



2x4 HDMI 2.0 Splitter/Extender

User's Guide



P/N:HDExt24-HD20

Thank you for purchasing from gofanco. Our products aim to meet all your connectivity needs wherever you go. For optimum performance and safety, please read the instructions carefully and keep this User's Guide for future reference. If you need more information about our products, please visit www.gofanco.com. For technical support, email us at support@gofanco.com. For drivers or manual download, please go to www.gofanco.com/downloads.

Important Safety Notices

Please read safety instructions carefully before installation and operation.

- Please pay close attention to all warnings and hints for this device
- Do not expose this unit to rain, heavy moisture, or liquid
- Do not put any items into the device or attempt to modify its operation
- Do not repair the device or open the enclosure without professional guidance to avoid electric shocks. Doing so may void your warranty
- Keep the product in a well-ventilated location to avoid damage from overheating
- Shut off power and make sure environment is safe before installation
- Do not plug the HDMI cables and IR cables in/out when the device is in use to avoid cable damage. Make sure they are plugged into the correct ports
- Use the included power adapter only. Make sure the specification matches if using 3rd-party DC power adapters

Introduction

The 2x4 HDMI 2.0 Splitter/Extender distributes HDMI signals from one of two source devices to 4 CAT6/7 outputs and one HDMI output (loopout).

Features

- Distributes HDMI signals from one of two inputs to 4 CAT6/7 outputs and one HDMI output (loopout)
- CAT6/7 outputs: Up to 80m (262ft) at 1080p and 70m (230ft) at 4K
- HDMI 2.0 and HDCP 2.2 compliant. 18Gbps bandwidth and supports up to 4K@60Hz YUV 4:4:4
- Supports bi-directional IR control, PoC, comprehensive EDID management, cascade connection, and 4K to 1080p downscaling
- Supports auto-switching based on 5V or TMDS detection
- Controllable by front panel buttons, IR, and RS232

Installation Requirements

- HDMI source devices (DVD player, set top box, PC, etc.)
- HDMI displays (SDTV/Monitor, HDTV/Monitor, projector, etc.)
- HDMI cables (not included)
- CAT cables (not included)

Package Contents

2x4 HDMI 2.0 Splitter/Extender

- 1x 2x4 HDMI 2.0 Splitter/Extender
- 4x Plastic cushions
- 4x IR Receiver cables
- 1x IR Emitter cable
- 1x RS232 Cable (3-pin to DB9)
- 1x IR cable (3.5mm (m) to 3.5mm (m)) used for IR cascade
- 1x Power adapter (12V/2A)
- Surface mount accessories
- 1x User guide

CAT 6/7 Receiver

- 4x CAT6/7 Receivers

Product Layout



Figure 1: 2x4 HDMI 2.0 Splitter/Extender Front Panel Layout

1	Power LED	Off: No power On: Splitter/Extender is powered on Blinking: Splitter/Extender is in standby mode
2	HDMI Input LED	On: HDMI input signal detected Flashing: HDMI input source not detected
3	Select Button	Press to switch to the next source device Press and hold for 3 seconds to switch between manual switching mode and automatic switching mode
4	EDID DIP Switch	Select between Lo-Res, Default, Hi-Res modes. See EDID Management on page 14

