



# User Manual

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## **Draco U-Switch**

**Model:  
K476-4U  
K476-8U**

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# 1 About This Manual

## 1.1 Scope

This manual describes how to install your U-Switch, how to operate it and how to perform trouble shooting.

## 1.2 Validity

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

## 1.3 Cautions and Notes

The following symbols are used in this manual:



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



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

# 2 Safety Instructions

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

### Installation

- Only use in dry, indoor environments.
- The U-Switch and the power supply units can get warm. Do not situate them in an enclosed space without any airflow.
- Do not place the power supply directly on top of the device.
- Do not obscure ventilation holes.
- Only use power supplies originally supplied with the product or manufacturer-approved replacements. Do not use a power supply if it appears to be defective or has a damaged case.
- Connect all power supplies to grounded outlets. In each case, ensure that the ground connection is maintained from the outlet socket through to the power supply's AC power input.
- Do not connect the link interface to any other equipment, particularly network or telecommunications equipment.
- Take any required ESD precautions.

### Repair

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

## **3 Description**

### **3.1 Application**

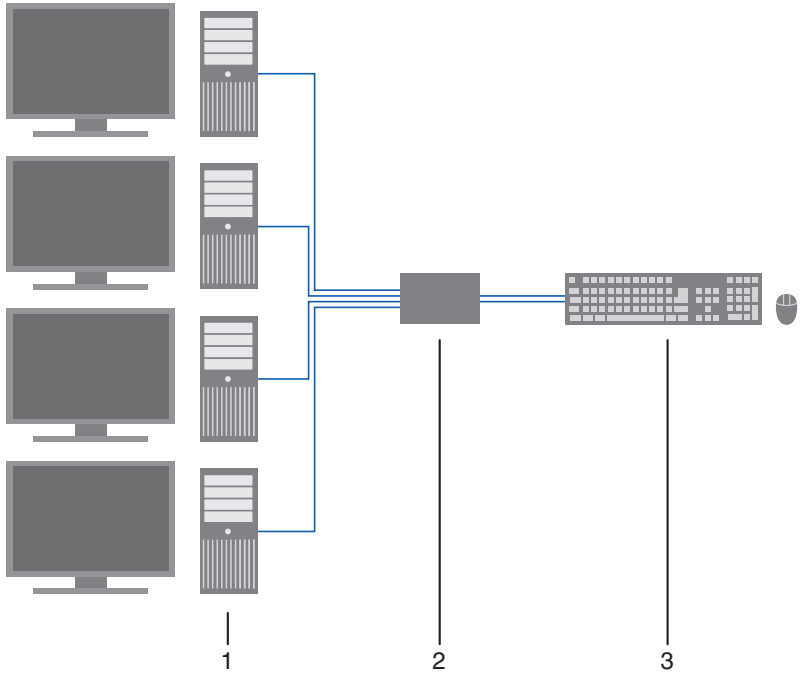
The U-Switch is used to handle several sources (computer, CPU, KVM Extender CON Units) and several monitors with one keyboard and mouse set only.

The U-Switch is especially suitable for use with KVM switches and KVM extenders of the Draco family.

## 3.2 System Overview

The U-Switch is connected to the sources (computer, CPU, KVM extender CON Units) by using the included cables.

Keyboard and mouse are also connected to the device.



- 1 Sources (computer, CPU, KVM Extender CON Units)
- 2 U-Switch
- 3 Keyboard, mouse



See Chapter 4.3, Page 15 for installation examples.

### 3.3 Product Range

Model	Description
K476-4U	U-Switch 4 Port
K476-8U	U-Switch 8 Port

### 3.4 Upgrade Kits

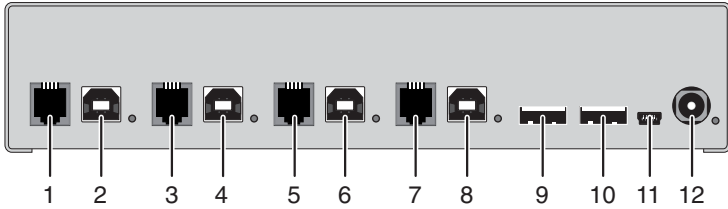
Model	Description
455-8G	19"/1U rack mount kit to mount up to 2 devices
455-1K	Mounting plate to mount by screws
455-2K	Mounting plate to mount by snap on

### 3.5 Accessories

Model	Description
260-5U	International power supply unit 100...240VAC / 5VDC / 4 A
445-2X	DVI-D splitter cable

