



# HDMI 2.0/12G-SDI Signal Generator

## User Manual

### 500830-V2



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## 1. Safety Precautions

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

- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burns.
- Do not open or remove the housing of the device as you may be exposed to dangerous voltage or other hazards.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture and do not install this product near water. Keep the product 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 the housing, unplug the module immediately.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Using supplies or parts not meeting the product specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- Install the device in a place with adequate ventilation to avoid damage caused by overheating.
- Unplug the power when left unused for a long period of time.
- Information on disposal of devices: do not burn or mix with general household waste, please treat them as normal electrical waste.

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## 2. Introduction

The HDMI 2.0/12G-SDI Signal Generator (model: 500830-V2) is a portable test tool that can generate HD/3G/12G SDI and HDMI 2.0 test patterns in a full range of resolutions up to 4K@60Hz (4:4:4). The unit assists users in validating the capabilities and proper operation of their sink devices. The user may select from various test pattern, resolutions, refresh rates, color spaces and other related parameters. When used with the 500831 Signal Analyzer, a useful set of cable connectivity/quality tests, and device compatibility tests can be performed to help identify problems. The device is an exceptional tool at an attractive price for any AV engineer/developer, Integrator and installer.

The Signal Generator is a portable device which can be used anytime you need it and anywhere, making it an invaluable tool. The unit supports an internal rechargeable Lithium-ion battery, allowing the device to be operated autonomously for up to 5 hours per charge.

## 3. Features

- Supports HDMI up to 4K/60 & 3D, and 12G-SDI
- Supports RGB4:4:4, YUV4:4:4, YUV4:2:2, YUV4:2:0 & Deep Color
- Supports 37 preset patterns & 43 preset resolutions
- 3" LCD panel for pattern preview & menu settings
- Supports up to 7 audio channels
- Supports HDCP on/off, for testing HDCP 1.4 & 2.3
- Supports EDID management
- Locally or remotely managed via RS232 or USB
- Free Windows management software

## 4. Package Contents

- One (1) HDMI 2.0/12G-SDI Signal Generator
- One (1) 12VDC/3A Power Supply
- Two (2) Wall-mounting bracket
- One (1) USB Cable 1.2m
- One (1) User manual (available via download)

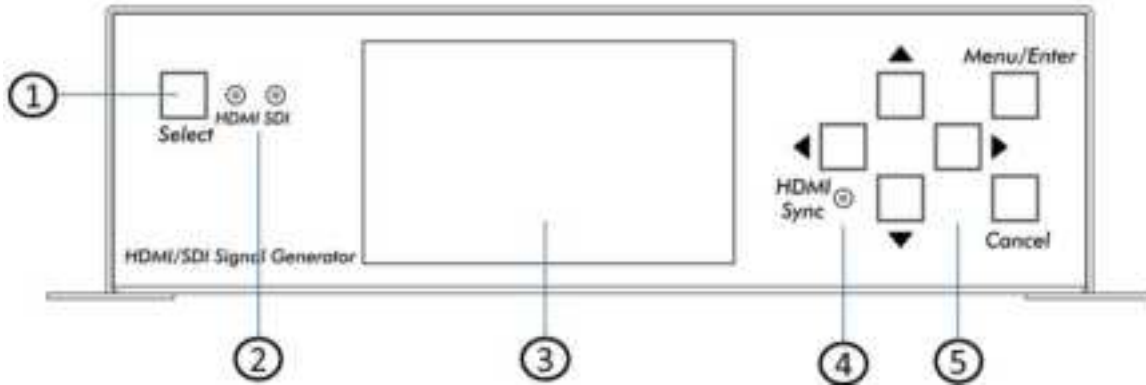
**Notes:** Confirm that the product and accessories are all included. If not, please contact the supplier from which you purchased the unit.

