User Guide
980 HDMI Protocol Analyzer Module
HDMI Sink & MHL Sink/Dongle Compliance Tests

Rev: A4

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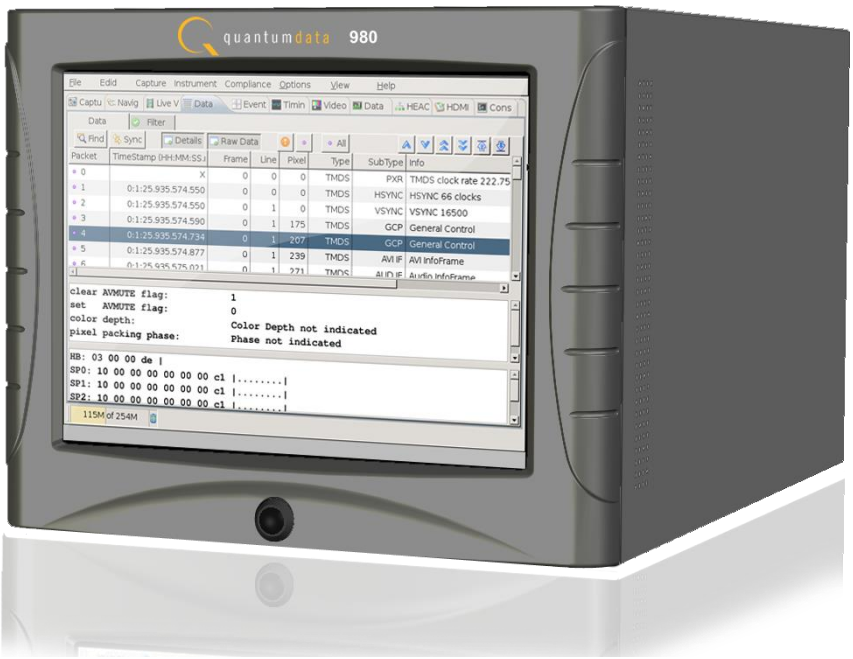
1 About the 980 Protocol Analyzer module

This chapter provides an overview of features of the 980 HDMI Protocol Analyzer and the 980 GUI Manager. The 980 HDMI Protocol Analyzer is an analyzer for HDMI/MHL source devices. It provides deep visibility into the HDMI/MHL protocol to help resolve common interoperability problems in HDMI/MHL systems. The 980 GUI Manager is a PC application to manage and use the 980 HDMI Protocol Analyzer module and other 980 modules.

The 980 HDMI Protocol Analyzer module is able to parse HDMI streams from source devices with a TMDS clock and pixel clock up to 297MHz.



1.1 What makes the 980 HDMI Protocol Analyzer Module Unique?

The 980 HDMI Protocol Analyzer for HDMI or MHL source devices provides full visibility into the protocol, timing, control and auxiliary data. It captures and decodes encrypted or unencrypted metadata (audio sample, infoframes and other data packets) as well as DDC transactions and CEC messages (C-Bus transactions for MHL).

Competitive “analyzers” available on the market are more limited because they utilize commercial silicon chips. The 980 HDMI Protocol Analyzer module uses a proprietary solution and therefore can provide much greater visibility into the protocol, timing and control data. The competitive “analyzers” support some of the 980 HDMI Protocol Analyzer features but not nearly all of them. They support functional testing but not true interoperability testing. Functional test “analyzers” often support only real time monitoring. The 980 HDMI Protocol Analyzer supports capture and store as well as Real Time monitoring.

For these same reasons, the 980 HDMI Protocol Analyzer module can support all of the tests in the HDMI and MHL source protocol compliance test specification. Functional test instruments cannot. For example, the 980 HDMI Protocol Analyzer supports all the Protocol source tests in Test 7-17 of the HDMI Compliance Test Specification and the Protocol Tests in the section 3.2.2.2 in the MHL Compliance Test Specification related to control periods, preamble and guard bands. Similarly the 980 HDMI Protocol Analyzer module can measure the audio sample rate precisely and therefore measure audio jitter correctly. Functional test instruments cannot support these tests correctly.

1.2 Scope of this User Guide

This User Guide provides descriptive and procedural information on the HDMI sink & MHL sink/dongle compliance test options.

Although you can run the compliance tests through the 980 HDMI Protocol Analyzer's "embedded GUI," all the examples used in the procedures in this document are taken from the external standalone PC 980 GUI Manager. The procedures are identical between the embedded GUI running through the 980 front panel display and the external standalone PC application but the look and feel is slightly different.

Note: There is a separate user guide for the HDMI and MHL source compliance tests. This HDMI compliance test user guide can be found on the Quantum Data website.

The following is a list of the User Guides available for the 980 systems:

- 980 HDMI Protocol Analyzer Gen 3 System – This User Guide covers source analysis testing for HDMI and MHL source devices as well as various transmitter features. This user guide is specifically for the functions of the 980 HDMI Protocol Analyzer Gen 3 system sold through 2012.
- 980 Advanced Test Platform Quick Start Guide – This Quick Start Guide covers startup procedures for the 980/980B platform. Used in conjunction with the 980 HDMI Protocol Analyzer Module User Guide and the Source and Sink Compliance test User Guides.
- 980 HDMI Protocol Analyzer module – This User Guide covers source analysis testing for HDMI and MHL source devices as well as various transmitter features. This user guide is specifically for the functions of the 980 HDMI Protocol Analyzer module equipped in one of the 980 Advanced Test Platform slots (980 Gen 3 or 980B). Used in conjunction with the 980 Advanced Test Platform Quick Start Guide.
- 980 HDMI Protocol Analyzer HDMI/MHL Source Compliance Test – This User Guide covers source compliance testing for both MHL and HDMI sources. These compliance test applications are provided by the 980 HDMI Protocol Analyzer module or the 980 HDMI Protocol Analyzer Gen 3 system. Used in conjunction with the 980 Advanced Test Platform Quick Start Guide.
- 980 HDMI Protocol Analyzer HDMI/MHL Sink Compliance Test – This User Guide covers sink compliance testing for both MHL and HDMI sinks (and MHL dongles). These compliance test applications are provided by the 980 HDMI Protocol Analyzer module or the 980 HDMI Protocol Analyzer Gen 3 system. Used in conjunction with the 980 Advanced Test Platform Quick Start Guide. (This User Guide.)
- 980 MHL CBUS Compliance Test Module - This User Guide covers MHL CBUS compliance testing for both MHL sources as well as sinks and dongles. This compliance test applications are provided by the 980 CBUS Compliance Test module. Used in conjunction with the 980 Advanced Test Platform Quick Start Guide.
- 980 HDMI Video Generator module – This User Guide covers the features and functions offered by the 980 HDMI Video Generator module. Used in conjunction with the 980 Advanced Test Platform Quick Start Guide.

1.3 Changes to this User Guide

The following changes were made to this document:

- Updated to include procedures for MHL 1.3 and 2.1 compliance support.
- Updated to include new 980 GUI Manager screens.

Note: Please be sure to check the Quantum Data website for updates to this User Guide.

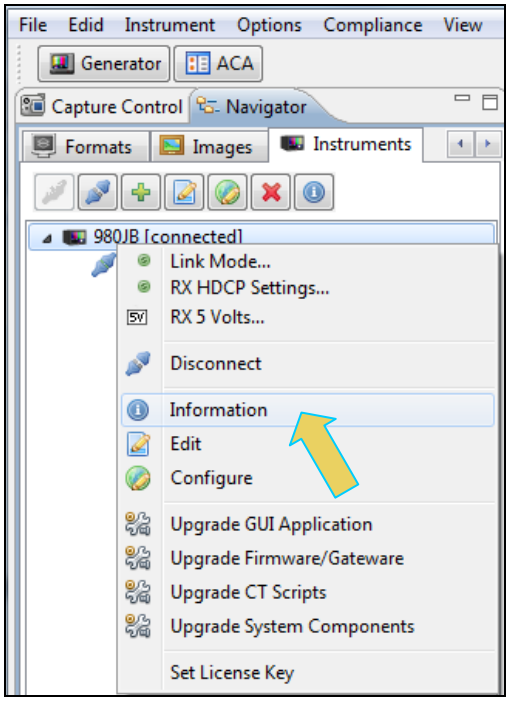
1.4 What options are available with the 980 HDMI Protocol Analyzer module?

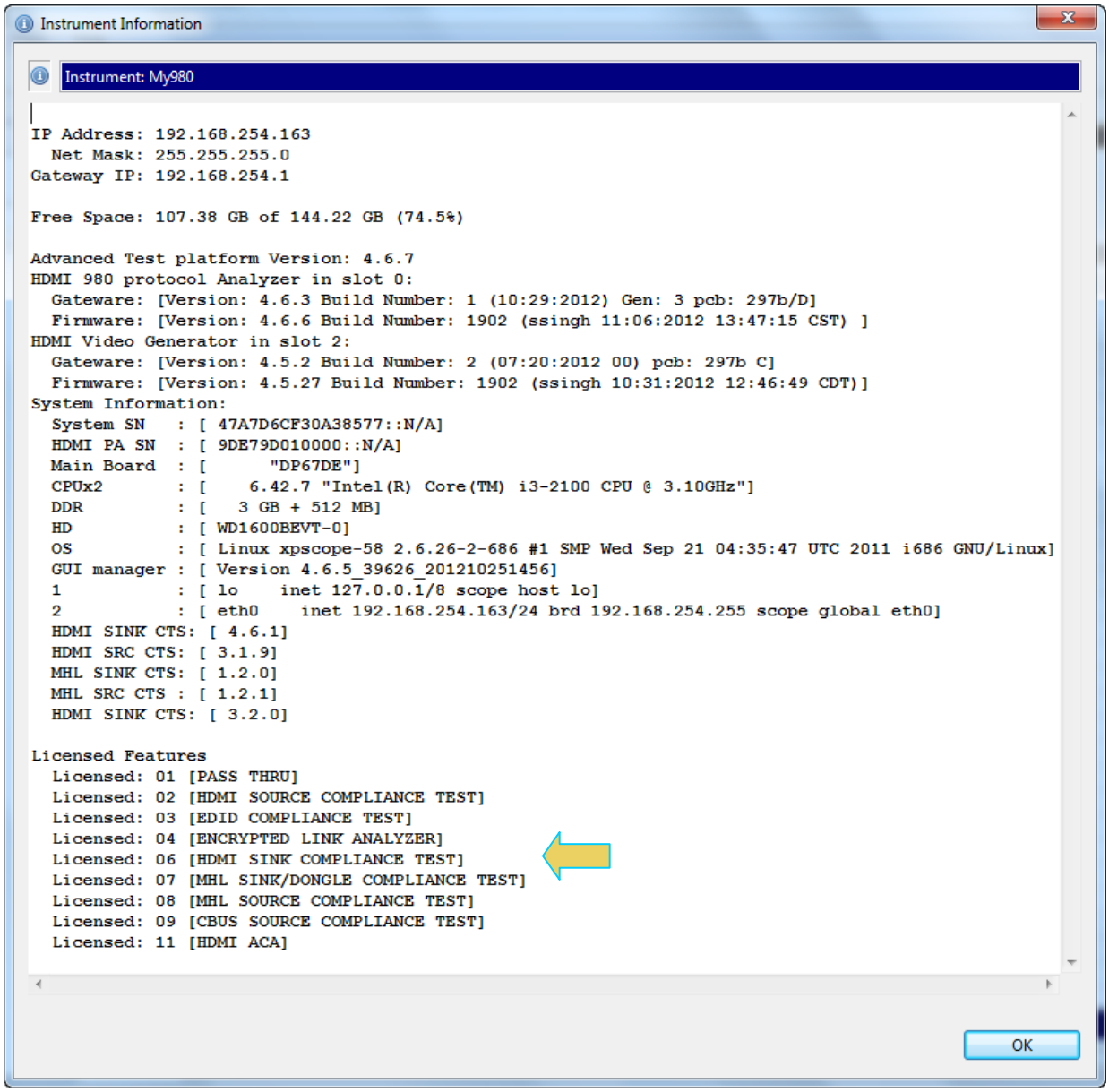
There are six (6) options that you can purchase with the 980 HDMI Protocol Analyzer module. You must have a license to use these options:

- Encrypted Link Analyzer mode for monitoring encrypted data between an HDMI source and sink device.
- HDMI Source Compliance tests in accordance with HDMI 1.4 CTS Sections 7.4 through 7.8.
- EDID Compliance test in accordance with Sections 8.2 and 8.5 of the HDMI 1.4 CTS.
- HDMI Sink Compliance tests in accordance with HDMI 1.4 CTS Sections 8.2 and 8.4 through 8.8.
- MHL Source Compliance tests in accordance with MHL 1.2, 1.3, 2.0 & 2.0 CTS Section 3.
- MHL Sink/Dongle Compliance tests in accordance with MHL 1.2, 1.3, 2.0 & 2.1 CTS Sections 4 and 5.

The MHL Sink/Dongle Compliance test suite requires the Quantum Data 882E or 882EA instrument, release 2.25.0 or later which uses firmware version 20.1887600.

You can determine what options the 980 HDMI Protocol Analyzer module is provisioned with by looking at the label on the bottom of the 980 HDMI Protocol Analyzer module or by accessing the Instrument Information screen on either the built-in or external 980 GUI manager. Refer to the following screens. When using the external 980 GUI Manager you must be connected to the 980 HDMI Protocol Analyzer module in order to read the Instrument Information.





1.5 980 User Interface

The 980 HDMI Protocol Analyzer provides a graphical user interface for operation. This GUI can run both on the 980 itself through the built-in color touch screen display or as a standalone application running on a PC. The look and feel and functions are similar but not identical. There are two key features that are not available in the external 980 GUI Manager GUI however: 1) viewing the incoming video stream, 2) viewing the video/audio metadata and auxiliary transactions in real time using the **Real Time** mode.

1.5.1 External 980 GUI Manager

The external 980 GUI Manager provides easy access to the captured data on your PC for sharing with others. Also the external 980 GUI Manager enables you to operate the 980 HDMI Protocol Analyzer module through a larger interface which allows you to use multiple panels at the same time.

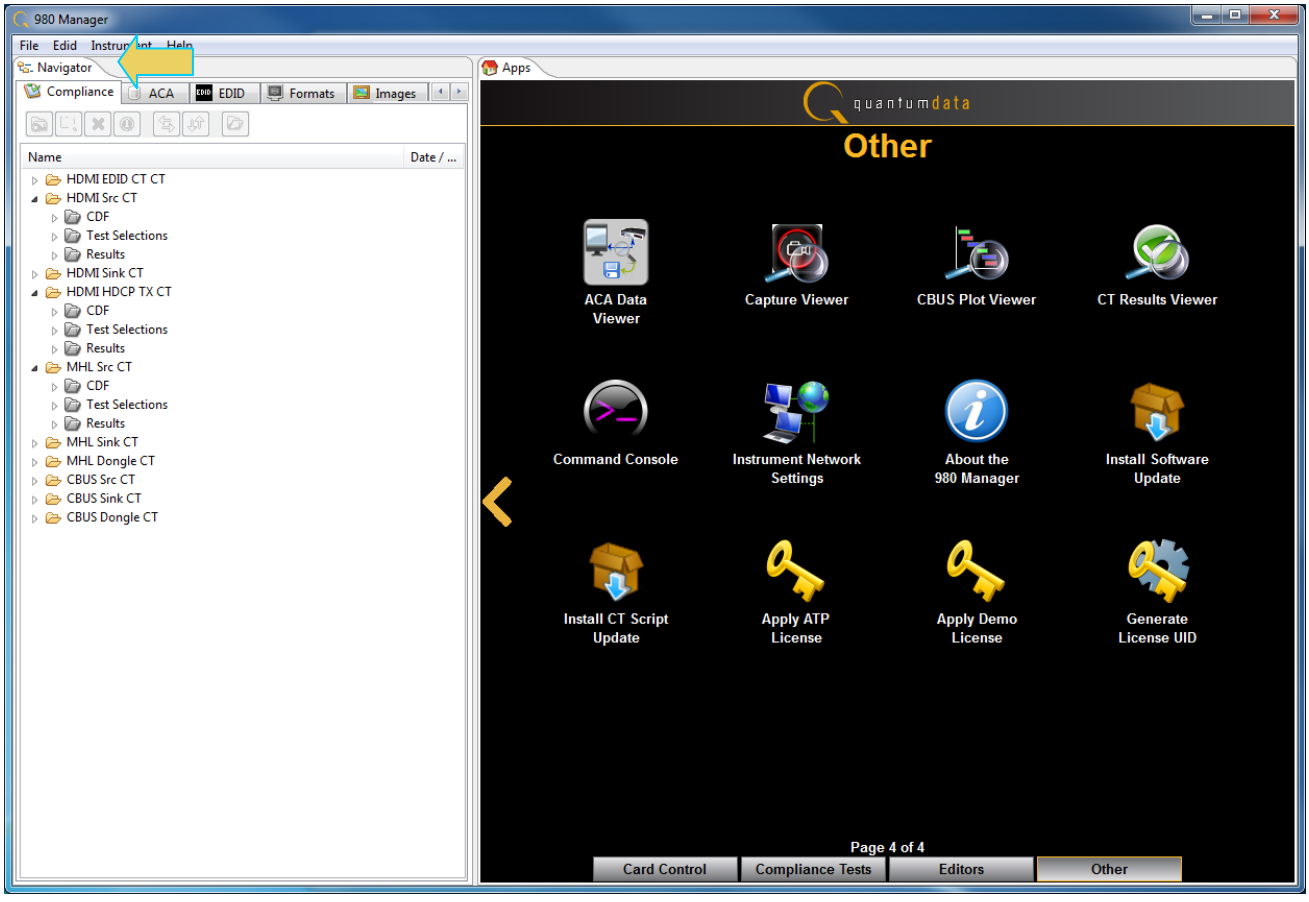
1.5.2 Embedded 980 GUI Manager

You can operate the 980 HDMI Protocol Analyzer module fully through the built-in color touch screen display. In addition to the basic operation of the 980 HDMI Protocol Analyzer the touch screen display GUI there are two key features that are only available in the embedded 980 GUI Manager GUI: 1) viewing the video in real time, 2) viewing the MHL video/audio metadata and DDC (MHL C-Bus) transactions in real time using the **Real Time** mode. You can view the incoming video from a source even when encrypted with HDCP content protection. The ability to view the incoming video also enables you to control the menus of the HDMI and MHL source device to ensure that it is in the correct mode. The built-in GUI also enables you to view the HDMI and MHL video metadata and DDC and MHL C-Bus transactions in real time, as they are being captured, using the **Real Time** mode.

