B cable (247-U2) or a 3.0 m USB A-A extension cable (436-USB20). The compatibility to other extension cables cannot be guaranteed.



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

To support other USB 'non-HID' devices, such as scanners, web cams or memory devices, use the USB 2.0 interfaces.

12.1.2 USB 2.0 (transparent)

The U-Switch with transparent USB 2.0 interface supports almost all types of USB 2.0 devices. USB 2.0 data transfer is supported with USB high speed (max. 480 Mbit/s).

Each USB embedded port provides a maximum current of 500 mA (high power). When using a USB high speed interface with 4 USB ports, respectively 2 connectors provide a maximum of 500 mA (high power) and 2 connectors a maximum of 100 mA.

12.1.3 Mini-USB

This interface enables a customer specified communication with the U-Switch. The firmware could also be updated using this interface.

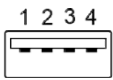
12.1.4 GPIO

An external switching solution (dry contact) with up to four buttons, each of which one associated LED can be connected to this interface. After pressing a button, the corresponding source is switched. The switching carried out is indicated on the associated LED. E.g., button 1 is assigned to the USB-B port for source 1. Max. 1.100 mA is supplied at the port for the power supply (pin 3) that is protected by a fuse.

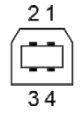
Each other port is limited to a maximum current draw of 170 mA.

12.2 Connector Pinouts

12.2.1 USB, Type A

Connector	Pin	Signal	Color
	1	+5 V (DC)	Red
	2	D -	White
	3	D +	Green
	4	GND	Black

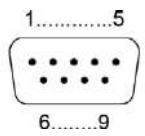
12.2.2 USB, Type B

Connector	Pin	Signal	Color
	1	+5 V (DC)	Red
	2	D -	White
	3	D +	Green
	4	GND	Black

12.2.3 Mini-USB, Type B

Connector	Pin	Signal	Color
	1	+5 V (DC)	Red
	2	D -	White
	3	D +	Green
	4	Not connected	-
	5	GND	Black

12.2.4 D-Sub 9 (GPIO)

Connector	Pin	Channel	Control
	1	1	OUT for LED 1, ground
	2	1	IN from push button 1
	3	-	+5 V (DC)
	4	2	OUT for LED 2, ground
	5	2	IN from push button 2
	6	3	OUT for LED 3, ground
	7	3	IN from push button 3
	8	4	OUT for LED 4, ground
	9	4	IN from push button 4

12.2.5 Power Supply Voltage

Connector	Pin	Signal
	Inside	+5 V (DC)
	Out-side	GND

12.3 Power Supply Voltage, Current Draw and Power Consumption

NOTICE

Overheating of the power supply units

In case of having redundant power supply units, the maximum current must not exceed the value of one of the two power supply units due to the heat dissipation.

12.3.1 Power Supply Voltage of the Chassis (AC)

Product type	Maximum current draw	Maximum voltage AC	Frequency
474-BODY2N	700 mA	100 V to 240 V	50/60 Hz
474-BODY2BPF	700 mA	100 V to 240 V	50/60 Hz
474-BODY6R-R1	1,500 mA	90 V to 264 V	47-63 Hz
474-BODY6BP	1,300 mA	100 V to 240 V	50/60 Hz
474-BODY6BPF	1,300 mA	100 V to 240 V	50/60 Hz
474-BODY21/4U	4,000 mA	2x 100 V to 240 V	50/60 Hz

12.3.2 Power Supply Voltage of the Chassis (DC)

Product type	Maximum current draw	Maximum voltage DC
474-BODY2	3,000 mA	5 V
474-BODY2R	3,000 mA	5 V
474-BODY2N	5,000 mA	5 V
474-BODY2BPF	5,000 mA	5 V
474-BODY4	5,000 mA	5 V
474-BODY4R	5,000 mA	5 V
474-BODY6R-R1	12,000 mA	5 V

12.3.3 Power Supply Voltage of the U-Switch Module and Add-on Modules

NOTICE

Exceeding the maximum permissible current draw

In addition to the current draw of the U-Switch module and add-on modules, there is also the current draw of the connected peripherals.

➡ Note the maximum current draw of the housing (see from chapter 12.3, page 59).

