SIMPLIFIED
M F G

SP18CAT120

18Gbps HDMI 1×8 120m HDBaseT Splitter

User Manual

VER 2.0

Thank you for purchasing this device

The Simplified MFG SP18CAT120 was designed to provide years of reliable service. Please read this manual thoroughly before connecting, operating, or adjusting this device. Please keep this manual for future reference.

Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lighting strikes, etc. Use of surge protection systems is highly recommended to protect and extend the life of your equipment. The HDSURGE is designed to protect your system when using cable and satellite boxes. It is highly recommended that you use one with these types of sources.

Table of Contents

1. **Introduction**

The SP18CAT120 HDMI 1x8 HDBaseT splitter can distribute 1 source signal to any 8 display devices. The HDMI signal transmission distance can be extended up to 120 meters at the resolution of 4K2K@60Hz, or 150 meters at 1080P@60Hz via a single CAT6/6a/7 cable. The SP18CAT120 supports 12V IR and RS-232 signal pass-through, audio extraction at RX and TX function and advanced EDID management.

2. **Features**

- HDMI 2.0b (18Gbps), HDCP 2.2 and HDCP 1.x compliant
- Supports video resolution up to 4K2K@60Hz 4:4:4
- Supports HDR, HDR10+, HLG and DolbyVision™
- Supports all HDMI audio formats pass-through
- Audio Breakout is available in balanced audio (Phoenix connector) and Coaxial S/PDIF at TX and 3.5mm mini jack and optical S/PDIF at RX
- Distance over Cat6/6a/7 is 120m (394ft) at 4K 150m (492ft) at 1080p
- Input is one HDMI Type-A with 1 HDMI loop output and 8 HDBaseT outputs
- 12V IR, RS-232 routed to HDBaseT output
- EDID can be copied or can be provided by internal EDID library
- RX Devices are powered by TX unit
- I RU Design for easy rack mounting

3. **Package Contents**

1 × SP18 Main Chassis (1 RU)
8 × RX Devices
9 × 12V IR Blaster Cables (1.5 meters)
9 × 20K~60KHz 12V IR Receiver Cables (1.5 meters)
9 × 3-pin Phoenix Connectors
1 × 5-pin Phoenix Connectors
18 × Mounting Ears (2 For Main Chassis) 16 for RX devices
1 × 24V/3.75A DC Locking Power Adapter
1 × User Manual

4. Specifications

Technical	
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2/1.x
Video Bandwidth	594MHz/18Gbps
Video Resolution	Up to 4k2k@60Hz 4:4:4
Color Depth	8-bit,10-bit,12-bit(1080p@60Hz) 8-bit (4K2K@60Hz YUV4:4:4) 8-bit,10-bit,12-bit(4K2K@60Hz YCbCr 4:2:2/4:2:0)
Color Space	RGB 4:4:4, YCbCr 4:4:4 / 4:2:2 /4:2:0
HDR	Support HDR, HDR10+, HLG, DolbyVision™
HDMI Audio Formats	LPCM 2.0/2.1/5.1/6.1/7.1, Dolby Digital, Dolby TrueHD, Dolby Digital+, Atmos, DTS-ES, DTS HD Master, DTS HD-HRA, DTS-X
Coaxial Audio Formats	PCM2.0, Dolby Digital / Plus, DTS 2.0/5.1
Analog Audio Formats	PCM 2.0CH
ESD Protection	Human body model—±8kV (Air-gap discharge) & ±4kV (Contact discharge)
Connection	
Input	1×HDMI Type A (19-pin female)
Output	1×HDMI Type A (19-pin female) 8x HDBaseT OUT [RJ45] 1x Coaxial Audio OUT [RCA] 1x L/R Audio OUT [5-pin phoenix connector]
Control	1×RS-232 (3-pin phoenix connector) 1x EDID DIP switch [5-pin] 1x IR IN [3.5mm Stereo Mini-jack] 1x IR OUT [3.5mm Stereo Mini-jack]

