VIDEO
PRODUCTS
INCORPORATED

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MONTEST-HDMI

High-Definition Multimedia Interface Pattern Generator

Quick Guide

Man096 Rev 3-06-08

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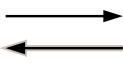
1. Features and Specifications

Features

- Provides total 35 Timings and 39 Patterns
- Supports HDCP signal verification pattern (P39)
- On-panel LED display and LED indicators
- Remote control
- Supports RS-232 control, specific PC application included
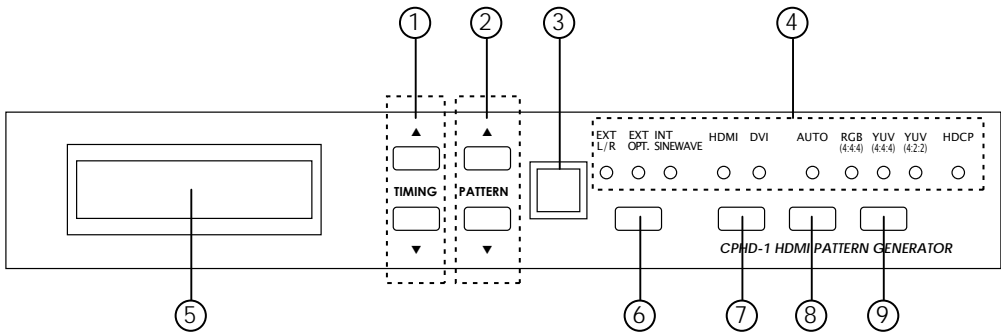
Specifications

- HDMI v1.2, HDCP 1.1 and DVI 1.0 compliant
- HDMI Frequency bandwidth: 1.65Gbps (single link)
- Input: Audio L/R x 1 and Toslink S/PDIF x 1
- Output: HDMI female port (type A connector) x 1
- Power Supply: 5VDC 3.2A power supply (AC 90-240V)
- Weight: 1.5Kgs
- Dimensions: 280(W) x 130(D) x 44(H) mm

RS-232 Protocol

Pin	Definititon		Pin	Definition
1	NC		1	NC
2	TxD		2	RxD
3	RxD		3	TxD
4	NC		4	NC
5	GND		5	GND
6	NC		6	NC
7	NC		7	NC
8	NC		8	NC
9	NC		9	NC

2. Front Panel Operation

1. Pattern Selection:
   From P01 ~ P39
2. Resolution/Freq. Selection:
   From T01 ~ T35
3. Remote control sensor
4. HDCP LED Indicator:
   The LED will illuminate when pattern "P39 HDCP-Produce" is selected and the output display (TV, monitor, etc.) supports HDCP. To unilluminate the HDCP indicator (Switch Off HDCP), frist step to change to other pattern and then changed either Timing, HDMI/DVI output selection or color space selection.
5. Display of PATTERN/TIMING:
   Upper line: Number of TIMING, Resolution and Frequency (Example: T01 640x480-60)
   Lower line: Number of PATTERN and name of PATTERN (Example: P01 WHITE)
6. Audio Source Selection:
   External L/R
   External Optical
   Internal Sinewave
7. HDMI/DVI Output Selection
8. Turn on/off AUTO pattern
   random-cycling
9. Color Space Selection:
   RGB 4:4:4
   YUV 4:4:4
   YUV 4:2:2

3. Rear Panel Installation and Connection
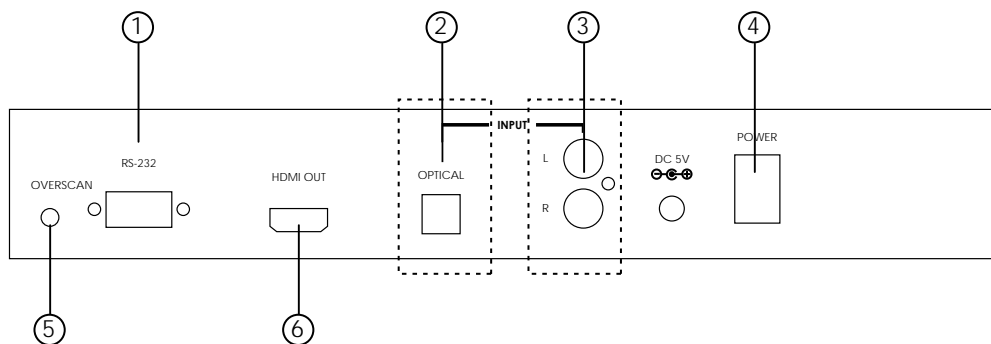
1. RS232 Communication Port:
   Connect to the COM1 or COM2 port of your PC, and control the unit remotely using the application provided.
2. Audio Optical Input
3. Audio L/R Input
4. Power Switch
5. Fill-Screen Button:
   For some modals of TV/monitor, the video signal can not fill the screen of display completely, to correct this problem, press the button once when the power is on.
6. HDMI OUT:
   The HDMI output can be connected to a HDMI display using HDMI cable, or to a DVI display using HDMI to DVI cable.