Product type	Maximum current draw	Maximum power consumption
B476-4U4T	1,710 mA	8 W
R474-BGX	10 mA	0 W

12.4 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)
Sound pressure level (SPL)	Max. 21 dBA per fan (474-6FAN and 474-MODFAN)
Heat dissipation	Corresponds to power consumption in Watt (W)

12.5 Dimensions

12.5.1 Dimensions of the Chassis

CPU Unit / CON Unit	Dimension	Dimension of the shipping box
474-BODY2 / 474-BODY2R	145 x 147 x 41 mm (5.7" x 5.8" x 1.7")	267 x 216 x 64 mm (10.5" x 8.5" x 2.5")
474-BODY2N	221 x 147 x 41 mm (8.7" x 5.8" x 1.7")	267 x 216 x 64 mm (10.5" x 8.5" x 2.5")
474-BODY4 / 474-BODY4R	293 x 147 x 41 mm (11.5" x 5.8" x 1.7")	550 x 365 x 115 mm (21.7" x 14.4" x 4.5")
474-BODY6R-R1	442 x 147 x 41 mm (17.4" x 5.8" x 1.7")	760 x 365 x 115 mm (29.9" x 14.4" x 4.5")
474-BODY6BP / 474-BODY6BPF	442 x 250 x 44 mm (17.4" x 9.8" x 1.7")	550 x 372 x 155 mm (21.7" x 14.6" x 6.1")
474-BODY21/4U	482 x 462 x 176 mm (19.0" x 18.2" x 6.9")	645 x 574 x 368 mm (25.4" x 22.6" x 14.5")

12.5.2 Dimension of the U-Switch Module and Add-on Modules

	Dimension	Dimension of the shipping box
B476-4U4T	120 x 20 x 145 mm (4.7" x 0.8" x 5.7")	250 x 191 x 38 mm (9.84" x 7.52" x 1.5")
R474-BGX	120 x 20 x 145 mm (4.7" x 0.8" x 5.7")	250 x 191 x 38 mm (9.84" x 7.52" x 1.5")

12.6 Weight

The following table contains the weight when the respective chassis is fully equipped, for both the CPU Unit and the CON Unit.

12.6.1 Weight of the Chassis

Chassis	Weight	Weight inclusive shipping box
474-BODY2 / 474-BODY2R	0.7 kg (1.5 lb)	2.5 kg (5.5 lb)
474-BODY2N	1.1 kg (2.4 lb)	2.9 kg (6.4 lb)
474-BODY4 / 474-BODY4R	0.9 kg (2.0 lb)	3.4 kg (7.5 lb)
474-BODY6R-R1	1.9 kg (4.2 lb)	5.1 kg (11.2 lb)
474-BODY6BP / 474-BODY6BPF	2.5 kg (5.5 lb)	3.5 kg (7.7 lb)
474-BODY21/4U	10.0 kg (22.1 lb)	14.5 kg (32.0 lb)

12.6.2 Weight of the U-Switch Module and Add-on Modules

Chassis	Weight
B476-4U4T	107 g (0.24 lb)
R474-BGX	57 g (0.13 lb)

12.7 MTBF

Specific MTBF values (mean time between failure) can be requested from the manufacturer if required.

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

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 Product Safety

The product safety of the following devices is proven by the compliance to the listed standards.

Type	Standards
474-BODY2BPF	<ul style="list-style-type: none"> • IEC 62368-1:2014 • EN 62368-1:2014/A11:207 • UL 62368-1:2014 • CAN/CSA-C22.2 No. 62368-1:2014
474-BODY6BP	
474-BODY6BPF	
474-BODY2N	<ul style="list-style-type: none"> • EN 60950-1/A12:2011 • IEC 60950-1/A1:2010 • UL 60950-1-2007 • CAN/CSA-C22.2 No. 60950-1:2007
474-BODY6R	
474-BODY21/4U	

The compliance to the standards is verified and confirmed by TÜV Süd, Germany.



14.3 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.

14.4 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
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, mouse, and monitor
CPU Unit	Component of a KVM Extender or Media Extender to connect to a source
Dual-Head	A system with two video connections
KVM	Keyboard, video, and mouse
Multi-Screen Control	Control of USB-HID of up to eight sources 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.
MTBF	Mean Time Between Failure (MTBF) is measured in power-on hours and describes the system reliability.
POH	Power-on hours corresponds to the average operating time
USB-HID	<p>USB-HID devices (Human Interface Device) allow users to interact with computers. There is no need for a special driver during installation; "New USB-HID device found" is reported.</p> <p>Typical USB-HID devices include keyboards, mice, graphics tablets and touch screens. Storage, video, and audio devices are not HID.</p>

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17 Change log

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

Edition	Date	Chapter	New functions / changes
REV02.00	2021-10-14	8.2.3, 8.5, 8.5.1	New/changed chapters because of technical improvement or new features
		8.4, 9	New chapters
		1.3, 2, 3, 4.3, 4.6, 4.7, 4.9, 5, 6.1.2, 7.2, 7.3, 8.2, 8.3,	Chapter changed or extended
REV01.00	2021-04-19	Initial user manual	-