



User Manual

HDMI Splitter 2x8 4K (60Hz 4:4:4) HDR with Downscaling

Model PT-SP-HD28DA

Designed in Germany

REACH | 1907/2006/EU

ROHS | 2011/65/EU

PureLink hereby declares that this product **PureTools PT-SP-HD28DA** complies with Directives 1907/2006/EU und 2011/65/EU.

EMC / LVD (Electro Magnetic Compatibility / Low Voltage Directive)

PureLink GmbH hereby declares that this product **PureTools PT-SP-HD28DA** complies with Directives 2014/30/EU and 2014/35/EU. The full text of the EU Declaration of Conformity is available at the following Internet address:

http://www.purelink.de/ce/4251364718308_CE.pdf



Preface

Read this user manual carefully before using this product. Pictures shown in this manual are for reference only. Different model layouts and specifications are subject to the physical product.

This manual is for operation instructions only, not for any maintenance usage.

In the constant effort to improve our product, we reserve the right to make changes in functions or parameters without prior notice or obligation.

Trademarks

Product model and logo are trademarks. Any other trademarks mentioned in this manual are acknowledged as the properties of the trademark owner. No part of this publication may be copied or reproduced without the prior written consent.

FCC Statement

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. It 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 commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.



SAFETY PRECAUTIONS

To ensure the best from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment
 - Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
 - Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
 - Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
 - Refer all servicing to qualified service personnel.
 - To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
 - Do not put any heavy items on the extension cable in case of extrusion.
 - Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
 - Install the device in a place with fine ventilation to avoid damage caused by overheat.
 - Keep the module away from liquids.
 - Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
 - Do not twist or pull by force ends of the optical cable. It can cause malfunction.
 - Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
 - Unplug the power cord when left unused for a long period of time.
 - Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.
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1. Product Introduction

Thanks for choosing the HDMI 2.0 2x8 Splitter, which can distribute either one of two HDMI inputs to eight outputs. The splitter supports HDMI video resolution up to 4K@60Hz 4:4:4, 1080P 3D and multichannel audio formats. Except passing EDID information from the display, there are multiple built-in EDID settings can be selected by the 4-pin DIP switch on the rear panel. The splitter can de-embed HDMI digital audio to stereo analog L/R and Toslink SPDIF audio outputs to provide audio sources for existing audio system.

CEC technology is adopted to turn on/off displays and adjust volume by the control buttons on the front panel. Moreover, the splitter supports convenient firmware upgrade through Micro-USB port.

1.1 Features

- Supports HDMI 2.0 and video resolution up to 4K@60Hz 4:4:4.
- HDMI inputs support HDCP 2.2 and the outputs support HDCP1.4.
- Supports video resolution down-scaling, the 4K input can be automatically degraded to 1080P output for compatibility with 1080P display.
- 18Gbps high bandwidth.
- Features RCA (L/R) jack and Toslink connector for audio de-embedded.
- Advanced EDID management: multiple preset and user defined allowed.
- Built-in equalizer for signal enhancement to avoid signal attenuation in transmission.
- Supports CEC control to turn on/off displays and adjust their volume.
- Provides LEDs to indicate the current operating status and to assist troubleshooting and installation.
- Firmware upgrade by Micro-USB port.

1.2 Packing List

- 1x HDMI 2.0 2x8 Splitter
- 2x Mounting Ears with 4 Screws
- 4x Plastic Cushions
- 1x Power Adapter (12V DC 1A)
- 1x User Manual

Note: Please contact your distributor immediately if any damage or defect in the components is found.

2. Technical Specification

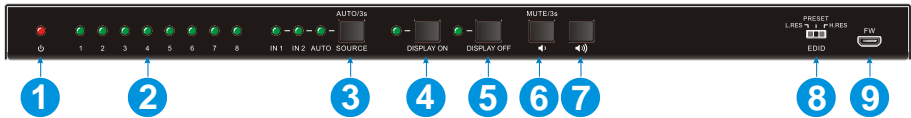
Video Input	
Input	(2) HDMI
Input Connector	(2) Female type-A HDMI
HDMI Input Resolution	Up to 4Kx2K@60Hz 4:4:4 8bit
HDMI Standard	2.0
HDCP Version	2.2
CEC	Supported
Video Output	
Output	(8) HDMI
Output Connector	(8) Female type-A HDMI
HDMI Output Resolution	Up to 4Kx2K@60Hz 4:4:4 8bit
HDMI Standard	2.0
CEC	Supported
Audio	
De-embedded Output	(1) AUDIO OUT; (1) SPDIF OUT
Output Connector	(1) RCA (L/R) jack; (1) Toslink connector
HDMI Audio Format	LPCM 7.1 audio, Dolby Atmos®, Dolby® TrueHD, Dolby Digital® Plus, DTS:X™, and DTS-HD® Master Audio™ pass-through.
Stereo Analog L/R Audio Format	PCM
Toslink Digital Audio Format	PCM, Dolby Digital, DTS, DTS-HD
Frequency Response	20Hz ~ 20KHz, ±3dB
Max Output Level	2.0Vrms ± 0.5dB. 2V = 16dB headroom above -10dBV (316mV) nominal consumer line level signal
THD+N	<0.05% (-80 dB), 20Hz ~ 20KHz bandwidth, 1KHz sine at 0dBFS level (or max level)
SNR	>80dB, 20Hz ~ 20 KHz bandwidth

