◇®BLACK BOX®

DKM KVM Extender TX/RX Interface Modules

Increase the distance between a source (computer, CPU) and its console (keyboard, mouse, and other peripheral devices).

Models available for CATx or fiber.
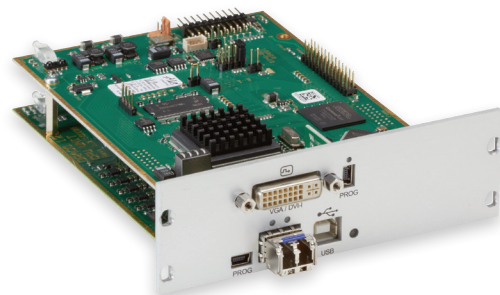
Contact Information

Order toll-free or for FREE 24/7 technical support: Call 877-877-BBOX (2269)
(outside U.S. call 724-746-5500)
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or our products, contact Black Box Tech Support at **877-877-BBOX (2269)**
or go to **blackbox.com** and click on "Talk to Black Box."
You'll be live with one of our technical experts in less than 60 seconds.

Federal Communications Commission and Industry Canada Radio Frequency Interference Statements

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

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

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

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

CE Declaration of Conformity

Instrucciones de Seguridad
(Normas Oficiales Mexicanas Electrical Safety Statement)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

18. Servicio por personal calificado deberá ser provisto cuando:
    A: El cable de poder o el contacto ha sido dañado; u
    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    C: El aparato ha sido expuesto a la lluvia; o
    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    E: El aparato ha sido tirado o su cubierta ha sido dañada.

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Safety Instructions

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

Installation

• Only use in dry, indoor environments.

• The KVM Extender and the power supply units can get warm. Do not install components 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 chassis.

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

• Do not connect the link interface to any other equipment, particularly network or telecommunications equipment.

• Take any required ESD precautions.

NOTE: To disconnect the device completely from the electric circuit, all power cables have to be removed.

Repair

• Do not attempt to open or repair a power supply unit.

• Do not attempt to open or repair the KVM Extender. There are no user serviceable parts inside.

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

1. Specifications

1.1 Interfaces

1.1.1 DVI-D Single Link

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

1.1.2 DVI-D Dual Link

The video interface supports the DVI-D protocol. All signals that comply to DVI-D Dual Link norm can be transmitted. This includes monitor resolutions up tp 2560x2048@60Hz. Data rate is limited to 330 MPixel/s.

1.1.3 DVI-I Single Link

The video interface supports the DVI-I protocol. All analog (VGA) or digital (DVI) signals that comply with the DVI-I Single-Link specification can be transmitted. This includes monitor resolutions for VGA up to 1920 x 1200 @ 60 Hz, and monitor resolutions for DVI-I up to Full HD (1080p) or for DVI-D 2K HD (up to 2048 x 1152). Data rate is limited to 165 Megapixels per second.

NOTE: Transmission of interlaced video signals, such as 1920 x 1080i, cannot be guaranteed.

1.1.4 HDMI Single Link

Video

The audio/ video interface can transmit monitor resolutions such as 1920 x1200 @60 Hz, Full HD (1080p) or 2K HD (up to 2048 x 1152). Data rate is limited to 165 MPixel/s and 8 bit.

Audio

The audio format PCM can be transmitted through the interface.

• Standards: Stereo Linear Pulse Code Modulation (LPCM)

• Bit Depth: 16 bit

• Sample Rate: Up to 96 kHz

Further audio formats will be supported in the future through a firmware update.

3D

The interface is compatible to 3D, so the 3D formats Side-by-Side and Top-and-Bottom can be transmitted.

NOTE: HDCP coded content is currently not supported.

1.1.5 DisplayPort

Video

The video interface supports the DisplayPort 1.2 standard. All signals that comply with this standard can be transmitted. This includes monitor resolutions up to 2560 x 2048@ 60 Hz or 3840 x 2160 @30 Hz. Data rate is limited to 330 MPixel/s.

Audio

Various audio formats can be transmitted through the interface.

• Standards: Stereo Linear Pulse Code Modulation (LPCM), DTS, DTS-HD (5.1), Dolby Digital, Dolby Digital Plus (5.1)

• Bit Depth: 16 to 24 bit

• Sample-Rate: 32 to 192 kHz

1.1.6 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 (such as Mac® keyboards) can also be supported using non-USB HID cards.

Mouse

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

Other USB-HID devices

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

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

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

1.1.7 PS/2

Our devices with PS/2 interface support the use of a PS/2 keyboard and mouse.

Keyboard

Compatible with most PS/2 keyboards, even with various special keyboards. Certain keyboards with additional functions can be run with special firmware.

Mouse

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

1.1.8 USB 2.0 (transparent)

DKM Modular Extender models with transparent USB 2.0 support allow the connection of all types of USB 2.0 devices (without restriction). USB 2.0 data transfer is supported, depending on the upgrade module, with high-speed USB (max. 480 Mbps) or full-speed USB (max. 36 Mbps).

Each USB 2.0 port provides a maximum current of 500 mA (high power). When using a USB high speed interface with 4 USB ports, respectively 2 connectors provides a maximum of 500 mA (high power) and 2 connectors a maximum of 100 mA.

1.1.9 RJ-45 (Interconnect)

For CATx communications, the extender requires a 1000BASE-T connection.

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

1.1.10 Fiber SFP Type LC (Interconnect)

The communication of fiber devices is performed via Gigabit SFPs that have to be connected to suitable fibers fitted with type LC connectors.

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

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

When handling, take care not to damage devices.

1.1.11 Serial Interface

The serial interface option supports a full-duplex transmission with a real hardware handshake up to a baud rate of 19,200.

The CON module is cabled as DTE (Data Terminal Equipment, such as CPU output) and can be connected directly to DCE (Data Communication Equipment) devices.

• A touchscreen can be connected directly to the CON module.

• To connect to a serial printer (or any other DTE instead of DCE device), you need a null-modem cable (cross-over cable) between the CON module and the device.

Operation of several devices:

The serial interface transmits six signals (three for each direction). Normally, four of the six signals are handshake signals (in addition to RxD and TxD). The following configurations, however, are possible using special adapter splitting cables:

• Three single 2-wire transmissions.

• Two transmissions with a handshake signal.

• A serial mouse and a single 2-wire transmission.

In this case, choose X-ON/X-OFF software handshake for traffic control at the printer and PC.

• Connection Format: DTE (Data Terminal Equipment)

• Speed: Up to 19,200 Baud

• Data Format: Format independent

• Data Transmission:

  - RxD (Receive Data)

  - TxD (Transmit Data)

• Traffic Control: The following signals are transmitted (hardware handshake):

  - RTS (Request To Send)

  - CTS (Clear To Send)

  - DTR (Data Terminal Ready)

  - DSR (Data Set Ready)

1.1.12 Serial Interface RS-422

KVM Extenders with a serial interface RS-422 (DB9) support a differential full-duplex transmission up to a Baud rate of 115,200 Baud.

The CPU unit is designed as controlling device and can, for example, be connected directly to video or media servers.

The CON unit is designed as a controlled device and so can be connected directly to remote controllers.

Table 1-1. Serial interface specifications.

Specification	Description
Connection Format	DTE (Data Terminal Equipment)
Speed	Up to 115,200 baud
Data Format	Format independent
Data Transmission	• RxD (Receive Data) • TxD (Transmit Data)
Traffic Control	The following signals are transmitted (hardware handshake): • RTS (Request to Send) • CTS (Clear to Send) • DTR (Data Terminal Ready) • DSR (Data Set Ready)

1.1.13 Analog Audio Interface

The Analog Audio option supports a bidirectional stereo audio transmission, in nearly CD quality.

The audio interface is a "line level" interface and it is designed to transmit the signals of a sound card (or another "line level" device) as well as to allow the connection of active speakers to the CON module.

Stereo audio can be transmitted bidirectionally at the same time.

Connection of a microphone:

Connect the microphone to the "audio" input of the CON module. There are two ways to establish this connection:

• The output of the CPU module is connected with the microphone input of the sound card (red). Adjust the sound card to provide an additional amplification (20 dB).

• The output of the CPU module is connected to the audio input of the sound card (blue). Choose this connection if the microphone has its own pre-amplifier.

NOTE: The CON module can do the pre-amplification of the microphone as well. Open the CON module, locate the "MIC" jumper on the audio board and close the pins.

Table 1-2. Analog audio specifications.

Specification	Description
Transmission Format	Digitized virtually CD-quality audio (16-bit, 38.4 kHz)
Signal Level	Line-level (5-volt peak-peak maximum)
Input Impedance	47 kOhm
Connections CPU Unit	(2) 3.5-mm stereo audio plug (audio in and audio out)
Connections CON Unit	(2) 3.5-mm stereo audio plug (audio in and audio out)

1.1.14 Digital Audio Interface

The digital audio option supports the unidirectional transmission of digital audio data.

Up to three sources can be connected to the CPU module. The active source is transmitted. If several sources are active, the XLR signal takes priority, otherwise the first active signal.

Up to three sinks can be connected to the CON module. The signal is available at all outputs concurrently.

DKM Modular Extender with digital audio option includes a built-in sample rate converter that provides predefined sample frequencies at the CON module's output.

The user can set the following parameters directly via a configuration file:

• Activate or deactivate sample rate converter

• Set sample frequency of the sample rate converter. The following sample frequencies are available:

– 32.0 kHz

– 44.1 kHz

– 48.0 kHz

– 96.0 kHz

• To deactivate the sample rate converter, write SRC_NONE in the Config.txt file of the CPU unit.

Table 1-3. Digital audio interface specifications.

Specification	Description
Compatibility	AES/EBU, S/PDIF, EIAJCP1201, IEC 60958
Standards	Dolby digital, DTS, PCM
CPU Unit (Inputs)	• Mini XLR (AES/EBU; symmetrical lockable) • Coaxial (S/PDIF; RCA, Cinch) • Optical (S/PDIF, TOSLINK®)
CON Unit (Outputs)	• Mini XLR (AES/EBU; symmetrical, lockable) • Coaxial (S/PDIF, RCA, Cinch) • Optical (S/PDIF, TOSLINK)

1.2 Interconnect Cable

1.2.1 CATx

NOTE: A point-to-point connection is required. Operation with several patch fields is possible. Routing over an active network component, such as an Ethernet hub, router, or switch, is not allowed.

• Avoid routing CATx cables along power cables.

• If the site has 3-phase AC power, make sure that the CPU module and CON module are on the same phase.

CAUTION: To maintain regulatory EMC compliance, you must use correctly installed shielded CATx cable throughout the interconnection link. Also, all CATx cables need to have ferrites on both cable ends close to the device.

Type of Interconnect Cable

The DKM Modular Extender requires interconnect cabling specified for Gigabit Ethernet (1000BASE-T). The use of solid-core (24 AWG), shielded, CAT5e (or better) is recommended.

Table 1-4. CATx interconnect cable specifications.

Parameter	Description
CATx solid-core cable 24 AWG	S/UTP (CAT5e) cable according to EIA/TIA-568-B. Four pairs of 24 AWG wires. Connection according to EIA/TIA-568-B (1000BASE-T).
CATx patch cable 26/8 AWG	S/UTP (CAT5e) cable according to EIA/TIA-568-B. Four pairs of 26/8 AWG wires. Connection according to EIA/TIA-568-B (1000BASE-T).

NOTE: You can use flexible cables (patch cables) type 26/8 AWG; however, but you'll only get half the maximum possible extension distance (Table 1-5).

Maximum Acceptable Cable Length

Table 1-5. Maximum acceptable CATx cable length.

Cable Type	Maximum Length
Solid-conductor 24 AWG CATx cable	400 feet (140 m)
Stranded-conductor 26/28 or 27/28 AWG or CATx cable	200 feet (70 m)

1.2.2 Fiber

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

Type of Interconnect Cable

(Cable notations according to VDE)

Table 1-6. Fiber cable specifications.

Cable Type	Description
Single-mode fiber 9 μm	• Duplex. • Indoor patch cable (EFN092)
Multimode fiber 50 μm	• Duplex. • Indoor patch cable (EFN6020)
Multimode fiber 62.5 μm	• Duplex. • Indoor patch cable (EFN116-LCLC)

Table 1-7. Maximum acceptable fiber cable length specifications.

Cable Type	Description
Single-mode fiber 9 μm	32,800 feet (10,000 m)
Single-mode 9μm XV	5,000 m (16,400 ft)
Multimode fiber 50 μm (OM3)	3280 feet (1000 m)
Multimode fiber 50 μm	1300 feet (400 m)
Multimode fiber 62.5 μm	650 feet (200 m)

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

Connector type

The Modular Extenders have fiber LC connectors.

1.3 Supported Peripherals

1.3.1 USB-HID Devices

The DKM Modular Extender will support most USB-HID devices, including the vast majority of keyboards and mice currently on the market. Many other kinds of HID devices such as bar-code scanners and touchscreens may also be compatible.

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

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

NOTE: Concurrent operation of more than two USB-HID devices is not possible even if you use a USB hub.

1.3.2 USB 2.0 Devices

DKM Modular Extender models featuring a transparent USB 2.0 connection use Extreme USB Technology. This technology supports all types of USB 2.0 devices; however, we cannot guarantee compatibility with every device on the market. Please contact Black Box Technical Support at 724-746-5500 or info@blackbox.com if any issues are found.

1.4 Connector Pinouts
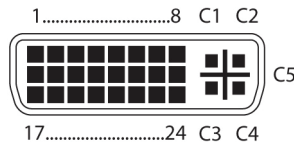
Connector DVI Single-Link

Figure 1-1. DVI-D single-link connector.

Table 1-8. DVI-D single-link connector pinout.

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

Connector DVI Dual-Link
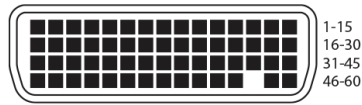
Figure 1-2. DVI-D dual link connector.

Table 1-9. DVI-D dual-link connector pinout.

Pin	Signal	Pin	Signal	Pin	Signal
1	GND	21	RX5_U	41	GND
2	Not connected	22	GND	42	GND
3	Not connected	23	Not connected	43	GND
4	GND	24	Not GND	44	BRXC_N
5	5V DVI	25	RX2_P	45	BRXC_P
6	DDC SCL	26	RX2_N	46	GND
7	DDC SDA	27	RX1_P	47	Not connected
8	GND	28	RX1_N	48	Not connected
9	BDDC SDA	29	RX0_P	49	GND
10	BDDC SCL	30	RX0_N	50	Not connected
11	B5V DVI	31	RXC_P	51	Not connected
12	GND	32	RXC_N	52	GND
13	Not connected	33	GND	53	Not connected
14	Not connected	34	GND	54	GND
15	GND	35	GND	55	Not connected
16	RX3_P	36	HPD	56	Not connected
17	RX3_N	37	Not connected	57	GND
18	RX4_P	38	Not connected	58	Not connected
19	RX4_N	39	Not connected	59	Not connected
20	RX5_P	40	BHPDT	60	GND

Connector DVI-I Single-Link
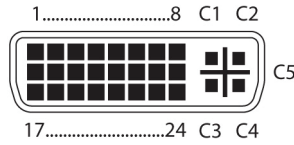
Figure 1-3. DVI-I connector.

Table 1-10. DVI-I single-link connector pinout.

Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2-	9	TMDS data 1-	17	TMDS data 0-
2	TMDS data 2+	10	TMDS data 1+	18	TMDS data 0+
3	TMDS data 2 GND	11	TMDS data 1 GND	19	TMDS data 0 GND
4	Not connected	12	Not connected	20	Not connected
5	Not connected	13	Not connected	21	Not connected
6	DDC input (SCL)	14	+5 VDC high impedance	22	TMDS clock GND
7	DDC output (SDA)	15	GND	23	TMDS clock +
8	V-sync	16	Hot-plug recogniition	24	TMDS clock -
C1	Red signal	—	—	C3	Blue signal
C2	Green signal	C5	GND	C4	H-sync

Connector HDMI Single-Link
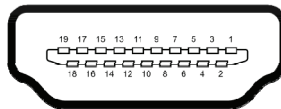
Figure 1-4. HDMI single-link connector.

Table 1-11. HDMI single-link connector pinout.

Pin	Signal	Pin	Signal	Pin	Signal
1	T.M.D.S data 2 +	8	T.M.D.S data 0 GND	15	DDC Input (SCL)
2	T.M.D.S data 2 GND	9	T.M.D.S data 0 -	16	DDC Output (SDA)
3	T.M.D.S data 2 -	10	T.M.D.S clock +	17	DDC/CEC/HEC GND
4	T.M.D.S data 1 +	11	T.M.D.S clock GND	18	+5VDC high impedance
5	T.M.D.S data 1 GND	12	T.M.D.S clock -	19	Hot Plug recognition
6	DDC Input (SCL)	13	CEC	—	—
7	T.M.D.S data 1 -	14	HEC data -	—	—

DisplayPort connector
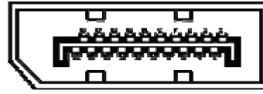
Figure 1-5. HDMI single-link connector.