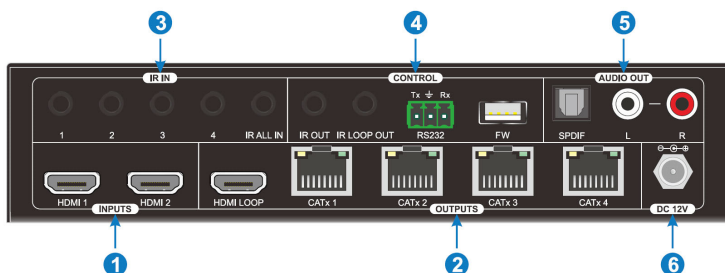


Figure 2: 2x4 HDMI 2.0 Splitter/Extender Rear Panel Layout

1	HDMI Input (1-2)	Connects to an HDMI source device
2	HDMI/Loop	Connects to a local HDMI display
	CAT 6/7 Out (1-4)	Connects to the Input of the CAT 6/7 Receivers. It supports PoC to power the receiver. The orange LED illuminates when an HDMI signal is detected. The green LED illuminates when powered on
3	IR All In	Connects to IR Receiver cable. Sends IR signals to all CAT 6/7 Receivers to control all the display devices. Connects to the IR Loop Out of the previous Splitter/Extender for cascading
	IR In (1-4)	Connects to IR emitter cable. Sends IR signals to the respective CAT 6/7 Receiver to control the display device
4	IR Out	3.5mm jack for controlling the source device from the CAT 6/7 Receivers
	IR Loop Out	Connects to the IR All In port of the next splitter
	RS232	Connects to the control PC using an RS232 cable (cable not included)
	FW	USB Type-A port for firmware update
5	S/PDIF Audio Out	Toslink output for audio de-embedding from the HDMI output
	L/R Audio Out	3.5mm analog stereo audio output for audio de-embedding from the HDMI output
6	DC 24V	Connects to the included 24V power adapter

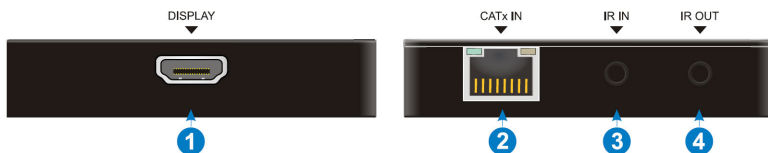


Figure 3: CAT 6/7 Receiver Front and Back Panel Layout

1	HDMI Out	Connects to an HDMI display
2	CAT 6/7 In	Connects to the Splitter/Extender's CAT 6/7 outputs using a CAT cable. It supports PoC to power the CAT 6/7 Receiver over CAT cable
		Orange LED: On when an HDMI signal is detected
		Green LED: On when the receiver is powered on
3	IR In	Connects to the IR receiver cable
4	IR Out	Connects to the IR emitter cable

Hardware Installation

1. Power off all devices including your HDMI source(s) and HDMI display(s).
2. Connect your HDMI source device(s) to the 2x4 HDMI 2.0 Splitter/Extender's HDMI Input connector(s) with HDMI cable(s) (HDMI cables not included).
3. Connect your CAT cables between the Splitter/Extender and CAT 6/7 Receivers.
4. Optional: Connect an HDMI display to the HDMI Output connector of the Splitter/Extender using an HDMI cable (HDMI cable not included). This connection is needed only if you require local monitoring of the HDMI signal.
5. Connect an HDMI display to each CAT 6/7 Receiver's HDMI Out connector with an HDMI cable (HDMI cables not included).
6. Optional: Connect the IR Receiver cables and the IR Emitter cable to the IR interface ports. This connection is needed only if you need to control your HDMI devices from the remote location. See IR Control, starting on page 11, for proper IR connection.
7. Plug the included power adapter into the Splitter/Extender's Power Jack, then plug the power adapter into a reliable power outlet. **Note:** The CAT 6/7 Receivers do not need power adapters, they can be powered from the Splitter/Extender over CAT cable with PoC technology.
8. Power on your HDMI source device(s) and HDMI display(s). The Splitter/Extender is ready for use.

Application Diagram

The application diagram shows the most typical input and output devices used with the Splitter/Extender.

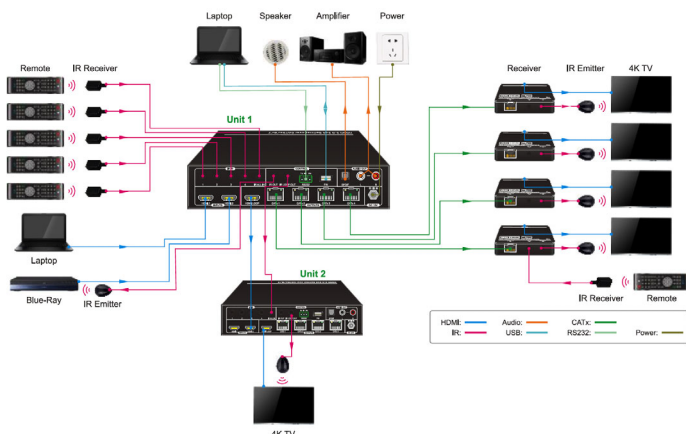
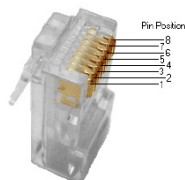


Figure 4: Application Diagram

CAT Cable Wiring

We suggest both RJ-45 connectors be wired identically using T568B wiring standard for the best performance and compatibility.