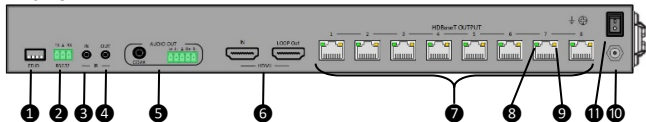| Mechanical	
Housing	Metal Enclosure
Silkscreen Color	Black
Dimensions	Transmitter: 440mm (W) × 130mm (D) × 44mm (H) Receiver: 140mm (W) × 65mm (D) × 18mm (H)
Weight	Transmitter: 1.62kg Receiver: 246g
Power Supply	Input: AC100 - 240V 50/60Hz, Output: DC 24V/3.75A (US/EU standards, CE/FCC/UL certified)
Power Consumption	72W
Operation Temperature	0°C ~ 40°C / 32°F ~ 104°F
Storage Temperature	-20°C ~ 60°C / -4°F ~ 140°F
Relative Humidity	20~90% RH (non-condensing)

5. **Operation Controls and Functions**

5.1 **Transmitter**
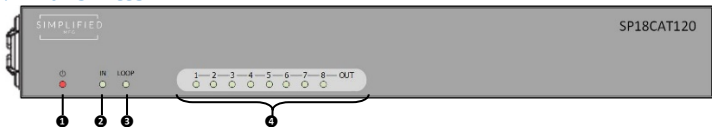
No.	Name	Function Description
1	POWER LED	When the SP18CAT120 is powered on, the red power LED will be illuminated
2	IN LED	When the HDMI IN port is connected to an active source device, the green LED will be illuminated
3	LOOP LED	When the HDMI LOOP OUT port connects an active display device, the green LED will be illuminated
4	OUT (1~8) LED	When the HDBT OUTPUT port connects an HDBaseT RX, the corresponding green OUT LED will be illuminated

Rear Panel

| No.	Name	Function Description
1	EDID DIP switch	Used to set EDID mode. Please refer to Section "6. EDID Mode" for details
2	RS-232	Connect to a PC or control system via a 3-pin phoenix connector cable for three functions: • Firmware update • Control the SP18CAT120 via RS-232 commands • RS-232 signal pass-through (from transmitter to receiver or from receiver to transmitter)
3	IR IN	Connect to IR receiver cable, the IR signal will emit to "IR OUT" port of the HDBaseT Receiver
4	IR OUT	Connect to IR blaster cable, the IR signal is from "IR IN" port of the HDBaseT Receiver
5	AUDIO OUT (COAX, L/R)	Coaxial/balanced audio output port, connect to amplifier input
6	HDMI ports	IN: HDMI input port, connect to HDMI source device with a HDMI cable LOOP OUT: HDMI output port for cascading another device or to continue signal to an existing display
7	HDBT OUTPUT port (1~8)	Connects to the HDBT IN port of the HDBaseT receiver with a CAT6/6A/7 cable.
8	Connection Signal Indicator LED (Green)	▪ Illuminated: Transmitter and Receiver are in good connection status. ▪ Flashing: Transmitter and Receiver are in poor connection status. ▪ Dark: Transmitter and Receiver are not connected.
9	Data Signal Indicator LED (Orange)	▪ Illuminated: HDMI signal with HDCP. ▪ Flashing: HDMI signal without HDCP. ▪ Dark: No HDMI signal.
10	DC 24V	Plug the DC 24V power supply into the unit and connect the adaptor to an AC outlet. (**Note:** The transmitter powers the receivers via a CAT cable.)
11	Power Switch	Enables power to all devices

5.2 HDBaseT Receiver
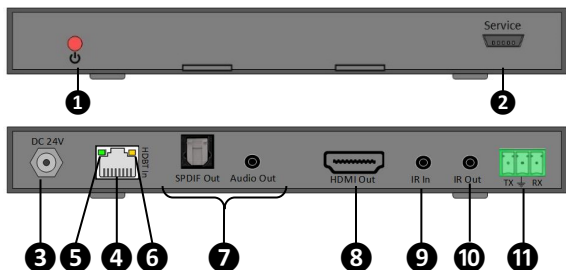
No.	Name	Function Description
1	Power Indicator	When the receiver is powered, this will illuminate
2	SERVICE port	Used for firmware update.
3	DC 24V	Plug DC 24V/1A power supply into the unit and connect the adapter to an AC outlet (**Note:** The HDBaseT receiver is powered by the transmitter via a CAT cable.)
4	HDBT IN	Connect to the HDBT OUTPUT port on the transmitter with a CAT cable.
5	Connection Signal Indicator lamp (Green)	• Illuminated: Transmitter and Receiver are in good connection status. • Flashing: Transmitter and Receiver are in poor connection status. • Dark: Transmitter and Receiver are not connected.
6	Data Signal Indicator lamp (Orange)	• Illuminating: HDMI signal with HDCP. • Flashing: HDMI signal without HDCP. • Dark: No HDMI signal.
7	AUDIO OUT	S/PDIF [optical] and 3.5mm Mini
8	HDMI Out	For connection to display via HDMI cable
9	IR INPUT	IR Input port for connection to the IR Receiver. IR receiver accepts IR from remote.

