



CPLUS-VPE2DD

4K UHD+ Dolby Digital & DTS Stereo Decoder



4K x 2K⁺
HDCP2.2

Operation Manual

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SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply.

Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

REVISION HISTORY

VERSION NO.	DATE (DD/MM/YY)	SUMMARY OF CHANGE
VR0	20/01/17	Preliminary Release
VR1	11/02/17	Delete texts



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1. INTRODUCTION

This 4K UHD HDMI with Dolby® Digital/DTS® Stereo Audio Decoder supports the transmission of high bandwidth (18Gbps) video and allows the associated audio signal to be simultaneously extracted and split to both digital and analog audio outputs, providing high quality audio and video performance. This unit can decode standard Dolby Digital & DTS formats up to 5.1 and output the audio as stereo (LPCM 2.0) over HDMI, S/PDIF (optical and coaxial) as well as analog RCA connections. It can also support the pass-through of HD and standard bitstream formats as well as LPCM 7.1 with audio sampling rates up to 192 kHz if needed. If the connected display supports ARC (Audio Return Channel), and has it enabled, then this unit can extract the ARC audio and output it via all available audio outputs. Both the input and output HDMI ports support 4K UHD resolutions up to 4K@60Hz (YUV 4:4:4, 8-bit). Built in EDID management support allows the user select from multiple EDIDs and, with the use of optional PC software, to edit, upload and download EDID files.

2. APPLICATIONS

- Audio extraction for use with non-HDMI AV receivers or powered speaker systems
- AV system integration and home theater installation
- Supporting HDMI sources on DVI displays with analog or external speaker systems
- HDMI/DVI EDID management

3. PACKAGE CONTENTS

- 1 x 4K UHD+ Dolby Digital & DTS Stereo Decoder
- 1 x 5V/2.6A Power Adaptor
- Operational Manual

4. SYSTEM REQUIREMENTS

- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.

- Audio receiving equipment such as audio amplifiers or powered speakers.
- The use of "Premium High Speed HDMI" cables is highly recommended.

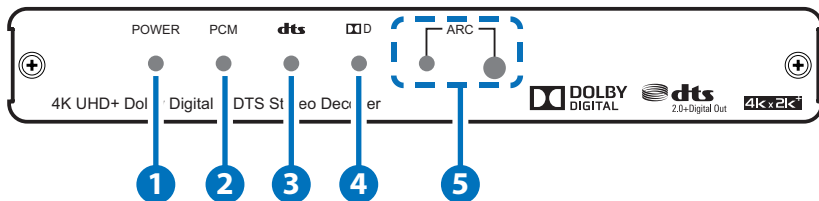
5. FEATURES

- HDMI input and output with 18Gbps (600MHz) 4K UHD support
- DVI 1.0 compliant with the use of an HDMI-DVI adaptor
- HDCP 1.4 and 2.2 compliant
- Supports HD resolutions up to 3840x2160@60 Hz (YUV 4:4:4, 8-bit) & 4096x2160@60 Hz (YUV 4:4:4, 8-bit)
- Supports 48-bit Deep Color up to 1080p60
- Supports pass-through of LPCM 7.1, bitstream and HD bitstream audio formats over HDMI
- Embedded Dolby Digital Decoder technology
- Embedded DTS 2.0 + Digital Out Decoder technology
- Integrated digital interpolation filter and Digital-to-Analog Converter (DAC)
- Supports LPCM sampling rates up to 96kHz.
- Supports Dolby Digital sampling rates up to 48kHz.
- Supports DTS sampling rates up to 96kHz.
- Simultaneous audio output via HDMI, analog stereo, Coaxial and Optical.
- Supports coaxial and optical audio sampling rates up to 96kHz.
- Support extracting HDMI audio signal from HDTV's ARC connection.
- Provides EDID management with EDID bypass and 1 user modifiable EDID
- PC based EDID management tool support
- Supports RS-232 style control via a Virtual COM port over USB

Note: 4K UHD sources or equivalently high-bandwidth signals require an appropriate compatible display and HDMI cables in order to achieve the best image quality. The use of "Premium High Speed HDMI" cables is highly recommended.

