

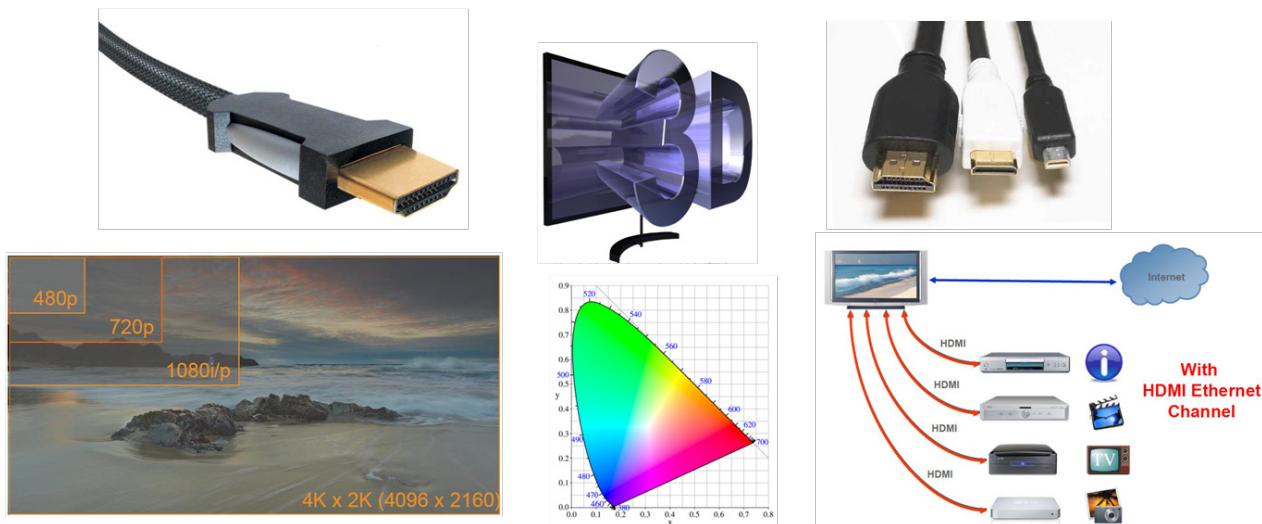
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### 1 What's new in HDMI 1.4a

HDMI 1.4a is the latest version of the HDMI standard adding new functionality including:

- Support for 3D over HDMI
- 4Kx2K video
- Additional color spaces
- HDMI micro connector for phones/portable devices, Automotive connection system
- HDMI Ethernet Channel – adding high speed IP networking over the HDMI cable
- Audio Return Channel - integrated upstream audio to a surround sound system



Agilent U4998A HDMI PAG is the replacement of N5998A. Per HDMI CTS guidelines, Agilent designates U4998A HDMI PAG module as N5998A replacement for HDMI Compliance Test.