Both connectors must be wired identically, to T568B standard.



RJ45 Plug Colour Code (T568B)	
Contact Side - Tab is on Back	
8	BROWN
7	WHITE / BROWN
6	GREEN
5	WHITE / BLUE
4	BLUE
3	WHITE / GREEN
2	ORANGE
1	WHITE / ORANGE

Note: You may use cat5e, cat6 UTP (cat6 preferred) in conjunction with the HDBaseT output; however for best performance use cat6a or cat7 (particularly in electrically noisy environments). The maximum distances & transmission performance for HDMI and HDBT may be compromised by cable quality, patch panels, poor termination, wall plates, cable kinks and electrical interferences. Generally ensure the cat cable is solid copper core of 23AWG (avoid CCA type), in one straight run (avoid/minimise patches) and avoid close proximity to any noisy electrical sources.

Source Device Switching

Manual Switching

Press the Select button to switch to the next source device, the corresponding input LED will light up.

Auto Switching

Press and hold down the Select button for at least 3 seconds to enable auto-switching mode. The operating parameters are shown below.

- The Splitter/Extender will switch to the first available active input starting with HDMI In 1
- New Input: When a new source device is detected, the Splitter/Extender will automatically switch to it
- Source Removed: When an active source is removed, the Splitter/Extender will switch to the first available active source
- Power Off: The Splitter/Extender saves the last configuration before powering off. If the last switching mode is auto switching, the splitter will automatically enter auto switching mode when it is restarted. Then if the last selected source input is still available, the Splitter/Extender will switch to it. Otherwise, it will switch to the first available active source input.

IR Control

Provides IR control of the connected devices. The IR feature is bi-directional so either the source device or the display device(s) can be remotely controlled.

Controlling the Source Device

1. Connect an IR Emitter Cable to the IR Out port of the Splitter/Extender.
2. Point the IR Emitter Cable's IR eye in line with the source device's IR window.
3. Connect an IR Receiver Cable to the IR In port on each CAT 6/7 Receiver.

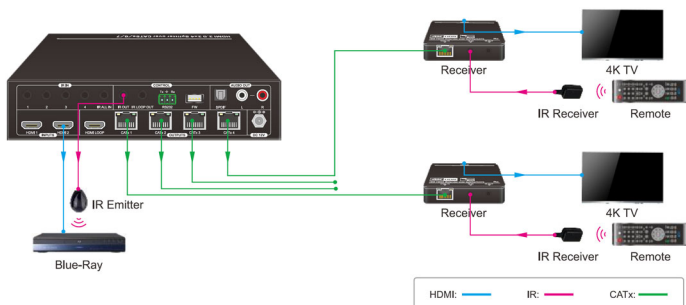


Figure 5: Source Device IR Control Connection Diagram

Controlling the Display Device(s) using IR In

Allows you to remotely control each display individually.

1. Connect an IR Receiver Cable to the IR In port of the Splitter/Extender.
2. Connect an IR Emitter Cable to the IR Out port on each CAT 6/7 Receiver.
3. Point the IR Emitter Cable's IR eye in line with the display's IR window.

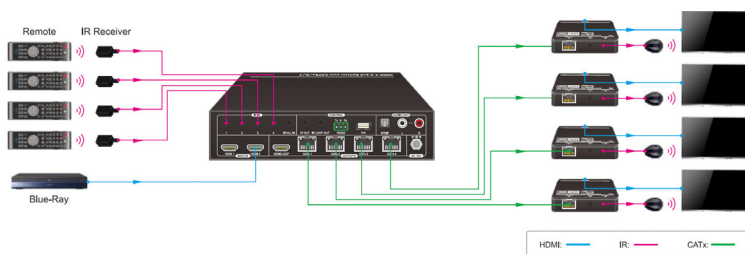


Figure 6: Display Device IR Control Connection Diagram

Controlling the Display Device(s) using IR All In Port

Allows remote controlling of all of the display devices simultaneously.