Audio	
Crosstalk Isolation	>70dB, 10KHz sine at 0dBFS level (or max level before clipping)
L-R Level Deviation	< 0.3dB, 1KHz sine at 0dBFS level (or max level before clipping)
Frequency Response Deviation	<± 0.5 dB 20Hz ~ 20KHz
Output Load Capability	1K ohm and higher (supports 10x paralleled 10k ohm loads)
Stereo Channel Separation	>70dB@1kHz
Control	
Control Part	(5) Control buttons; (1) EDID 3-pin DIP switch; (1) EDID 4-pin DIP switch; (1) Micro-USB port
General	
Bandwidth	18Gbps
Operation Temperature	-10°C ~ +55°C
Storage Temperature	-25°C ~ +70°C
Relative Humidity	10%-90%
Power Supply	Input:100V~240V AC; Output: 12V DC 1A
Power Consumption	12W(Max)
Dimension (W*H*D)	324mm x 20mm x 100mm
Net Weight	About 900g

Note: Please adopt high-qualified HDMI cable fully compliant with HDMI 2.0 for reliable transmission and connection.

3. Panel Description

3.1 Front Panel



- ① **POWER LED:** The LED illuminates red when power is applied.
- ② **OUTPUT LEDs:** The LED illuminates green when there is HDMI output on the corresponding channel.
- ③ **SOURCE Button and LEDs:**
 - Press the button to switch to next source device, and then the corresponding input LED will illuminate green.
 - Press and hold the button at least three seconds to enable automatic switching mode. The splitter will automatically select the first available active source device starting at HDMI input 1.
 - ✓ Upon detecting a new source device connect, the splitter will automatically select the new one. When an active source device is removed, the splitter will switch to the next one.
 - ✓ Once restart the splitter, it will resume the last switching status.
 - Press and hold the button at least three seconds again to exit automatic switching mode, and the current channel won't be changed.
- ④ **DISPLAY ON Button and LED:** Press the button to turn on displays. The LED blinks green when press this button to send control signal.

- ⑤ **DISPLAY OFF Button and LED:** Press the button to turn off displays. The LED blinks green when press this button to send control signal.
- ⑥ **VOLUME DOWN/MUTE Button:** Press the button to decrease the volume of displays. Press and hold this button at least three seconds to mute the displays.
- ⑦ **VOLUME UP Button:** Press the button to increase the volume of displays or exit mute mode if the displays is already in the mute mode.
- ⑧ **EDID:** 3-pin DIP Switch for the Extended Display Identification Data (EDID) value setting. Please refer to the **5.EDID Management** for more details.
- ⑨ **FW:** Micro-USB port for firmware upgrade.

Note: Only the displays which support CEC can be controlled by **DISPLAY ON**, **DISPLAY OFF**, **VOLUME UP** and **VOLUME DOWN** buttons.

3.2 Rear Panel



- ① **INPUTS:** Two type-A female HDMI input ports to connect HDMI sources.
- ② **OUTPUTS:** Eight type-A female HDMI output ports to connect HDMI displays.
- ③ **AUDIO OUT:** RCA jack for stereo analog audio output.
- ④ **SPDIF OUT:** Toslink connector for digital audio output.
- ⑤ **EDID:** 4-pin DIP switch for EDID setting. Please refer to the **5.EDID Management** for more details.
- ⑥ **DC 12V:** DC barrel port to connect an AC power adapter.