You can transfer data captures taken from the built-in touch display to your PC where they can be viewed through the external 980 GUI Manager and also disseminated to others for analysis.

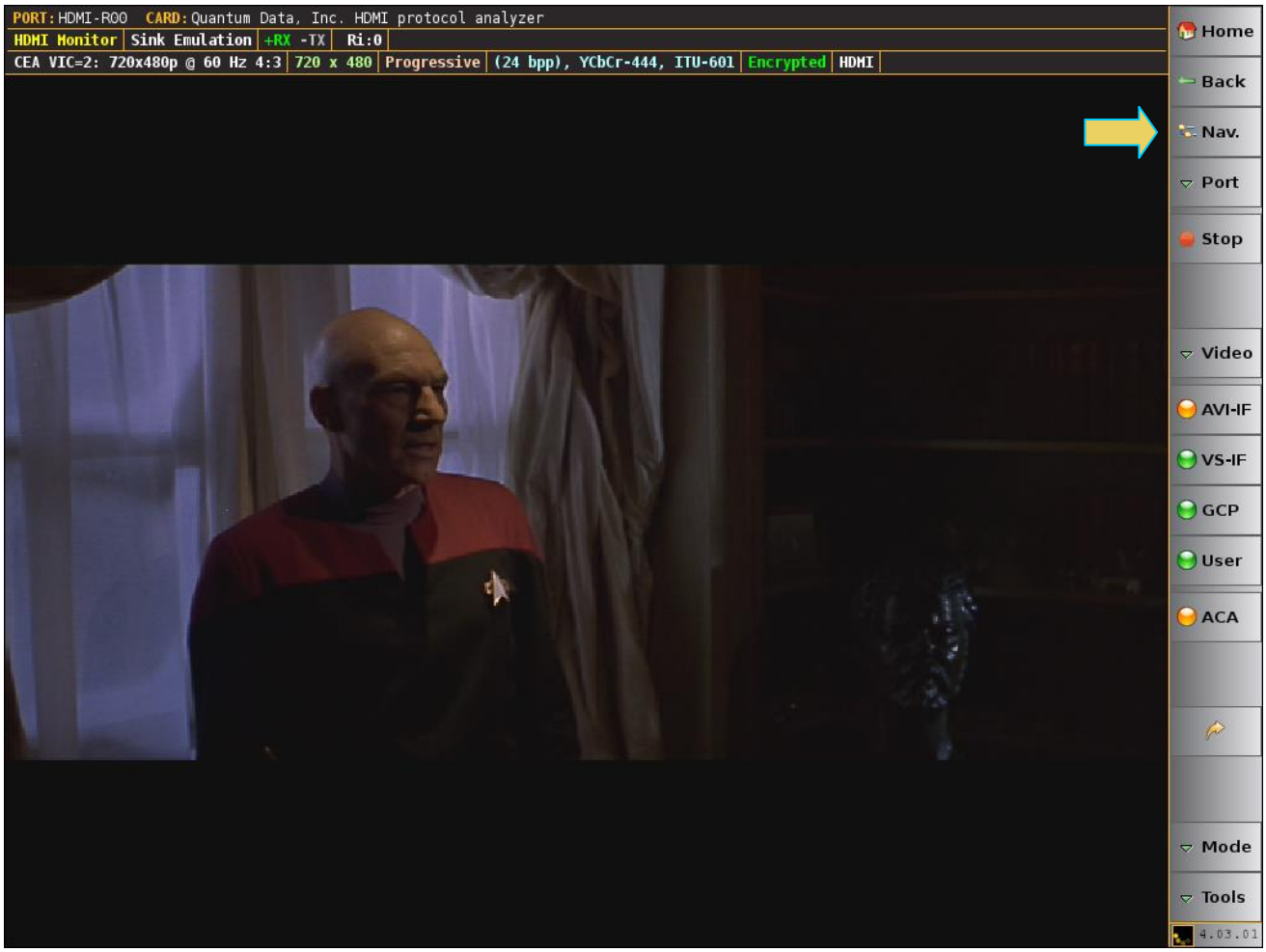
1.5.3 Embedded 980 GUI Manager and External GUI Manager layout differences

Aside from the “Real Time” mode there are a few other differences in the layouts between the embedded 980 GUI Manager and the External 90 GUI Manager. The primary difference is the **Navigator** panel which enables you to access the data elements and test results from an instrument. In the External 980 GUI Manager, the **Navigator** panel is always present on the left side of the 980 GUI Manager application window as shown below.

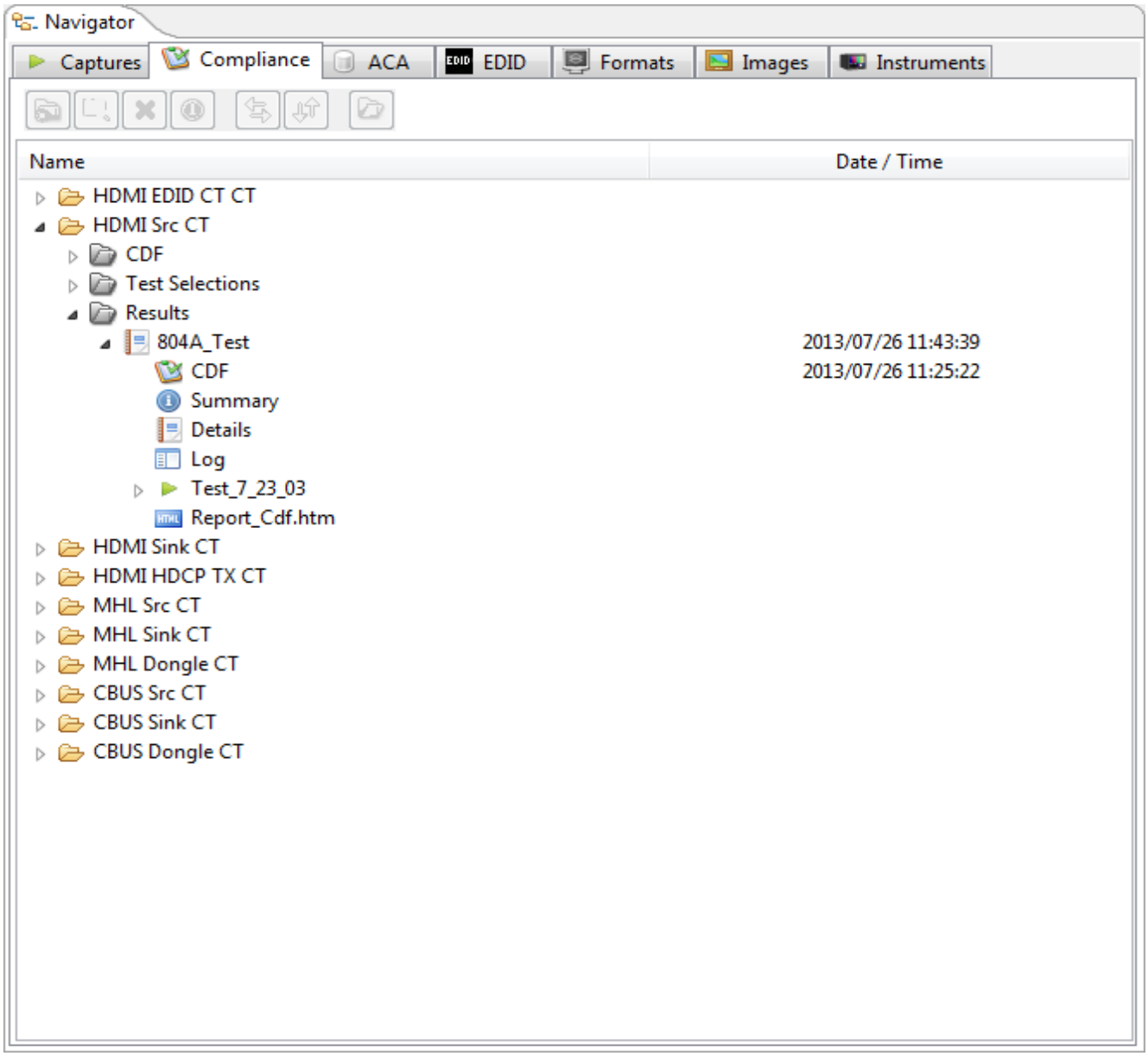


In the Embedded 980 GUI Manager, the **Navigator** panel must be opened. You can access it either from the Other Page of the Apps window (refer to the first screen example below) or you can access the **Navigator** from the Real

Time window as shown in the second screen example. Finally you can also access the **Navigator** from any window in the embedded GUI using the activation key at the bottom of any screen as shown below.



When you access the **Navigator** it will appear in the window as shown below.



1.6 What kinds of data does the 980 HDMI Protocol Analyzer module allow you to view?

By providing visibility into the HDMI and MHL protocol, metadata, video, audio and auxiliary data, the 980 HDMI Protocol Analyzer module enables you to detect changes and identify anomalies in the HDMI or MHL signal. The following is a list of the data types you can view (currently):

- Video
  - Timing parameters
  - Pixel values
- Protocol Data
  - Guard band
  - Preamble

- Data Islands, including:
  - Infoframes (AVI, Audio, Source Product Descriptor, etc.)
  - General Control Packet (GCP)
  - Audio Clock Regeneration (ACR)
  - Audio Sample Packet Header including Channel Status Blocks
- Hot plug events
- DDC, C-Bus (MHL) transactions, including:
  - HDCP
  - EDID
- Control data (vsync, hsync, encryption enable)
- HDMI CEC transactions
- HDMI Audio Return Channel (ARC) data

2 Getting Started

Please refer to the *980 Advanced Test Platform Quick Start Guide* for detailed Getting Started Procedures. This Quick Start Guide is available on the Quantum Data Downloads page or the 980 product pages.

3 HDMI Sink Compliance Tests

This chapter describes how to use the HDMI sink compliance test feature. Please note you will have to purchase the 980 HDMI Sink Compliance Test option in order to run these tests.

The following test sections in the HDMI 1.4a Sink Compliance Test specification are supported through the 980 GUI Manager:

- 8.2 Sink - EDID/E-DDC Tests
  - Test ID 8-1 – EDID Readable
  - Test ID 8-2 – VESA Structure
  - Test ID 8-3 – CEA Timing Extension
- 8.4 Sink - Protocol Tests
  - Test ID 8-15 – Character Synchronization
  - Test ID 8-16 – Acceptance of Valid Packet Types
- 8.5 Video – Video Timing Tests
  - Test ID 8-17 – Basic Format Support
  - Test ID 8-18 – HDMI Format Support
  - Test ID 8-19 – Pixel Encoding
  - Test ID 8-20 – Video Format Timing
- 8.6 Sink - Audio Tests
  - Test ID 8-21 – Audio Clock Regeneration
  - Test ID 8-23 – Audio Formats
- 8.7 Sink - Interoperability with DVI Tests
  - Test ID 8-24 – Interoperability with DVI
- 8.8 Sink - Advanced Features Tests
  - Test ID 8-25 – Deep Color
  - Test ID 8-27 – High Bitrate Audio (*this test requires 882*)
  - Test ID 8-29 – 3D Video Format Timing
  - Test ID 8-30 – 4K by 2K Video Format Timing (only available on the 980 297MHz version “Gen 3”)
  - Test ID 8-31 – AVI Infoframe support for Extended Colorimetry, Content Type, Selectable YCC Quantization Range

3.1 Workflow for running the HDMI Sink Compliance Tests

The following is the high level workflow for running the HDMI Sink Compliance Tests. This workflow assumes that you have powered up the 980 and the sink device under test. The procedure also assumes you will be running the compliance test through the external 980 GUI Manager.

1. Established an Ethernet session with the 980.
2. Connect the source device under test to the 980 HDMI Protocol Analyzer via HDMI.
3. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.

Note: You can now select addition formats for testing on an individual test basis. This enables you to run a particular test on a format that is not specified in the CTS.

4. Select the tests that you wish to run from the **Test Selection** panel.
5. Initiate the tests through the **Test Options / Review** panel.
6. View the detailed data for test failures if failures occur.
7. View the results in the **Test Results** panel under the **Navigator** panel.

3.2 Connection for 980 GUI Manager and 980/980B – HDMI Sink Compliance

This subsection describes the procedures for connecting the external 980 GUI Manager to the 980/980B when testing an HDMI sink device for compliance. *If you are using the embedded 980 GUI Manager this procedure does not apply.* In order to operate the 980/980B with the external 980 GUI Manager you will need to establish a connection between the 980 and the 980 GUI Manager. The 980 GUI Manager will be running on your laptop or host PC. You will either be connecting directly from the 980 GUI Manager to the 980 through an Ethernet cable or you will be connecting through your corporate LAN network or local Ethernet hub.

When using the external 980 GUI Manager, you will need to ensure that the IP addresses of the 980 and the network interface card on the PC hosting the 980 GUI Manager are compatible. To be compatible, the IP addresses must have the same network portions of their IP address but different host portions. You can either change the IP address of the host PC using standard Windows OS techniques or you can change the IP address of the 980. The 980 is provisioned with a default IP address (192.168.1.10).

If you are connecting directly between your host PC and the 980 or through a local Ethernet hub, you will manually set the IP addresses of the host PC and 980/980B such that they are compatible. If you are connecting through your corporate LAN, the PC that the external 980 GUI Manager is running on will typically have an IP address assigned to it through DHCP services. In this case you can either assign an IP address to the 980/980B directly or allow the network DHCP server on your corporate network to assign one to the 980/980B.

The procedures for setting the IP address of the 980/980B are provided in the following subsection. These procedures also describe how to enable the 980 DHCP client to allow the network to assign an IP address.

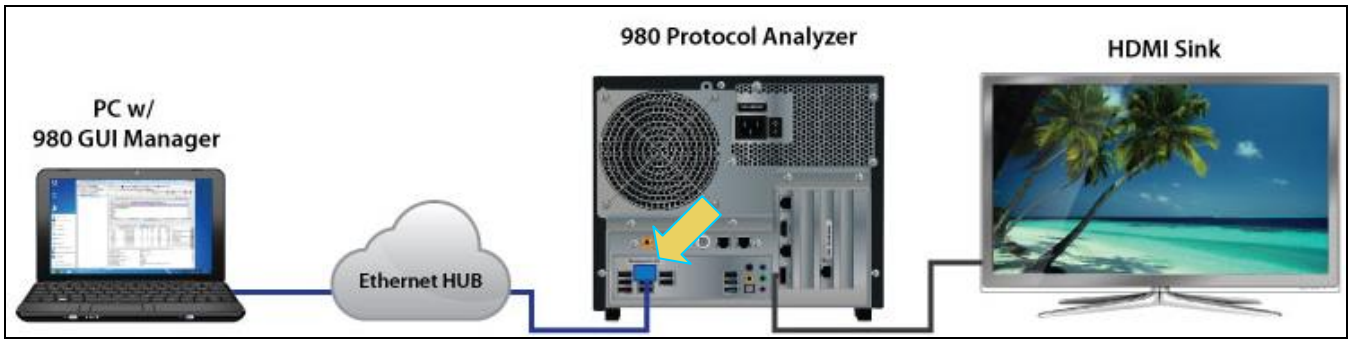
3.2.1 Establishing the Ethernet connections between the 980 GUI Manager and the 980/980B

This subsection describes how to make the physical Ethernet connections between the PC hosting the external 980 GUI Manager and the 980. This procedure assumes that you have assembled the 980/980B and host PC for the 980 GUI Manager and applied power to them.

