



## 4K@60 and HDCP 2.2 supported Digital Multi Switcher

# MSD-802UHD Specification (Preliminary)

The IDK MSD-802UHD is a high-performance digital multi switcher with a scan converter and up to 8 inputs and 2 outputs.

For video input, 8 digital and 2 analog inputs are included and the following signals are supported: HDMI, HDBaseT, DVI, composite video, Y/C, analog RGB, and analog YPbPr signals. Front panel HDBaseT input supports Power over HDBaseT (POH) that can power the connected devices. Input video signals are converted to HDMI and HDBaseT signals (2 outputs) simultaneously, and output at a resolution up to 4K@60.

For audio input, 8 digital and 3 analog inputs are included. Selected audio signals are output to digital audio and analog audio. Audio level of each input can be set individually. The lip sync function corrects the gap between the video and audio.

This switcher also has RS-232C and LAN ports as communication ports for control to enable you to set menus remotely. You can also control external devices that are connected to the MSD-802UHD over RS-232C, LAN, CEC, or contact closure by registering external control commands. The waiting function helps you to send external commands after cooling time passes as power supply control of projectors or the like. External control commands can be executed from front keys, RS-232C, or LAN; they can also be executed when input channel selection keys or power supply key is operated.

### ■Specification

		Item	Description	
Input	Video	HDMI / DVI	Number / Signal	2 inputs / HDMI Deep Color (*1) / DVI 1.0 (HDCP 1.4 / 2.2) - TMDS single link - TMDS clocks: 25 MHz to 300 MHz - TMDS data rate: 0.75 Gbps to 18 Gbps
			Connector	2 female HDMI Type A
			Number / Signal	3 inputs / HDMI Deep Color (*1) / DVI 1.0 (HDCP 1.4) - TMDS single link - TMDS clock: 25 MHz to 225 MHz - TMDS data rate: 0.75 Gbps to 6.75 Gbps * Switch-selectable between digital and analog
			Connector	3 female HDMI Type A
			Number / Signal	2 inputs / HDMI Deep Color (*1) / DVI 1.0 (HDCP 1.4) - TMDS single link - TMDS clock: 25 MHz to 225 MHz - TMDS data rate: 0.75 Gbps to 6.75 Gbps * Switch-selectable between digital and analog
			Connector	2 female 29-pin DVI-I
		Others	EDID emulation	
		HDBaseT	Number / Signal	1 input / HDMI Deep Color (*1) / DVI 1.0 (HDCP 1.4 / 2.2 (*2)) - TMDS single link - TMDS clock: 25 MHz to 300 MHz - TMDS data rate: 0.75 Gbps to 9 Gbps
			Connector	1 RJ-45 (*4)
			Others	EDID emulation POH power feeding ( Worth of IEEE 802.3af) (*3)
		Universal Analog	Number / Signal	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 * Switch-selectable between digital and analog
			Connector	2 female 29-pin DVI-I
	Others		EDID emulation	
	Format		HDMI / DVI (IN1 to IN2)	Dot clock 25 MHz to 600 MHz 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 4:4:4)
		HDMI / DVI (IN3 to IN5)	Dot clock 25 MHz to 165 MHz 480i / 480p / 576i / 576p / 720p / 1080i / 1080p VGA to QWXGA * WUXGA / QWXGA are only supported Reduced Blanking	
		Universal Analog (IN6 and IN7)	Dot clock 25 MHz to 165 MHz NTSC/PAL 480i / 480p / 576i / 576p / 720p / 1080i / 1080p VGA to QWXGA * WUXGA / QWXGA are only supported Reduced Blanking	
		HDBaseT (IN8)	Dot clock 25 MHz to 600 MHz 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 4:2:0) VGA to 4K	
	Audio	Digital	Number / Signal	8 inputs / Multi-channel linear PCM up to 8 channels * switch selectable between analog audio - Sampling frequency: 32 kHz to 192 kHz - Sample size: 16 bit to 24 bit - Reference level: -20 dBFS - Max. input level: 0 dBFS * Switch-selectable between digital and analog audio
			Connector	5 female HDMI Type A, 2 female DVI-I (29-pin), 1 RJ-45 (*4)
		Analog	Number / Signal	3 inputs / Stereo LR balanced/unbalanced signal * switch selectable between digital audio - Balanced signal Input impedance: 48k Ω Reference level: -10 dBu Max. output level: +10 dBu * Switch-selectable between digital and analog audio - Unbalanced signal Input impedance: 24kΩ Reference level: -10 dBu Max. output level: +10 dBu
Connector			3 terminal blocks 5-pin	
Output	Video	HDMI / DVI	Number / Signal	2 outputs / HDMI Deep Color (*1) / DVI 1.0 (HDCP 1.4 / 2.2) - TMDS single link - TMDS clocks: 25 MHz to 300 MHz * The switcher can output both an HDMI output and an HDBaseT output simultaneously.
			Connector	2 female HDMI Type A
	HDBaseT	Number / Signal	2 outputs / HDMI Deep Color (*1) / DVI 1.0 (HDCP 1.4 / 2.2(*2)) - TMDS single link	