Table 1-12. HDMI single-link connector pinout.

Pin	Signal	Pin	Signal	Pin	Signal
1	ML-LANE3(N)	8	GND	15	AUX CH(P)
2	GND	9	ML-LANE1(P)	16	GND
3	ML-LANE3(P)	10	ML-LANE0(N)	17	AUX CH(N)
4	ML-LANE2(N)	11	GND	18	Hot Plug Detect
5	GND	12	ML-LANE0(P)	19	Power Out Return
6	ML-LANE2(P)	13	Config1/GND	20	Power Out (not connected)
7	ML-LANE1(N)	14	Config2/GND	—	—

Connector USB Type B

Figure 1-6. USB Type B connector.

Table 1-13. USB Type B connector pinout.

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

Connector USB Type A

1 2 3 4
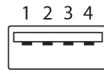
Figure 1-7. USB Type A connector.

Table 1-14. USB Type A connector pinout.

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

Connector Mini USB Type B

1....5

Figure 1-8. Mini USB Type B connector.

Table 1-15. Mini USB Type B connector pinout.

Pin	Signal	Color
1	VCC (+5 VDC)	Red
2	Data -	White
3	Data +	Green
4	Not connected	—
5	GND	Black

Connector PS/2

Figure 1-9. PS/2 connector.

Table 1-16. PS/2 connector pinout.

Pin	Signal
1	Data
2	GND
3	VCC (+ 5VDC)
4	CLK
5	Not connected
6	Not connected
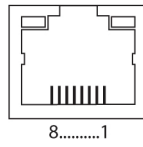
RJ-45 connector

Figure 1-10. RJ-45 connector.

Table 1-17. RJ-45 connector pinout.

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

Fiber SFP Type LC
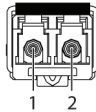
Figure 1-11. SFP Type LC connector.

Table 1-18. SFP Type LC connector pinout.

Pin	Signal
1	Data OUT
2	Data IN

Power Supply

5VDC

Figure 1-12. Power supply label..

Table 1-19. Power supply connector pinout.

Pin	Signal
Inside	VCC (+5 VDC)
Outside	GND

DB9 (Serial) RS-232
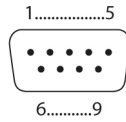
Figure 1-13. DB9 serial connector.

Table 1-20. DB9 serial RS-232 connector pinout.

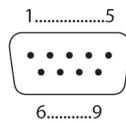| Pin	Signal	Pin	Signal
1	Not connected	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	0	Not connected
5	GND	—	—

DB9 (Serial) RS-422 Controlled Device

Figure 1-14. DB9 serial connector.

Table 1-21. DB9 serial RS-422 connector pinout, controlled device.

Pin	Signal	Pin	Signal
1	GND	6	Rx GND
2	RxA	7	RxB
3	TxB	8	TxA
4	Tx GND	0	Not connected
5	Not connected	—	—

DB9 (Serial) RS-422 Controlling Device

```
1...............5
 . . . . .
 . . . .
6..........9
```
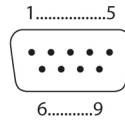
Figure 1-15. DB9 serial connector.

Table 1-22. DB9 serial RS-422 connector pinout, controlling device.

Pin	Signal	Pin	Signal
1	GND	6	Tx GND
2	TxA	7	TxB
3	RxB	8	RxA
4	Rx GND	0	Not connected
5	Not connected	—	—

3.5-mm Stereo Jack Plug

```
2 1 3
```

Figure 1-16. 3.5-mm stereo jack plug.

Table 1-23. 3.5-mm stereo jack plug pinout.

Pin	Signal
1	GND
2	Audio IN/OUT L
3	Audio IN/OUT R

RCA (Cinch)

```
1  2
```

Figure 1-17. RCA connector.

Table 1-24. RCA connector pinout.

Pin	Signal
1	GND
2	Data IN/OUT

Mini-XLR

Figure 1-18. Mini XLR connector.

Table 1-25. Mini XLR connector pinout.

Pin	Signal
1	GND
2	Data +
3	Data -

TOSLINK
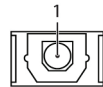
Figure 1-19. TOSLINK connector.

Table 1-26. TOSLINK connector pinout.

Pin	Signal
1	Data IN/OUT

1.5 Power Supply, Environmental, Dimensions, and Shipping Weight

Table 1-27. Power supply, environmental, dimensions, and shipping weight specifications.

Power	Basic modules: Single-head devices: 800 mA max., VGA: 900 mA max.; Upgrade modules: Analog audio/serial 300 mA max., Digital audio: 300 mA max., USB-HID: 300 mA max.; USB 2.0 modules: 2500 mA max.
Environmental	Temperature Tolerance: Operating: +41 to +113° F (+5 to +45° C) Storage Temperature: -13 to +140° F (-25 to +60° C); Relative Humidity (Max.): 80% non-condensing
Dimensions	CPU Module/CON Module: 1.6"H x 5.7"W x 5.6"D (4.1 x 14.5 x 14.2 cm)
Shipping Weight	CPU Module/CON Module: 0.6 lb. (0.3 kg)

2. Overview

2.1 Application

The DKM Modular Extender is used to increase the distance between a source (computer, CPU) and its console (keyboard, mouse, and other peripheral devices). It's designed for use with CATx (twisted-pair) interconnect cables or fiber interconnect cables.

The DKM Modular Extender with CATx interconnect cables won't work between buildings where you should use a fiber optic based product instead.

The DKM Modular Extender with fiber interconnect cables also works with applications in environments with a great deal of electromagnetical interference. Electromagnetical interference can limit the maximum distance und reliability.

The DKM Modular Extender is fully compatible with the DKM Compact Extender (ACX1T/ACX1R series).

2.2 System Overview

The DKM Modular Extender consists of at least one CPU module and one console (CON) module. A 2-, 4-, or 6-slot modular case holds the modules. The DKM Modular cases (2-slot, 4-slot, or 6-slot) are installed at the CPU (transmitter) and CON (receiver) site.

The CPU module connects directly to the source (computer, CPU) using the supplied cables. The CON module connects to the console (monitor, keyboard, and mouse). The CPU module and the CON modules communicate with each other through the interconnect cables. Figure 2-1 shows a typical system application. Table 2-1 describes the components shown in the diagram.
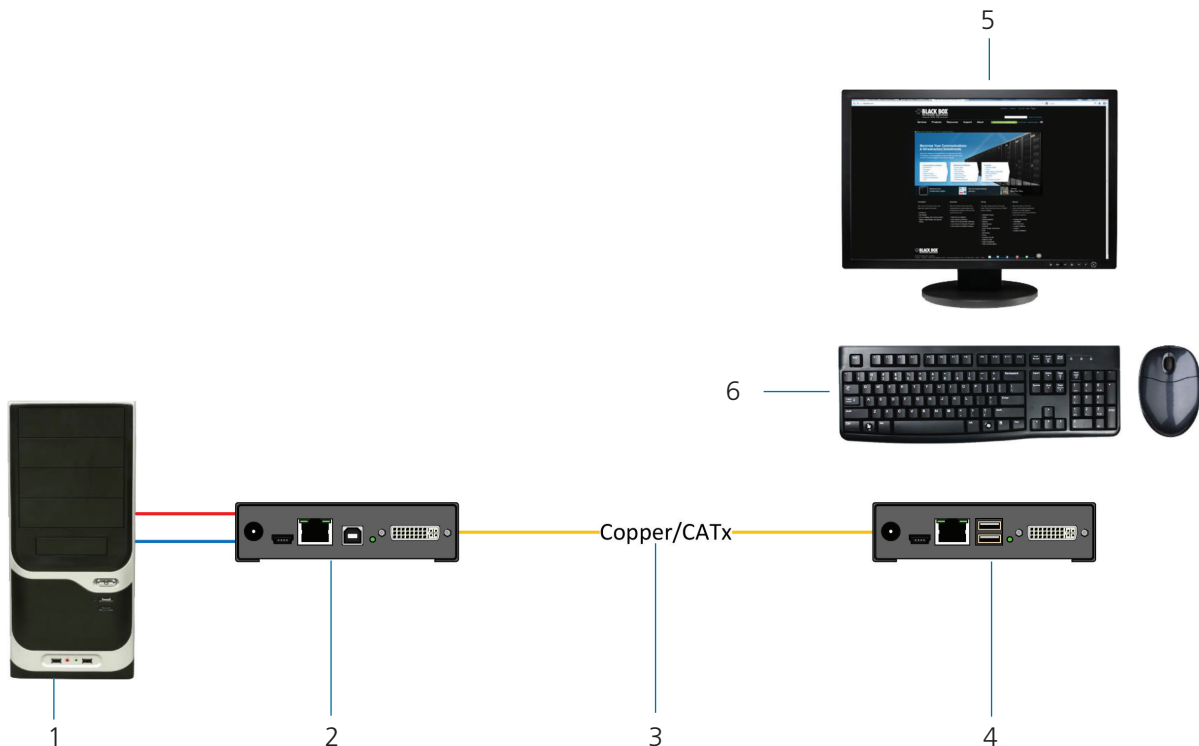
Figure 2-1. System diagram.

Table 2-1. System components.

Number	Component
1	Source (computer, CPU)
2	DKM Modular Extender CPU unit
3	Interconnect cable
4	DKM Modular Extender CON unit
5	Console (monitor, keyboard, mouse)
6	USB-HID devices (option, only with four USB-HID devices)

NOTE: See Section 3.3 for installation examples.

2.3 Part Numbers

Part numbers for connections via CATx or fiber cable:

All mentioned devices are available in the following versions:

• Connection via CATx cable (xx = "C")

• Connection via single-mode fiber cable (x = "SM")

Part numbers for CPU module and CON module:

IMPORTANT! The part numbers for the CPU module and the CON module can be derived from the part number of the complete device.

• CPU module: ACX1MT

• CON module: ACX1MR

NOTE: All devices in the ACX1MT/R DKM Modular series are compatible with the devices of the DKM Compact Extenders (ACX1T/R series).

2.3.1 Chassis

NOTE: For information about the chassis, see the Chassis User Manual.

2.3.2 KVM Extender Modules

Table 2-2. KVM Extender modules.

Part Number	Description
ACX1MT-DHID-C	Single-Head module for (1) DVI-D Single link
ACX1MR-DHID-C	
ACX1MT-VDHID-C	Single-Head module for (1) DVI-I input (VGA / DVI), Single-Link (up to 1920 x 1200) with (2) USB-HID
ACX1MR-VDHID-C	
ACX1MT-DHID-SM	Single-Head module for (1) DVI-D Single Link (up to 1920 x 1200) with (2) USB-HID
ACX1MR-DHID-SM	
ACX1MT-DHS-SM	Single-Head module for (1) DVI-D Single Link (up to 1920 x 1200) with (2) USB-HID
ACX1MR-DHS-SM	
ACX1MT-VDHID-SM	Single-Head module for (1) DVI-I (VGA/DVI onboard) Single-Link (up to 1920 x 1200) with (2) USB-HID
ACX1MR-VDHID-SM	
ACX1MT-DHID-2C	Single-Head module for (1) DVI-D Single Link (up to 1920 x 1200) with (2) USB-HID and redundant connector for interconnect cables
ACX1MR-DHID-2C	
ACX1MT-VDHID-2C	Single-Head module for (1) DVI-I (VGA/DVI) Single Link (up to 1920 x 1200) with (2) USB-HID
ACX1MR-VDHID-2C	
ACX1MT-DHID-2S	Single-Head module for (1) DVI-D Single Link (up to 1920 x 1200) with (2) USB-HID and redundant connector for interconnect cables
ACX1MR-DHID-2S	
ACX1MT-VHID-2S	Single-Head module for (1) DVI-I (VGA/DVI onboard) Single-Link (up to 1920 x 1200) with (2) USB-HID and redundant connector for interconnect cables
ACX1MR-VHID-2S	
ACX1MT-DVHID-C	Single-Head module for (1) DVI-I (VGA/DVI) Single Link (up to 1920x1200) with (2) USB-HID
ACX1MR-DVHID-C	
ACX1MT-DVHID-SM	Single-Head module for (1) DVI-I (VGA/DVI) Single Link (up to 1920 x 1200) with (2) USB-HID
ACX1MR-DVHID-SM	
ACX2MT-DLH-C	Single-Head module for (1) DVI-D Dual Link (up to 2560 x 1600), (2) USB-HID
ACX2MR-DLH-C	
ACX2MT-DHH-C	Dual-Head module for (2) DVI-D Single Link (up to 1920 x 1200), (2) USB-HID
ACX2MR-DHH-C	
ACX2MT-DLH-SM	Single-Head module for (1) High-Speed DVI-D Dual Link (up to 2560 x 1600), (2) USB-HID
ACX2MR-DLH-SM	
ACX2MT-DLHS-SM	Single-Head module for (1) High-Speed DVI-D Dual Link (up to 2560 x 1600), (2) USB-HID
ACX2MR-DLHS-SM	

Table 2-2. KVM Extender modules (continued).

Part Number	Description
ACX2MT-DHHS	Dual-Head module for (2) DVI-D High-Speed Single Link (up to 1920 x 1200), (2) USB-HID
ACX2MR-DHHS	
ACX2MT-DHH-SM	Dual-Head module for (2) DVI-D Single Link (up to 1920 x 1200), (2) USB-HID
ACX2MR-DHH-SM	
ACX2MT-DLH-2C	Dual-Head module for (2) DVI-D Single Link (up to 1920 x 1200), (2) USB-HID and redundant connector for interconnect cables.
ACX2MR-DLH-2C	
ACX2MT-DHH-2C	Dual-Head module for (2) DVI-D Single Link (up to 1920 x 1200), (2) USB-HID and redundant connector for interconnect cables.
ACX2MR-DHH-2C	
ACX1MT-HDMI-C	Single-Head module for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID
ACX1MR-HDMI-C	
ACX1MT-HDMI-2C	Single-Head module for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID
ACX1MR-HDMI-2C	
ACX1MT-HDM2-2C	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID and local output and redundant connector for interconnect cables
ACX1MT-HDMI-SM	Single-Head module for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID
ACX1MR-HDMI-SM	
ACX1MT-HDMI-2C	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID and local output and redundant connector for interconnect cables
ACX1MR-HDMI-2C	
ACX1MT-HDM2-2C	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200) with local HDMI output, (2) USB-HID, and redundant connector for interconnect cables
ACX1MT-HDMI-SM	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID, KVM switch for local workstation and redundant connector for interconnect cables
ACX1MR-HDMI-SM	
ACX1MT-HDMI-2C	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID, KVM switch for local workstation
ACX1MR-HDMI-2C	
ACX1MT-HDM2-SM	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID with local HDMI output
ACX1MT-HDM2-2S	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID with local HDMI output and redundant connector for interconnect cables
ACX1MR-HDSW-C	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID with built-in KVM switch on CON unit
ACX1MT-HDSW-2C	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID with built-in KVM switch on CON unit and redundant connectors for interconnect cables

Table 2-2. KVM Extender modules (continued).

Part Number	Description
ACX1MR-HDSW-SM	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID with built-in KVM switch on CON unit
ACX1MR-HDSW-2S	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200), (2) USB-HID with built-in KVM switch on CON unit and redundant connectors for interconnect cables
ACX1MT-HDO-C	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200)
ACX1MR-HDO-C	
ACX1MT-HDO-SM	Single-Head KVM Extender for (1) HDMI Single Link (up to 1920 x 1200)
ACX1MR-HDO-SM	
ACX2MT-DPH-C	Single-Head module for (1) DisplayPort with (2) USB-HID
ACX2MR-DPH-C	
ACX2MT-DPH-SM	Single-Head module for (1) DisplayPort with (2) USB-HID
ACX2MR-DPH-SM	
ACX2MT-DPHS-SM	Single-Head module for (1) DisplayPort with (2) USB-HID
ACX2MR-DPHS-SM	
ACX2MT-DPH-2C	Single-Head module for (1) DisplayPort with (2) USB-HID and redundant connector for interconnect cables
ACX2MR-DPH-2C	
ACX2MT-DPH-2S	Single-Head module for (1) DisplayPort with (2) USB-HID and redundant connector for interconnect cables
ACX2MR-DPH-2S	
ACX2MT-DPHS-2S	Single-Head module for (1) DisplayPort with (2) USB-HID and redundant connector for interconnect cables
ACX2MR-DPHS-2S	
ACX1MT-U23-C	USB 2.0 upgrade module with (4) USB 2.0 HID
ACX1MR-U23-C	
ACX1MT-U23-SM	USB 2.0 over fiber upgrade module with (4) USB 2.0 HID
ACX1MR-U23-SM	
ACX2MT-DP4KHS-SM	Single-Head high-speed module for (1) DisplayPort 4K with (2) USB 2.0 HID
ACX2MR-DP4KHS-SM	
ACX2MT-DP4KHS-2S	Single-Head high-speed module for (1) DisplayPort 4K with (2) USB 2.0 HID
ACX2MR-DP4KHS-2S	

2.3.3 Upgrade Modules

Table 2-3. Upgrade modules.