1. Connect an IR Receiver Cable to the IR All In port of the Splitter/Extender.
2. Connect an IR Emitter Cable to the IR Out port on each CAT 6/7 Receiver.
3. Point the IR Emitter Cable's IR eye in line with the display's IR window.

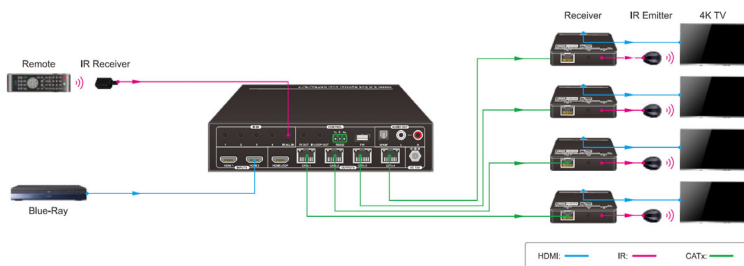


Figure 7: Display Device IR Control Connection Diagram

Note:

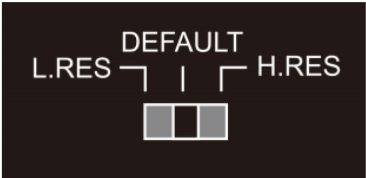
The IR All In will relay the received IR signal to all the CAT 6/7 outputs whereas the IR IN connectors associated with each CAT 6/7 output will only relay the IR signal to its respective CAT 6/7 Receiver. The IR All In can also be connected to the IR Loop Out of another Splitter/Extender when two or more units (up to a maximum of five) are connected in a cascade mode while using only a single IR detector at the start of the cascade connection.

The IR Out connector will output the IR signals received from any of the CAT 6/7 Receivers, so as to allow control of a source from any of the remote CAT 6/7 Receivers.

EDID Management

EDID is used by the source device to match the video resolution to the connected display(s). The source device obtains its EDID from the 1st connected display as default setting. However, since displays with different capabilities are often connected to the Splitter/Extender, the EDID DIP switch can be used to set the EDID to a fixed value to offer the best compatibility across all connected displays.

Front Panel EDID Switch



L. RES	The Extender/Splitter reads EDID from all connected displays, and then the source device will automatically use the EDID from the display with the lowest resolution
Default	The factory default EDID is 4K@60Hz, deep color, stereo audio
H. RES	The Extender/Splitter reads EDID from all connected displays, and then the source device will automatically use the EDID from the display with the highest resolution

Resolution Downscaling

The Splitter/Extender supports 4K resolution downscaling for compatibility with 1080p display devices shown in the table below.

#	Input			Output	
	Resolution	Refresh	Color Space	Downscale	1080p Specs
1	3840x2160	60	4:4:4	Support	1080p@60Hz 4:4:4
2	3840x2160	30	4:4:4	Support	1080p@30Hz 4:4:4
3	3840x2160	24	4:4:4	Support	1080p@24Hz 4:4:4
4	3840x2160	60	4:2:0	Support	1080p@60Hz 4:4:4
5	3840x2160	50	4:2:0	Support	1080p@50Hz 4:4:4
6	3840x2160	60	4:2:2	Support	1080p@60Hz 4:4:4
7	3840x2160	50	4:2:2	Support	1080p@50Hz 4:4:4
8	3840x2160	30	4:2:2	Support	1080p@30Hz 4:4:4
9	3840x2160	24	4:2:2	Support	1080p@24Hz 4:4:4

RS232 Control

Connect the control PC's RS232 serial port to the Splitter/ Extender's RS232 port using the included RS232 cable.

RS232 Control Software

Works with most serial command and monitoring software such as CommWatch.