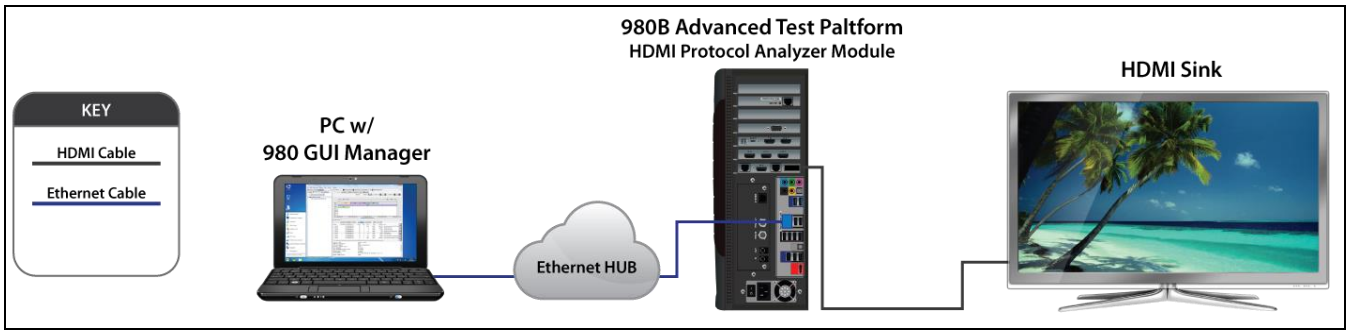
To make the physical Ethernet connection when using the external 980 GUI Manager and connecting through your corporate LAN or local Ethernet hub:

This procedure is used when you using the external 980 GUI Manager and connecting to the 980/980B through your corporate LAN network or local Ethernet hub. If you are connecting directly from the 980/980B to the 980 GUI Manager, use the next procedure.

1. Connect an Ethernet cable from the 980/980B Ethernet jack on the lower left half of the back panel of the 980/980B to your corporate LAN or local Ethernet hub. Refer to the diagrams below.
2. Connect an Ethernet cable from your PC hosting the external 980 GUI Manager to your corporate LAN or local Ethernet hub. Refer to the diagrams below. The first diagram depicts the configuration for HDMI sink testing and the second diagram depicts the configuration for MHL sink devices.



Ethernet connection through corporate LAN or hub – 980

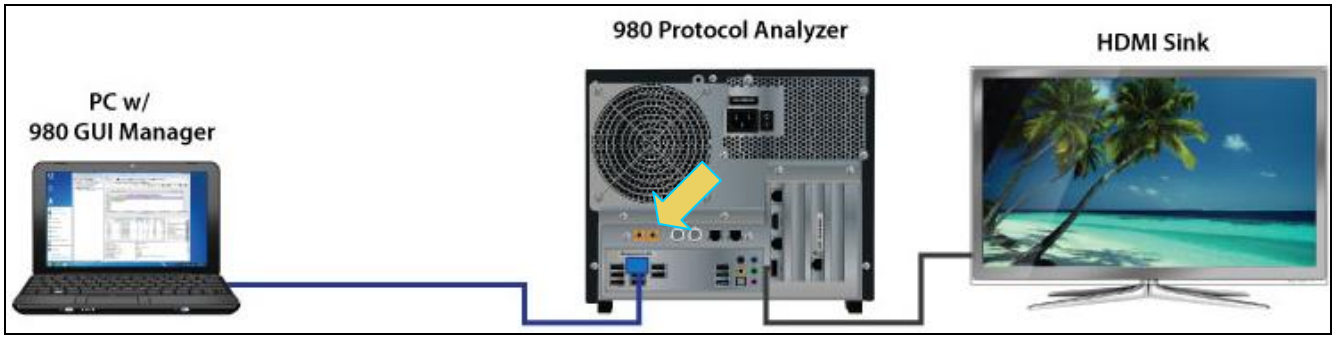


Ethernet connection through corporate LAN or hub – 980B

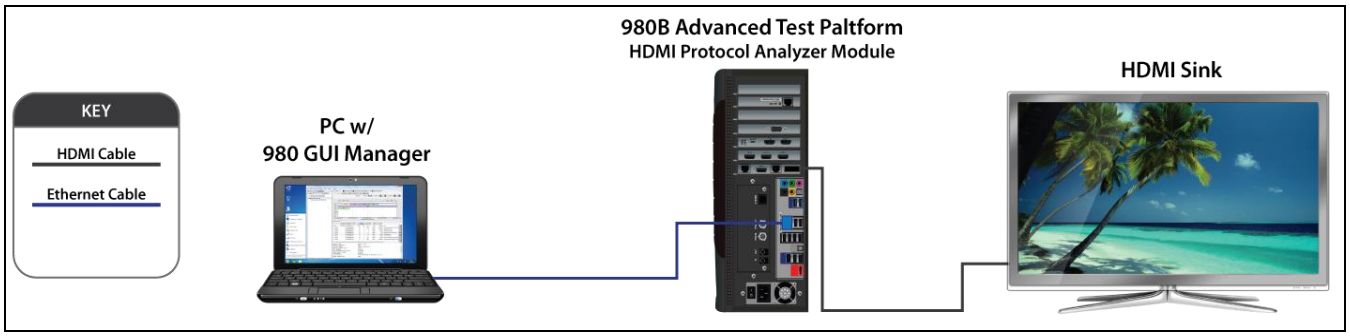
To make the physical connections using Ethernet Point-to-Point connection with the external GUI Manager:

This procedure is used when you using the external 980 GUI Manager and connecting to the 980/980B directly. If you are connecting through your corporate LAN, use the previous procedure.

1. Connect an Ethernet cable from the 980/980B Ethernet jack on the lower left half of the back panel of the 980/980B frame to your PC hosting the 980 GUI Manager. The first diagram depicts the configuration for HDMI sink testing and the second diagram depicts the configuration for MHL sink devices.



Ethernet direct connection – 980

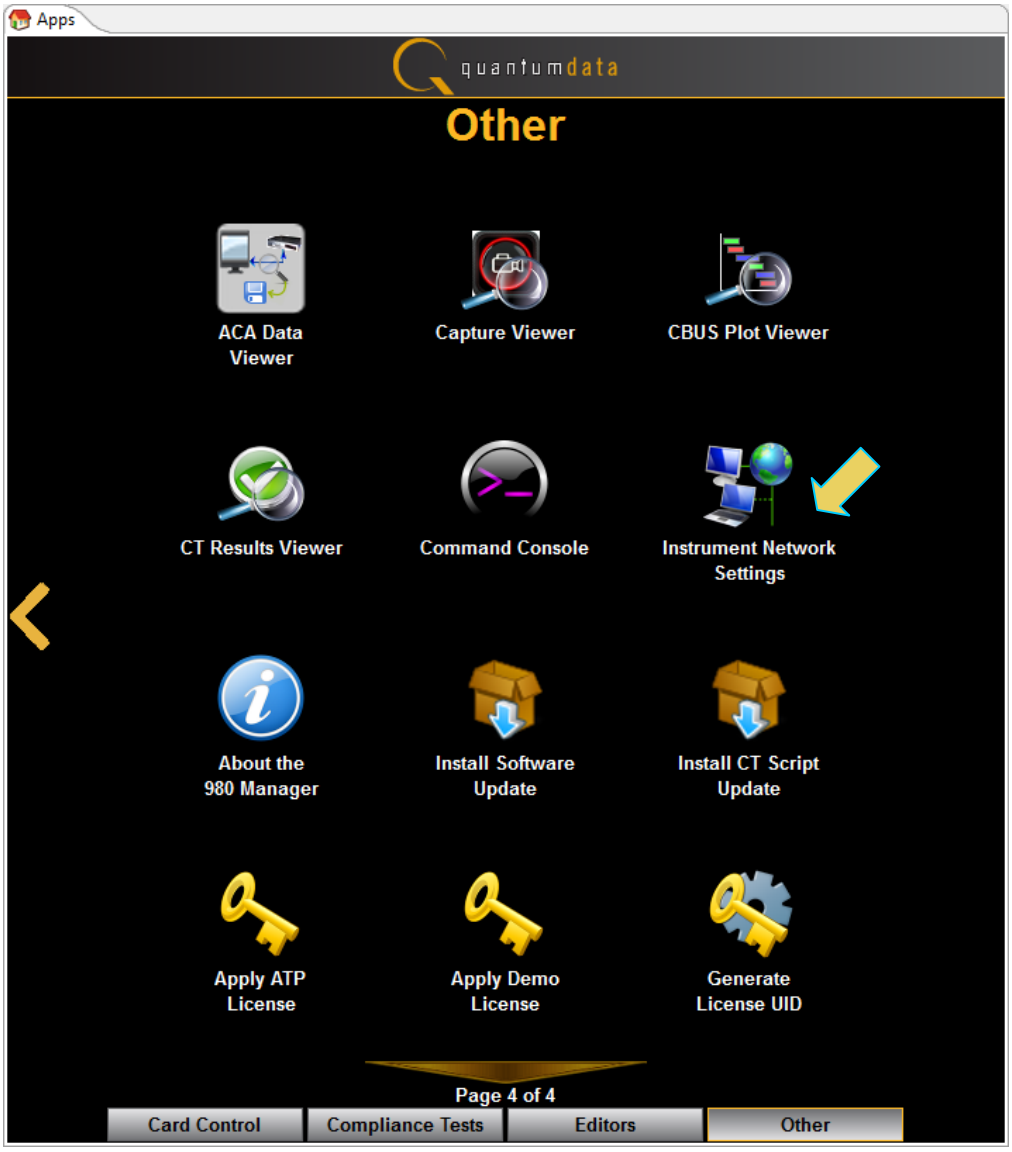


Ethernet direct connection – 980B

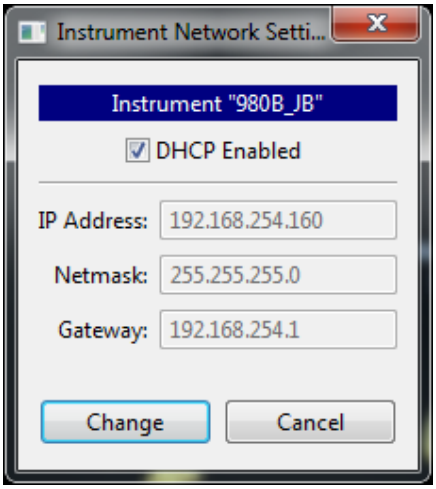
To set the IP address of the 980 through the embedded 980 GUI Manager:

This procedure assumes that you have established a physical Ethernet connection between your PC and the 980. Note that you will have to use the embedded 980 GUI Manager to set the IP address for the initial connection.

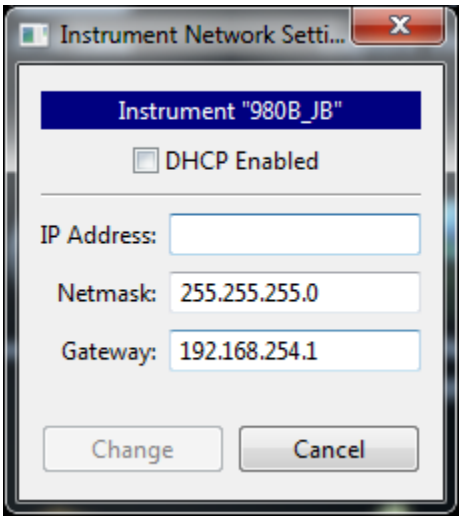
1. Touch select the Instrument Network Settings icon on Page 4 (Other apps) page as shown below.



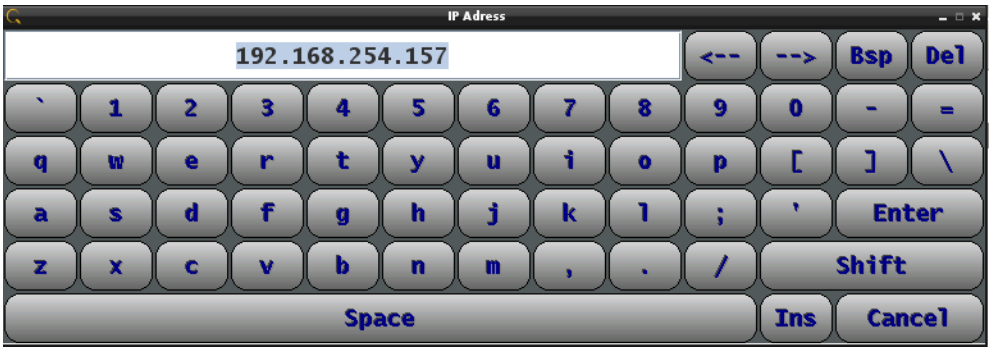
A dialog box will appear showing the current IP address and enabling you to reset the IP address.



2. If the IP address of the 980 is compatible with IP address of your PC and corporate network, no further action is required. If you wish to change the IP address, continue.
3. If you are wish to allow the 980's IP address to be set through DHCP services, select the DHCP Checkbox as shown above.
4. Alternatively, is you wish to set the IP address without DHCP, deselect DHCP (see example below) and touch select the IP address field to access the on-line keyboard which enables you to change the IP address. Edit the IP address and press the **Enter** key on the on-line keyboard.



Note: You will have to deselect DHCP if it is checked in order to access the pop up keyboard.



5. Touch select the **Change** activation button to initiate the change. You do not have to reboot the 980 for the IP address change to take effect.

To set the IP address of the 980 through the command line

1. Open up a DOS window on your PC.

   Note: This procedure requires a telnet session. Use standards Windows OS utilities or third party utilities.

2. Establish a telnet session to the 980 using the default IP address as follows:

   `telnet 192.168.1.10`

   You will be prompted with the `Pscope login`: prompt. Enter the following for a user name and password:

   `Pscope login: qd`

   `Password: qd`

   When the `p-scope` prompt appears, you will need to execute a command to change its IP address using the following command:

   `Setip <IP_address> <subnet mask> <gateway>`

   Note: You will have to include the subnet mask and gateway address as arguments.

   The following is an example:

   `p-scope> setip 192.168.254.100 255.255.255.0 192.168.254.1`

   `If you wish to use DHCP to set the IP address, use the following command:`

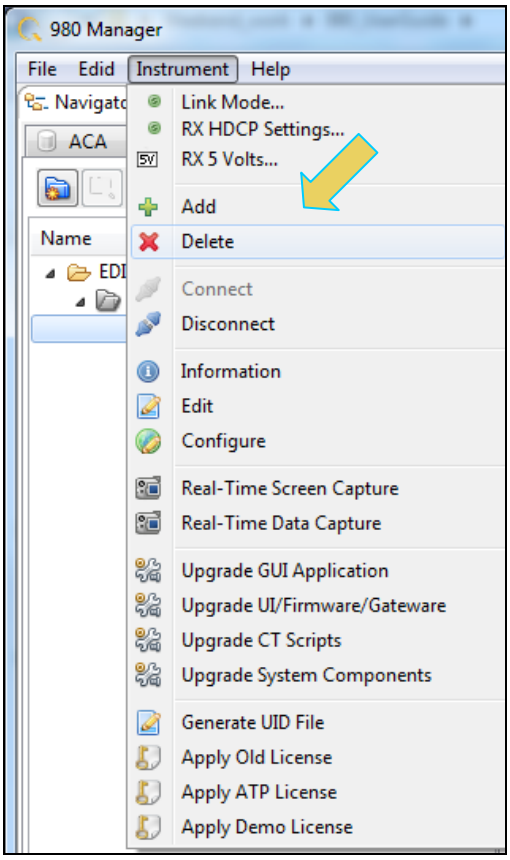
   `p-scope> setip dhcp`

   You will be able to view the new IP address on the bottom status strip next to the **Navigator** button. The status strip will indicate if the IP was set through DHCP as show in the example below.

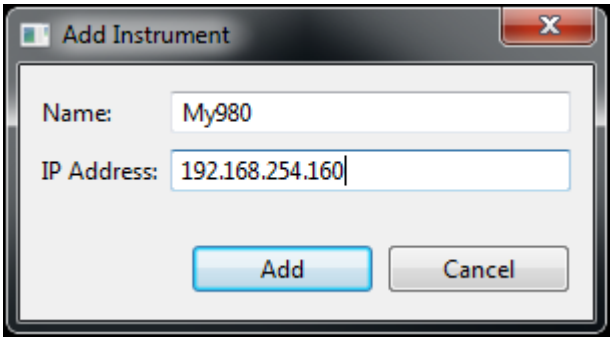
3.2.2 Establishing a Management Session between the 980 GUI Manager and the 980/980B

This procedure describes how to establish a management session between your 980 GUI Manager and the 980. The procedure assumes that you have IP addresses provisioned in the 980/980B and the PC hosting the 980 GUI Manager and that you have a suitable Ethernet cable connected between the PC and the 980/980B either directly or through your corporate LAN.

1. Add your 980 to the 980 GUI Manager application using the green **+** icon or the **+ Add** item on the Instrument pull-down menu identified below.

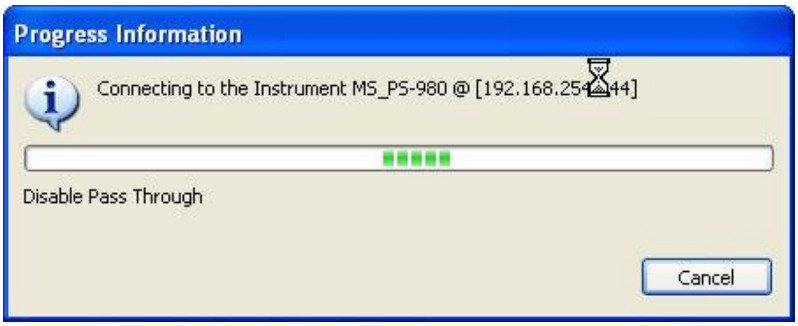


The **Add Instrument** dialog appears enabling you to enter the name and IP information for the 980 that you are trying to connect to (below).