10	IR OUT	Connect to the IR blaster cable, the IR signal is from IR IN port of the transmitter.
11	RS-232	3-pin Phoenix connector for RS-232 command transmission. The RS-232 command will pass-through from transmitter to receiver or from receiver to transmitter.

5.3 IR Pin Definition

IR BLASTER   IR RECEIVER

IR BLASTER
1 +
2 -

IR RECEIVER
1 IR Signal
2 Grounding
3 Power 12V
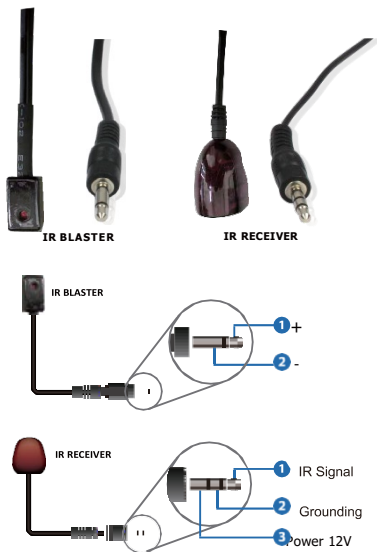
Note: When the angle between the IR receiver and the remote control is ± 45 °, the transmission distance is 0-5 meters; when the angle between the IR receiver and the remote control is ± 90 °, the transmission distance is 0-8 meters.

6. EDID Mode

The defined EDID setting list of the product is shown as below:

EDID Mode	EDID Description
11111	1080P, Stereo Audio 2.0
11110	1080P, Dolby/DTS 5.1
11101	1080P, HD Audio 7.1
11100	1080I, Stereo Audio 2.0
11011	1080I, Dolby/DTS 5.1
11010	1080I, HD Audio 7.1
11001	1080P 3D, Stereo Audio 2.0
11000	1080P 3D, Dolby/DTS 5.1
10111	1080P 3D, HD Audio 7.1
10110	4K2K30Hz_444, Stereo Audio 2.0
10101	4K2K30Hz_444, Dolby/DTS 5.1
10100	4K2K30Hz_444, HD Audio 7.1
10011	4K2K60Hz_420, Stereo Audio 2.0
10010	4K2K60Hz_420, Dolby/DTS 5.1
10001	4K2K60Hz_420, HD Audio 7.1
10000	4K2K60Hz_444, Stereo Audio 2.0
01111	4K2K60Hz_444, Dolby/DTS 5.1
01110	4K2K60Hz_444, HD Audio 7.1
01101	4K2K60Hz_444, Stereo Audio 2.0 HDR
01100	4K2K60Hz_444, Dolby/DTS 5.1 HDR
01011	4K2K60Hz_444, HD Audio 7.1HDR
01010	COPY_FROM_LOOP OUT
01001	COPY_FROM_HDBT OUT1
01000	COPY_FROM_HDBT OUT2
00111	COPY_FROM_HDBT OUT3
00110	COPY_FROM_HDBT OUT4
00101	COPY_FROM_HDBT OUT5
00100	COPY_FROM_HDBT OUT6
00011	COPY_FROM_HDBT OUT7
00010	COPY_FROM_HDBT OUT8
00001	1080P, Stereo Audio 2.0
00000	PC control mode

7. ASCII Commands

The product also supports ASCII command control. Connect the RS-232 port of the product to a PC with a 3-pin phoenix connector cable. Then, open a Serial Command tool on PC to send ASCII commands to control the product. The ASCII command list about the product is shown as below.