6. OPERATION CONTROLS AND FUNCTIONS

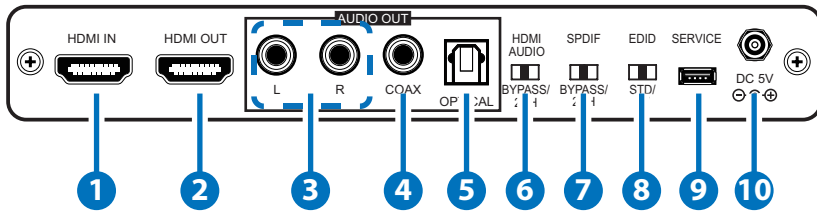
6.1 Front Panel



- 1 POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.
- 2 PCM LED:** This LED will illuminate when LPCM audio is detected on the HDMI input. If the ARC function is active, this LED will illuminate when LPCM is detected from the ARC source.
- 3 dts LED:** This LED will illuminate when DTS 2.0+Digital audio is detected on the HDMI input. If the ARC function is active, this LED will illuminate when DTS 2.0+Digital audio is detected from the ARC source.
- 4 Dolby LED:** This LED will illuminate when Dolby Digital audio is detected on the HDMI input. If the ARC function is active, this LED will illuminate when Dolby Digital audio is detected from the ARC source.
- 5 ARC LED/ ARC:** Pressing the this button will enable/disable the unit's ARC (Audio Return Channel) functionality. When the ARC function is enabled, the LED will illuminate and ARC audio sent back from the connected display will be output over all local audio outputs. When the ARC function is not enabled the LED will remain off.

Note: Please ensure that the connected display supports ARC and that the display's ARC function is enabled before activating the ARC functionality of this unit. Failure to meet these requirements will result in no audio output.

6.2 Rear Panel



- 1 HDMI IN:** Connect to HDMI source equipment such as a media player, game console or set-top box.
- 2 HDMI OUT:** Connect to an HDMI TV, monitor or amplifier for digital video and audio output.
- 3 L/R OUT:** Connect to powered speakers or an amplifier for stereo analog audio output.
- 4 COAX OUT:** Connect to powered speakers or an amplifier for digital audio output using an appropriate coaxial cable.
- 5 OPTICAL:** Connect to powered speakers or an amplifier for digital audio output using an appropriate optical cable.
- 6 HDMI AUDIO BYPASS/2CH:** This switch controls the audio output format for the HDMI port. Moving the switch to the left sets it to "BYPASS" which allows audio to pass unchanged from the HDMI input port. Moving the switch to the right sets it to "2CH" which enables decoding Dolby Digital and DTS audio from the HDMI input and down-mixing it to LPCM 2.0.
- 7 SPDIF BYPASS/2CH:** This switch controls the audio output format for the S/PDIF audio output ports (Optical and Coaxial). Moving the switch to the left sets it to "BYPASS" which allows audio to pass unchanged from the HDMI input port. Moving the switch to the right sets it to "2CH" which enables decoding Dolby Digital and DTS audio from the HDMI input and down-mixing it to LPCM 2.0.
- 8 EDID:** This switch controls which EDID is sent to the connected HDMI input device. Moving the switch to the left sets it to "STD" mode which will use the internal (user) EDID. Moving the switch to the right sets it to "TV" mode which will pass the EDID from the connected display device to the HDMI input device.

Note: By default the "STD" EDID contains video resolution support up to 1080p@60Hz and audio support including LPCM 2.0 up to 96kHz, Dolby Digital (5.1 channel) and DTS (5.1 channel).