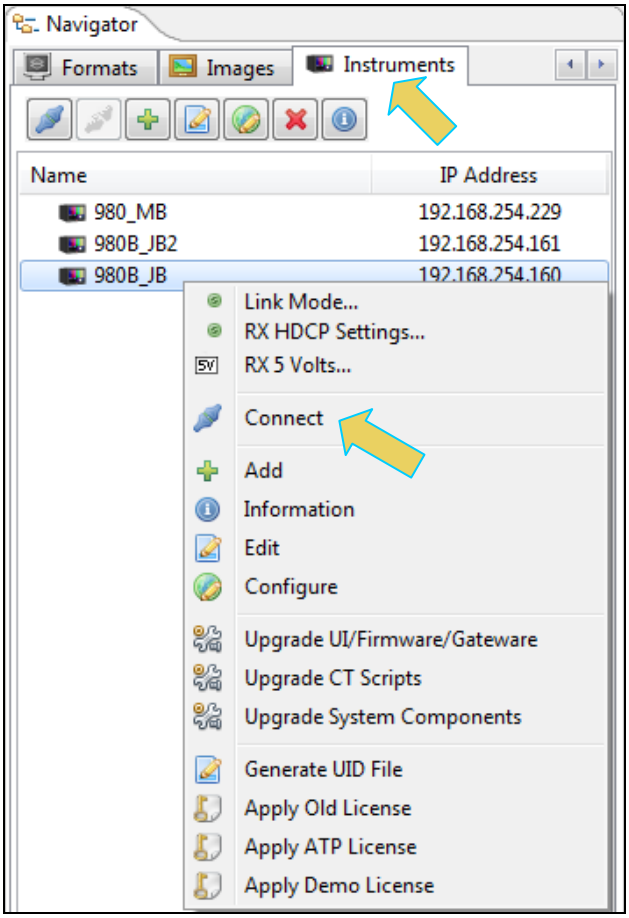
2. Enter the name (any suitable name) and IP address of the 980 that you want to connect to in the **Add Instrument** dialog box (above). Then click on the **Add** activation button.

   You will see a series of messages on a dialog boxes describing the progress. One example is shown below:



The 980/980B with the IP address you entered appears on the list in the **980 Navigator** panel (below). The 980 GUI Manager application will automatically connect to the 980/980B once you add the 980 to the application.

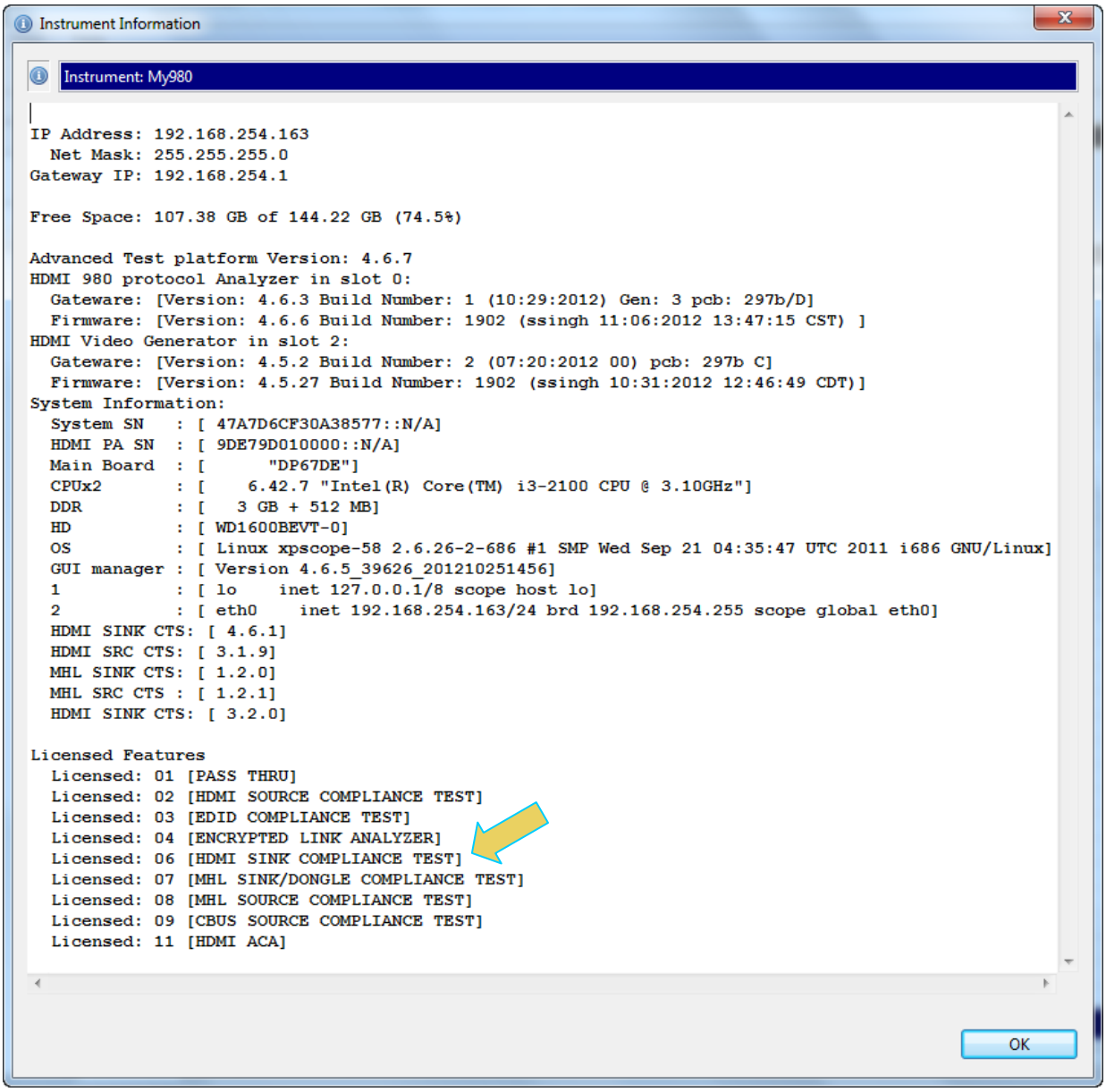
3. (If not already connected) Connect to the 980 using either the **Connect** icon or the **Connect** item on the right click menu as shown in the screen below. Note that you can also double click on the 980/980B in the **Instrument** dialog box in order to initiate a connection.



A dialog box appears indicating that a connection is in progress:

Once the connection is made the information about the connected 980/980B is available via the right click menu as shown below.

The information is then displayed in a separate window. The information on the **Instrument Information** window will be helpful if you call Quantum Data customer support during an upgrade process.

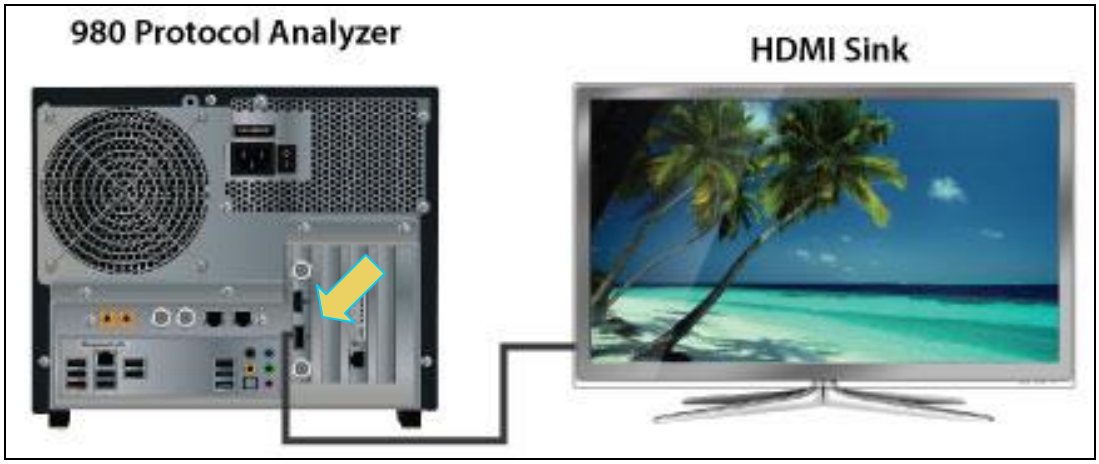


3.3 Making the HDMI connections

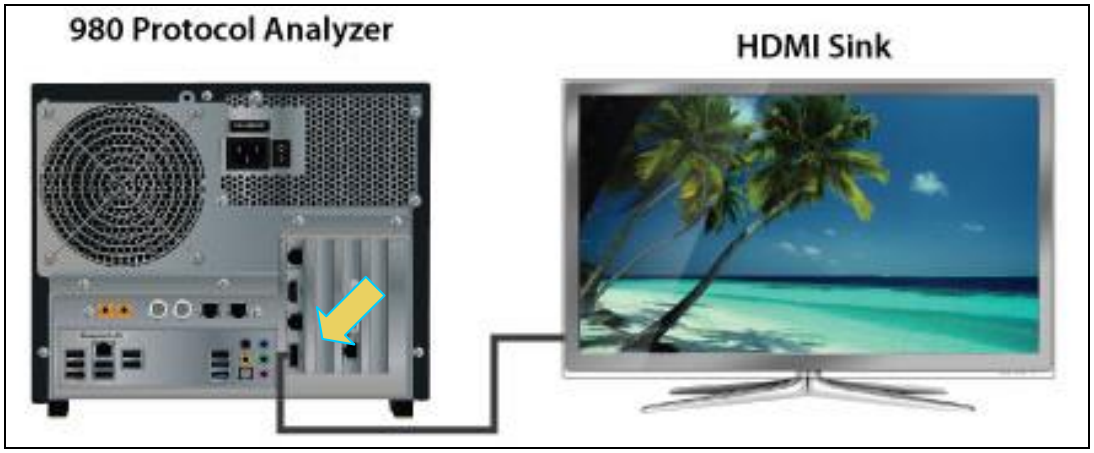
This subsection describes the physical connections required to run the HDMI sink compliance tests. This procedure assumes that you have assembled the 980/980B with the HDMI Protocol Analyzer module and sink device under test into your work area.

To make the physical HDMI connections:

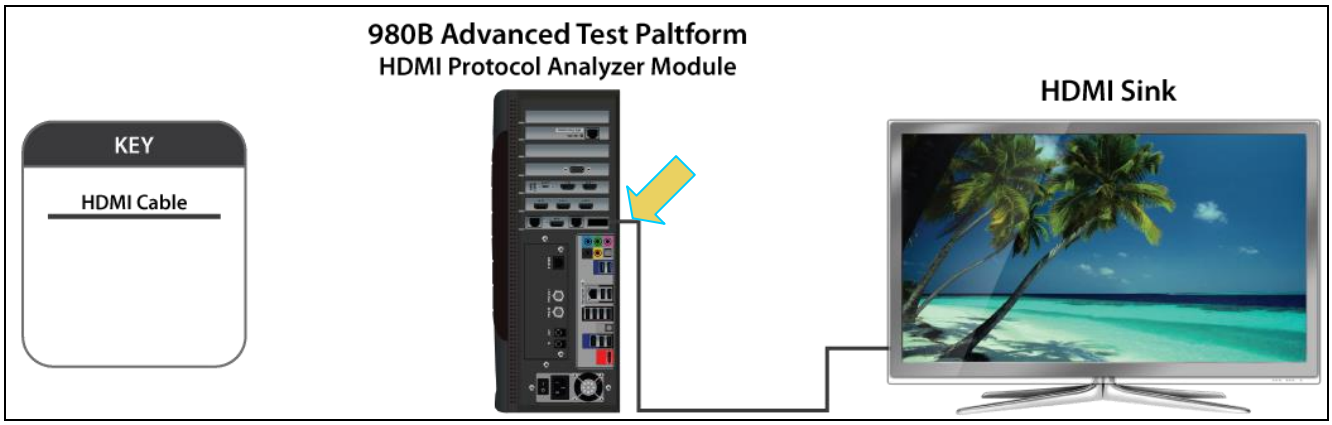
Refer to the procedures and diagram below.



Connections for HDMI sink compliance – 980 Rev C Protocol Analyzer module



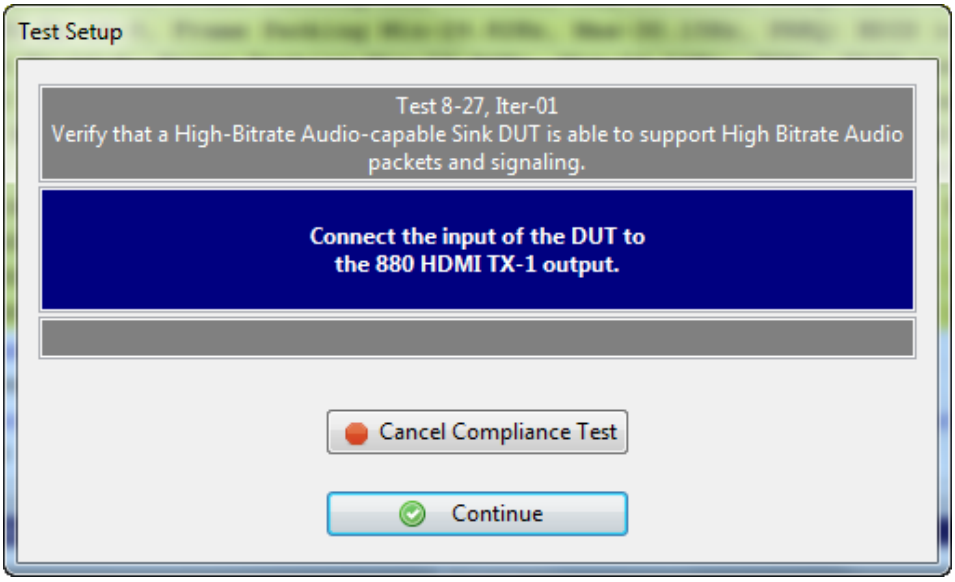
Connections for HDMI sink compliance – 980 Rev D Protocol Analyzer module



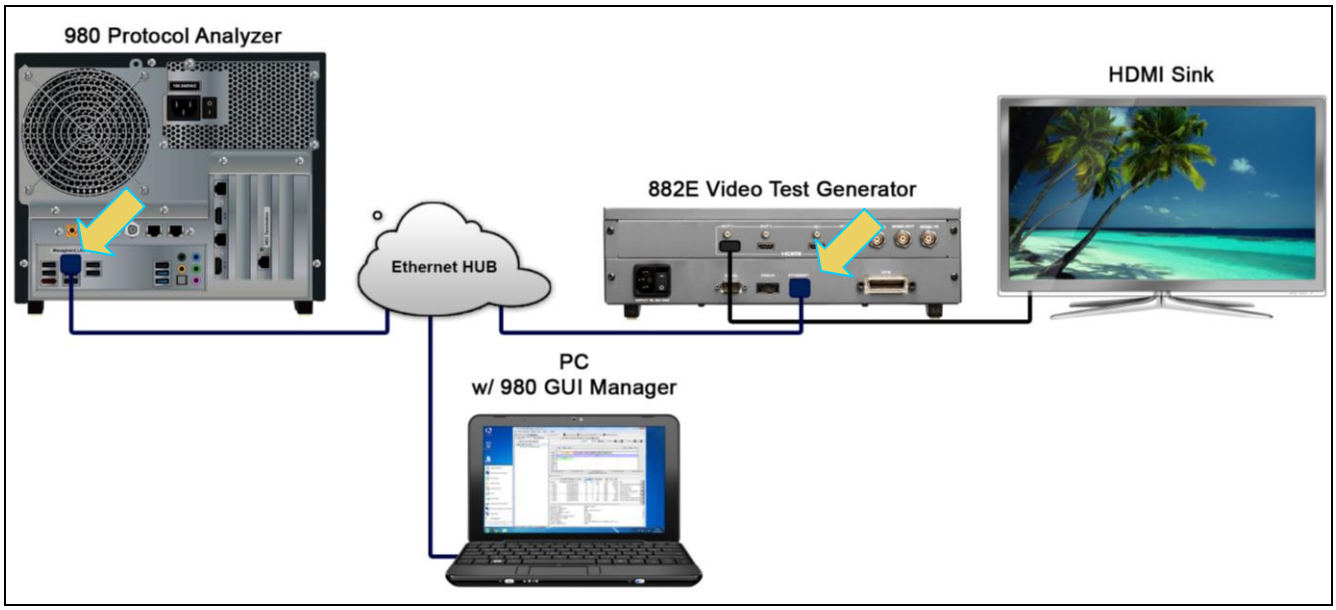
Connections for HDMI sink compliance – 980B

1. Connect your HDMI sink device under test to the HDMI Tx connector (the bottom most HDMI connector shown in the figure above) on the 980 Protocol Analyzer. Use a high speed HDMI cable.

   Special Note about High Bitrate Audio Test: The High Bitrate Audio test requires the use of the Quantum Data 882E or 882EA. When the 980 GUI Manager is ready to run the High Bitrate audio test 8-27 during the test execution, it will instruct you to reconfigure the test setup such that the 882EA HDMI Out port is connected to the sink device under test. The following dialog box is presented.



