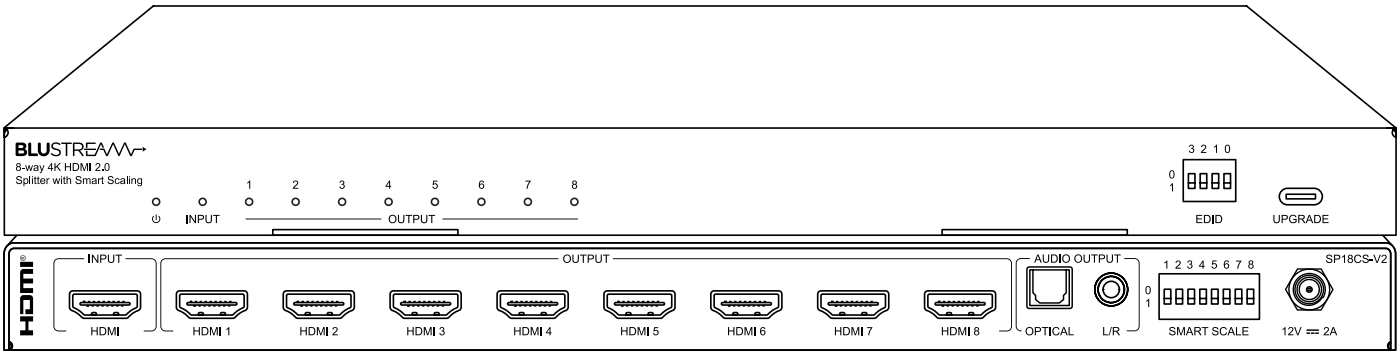
SP18CS-V2

User Manual



Introduction

Our SP18CS-V2 4K HDMI 2.0b splitter distributes a single HDMI source to eight simultaneous outputs with both digital (S/PDIF) and analogue audio breakout. The splitter supports full HDMI 2.0b and HDCP 2.2 with video resolutions up to and including 4K @ 60Hz 4:4:4 with automatic video down conversion on each output.

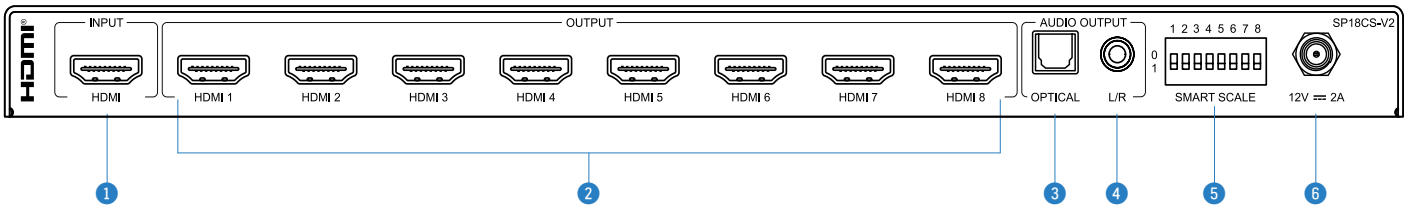
FEATURES:

- Features 1 x HDMI input that is replicated to 8 x HDMI outputs
- Supports HDMI 2.0b 18Gbps specification including HDR
- Supports up to 4K UHD 60Hz 4:4:4
- Video down-conversion (Smart Scale) on outputs allowing a display only capable of supporting lower video resolutions (4K 60Hz 4:2:0 or 1080p) to receive 4K 60Hz 4:4:4 video content while still showing maximum original 4K UHD resolution on remaining video outputs
- Supports all industry standard video resolutions including VGA-WUXGA and 480i-4K
- Supports bitstream passthrough of multichannel surround sound including object-based audio formats in line with HDMI specifications
- HDMI audio breakout to analogue L/R audio and optical (S/PDIF) digital outputs concurrently
- Advanced EDID management
- HDCP 2.2 compliant