## 5. Specifications

Technical	
Environment	HDMI 2.0 and 12G-SDI
Devices	Testing projectors, monitors, and TV displays. Plus cable infrastructure when paired with 500831.
HDMI Signal Support	Up to HDMI 2.0/DVI
SDI Signal Support	HD-SDI, 3G-SDI and 12G-SDI
HDCP Support & Control	Supports HDCP 1.4 and 2.3, with Enable/Disable control
Video Bandwidth	Up to 18.0GHz (6.0GHz per channel)
Color Depth	24bits, 30bits, 36bits and 48bits
Color Space	RGB444, YUV444, YUV422, YUV420 (HDMI 2.0 only)
Resolution/Refresh Rate Presets	43 preset resolutions: VESA, 480p, 720p, 1080i, 1080p, 2160p, 4K, 720P-3D, 1080P-3D, ... Auto modes: one auto mode
User Defined Resolutions/Refresh Rates	10 configurable presets
Supported Patterns	37 preset patterns (36 2D pattern and one 3D pattern)
Audio Bit Depth	16bit, 20bit and 24bit
Audio Sample Rate	32KHz, 44KHz, 48KHz, 88KHz, 96KHz, 176KHz and 192KHz
Vertical Frequency Range	≤ 60Hz
Connectors	One (1) HDMI connector for HDMI video-out One (1) SDI (BNC) connector for SDI video-out One (1) 3.5mm connector for analog audio-in One (1) RS232 DB9 connector for management One (1) RS232 DB9 Connector for cascading management port One (1) USB connector for management One (1) 2.1mm barrel jack power connector
Power Source	One (1) 110/240VAC to 12VDC @ 3A power supply, with interchangeable blades for US, UK and EU. One (1) built-in (non-serviceable) rechargeable Lithium-ion battery supporting up to 5 hours of usage per charge. (Unit supports a power switch on rear. Battery charge duration may vary.)
Power Consumption	11W
Temperature	Operating: 0° to 40°C    Storage: -20° to 85°C Humidity: Up to 95% non-condensing
Enclosure	Metal
Dimensions	6.69 x 1.97" x 4.29" (170mm x 50mm x 109mm), not including connectors
Weight	2.80lbs (1.27kg), shipping weight
Compliance	Regulatory: FCC, CE, RoHS    Flammability: 94V0
Warranty	2 years
Order Information	500830-V2 HDMI 2.0/12G-SDI Signal Generator (UPC: 627699018309)
Companion Product	500831 HDMI 2.0/3G-SDI Signal Analyzer (sold separately)

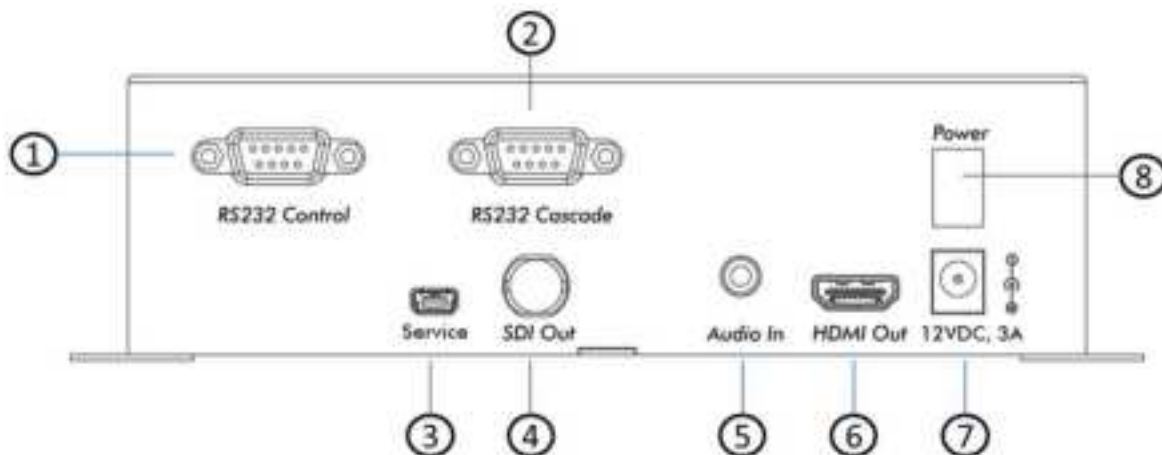
## 6. Product Panel Overview

### 6.1 Front Panel



1. HDMI/SDI mode select button
2. HDMI or SDI mode LED Indicator
3. 3 inch LCD panel. The display shows actually generated signals transmitted on the output port, as well as to control/navigation menus and device settings.
4. HDMI Sync Status LED. Shows the HDMI link status and is lit when the link is active. The LED will be off when the link is lost or the HPD is not present from the sink device. The link will blink if an EDID error exists.
5. Convenient and ergonomic buttons for operating and navigating menus and settings with Up, Down, Left, Right, Enter (Menu) and Cancel buttons.