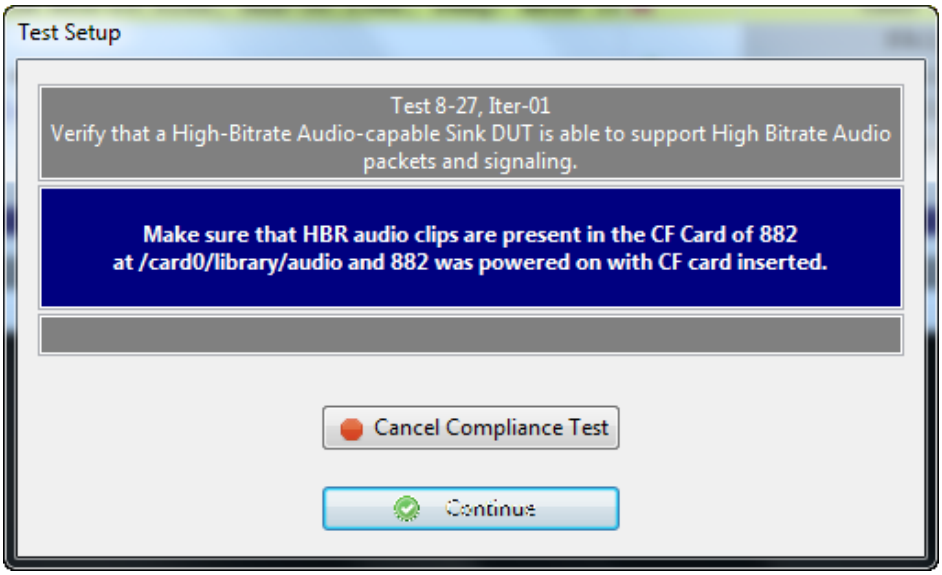
   The following diagram is a depiction of the test setup for the High Bitrate audio test along with the procedures for making the connections.



2. Connect an HDMI cable from the Quantum Data 882E/EA HDMI Out port to the sink device under test (above).

   The HDMI cable connected from the 980 Protocol Analyzer module to the sink device will be temporarily removed.

   Note: You will have to ensure that you have the High Bitrate audio files stored on the CF Card in the 882. A dialog box instructs you to do this (below).



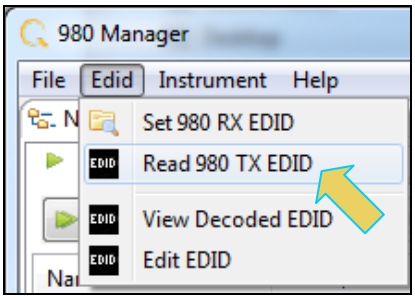
3.4 Completing the CDF

Use the following procedures to complete the CDF. You will have to know the capabilities of the sink device under test. You can determine this from the spec sheet or by reading its EDID. You can read the EDID through the 980 Protocol Analyzer GUI interface. Use the following procedure.

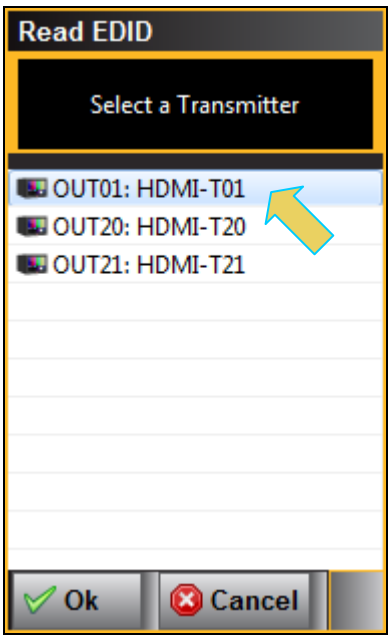
To read the EDID of the sink device under test:

Note: The 980 will have to be connected to the sink device in order to read the EDID.

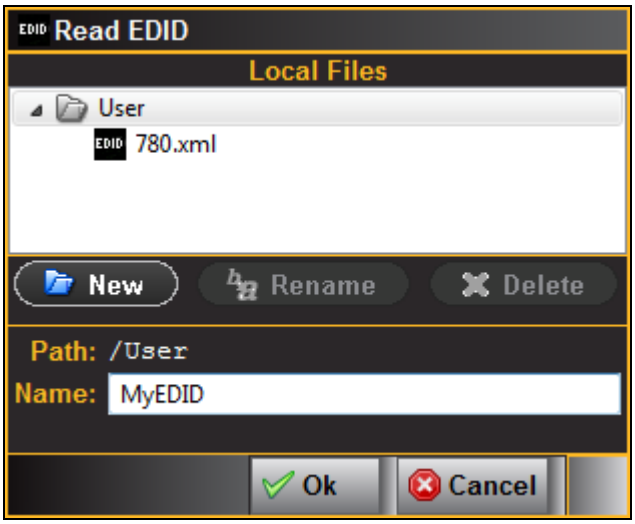
1. Select Read 980 Tx EDID from the EDID top level menu as shown below.



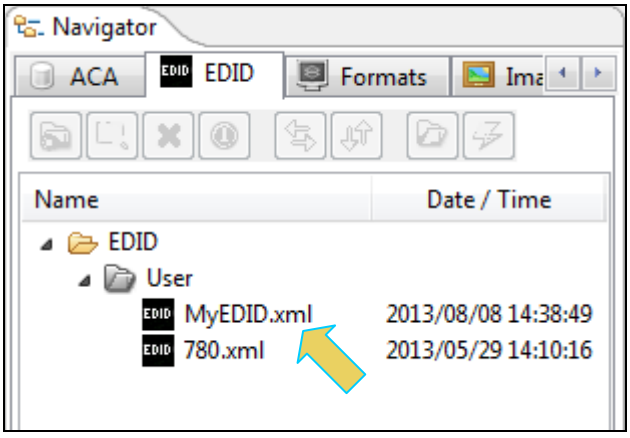
A dialog box will appear asking you which port you want to read the EDID from. Note that if there are no other modules in the 980 you will not get this dialog box. In this case select the Tx port that corresponds to the 980 Protocol Analyzer module's Tx port.



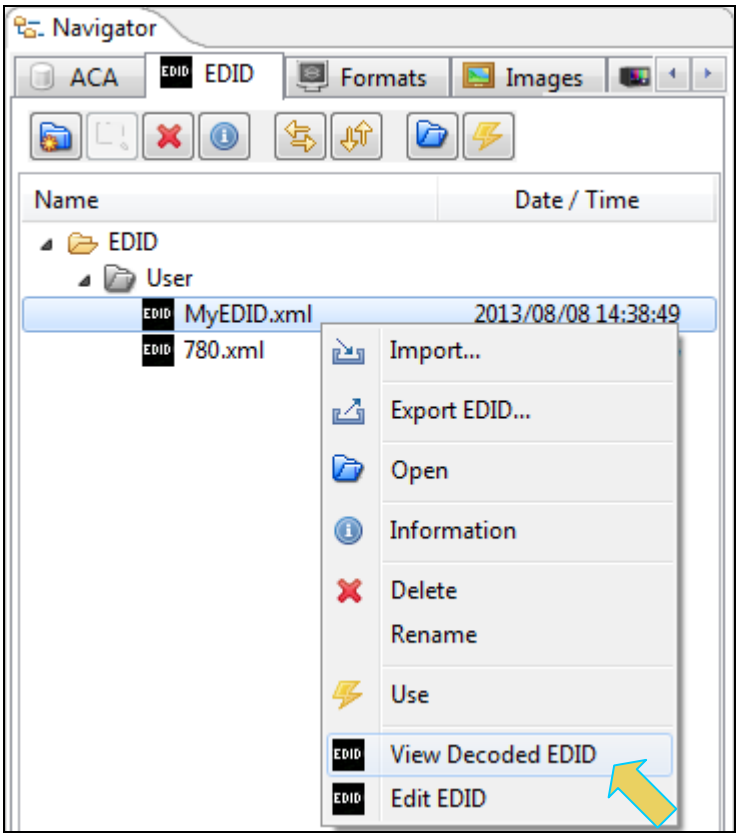
2. Assign a name to the EDID. You will be prompted to assign a file name in order to store the EDID for later viewing. The dialog box is shown below.



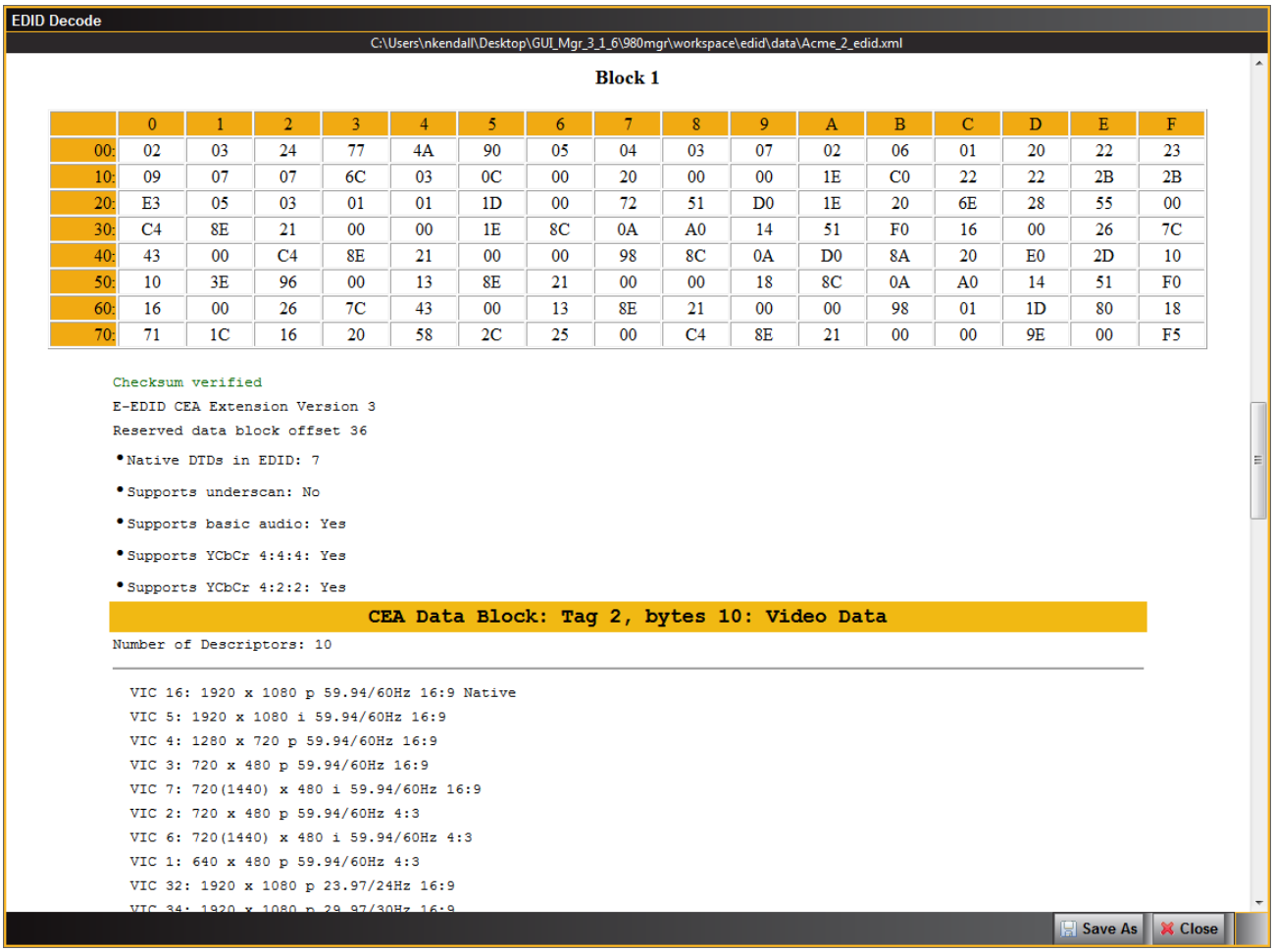
You will then see the EDID appear in the **Navigator** panel.



3. View the EDID by navigating to the **Navigator/EDID** window and opening up the EDIDs directory. Then right click on the EDID file you wish to view and select View Decoded EDID as shown below.

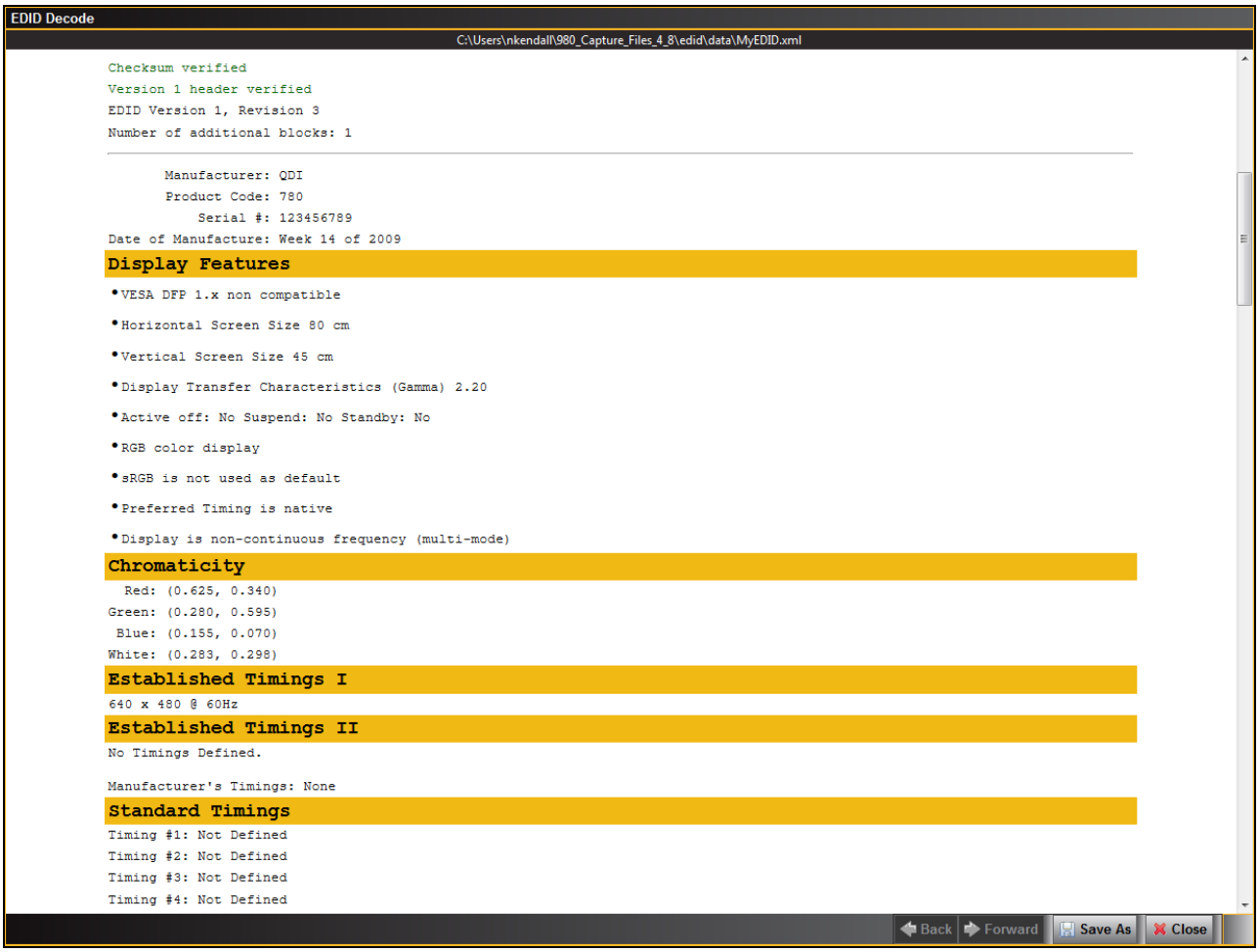


A window opens up allowing you to view the entire contents of the EDID in hex and human readable text. The first page of the EDID report is shown on the screen below.