Front Panel Description

1. Power LED - indicates if SP18CS-V2 is on or off
2. Input LED - illuminates if HDMI input is active
3. Output LED - illuminates if HDMI output is active
4. EDID DIP switch - used to adjust HDMI input EDID settings
5. Micro USB connector - used for firmware upgrade

Rear Panel Description

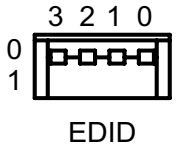


1. HDMI input - connect to HDMI source
2. HDMI outputs 1-8 - connect to HDMI displays
3. Digital Audio Output - Optical (S/PDIF)
4. Analogue L/R Audio Output - 3.5mm stereo connector with fixed line level output. Supports 2 channel PCM audio formats only
5. Smart Scale DIP switch – Used for changing the scaling options per HDMI output
6. Power port - use included 12V/2A power adaptor

EDID Control

EDID (Extended Display Identification Data) is a data structure that is used between a display and a source. This data is used by the source to find out what audio and video resolutions are supported by the display/s. By pre-determining the video resolution and audio format of the source and display devices, you can reduce the time needed for EDID hand shaking thus making power cycles quicker and more reliable. Configuration of the EDID settings for the input can be achieved either via the EDID DIP switches on the rear of the splitter, or by using the micro-USB connector and Blustream EDID API commands.

EDID Dip switches



EDID Dip switches

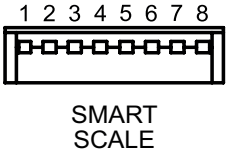
[DIP]=0000: HDMI 1080p@60Hz, Audio 2ch PCM (default)
[DIP]=0001: HDMI 1080p@60Hz, Audio 5.1ch PCM/DTS/DOLBY
[DIP]=0010: HDMI 1080p@60Hz, Audio 7.1ch PCM/DTS/DOLBY/HD
[DIP]=0011: HDMI 4K@60Hz 4:2:0 / 4K@30Hz 4:4:4, Audio 2ch PCM
[DIP]=0100: HDMI 4K@60Hz 4:2:0 / 4K@30Hz 4:4:4, Audio 5.1ch PCM/DTS/DOLBY
[DIP]=0101: HDMI 4K@60Hz 4:2:0 / 4K@30Hz 4:4:4, Audio 7.1ch PCM/DTS/DOLBY/HD
[DIP]=0110: HMDI 4K@60Hz 4:4:4. 8-bit, Audio 2ch PCM
[DIP]=0111: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2ch 5.1ch PCM/DTS/DOLBY
[DIP]=1000: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1ch PCM/DTS/DOLBY/HD
[DIP]=1001: HDMI 4K@60Hz 4:4:4, 10-bit HDR, Audio 2ch PCM
[DIP]=1010: HDMI 4K@60Hz 4:4:4, 10-bit HDR, Audio 5.1ch PCM/DTS/DOLBY
[DIP]=1011: HDMI 4K@60Hz 4:4:4, 10-bit HDR, Audio 7.1ch PCM/DTS/DOLBY/HD
[DIP]=1100: DVI 1920x1080@60Hz, Audio None
[DIP]=1101: DVI 1920x1200@60Hz, Audio None
[DIP]=1110: EDID pass-through (Copy from Sink 1)
[DIP]=1111: EDID via API / Software Fallback EDID request (not set from Software): DVI 1280x1024, Audio None

Smart Scale Control

The SP18CS-V2 has a smart scale feature on each output allowing a display only capable of supporting lower video resolutions (4K 60Hz 4:2:0 or 1080p) to receive 4K 60Hz 4:4:4 video content while still showing maximum original 4K UHD resolution on remaining video outputs.

The SP18CS-V2 default smart scale mode is AUTO which will automatically negotiate the best output resolution suitable for the connected display. If the scaler mode is set to bypass the video output will match the source input signal.