### 6.2 Rear Panel



1. DB9 connector for RS232 control
2. DB9 connector for RS232 cascade, to another tester
3. USB port for control
4. SDI out
5. 3.5mm jack for 2CH analog audio in
6. HDMI out
7. 12VDC barrel socket
8. Power switch

## 7. Operation Control & Functions

1. For HDMI connections: Connect an HDMI cable from the Signal Generator to a TV or other HDMI sink device.
2. When managing the test via the Windows Control Software, connect the Windows PC RS232 port to the RS232 port on the Signal Generator.
3. The Signal Generator can be run on the internal battery, or can be run via an external power source, such as from the included power supply by connecting the power supply to the Signal Generator power socket.
4. The Signal Generator may be controlled via the Front Panel by using the ergonomic push buttons.
5. Be sure the HDMI Out LED is On. If this LED is Off, but the SDI Out LED is On, then press the 'Select' button to change to HDMI mode.

For SDI applications: Follow the same procedure as above, but select SDI mode, use SDI coax cable of appropriate grade, and ensure that the SDI Out LED is On. If this LED is Off, but the HDMI Out LED is On, then press the 'Select' button to change to SDI mode.

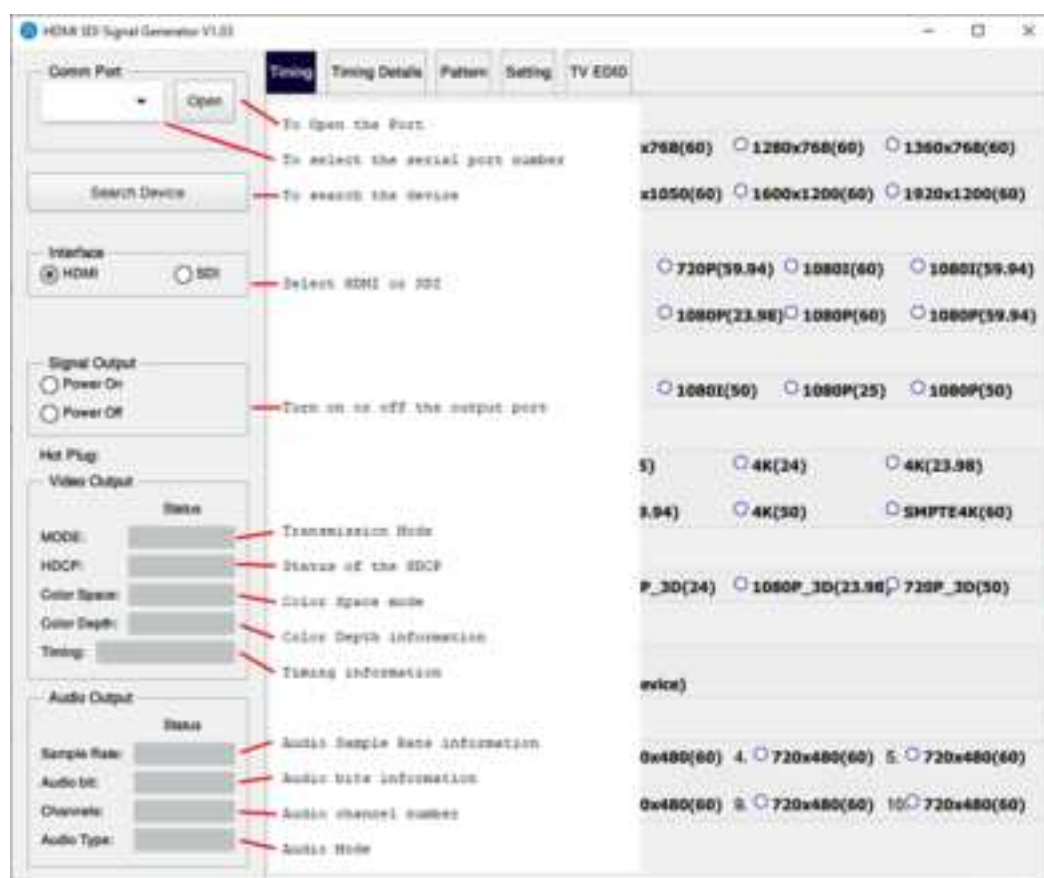