Part Number	Description
ACX1MT-HID	Upgrade module with (2) USB-HID
ACX1MR-HID	
ACX1MT-EU	Upgrade module with (2) USB 2.0
ACX1MR-EU	
L/R474-BUE	Upgrade module with Analog Audio (bidirectional) and (2) USB 2.0
ACX1MT-AR	Upgrade module with analog audio/serial (bidirectional)
ACX1MR-AR	
L/R474-BSX	Upgrade module with Analog Audio/Serial RS422 (bidirectional)
ACX1MT-ARP	Upgrade module with Analog Audio / Serial RS232 (bidirectional) and PS/2
ACX1MR-ARP	
L/R474-BXP	Upgrade module with PS/2 (only available with upgrade module Analog Audio/Serial)
ACX1MT-DA	Upgrade module with digital audio (unidirectional)
ACX1MR-DA	
ACX1MT-ARH	Upgrade module with analog audio/seral (bidirectional) and (2) USB-HID
ACX1MR-ARH	
ACX1MT-DAH	Upgrade module with digital audio (unidirectional) and (2) USB-HID
ACX1MR-DAH	
ACX1MT-ARE	Upgrade module with Analog Audio/Serial RS232 (bidirectional) and (2) USB 2.0
ACX1MR-ARE	
ACX1MT-DAE	Upgrade module with Digital Audio (unidirectional) and (2) USB 2.0
ACX1MR-DAE	
ACX1MT-DAX	Upgrade module with digital audio (bidirectional)
ACX1MR-DAX	
ACX1MR-ARD	Upgrade module with digital audio (unidirectional) and analog audio/serial (bidirectional)
ACX1MT-ARD	
ACX1MT-U2-C	USB 2.0 upgrade module with (4) USB 2.0
ACX1MR-U2-C	
ACX1MT-U2-SM	USB 2.0 upgrade module with (4) USB 2.0
ACX1MR-U2-SM	

2.3.4 Chassis for Free Configuration

Table 2-4. Chassis for free configuration.

Part Number	Description
ACXMODH2-R2	DKM extender for free configuration in a 2-slot chassis, external power supply unit
ACXMODH2R-R2	DKM extender for free configuration in a 2-slot chassis, external power supply unit, preparation for redundancy for a second external power supply unit
ACXMODH2R-P-R2	DKM extender for free configuration in a 2-slot chassis, internal power supply unit, preparation for redundancy of an external power supply unit
ACXMODH4-R2	DKM extender for free configuration in a 4-slot chassis, external power supply unit
ACXMODH4R-R2	DKM extender for free configuration in a 4-slot chassis, external power supply unit, preparation for redundancy of a second external power supply unit
ACXMODH6R-R2	DKM extender for free configuration in a 6-slot chassis, internal power supply unit, preparation for redundancy of an external power supply unit
ACXMODH6BPAC-R2	DKM extender for free configuration in a 6-slot chassis, active backplane, 2x internal power supply unit (redundancy)
ACXMODH6FPAC-R2	DKM extender for free configuration in a 6-slot chassis, active backplane, 2x internal power supply unit (redundancy) with connectors on rear side
ACXMODH21	DKM extender for free configuration in a 21-slot 4U chassis, internal power supply unit, preparation for redundancy for a second external power supply unit

NOTE: When using redundant power supply units, the load will be shared between units.

2.4 Upgrade Kits

Table 2-5. Upgrade kits.

Part Number	Description
ACXMODH-RMK	19"/1U rackmount kit for 2-, 4-, and 6-fold chassis (for older non-R2 chassis)
ACXMODH-DMK	Fastening strips for screw or snap on for 2-, 4-, and 6-fold chassis
ACXMODH-R	Retrolifting for redundant power supply option (without power supply) for 4-fold chassis
ACXMODH2-PS	Power supply for 2-fold chassis (spare or redundant), 5-VDC, 3-A
ACXMODH4-PS	Power supply for 4-fold chassis (spare or redundant), 5-VDC, 5-A
ACXMODH6-PS	Power supply for 6-fold chassis (spare or redundant), 5-VDC, 8-A
ACXMODH21-4S	Blind plate 3U/4HP for 2-, 4-, and 6-fold chassis
ACXMODH21-8S	Blind plate 3U/8HP for 2-, 4-, and 6-fold chassis

2.5 Accessories

Table 2-6. Accessories.

Part Number	Description
BC00200	6-foot (1.8-m) serial RS-232 cable
USB05-0006	6-foot (1.8-m) USB Type A to B cable
EVNDVI04-0006	6-foot (1.8-m) VGA cable (VGA to DVI-I)
EVNDVI02-0006	6-foot (1.8-m) DVI-D cable (DVI-D)
ACXSPL12	DVI-D splitter cable
EJ110-0005	5-foot (1.5-m) 3.5-mm stereo jack cable
EJ514-0005-MM	5-foot (1.5-m) RCA cable (Cinch male connector)
EFJ04-001M	3-foot (1-m) TOSLINK cable (F05 male connector)
Contact Tech Support at 724-746-5500 or info@blackbox.com.	6-foot (1.8-m) Mini-XLR cable (3-pole)

2.6 Device Views
2.6.1 Compatible Chassis

ACXMODH2-R2 and Compatible Accessories

ACXMODH2-R2 Specifications

Connectors	(1) 2.5-mm barrel connector for power
Power	Primary Power Output: 5 V, 3 A; Secondary Power Output: Does not support redundant power
Dimensions	1.7"H x 5.7"W x 5.75"D (4.3 x 14.5 x 14.6 cm)
Weight	0.6 lb. (0.3 kg)

ACXMODH2-R2 Acccessories

Rackmount Option	ACXMODHEAR2
Optional Redundant Power Supply	Does not support redundant power
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S

ACXMODH2-R2 front view.
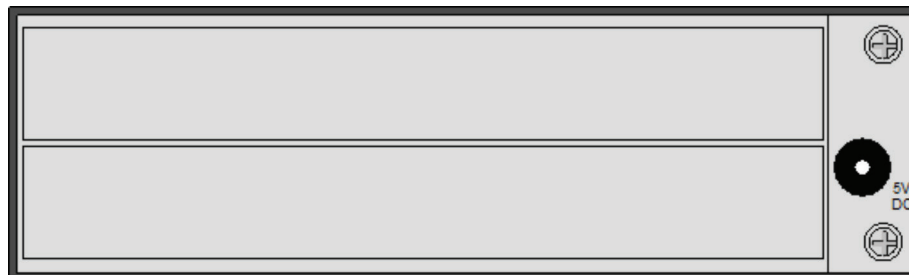
ACXMODH2-R2 back view.

ACXMODH2R-R2 and Compatible Accessories

ACXMODH2R-R2 Specifications

Connectors	(2) 2.5-mm barrel connectors for power
Power	Primary Power Output: 5 V, 3 A; Secondary Power Output (optional): 5 V, 3 A
Dimensions	1.7"H x 5.7"W x 5.75"D (4.3 x 14.5 x 14.6 cm)
Weight	0.6 lb. (0.3 kg)

ACXMODH2R-R2 Acccessories

Rackmount Option	ACXMODHEAR2
Optional Redundant Power Supply	ACXMODH2-PS
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S
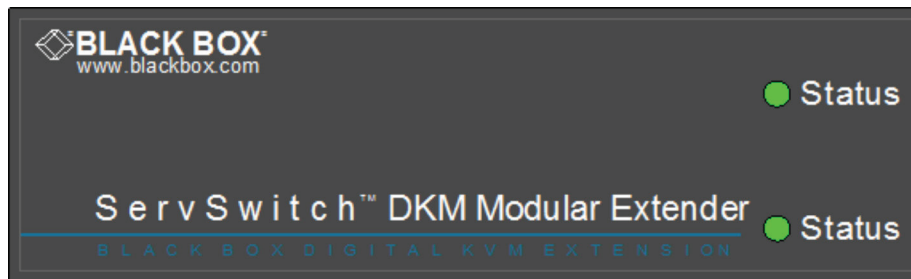
ACXMODH2R-R2 front view.
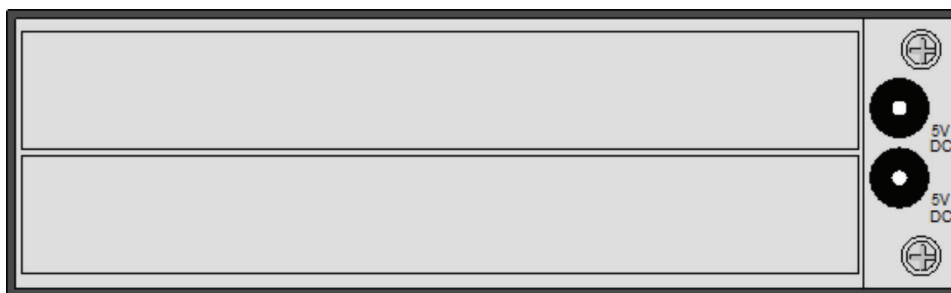
ACXMODH2R-R2 back view.

ACXMODH2R-P-R2 and Compatible Accessories

ACXMODH2R-P-R2 Specifications

Connectors	(1) 2.5-mm barrel connector for power;
	(1) IEC320, C14
Power	Primary Power Output: 5 V, 3 A
	NOTE: If you are using this chassis as an 8-Port DKM FX Switch, use a higher amperage power supply such as
	ACXMODH6-PS or the main IEC320 power input.
	Secondary Power Output (optional): 5 V, 3 A
Dimensions	1.7"H x 8.75"W x 5.75"D (4.3 x 22.2 x 14.6 cm)
Weight	0.8 lb. (0.4 kg)

ACXMODH2R-P-R2 Acccessories

Rackmount Option	ACXMODHEAR2P
Optional Redundant Power Supply	ACXMODH2-PS (5 V, 3 A, for standard cards);
	ACXMODH4-PS (5 V, 5 A, for load sharing)
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S

ACXMODH2R-P-R2 front view.
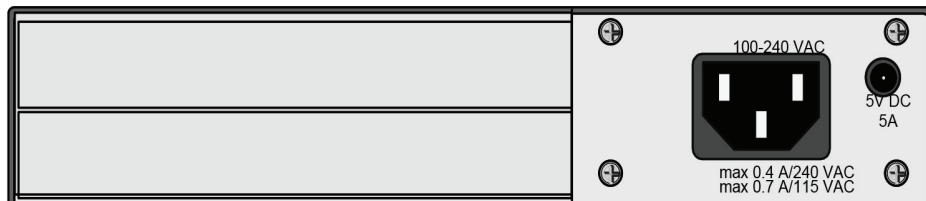
ACXMODH2R-P-R2 back view.

ACXMODH4-R2 and Compatible Accessories

ACXMODH4-R2 Specifications

Connectors	(1) 2.5-mm barrel connector for power
Power	Primary Power Output: 5 V, 5 A; Secondary Power Output: Does not support redundant power
Dimensions	1.7"H x 11.5"W x 5.75"D (4.3 x 29.2 x 14.6 cm)
Weight	0.9 lb. (0.4 kg)

ACXMODH4-R2 Acccessories

Rackmount Option	ACXMODHEAR4
Optional Redundant Power Supply	Does not support redundant power
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S

ACXMODH4-R2 front view.

ACXMODH4-R2 back view.

ACXMODH4R-R2 and Compatible Accessories

ACXMODH4R-R2 Specifications

Connectors	(2) 2.5-mm barrel connectors for power
Power	Primary Power Output: 5 V, 5 A; Secondary Power Output (optional): 5 V, 5 A
Dimensions	1.7"H x 11.5"W x 5.75"D (4.3 x 29.2 x 14.6 cm)
Weight	0.9 lb. (0.4 kg)

ACXMODH4R-R2 Acccessories

Rackmount Option	ACXMODHEAR4
Optional Redundant Power Supply	ACXMODH4-PS
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S
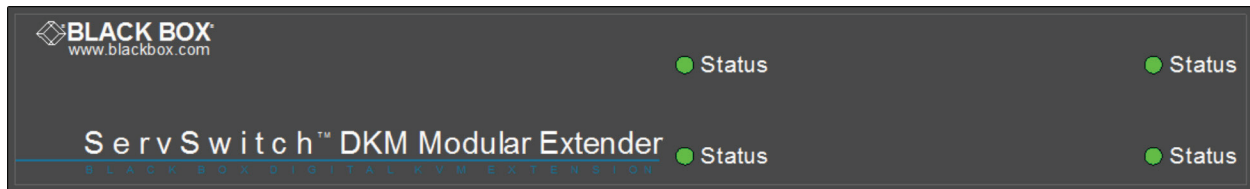
ACXMODH4R-R2 front view.

ACXMODH4R-R2 back view.

ACXMODH6R-R2 and Compatible Accessories

ACXMODH6R-R2 Specifications

Connectors	(1) IEC320 main power input; (1) 2.5-mm barrel connector for redundant power
Power	Primary Power Output: 5 V, 8 A; Secondary Power Output (optional): 5 V, 8 A
Dimensions	1.7"H x 17.5"W x 5.75"D (4.3 x 44.5 x 14.6 cm)
Weight	1.75 lb. (0.8 kg)

ACXMODH6R-R2 Acccessories

Rackmount Option	ACXMODHEAR6
Optional Redundant Power Supply	ACXMODH6-PS
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S
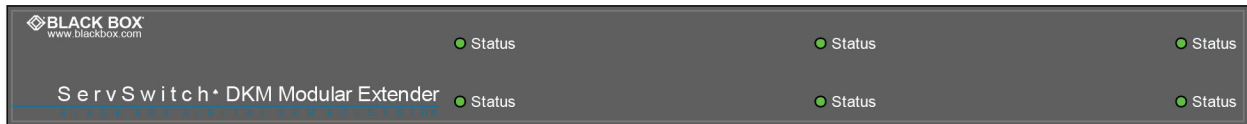
ACXMODH6R-R2 front view.
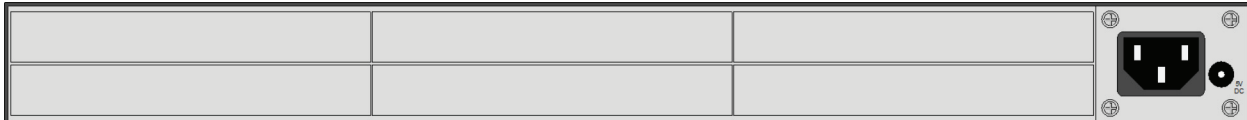
ACXMODH6R-R2 back view.

ACXMODH6BPAC-R2 and Compatible Accessories

ACXMODH6BPAC-R2 Specifications

Connectors	(2) IEC320 main power inputs
Power	Primary Power Output: 5 V, 10 A; Redundant Power Output (included): 5 V, 10 A
Dimensions	1.7"H x 17.5"W x 8"D (4.3 x 44.5 x 20.3 cm)
Weight	1.75 lb. (0.8 kg)

ACXMODH6BPAC-R2 Acccessories

Rackmount Option	ACXMODHEAR6FPAC
Redundant Power Supply	Included
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S
Optional Fan	ACXMODH6FAN

ACXMODH6BPAC-R2 front view.
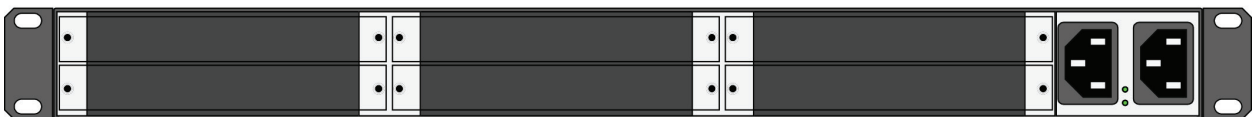
ACXMODH6BPAC-R2 back view.

877-877-BBOX (2269) | BlackBox.com

ACXMODH6FPAC-R2 and Compatible Accessories

ACXMODH6FPAC-R2 Specifications

Connectors	(2) IEC320 main power inputs
Power	Primary Power Output: 5 V, 10 A; Secondary Power Output (optional): 5 V, 10 A
Dimensions	1.7"H x 17.5"W x 8"D (4.3 x 44.5 x 20.3 cm)
Weight	1.75 lb. (0.8 kg)

ACXMODH6FPAC-R2 Acccessories

Rackmount Option	ACXMODHEAR6FPAC
Redundant Power Supply	Included
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S
Optional Fan	ACXMODH6FAN

ACXMODH6FPAC-R2 front view.
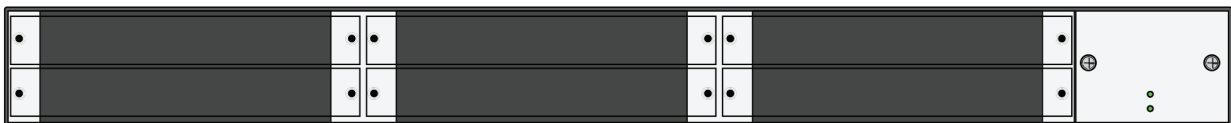
ACXMODH6FPAC-R2 back view.