- Download CommWatch or the serial command software of your choice
- Installation: Copy the control software files and paste them to the hard drive of your PC
- Uninstallation: Delete all control software files from the PC

Basic Settings

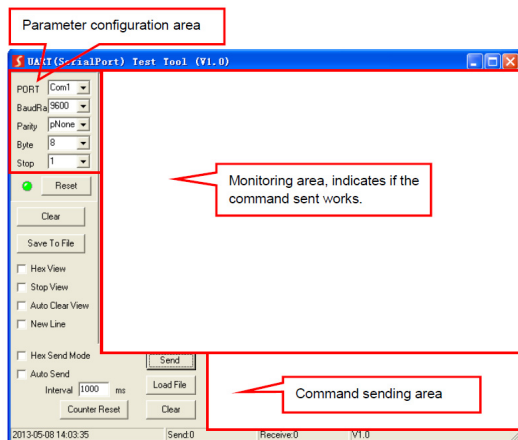
1. Connect all input and output devices as needed, then connect the PC to the Splitter.
2. Double click the software icon to run the control software. The icon is shown below.



The examples shown on this page and the following page are from CommWatch serial command software.

Control Software Interface

Set the COM port, Baud rate, data bit, stop bit, and parity.
Enter commands into the Command Sending Area.



RS232 Commands

The splitter and compatible receivers features RS232 ports to transmit RS232 signals from computer to control far-end third-party devices by using 3-pin to DB9 cable and a RS232 control software, such as docklight. After installing the RS232 control software, please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly. Compatible receivers must be able to communicate at 9600, 19200, 38400, 57600, or 115200 baud. The splitter requires the following communication protocol parameters: Baud rate: 9600 (default) Data bit: 8 Stop bit: 1 Parity bit: none

Note:

All commands need to be ended with "<CR><LF>".
In the commands, "[" and "]" are not needed to be typed in actual operation.
Type the command carefully, it is case-sensitive.

System Commands

Command	Function	Command Example and Feedback
>SetDeviceModel:XXXX	Set the product's name.	>SetDeviceModel: HDExt24-HD20
		<Model:HDExt24-HD20
>GetDeviceModel	Get the product's name.	<Model:HDExt24-HD20
>SetDeviceModelRst	Reboot the device	>SetDeviceModelRst
		<DeviceModelRst

Signal Switching Commands

Command	Function	Command Example and Feedback
>SetVideo [Param]	Switch input source to all outputs. param = 01, 02 01 – HDMI input1	>SetVideo 01
		<Video 01

Signal Switching Commands Cont'd

Command	Function	Command Example and Feedback
	02 – HDMI input2.	
>GetVideo	Get the current input source.	>GetVideo
		<\Video 01
>SetAutoSwitch [Param]	Enable or Disable auto switching. Param = On, Off On – Enable Off - Disable	>SetAutoSwitch On
		<AutoSwitch On
>GetAutoSwitch	Get the auto switching status.	>GetAutoSwitch
>SetSignalDetect [Param]	Set signal detection mode. param = 5V, TMDS	>SetSignalDetect 5V
		<SignalDetectMode 5V
>GetSignalDetect	Get signal detection mode.	>GetSignalDetect
		<SignalDetectMode 5V
>SetSystemStandbyMode [Param]	Enable or disable standby mode. param= On, Off	>SetSystemStandbyMode On
		<SystemStandbyMode On
>GetSystemStandbyMode	Get the status of standby mode.	>GetSystemStandbyMode
		<SystemStandbyMode On
>SetSystemStandbyModeTime: [Param]	Set the delay time to send standby commands after input signal removed. param = 1 ~ 10 min	>SetSystemStandbyModeTime: 10
		<SystemStandbyModeTime: 10min
>GetSystemStandbyModeTime	Set the delay time to send standby commands after input signal removed.	>GetSystemStandbyModeTime
		<SystemStandbyModeTime: 10min
>SetSystemPowerMode [Param]	Set system on or standby mode. param= On, Off	>SetSystemPowerMode On
		<SystemPowerMode On