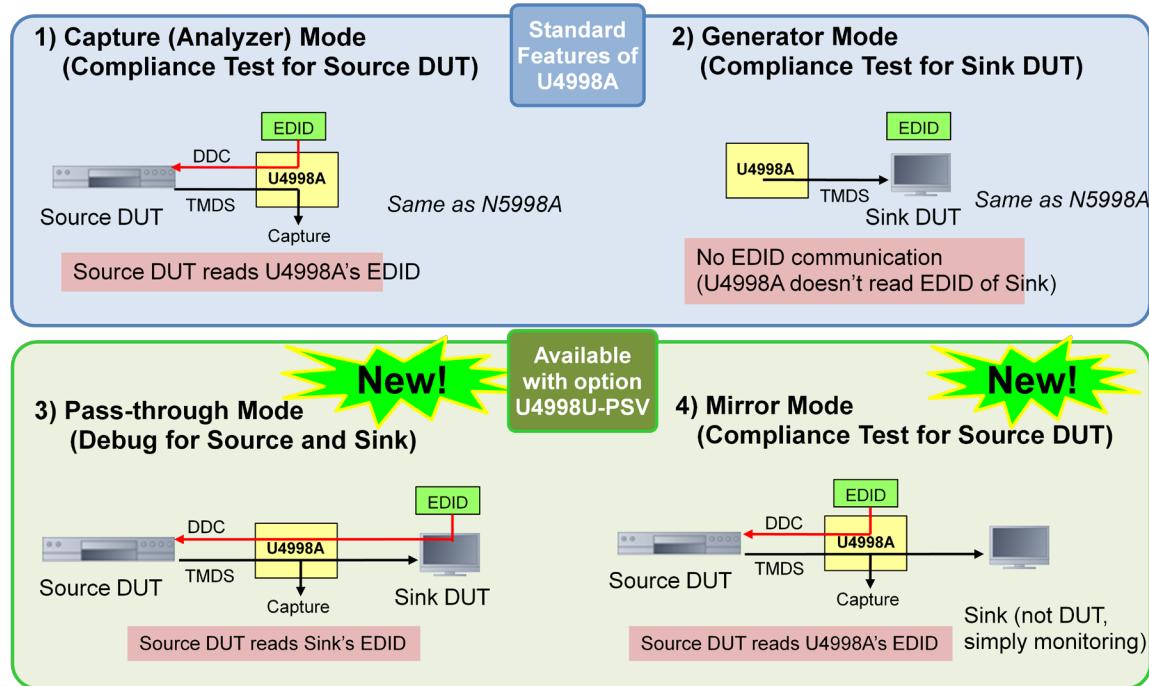
**N5998A PAG (DISCONTINUED)**  
Upgrades to 1.4a still available  
via N5998U



**U4998A Module + U4002A Chassis**



## 2 What's new in U4998A?



|   | N5998A HDMI PAG                     | U4998A HDMI PAG   |
|---|-------------------------------------|---|
| <b>HDMI Spec Support</b>                | HDMI 1.4a (via upgrade)             | HDMI 1.4a   |
| <b>Measurement Modes</b>                | Capture Compliance Generation       | Capture Compliance Generation<br><b>Passive Monitoring (via option)</b> |
| <b>Max Data Rate</b>                    | 2.25 Gbps                           | <b>3.4 Gbps</b>   |
| <b>4k x 2k, VIC 63 &amp; 64 Support</b> | No                                  | Yes   |
| <b>Frequency Counter</b>                | Requires external frequency counter | Automatic frequency detection   |
| <b>Hot Plug Detect</b>                  | No                                  | Yes   |
| <b>Remote programming via COM</b>       | Yes                                 | Yes   |
| <b>Host PC Connection</b>               | USB                                 | PCIe  |
| <b>Host PC Operating System</b>         | Windows XP                          | Windows XP or 7   |

### 3 U4998A Literatures

| Title  | Type  | Link Address  |
|--|---|---|
| U4998A Preliminary Data Sheet ( <b>Non-Public Info</b> ) | Preliminary Data Sheet  | <a href="ftp://wcosp03.cos.agilent.com/field/U4998A%20HDMI%20PAG/">ftp://wcosp03.cos.agilent.com/field/U4998A%20HDMI%20PAG/</a>   |
| U4998A Internal and Customer Presentation                | Presentation Slides   |   |
| U4998A Installation Guide                                | Installation Guide  | <a href="#">Download</a>  |
| U4998A User's Guide                                      | User's Guide  | Refer to LA Help file under U4998A  |
| AMP or AXIe Info   | Tested Computer List, Installation Guide, Firmware upgrade user's guide, and etc.       | <a href="ftp://wcosp03.cos.agilent.com/field/AXIe%20and%20AMP%20Main%20Frame%20Info/">ftp://wcosp03.cos.agilent.com/field/AXIe%20and%20AMP%20Main%20Frame%20Info/</a>   |
| U4998A Software  | LA software (LA Matrix Software for connection purpose) + PAG software (HDMI Evaluator) | <a href="http://www.home.agilent.com/agilent/editorial.jspx?cc=US&amp;lc=eng&amp;ckey=1000000953:epsg:sud&amp;nid=-536902443.0.00&amp;id=1000000953:epsg:sud">http://www.home.agilent.com/agilent/editorial.jspx?cc=US&amp;lc=eng&amp;ckey=1000000953:epsg:sud&amp;nid=-536902443.0.00&amp;id=1000000953:epsg:sud</a> |