- 9 **SERVICE:** This slot is for EDID management, control and firmware update use. Connect directly to your PC/laptop using a standard Mini-USB cable to connect using the PC software or to send commands (via virtual COM port).
- 10 **DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

6.3 Virtual COM Port Settings & Commands

Settings:

Baud Rate: 115200bps

Data bits: 8

Parity: None

Flow Control: None

Stop Bits: 1

Commands:

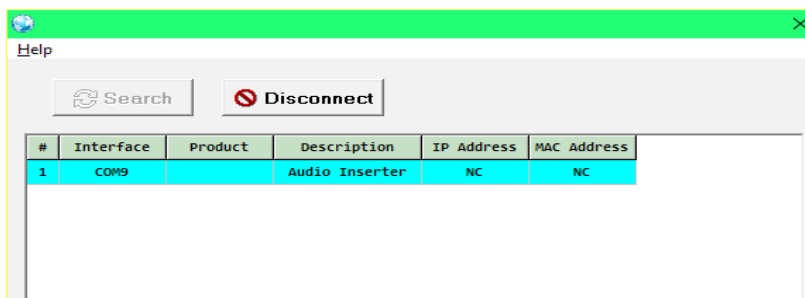
Command Name	Description	Parameters
SOURCEDET	SHOW INPUT INFORMATION	NONE
SINKINFO	SHOW SINK INFORMATION	NONE
HDCPIN	SET/SHOW INPUT HDCP STATUS	HDCPIN N [N=1~3, ?] 1: FOLLOW IN 2: FOLLOW OUT 3: APPLE MODE ?: GET STATUS Default: FOLLOW OUT
ECHO	SET/SHOW CONSOLE AUTO ECHO MODE	ECHO N [N=0, 1, ?] 0: OFF 1: ON ?: GET STATUS Default: ON
FADEFAULT	SET UNIT TO FACTORY DEFAULT	NONE
VER	SHOW UNIT FIRMWARE VERSION	NONE
REBOOT	SYSTEM REBOOT	NONE
?	SHOW DESCRIPTION OF COMMAND	NONE
HELP	SHOW DESCRIPTIONs OF COMMAND	NONE

Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive

6.4 EDID Manager

This unit uses an EDID Management application which allows the user to copy the EDID from an attached display, edit an existing EDID file stored on the PC or create a basic EDID from scratch. The EDID can then be uploaded to the unit for use. Please obtain the EDID Management software from your authorized dealer and save it in a directory where you can easily find it.

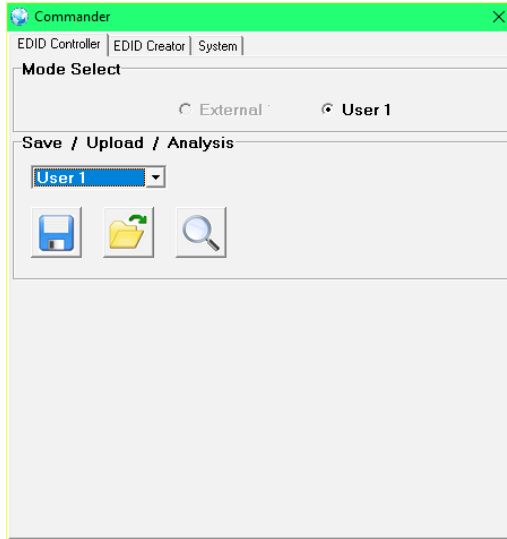
Before connecting the unit to your PC, please install the appropriate Virtual COM Port Driver depending on your Windows version. Next, install the EDID Management software. After the installation has successfully completed, an icon for it will appear on the windows desktop. Launch the software by double-clicking on the icon and the EDID Management device detection window will open up on your screen.



After launching the software, power the unit on and then connect it to the PC/laptop using a USB cable. Click on the "Search" button and any detected units will be displayed in the list. Clicking on a detected unit will open the EDID Commander window.

EDID Controller Tab

Mode Select: The currently selected EDID is displayed here. The "External" EDID corresponds to the "TV" setting on the back of the unit. The "User 1" EDID corresponds to the "STD" setting on the back of the unit. The User 1 EDID is user-replaceable. To return the User 1 EDID to its original values, please perform a factory reset on the unit.