ACXMODH21R and Compatible Accessories

ACXMODH21R Specifications

Connectors	(2) IEC320 main power inputs; (21) 20-position headers for cards
Power	Primary Power Output: 5 V, 50 A; Secondary Power Output (optional): 5 V, 50 A
Dimensions	7"H x 19"W x 18.25"D (17.8 x 48.3 x 46.4 cm)
Weight	16 lb. (7.3 kg)

ACXMODH21R Acccessories

Rackmount Option	Included
Optional Redundant Power Supply	ACXMODH21-PS
Blanking Panel Options	ACXMODH21-4S or ACXMOD21-8S
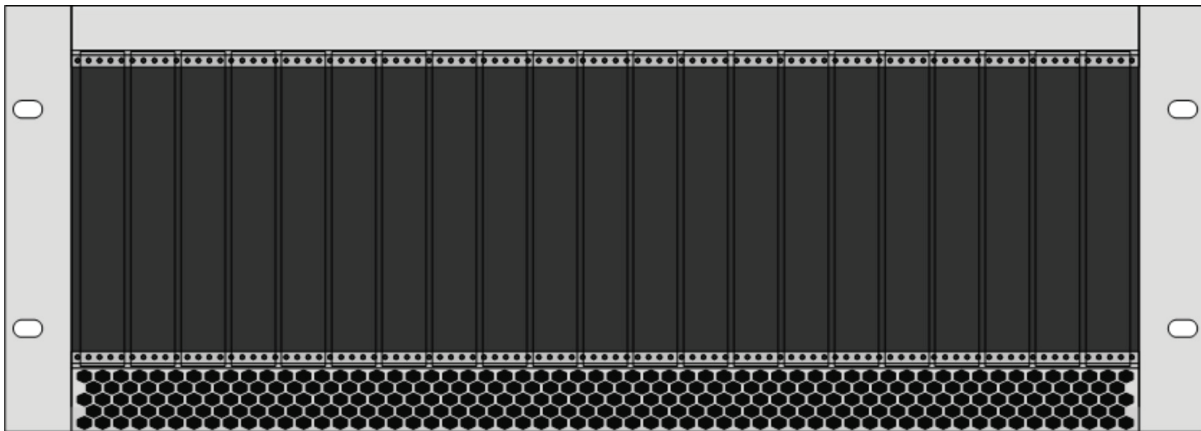
ACXMODH21R front view.
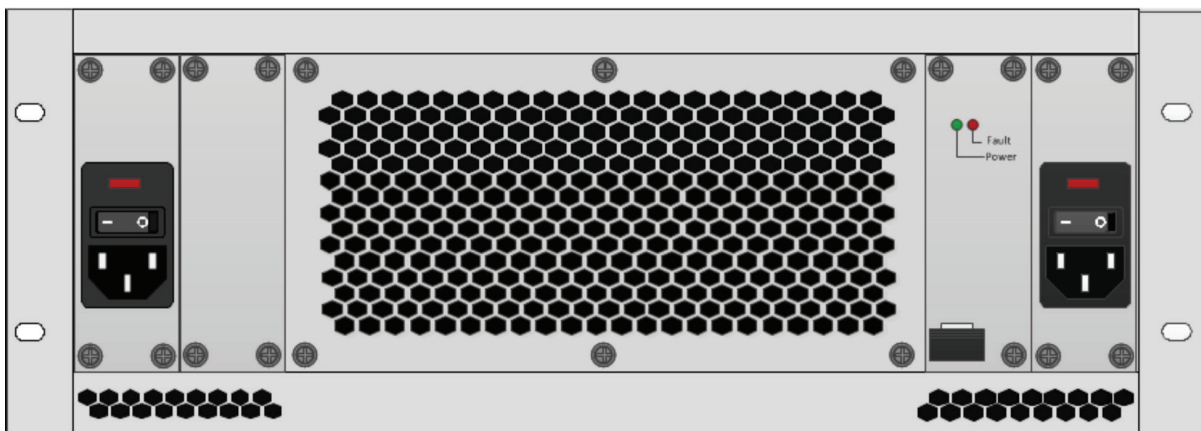
ACXMODH21R back view.

2.6.2 ACX1MT-DHID-C/ACX1MR-DHID-C

CPU Unit, rear view   CON Unit, rear view
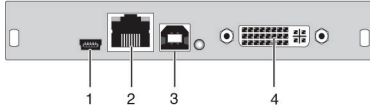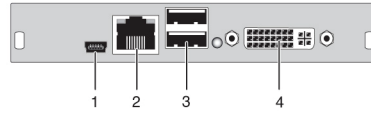
CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB-HID	3	Connect to USB-HID devices
4	To CPU: DVI-D	4	Connect to DVI monitor

2.6.3 ACX1MT-VDHID-C /ACX1MR-VDHID-C

CPU Unit, rear view   CON Unit, rear view
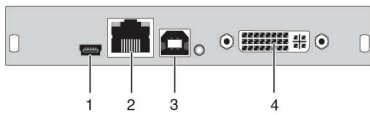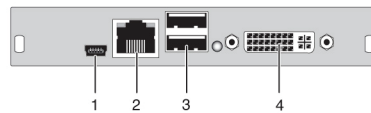
CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB-HID	3	Connect to USB-HID devices
4	To CPU: DVI-D, DVI-I	4	Connect to DVI monitor, DVI-I

2.6.4 Basic Module ACX1MT-DHID-SM/ACX1MR-DHID-SM

CPU Unit, rear view
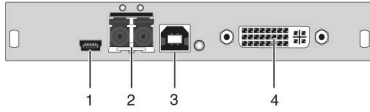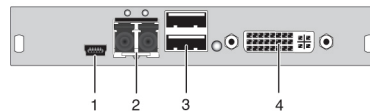
CON Unit, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB-HID	3	Connect to USB-HID devices
4	To CPU: DVI-D	4	Connect to DVI monitor

2.6.5 ACX1MT-DHS-SM/ACX1MR-DHS-SM

CPU Unit, rear view
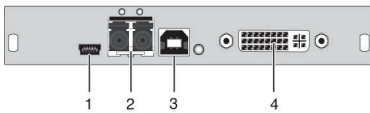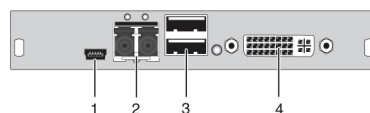
CON Unit, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB-HID	3	Connect to USB-HID devices
4	To CPU: DVI-D	4	Connect to DVI monitor

2.6.6   ACX1MT-VHID-SM/ACX1MR-VHID-SM

CPU Unit, rear view
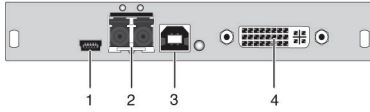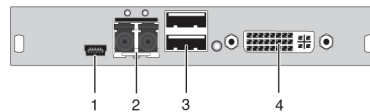
CON Unit, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB-HID	3	Connect to USB-HID devices
4	To CPU: DVI-D, DVI-I	4	Connect to DVI monitor, DVI-D

2.6.7 ACX1MT-DHID-2C/ACX1MR-DHID-2C

CPU Unit   CON Unit
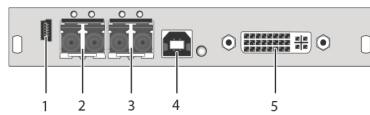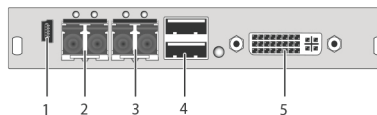
Rear view

1   Service port
2   Connected to interconnect cable 1
3   Connected to interconnect cable 2
4   To CPU: USB-HID
5   To CPU: DVI-D

Rear view

1   Service port
2   Connected to interconnect cable 1
3   Connected to interconnect cable 2
4   Connect to USB-HID devices
5   Connect to DVI monitor

2.6.8 ACX1MT-VDHID-2S/ACX1MR-VDHID-2S
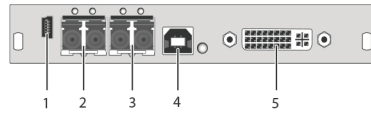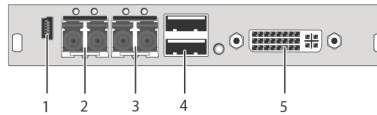
CPU Unit

CON Unit

Rear view

1   Service port
2   Connected to interconnect cable 1
3   Connected to interconnect cable 2
4   To CPU: USB-HID
5   To CPU: DVI-D, DVI-I

Rear view

1   Service port
2   Connected to interconnect cable 1
3   Connected to interconnect cable 2
4   Connect to USB-HID devices
5   Connect to DVI monitor, DVI-I

2.6.9   ACX1MT-DHID-2S/ACX1MR-DHID-2S

CPU Unit
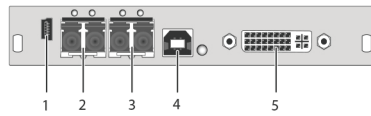
CON Unit
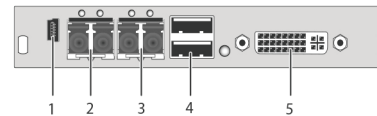
Rear view

1   Service port
2   Connected to interconnect cable 1
3   Connected to interconnect cable 2
4   To CPU: USB-HID
5   To CPU: DVI-D

Rear view

1   Service port
2   Connected to interconnect cable 1
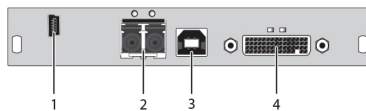3   Connected to interconnect cable 2
4   Connect to USB-HID devices
5   Connect to DVI monitor

2.6.10 ACX1MT-VDHID-2S/ACX1MR-VDHID-2S

CPU Unit   CON Unit

Rear view   *Rear view*
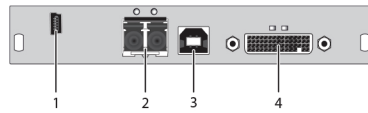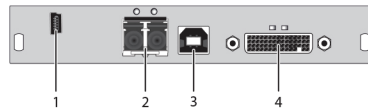
1   Service port   1   Service port
2   Connected to interconnect cable 1   2   Connected to interconnect cable 1
3   Connected to interconnect cable 2   3   Connected to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: DVI-D, DVI-I   5   Connect to DVI monitor, DVI-I

2.6.11 Basic Module ACX1MT-DVHID-C/ACX1MR-DVHID-C

CPU Unit, rear view   CON Unit, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB-HID	3	Connect to USB-HID devices
4	To CPU: DVI-I (VGA/DVI)	4	IR receiver for remote control
5	IR receiver for remote control	5	Connect to DVI monitor, DVI-D
6	Service port	—	—

2.6.12 Basic Module ACX1MT-DVHID-SM/ ACX1MR-DVHID-SM

CPU Unit, rear view   CON Unit, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB-HID	3	Connect to USB-HID devices
4	To CPU: DVI-I (VGA/DVI)	4	IR receiver for remote control
5	IR receiver for remote control	5	Connect to DVI monitor, DVI-D
6	Service port	—	—

2.6.13 ACX2MT-DLH-C/ACX2MR-DLH-C

CPU Unit   CON Unit
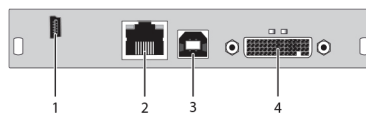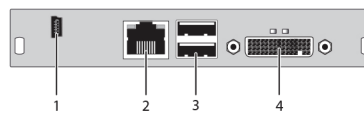
Rear view

1   Service port
2   Connected to interconnect cable
3   To CPU: USB-HID
4   To CPU: DMS-59

Rear view

1   Service port
2   Connected to interconnect cable
3   Connect to USB-HID devices
4   Connect to DVI monitor(s) (DMS-59)

2.6.14 ACX2MT-DHH-C/ACX2MR-DHH-C
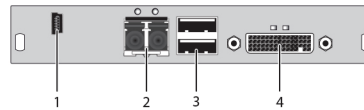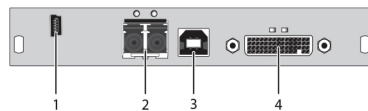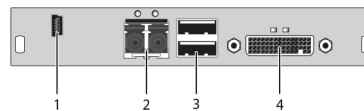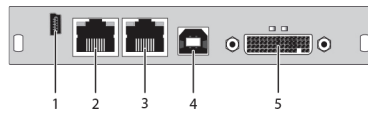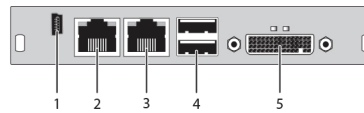
CPU Unit   CON Unit
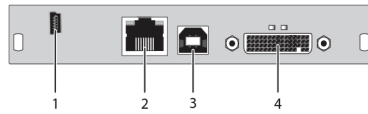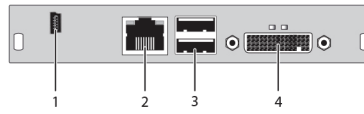
Rear view   *Rear view*

1   Service port   1   Service port
2   Connected to interconnect cable   2   Connected to interconnect cable
3   To CPU: USB-HID   3   Connect to USB-HID devices
4   To CPU: DMS-59   4   Connect to monitor(s) (DMS-59)

2.6.15 ACX2MT-DLH-SM/ACX2MR-DLH-SM

CPU Unit   CON Unit
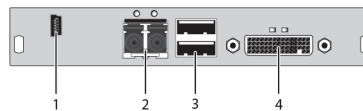
Rear view   *Rear view*

1   Service port   1   Service port
2   Connected to interconnect cable   2   Connected to interconnect cable
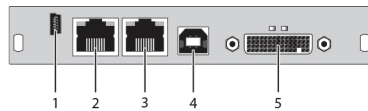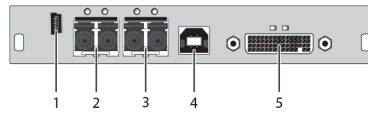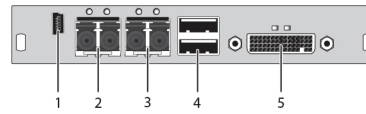3   To CPU: USB-HID   3   Connect to USB-HID devices
4   To CPU: DMS-59   4   Connect to monitor(s) (DMS-59)

2.6.16 ACX2MT-DHH-SM/ACX2MR-DHH-SM

CPU Unit   CON Unit

Rear view

1	Service port
2	Connected to interconnect cable
3	To CPU: USB-HID
4	To CPU: DMS-59
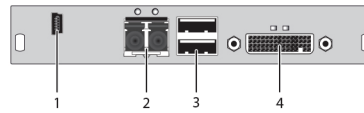
Rear view

1	Service port
2	Connected to interconnect cable
3	Connect to USB-HID devices
4	Connect to monitor(s) (DMS-59)

2.6.17 ACX2MT-DHHS-SM/ACX2MR-DHHS-SM

CPU Unit   CON Unit

Rear view

1	Service port
2	Connected to interconnect cable
3	To CPU: USB-HID
4	To CPU: DMS-59

Rear view

1	Service port
2	Connected to interconnect cable
3	Connect to USB-HID devices
4	Connect to monitor(s) (DMS-59)

2.6.18 ACX2MT-DLHS-SM/ACX2MR-DLHS-SM

CPU Unit   CON Unit

Rear view

1	Service port
2	Connected to interconnect cable
3	To CPU: USB-HID
4	To CPU: DMS-59

Rear view

1	Service port
2	Connected to interconnect cable
3	Connect to USB-HID devices
4	Connect to monitor(s) (DMS-59)

2.6.19 ACX2MT-DLH-2C/ACX2MR-DLH-2C

CPU Unit   CON Unit
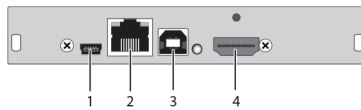
Rear view   *Rear view*

1   Service port   1   Service port
2   Connected to interconnect cable 1   2   Connected to interconnect cable 1
3   Connected to interconnect cable 2   3   Connected to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: DMS-59   5   Connect to monitor(s) (DMS-59)

2.6.20 ACX2MT-DHH-2C/ACX2MT-DHH-2C

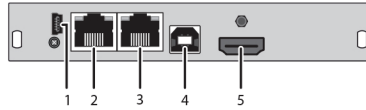CPU Unit   CON Unit

Rear view   *Rear view*
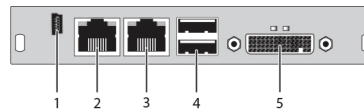
1   Service port   1   Service port
2   Connected to interconnect cable 1   2   Connected to interconnect cable 1
3   Connected to interconnect cable 2   3   Connected to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: DMS-59   5   Connect to monitor(s) (DMS-59)