	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00:	02	03	24	77	4A	90	05	04	03	07	02	06	01	20	22	23
10:	09	07	07	6C	03	0C	00	20	00	00	1E	C0	22	22	2B	2B
20:	E3	05	03	01	01	1D	00	72	51	D0	1E	20	6E	28	55	00
30:	C4	8E	21	00	00	1E	8C	0A	A0	14	51	F0	16	00	26	7C
40:	43	00	C4	8E	21	00	00	98	8C	0A	D0	8A	20	E0	2D	10
50:	10	3E	96	00	13	8E	21	00	00	18	8C	0A	A0	14	51	F0
60:	16	00	26	7C	43	00	13	8E	21	00	00	98	01	1D	80	18
70:	71	1C	16	20	58	2C	25	00	C4	8E	21	00	00	9E	00	F5

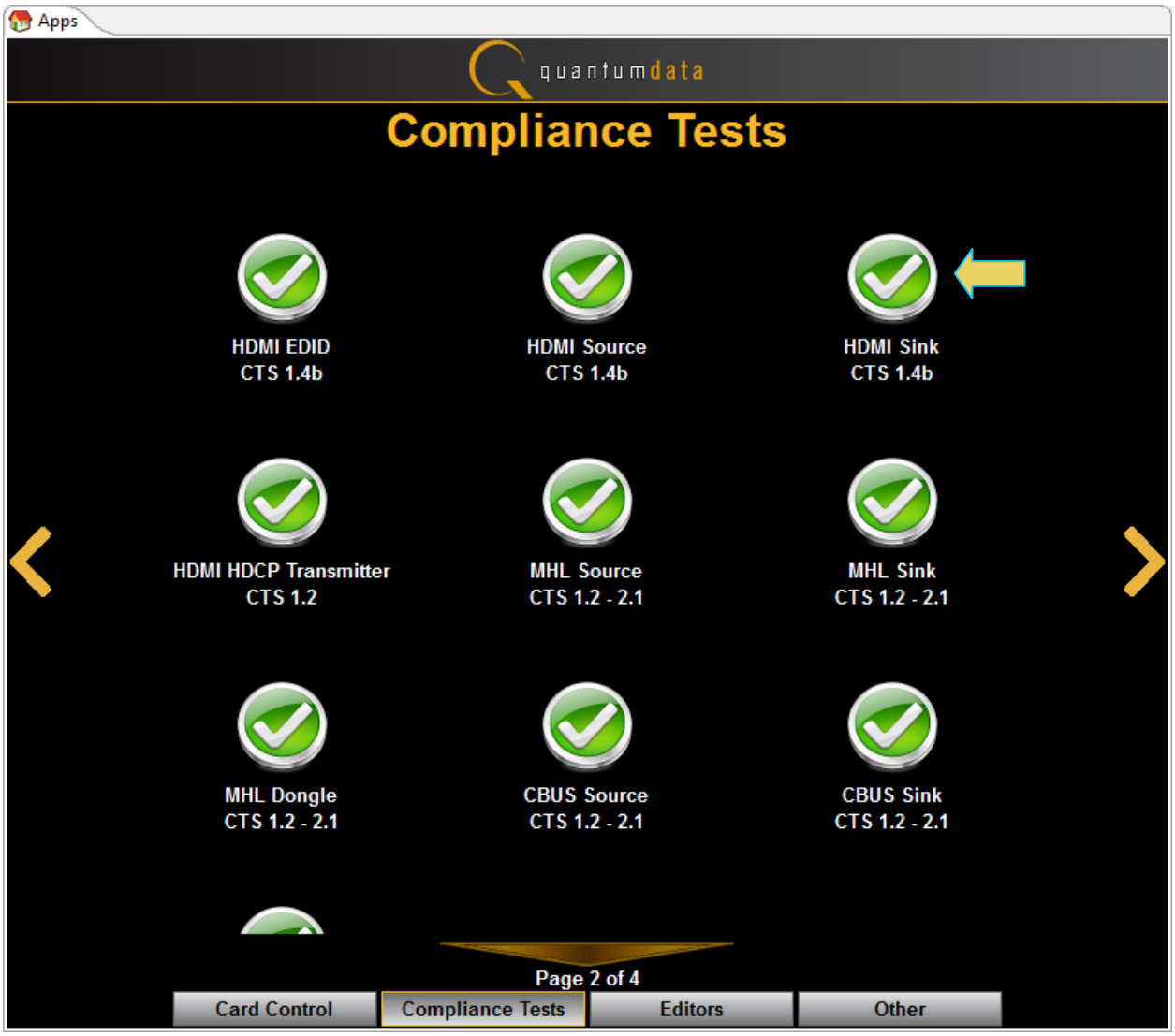
The second page of the EDID report is shown on the next screen below.



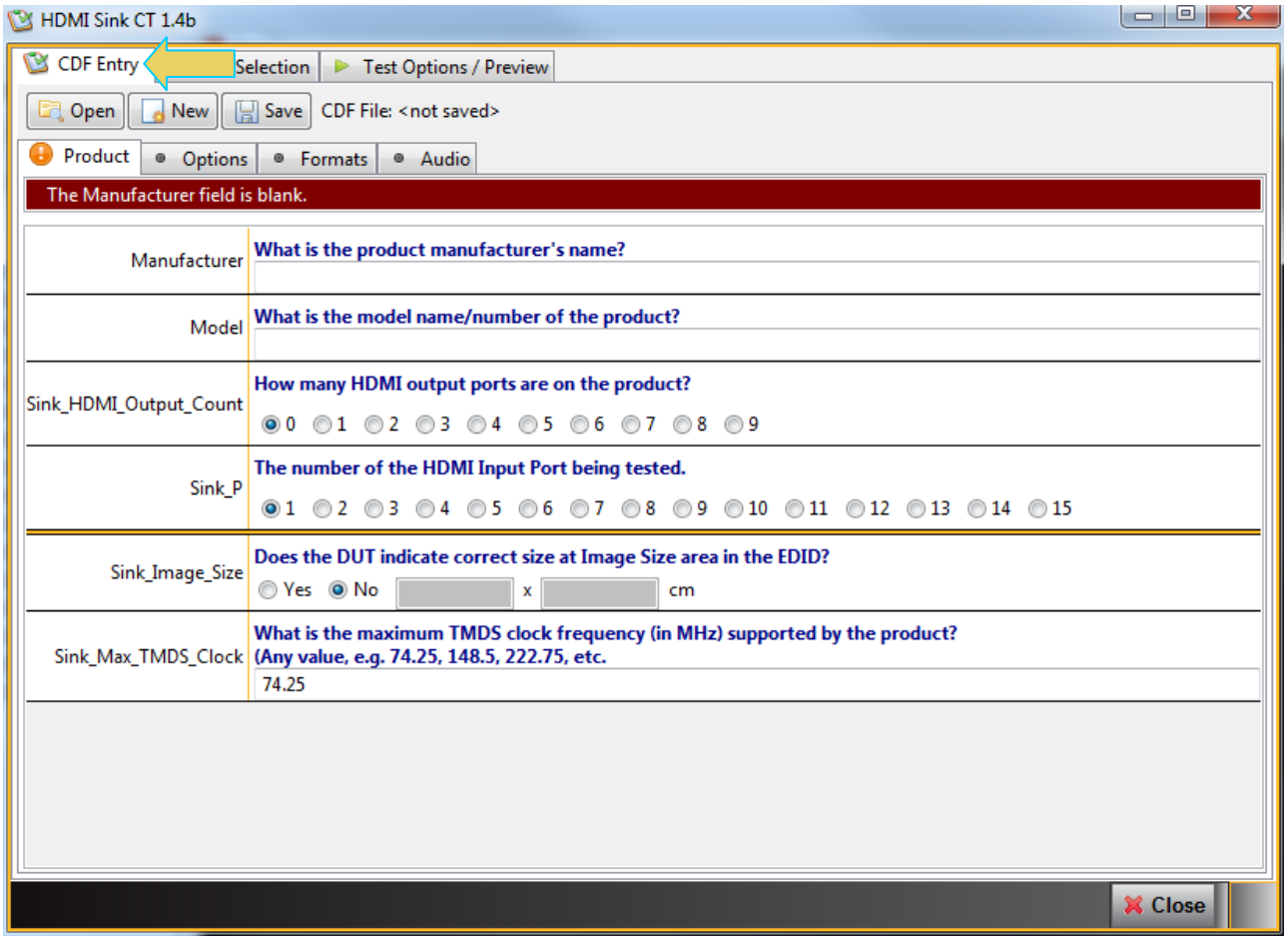
You can save the EDID report to your PC by clicking on the **Save As** activation button on the lower right side. Click on **Close** to exit out of the viewing window.

To complete the CDF for the 980 sink compliance test:

1. From the **Compliance Tests page of the Apps panel**, select HDMI Sink Compliance test as shown below.



2. Select the **CDF Entry** panel as shown below.

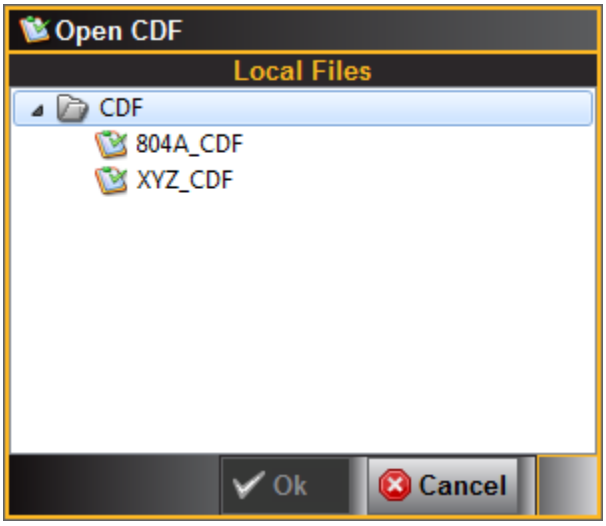


3. To create a new CDF, click on the **New** activation button.

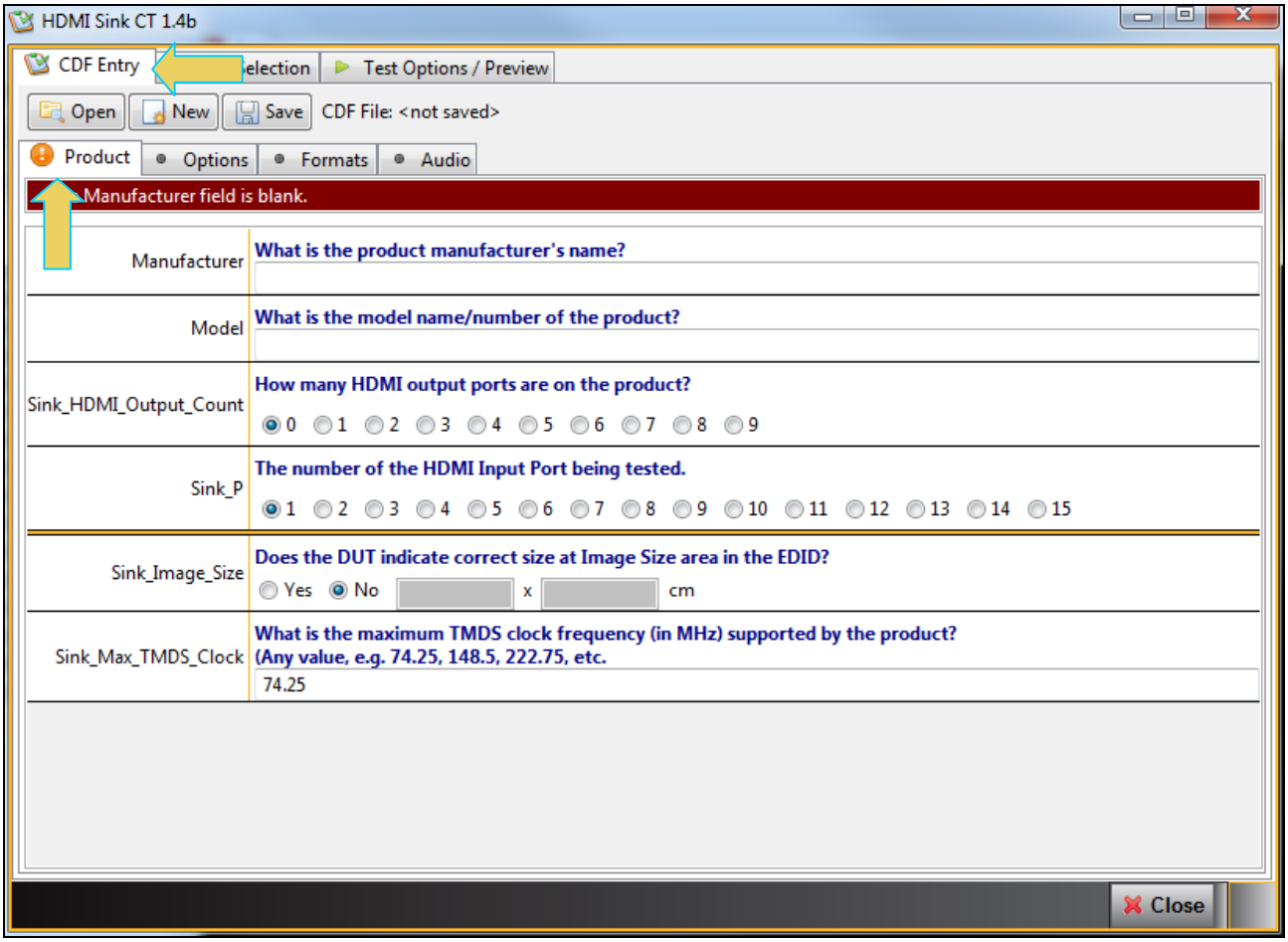
   You will be prompted with a confirmation that you want to start a new CDF and reset the values. Click **OK** to proceed.

4. To open an existing CDF, click on the **Open** activation button.

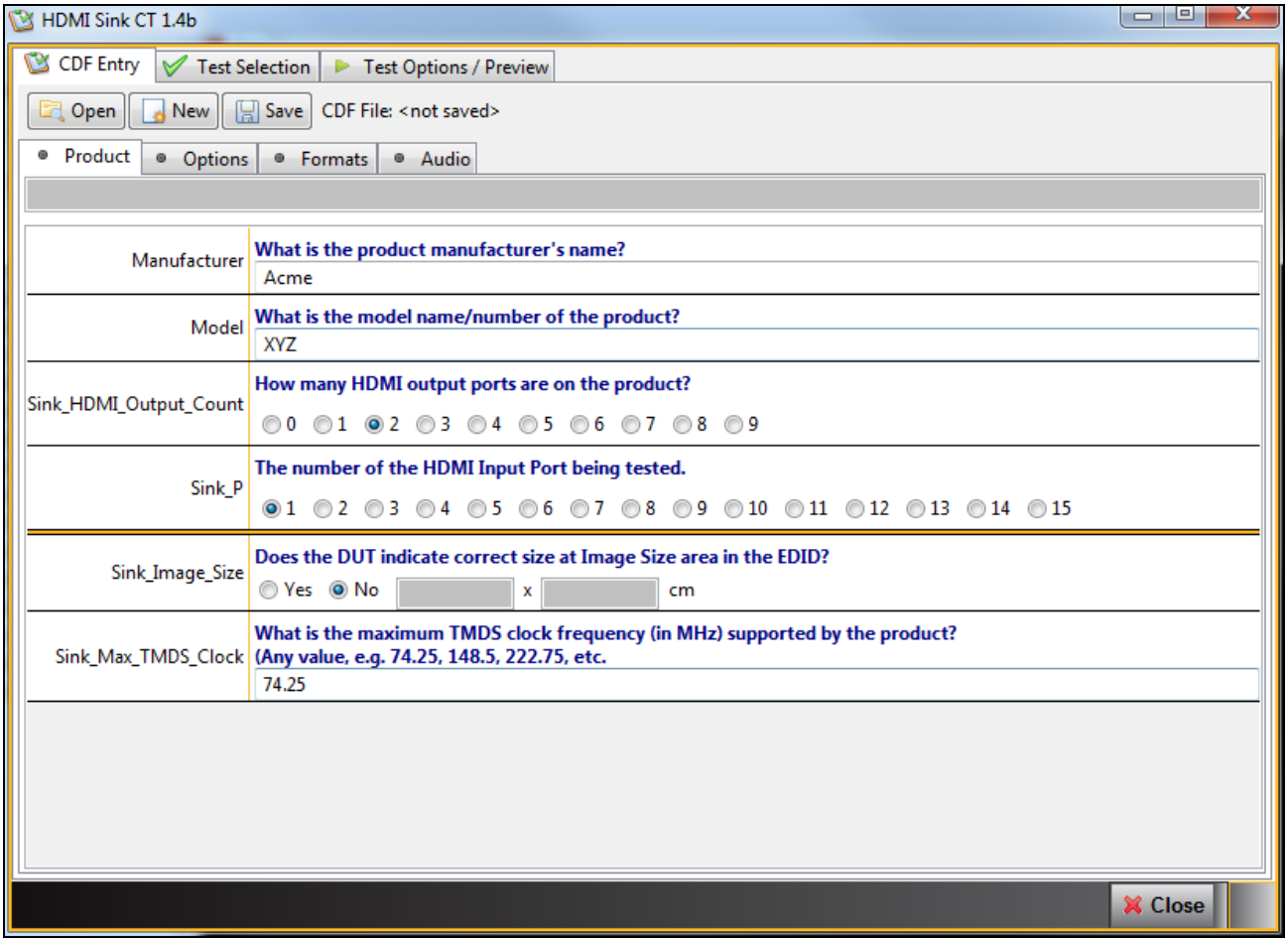
   You will be prompted with a dialog box that enables you to open a CDF. Select a CDF and then **OK** to proceed.