## 6. Menu mode:

- The 'Enter' key can operate as a MENU or Enter (Confirm) function key.
  - Press 'Enter' to activate Menu mode and display the various available menus. Menu mode will turn off automatically after 5 seconds of no input activity.
  - Press 'Cancel' to turn off Menu mode.
  - While in Menu mode the user can scroll through the various available menus.
    - Press 'Left' or 'Right' to change to the next or previous menu.
    - Press 'Up' or 'Down' to change settings within a given menu.
  - When in normal display mode (not in Menu mode)
    - Press 'Up' or 'Down' to change patterns.
    - Press 'Left' or 'Right' to change timing data.
7. The various available menus include the following: Video Resolution, Color Space, Color Depth, HDCP, HDMI/DVI, Audio Sample Rate, Audio Resolution, Audio Source, Audio channels, Output Standby, Network Settings, Save EDID, and Sink EDID Info.
8. Control the Signal Generator from a PC via RS232 or USB.

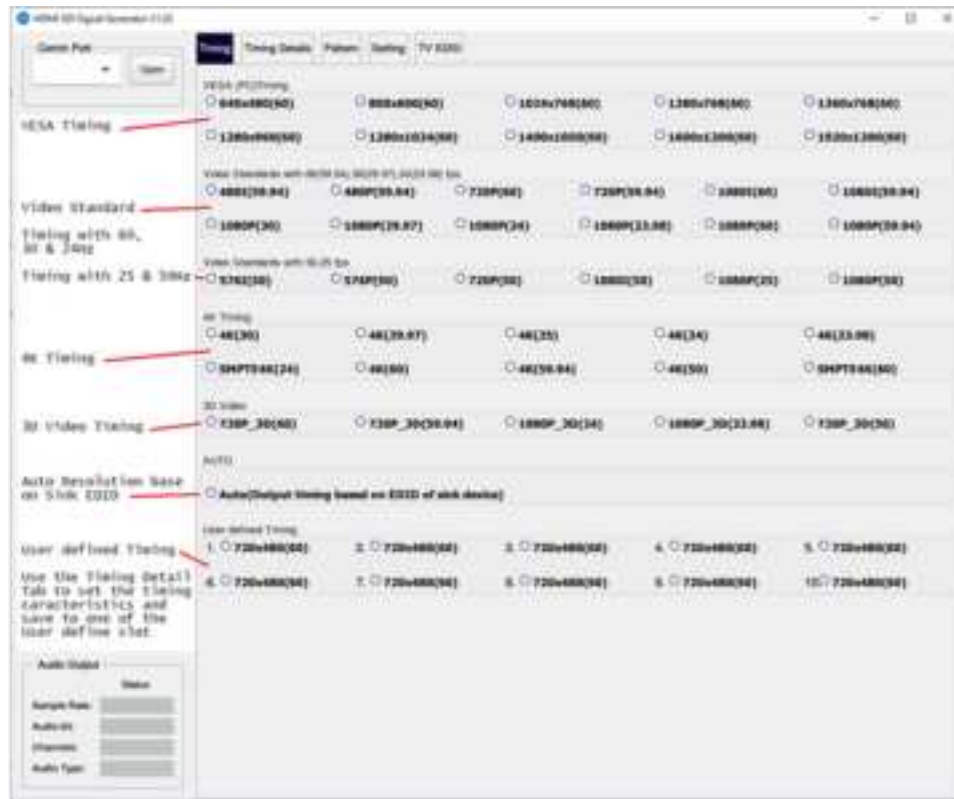
## a) Main menu (on left):

The main menu is located on the left portion of the screen, which allows for serial port selection, Auto Search machine function, Address Management function, Output port on/off and information via OSD showing video and audio parameters.