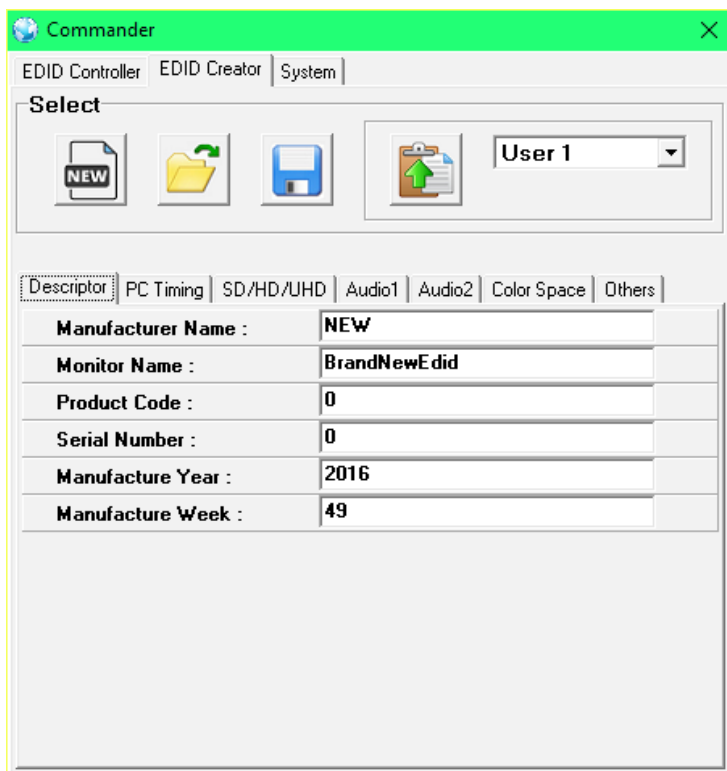


Save/Upload/Analysis: EDIDs may be saved to a PC, uploaded from a PC or analyzed.

- Any EDID from the unit or the connected HDMI display can be saved to your PC as a *.bin file by selecting the EDID source from the drop down menu and then clicking the "Save" icon.
- Previously saved EDID files (*.bin format) can be re-uploaded into the unit by selecting the User EDID to replace from the dropdown and then clicking the "Upload" icon. Before accepting the upload, the software will check and verify that the EDID's header and checksum values are acceptable.
- To analyze any EDID stored within the unit, select the EDID to view from the dropdown and click on the "Analysis" icon.

EDID Creator Tab

Click on the EDID Creator tab to begin designing a new EDID from scratch (select the "New" icon), to modify an existing EDID stored on the PC as a .bin file (select the "Load" icon) or to edit an EDID copied from the unit via the EDID Analyzer's edit option. Selecting "New" will automatically populate the various EDID fields with basic information that can be easily edited to match the user's preferences. Clicking on the "Load" icon will open a file load window and after the *.bin file has been selected and loaded the EDID fields will be populated with the information from that file. The same will happen when the EDID is copied from the EDID Analyzer window.



The screenshot shows the 'Commander' application window with the 'EDID Creator' tab selected. The window has a green title bar and a tabbed interface with 'EDID Controller', 'EDID Creator', and 'System'. Under the 'Select' section, there are four icons: 'NEW' (a document with 'NEW' text), a folder with a refresh arrow, a floppy disk, and a clipboard with an up arrow. A dropdown menu next to the icons is set to 'User 1'. Below this, there are several tabs: 'Descriptor', 'PC Timing', 'SD/HD/UHD', 'Audio1', 'Audio2', 'Color Space', and 'Others'. The 'Descriptor' tab is active, showing a form with the following fields:

Manufacturer Name :	NEW
Monitor Name :	BrandNewEdid
Product Code :	0
Serial Number :	0
Manufacture Year :	2016
Manufacture Week :	49

The following tabs provide access to a wide range of EDID information which can be edited:

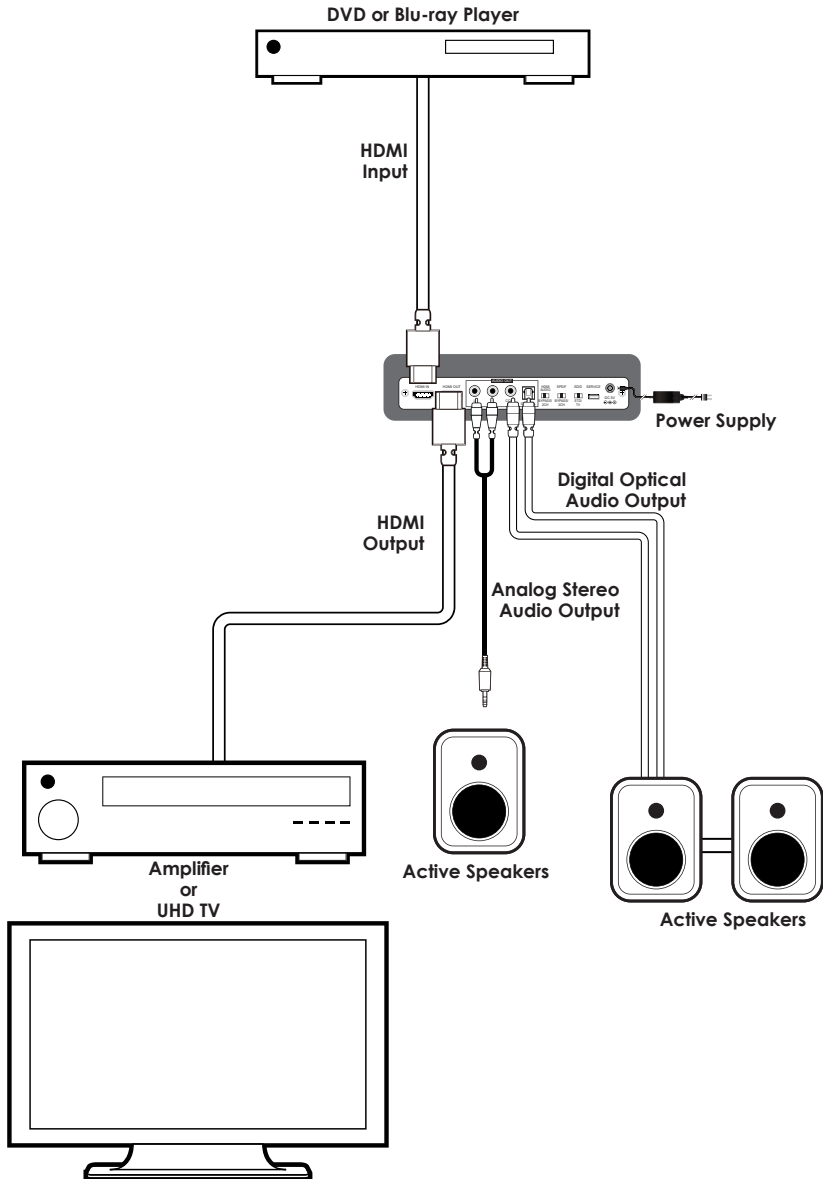
- **Descriptor:** This tab allows for the editing of various description and information fields within the EDID file such as Manufacturer Name, Monitor Name, etc.
- **PC Timing and SD/HD/UHD:** These tabs allow for the selection of the resolutions and refresh rates that the EDID will report as supported.
- **Audio1 and Audio2:** These tabs allow for the selection of which audio formats, audio frequencies, channels and speaker locations are supported.
- **Color Space:** This tab allows for the selection of which color formats and bit depths are supported, including BT.2020 and HDR support options.
- **Others:** This tab contains options for supporting 3D and defining the CEC Address.

Once the user is finished editing or creating an EDID it can be saved to a *.bin file locally or uploaded directly to the unit using the "Save" and "Upload" icons respectively.

System Tab

Select the System tab to edit the unit's description, to reset the unit to factory defaults and to view the unit's current hardware and firmware version information.