### 4 U4998A HDMI PAG Demo Setup Overview

#### Live Demo Requirements:

##### Hardware

1. U4002A + U4998A x 1
2. U4002A-EXP (Express card adapter) x 1
3. U4002A-2MC (PCIE Cable) x 1
4. Either video camera (supplied by division) or LCD Monitor/TV with HDMI input

##### Software

1. Logic Analyzer software version, V5.00 or higher
2. U4998A HDMI Video/Audio Generator Files, V5.00 or higher

## 5 DO and DON'T

### 5.1 DO

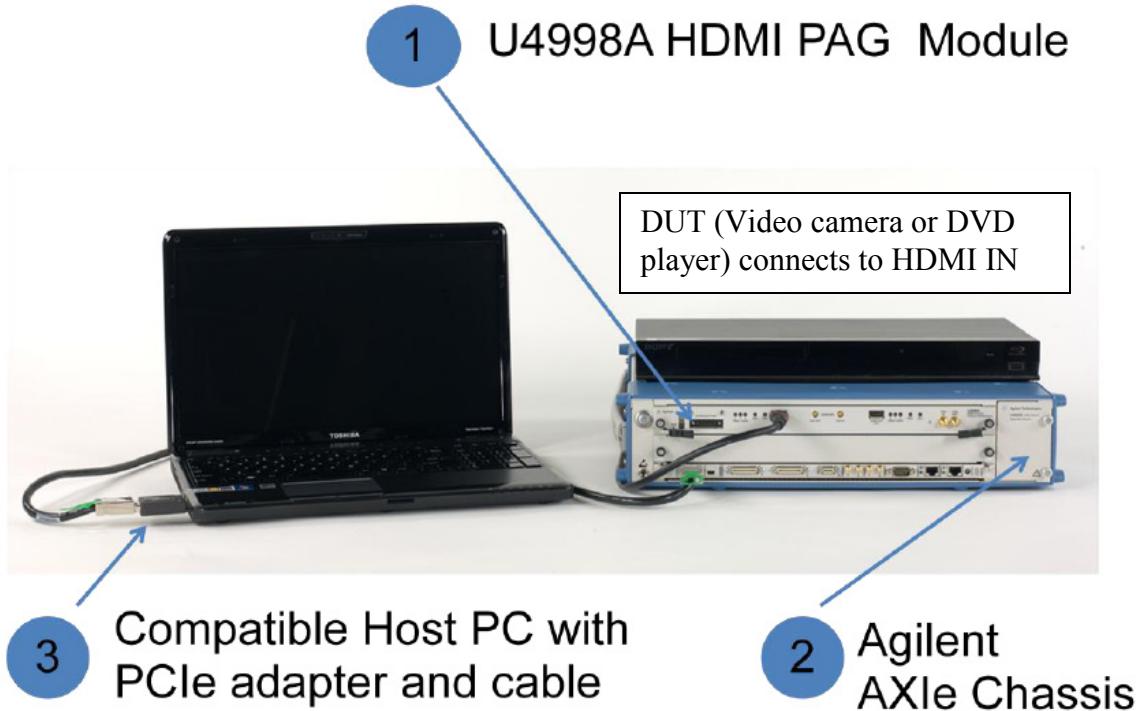
- Make sure all the firewall and security software are shutdown or turned off, else you couldn't get the connection
- Make sure you read the user's guide since there are 2 pieces of software, Agilent LA Matrix Software (use to setup the connection, capture and upload the file) and HDMI Evaluator (ONLY the 2<sup>nd</sup> tab: HDMI Evaluator is using).
- Power on sequence. After the front GREEN LIGHT turned on, wait for 2 minutes then only power on your PC. If not, the PC won't recognize your U4002A + U4998A as a system. There will be a green round light showing in the right bottom corner on your PC if your frame is successfully connected. If your PC boot up time is slow, then you may have to restart the logic service under Administrative Tools→Services→Agilent Logic Analysis.
- Make sure you have your laptop with you. We have tested all the Agilent laptop models, all models work with U4002A frame. Just in case your customer PC won't work (it might caused by BIOS), then you can use your PC to connect and troubleshoot.
- **LAN cable is needed.** Just to get ready if you fall into the upgrade process. Sometime, the system requires the firmware upgrade if you received the old module/frame. Do download all the necessary info at <ftp://wcosp03.cos.agilent.com/field/AXIe%20and%20AMP%20Main%20Frame%20Info/>.