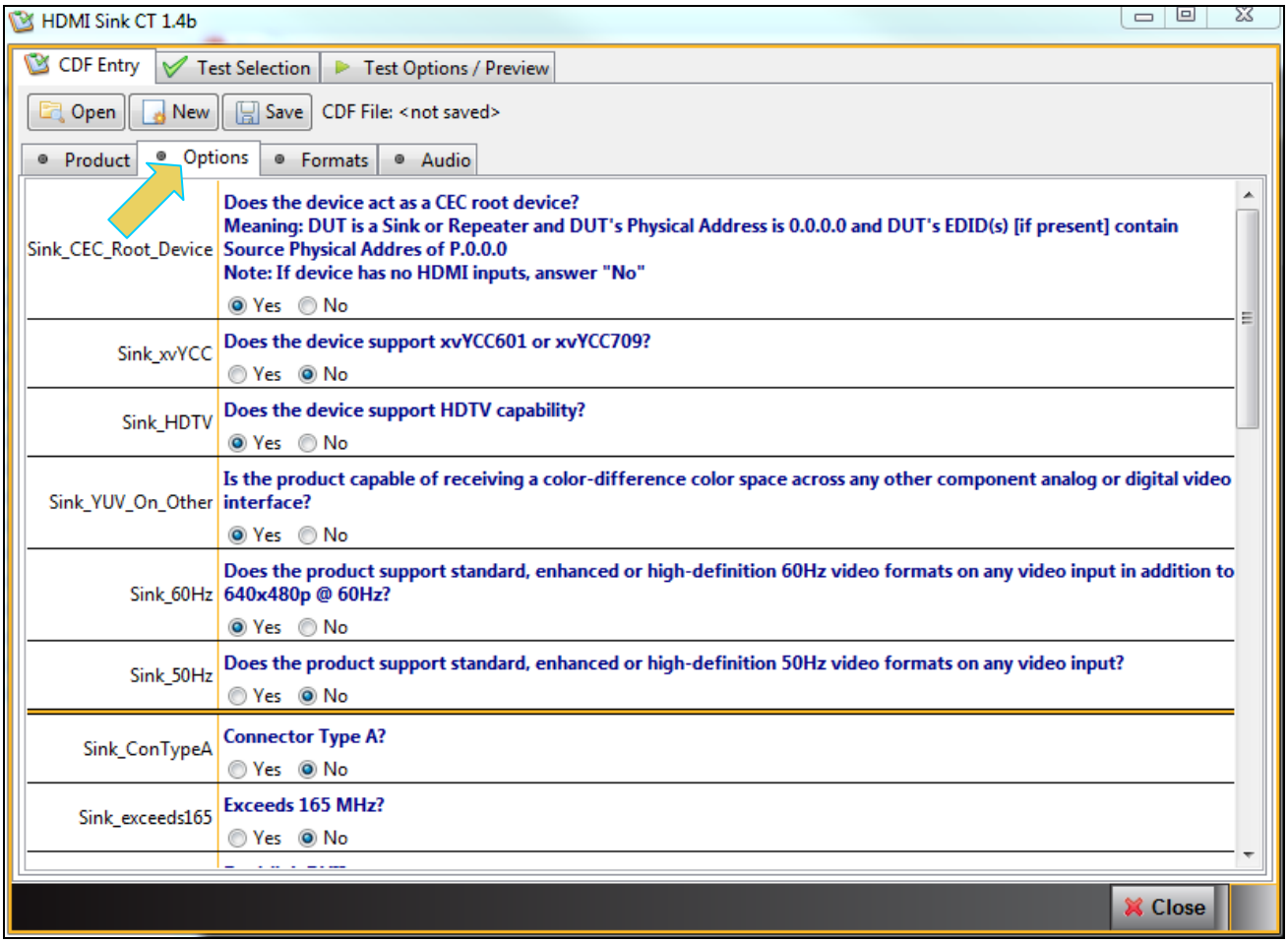
5. Complete the items in the **Product** tab of the **CDF Entry** panel shown below. Note that you will have to complete the essential fields in order to proceed. A status message in red will appear indicating if you have not completed all the essential fields.

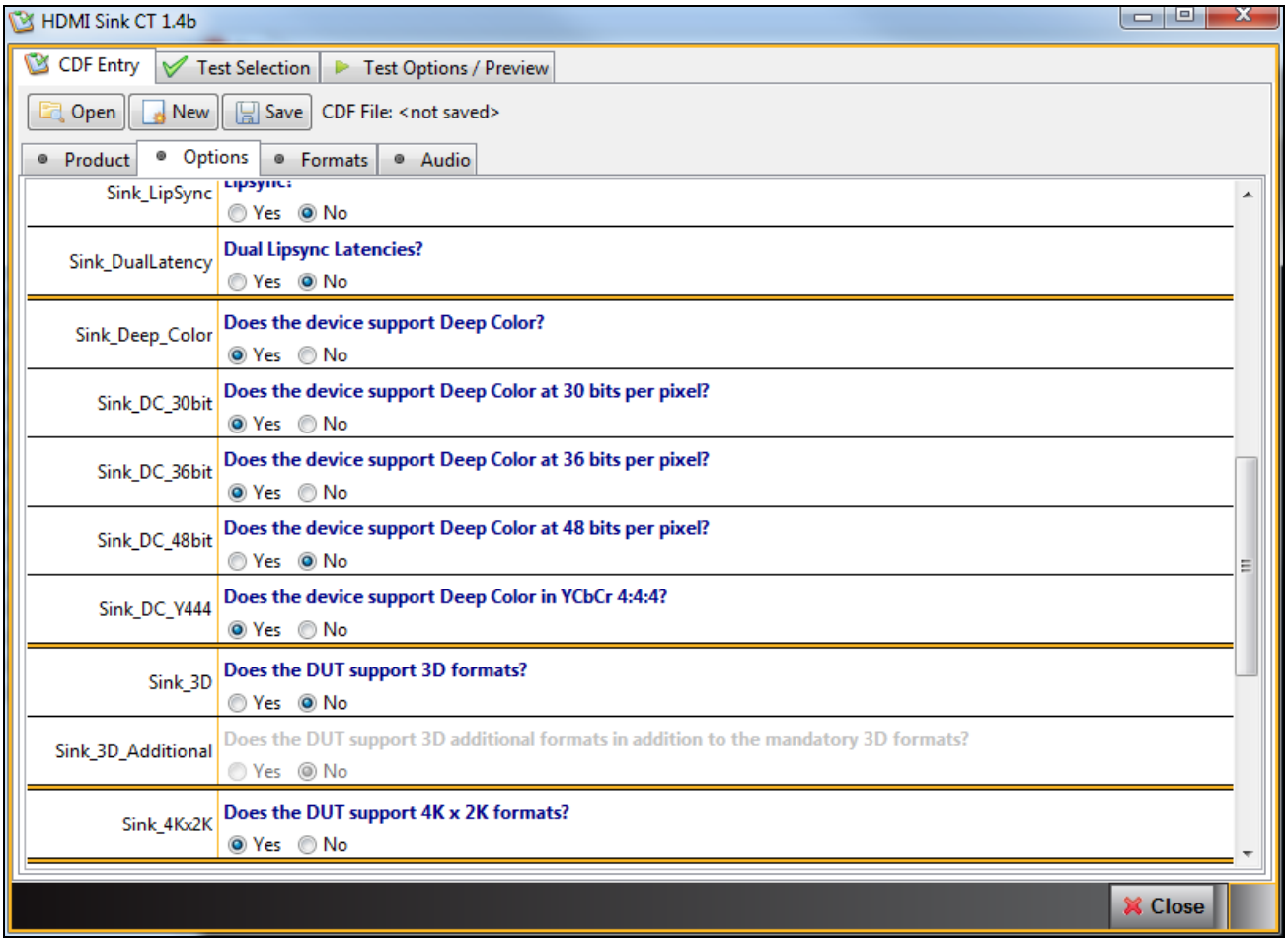


Once you have completed all the required fields the message will go away as shown in the following screen.

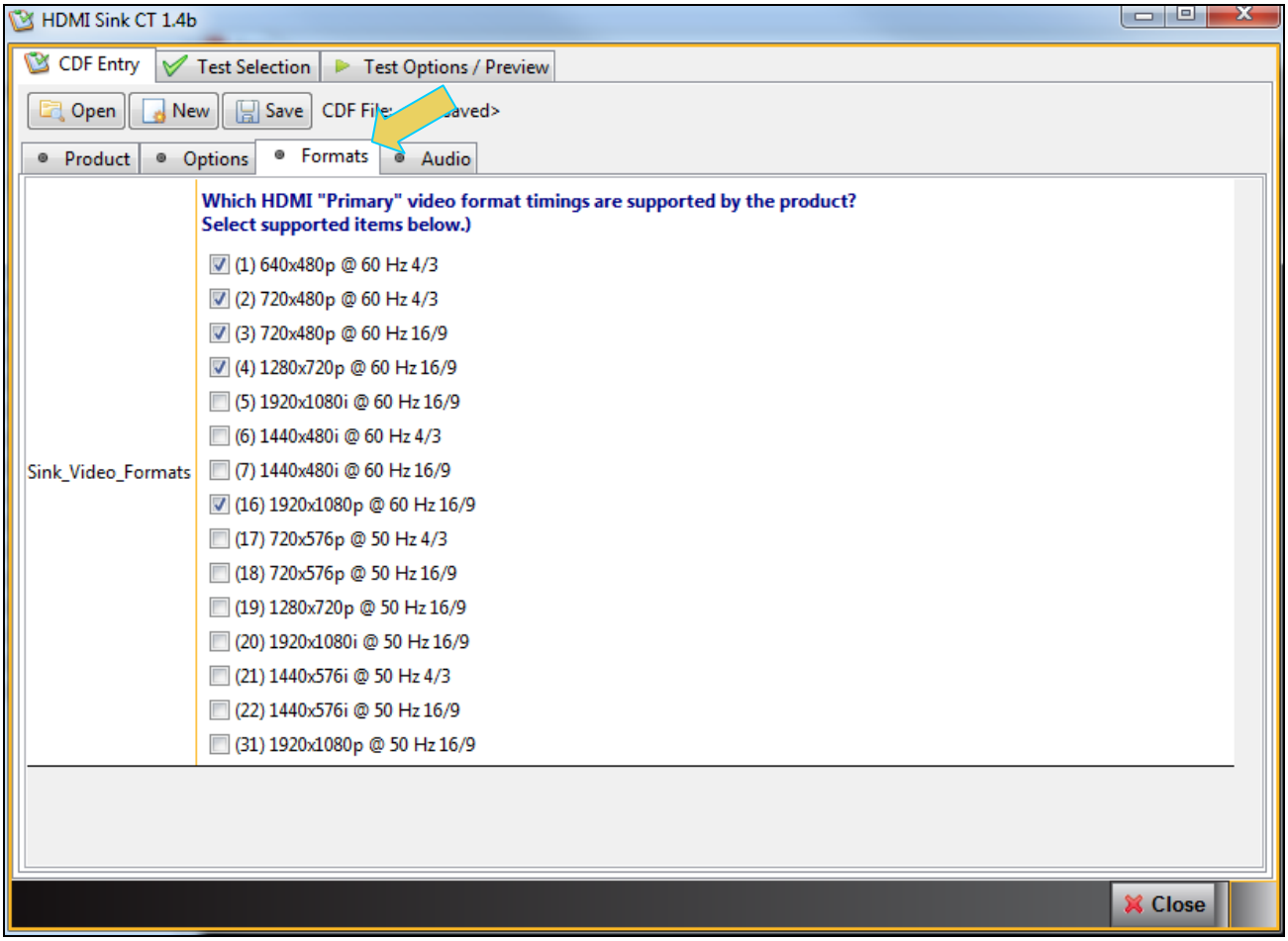


6. Complete the items in the **Options** tab. Refer to the following screen shots.

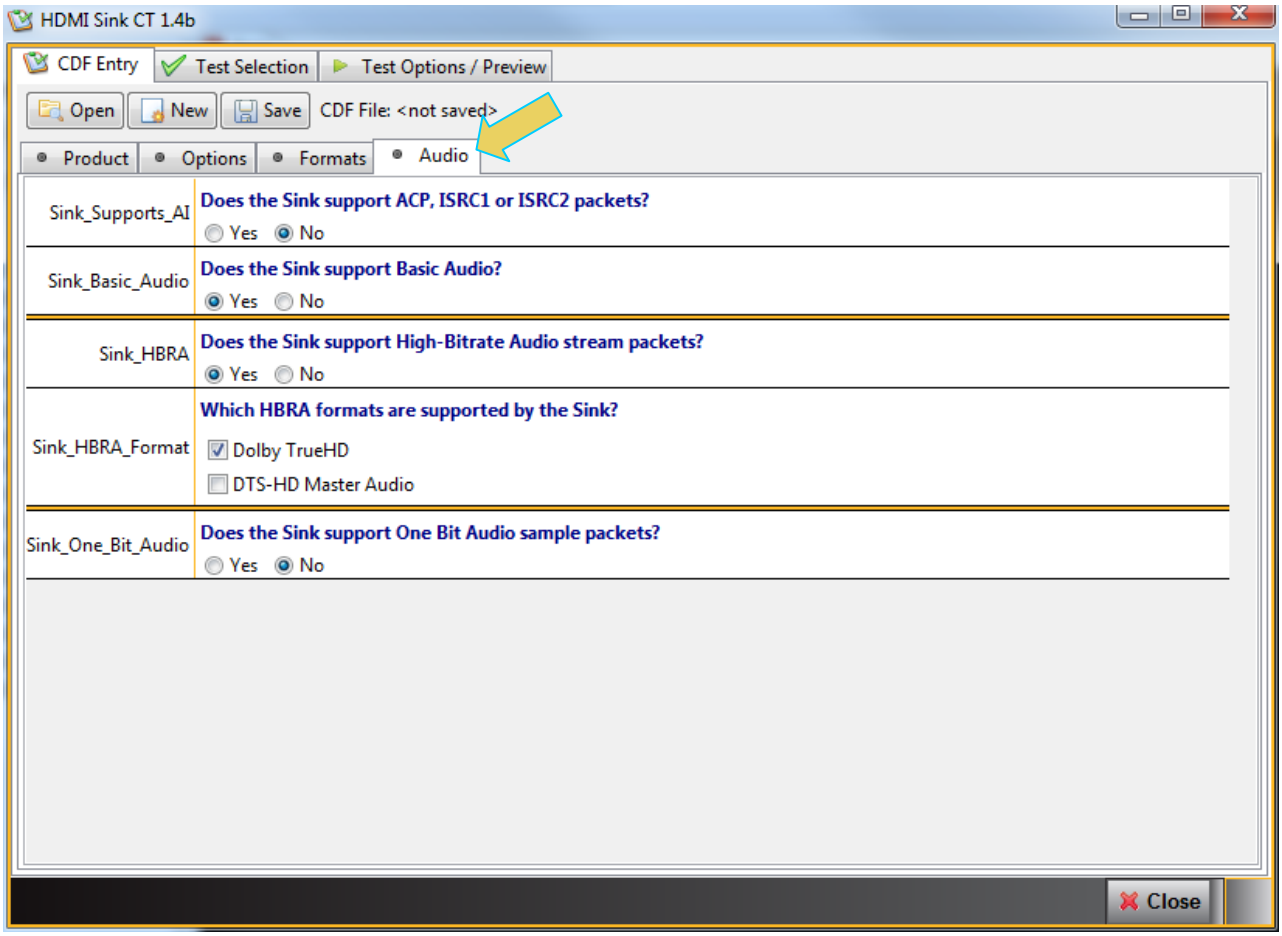



HDMI Sink CT 1.4b
CDF Entry
Test Selection
Test Options / Preview
Open
New
Save
CDF File: <not saved>
Product
Options
Formats
Audio
Sink_LipSync
Yes No
Sink_DualLatency
Dual Lipsync Latencies?
Yes No
Sink_Deep_Color
Does the device support Deep Color?
Yes No
Sink_DC_30bit
Does the device support Deep Color at 30 bits per pixel?
Yes No
Sink_DC_36bit
Does the device support Deep Color at 36 bits per pixel?
Yes No
Sink_DC_48bit
Does the device support Deep Color at 48 bits per pixel?
Yes No
Sink_DC_Y444
Does the device support Deep Color in YCbCr 4:4:4?
Yes No
Sink_3D
Does the DUT support 3D formats?
Yes No
Sink_3D_Additional
Does the DUT support 3D additional formats in addition to the mandatory 3D formats?
Yes No
Sink_4Kx2K
Does the DUT support 4K x 2K formats?
Yes No
Close

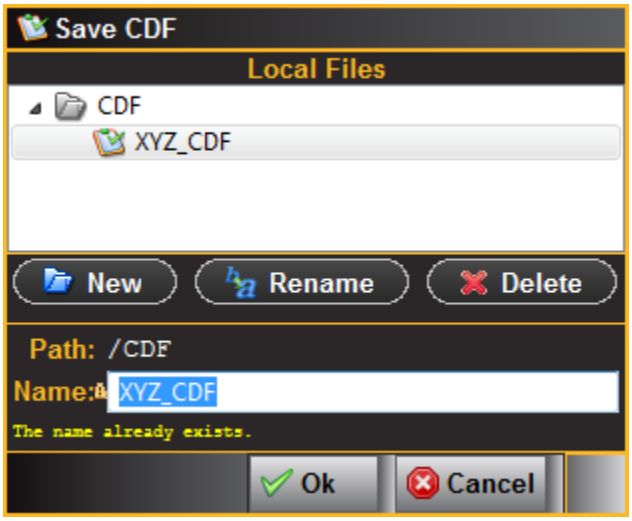
7. Complete the items in the **Formats** tab.



