Digital Multi Switcher
MSD-501

The IDK MSD-501 is a high-performance digital multi switcher with a scan converter and up to 5 inputs and 1 output.
Video signals HDMI, DVI, Composite Video, S-Video, Analog RGB, and Analog YPbPr can be input and converted up to QWXGA or 1080p. The MSD-501 includes an HDMI output and an HDBaseT output that can output simultaneously. The MSD-501 also has 3 digital and 5 analog audio inputs. Audio signals of IN1 to IN3 are switch-selectable between digital audio (HDMI) and analog audio (RCA), and audio output is simultaneous output both digital and analog output. Sound level of input and output can be set respectively. Gaps between video and audio can be compensated by Lip Sync. Front Panel VFD Menu is a useful for checking input and output signal status on the switcher and set or changes the settings of the switcher to support AV systems in a field. The MSD-501 also has other features such as built-in scan converter, Seamless Switching, and Aspect Ratio Control for complete AV switching and distribution.

■ Specification

Item			Description
Input	Video	HDMI/DVI	3 inputs HDMI Deep Color (*1)/DVI 1.0 TMDS single link, HDCP 1.4, TMDS clock: 25 MHz to 225 MHz Built-in cable EQ, EDID emulation, CEC Connector: Female HDMI Type A (19-pin)
		Universal Analog	2 inputs Composite video/Y/C/Analog RGB/Analog YPbPr (auto-recognition) Composite video (VBS Signal): 1.0 V[p-p]/75 Ω Y/C: 1.0 V[p-p](Y)/0.286 V[p-p](C)/75 Ω Analog RGB: 0.7 V[p-p](1.0 V[p-p] Sync on Green)/75 Ω HS/VS TTL level, CS TTL level, Sync on Green Analog YPbPr: 1.0 V[p-p](Y)/0.7 V[p-p](Pb/Pr)/75 Ω EDID emulation Connector: Female high-density D-sub (15-pin)
		Format	Analog: NTSC/PAL Analog/HDMI/DVI: VGA to QWXGA (Dot clock: 25 MHz to 165 MHz) *For WUXGA/QWXGA, only Reduced Blanking is supported. Analog/HDMI/DVI: 480i / 480p / 576i / 576p / 720p / 1080i / 1080p
	Audio	Digital	3 inputs *Switch-selectable between analog audio Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. input level: 0 dBFS Connector: Female HDMI Type A (19-pin)
		Analog	5 inputs *IN1 to IN3 are switch-selectable between digital audio Stereo LR unbalanced Input impedance: 24 kΩ, Reference level: -10 dBu, Max. input level: +10 dBu Connector: RCA pin jack
Output	Video	HDMI/DVI	1 output *Output video can be distributed to an HDMI/DVI and HDBaseT simultaneously. HDMI Deep Color (*1)/DVI 1.0 TMDS single link, HDCP 1.4 Built-in cable EQ, CEC Connector: Female HDMI Type A (19-pin)
		HDBaseT	1 output *Output video can be distributed to an HDMI/DVI and HDBaseT simultaneously. HDBaseT (*2) RS-232C, LAN, CEC Connector: RJ-45 (*3) Cable: CAT.5E HDC, Cat5e UTP/STP, Cat6 UTP/STP (*4)
		Format	VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / VESAHD / WUXGA / QWXGA *For VESAHD/WUXGA/QWXGA, only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p
	Audio	Digital	1 output *Audio can be distributed to an HDMI output and an HDBaseT output simultaneously. Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. output level: 0 dBFS Connector: Female HDMI Type A (19-pin), RJ-45
		Analog	1 output Stereo LR unbalanced Output impedance: 75 Ω, Sample size: -10 dBu, Max. output level: +10 dBu Connector: RCA pin jack
		Lip Sync	Up to 16 frames
Maximum transmission distances	Digital Input		98 ft. (30 m) (*5)
	Digital output		HDMI/DVI: 164 ft. (50 m) (*5), HDBaseT: 328 ft. (100 m) (*6)