### 5.1 DON'T

- Don't press any button in the HDMI Protocol Analyzer software except the buttons on HDMI Evaluator in the second tab, else it will crash your system.
- Do not forget to pack all the items after your demo. The items included:
  1. U4002A + U4998A x 1
  2. U4002A-EXP (Express card adapter) x 1
  3. U4002A-2MC (PCIE Cable) x 1
  4. Toshiba Video Camera x 1
  5. HDMI cable (connect between video camera and U4998A) x 1
  6. Video Camera Power adapter x 1

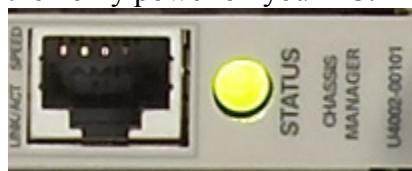
## 6 Capture Demo Guide

6.1 Connect your hardware according to the figure shown in below.

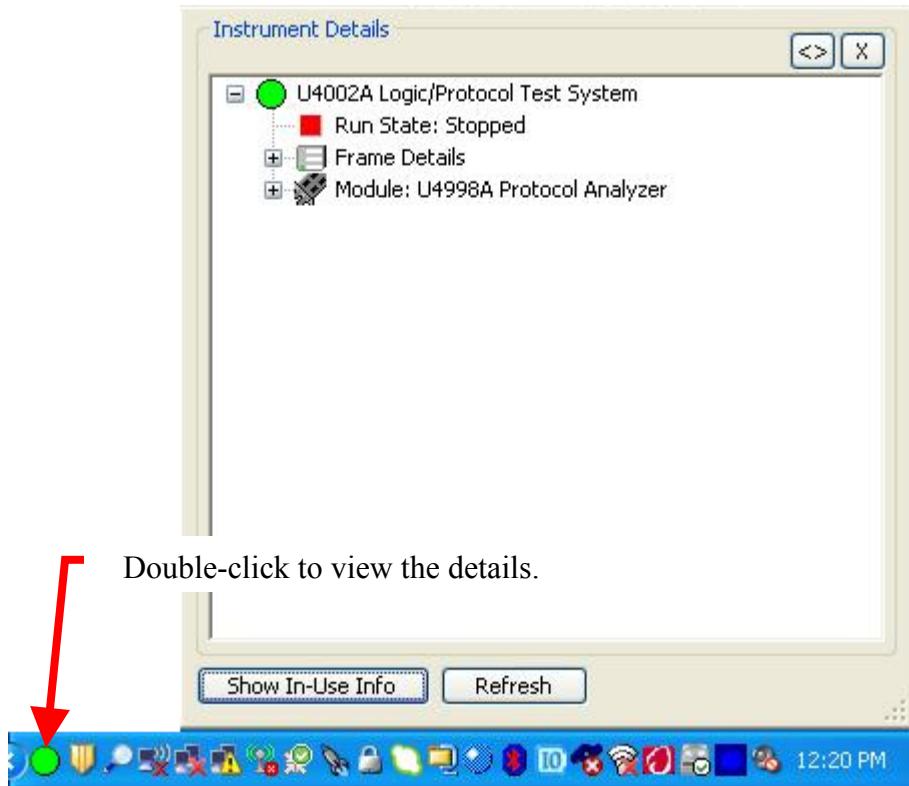


6.2 Power on the system but keep the Host PC remaining off.

6.3 **IMPORTANT STEP.** After the front green LED turned on, wait for 2 minutes then only power on your PC.