## 3.6 Device Views

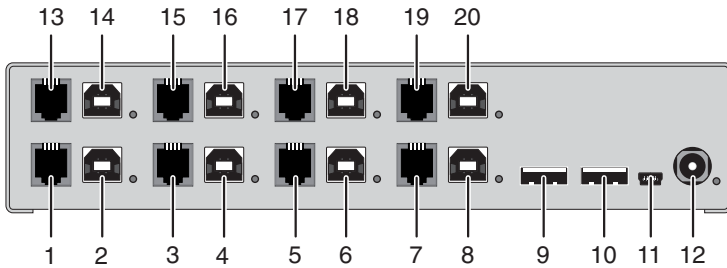
### 3.6.1 Model K476-4U



#### *Rear View*

- 1 Connect to RJ10 / 4P4C (Port 1)
- 2 To CPU 1: USB-HID
- 3 Connect to RJ10 / 4P4C (Port 2)
- 4 To CPU 2: USB-HID
- 5 Connect to RJ10 / 4P4C (Port 3)
- 6 To CPU 3: USB-HID
- 7 Connect to RJ10 / 4P4C (Port 4)
- 8 To CPU 4: USB-HID
- 9 Connect to USB-HID devices 1
- 10 Connect to USB-HID devices 2
- 11 Service port
- 12 Connect to 5VDC power supply

### 3.6.2 Model K476-8U



#### *Rear View*

- 1 Connect to RJ10 / 4P4C (Port 1)
- 2 To CPU 1: USB-HID
- 3 Connect to RJ10 / 4P4C (Port 2)
- 4 To CPU 2: USB-HID
- 5 Connect to RJ10 / 4P4C (Port 3)
- 6 To CPU 3: USB-HID
- 7 Connect to RJ10 / 4P4C (Port 4)
- 8 To CPU 4: USB-HID
- 9 Connect to USB-HID devices 1
- 10 Connect to USB-HID devices 2
- 11 Service port
- 12 Connect to 5VDC power supply
- 13 Connect to RJ10 / 4P4C (Port 5)
- 14 To CPU 5: USB-HID
- 15 Connect to RJ10 / 4P4C (Port 6)
- 16 To CPU 6: USB-HID
- 17 Connect to RJ10 / 4P4C (Port 7)
- 18 To CPU 7: USB-HID
- 19 Connect to RJ10 / 4P4C (Port 8)
- 20 To CPU 8: USB-HID

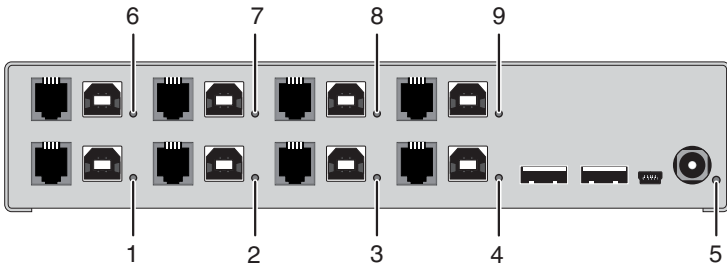
## 3.7 Status LEDs

The U-Switch is fitted with a multi color LED on both sides for indication of connection status:



*Front View*

Pos.	LED	Status	Description
1	<b>Status</b> (green)	Off	Device not ready
		On	Device ready
2	<b>Power</b> (red)	Off	Power supply not available
		On	Power supply available



Rear View

Pos.	LED	Status	Description
1	<b>USB Status</b> CPU 1 (green)	Off	No connection to CPU 1
		On	Connection to CPU 1
2	<b>USB Status</b> CPU 2 (green)	Off	No connection to CPU 2
		On	Connection to CPU 2
3	<b>USB Status</b> CPU 3 (green)	Off	No connection to CPU 3
		On	Connection to CPU 3
4	<b>USB Status</b> CPU 4 (green)	Off	No connection to CPU 4
		On	Connection CPU 4
5	<b>Power</b> (red)	Off	Device not ready
		On	Device ready
6	<b>USB Status</b> CPU 5 (green)	Off	No connection to CPU 5
		On	Connection to CPU 5
7	<b>USB Status</b> CPU 6 (green)	Off	No connection to CPU 6
		On	Connection to CPU 6
8	<b>USB Status</b> CPU 7 (green)	Off	No connection to CPU 7
		On	Connection to CPU 7
9	<b>USB Status</b> CPU 8 (green)	Off	No connection to CPU 8
		On	Connection to CPU 8

## 4 Installation

### 4.1 Package Contents

Your extender package contains the following items:

- 5VDC international power supply unit
- German power cord
- Quick Setup
- 4x USB cable (1.8 m, type A to type B)



**Additional content for K476-8U:**

- 4x USB cable (1.8 m, type A to type B)



If anything is missing, contact your dealer.