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		Connector	- TMDS clocks: 25 MHz to 300 MHz * The switcher can output both an HDMI output and an HDBaseT output simultaneously (*6).
		Format	Dot clocks: 25 MHz to 600 MHz 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (3840 x 2160) / 4K (4096 x 2160) VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / VESAHD / WUXGA / QWXGA / WQHD / WQXGA * VESAHD / WUXGA / QWXGA / WQHD / WQXGA are only output as Reduced Blanking
	Audio	Digital	2 outputs / Multi-channel linear PCM up to 8 channels - Sampling frequency: 32 kHz to 192 kHz - Quantized bit rate: 16 bit to 24 bit - Reference level: -20 dBFS - Max. output level: 0 dBFS * The switcher can output both an HDMI output and an HDBaseT output simultaneously.
		Analog	2 outputs / Stereo LR balanced/unbalanced signal - Balanced signal Output impedance: 100 Ω Reference level: -10 dBu Max. output level: +10 dBu - Unbalanced signal Output impedance: 50 Ω Reference level: -10 dBu Max. output level: +10 dBu Connector: 2 terminal blocks 5-pin
Maximum cable distance		Digital Input	HDMI / DVI: up to 99 ft. approx. / 30 m (1080p@60), 39.37 ft. approx. / 12 m (4K@60) (*7) HDBaseT: up to 328 ft. approx. / 100 m (*8)
		Digital output	HDMI / DVI: up to 99 ft. approx. / 30 m (1080p@60), 39.37 ft. approx. / 12 m (4K@60) (*7) HDBaseT: up to 328 ft. approx. / 100 m (*8)
Cable (HDBaseT)		Cat5e UTP / STP, Cat6 UTP / STP, CAT.5E HDC cable (*5)	
Functions	Analog video processing unit		3D Y/C separation
	Scan Converter		Aspect Ratio Control, Seamless Switching (*9), Picture adjustment (brightness, contrast, display position, display size etc.), I/P conversion
	Others		All function setting through browser Automatic input detection and switching Volume adjustment (volumes of input and output ports can be set separately) Lip Sync (Max. 16 frames) Audio breakaway enables independent audio and video switching Cross-point memory (8 settings) Preset memory (8 settings and startup settings) Last memory Anti-Snow (*10) Connection Reset (*11) External control commands (32 commands) Operation lock
External control	Serial control port	Number / Signal	1 port / RS-232C
		Connector	1 terminal blocks 3-pin
	LAN control port	Number / Signal	1 port / 10Base-T (Auto Negotiation), 100Base-TX (Auto Negotiation), Auto MDI/MDI-X
		Connector	1 RJ-45
	Contact closure port	Number / Signal	3 ports / Non-voltage contact input up to DC 24 V 500 mA (3 connectors)
		Connector	1 terminal blocks 6-pin
Command control port	Number / Signal	3 ports / Controlling keys and LED	
	Connector	1 terminal blocks 7-pin	
External control		RS-232C, LAN, contact closure, CEC (power control of sink device) (*12), PLink (class1)	
Others	Power		100 - 240 VAC ± 10 %, 50 Hz / 60 Hz ± 3 Hz
	Power consumption		TBD
	Dimensions		16.93(W) × 1.73(H) × 13.78(D)"/430(W) × 44 (H) × 350(D) mm (EIA 1U, projections not included)
	Weight		TBD
	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 4K format: 24 bit/pixel (8 bit/component) is supported.

\*3 HDBaseT input/output: DVI signals protected by HDCP are not supported. To transmit those signals, use an IDK's twisted pair cable extender supporting DVI signals.

\*4 For power feeding, please use an HDBaseT transmitter supporting IEEE 802.3af.

\*5 RJ-45 (HDBaseT connector) is only for extending digital video and audio signals over a Cat5e/Cat6 twisted pair cable. Use it with IDK's twisted pair cable transmitter or receiver. Do not use for LAN devices.

\*6 T568A or T568B straight. The CAT.5E HDC cable is developed by IDK and recommended by HDBaseT alliance.

\*7 The maximum format of HDBaseT output is 4K@30.

\*8 The maximum cable distance varies depending on the connected devices and was measured under following conditions:

· 1080p@60: when IDK's AWG24 cable was used and signals of 1080p@60 24 bit / pixel (8 bit / component) was input or output.

· 4K@60 : when IDK's 18 Gbps supported cable was used and signals of 4K@60 24 bit / pixel (8 bit / component) was input or output.