2.6.21 ACX2MT-DLH-SM/ACX2MT-DLH-SM

CPU Unit   CON Unit

Rear view   *Rear view*

1   Service port   1   Service port
2   Connected to interconnect cable 1   2   Connected to interconnect cable 1
3   Connected to interconnect cable 2   3   Connected to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: DMS-59   5   Connect to monitor(s) (DMS-59)

2.6.22 ACX1MT-HDMI-C/ACXMR-HDMI-C

CPU Unit   CON Unit
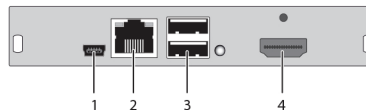
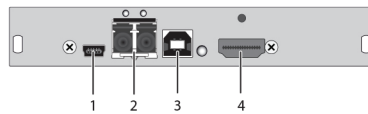*Rear view*   *Rear view*

1   Service port   1   Service port
2   Connected to interconnect cable   2   Connected to interconnect cable
3   To CPU: USB-HID   3   Connect to USB-HID devices
4   To CPU: HDMI   4   Connect to HDMI monitor

2.6.23   ACX1MT-HDMI-2C /ACX1MR-HDMI-2C

CPU Unit   CON Unit
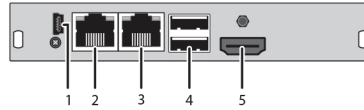
Rear view   *Rear view*

1   Service port   1   Service port
2   Connected to interconnect cable 1   2   Connected to interconnect cable 1
3   Connected to interconnect cable 2   3   Connected to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: HDMI   5   Connect to HDMI monitor

2.6.24 ACX1MT-HDM2-C

CPU Unit
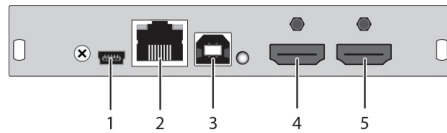
Rear view

1 Service port
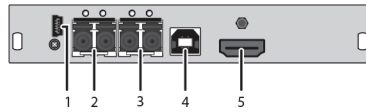2 Connected to interconnect cable
3 To CPU: USB-HID
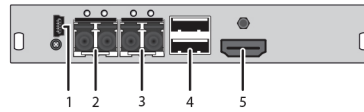4 To CPU: HDMI
5 Local output: HDMI

2.6.25 ACX1MT-HDM2-2C

CPU Unit
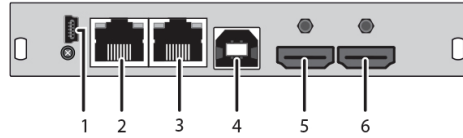
Rear view

1 Service port
2 Connected to interconnect cable 1
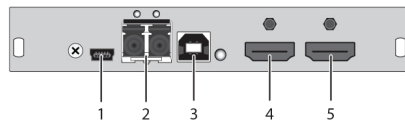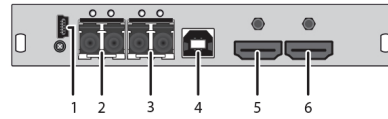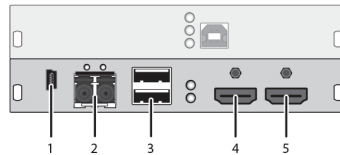3 Connected to interconnect cable 2
3 To CPU: USB-HID
4 To CPU: HDMI
5 Local output: HDMI

2.6.26 ACX1MT-HDMI-SM/ACX1MR-HDMI-SM

CPU Unit   CON Unit

Rear view   *Rear view*

1   Service port   1   Service port
2   Connected to interconnect cable 1   2   Connected to interconnect cable 1
3   To CPU: USB-HID   3   Connect to USB-HID devices
4   To CPU: HDMI   4   Connect to HDMI monitor
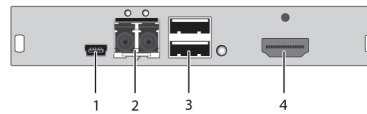
2.6.27 ACX1MT-HDMI-SM/ACX1MR-HDMI-SM

CPU Unit   CON Unit

Rear view   *Rear view*

1   Service port   1   Service port
2   Connected to interconnect cable 1 2   Connected to interconnect cable 1
3   Connected to interconnect cable 2 3   Connected to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: HDMI   5   Connect to HDMI monitor

2.6.28 ACX1MT-HDM2-SM/ACX1MR-HDM2-SM

CPU Unit

Rear view

1   Service port
2   Connected to interconnect cable
3   To CPU: USB-HID
4   To CPU: HDMI
5   Local output: HDMI

2.6.29 ACX1MT-HDM2-2S

CPU Unit

Rear view

1 Service port
2 Connect to interconnect cable
3 Connect to interconnect cable
4 To CPU: USB-HID
5 To CPU: HDMI
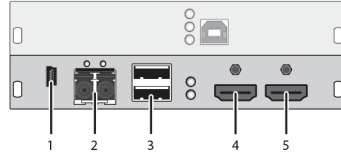6 Local output: HDMI

2.6.30 ACX1MR-HDSW-C

CON Unit

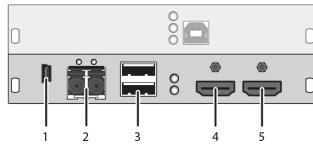*Rear view*

1 Service port
2 Connect to interconnect cable
3 Connect to USB-HID devices
4 Connect to HDMI monitor
5 Local input: HDMI

877-877-BBOX (2269) | BlackBox.com

2.6.31 ACX1MR-HDSW-2C

CON Unit

Rear view

1 Service port
2 Connect to interconnect cable 1
3 Connect to USB-HID devices
4 Connect to HDMI monitor
5 Local input: HDMI

2.6.32 ACX1MR-HDSW-SM

CON Unit
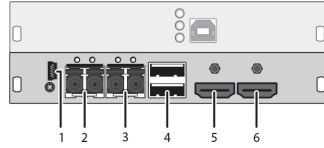

Rear view

1 Service port
2 Connect to interconnect cable 1
3 Connect to USB-HID devices
4 Connect to HDMI monitor
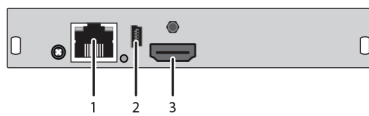5 Local input: HDMI

2.6.33 ACX1MR-HDSW-2S

CON Unit

Rear view

1 Service port
2 Connect to interconnect cable 1
3 Connect to interconnect cable 2
4 Connect to USB-HID devices
5 Connect to HDMI monitor
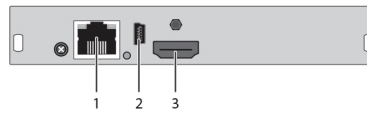6 Local input: HDMI

2.6.34 ACX1MT-HDO-C/ACX1MR-HDO-C

CPU Unit   CON Unit

Rear view   *Rear view*
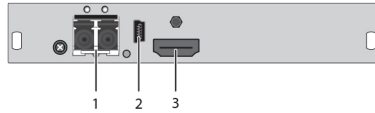
1 Connected to interconnect cable   1 Connected to interconnect cable
2 Service port   2 Service port
3 To CPU: HDMI   3 Connect to HDMI monitor
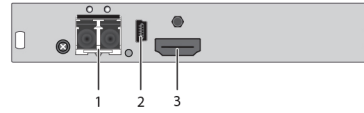
2.6.35 ACX1MT-HDO-SM/ACX1MR-HDO-SM

CPU Unit   CON Unit

Rear view   *Rear view*
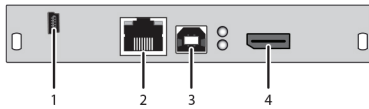
1	Connected to interconnect cable	1	Connected to interconnect cable
2	Service port	2	Service port
3	To CPU: HDMI	3	Connect to HDMI monitor

NOTE: The video-only modules without USB-HID connection are only meant for use with basic extender modules.
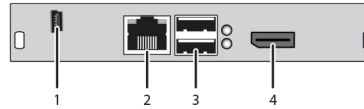
2.6.36 ACX2MT-DPH-C/ACX2MR-DPH-C

CPU Unit   CON Unit

Rear view   *Rear view*

1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB-HID	3	Connect to USB-HID devices
4	To CPU: DisplayPort	4	Connect to DisplayPort monitor

2.6.37 ACX2MT-DPH-SM/ACX2MR-DPH-SM

CPU Unit

CON Unit

Rear view

1   Service port
2   Connect to interconnect cable
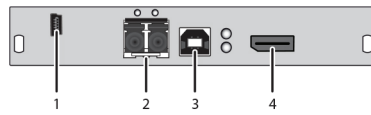3   To CPU: USB-HID
4   To CPU: DisplayPort

Rear view

1   Service port
2   Connect to interconnect cable
3   Connect to USB-HID devices
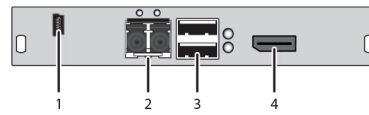4   Connect to DisplayPort monitor

2.6.38 ACX2MT-DPHS-SM/ACX2MR-DPHS-SM

CPU Unit

CON Unit

Rear view

1   Service port
2   Connect to interconnect cable
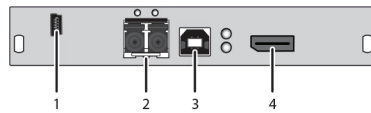3   To CPU: USB-HID
4   To CPU: DisplayPort

Rear view

1   Service port
2   Connect to interconnect cable
3   Connect to USB-HID devices
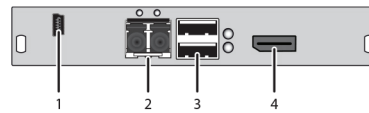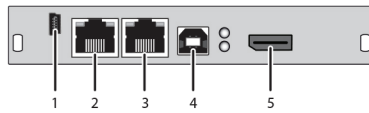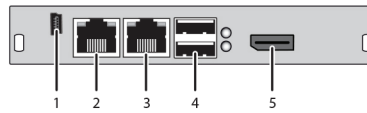4   Connect to DisplayPort monitor

2.6.39 ACX2MT-DPH-2C/ACX2MR-DPH-2C

CPU Unit   CON Unit

Rear view   *Rear view*

1   Service port   1   Service port
2   Connect to interconnect cable 1   2   Connect to interconnect cable 1
3   Connect to interconnect cable 2   3   Connect to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: DisplayPort   5   Connect to DisplayPort monitor

2.6.40 ACX2MT-DPH-2S/ACX2MR-DPH-2S

CPU Unit   CON Unit

Rear view   *Rear view*
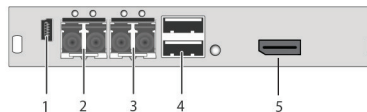
1   Service port   1   Service port
2   Connect to interconnect cable 1   2   Connect to interconnect cable 1
3   Connect to interconnect cable 2   3   Connect to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: DisplayPort   5   Connect to DisplayPort monitor

2.6.41 ACX2MT-DPHS-2S/ACX2MR-DPHS-2S

CPU Unit   CON Unit
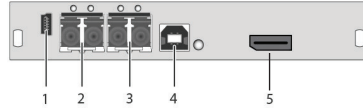
Rear view   *Rear view*

1   Service port   1   Service port
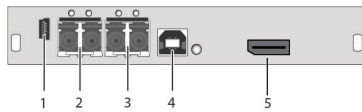2   Connect to interconnect cable 1   2   Connect to interconnect cable 1
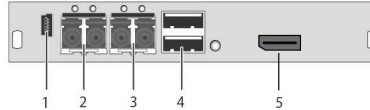3   Connect to interconnect cable 2   3   Connect to interconnect cable 2
4   To CPU: USB-HID   4   Connect to USB-HID devices
5   To CPU: DisplayPort   5   Connect to DisplayPort monitor

2.6.42 Upgrade Module ACX1MT-HID/ACX1MR-HID

CPU Unit, rear view   CON Unit, rear view

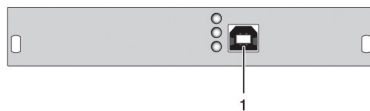| CPU unit		CON unit	
1	To CPU: USB-HID	1	Connect to USB-HID devices

2.6.43 ACX1MT-EU/ACX1MR-EU

CPU Unit   CON Unit

Rear view   *Rear view*

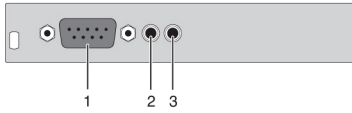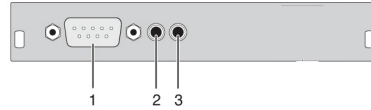1   To CPU: USB-HID   1   Connect to USB-HID devices

2.44 Upgrade Module ACX1MT-AR/ACX1MR-AR

CPU Unit, rear view   CON Unit, rear view

CPU unit		CON unit	
1	Connect to serial (DB9)	1	Connect to serial DB9
2	Audio IN	2	Audio IN
3	Audio OUT	3	Audio OUT

2.6.45 ACX1MT-ARP/ACX1MR-ARP

CPU Unit   CON Unit

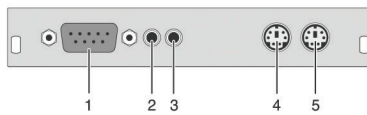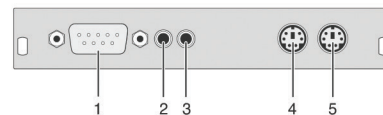*Rear view*   *Rear view*

1   Connect to serial DB9   1   Connect to serial DB9
2   Audio IN   2   Audio IN
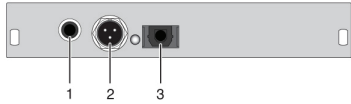3   Audio OUT   3   Audio OUT
4   To CPU: PS/2 mouse   4   Connect to PS/2 module
5   To CPU: PS/2 keyboard   5   Connect to PS/2 keyboard

2.6.46 Upgrade Module ACX1MT-DA/ACX1MR-DA

CPU Unit, rear view   CON Unit, rear view
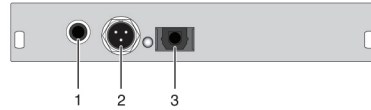
CPU unit		CON unit	
1	S/PDIF input (RCA)	1	S/PDIF output (RCA)
2	AES/EBU input (Mini-XLR)	2	AES/EBU output (Mini-XLR)
3	S/PDIF input (TOSLINK®)	3	S/PDIF output (TOSLINK)

2.6.47 Upgrade Module ACX1MT-ARH/ACX1MR-ARH

CPU Unit, rear view   CON Unit, rear view
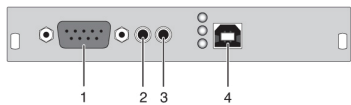
CPU unit		CON unit	
1	Connect to serial (DB9)	1	Connect to serial (DB9)
2	Audio IN	2	Audio IN
3	Audio OUT	3	Audio OUT
4	To CPU: USB-HID	4	Connect to USB-HID devices

2.6.48 Upgrade Module ACX1MT-DAH/ACX1MR-DAH

CPU Unit, rear view   CON Unit, rear view
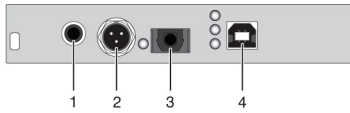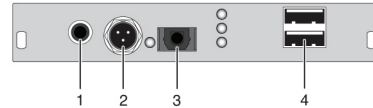
CPU unit		CON unit	
1	S/PDIF input (RCA)	1	S/PDIF output (RCA)
2	AES/EBU input (Mini-XLR)	2	AES/EBU output (Mini-XLR)
3	S/PDIF input (TOSLINK)	3	S/PDIF output (TOSLINK)
4	To CPU: USB-HID	4	Connect to USB-HID devices

2.6.49 ACX1MT-ARE/ACX1MR-ARE

CPU Unit   CON Unit
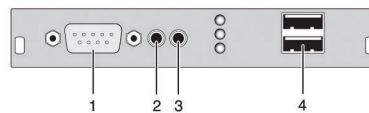
Rear view

1   Connect to serial DB9
2   Audio IN
3   Audio OUT
4   To CPU: USB 2.0

Rear view

1   Connect to serial DB9
2   Audio IN
3   Audio OUT
4   Connect to USB 2.0 devices

2.6.50 ACX1MT-DAE/ACX1MR-DAE

CPU Unit   CON Unit
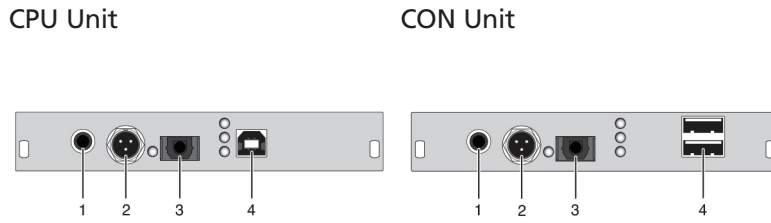

Figure 2-X.
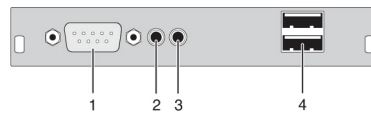
Rear view   *Rear view*

1   S/PDIF input (RCA)   1   S/PDIF output (RCA)
2   AES/EBU input (Mini-XLR)   2   AES/EBU output (Mini-XLR)
3   S/PDIF input (TOSLINK)   3   S/PDIF output (TOSLINK)
4   To CPU: USB 2.0   4   Connect to USB 2.0 devices