### 4.2 System Setup

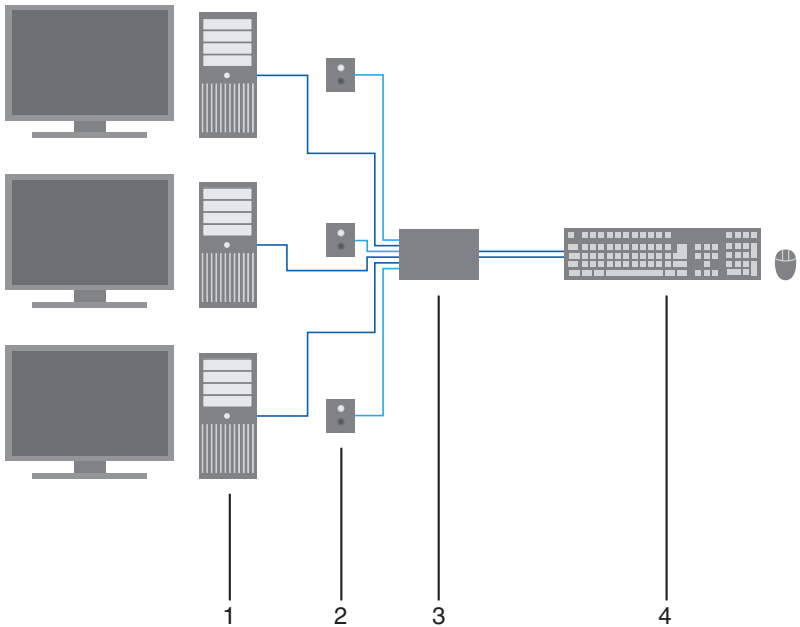


First time users are recommended to setup the system with the CPU Unit and the CON Unit in the same room as a test setup. This will allow you to identify and solve any cabling problems, and experiment with your system more conveniently.

1. Switch off all devices.
2. Connect the USB cables to the CPUs (CON Units) and to the U-Switch.
3. Connect mouse and keyboard to the U-Switch.
4. Connect the 5VDC power supply with the U-Switch.
5. Power up the system.

## 4.3 Example Applications

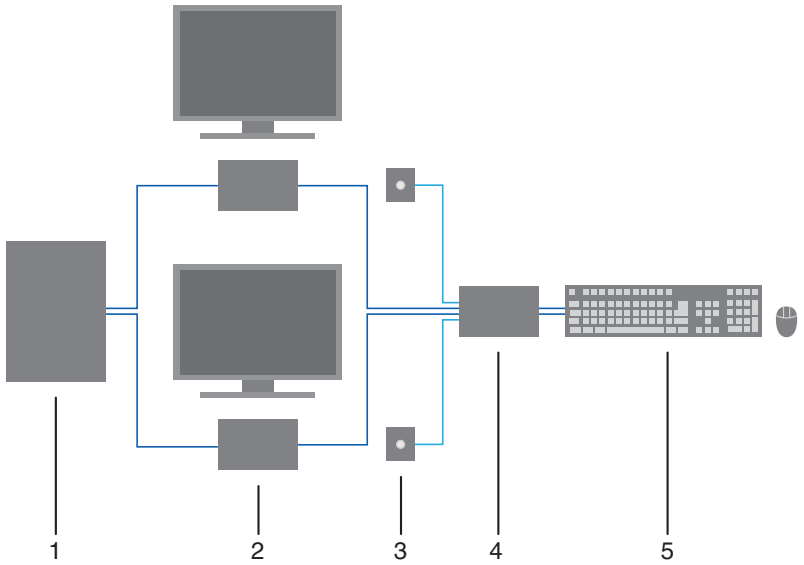
This section illustrates typical installations of the U-Switch:



*U-Switch (Direct CPU connection)*

- 1 Source (computer, CPU)
- 2 Switch button (see Chapter 5.3, Page 18)
- 3 U-Switch
- 4 Keyboard, mouse

# Draco U-Switch



*U-Switch (In combination with Draco KVM switch)*

- 1 Draco KVM Switch
- 2 CON Units
- 3 Monitor LEDs (see Chapter 5.2, Page 18)
- 4 U-Switch
- 5 Keyboard, mouse

## 5 Configuration

### 5.1 Command Mode

The U-Switch has a Command Mode that allows several functions via keyboard command during normal use.