ASCII Commands				
Serial port protocol. Baud rate: 115200, Data bits: 8bit, Stop bits:1, Check bit: 0				
x - Parameter 1 y - Parameter 2 ! - Delimiter				
Command Code	**Function Description**	**Example**	**Feedback**	**Default Setting**
Power				
s power z!	Power on/off the device,z=0~1 (z=0 power off, z=1 power on)	s power 1!	Power on System Initializing... Initialization Finished! FW version x.xx.xx	power on
r power!	Get current power state	r power!	power on/power off	
s reboot!	Reboot the device	s reboot!	Reboot… System Initializing... Initialization Finished! FW version x.xx.xx	
System Setup				
help!	List all commands	help!		
r type!	Get device model	r type!	HDC-SPB18H150	
r status!	Get device current status	r status!	Get the unit all status: power, in/out connection, edid mode	
r fw version!	Get Firmware version	r fw version!	MCU BOOT: Vx.xx.xx MCU APP: Vx.xx.xx	
r link in!	Get the connection status of the input port	r link in!	HDMI IN: connect	
r link out y!	Get the connection status of the y output port, y=0~9(0=all, 1~8=HDBT 1~8, 9=loop out)	r link out 1!	hdmi loop out: connect hdbt output 1: connect	
s reset!	Reset to factory defaults	s reset!	Reset to factory defaults System Initializing... Initialization Finished! FW version x.xx.xx	

Command Code	Function Description	Example	Feedback	Default Setting
Output Setting				
s hdmi stream z!	Set hdmi loop output stream on/off z=0~1(0:disable,1:enable)	s hdmi stream 1 !	Enable hdmi loop out stream Disable hdmi loop out stream	enable
s hdmi hdcp z!	Set hdmi loop output hdcp on/off z=0~1(0:disable,1:enable)	s hdmi hdcp 1!	Enable hdmi loop out hdcp Disable hdmi loop out hdcp	enable
s hdbt y hdcp z!	Set hdbt output y hdcp on/off, y=0~8(0=all) z=0~1(0:disable, 1:enable)	s hdbt 1 hdcp 1 ! s hdbt 0 hdcp 1 !	Enable hdbt output 1 hdcp Disable hdbt output 1 hdcp Enable hdbt all outputs hdcp Disable hdbt all outputs hdcp	enable
s hdbt y stream z!	Set hdbt output y stream on/off, y=0~8(0=all) z=0~1 (0:disable,1:enable)	s hdbt 1 stream 1 ! s hdbt 0 stream 1 !	Enable hdbt output 1 stream Disable hdbt output 1 stream Enable hdbt all outputs stream Disable hdbt all outputs stream	enable
r hdmi stream!	Get hdmi loop out stream status	r hdmi stream!	Enable hdmi output stream	
r hdmi hdcp!	Get hdmi loop out hdcp status	r hdmi hdcp!	Enable hdmi output hdcp	
r hdbt y hdcp!	Get hdbt output y hdcp status, y=0~8(0=all)	r hdbt 1 hdcp!	Enable hdbt output 1 hdcp	
r hdbt stream!	Get hdbt output y stream status, y=0~8(0=all)	r hdbt 1 stream!	Enable hdbt output 1 stream	

Command Code	Function Description	Example	Feedback	Default Setting
EDID Setting				

s edid in from z!	Set input EDID from default EDID z, z=1~32
	1. 1080p,Stereo Audio 2.0
	2. 1080p,Dolby/DTS 5.1
	3. 1080p,HD Audio 7.1
	4. 1080i,Stereo Audio 2.0
	5. 1080i,Dolby/DTS 5.1
	6. 1080i,HD Audio 7.1
	7. 3D,Stereo Audio 2.0
	8. 3D,Dolby/DTS 5.1
	9. 3D,HD Audio 7.1
	10. 4K2K30_444,
	   Stereo Audio 2.0
	11. 4K2K30_444,
	   Dolby/DTS 5.1
	12. 4K2K30_444,HD Audio 7.1
	13. 4K2K60_420,
	   Stereo Audio 2.0
	14. 4K2K60_420,
	   Dolby/DTS 5.1
	15. 4K2K60_420,HD Audio 7.1
	16. 4K2K60_444,
	   Stereo Audio 2.0
	17. 4K2K60_444,
	   Dolby/DTS 5.1
	18. 4K2K60_444,HD Audio 7.1
	19. 4K2K60_444,
	   Stereo Audio 2.0 HDR
	20. 4K2K60_444,
	   Dolby/DTS 5.1 HDR
	21. 4K2K60_444,
	   HD Audio 7.1 HDR 22.
	copy from hdmi loop out 23.
	copy from hdbt output 1
	24. copy from hdbt output 2
	25. copy from hdbt output 3
	26. copy from hdbt output 4
	27. copy from hdmi output 5
	28. copy from hdbt output 6
	29. copy from hdbt output 7
	30. copy from hdbt output 8
	31. 1080p,Stereo Audio 2.0
	32. use user1 EDID
		s edid in from 1!	input EDID:1080p, Stereo Audio 2.0
			