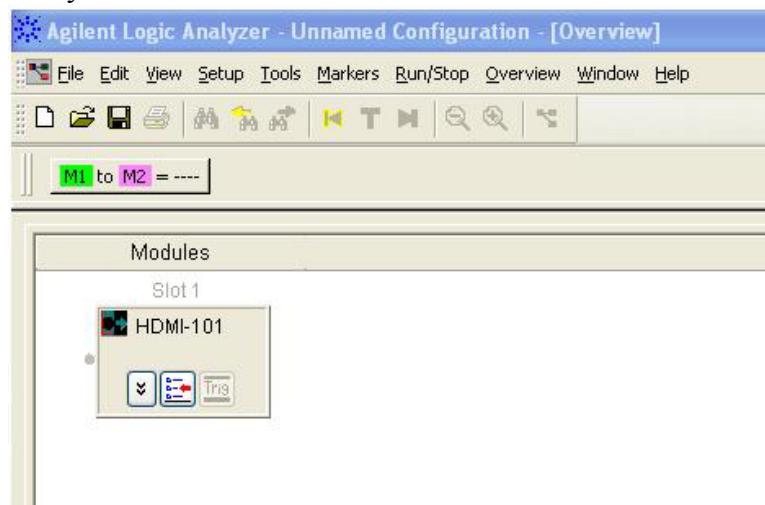


6.4 There will be a green round light showing in the right bottom corner on your PC if your frame is successfully connected. Double-click to view the instrument details.

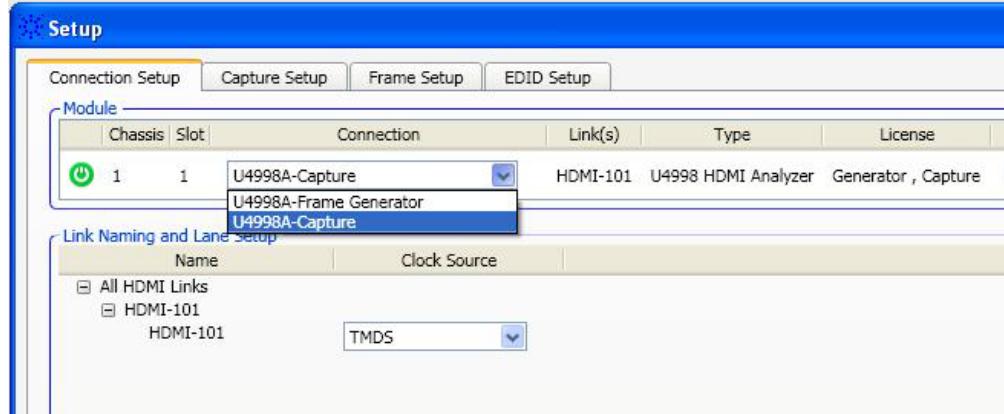


6.5 Click **Start > Programs > Agilent Logic Analyzer > Agilent Logic Analyzer** option on the Windows task bar.

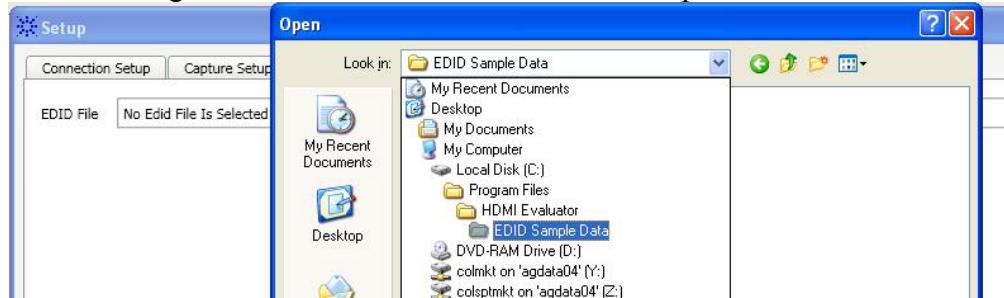
6.6 Click the **HDMI** module displayed in the **Overview** window of Logic Analyzer GUI.