5. TIMING Table

No.	Resolution	Frequency (Hz)
T01	640x480	60
T02	640x480	72
T03	640x480	75
T04	640x480	85
T05	800x600	56
T06	800x600	60
T07	800x600	72
T08	800x600	75
T09	800x600	85
T10	1024x768	60
T11	1024x768	70
T12	1024x768	75
T13	1024x768	85
T14	1280x960	60
T15	1280x960	85
T16	1280x1024	60
T17	1280x1024	75
T18	1280x1024	85
T19	1600x1200	60
T20	1920x1200	60
T21	720x480**i**	59
T22	720x480**i**	60
T23	720x480**p**	59
T24	720x480**p**	60
T25	1280x720**p**	59
T26	1280x720**p**	60
T27	1920x1080**i**	59
T28	1920x1080**i**	60
T29	1920x1080**p**	59
T30	1920x1080**p**	60
T31	720x576**i**	50
T32	720x576**p**	50
T33	1280x720**p**	50
T34	1920x1080**i**	50
T35	1920x1080**p**	50

No.	Signal Content	Description
P01	PURITY	**Purity pattern** Purity offers eight different full field patterns: Black, White (100% Y)
P02	PURITY	Primary colors: Red, Green, Blue Complementary colors: Magenta, Yellow, Cyan
P03	PURITY	P01: White
P04	PURITY	P02: Blue P03: Red
P05	PURITY	P04: Magenta P05: Green
P06	PURITY	P06: Cyan P07: Yellow
P07	PURITY	P08: Black
P08	PURITY	

Application

1. The red and green patterns are most frequently used for checking color purity. The red pattern is selected only this color should be visible; the presence of any other color is an indication that color purity needs adjustment.
2. The green pattern provides a purity check for three in-line tubes. In the in-line tubes, the guns are in a horizontal position and the green gun is located in the center.
3. The blue is the complementary colors are often used to check the color performance.
4. The red are used to ensure that there is no interference between the sound and chroma carrier. Furthermore the red pattern is used to adjust the longplay delay level to minimum flicker.
5. In addition to the primary and complementary colors 100% white can be selected as well as black pattern with color burst to check.

P09	GRAD	**Gradual pattern** Gradual transition of colors.
P10	GRAD	P09: Red P10: Green
P11	GRAD	P11: Blue P12: Gray
P12	GRAD	

Application
This pattern is for brightness control and luminance writing current. And this can overall the color performance, amplitude response/resolution and linearity of chroma amplitude.

P13		**Color Bar** Comprises 8 vertical bars- White, Yellow, Cyan, Green, Magenta, Red, Blue and Black

Application
The white bar, to adjust the amplitude of the color difference signals with respect to the luminance signal on the picture tube. The blue and green guns can be switched off to allow the amplitude of the R-Y signal to be adjusted. This is done by ensuring that no difference in brightness is observed between vertical bars five and six of the color bar and the horizontal reference bar. In a similar fashion, the amplitude of the B-Y demodulator can be determined.

P14		**Grayscale** Full screen linear staircase signal with 8/16/32/64 identical steps from black to white
P15		P14: 8 steps
P16		P15: 16 steps P16: 32 steps
P17		P17: 64 steps

Application
This is used to locate faulty linearity of the video amplifier or greyscale setting. Nonlinearities mainly result in a compression of the white level.

		Black-White Vertical
P18		Full screen linear vertical bar signal with black/white intervals of 1/6/12 pixels.
P19		P18: 1 pixel
P20		P19: 6 pixels
		P20: 12 pixels

Application
This pattern serves for a quick check of color monitor's horizontal bandwidth and phase behavior of a video transmission. Also, verify video amplifier and color temperature.

		Black-White Horizontal
P21		Full screen linear Horizontal bar signal with black/white intervals of 1/3/6 pixels.
P22		P21: 1 pixel
P23		P22: 3 pixels
		P23: 6 pixels

Application
This pattern serves for a quick check of color monitor's vertical bandwidth and phase behavior of a video transmission. Also, verify video amplifier and color temperature.