Signal Switching Commands Cont'd

Command	Function	Command Example and Feedback
>GetSystemPowerMode	Get the system power status.	>GetSystemPowerMode
		<SystemPowerMode On
>SetRS232Baud [Param]	Set the baud rate of splitter. param = 115200 57600 38400 19200 9600	>SetRS232Baud 115200
		<SetRS232Baud 115200
>GetRS232Baud	Get the baud rate of splitter.	<GetRS232Baud

CEC Commands

>SetCecSrcMenu [Param]	Send CEC MENU command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcMenu 01
		<CecSrcMenu 01
>SetCecSrcUp [Param]	Send CEC UP command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcUp 01
		<CecSrcMenu 01
>SetCecSrcDown [Param]	Send CEC DOWN command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcDown 01
		<CecSrcDown 01
>SetCecSrcLeft [Param]	Send CEC LEFT command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcLeft 01
		<CecSrcLeft 01
>SetCecSrcRight [Param]	Send CEC RIGHT command to source device. Param = 01, 02 01 – HDMI1	>SetCecSrcRight 01
		<CecSrcRight 01

CEC Commands Cont'd

	02 – HDMI2	
>SetCecSrcBack [Param]	Send CEC BACK command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcBack 01
		<CecSrcBack 01
>SetCecSrcEnter [Param]	Send CEC ENTER command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcEnter 01
		<CecSrcEnter 01
>SetCecSrcOn [Param]	Send CEC ON command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcOn 01
		<CecSrcOn 01
>SetCecSrcOff [Param]	Send CEC OFF command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcOff 01
		<CecSrcOff 01
>SetCecSrcStop [Param]	Send CEC STOP command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcStop 01
		<CecSrcStop 01
>SetCecSrcPlay [Param]	Send CEC PLAY command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcPlay 01
		<CecSrcPlay 01
>SetCecSrcPause [Param]	Send CEC PAUSE command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcPause 01
		<CecSrcPause 01
>SetCecSrcPrev [Param]	Send CEC PREV command to source device. Param = 01, 02 01 – HDMI1	>SetCecSrcPrev 01
		<CecSrcPrev 01

CEC Commands Cont'd

	02 – HDMI2	
>SetCecSrcNext [Param]	Send CEC NEXT command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcNext 01
		<CecSrcNext 01
>SetCecSrcRewind [Param]	Send CEC REWIND command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcRewind 01
		<CecSrcRewind 01
>SetCecSrcFastForward [Param]	Send CEC Fast-forward command to source device. Param = 01, 02 01 – HDMI1 02 – HDMI2	>SetCecSrcFastForward 01
		<CecSrcFastForward 01
>SetCecDisplayOn [Param]	Send CEC ON command to display devices.	>SetCecDisplayOn
		<CecDisplayOn
>SetCecDisplayOff [Param]	Send CEC OFF command to display devices.	>SetCecDisplayOff
		<CecDisplayOff

FAQ & Troubleshooting

Q: Poor video quality or no video signal on display:

A1: Check whether the HDMI cables are connected properly and are in good working condition.

A2: Make sure the resolution of the display is compatible with the splitter's resolution

Q: No HDMI signal output from the CAT 6/7 connectors while the local HDMI out port is working normally:

A1: Check whether the HDMI cables are connected properly and are in good working condition.

Q: Splash screen on the displays:

A1: Cause by damaged or low quality HDMI cables. Change to a higher quality HDMI cable.