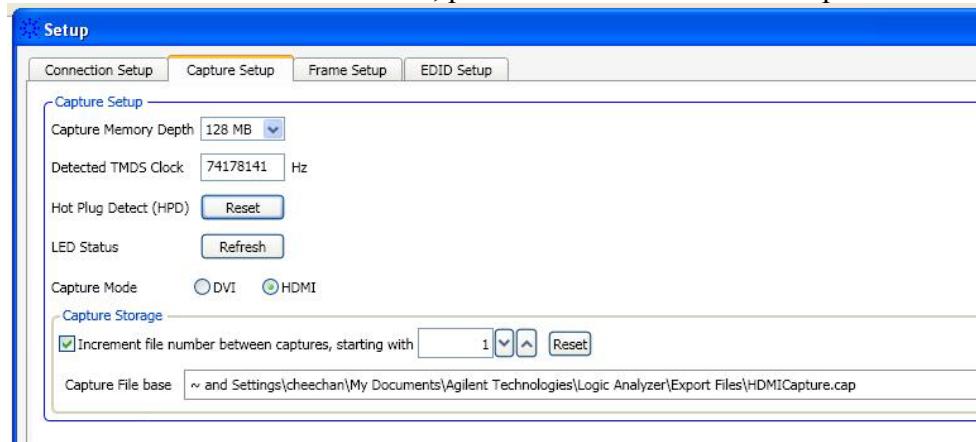
6.7 Select **Setup > Setup** from the menu displayed on clicking the HDMI module. Select U4998A-Capture from the connection and click ‘Apply’ button to complete the connection setup.



6.8 Click on the ‘EDID Setup’ tab, and select the EDID file named ‘EDID01.edi’ under C:\Program Files\HDMI Evaluator\EDID Sample Data.



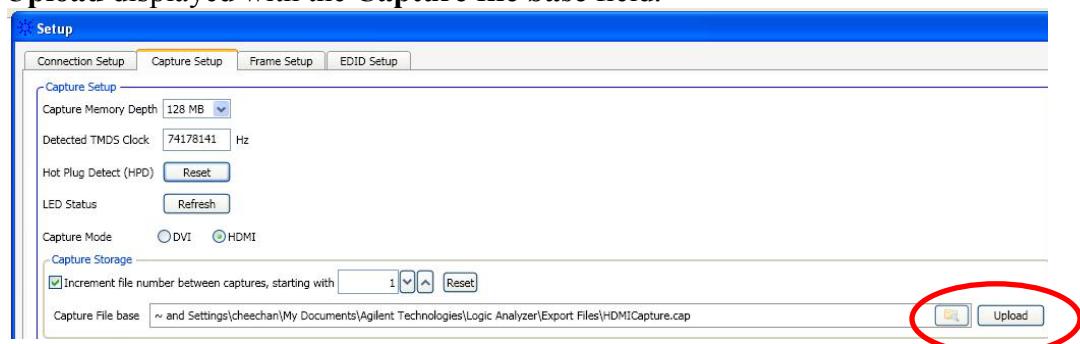
6.9 Click on the ‘Capture Setup’ tab to define the memory depth, the maximum memory size is 4GB. You will notice the TMDS clock is detected when your device (video camera or player) is connected. Press the ‘Reset’ button to make sure the connection is reset. Then, press ok to terminate the setup.