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Item		Description
Functions	Analog video processing unit	3D Y/C separation
	Scan Converter	Motion adaptive interlaced/progressive conversion, Aspect ratio control, Picture adjustment (brightness, contrast, display position, display size, etc.), Seamless switching with one black frame (*7)
	Others	Volume adjustment (volumes of input and output ports can be set separately), Lip Sync, Audio Downmix, Audio breakaway for independent audio and video switching, Input channel automatic switching, Crosspoint memory (7 settings), Preset memory (8 settings), Last memory, Anti-snow (*8), Connection Reset (*9), External control commands (32 commands), Front key function lock
External control	RS-232C	1 male D-Sub (9-pin)
	LAN	1 port/RJ-45 10Base-T/100Base-TX (Auto Negotiation), Auto MDI/MDI-X
	External control	RS-232C, LAN, HDBaseT, PJLink (class1), CEC (power control of sink device) (*10)
General	Power	100 - 240 VAC ± 10%, 50 Hz/60 Hz ± 3 Hz
	Power consumption	About 35 Watts
	Dimensions	16.9 × 1.7 × 11.8" (430 (W) × 44(H) × 300 (D) mm) (1U high) (Excluding connectors and the like)
	Weight	9.3 lbs. (4.2 kg)
	Temperature	Operating : 32°F to 104°F (0°C to +40°C) Storage : -4°F to +176°F (-20°C to +80°C)
	Humidity	Operating/Storage: 20% to 90% (Non Condensing)

*1   30 bit/pixel (10 bit/component) Deep Color is supported while x.v.Color, 3D, ARC and HEC are not supported.
*2   HDBaseT output: DVI signals protected by HDCP are not supported. To transmit those signals, use an IDK's HDC-RD100 as a receiver supporting DVI signals.
*3   RJ-45 (HDBaseT output connector) is only for extending digital video and audio signals over a Cat5e/Cat6 cable. Use it with IDK's category cable receiver. Do not use it for LAN devices.
*4   T568A or T568B straight. The CAT.5E HDC cable is developed by IDK and recommended by HDBaseT alliance.
*5   The maximum cable distance varies depending on the connected devices and was measured under following conditions:
       ・1080p@60: when IDK's AWG 24 cable was used and signals of 1080p@60 24 bit/pixel (8 bit/component) was input or output.
       The maximum cable distance depends on the connected devices. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above.
*6   The maximum transmission distance was obtained when IDK's CAT.5E HDC cable was used. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above. Operations may not be stable with some LCD devices; please check the operation beforehand or contact us. The maximum transmission distance is the shorter distance of connected HDBaseT product or sink device's maximum transmission distance.
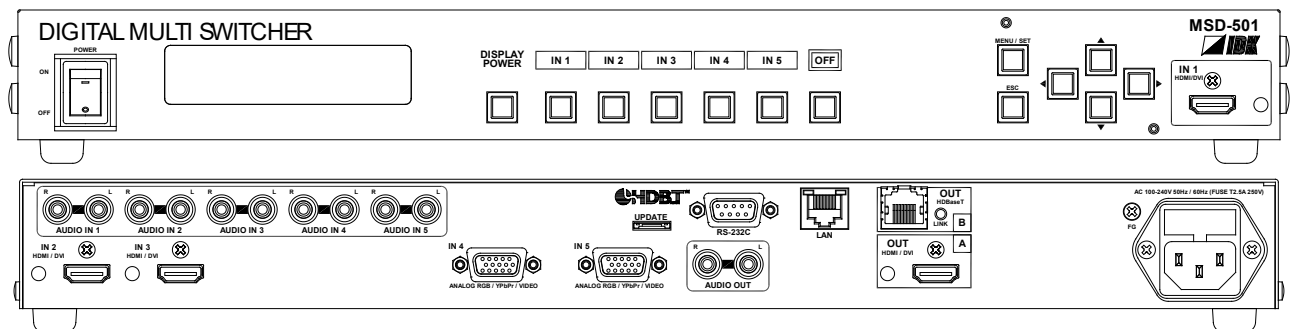*7   Seamless switching with a black frame.
*8   The anti-snow feature automatically fixes snow noise that is a specific symptom of HDCP-compliant signals and mainly occurs at start-up. This feature does not work when snow noise has already occurred during startup or when it occurs due to a bad condition of the transmission line.
*9   For digital systems, some problems, such as an HDCP authentication error, can often be recovered by physically disconnecting and reconnecting the digital cables. However, the Connection Reset feature will fix these problems automatically without the need to physically plug and unplug the cables. It creates the same condition as if the cable were physically disconnected and reconnected. This feature only works for the MSD's output. If other devices are connected between the MSD's output and sink device, this feature may be invalid.
*10   The sink device must support CEC. Some sink devices cannot be controlled from the MSD through CEC.
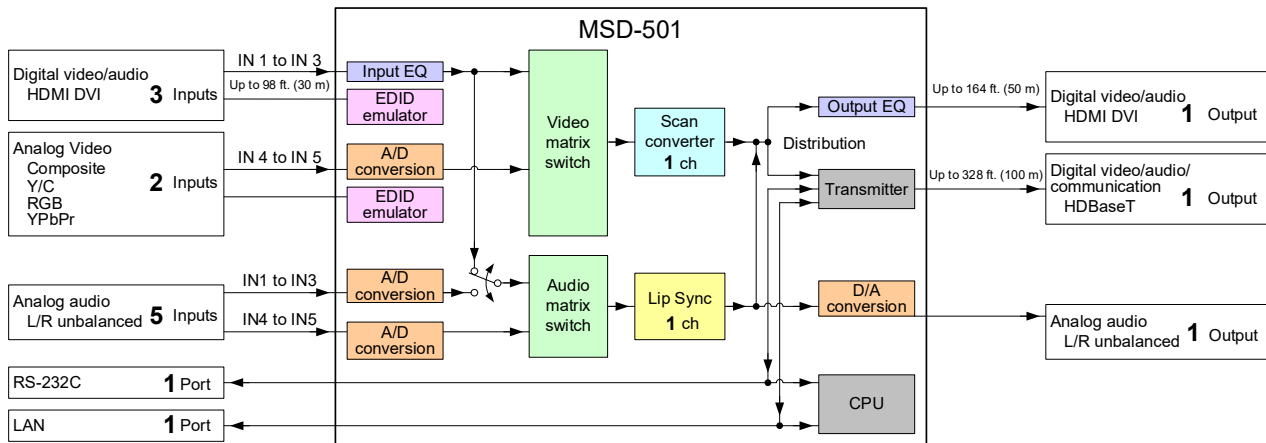
■ **Front & Rear Panels**