2.6.51 Upgrade Module ACX1MT-DAX/ACX1MR-DAX

CPU Unit, rear view   CON Unit, rear view
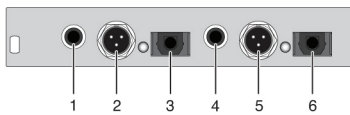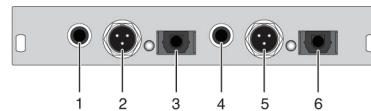
CPU unit		CON unit	
1	S/PDIF input (RCA)	1	S/PDIF output (RCA)
2	AES/EBU input (Mini-XLR)	2	AES/EBU output (Mini-XLR)
3	S/PDIF input (TOSLINK)	3	S/PDIF output (TOSLINK)
4	S/PDIF output (RCA)	4	S/PDIF input (RCA)
5	AEX/EBU output (Mini-XLR)	5	AES/EBU input (Mini-XLR)
6	S/PDIF output (TOSLINK)	6	S/PDIF input (TOSLINK)

2.6.52 Upgrade Module ACX1MT-ARD/ACX1MR-ARD

CPU Unit, rear view
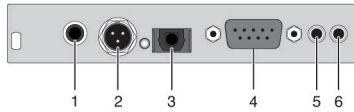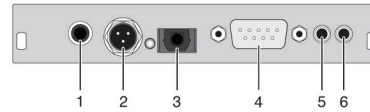
CON Unit, rear view
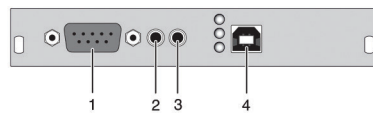
CPU unit		CON unit	
1	S/PDIF input (RCA)	1	S/PDIF output (RCA)
2	AES/EBU input (Mini-XLR)	2	AES/EBU output (Mini-XLR)
3	S/PDIF input (TOSLINK)	3	S/PDIF output (TOSLINK)
4	Connect to serial (DB9)	4	Connect to serial (DB9)
5	Audio IN	5	Audio IN
6	Audio OUT	6	Audio OUT

2.6.53 USB 2.0 Module ACX1MT-U2-C/ACX1MR-U2-C

CPU Unit, rear view
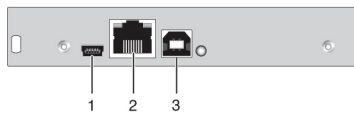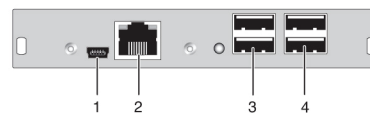
CON Unit, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB 2.0	3	Connect to USB 2.0 devices

NOTE: Operates at 480 Mbps.

2.6.54 USB 2.0 Module ACX1MT-U2-SM/ACX1MR-U2-SM

CPU Module, rear view
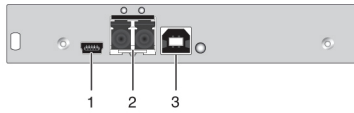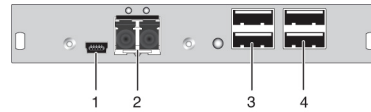
CON Module, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB 2.0	3	Connect to USB 2.0 devices

NOTE: Operates at 480 Mbps.

2.6.55 USB 2.0 Module ACX1MT-U23-C/ACX1MR-U23-C

CPU Unit, rear view
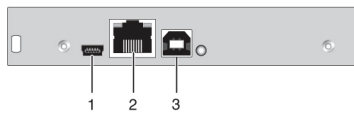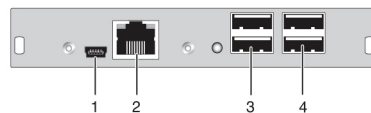
CON Unit, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB 2.0	3	Connect to USB 2.0 devices

2.6.56 USB 2.0 Module ACX1MT-U23-SM/ACX1MR-U23-SM

CPU Module, rear view
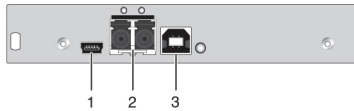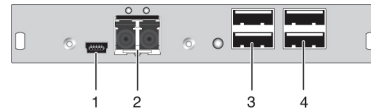
CON Module, rear view

CPU unit		CON unit	
1	Service port	1	Service port
2	Connect to interconnect cable	2	Connect to interconnect cable
3	To CPU: USB 2.0	3	Connect to USB 2.0 devices

2.6.57 ACX2MT-DPH4KHS-SM/ACX2MR-DPH4KHS-SM

CPU Unit, rear view
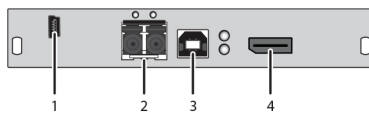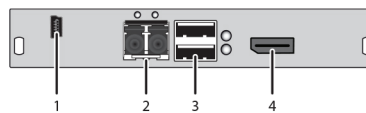
CON Unit, rear view

Rear view

1   Service port
2   Connect to interconnect cable
3   To CPU: USB-HID
4   To CPU: DisplayPort

Rear view

1   Service port
2   Connect to interconnect cable
3   Connect to USB-HID devices
4   Connect to DisplayPort monitor

2.6.58 ACX2MT-DPH-2S/ACX2MR-DPH-2S

CPU Unit, rear view   CON Unit, rear view
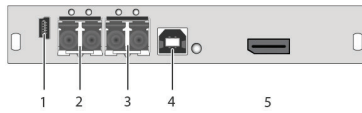
Rear view

1   Service port
2   Connect to interconnect cable 1
3   Connect to interconnect cable 2
4   To CPU: USB-HID
5   To CPU: DisplayPort
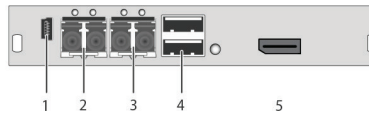
Rear view

1   Service port
2   Connect to interconnect cable 1
3   Connect to interconnect cable 2
4   Connect to USB-HID devices
5   Connect to DisplayPort monitor

2.7 Status LEDs

2.7.1 KVM Extender Module Status

The KVM Extender module has a multicolor LED on both sides to indicate overall status. It also has two additional LEDs on the back side to indicate the connection status.
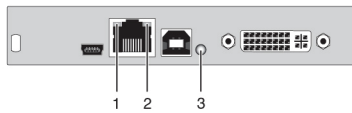
CPU module, rear view   CON module, rear view
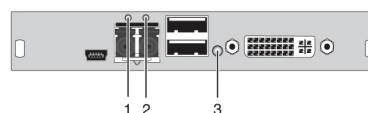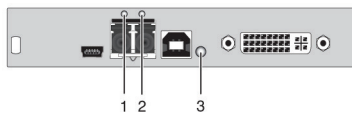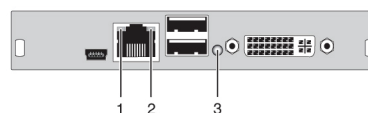
Status LEDs on the basic module.

LED 1 and 2: Connection Status.

Position	LED	Status	Description
1	Failure LED (green)	Off	Connection available
		On or Flashing	Connection failure (flashing for about 20 seconds following a connection failure)
2	Status LED (green)	Flashing	No connection via interconnect cable
		On	Connection available

LED 3: USB and Video Status.

Color	Description
Red	Device ready
Violet	Connection and USB signal (interconnect) available
Green	Connection and video signal available
Light Blue	Connection, USB, and video signal available (operating status)

2.7.2 KVM Extender Module VGA/DVI-I Status

The KVM Extender module with VGA/DVI-I input has a multicolor LED on the front side of the CPU module to indicate connection status. More information is available via on-screen display (OSD) (see the manual for the Media/DVI Converter [ACS411A-R2]).

CPU module

Front view of the CPU module.

LED 3: Connection Status VGA/DVI-I.

LED	Description
Dark Red	No video signal; monitor not detected
Red	Video signal not supported; monitor not detected
Green	Video signal supported; monitor not detected
Blue	No video signal; monitor detected
Violet	Video signal not supported; monitor detected
Light Blue	Video signal supported; monitor detected

2.7.3 Upgrade Module Digital Audio Status

The upgrade module digital audio has another multicolor LED on the rear side to indicate the connection status:

CPU module, rear view   CON module, rear view
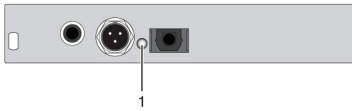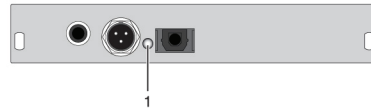
Status upgrade module digital audio.

LED 1: Digital Audio Status.

LED color	Description
Red	No signal
Light Blue	Static: CPU Unit: S/PDIF signal (RCA) availabl
	Flashing: CPU Unit: Digital noise
Violet	Static: CPU Unit: AES/EBU signal (Mini-XLR) available
	Flashing: CPU Unit: Digital noise
Blue	Static: CPU Unit: S/PDIF signal (TOSLINK) available
	Flashing: CPU Unit: Digital noise
Green	CON Unit: Signal available

2.7.4 Upgrade Module USB-HID Status

The upgrade module USB-HID has three LEDs on the rear side to indicate the connection status:

CPU module, rear view   CON module, rear view
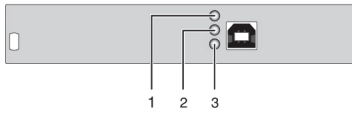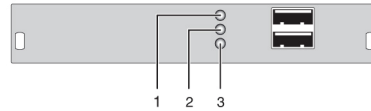
Status upgrade modules USB-HID.

LED 1, 2, and 3: Status.

Position	LED	Status	Description
1, 2	Device LED (orange)	Off	No USB-HID device or not supported; USB device connected
		Flashing fast	USB-HID device active
		On	USB-HID device ready or DKM Modular Extender in command mode
3	Status LED (orange)	Off	• No power supply voltage • CPU Unit: DKM Modular Extender in command mode or no connection • CON Unit: Keyboard in command mode
		Flashing slowly	CON Unit: DKM Modular Extender in command mode or no connection
		Flashing fast	Operating status

2.7.5 Upgrade Module USB 2.0 Embedded Status

The upgrade module USB 2.0 embedded is fitted with three LEDs on the rear side that indicate the connection status.
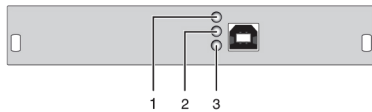
CPU module, rear view   CON module, rear view
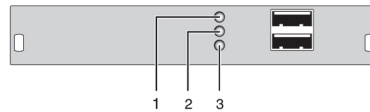
USB 2.0 embedded upgrade module.

USB 2.0 embedded upgrade module status LEDs.

Position	LED	Status	Description
1	Status LED (green)	Off	No USB 2.0 device connected
		Flashing slowly	USB 2.0 device connected
2	Status LED (green)	Off	No connection to source (computer, CPU) available
		Flashing slowly	• Connection to source (computer, CPU) available • No USB 2.0 device connected
3	Status LED (green)	On	• Connection to source (computer, CPU) available • USB 2.0 device(s) connected
		Off	No connection between CON and CPU module
		On	Connection between CON and CPU module available

2.7.6 USB 2.0 Module Status

The USB 2.0 module has a multicolor LED on both sides to indicate overall status. It also has two more LEDs on the back side to indicate the connection status.
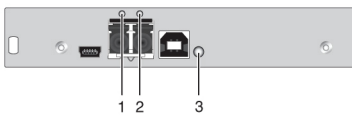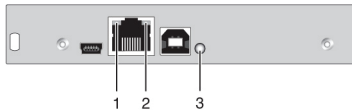
CPU module, rear view   CON module, rear view
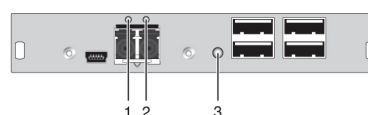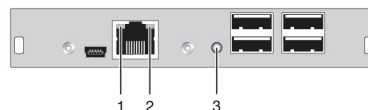
Status USB 2.0 module.

LEDs 1 and 2: Status.

Position	LED	Status	Description
1	Failure LED (green)	Off	Connection available
		On or flashing	Connection failure (flashing for about 20 seconds following a connection failure)
2	Status LED (green)	Off	No connection via interconnect cable
		On	Connection available

LED 3: USB 2.0 Status.

LED color	Description
Red	Device ready
Green	Only connection available, no USB 2.0 signal
Green/light blue flashing	Connection available, no USB 2.0 device connected (only CON unit)
Light blue	Connection and USB 2.0 signal available (operating status)

3. Installation

3.1 Package Contents

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

KVM Extender:

• DKM Modular Chassis with pre-installed CON/CPU Modules

• (2) 5-VDC international power supply units

• (2) country-specific power cords

• Quick Start Guide

• (1) DVI video cable (6-ft. [1.8 m], DVI-D male-to-male)

Figure 3-1. DVI video cable.

• (1) USB cable (6-ft. [1.8 m], Type A to Type B)

Figure 3-2. USB cable.

The KVM Extender VGA/DVI-I (replaces DVI-D cable) also includes:

• VGA cable (6-ft. [1.8 m], VGA male to DVI-I male)

Figure 3-3. VGA cable.

• Infrared remote control

The upgrade module Analog Audio/Serial RS-232 also includes:

• Serial cable (6-ft. [1.8 m], RS-232 male connector)

Figure 3-4. Serial cable.

• Stereo jack cable (5.2-ft. [1.6-m], 3.5 mm male connector)

Figure 3-5. Stereo jack cable.

The upgrade module serial RS-422 also includes:

• Serial cable (6-ft. [1.8-m], RS-422 male connector

Figure 3-6. Serial cable.

The upgrade module Digital Audio also includes:

• RCA cable (8.2-ft. [2.5 m], Cinch male connector)

Figure 3-6. RCA cable.

• TOSLINK cable (6-ft. [1.8 m], F05 male connector)

Figure 3-7. TOSLINK cable.

The upgrade module USB-HID also includes:

• USB cable (6-ft. [1.8 m], USB Type A to Type B)

Figure 3-8. USB cable.

The upgrade module PS/2 also includes:

• (2) PS/2 cables (6-ft. [1.8 m], 6-pole connector)

Figure 3-9. PS/2 cable.

The USB 2.0 embedded upgrade module also includes:

• USB cable (6-ft. [1.8 m], USB Type A to Type B)

Figure 3-10. USB cable.

The USB 2.0 module also includes:

• USB cable (6-ft. [1.8 m], USB Type A to Type B)

Figure 3-11. USB cable.

NOTE: If anything is missing, please contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

3.2 System Setup

NOTE: If you are a first-time user, we recommend that you set up the system with the CPU module and the CON module in the same room as a test setup. This will enable you to identify and solve any cabling problems, and experiment with your system more conveniently.

NOTE: Verify that interconnect cables, interfaces, and handling of the devices comply with the requirements (see Section 3.1).

3.2.1 KVM Extender Module Setup

1. Switch off all devices.

CON Module Installation

2. Connect your monitor(s), keyboard, and mouse to the CON module.

3. Connect the CON module with the interconnect cable(s).

4. Connect the 5-VDC power supply to the CON module.

CPU Module Installation

5. Connect the source (computer, CPU) with the supplied cables to the CPU module. Make sure the cables are not strained.

6. Connect the CPU module to the interconnect cable(s).

7. Connect the 5-VDC power supply to the CPU module.

8. Power up the system.

NOTE: To power up the system, the following sequence is recommended: Monitor – CON module – CPU module – source.

NOTE: The basic module with VGA / DVI-I input is connected as mentioned above. Default output video setting is scaled to 1024 x 768. For a complete and detailed description of the setup and configuration of the VGA option, see the Media/DVI Converter (ACS411A-R2) manual.

NOTE: In the modular chassis, CON modules may be fitted next to CPU modules. The CON/CPU naming convention is based on the module rather than on the chassis that holds the modules.

3.2.2 Setup of Upgrade Modules

You can hot-plug the modules.

Upgrade Module Analog Audio/Serial:

1. Connect the audio source with the CPU module (for example, CPU audio output with audio input, CPU audio input with audio output).

2. Connect the audio output at the CON module with headphones or suitable speakers.

3. Connect the audio input at the CON module with a suitable microphone.

Upgrade Module Serial RS422:

1. Connect the CPU to the CPU Unit by using the serial cable.

2. Connect the CON Unit to the serial connector of the input device.

Upgrade Module Digital Audio:

1. Connect the digital audio source with the suitable audio input of the CPU module.

2. Connect the audio output of the CON module with suitable speakers or audio amplifiers.

NOTE: If several active sources are connected, Mini-XLR input takes priority. The audio signal is available at all outputs.