6.10 Press the  Run button to start capture the signal.

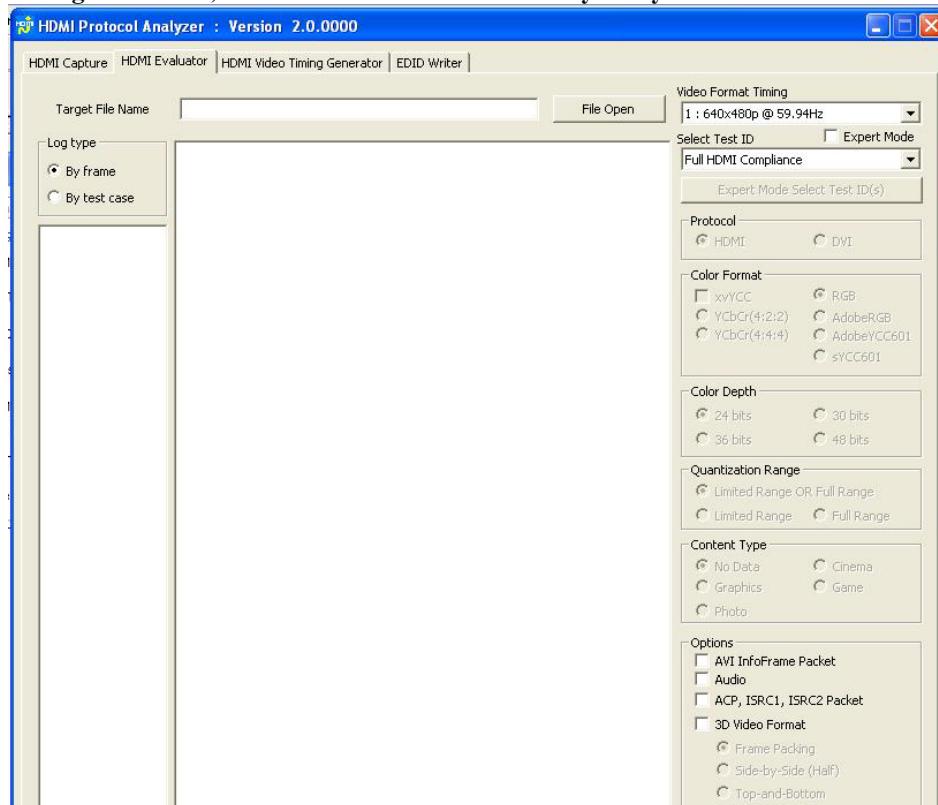
**Note:** The TMDS data channel LEDs for the HDMI IN connector on the front panel of U4998A turns green indicating the start of capture. If the LEDs turn orange, it indicates the reception of HDMI data but the three TMDS data channels are not aligned. The LEDs turn red if non HDMI data is received.

6.11 Once again, back to the **Setup** dialog box to upload the captured file. Click **Upload** displayed with the **Capture file base** field.



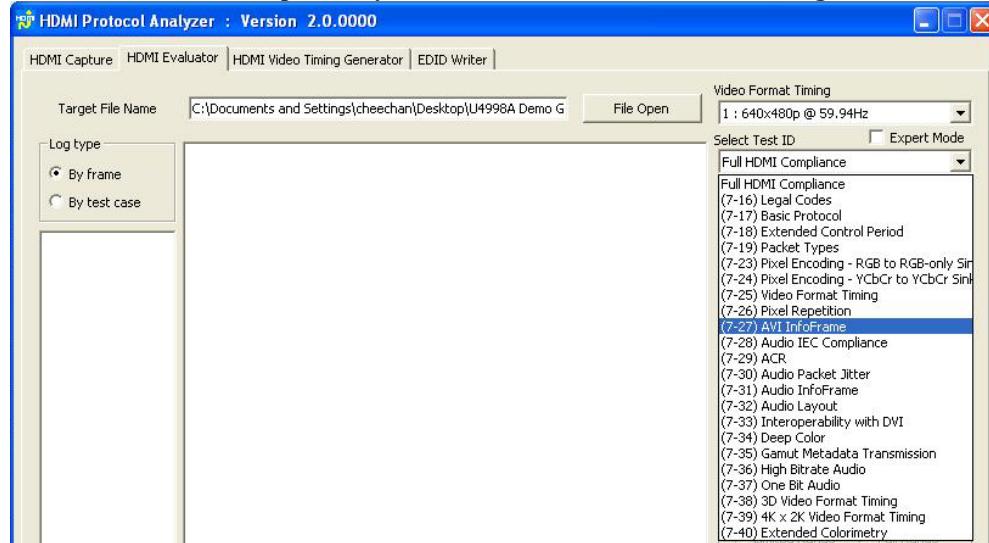
6.12 Open the 'HDMI Evaluator' software, go to **Start > All Programs > HDMI Evaluator**.

**Note:** DO NOT use the rest of the features including HDMI Capture, HDMI Video Timing Generator, and EDID Writer. It will crash your system.