Specifications

2x4 HDMI 2.0 Splitter/Extender

Video Input	
Input	(1) HDMI
Input Connector	(1) Female type A HDMI
HDMI Input Resolution	Up to 4K@60Hz 4:4:4 8bit
Video Output	
Output	(1) HDMI, (4) CAT
Output Connector	(1) Female type A HDMI; (4) RJ45
HDMI Output Resolution	Up to 4K@60Hz 4:4:4
CAT Output Resolution	Up to 4K@60Hz 4:4:4 (Signal has been compressed.)
SPDIF Audio Output	
Audio Output	(1) SPDIF
Audio Output Connector	(1) Toslink
Audio Format	LPCM 2ch, Dolby Digital 2ch, 5.1ch, 7.1ch, Dolby TureHD 7.1ch, DTS 2ch, 5.1ch
Output Level	±0.05dBFS
Frequency Response	20Hz ~20kHz, ±1dB
THD+N	< 0.05%, 20Hz ~20kHz bandwidth, 1kHz sine at 0dBFS level (or max level)
SNR	> 90dB, 20Hz ~20kHz bandwidth
Crosstalk Isolation	> 70dB, 10kHz sine at 0dBFS level (or max level before clipping)
Noise	-90dB
Stereo Balanced L/R Audio Output	
Audio Output	(1) Stereo balanced L/R audio
Audio Output Connector	(1) 5-pin terminal block
Audio Format	PCM
Frequency Response	20Hz ~20kHz, ±1dB
Max output level	2.0Vrms ± 0.5dB.
THD+N	< 0.05%, 20Hz ~20kHz bandwidth, 1kHz sine at 0dBFS level (or max level)
SNR	> 80dB, 20Hz ~20kHz bandwidth
Crosstalk Isolation	> 70 dB, 10kHz sine at 0dBFS level (or max level before clipping)
L-R Level Deviation	< 0.3 dB, 1kHz sine at 0dBFS level (or max level before clipping)
Output Load Capability	1kohm and higher (supports 10x paralleled 10kohm loads)
Noise	- 80dB

2x4 HDMI 2.0 Splitter / Extender Cont'd

Control	
Control port	(1) EDID, (1) FIRMWARE, (1) IR ALL IN, (4) IR IN, (1) IR LOOP OUT, (1) IR OUT, (1) RS232 IN
Control Connector	(1) 3-pin DIP switch, (1) USB-A, (7) 3.5mm mini jacks, (1) 3-pin terminal block
General	
HDMI Standard	2.0
HDCP Version	2.2
PoC	12V PoC power for the receiver
Transmission Distance	4K ≤ 70 meters (230ft), 4K/1080p ≤ 70 meters (230ft)
Operation Temperature	-10 ~ +55°C
Storage Temperature	-25 ~ +70°C
Relative Humidity	10% ~ 90%
AC Adapter Input Power	100V~240V AC, 50/60Hz
Input Power	12V DC 2A
Power Consumption	14.5W (Max)
Dimension (W*H*D)	200mm x 44mm x 130mm
Net Weight	855g

Note: SPDIF audio output does not support DTS-HD Master Audio and Dolby TrueHD

CAT 6/7 Receiver

Video	
Input	(1) CAT
Input Connector	(1) RJ45
Input Resolution	Up to 4K@60Hz 4:2:0
Output	(1) HDMI
Output Connector	(1) Type-A female HDMI
Output Resolution	Up to 4K@60Hz 4:4:4 8bit HDR10
Control	
Control Part	(1) IR In, (1) IR Out
Control Connector	(2) 3.5mm jacks
General	
Bandwidth	18Gbps
HDMI Standard	2.0

CAT 6/7 Receiver Cont'd

HDCP Version	2.2, 1.4 compliant
Bidirectional PoC	Support
HDMI 2.0 Cable Length	4K@60Hz 4:4:4 ≤ 5m, 4K@60Hz 4:2:0 ≤ 10m, 1080p ≤ 15m
Transmission Distance	4K ≤ 70 meters (230ft), 1080p ≤ 262 feet (80 meters)
Operation Temperature	-5~ +55℃
Storage Temperature	-25 ~ +70℃
Relative Humidity	10%-90%
Power Supply	Input:100V~240V AC; Output:12V DC 1A
Power Consumption	4W (Max)
Dimension (W*H*D)	80mm x 16.8mm x 80mm
Net Weight	70g

Note: Please adopt quality CAT Ethernet cable compliant with CAT5e or higher standard for reliable transmission.

Disclaimer

The product name and brand name may be registered trademarks of related manufacturers. TM and ® may be omitted on the user's guide. The pictures on the user's guide are just for reference, and there may be some slight differences with the actual products.

We reserve the right to make changes without prior notice to a product or system described herein to improve reliability, function, or design.



Thank you for choosing gofanco

www.gofanco.com