The maximum cable distance depends on the connected devices. With some combinations, and if you use cables of other manufacturer, video may be disturbed or may not be output even if signals are within the range mentioned above.

\*9 If connected to a device that is in extremely bad condition, the video may be unstable or not be output. Operations may not be stable with some LCD devices; please check the operation beforehand or contact us.

\*10 Seamless switching with a black frame.

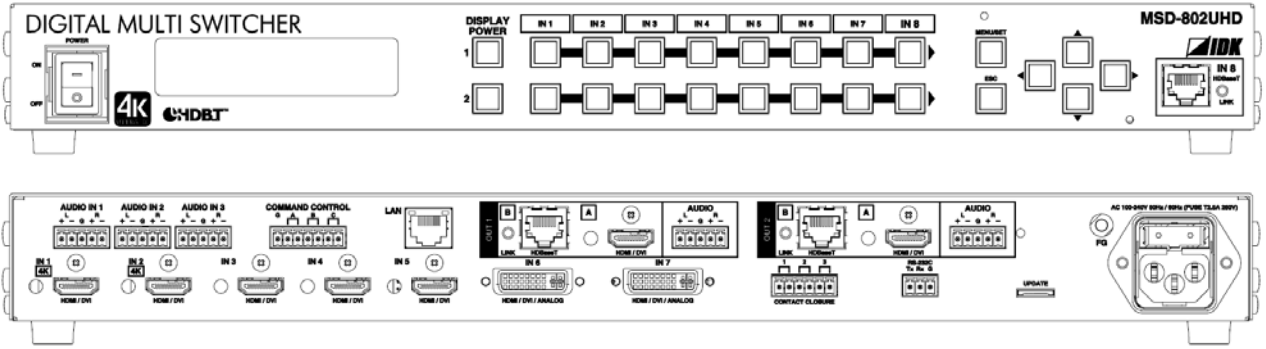
\*11 The anti-snow feature automatically fixes snow noise that is a specific symptom of HDCP-compliant signals and mainly occurs at start-up. This feature does not work when snow noise has already occurred during startup or when it occurs due to a bad condition of the transmission line.

\*12 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.

\*13 The sink device must support CEC. Some sink devices cannot be controlled from the MSD through CEC.

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■ Front & Rear Panel

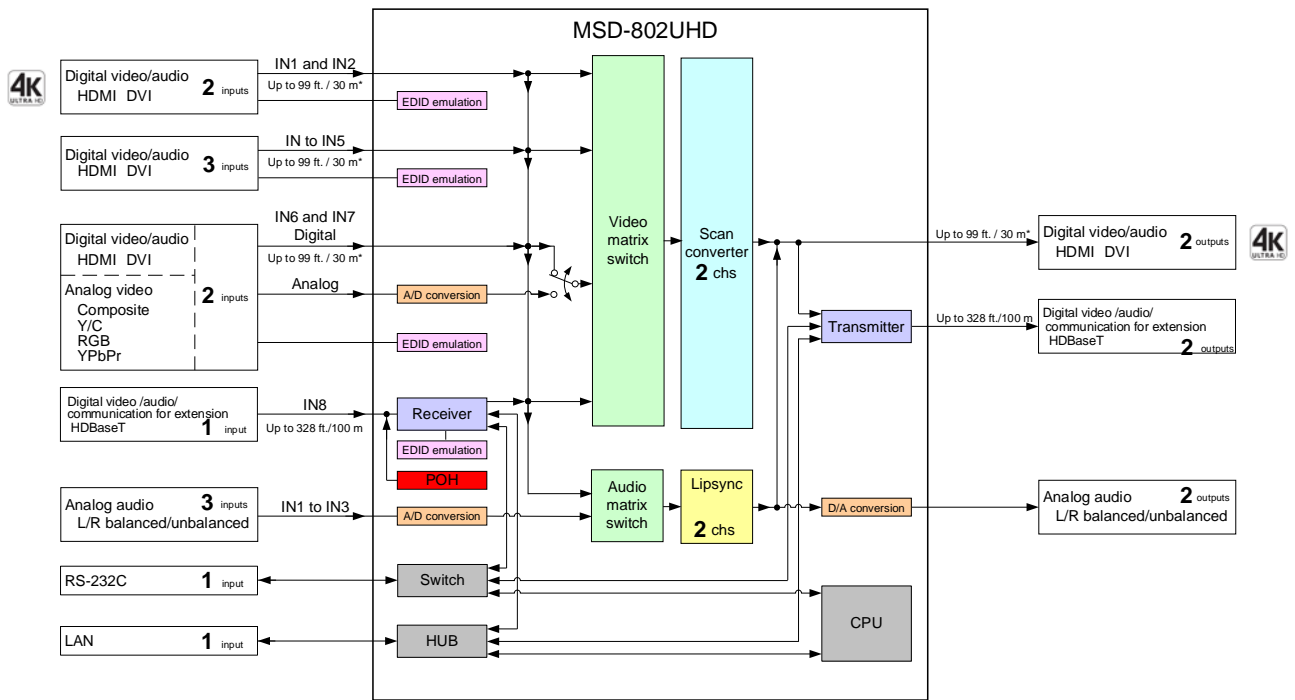


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# 4K@60 and HDCP 2.2 supported Digital Multi Switcher MSD-802UHD Diagram and Features (Preliminary)