Upgrade Module USB-HID:

1. Connect the CPU with the CPU module (USB-HID 2).

2. Connect the USB-HID devices with the CON module (Connect to USB-HID device 2).

Upgrade Module PS/2:

1. Connect the CPU to a CPU unit with cables for PS/2 devices.

2. Connect the PS/2 devices to the CON unit (Connector to PS/2 devices).

Upgrade Module USB 2.0 Embedded:

1. Connect the CPU to the CPU Unit (USB 2.0).

2. Connect the USB 2.0 devices to the CON Unit (Connect to USB 2.0 devices).

Upgrade Module USB 2.0:

1. Connect the CPU to the CPU Unit (USB 2.0).

2. Connect the USB 2.0 devices to the CON Unit (Connect to USB 2.0 devices).

3.3 Example Applications

This section illustrates typical installations of DKM Modular Extenders:

Copper/CATx
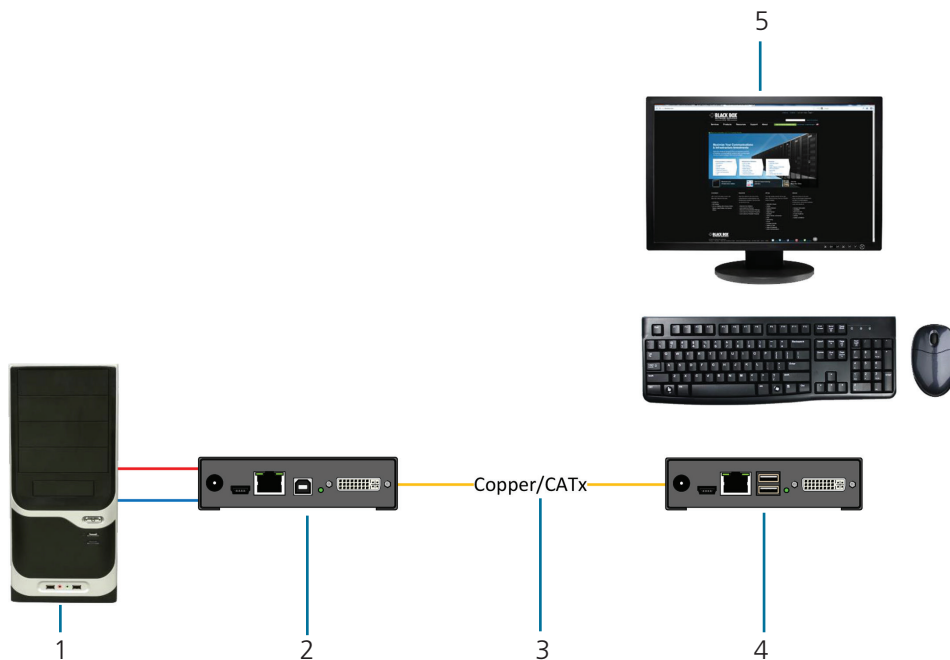
Figure 3-12. DKM Modular Extender (Single-Head).
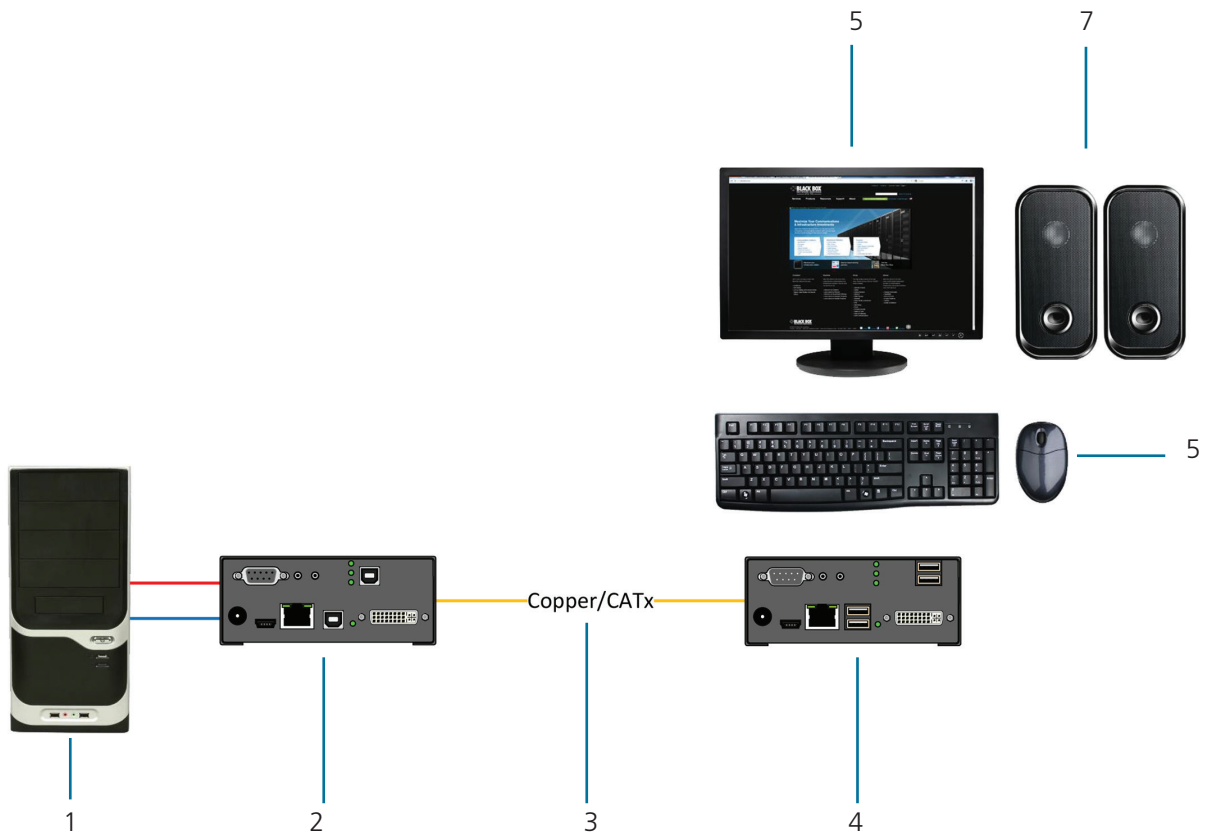
Figure 3-13. DKM Modular Extender (Single-Head with Digital/Analog Audio).
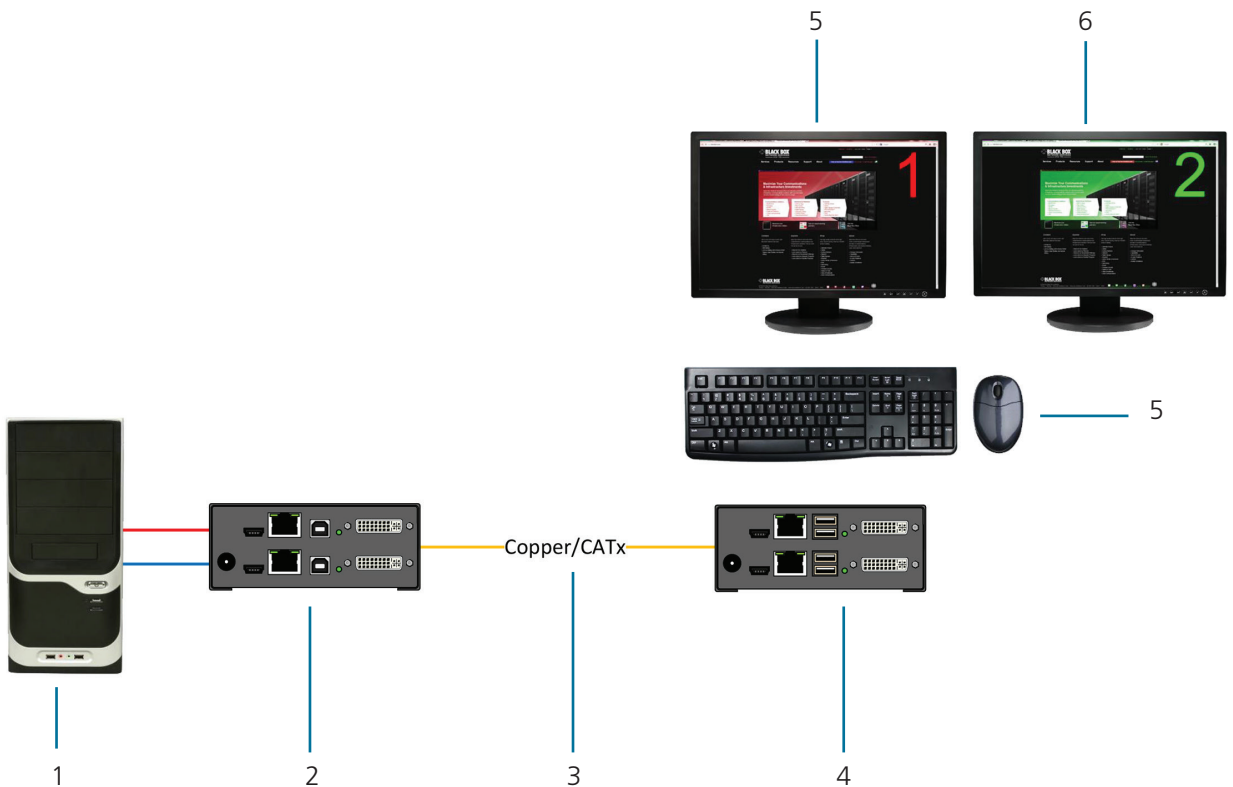
Figure 3-14. DKM Modular Extender (Dual-Head).

Table 3-1. Components in Figures 3-10 through 3-12.

Number	Description
1	Source (computer, CPU)
2	DKM Modular Extender CPU Unit
3	Interconnect cable
4	DKM Modular Extender CON Unit
5	Console (keyboard, monitor, mouse)
6	Second monitor (option, only with dual-head devices)
7	Audio sink (optional, only with devices with analog audio/serial option or digital audio option

4. Configuration

4.1 Transmission Parameters

The device operates with a proprietary compression method. In its default configuration, the device adapts dynamically to monitor resolution and image content. This configuration works in almost all conditions. Modify it only if image quality is not fully satisfactory.

NOTE: In exceptional cases, detached "frame droppings" (loss of single pictures) or color effects can appear.

4.2 DDC Settings

By default, the device sends the factory preset DDC information to the CPU. This information works in most cases.

During normal operation , you can downoad the console monitor's DDC information (see Chapter 5).

For special requirements, DDC information can be retrieved and uploaded as a binary file at both the CPU module and the CON module.

Connect your computer with a USB Mini cable to the CPU module's or CON module's service port.

You can now access the data area of the unit as a flash drive "Extender."

Uploading DDC Information

Copy the binary file containing your specific DDC information to the flash drive of the CPU module or CON module.

The current DDC information is replaced.

Retrieving DDC Information

Copy the file "DDC-EDID.bin" on the flash drive of the CPU module to your computer.

To open the binary file, you have to install a suitable software, for example, WinDDCwrite (Download), on your computer.

Reset to Factory DDC Information

Delete the file called "DDC-EDID.bin" on the flash drive of the CPU module. By deleting this file, the factory DDC Information is restored.

4.3 Command Mode

During normal use, the console keyboard functions in the usual manner. However, for all KVM Extenders with USB-HID support, you can set the keyboard into a Command Mode by using a specific "hotkey" sequence. While in Command Mode, several functions are performed via keyboard commands. To exit Command Mode, press <Esc>. While in Command Mode, the LEDs Shift and Scroll on the console keyboard will flash.

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

Table 4-1 lists the keyboard commands to enter and to exit Command Mode and to change the hotkey sequence.

Table 4-1. Keyboard commands.

Function	Keyboard Command
Enter Command Mode	2x <Left-Shift>/Hotkey
Exit Command Mode	<Esc>
Change Hotkey sequence	<Currrent Hotkey>, <c>, <newHotkey code>, <Enter>

Table 4-2. Keyboard sequences.

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

You can change the hotkey sequence to enter Command Mode. Table 4-3 lists the hotkey codes for the available key sequences.

Table 4-3. Hotkey Sequences.

Hotkey Code	Hotkey
0	Freely selectable (since 1-12-2012)
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>

Set freely selectable "Hot Key" (exemplary)

In order to set a freely selectable 'Hot Key' (e.g. 2x <Space>), use the following keyboard sequence:

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

Reset "Hot Key"

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

4.4 USB-HID Ghosting

This function allows specific keyboard and mice descriptors (device descriptions) to be permanently stored in the CPU unit. This eliminates the need to register and deregister the keyboard and mouse on an operating system each time there is a shared use of a source (computer, CPU) by two or more consoles within a KVM matrix.

The following table lists the keyboard commands for the configuration of USB-HID Ghosting:

Table 4-4. Keyboard commands for USB-HID ghosting configuration.

Function	Keyboard Command
Writes the device descriptions of the input devices connected to the CON Unit into the CPU Unit. Activating the emulation in the CPU Unit.	<'Hot Key'>, <h>, <w>, <Enter>
Activates the emulation of already stored device descriptions in the CPU Unit.	<'Hot Key'>, <h>, <e>, <Enter>
Deactivates the emulation of active device descriptions in the CPU Unit. The input devices connected to the CON Unit will be now passed transparently to the source (computer, CPU).	<'Hot Key', <h>, <d>, <Enter>
Deactivates the emulation of active device descriptions in the CPU Unit. Deletes the descriptions out of the CPU Unit. The input devices connected to the CON Unit will be now passed transparently to the source (computer, CPU).	<'Hot Key', <h>, <r>, <Enter>

NOTE: When using a USB combo device as a USB-HID input device, switching to a CPU Unit with activated USB-HID Ghosting may cause limited functionality.

4.5 Configuration File

The KVM Extender contains a configuration file (Config.txt) to set specific parameters and to read out device and video information. You can find it on the flash drive of the KVM Extender. 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.

NOTE: After setting a parameter, you need to restart the KVM Extender.

NOTE: To ensure correct identification and acceptance of the parameters, the start command #CFG has to be written into the first line of the Config.txt file.

4.5.1 Parameters for CPU Units

You can write the following parameters into the configuration file of a CPU Unit.

Table 4-5. Parameters for CPU units.

DDC Management	
Parameter	Function
ENAHPDET	Enable hotplug switch
LOCKEDID	Activate DDC write protection
Digital Audio	
Parameter	Function
SRC32000	Activate sample rate conversion, sample rate 32 kHz (only with digital audio upgrade module)

Table 4-5 (continued). Parameters for CPU units.

Digital Audio (continued)	
Parameter	Function
SRC44100	Activate sample rate conversion, sample rate 44,1 kHz (only with digital audio upgrade module)
SRC48000	Activate sample rate conversion, sample rate 48 kHz (only with digital audio upgrade module)
SRC96000	Activate sample rate conversion, sample rate 96 kHz (only with digital audio upgrade module)
SRC_NONE	Deactivate sample rate conversion (only with digital audio upgrade module)
Compression	
Parameter	Function
MEDCPRATE	Activate medium compression rate
MINCPRATE	Activate low compression rate
MAXCPRATE	Activate high compression rate
Shared Operation	
Parameter	Function
KBDCON	Activate Keyboard Connect (only with redundant CPU Units)
MOUCON	Activate Mouse Connect (only with redundant CPU Units)
RELEASETIME=n	Release timer n = 0...9 seconds for Mouse and Keyboard Connect, without parameter = 10 seconds
General Settings	
Parameter	Function
DISPLAY2	Show video channel 2 per default after switching on the respective Dual-Head unit

4.5.2 Parameters for CON Units

You can write the following parameters into the configuration file of a CON Unit.

Table 4-6. Parameters for CON units.

Output Settings	
Parameter	Function
1080p50Hz	Always display 50 Hz when using 1920 x 1080
DISEXTOSD	Deactivate extender OSD
ENAFRAME	Show orange colored frame when losing extender connection
ENAHOLDPIC	Show last transmitted picture highlighted by an orange colored frame when losing connection
ENADDCTX	Activate DDC transmission by unplugging and connecting the monitor back to the CON Unit
CENTERMODE	Simulate the native resolution of Dual-Link monitors by an additional black frame in order to enable Instant Switching (Dual-Link models only).
PARAM=V	Simultaneous output of DVI-D and VGA signal (DVI-I module only)

4.5.3 Parameters for CPU und CON Units

You have to write the following parameters into the configuration file of both CON Unit and CPU Unit.

Table 4-7. Parameters for CPU and CON units.

Local switching	
Parameter	Function
BLANKSCR	Activate dark switching between local and remote console by keyboard or mouse event (only with HDMI extenders and local control by an USB-HID CON upgrade module).
PRIVATEMODE	Activate switching of video and control between local and remote console by keyboard commands (only with HDMI extenders and local control by an USB-HID CON upgrade module).

USB 2.0 embedded	
Parameter	Function
ENAUSB11	Activate USB 1.1 mode for USB 2.0 embedded upgrade modules (only with USB 2.0 embedded upgrade module).