		Multi-burst	-Video bandwidth
P24		Full screen definition pattern of frequencies 0.5, 1.0, 2.0, 4.0, 4.8, and 5.8 MHz for 625 line systems.	-Check luminance amplifier in B/W
			-Amplitude response/ resolution
P25		P24: Multi-burst 1	-Check resolution of monitors and video recorders
		P25: Multi-burst 2	-Measure the frequency amplitude response

Application
The pattern checks the bandwidth of the video or luminance amplifier in B/W or CTVs as well as the resolution of monitors and video recorders. It can also be used to check or measure the frequency amplitude response.

|		
P26		**Grid** Full screen grid with black/white intervals of 1/3/6/12 pixels.
P27		
P28		P26: 1 pixel P27: 3 pixels P28: 6 pixels P29: 12 pixels
P29		
Application		
This pattern is mainly used for checking and aligning dynamic and corner convergence of TVs or monitors.		
P30		**Running H** Full screen filled with lines of H characters, a new line of H will run from upper left corner and fill down when a line is completed.
Application		
This is the special test for test/video motion verification and refreshing rate.		
P31		**Circle** Black circles on white background, 640x480 has 4 by 3 total 12 circles, 800x600 has 5 by 3 total 15 circles, 1024x768 has 6 by 4 total 24 circles,
Application		
It's suited for checking the overall linearity and geometry of the screen of a monitor or TV.		
P32		**Black/White Up/Down** Full screen filled with upper half of 100% white and lower half of 100% black.
Application		
This pattern is for brightness control and purity checking. Also, to do the white setting and synchronization.		

|		
P33	**CYP**	**Cypress Patterns** Cypress specifically designed patterns. P33: Greyscale
P34	**CYP**	P34: 3 step Horizontal color bar P35: SAMPTEbar
P35	**CYP**	P36: CYP-4 P37: Britebox-1 P38: Britebox-2
P36	**CYP**	
P37	**CYP**	
P38	**CYP**	

Application

P33: This pattern is used for a reflection check or for adjusting the VCR video demodulator to a symmetrical black and white jump or opposite.
P34: This pattern serves for a quick check of color monitor.
P35,P36: This pattern can be used to check the video handling capabilities of most parts of a television system.
P37,P38: The wrong brightness setting on the monitor may cause other tests such as Contrast, Focus and Beam Size to be invalid.

P39	**HDCP**	**HDCP-Produce** Green/Blue horizontal bars with HDCP verification and data comparison on the upper first third area of black background

Application

To test DVI and HDMI receivers with HDCP. All DVI and HDMI options, including analyzer options, support HDCP production keys if the HDCP option is installed.

6. Remote Control

1. Switch to P39 HDCP
2. Turn on/off AUTO pattern random-cycling
3. Color Space Selection:
   RGB 4:4:4
   YUV 4:4:4
   YUV 4:2:2
4. Audio Output Selection:
   External L/R
   External Optical
   Internal Shinewave
5. HDMI/DVI Output Selection
6. Quick TIMING Selection:
   VGA - T01 640x480-60
   SVGA - T06 800x600-60
   XGA - T10 1024x768-60
   SXGA - T16 1280x1024-60
   UXGA - T19 1600x1200-60
   1080i - T27 1920x1080i-59
   480p - T23 720x480p-59
   720p - T25 1280x720p-59
   1080p - T29 1920x1080p-59
7. Sampling Rate (-)
   Sampling Rate (+)
   192 KHz
   96 KHz
   48 KHz
   44K1Hz
   32 KHz
8. [pqtu]
   UP/DOWN: TIMING (+) (-)
   RIGHT/LEFT: PATTERN (+) (-)
9. A/V Mute ON
10. A/V Mute OFF
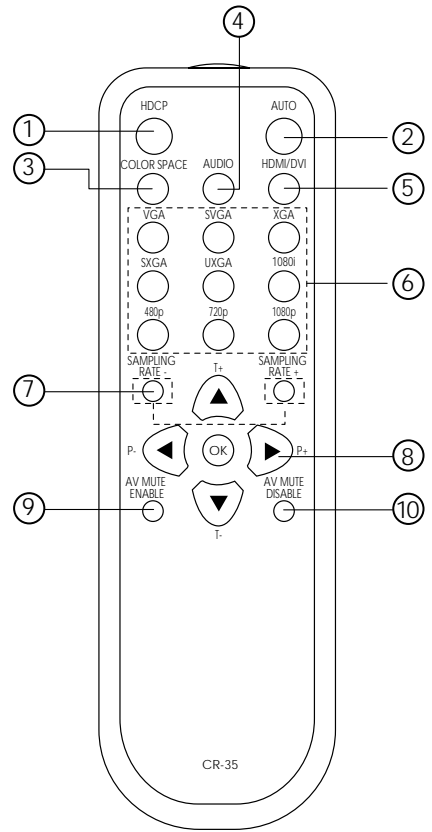
7. RS232 Remote Control Application

To install this application, first download the setup.exe file found on the webpage that opens when you insert the instruction manual CD.   This file can also be found on the product webpage:

http://montest.com/montest-hdmi.html.