## ■ Diagram



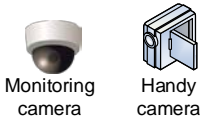
\*Maximum cable distance  
 1080p@60: up to 99 ft. approx. / 30 m  
 4K@60: up to 39.37 ft. approx. / 12 m (when IDK's 18 Gbps supported cable is used), only IN1 and IN2

## ■ Application Example

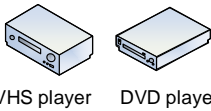
### ● Digital device



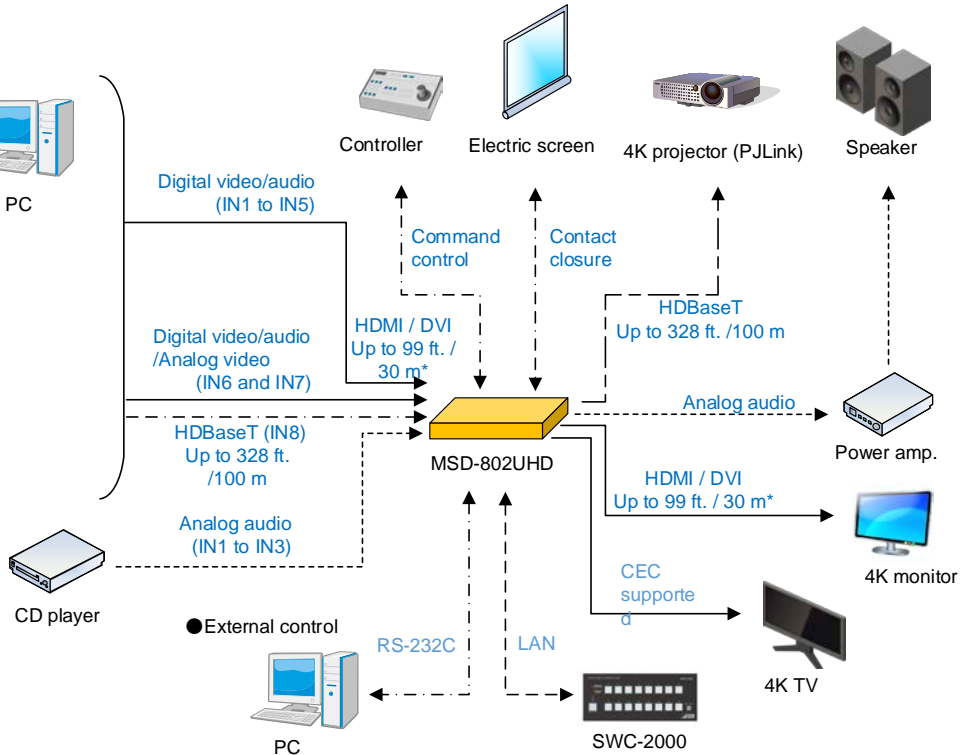
Blu-ray player PC



### ● Analog device



VHS player DVD player



\*Maximum cable distance  
 1080p@60: up to 99 ft. approx. / 30 m  
 4K@60: up to 39.37 ft. approx. / 12 m (when IDK's 18 Gbps supported cable was used), only IN1 and IN2, only output

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**[Features]****■ Video**

- Up to 4K@60 (4:4:4)
- HDCP 1.4/2.2
- Up to 328 ft./100 m over a Cat6 cable
- I/P conversion
- Scan converter
- Aspect ratio control
- Seamless switching<sup>\*1</sup>
- A/D conversion
- Anti-snow

**■ Audio**

- A/D, D/A conversion
- Volume adjustment
- Lip sync

**■ Control input**

- RS-232C
- LAN
- Command control

**■ Control output**

- Control command output (controlling projector, etc.)
- PJLink
- Power control of sink device over CEC
- Contact closure

**■ Others**

- Power over HDBaseT(POH) power feeding (HDBaseT input)
- EDID emulation
- All functions setting through browser
- Automatic input detection and switching
- Audio breakaway enables independent audio and video switching
- Cross point memory
- Preset memory
- Last memory
- Connection reset
- Operation lock

<sup>\*1</sup> Seamless switching with a black frame