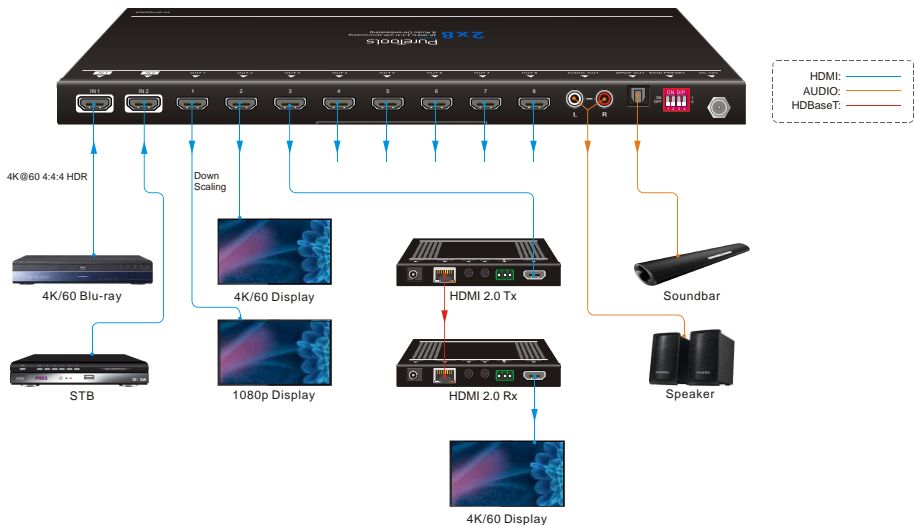
4. System Connection

4.1 Usage Precaution

- Make sure all components and accessories included before installation.
- System should be installed in a clean environment with proper temperature and humidity.
- All of the power switches, plugs, sockets, and power cords should be insulated and safe.
- All devices should be connected before power on.

4.2 System Diagram

The following diagram illustrates the typical input and output connection of the splitter:



5. EDID Management

The Extended Display Identification Data (EDID) is used by the source device to match its video resolution with the connected display. By default, the source device obtains its EDID from the first connected display. Meanwhile, since the displays with different capabilities are connected to the splitter, the 3-pin DIP switch on the front panel and the 4-pin DIP switch on the rear panel can be used in combination to set the EDID to a fixed value to ensure the compatibility in video resolution.

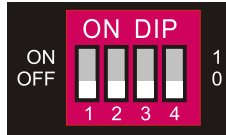


Switch Status	Description
L.RES	The splitter reads all EDID information from all connected displays, and choose the one with lowest resolution passing to the source.
PRESET	In this mode, the 4-pin DIP switch on the rear panel can be used to select predefined EDID and customize a specific EDID as need.
H.RES	The splitter reads all EDID information from all connected displays, and choose the one with highest resolution passing to the source.

- **Predefined EDID setting**

When the 3-pin DIP switch on the front panel is in **PRESET** mode, the 4-pin DIP switch on the rear panel can be used to set the EDID to a built-in fixed value. Use the following table to determine the settings for the 4-pin DIP switch for specific video resolution and audio capabilities.

When in the lower position, the switch represents "0", while putting the switch in the upper position, it represents "1".



Switch Status	Video Resolution	Audio Format
0000	Obtains EDID from the display connected to the HDMI output port 1.	
0001	Obtains EDID from the display connected to the HDMI output port 2.	
0010	Obtains EDID from the display connected to the HDMI output port 3.	
0011	Obtains EDID from the display connected to the HDMI output port 4.	
0100	Obtains EDID from the display connected to the HDMI output port 5.	
0101	Obtains EDID from the display connected to the HDMI output port 6.	
0110	Obtains EDID from the display connected to the HDMI output port 7.	
0111	Obtains EDID from the display connected to the HDMI output port 8.	
1000	720P	LPCM
1001	1080P	LPCM
1010	1080P	DTS/Dolby
1011	3840x2160@30Hz	LPCM
1100	3840x2160@30Hz	DTS/Dolby
1101	3840x2160@60Hz	LPCM
1110	3840x2160@60Hz	DTS/Dolby

● **User defined EDID setting**

Except directly invoking the built-in EDID, the specific EDID can be customized by following the below operation process.

- 1) Rename the user defined EDID according the following format.

EC_XX_XXXX_XXX.bin

- EC: Represents EDID.
- xx: Represents EDID ID. It is "15".
- xxxx: Represents the video parameter.
- xxx: Represents the audio format.

Example: EC_11_720P_LPCM.bin

- 2) Power on the splitter, and then connect to the PC with USB cable. The PC will automatically detect a U-disk named of "BOOTDISK".
- 3) Double-click to open the U-disk, a file named of "READY.TXT" will be showed.
- 4) Copy the user defined EDID (such as **EC_11_720P_LPCM.bin**) to the "BOOTDISK" U-disk.
- 5) Reopen the U-disk to check the filename "READY.TXT" whether automatically becomes "SUCCESS.TXT", if yes, the user defined EDID was imported into the splitter and saved as its corresponding EDID ID successfully.
- 6) Remove the USB cable, and then reboot the splitter.
- 7) The new EDID now can be invoked via the 4-pin DIP switch directly. The EDID ID and its corresponding switch status is shown in the below list.

ID	Switch Status
15	1111

6. Video Resolution Down-scaling

The product supports video resolution down-scaling, the 4K input can be automatically degraded to 1080P output for compatibility with 1080P display, shown in the below chart.