Double-click the setup.exe file and follow the prompts to automatically place the application in C:\montest on your computer.

To launch the application, double-click on the CPHD-1.exe file in the C:\montest directory. View the main window.

7.1 Main Window
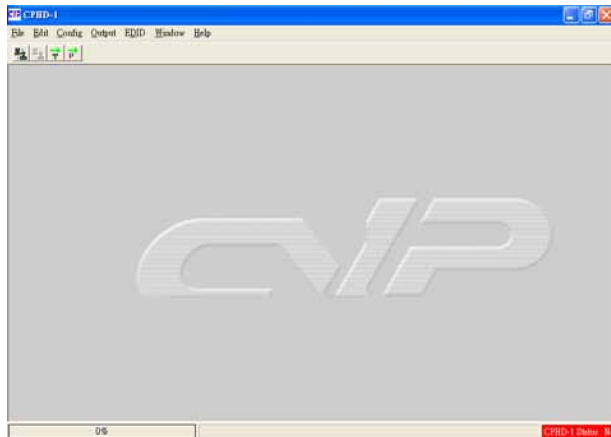
IMPORTANT: When the right hand bottom shows warning message 'CPHD-1 Status: Not Exist', click the Connect *button to link to the unit.*

7.2 Select COM port to control

Click and select the [COM port] from [Config] option of the tool bar to launch the Program window. There are 8 different COM ports can choose. After the port been selected click [OK] to confirm the control port.
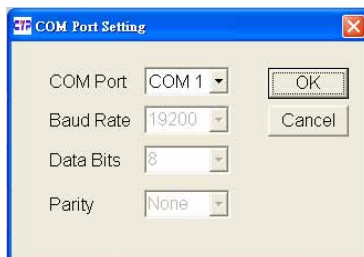
7.3 Switch TIMING

Click and select the [Timing] from [Output] option of the tool bar to launch the Program window.
Click [Show List] to display each timing's Horizontal/Vertical/Pixel Clock.
Click [Run Timing] button to start the output of selected timing.

List of Timings

Timing Name	Pixel Rate	Horizontal	Vertical
640x480-60	25.175 MHz	31.469 KHz	59.940 Hz
640x480-72	31.500 MHz	37.861 KHz	72.809 Hz
640x480-75	31.500 MHz	37.500 KHz	75.000 Hz
640x480-85	36.000 MHz	43.269 KHz	85.008 Hz
800x600-56	36.000 MHz	35.156 KHz	56.250 Hz
800x600-60	40.000 MHz	37.879 KHz	60.317 Hz
800x600-72	50.000 MHz	48.077 KHz	72.188 Hz
800x600-75	49.500 MHz	46.875 KHz	75.000 Hz
800x600-85	56.250 MHz	53.674 KHz	85.061 Hz
1024x768-60	65.000 MHz	48.363 KHz	60.004 Hz
1024x768-70	75.000 MHz	56.476 KHz	70.069 Hz
1024x768-75	78.750 MHz	60.023 KHz	75.029 Hz
1024x768-85	94.500 MHz	68.677 KHz	84.997 Hz

7.4 Switch PATTERN

Click and select the [Pattern] from [Output] option of the tool bar to launch the Program window.
Click [Show List] to select output pattern and then click [Run Pattern] button to start the output of selected pattern.
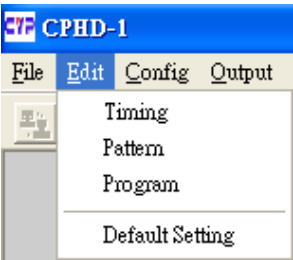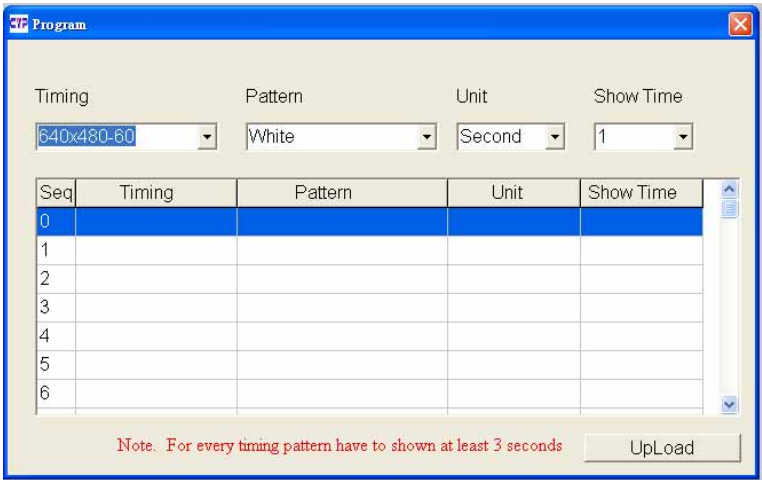