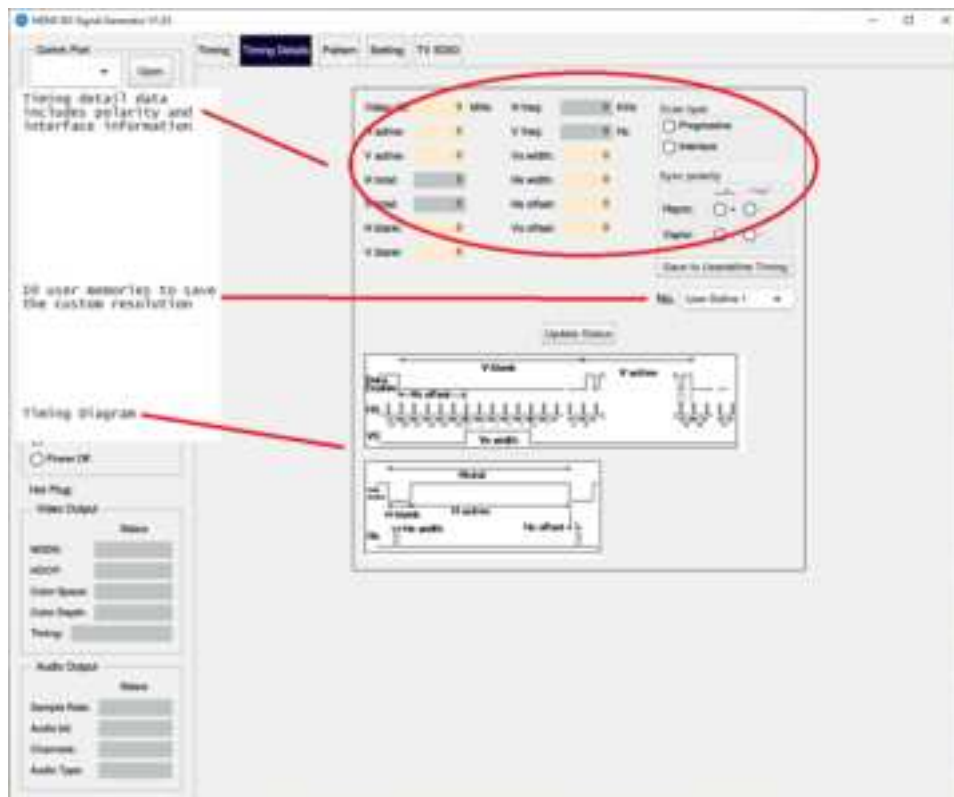




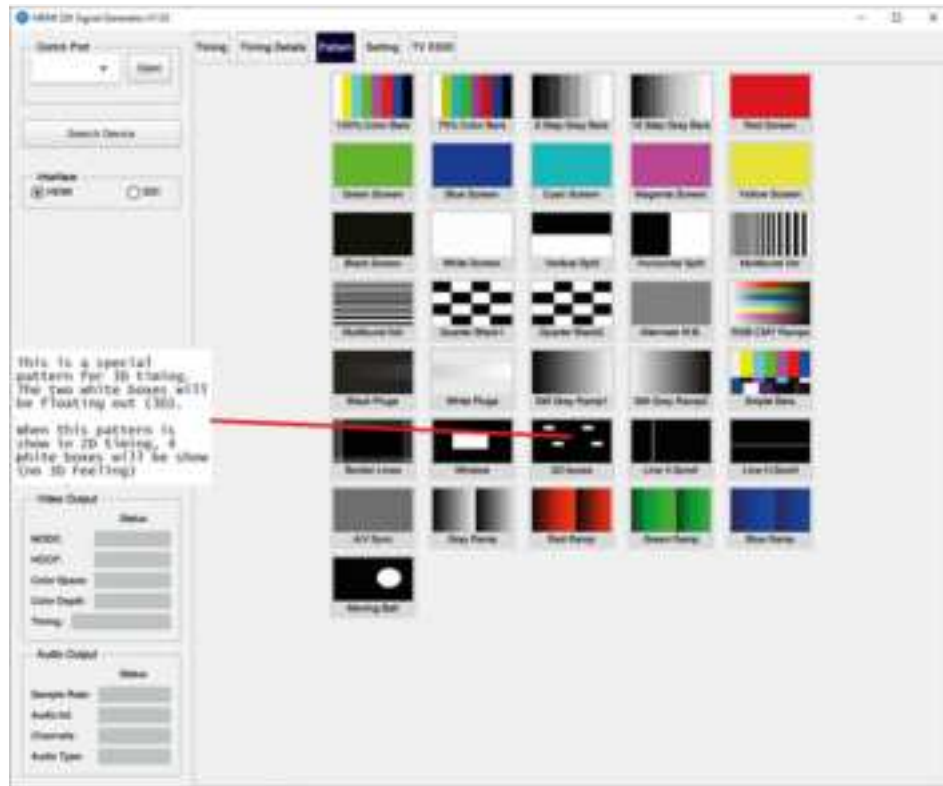
b) Timing control menu:



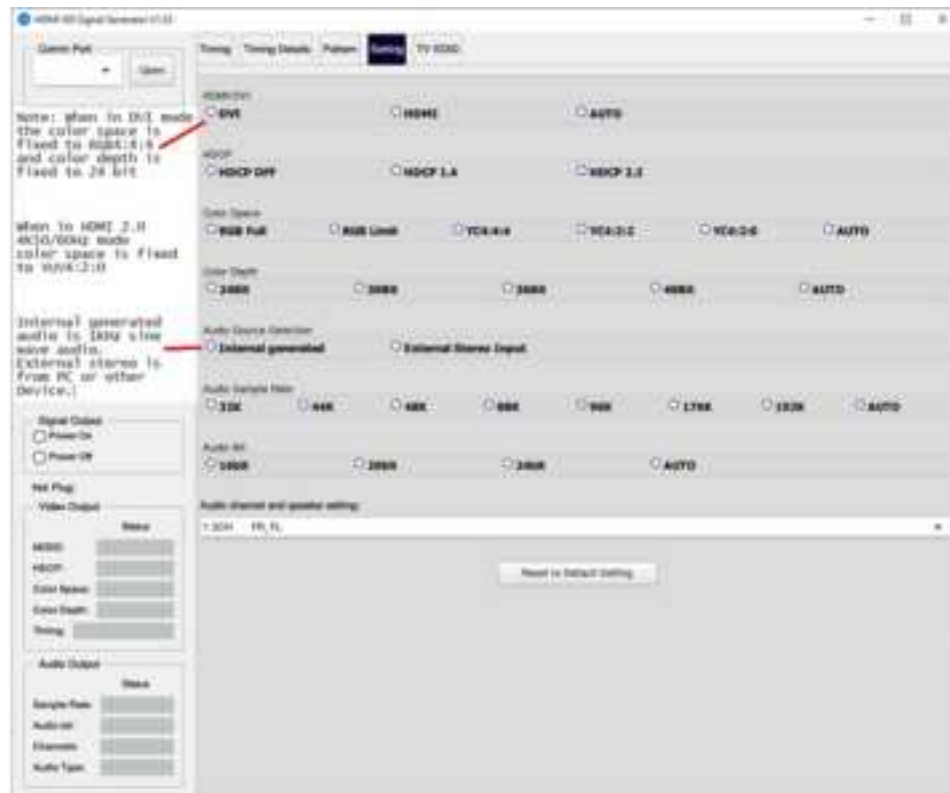
c) Timing detail menu:



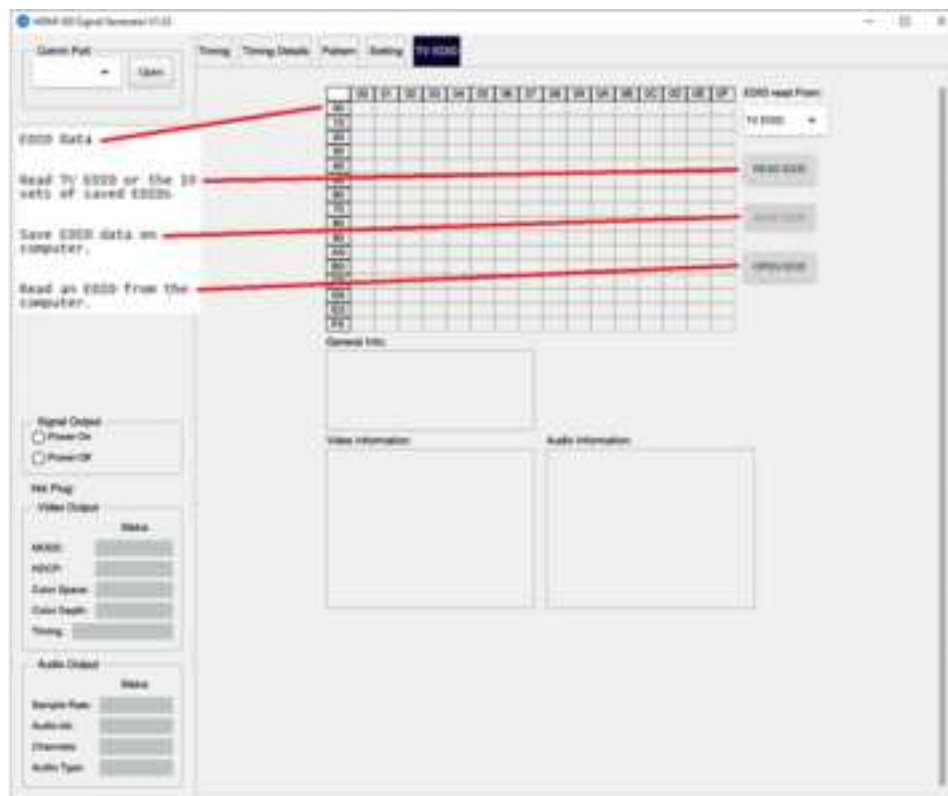
d) Pattern select menu:



e) Setting menu:



f) EDID management menu:



**Note:** The Signal Generator can save 10 sets of EDID data. This function is useful when the installer is in the field analyzing HDMI system problems.

g) SDI timing setting:



The Signal Generator can be used to set up a large test system. All Signal Generators and Signal Analyzers in a system can be cascaded by using the RS232 (3 pin) Phoenix connector. When more than one Signal Generator is connected on a single serial chain (Bus), these devices must have unique (different) identification address.

Each address can have a binding note, which has at most 10 characters. After the address table is saved, it can be selected via the address selector on the main menu.

## 8. USB Port Serial Driver Installation

For a Windows system, there is an executable available. Download executable file from the website: <http://www.ftdichip.com/Drivers/VCP.htm>

Execute the downloaded file 'CDM v2.12.00 WHQL Certified.exe' to install the driver for FTDI USB-UART.

Currently Supported VCP Drivers:

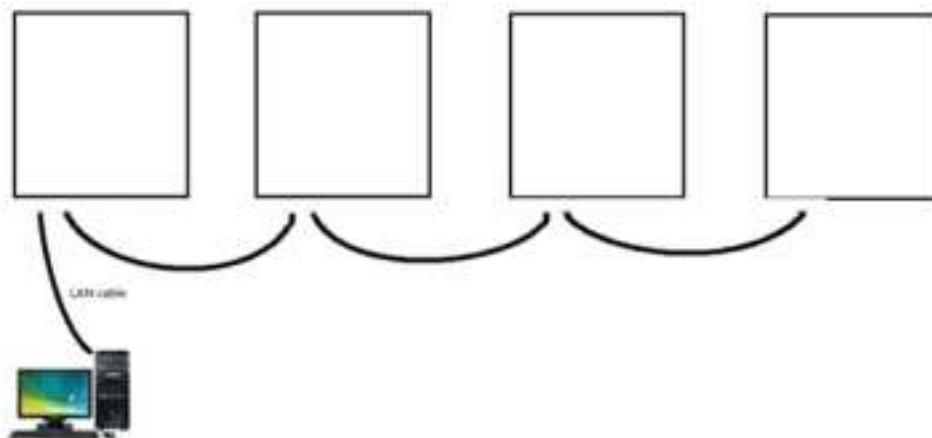
Operating System	Release Date	Processor Architecture							Comments
		x86 (32-bit)	x64 (64-bit)	PPC	ARM	MIPSII	MIPSIV	SH4	
Windows*	2014-09-29	2.12.00		-	-	-	-	-	2.12.00 WHQL Certified Available as setup executable <a href="#">Release Notes</a>
Linux	2009-05-14	1.5.0	1.5.0	-	-	-	-	-	All FTDI devices now supported in Ubuntu 11.10, kernel Refer to <a href="#">TN-101</a> if you need a custom VCP VID/PID
Mac OS X	2012-08-10	2.2.18	2.2.18	2.2.18	-	-	-	-	Refer to <a href="#">TN-105</a> if you need a custom VCP VID/PID
Windows CE 4.2-5.2**	2012-01-05	1.1.0.20	-	-	1.1.0.20	1.1.0.10	1.1.0.10	1.1.0.10	
Windows CE 6.0/7.0	2012-01-05	1.1.0.20 CE 6.0 CAT CE 7.0 CAT	-	-	1.1.0.20 CE 6.0 CAT CE 7.0 CAT	1.1.0.10	1.1.0.10	1.1.0.10	For use of the CAT files supplied for ARM and x86 builds re

Or download the driver files and install the FTDI USB-UART manually.

For other Operating Systems, you need to download the driver files and install the FTDI USB-UART manually.