5. Operation

5.1 Download of DDC Information

By default, data from the internal DDC list is reported to the source (computer, CPU). If these settings do not lead to a satisfying result, you can download and store the console monitor's DDC information internally. The devices must be configured accordingly (see Section 4.2).

On all KVM Extenders with USB-HID support, the user can load the DDC information of the console monitor via keyboard command under operating conditions.

1. Enter Command Mode with the "**hotkey**" (see Section 4.2).

2. Press the **<a>** key to download the DDC information of the console monitor.

The screen goes black for a short time.

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

3. Restart the corresponding source (computer, CPU).

The video mode has been readjusted. Screen quality should be optimal. The CPU should now show the console monitor as the current screen, together with the available video resolutions.

The DDC information of the console monitor was loaded once. Reloading is possible by repeating the operation.
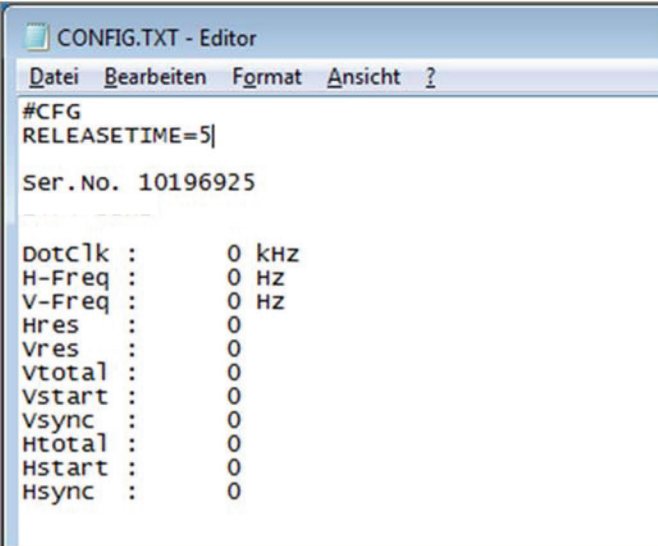
5.2 Shared Operation of redundant CPU Units

CPU Units with a redundant connector for interconnect cables offer the possibility for a competing control by two connected CON Units.

Taking over control is performed using a keyboard and/or mouse. The release timer function determines the release time of the input devices at one of the CON Units after that control can be taken over from the second CON Unit.

In order to configure a redundant CPU Unit for the operation with two competing CON Units, proceed as follows:

1. Connect a redundant CPU Unit to any source (computer, CPU) by using a mini USB connection.

2. Open the file "Config.txt" that is located on the appearing flash drive of the extender.

3. Activate the release timer by writing the parameter RELEASETIME=n into the second line. The variable "n" defines the time in seconds and has to be replaced by the numbers 0 to 9 (e.g. RELEASETIME=5). If this parameter is not activated at all, the release time is set to 2 seconds by default. The parameter RELEASETIME=X deactivates the shared operation.

4. Save your changes.

5. Reboot the CPU Unit.

Figure 5-1. Example View – Config.txt.

NOTE: When using a USB combo device as a USB-HID input device, switching to a CPU Unit with activated USB-HID Ghosting may cause limited functionality.
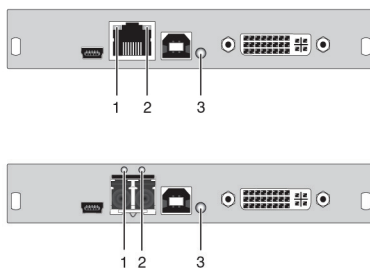
6. Troubleshooting

6.1 General Failures

Table 6-1. General failures troubleshooting.

Diagnosis	Possible Reason	Measure
	Parameter not set or saved	• Write parameter into Config.txt file and save changes.
	Start Commanc #CFG not set	• Write start command #CFG into first line of the Config.txt file.
Config.txt parameter without function	Parameter written incorrectly	• Check correct spelling and capitalization.•
	Extender not restarted	• Restart extender.

6.2 Blank Screen
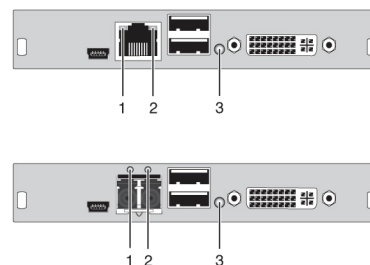
CPU module, rear view

CON module, rear view

Figure 6-1. Blank screen.

Table 6-2. Blank screen troubleshooting.

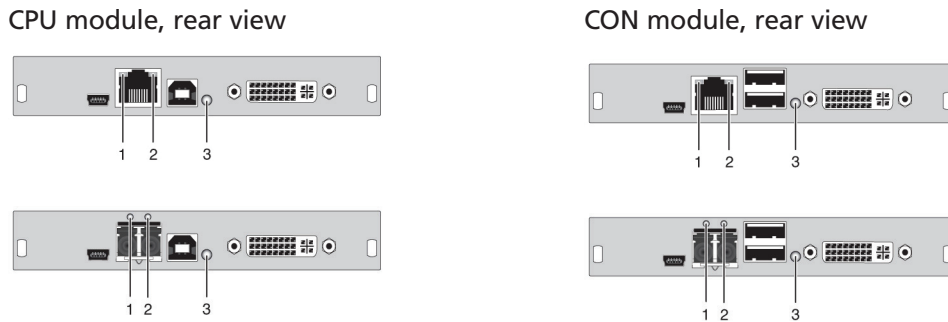| Diagnosis	Possible Reason	Measure
LED 3 off	Power supply	• Check power supply units and the connection to the power network.
LED 1 on or LED 2 off	Connection between the CON unit and the CPU unit	• Check interconnect cables and connections.
CPU unit: LED 3 red or yellow	No video signal detected by source (computer, CPU)	• Check DVI-D cable to CPU. • Download DDC information from console monitors (see Chapter 5). Reboot CPU if necessary.
CON unit: LED 3 red or yellow	No monitor detected	• Check connection, length, and quality of the DVI-D cable to monitor; tighten cable thumbscrews.
	No video signal detected from CPU unit	• Check connection, length, and quality of the interconnect cables between the units. • Download DDC information from console monitors (see Chapter 5). Reboot CPU if necessary.

6.3 USB-HID

CPU module, rear view

CON module, rear view

Figure 6-2. USB-HID module.

Table 6-3. USB-HID troubleshooting.

Diagnosis	Possible Reason	Measure
Keyboard LEDs **Shift** and **Scroll** are blinking	Keyboard in command mode	• Press <Esc> to leave command mode
CPU unit: LED 3 green or violet	No USB connection to CPU	• Check connection of USB cable to CPU; select another USB port if necessary. • Remove USB and power cable and restart CPU. Connect power cable first.
CON unit: LED 3 green or violet	Problems with USB connection	• Check connection of USB cable to USB-HID device. • Remove DVI and power cable and restart CON unit. Connect power cable first.
USB device without function	No USB-HID device	• Connect USB-HID device.
	USB-HID device is not supported	• Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com if necessary.

6.4 Serial Connection

Table 6-4. Serial connection upgrade module troubleshooting.

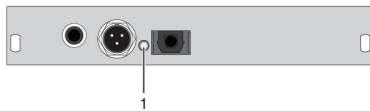| Diagnosis	Possible Reason	Measure
Serial device not operational	Settings of the serial interface	• Check baud rate and general settings.
	No serial connection to CPU	• Check connection via serial cable.
	No serial connection to end device (for example, touchscreen, keyboard)	• Connect serial end device and switch it on. • Check connection via serial cable.
Touchscreen not operational	Hardware handshake	• Adjust serial interface to X-ON/X-OFF software handshake.

6.5 Analog Audio

Table 6-5. Analog audio troubleshooting.

Diagnosis	Possible Reason	Measure
CON unit: No signal at audio output	No audio connection to CPU/audio source	• Connect analog audio source. • Check audio cable.
	No signal	• Switch analog audio source on. • Activate analog output at CPU/audio source.
	No audio connection to audio sink (for example, speakers)	• Connect analog audio sink and switch it on. • Check connection of audio cable.
CPU unit: No signal at audio output (microphone)	No audio connection to audio source (microphone)	• Connect analog audio source (microphone). • Check connection of audio cable.
	No signal	• Switch analog audio source on. • Activate analog output at audio source.
	No audio connection to audio sink (for example, CPU)	• Check connection to CPU. • Check connection of audio cable. • Check audio configuration.

6.6 Digital Audio

CPU module, rear view   CON module, rear view
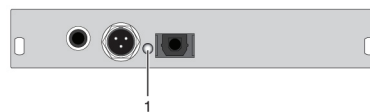
1   1

Figure 6-3. Digital audio module.

Table 6-6. Digital audio upgrade module troubleshooting.

Diagnosis	Possible Reason	Measure
CPU unit: LED 1 red	No audio connection to CPU/audio source	• Connect digital audio source. • Check connection of audio cable.
	No signal	• Switch digital audio source on. • Activate digital output at CPU/audio source.
CON unit: LED 1 red	No audio connection to audio sink (for example, speakers)	• Connect digital audio sink. • Check connection of audio cable.
	No signal	• Check signal at CPU unit.
No signal/LEDs 1 OK	Digital silence at active audio source	• Check LEDs at CPU unit. • Check audio format. • Change audio input.

6.7 USB-HID Upgrade Module

CPU module, rear view   CON module, rear view

Figure 6-4. USB-HID at the basic module.

Table 6-7. USB-HID upgrade module troubleshooting.

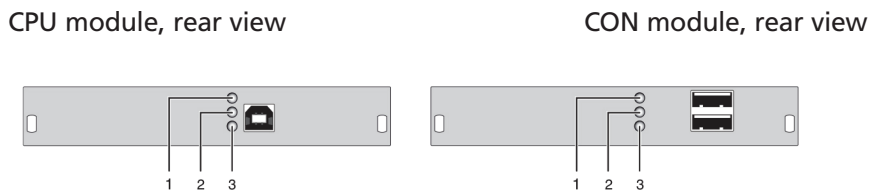| Diagnosis	Possible Reason	Measure
LEDs 1 and 2 off	Device at higher/lower USB-HID port not detected	• Check connection of USB cable to USB-HID device. • Connect USB-HID device. • Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com or your local Black Box subsidiary if necessary.
CPU unit: LED 3 off	Connection between CON unit and CPU unit	• Check interconnect cable and connectors.
CON unit: LED 3 off	Keyboard in command mode	• Press <Esc> to leave command mode.
CON unit: LED 3 flashing slowly	Connection between CON unit and CPU unit	• Check interconnect cable and connections.
	Keyboard in command mode	• Press <Esc> to leave command mode.

6.8 USB 2.0 Embedded

CPU module, rear view   CON module, rear view

Figure 6-5. USB 2.0 Embedded.

Table 6-8. USB-HID upgrade module troubleshooting.

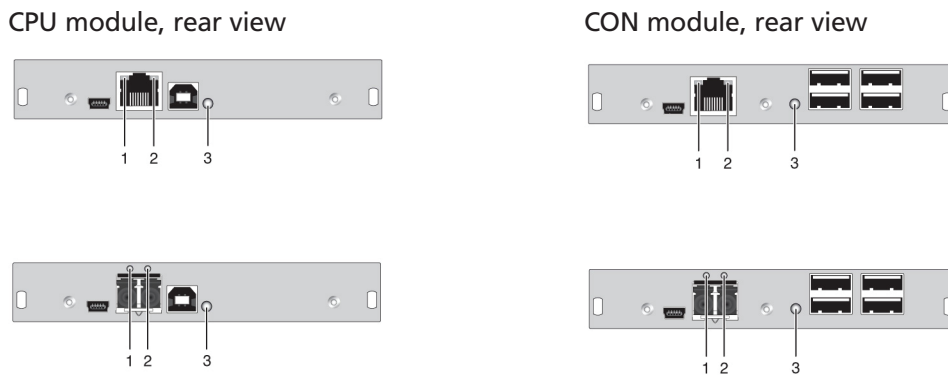| Diagnosis	Possible Reason	Measure
CPU & CON Unit: LED 3 off	No connection to CPU	• Check connection USB cable to CPU; select another USB port if necessary. • Remove USB and power cable and restart CPU. Connect power cable first.
CPU & CON Unit: LED 2 off	Connection between CON unit and CPU unit	• Check interconnect cable and connectors.
CPU & CON Unit: LED 2 off and USB 2.0 device without function	No USB 2.0 device	• Connect USB 2.0 device.
	USB 2.0 device is not supported	• Check installation at the CPU, also the necessary drivers. • New connection of the USB 2.0 device. • Contact dealer if necessary

6.9 USB 2.0 Upgrade Module

CPU module, rear view   CON module, rear view

Figure 6-6. USB 2.0 upgrade module.

Table 6-9. USB 2.0 upgrade module troubleshooting.

Diagnosis	Possible Reason	Measure
CPU unit: All LEDs off	No connection to CPU	• Check connection USB cable to CPU; select another USB port if necessary. • Remove USB and power cable and restart CPU. Connect power cable first.
CON unit: LED 3 red	Connection between CON unit and CPU unit	• Check interconnect cable and connectors.
CON unit: LED 3 flashing green/turquoise and USB 2.0 device without function	No USB 2.0 device	• Connect USB 2.0 device.
	USB 2.0 device is not supported	• Check installation at the CPU. Also check to make sure the CPU has the necessary drivers. • New connection of the USB 2.0 device. • Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com if necessary.

7. Technical Support

7.1 Contacting Black Box

If you determine that your ServSwitch DKM Extender is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com or your local Black Box subsidiary.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

• the nature and duration of the problem.

• when the problem occurs.

• the components involved in the problem.

• any particular application that, when used, appears to create the problem or make it worse.

7.2 Shipping and Packaging

If you need to transport or ship your ServSwitch DKM Extender:

• Package it carefully. We recommend that you use the original container.

• If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.

8. Glossary

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

Access: A system to operate a source (computer, CPU) from two consoles.

AES/EBU: Digital audio standard that is officially known as AES3. It's used to carry digital audio signals between devices.

CATx: Any CAT5e (CAT6, CAT7) cable

CGA: The Color Graphics Adapter (CGA) is an old analog graphic standard that displays up to 16 colors and at a maximum resolution of 640 x 400 pixels.

Component Video: The Component Video (YPbPr) is a high-quality video standard that consists of three independently and separately transmittable video signals: the luminance signal and two color difference signals.

Composite Video: The Composite Video is also called FBAS and it is part of the PAL TV standard.

CON module: Component of a DKM Modular 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 module: Component of a DKM Modular Extender 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 can exchange data via a monitor cable and the operating system can install and configure a monitor driver automatically.

Dual-Head: A system with two video connections.

Dual-Link: A DVI-D interface for resolutions up to 2560 x 2048 that transmits signals up to 330 MPixel/s (24-bit)

DVI: Digital video standard, introduced by the Digital Display Working Group (http://www.ddwg.org). 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).

EGA: The Enhanced Graphics Adapter (EGA) is an old analog graphics standard, introduced by IBM in 1984. It uses a DB9 connector for connection.

FBAS: The analog color video baseband signal (FBAS) is also called Composite Video and it is part of the PAL TV standard.

Fiber: Single-mode or multimode fiber cables.

KVM: Keyboard, video and mouse.

Mini-XLR: Industrial standard for electrical plug connections (3-pole) for the transmission of digital audio and control signals.

Multimode: 62.5µ fiber cable or 50µ fiber cable

OSD: The on-screen-display displays information or operates a device.

Quad-Head: A system with four video connections.

RCA (Cinch): A non-standardized plug connection that transmits electrical audio and video signals, especially with coaxial cables.

SFP: Small Form Factor Pluggable (SFPs) are pluggable interface modules for Gigabit connections. SFP modules are available for CATx and fiber interconnect cables.

Single-Head: A system with one video connection.

Single Link: A DVI-D interface that supports resolutions up to 1920 x 1200 by transmitting signals up to 165 Megapixels per second (24-bit). Alternative frequencies are Full HD (1080p), 2K HD (2048 x 1080), and 2048 x 1152.

Single-mode: 9µ fiber cable

S/PDIF: A digital audio interconnect that is used in consumer audio equipment over relatively short distances.

S-Video (Y/C): The S-Video (Y/C) is a video format that transmits luminance and chrominance signals separately. It has a higher quality standard than FBAS.

TOSLINK: Standardized fiber connection system that digitally transmits audio signals (F05 plug connection).

Triple-Head: A system with three video connections.

USB-HID: USB-HID devices (Human Interface Device) allow for data input. There is no need for a special driver during installation; "New USB-HID device found" is reported. Typical HID devices include keyboards, mice, graphics tablets, and touchscreens. Storage, video, and audio devices are not HID.

VGA: Video Graphics Array (VGA) is a computer graphics standard with a typical resolution of 640 x 480 pixels and up to 262,144 colors. It follows the graphics standards MDA, CGA and EGA.