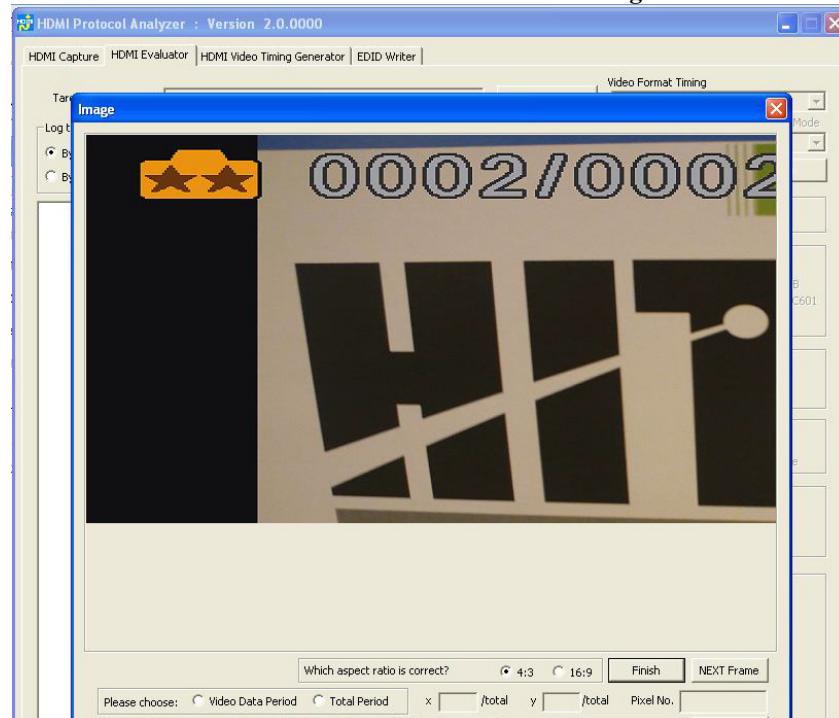
6.13 Select the uploaded file by clicking the 'File Open' and select the 7-27 Test ID for the initial startup.

**Note: 7-27 test case will provide you the frame information such as image resolution.**

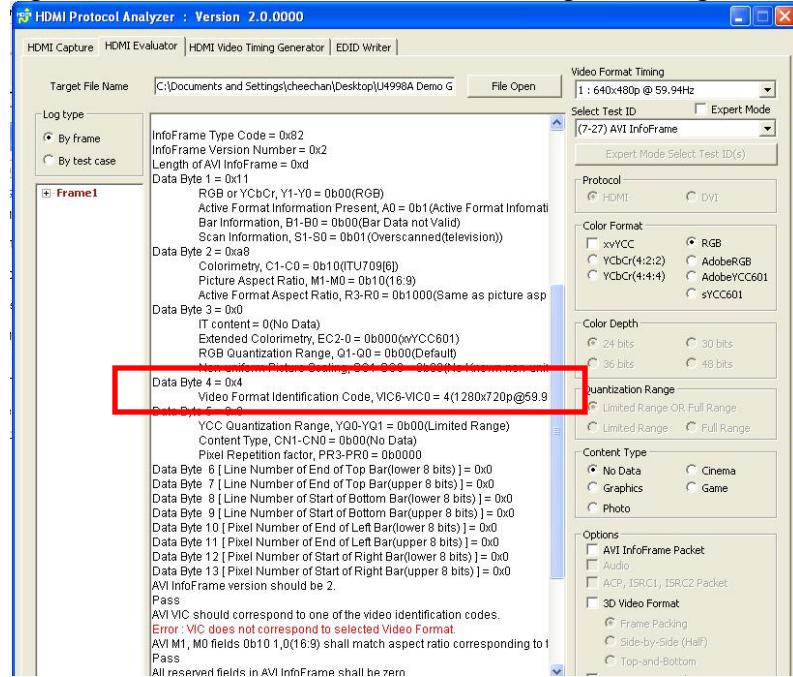


6.14 The HDMI Evaluator will display the captured image, however the resolution setting defined in the 'Video Format Timing' is offset from the original.

**Note: The only way to kill the Image screen is select the '4:3' or '16:9' option, then click on the 'Finish' button. If you have multiple frames such as you capture the video stream, then click on 'Next Frame' button to view the next image.**



6.15 The actual image resolution will be shown in the result as highlighted in the figure below. Select the video format timing according to the result.



6.16 The image will fit the display window if the resolution is selected correctly.



## **7 Generation Demo Guide**

- 7.1 Connect the Sink device HDMI Input to the U4998A HDMI Output.
- 7.2 Following the instruction in Agilent Logic Analyzer Help > U4998A HDMI 1.4a > Testing a HDMI Sink Device.