## 9. Cascading the Control Bus

1. Connect the Signal Generator to an appropriate HDMI input port on a sink device (such as a display).
2. Connect the power supply to the unit. The unit can also operate on the internal battery.
3. The RS232 port or the USB port can be used for control.
4. There are two RS232 ports. The first RS232 port is used for control, while the second RS232 port is for cascading and can be used to connect to the next Signal Analyzer down-stream. In this way, many Signal Analyzers can be cascaded and controlled easily.



5. Set different Serial address for each Signal Generator and Signal Analyzer (if any).
6. On the first unit connect the RS232 Control port to the controlling PC and connect the RS232 Cascade port to the next down-stream Signal Analyzer or Signal Generator RS232 Control port, and so on.

## 10. Applications

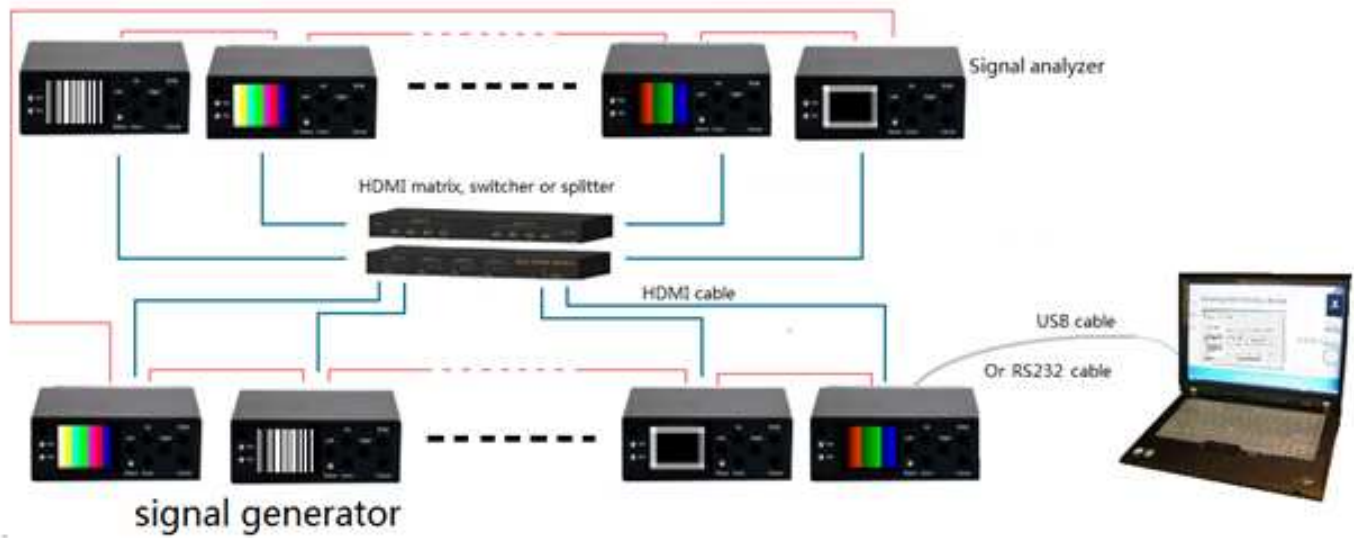
The HDMI 2.0/12G-SDI Signal Generator (500830-V2) is intended to be used to test HDMI sink devices, which may include HDMI or SDI matrix, switches, Switchers, splitters, TV sets, etc. (see figure below).



The HDMI 2.0/12G-SDI Signal Generator (500830-V2) also works with the HDMI 2.0/3G-SDI Signal Analyzer (500831), which is practical when testing devices placed between source and sink equipment, such as a matrix switches, switchers and splitters as shown below. This device pairing creates a flexible and powerful UHD test system. The test systems can be controlled via a single RS232 control port, since the RS232 signal can cascaded (daisy chained) across multiple testing devices (500830 & 500831 devices).

The combination of the HDMI 2.0/12G-SDI Signal Generator (500830-V2) and HDMI 2.0/3G-SDI Signal Analyzer (500831) provides the user with a sophisticated low cost UHD troubleshooting testing system. The setup can be used to analyze bit error levels, and for long term "Time /Event based sampling" tests that are extremely difficult to do by individual technician alone.

# HDMI 2.0/12G-SDI Signal Generator



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500830-V2

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