			Please toggle EDID dip switch to 00000!
				1080p,Stereo Audio 2.0

Command Code	Function Description	Example	Feedback	Default Setting
s edid user1 00 FF FF FF FF …!	Set user1 EDID data	s edid user1 00 ff ff ff ff …. !	user1 EDID data: 00 FF FF ….	
r edid user1!	Get user1 EDID data	r edid user1!	user1 EDID data : 00 FF FF FF FF FF FF 00 ………	
r edid in!	Get EDID status of the input	r edid in!	input EDID: 4K2K60_ 444,Stereo Audio 2.0	
r edid in data!	Get the EDID data of the hdmi input	r edid in data!	EDID data : 00 FF FF FF FF FF FF 00 ……	
RS-232 BYPASS Setting				
s rs232 bypass hdbt y!	Set RS-232 port connect to HDBT out1 Receiver RS-232 port, y=0~9(0=all, 1~8= hdbt out 1~8, 9=NC)	s rs232 bypass hdbt 1!	RS-232 connect to HDBT OUT1 RS-232 not connect to HDBT OUT	y=0
r rs232 bypass!	Get RS-232 port connect to HDBT out receiver RS-232 port	r rs232 bypass!	RS-232 connect to HDBT OUT1 RS-232 connect to all HDBT OUT RS-232 not connect to HDBT OUT	
s device baud w size x stop y parity z!	Set receiver control device COM port setting, w=2400, 4800,9600,19200,38400, 57600,115200, x=7,8 y=1,2, z=none, even, odd	s device baud 57600 size 8 stop 1 parity none!	receiver device COM port setting baudrate: 57600 data size :8, stop:1 parity: none	
s rs232 time x!	set send RS232 command wait time x=200~5000ms	s rs232 time 200!	send RS-232 command wait time 200ms	200ms

8. Application Example
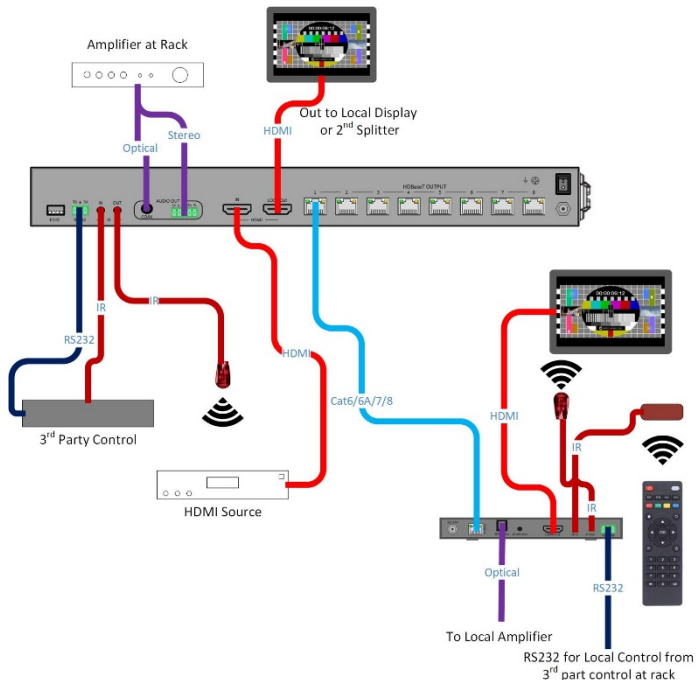
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9. **Warranty and Contact Information**

Should you feel that this product does not function adequately due to defects in materials or workmanship, we (referred to as "the warrantor") will, for the length of the period indicated below (starting from the original date of the purchase) either a) repair the product with new or refurbished parts. Or b) Replace the product with new or refurbished product. All Simplified MFG products are covered by a 3-year PARTS and LABOR warranty. During this period there will be no charge for unit repair, replacement of unit components or replacement of the product if deemed necessary. The decision to repair or replace is made by the warrantor. The purchaser must mail in the product during the warranty period. This limited warranty only covers the product purchased as new and is extended to the original purchaser only. It is non-transferrable to subsequent owners, even during the warranty period. A purchase receipt or other proof of purchase date is required for the limited warranty service.

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