Smart Scale DIP Switches



Smart Scale DIP Switches

[DIP]=1: HDMI Output 1
[DIP]=2: HDMI Output 2
[DIP]=3: HDMI Output 3
[DIP]=4: HDMI Output 4
[DIP]=5: HDMI Output 5
[DIP]=6: HDMI Output 6
[DIP]=7: HDMI Output 7
[DIP]=8: HDMI Output 8

Smart Scale Modes

[DIP]=UP: Auto Smart Scale
[DIP]=Down: Smart Scale bypass / Force 1080p (see below)

Should the auto-negotiation not produce the desired result, the SP18CS-V2 has the ability to force the down-scaler to output 1080p on individual outputs - this replaces the BYPASS scaling option. To change the scaling mode either change the mode via API command, or after power cycle complete the following sequence of changes to Smart Scale DIP switch '1' (the left switch):

00000000 > 10000000 > 00000000 > 10000000 > 00000000 > 10000000 > 00000000

On completion of the sequence above, the input LED's will flash. Select the outputs that need to be forced to 1080p by setting the Smart Scale DIP switch/es to 'DOWN'. The video output will now be fixed to 1080p. To revert this setting, simply put the DIP switch back to the UP position.

Specifications

- **Video Input Connectors:** 1 x HDMI Type A
- **Video Output Connectors:** 8 x HDMI Type A
- **EDID:** 4-pin DIP switch
- **Smart Scale:** 8-pin DIP switch
- **RS-232 Serial Port:** 1 x Micro USB connector
- **Audio Output Connectors:** 1 x Digital (Optical), 1 x Analogue audio L/R (3.5mm stereo Jack)
- **Dimensions (W x D x H):** 300mm x 92mm x 23mm, without feet
- **Shipping Weight:** 1.3g
- **Operating Temperature:** 32°F to 104°F (0°C to 40°C)
- **Storage Temperature :** -4°F to 140°F (-20°C to 60°C)
- **Power Supply:** 12V/2A DC

Package Contents

- 1 x SP18CS-V2
- 1 x 12V/2A DC power supply
- 1 x Mounting kit
- 1 x Quick reference card

NOTE: *Specifications are subject to change without notice. Weights and dimensions are approximate.*

Certifications

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

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

CANADA, INDUSTRY CANADA (IC) NOTICES

This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

CORRECT DISPOSAL OF THIS PRODUCT

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

Communication Protocols and Commands

The SP18CS-V2 can be controlled with control commands via serial (RS-232).

The default RS-232 communication settings are:

- **Baud rate:** 57600
- **Data bits:** 8
- **Stop bits:** 1
- **Parity bit:** none
- **Control Character:** CR+LF (Carriage Return 0x0D /r + Line Feed 0x0A /n)

The following pages list all available control commands.

Commonly Used Commands:

There are several commands that are commonly used for control and testing:

STATUS	Status will give feedback on the switcher such as outputs on, type of connection, etc.
PON	Power on
POFF	Power off

Common Mistakes:

- Control Character
  - Serial terminal applications and control software vary in how they handle command termination. Some applications automatically append a Carriage Return CR and/or Line Feed LF character when transmitting a command. Other applications transmit the command string exactly as entered, requiring control characters to be added manually.
  - Blustream products require a Carriage Return (CR, 0D, /r) + Line Feed (LF, 0A, /n) at the end of each serial command. Commands that are not terminated with these characters will not be recognized.
  - Before troubleshooting serial communication issues, confirm how the application handles command termination and ensure that CR and LF characters are appended to every transmitted command.
- Spaces
  - Blustream commands do not require space between commands unless specified. There may be some applications that require spacing in order to work.
  - How the string should look is as follows: OUTON
  - How the string may look if spaces are required: OUT{Space}ON
- Baud rate, or other serial protocol settings, not set correctly

Communication Protocols and Commands (continued)