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



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

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

Function	Keyboard Command
Enter Command Mode (default)	2x <Right Shift> (or 'Hot Key')
Exit Command Mode	<Esc>
Change 'Hot Key' sequence	<Left Ctrl> + <Left Shift> + <c>, <'Hot Key' Code>, <Enter>



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

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

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

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



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

## 5.2 External Display (optional)

The U-Switch has a RJ10 interface at each USB-HID port for CPUs (see Chapter 7.1.2, Page 21). It provides the current status of the port, e.g. for control of a status LED.

## 5.3 External Control (optional)

The U-Switch has a RJ10 interface at each USB-HID port for CPUs (see Chapter 7.1.2, Page 21). The current switching status can be changed by a potential-free contact, e.g. by a button.

## 6 Operation

### 6.1 Switching a Source

#### 6.1.1 Switching via Keyboard

From your console, you can switch via keyboard sequence between different monitors.

1. Open Command Mode with the 'Hot Key' (see Chapter 5.1, Page 17).
2. Enter the number of the specific source or monitor and confirm with <Enter>.

At the same time Command Mode is closed and the keyboard LEDs return to previous status.

Keyboard and mouse are connected to the specified source or monitor.

#### 6.1.2 External Switching (optional)

Optionally, you can connect a button with a RJ10 interface to switch to the respective source or monitor.

The RJ10 interface is separately available for each USB-HID port with CPU connection.

# 7 Specifications

## 7.1 Interfaces

### 7.1.1 USB-HID

Our devices with an USB-HID interface support a maximum of two devices compliant with the 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.

#### **Mouse**

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

#### **Other USB-HID devices**

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



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 HID devices allowed.

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

## 7.1.2 RJ10 / 4P4C

This interface is used to establish a customer specific communication with the U-Switch.

### External Status LED

For control of an external Status LED to show the status of the respective port, please proceed as follows:

Connect the anode of your LED with pin 1 and the cathode with pin 2. Use a suitable series resistor that you connect in series. The interface supplies 3.3 V output voltage with 15 mA max.

### External Button

To control a port by an external button, please proceed as follows:

Use an NC (normally closed) contact as a switch. This contact has to short-circuit pin 3 and pin 4 for switching.

## 7.2 Supported Peripherals

### 7.2.1 USB-HID Devices

The U-Switch will support most USB-HID devices, including the vast majority of keyboards and mice currently on the market. Many other kinds of HID device such as bar-code scanners and touch screens may also be compatible

It is not possible to guarantee support for all available USB-HID devices. In certain cases, custom firmware may be required.


USB-HID (and other) devices that are not supported as standard will normally operate with our devices featuring transparent USB support.



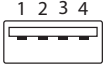
Please note that concurrent operation of more than two USB-HID devices is not possible even if you use a USB hub.

## 7.3 Connector Pinouts


### Connector USB Type B

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


### Connector USB Type A

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


### Connector Mini USB Type B

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

### RJ10 / 4P4C

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

## Power Supply

Picture	Pin	Signal
	Inside	VCC (+5VDC)
	Outside	GND

## 7.4 Power Supply

Voltage	5 VDC
Power Requirement	<ul style="list-style-type: none"> <li>• K476-4U: max. 500 mA</li> <li>• K476-8U: max. 700 mA</li> </ul>

## 7.5 Environmental Conditions

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

## 7.6 Size

U-Switch	209 x 143 x 42 mm (8.2" x 5.6" x 1.7")
Shipping Box	280 x 180 x 130 mm (11.0" x 7.1" x 5.1")

## 7.7 Shipping Weight

U-Switch	0.6 kg (1.3 lb)
Shipping Box	1.1 kg (2.4 lb)

## 8 Troubleshooting

### 8.1 USB-HID

Diagnosis	Possible Reason	Measure
Keyboard LEDs <b>Shift</b> and <b>Scroll</b> are flashing	Keyboard in Command Mode	➔ Press <Esc> to leave Command Mode.
USB device without function	No USB-HID device	➔ Connect USB-HID device.
	USB-HID device is not supported	➔ Check compatibility. ➔ Contact dealer if necessary.