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Digital Multi Switcher
MSD-501 Diagram and Features

■ Diagram

MSD-501

Digital video/audio HDMI DVI **3** Inputs	IN 1 to IN 3 Up to 98 ft. (30 m)	Input EQ / EDID emulator
Analog Video Composite Y/C RGB YPbPr **2** Inputs	IN 4 to IN 5	A/D conversion / EDID emulator

Video matrix switch → Scan converter **1** ch → Output EQ — Up to 164 ft. (50 m) → Digital video/audio HDMI DVI **1** Output

Distribution → Transmitter — Up to 328 ft. (100 m) → Digital video/audio/communication HDBaseT **1** Output

Analog audio L/R unbalanced **5** Inputs — IN1 to IN3 / IN4 to IN5 → A/D conversion → Audio matrix switch → Lip Sync **1** ch → D/A conversion → Analog audio L/R unbalanced **1** Output

RS-232C **1** Port

LAN **1** Port

CPU

[Features]

■ Video
- Up to 1080p/QWXGA (Reduced Blanking)
- Automatic input signal equalization
  - Input : Up to 98 ft. (30 m)
  - Output : Up to 164 ft. (50 m)
- Up to 328 ft. (100 m) over Cat6 cable
- Motion adaptive interlaced/progressive conversion
- Scan conversion
- Aspect ratio control
- Seamless switching with one black frame
- Analog/Digital conversion
- Anti-snow

■ Audio
- Embedding/De-embedding
- Volume adjustment (Input/Output)
- Lip Sync
- Audio Downmix

■ Control Input
- RS-232C
- LAN

■ Control Output
- Control command output (e.g. controlling projectors)
- PJLink
- CEC (Control sink device power)

■ Others
- EDID emulation
- Audio breakaway for independent audio and video switching
- Input channel automatic switching
- Front panel HDMI input connector
- Crosspoint memory
- Preset memory
- Last memory
- Connection Reset
- Front key function lock
- HDBaseT: RS-232C, LAN and CEC are supported

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