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

Video Bandwidth	18Gbps (600Mhz)
Input Ports	1 x HDMI, 1 x Mini-USB (service & control only)
Output Ports	1 x HDMI 2 x RCA (Analog Audio) 1 x Coaxial S/PDIF (Digital Audio) 1 x Optical S/PDIF (Digital Audio)
Power Supply	5V / 2.6A DC (US/EU standards, CE/FCC/ UL certified)
ESD Protection	Human body model: ±8kV (air-gap discharge) ±4kV (contact discharge)
Chassis Material :	Metal
Silkscreen color :	Black
Dimensions	180mm x 25mm x 104mm (W×H×D) [Case Only] 180mm x 25mm x 112.75mm (W×H×D) [All Inclusive]
Weight	358g
Operating 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)
Power Consumption	4.8w

8.1 Video Supports Specification

DVI and HDMI Supported Resolutions (Hz)	Input	Output
640x480@60/72/75/85	√	√
720x400@85	√	√
800x600@56/60/72/75/85	√	√
1024x768@60/70/75/85	√	√
1280x720@60	√	√
1280x768@60/75/85	√	√
1280x800@60	√	√
1360x768@60	√	√
1440x900@60	√	√
1600x900@60	√	√
1600x1200@60	√	√
1920x1080@60	√	√
1920x1200@60	√	√
1440x576i@50	√	√
1440x480i@59.94/60	√	√
720x480p@59.94/60	√	√
720x576p@50	√	√
1280x720p@50/59.94/60	√	√
1920x1080i@50/59.94/60	√	√
1920x1080p@23.97/24/25/29.97/30/50/59.94/60	√	√
3840x2160@24/25/30/50/60 (YUV 4:4:4)	√	√
4096x2160@24/25/30/50/60 (YUV 4:4:4)	√	√
3840x2160@60 (YUV 4:2:0)	√	√
4096x2160@60 (YUV 4:2:0)	√	√

8.2 Audio Support Specification

Input Level/ Freq.	Output (Decoded)	Output Level Vrms/ dB±10%	THD+N (A-Weight)	Frequency Response	SNR >90dB	Crosstalk <-90dB
HDMI 0dB/1kHz 48~96kHz	Analog	2 Vrms	< 0.01%	±1 dBFS	>104dB	<-90dB
	Coaxial	0 dB	< 0.0005%	±1 dBFS	>141dB	<-164dB
	Optical	0 dB	< 0.0005%	±1 dBFS	>141dB	<-163dB
	HDMI	0 dB	< 0.0005%	±1 dBFS	>141dB	<-164dB

8.3 Input to Output Audio Format

Audio Input	Input Format	AUDIO OUTPUT				
		Analog L/R	HDMI		SPDIF	
			Switch Status		Switch Status	
			BYPASS	2CH	BYPASS	2CH
HDMI	LPCM 2.0	Analog 2 Chan.	LPCM 2.0	LPCM 2.0	LPCM 2.0	LPCM 2.0
	Dolby Digital	Decoded Lt/Rt	Bitstream Pass-through	LPCM 2.0 (Lt/Rt)	Bitstream Pass-through	LPCM 2.0 (Lt/Rt)
	DTS	Decoded Lo/Ro	Bitstream Pass-through	LPCM 2.0 (Lo/Ro)	Bitstream Pass-through	LPCM 2.0 (Lo/Ro)
HDMI ARC	LPCM 2.0	Analog 2 Chan.	HDMI Pass-through ARC Bitstream Pass-through		LPCM 2.0	LPCM 2.0
	Dolby Digital	Decoded Lt/Rt			LPCM 2.0 (Lt/Rt)	
	DTS	Decoded Lo/Ro			LPCM 2.0 (Lo/Ro)	

9. ACRONYMS

ACRONYM	COMPLETE TERM
CEC	Consumer Electronics Control
COAX	Coaxial
DTS	Digital Theater System
DVI	Digital Visual Interface
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDTV	High-Definition Television
OPT	Optical
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduce Blanking)



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