## 9 Technical Support

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

### 9.1 Support Checklist

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

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

### 9.2 Shipping Checklist

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



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

## 10 Regulatory and Standards Compliance

### 10.1 CE Declaration Of Conformity

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

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



CE Marking 2009

Product list:

K476-4U, K476-8U

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

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

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

Manufacturer:

IHSE GmbH  
Maybachstrasse 11  
88094 Oberteuringen  
Deutschland

Oberteuringen, 26 January 2010

The Management



#### Use in a Domestic Environment

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

### 10.2 North American Regulatory Compliance

This equipment has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

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

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

### 10.3 WEEE

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

The device labels carry a respective marking.

### 10.4 RoHS

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

The device labels carry a respective marking.

# 11 Glossary

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

<b>Term</b>	<b>Explanation</b>
Cat X	Any Cat 5e (Cat 6, Cat 7) cable
CGA	The Color Graphics Adapter (CGA) is an old analog graphic standard with up to 16 displayable colors and a maximum resolution of 640x400 pixels.
Component Video	The Component Video (YPbPr) is a high-quality video standard that consists of three independently and separately transmittable video signals, the luminance signal and two color difference signals.
Composite Video	The Composite Video is also called FBAS and it is part of the PAL TV standard.
CON Unit	Component of a U-Switch or Media Extender to connect to the console (monitor(s), keyboard and mouse; optionally also with USB 2.0 devices)
CPU Unit	Component of a U-Switch or Media Extender to connect to a source (computer, CPU)
DDC	The Display Data Channel (DDC) is a serial communication interface between monitor and source (computer, CPU). It allows a data exchange via monitor cable and an automatic installation and configuration of a monitor driver by the operating system.
Dual Access	A system to operate a source (computer, CPU) from two consoles
Dual-Head	A system with two video connections
Dual-Link	A DVI-D interface for resolutions up to 2560x2048 by signal transmission of up to 330 MPixel/s (24-bit)
DVI	Digital video standard, introduced by the Digital Display Working Group ( <a href="http://www.ddwg.org">http://www.ddwg.org</a> ). Single Link and Dual Link standard are distinguished. The signals have TMDS level.
DVI-I	A combined signal (digital and analog) that allows running a VGA monitor at a DVI-I port – in contrast to DVI-D (see DVI).
Fiber	Single-mode or multi-mode fiber cables

Term	Explanation
EGA	The Enhanced Graphics Adapter (EGA) is an old analog graphic standard, introduced by IBM in 1984. A D-Sub 9 connector is used for connection.
FBAS	The analog color video baseband signal (FBAS) is also called Composite Video and it is part of the PAL TV standard.
Console	Keyboard, mouse and monitor
KVM	Keyboard, video and mouse
Mini-XLR	Industrial standard for electrical plug connections (3 pole) for the transmission of digital audio and control signals
Multi-mode	62.5 $\mu$ multi-mode fiber cable or 50 $\mu$ multi-mode fiber cable
OSD	The On-Screen-Display is used to display information or to operate a device.
Quad-Head	A system with four video connections
RCA (Cinch)	A not standardized plug connection for transmission of electrical audio and video signals, especially with coaxial cables
SFP	SFPs (Small Form Factor Pluggable) are pluggable interface modules for Gigabit connections. SFP modules are available for Cat X and fiber interconnect cables.
Single-Head	A system with one video connection
Single Link	A DVI-D interface for resolutions up to 1920x1200 by signal transmission of up to 165 MPixel/s (24-bit). Alternative frequencies are Full HD (1080p), 2K HD (2048x1080) and 2048x1152.
Single-mode	9 $\mu$ single-mode fiber cable
S-Video (Y/C)	The S-Video (Y/C) is a video format transmitting luminance and chrominance signals separately. Thereby it has a higher quality standard than FBAS.
TOSLINK	Standardized fiber connection system for digital transmission of audio signals (F05 plug connection)
Triple-Head	A system with three video connections

## Draco U-Switch

Term	Explanation
USB-HID	<p>USB-HID devices (Human Interface Device) allow for data input.</p> <p>There is no need for a special driver during installation; "New USB-HID device found" is reported.</p> <p>Typical HID devices include keyboards, mice, graphics tablets and touch screens. Storage, video and audio devices are <b>not</b> HID.</p>
VGA	<p>Video Graphics Array (VGA) is a computer graphics standard with a typical resolution of 640x480 pixels and up to 262,144 colors. It can be seen as a follower of the graphics standards MDA, CGA and EGA.</p>