List of Patterns

7.5 Programming TIMING/PATTERN

Click and select the [Program] from [Edit] option of the tool bar to launch the Program window.
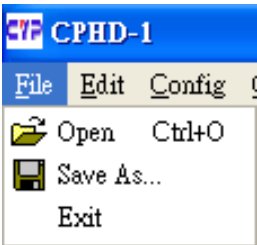

Program the desired sequence of timing/pattern/unit/show time, then click [Upload] to send the program to the unit.

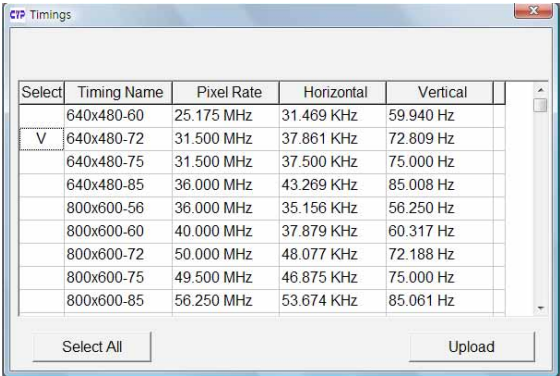*IMPORTANT: For every timing pattern have to shown at least 3 seconds.*

Click and select the [Save as] from [File] option of the tool bar to save your settings.

Click the [Open] from [File] option of the tool bar to load the saved data.

Click and select the [Timing] from [Edit] option of the tool bar to launch the Program window.

Select	Timing Name	Pixel Rate	Horizontal	Vertical
	640x480-60	25.175 MHz	31.469 KHz	59.940 Hz
V	640x480-72	31.500 MHz	37.861 KHz	72.809 Hz
	640x480-75	31.500 MHz	37.500 KHz	75.000 Hz
	640x480-85	36.000 MHz	43.269 KHz	85.008 Hz
	800x600-56	36.000 MHz	35.156 KHz	56.250 Hz
	800x600-60	40.000 MHz	37.879 KHz	60.317 Hz
	800x600-72	50.000 MHz	48.077 KHz	72.188 Hz
	800x600-75	49.500 MHz	46.875 KHz	75.000 Hz
	800x600-85	56.250 MHz	53.674 KHz	85.061 Hz

Select All   Upload

Program the desired timings, and then click [Upload] to send the program to the unit.
Click and select the [Pattern] from [Edit] option of the tool bar to launch the Program window.
Program the desired patterns and then click [Upload] to send the program to the unit.

Select	Pattern Name
	White
	Blue
V	Red
	Magenta
	Green
	Cyan
	Yellow
	Black
	Gradually Red
	Gradually Green

Select All   Upload

Click and select the [Default Setting] from [Edit] option of the tool bar to reset the unit to factory setting.

7.6 EDID

7.6.1 Read EDID

Click and select the [Read EDID] from [EDID] option of the tool bar to read out the EDID from the display source (e.g. LCD TV). Meanwhile, click and select the [Save as] from [File] option of the tool bar to save the EDID information to the computer in .bin format (e.g. to save as this file format "cypress.bin").

7.6.2 Memory of EDID

When click and select the [Memory] from [EDID] to read out the data, but the user may not know the data information that read out from the source. The user can use "Explore Semiconductor EDID Editor" to read out the EDID information.
From "Explore Semiconductor EDID Editor", click the [Open] from [File] option of the tool bar to read out the EDID data.

7.6.3 Upload EDID

Click the [Open] from [File] option of the tool bar to load the saved data (e.g. cypress.bin).
Click and select the [Upload EDID] from [EDID] option of the tool bar to write the EDID to the unit.
INPORTANT: After upload EDID to the unit, don't operation this unit before write EDID to the display unit. Otherwise, the EDID data will lose due to the memory size problem.

7.6.4 Write EDID

Click and select the [Write EDID] from [EDID] option of the tool bar to write the EDID to the display unit.

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