COMMAND	ACTION
?/HELP	Print Help Information
STATUS	Print System Status And Port Status
RESET	Reset System To Default Setting (Should Type ""Yes"" To Confirm, ""No"" To Discard)
PON	Set System Power On
POFF	Set System Power Off
RS232BAUD z	Set RS232 Baudrate To z z=1 2400, 2 4800, 3 9600, 4 19200, 5 38400, 6 57600 (Default), 7 115200
OUT xx ON/OFF	Set Output:xx On Or Off xx=00: Set All Output On/Off xx=01: Set Output 01 On/Off xx=02: Set Output 02 On/Off xx=03: Set Output 03 On/Off xx=04: Set Output 04 On/Off xx=05: Set Output 05 On/Off xx=06: Set Output 06 On/Off xx=07: Set Output 07 On/Off xx=08: Set Output 08 On/Off
OUT xx Scaling	yy Set Output:xx Video Mode yy xx=00: Select All Output Port xx=01: Select Output 01 Port xx=02: Select Output 02 Port xx=03: Select Output 03 Port xx=04: Select Output 04 Port xx=05: Select Output 05 Port xx=06: Select Output 06 Port xx=07: Select Output 07 Port xx=08: Select Output 08 Port yy=01: Select Output Port Video Mode Bypass yy=02: Select Output Port Video Mode Force 1080p yy=03: Select Output Port Video Mode Match TV
EDID SAVE zz	Save EDID File From PC Into User Slot zz zz=34: User EDID 01 zz=35: User EDID 02
EDID xx CP yy	Set Input:xx EDID Copy From Output:yy (EDID Dip Switch Must Be Switched To EDID Software) xx=00: Select All Input Port xx=01: Select Input Port yy=01: Copy Output 01 Port EDID yy=02: Copy Output 02 Port EDID yy=03: Copy Output 03 Port EDID yy=04: Copy Output 04 Port EDID yy=05: Copy Output 05 Port EDID yy=06: Copy Output 06 Port EDID yy=07: Copy Output 07 Port EDID yy=08: Copy Output 08 Port EDID

COMMAND	ACTION
EDID xx DF zz	Set Input:xx EDID To Default EDID:zz (EDID Dip Switch Must Be Switched To EDID Software) xx=00: Select All Input Port xx=01: Select Input Port zz=00: HDMI 1080p@60Hz, Audio 2CH PCM zz=01: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY zz=02: HDMI 1080p@60Hz, Audio 7.1CH DTS/DOLBY/HD zz=03: HDMI 1080i@60Hz, Audio 2CH PCM zz=04: HDMI 1080i@60Hz, Audio 5.1CH DTS/DOLBY zz=05: HDMI 1080i@60Hz, Audio 7.1CH DTS/DOLBY/HD zz=06: HDMI 1080p@60Hz/3D, Audio 2CH PCM zz=07: HDMI 1080p@60Hz/3D, Audio 5.1CH DTS/DOLBY zz=08: HDMI 1080p@60Hz/3D, Audio 7.1CH DTS/DOLBY/HD zz=09: HDMI 4K@30Hz 4:4:4, Audio 2CH PCM zz=10: HDMI 4K@30Hz 4:4:4, Audio 5.1CH DTS/DOLBY zz=11: HDMI 4K@30Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD zz=12: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 2CH PCM zz=13: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 5.1CH DTS/DOLBY zz=14: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD zz=15: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2CH PCM zz=16: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY zz=17: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1CH DTS/DOLBY/HD zz=18: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 2CH PCM zz=19: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 5.1CH DTS/DOLBY zz=20: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 7.1CH DTS/DOLBY/HD zz=21: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 2CH PCM zz=22: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 5.1CH DTS/DOLBY zz=23: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 7.1CH DTS/DOLBY/HD zz=24: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 2CH PCM zz=25: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 5.1CH DTS/DOLBY zz=26: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 7.1CH DTS/DOLBY/HD zz=27: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 2CH PCM zz=28: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 5.1CH DTS/DOLBY zz=29: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 7.1CH DTS/DOLBY/HD zz=30: DVI 1280x1024@60Hz, Audio None zz=31: DVI 1920x1080@60Hz, Audio None zz=32: DVI 1920x1200@60Hz, Audio None zz=33: HDMI 1920x1200@60Hz, Audio 2CH PCM/6CH PCM zz=34: User EDID 01 zz=35: User EDID 02 zz=36: EDID pass-through (Copy from Sink 1) (Default)"