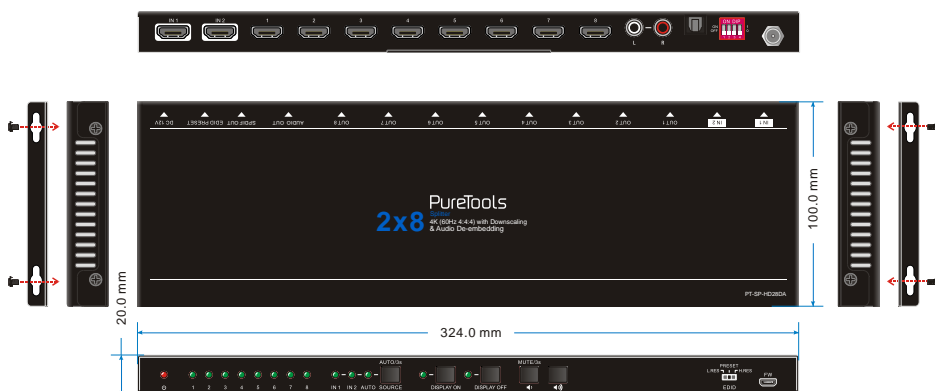
#	Input			Output	
	Resolution	Refresh	Color Space	Downscale	1080P Specs
1	3840x2160	60	4:4:4	Support	1080P@60Hz 4:4:4
2	3840x2160	30	4:4:4	Support	1080P@30Hz 4:4:4
3	3840x2160	24	4:4:4	Support	1080P@24Hz 4:4:4
4	3840x2160	60	4:2:0	Support	1080P@60Hz 4:2:0
5	3840x2160	30	4:2:0	Support	1080P@30Hz 4:2:0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

7. Firmware Upgrade

Please follow the below steps to upgrade firmware by the Micro-USB port:

- 1) Connect the splitter to the PC with USB cable.
- 2) Power on the splitter, and then the PC will automatically detect a U-disk named of "BOOTDISK".
- 3) Double-click to open the U-disk, a file named of "READY.TXT" will be showed.
- 4) Directly copy the latest upgrade file (.bin) to the "BOOTDISK" U-disk.
- 5) Reopen the U-disk to check the filename "READY.TXT" whether automatically becomes "SUCCESS.TXT", if yes, the firmware was upgraded successfully, otherwise, the firmware upgrade is fail, the name of upgrade file (.bin) should be confirm again, and then follow the above steps to upgrade again.
- 6) Remove the USB cable after firmware upgrade.

8. Panel Drawing



9. Troubleshooting and Maintenance

Problems	Potential Causes	Solutions
Colour losing or no video signal output in HDMI display.	The connecting cables may not be connected correctly or it may be broken.	Check whether the cables are connected correctly and in working condition.
	The display is not compatible with the present output resolution.	Make sure the resolution of the display(s) is compatible with the present resolution.
No HDMI signal output in the splitter while local HDMI input is in normal working state.	The connecting cables may not be connected correctly or it may be broken.	Check whether the cables are connected correctly and in working condition.
Splash screen in output devices.	Poor quality of the connecting cable.	Change for another cable of good quality.
Static becomes stronger when connecting the video connectors.	Bad grounding.	Check the grounding and make sure it is connected well.

Note: If your problem still remaining after following the above troubleshooting steps, please contact your local dealer or distributor for further assistance.

10. After-Sales Service

If there appear some problems when running the product, please check and deal with the problems referring to this user manual. Any transport costs are borne by the users during the warranty.

- 1) **Product Limited Warranty:** The product will be free from defects in materials and workmanship for **two years** (The purchase invoice shall prevail).
Proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the unit is within the Warranty period must be presented to obtain warranty service.

- 2) **What the warranty does not cover (servicing available for a fee):**
 - Warranty expiration.
 - Factory applied serial number has been altered or removed from the product.
 - Damage, deterioration or malfunction caused by:
 - Normal wear and tear.
 - Use of supplies or parts not meeting our specifications.
 - No certificate or invoice as the proof of warranty.
 - The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
 - Damage caused by force majeure.
 - Servicing not authorized by distributor.
 - Any other causes which does not relate to a product defect.
 - Delivery, installation or labor charges for installation or setup of the product.

- 3) **Technical Support:** For any questions or problems, contact your distributor or reseller and tell them the respective product name and version, the detailed failure situation as well as the formation of the cases.

Asking for Assistance

Technical Support:

Phone: +49 5971 800299 - 0

Fax: +49 5971 800299 – 99

Technical Support Hours:

8:30 AM to 5:00 PM Monday thru Thursday

8:30 AM to 4:00 PM Friday

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