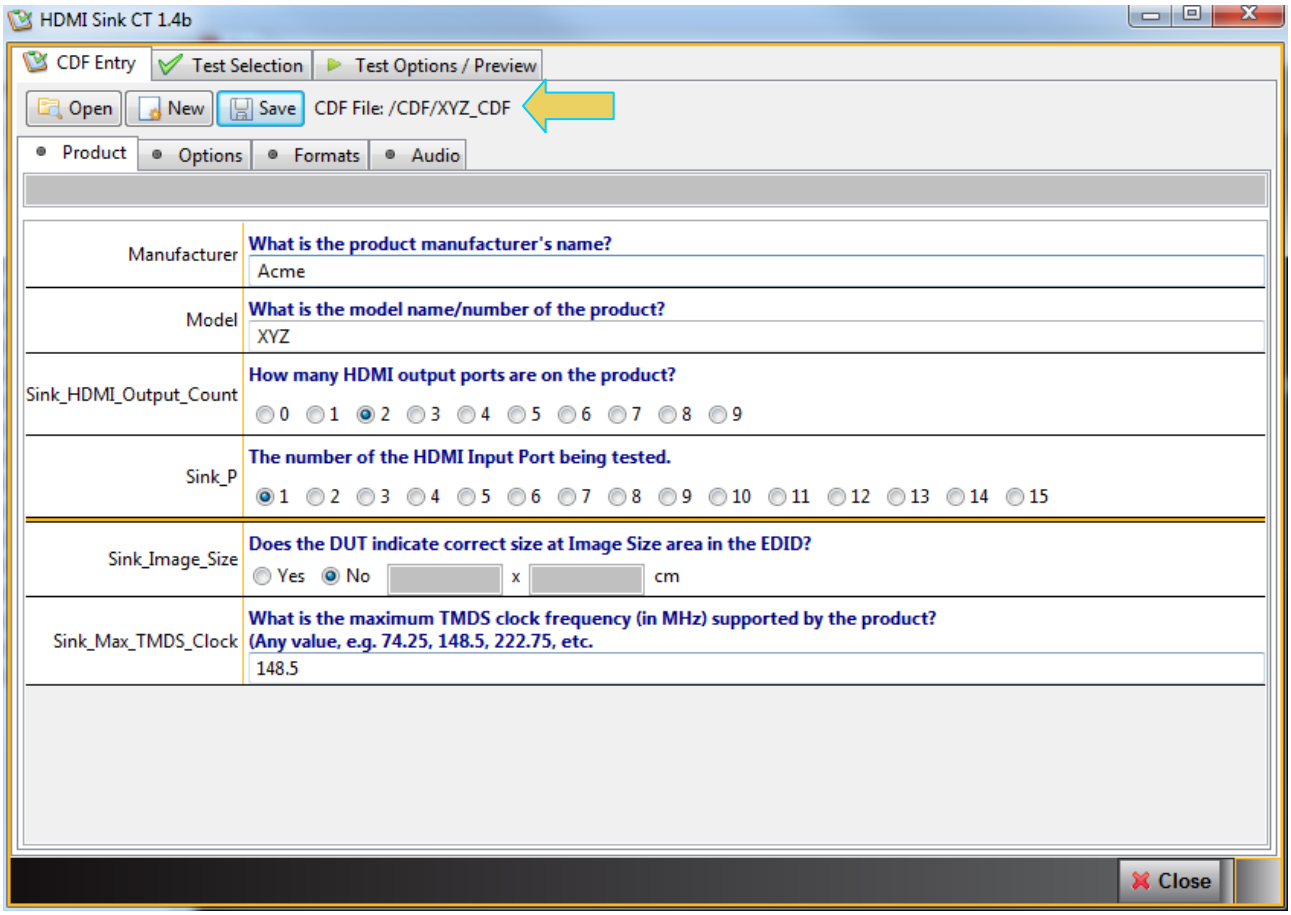
8. Complete the items in the **Audio** tab.



9. Save the CDF. A confirmation box with a default name will appear as shown below. Edit the name if necessary and click OK.



When you save the CDF the name appears next to the **Save** button as indicated on the screen below.



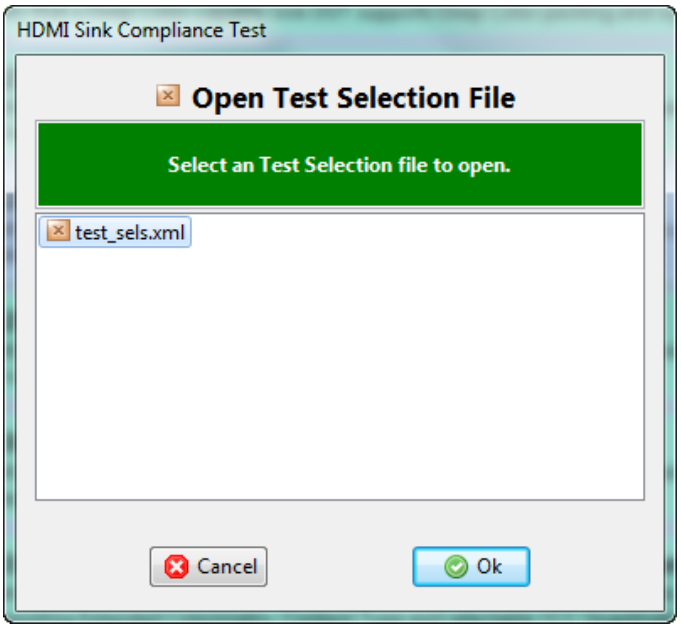
3.5 Selecting which tests to run

Use the following procedures to select the tests to run. There are multiple tabs which correspond to each section in the CTS.

To select the tests to run:

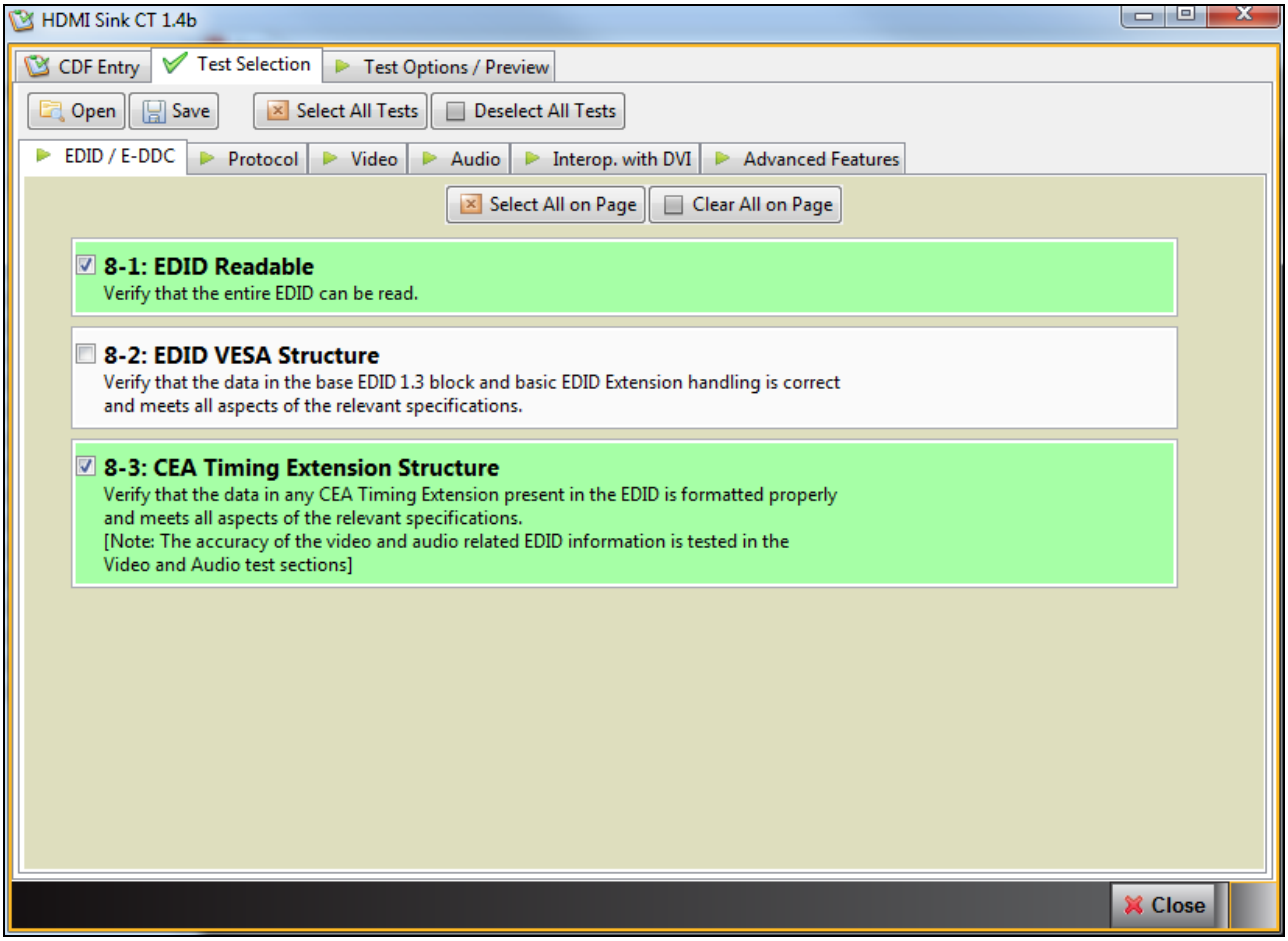
1. Select the **Test Selection** panel as shown below.
2. To open an existing Test Selection file, click on the **Open** activation button.

   You will be prompted with a dialog box that enables you to open a Test Selection. Select a Test Selection file and then **OK** to proceed; **Cancel** to exit.



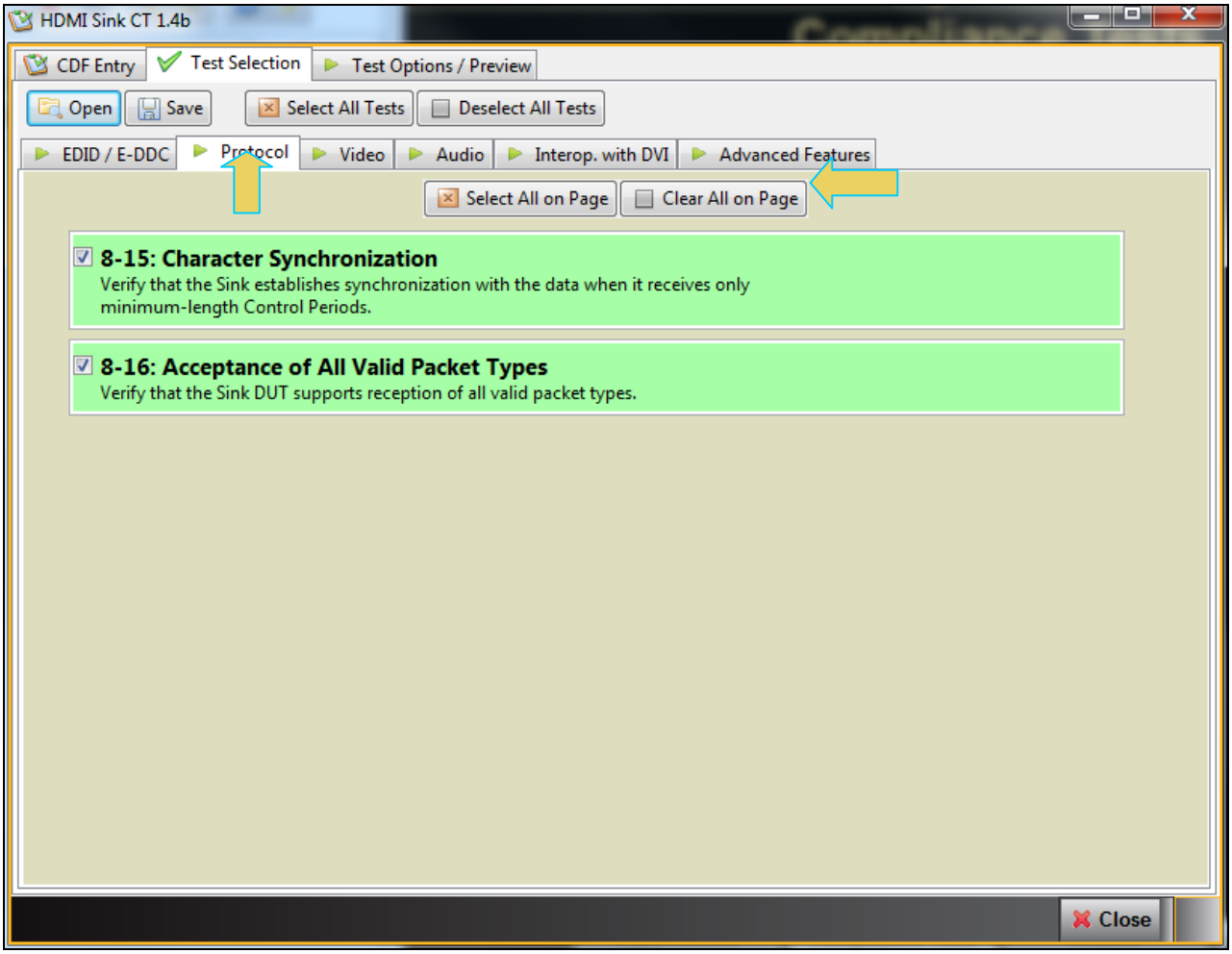
3. Select the tests in the **EDID / E-DDC** tab of the **Test Selection** panel shown below.

   Note: The **EDID / E-DDC** tab will only appear if you have purchased the EDID Compliance Test option.

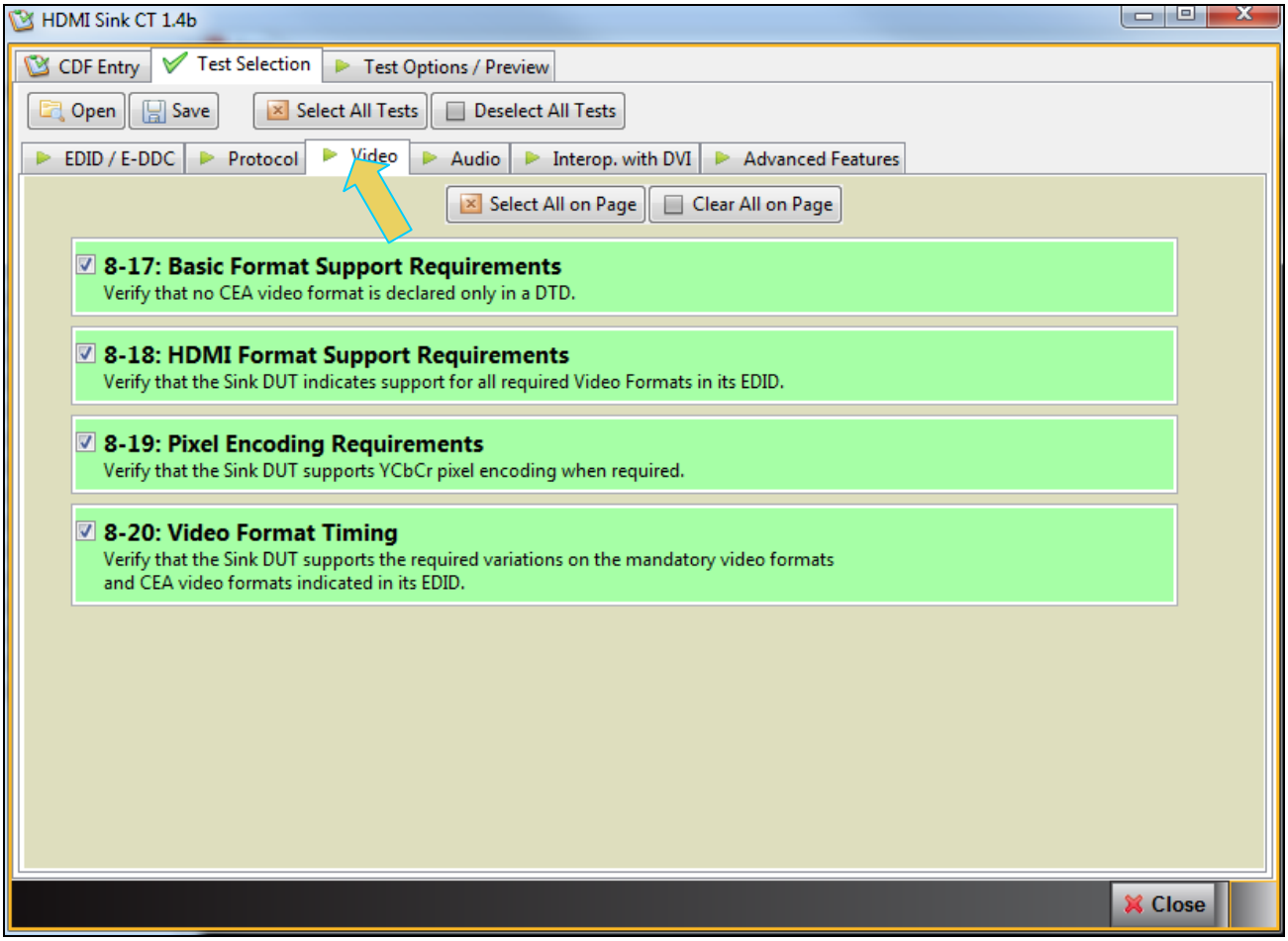


4. Select the tests in the **Protocol** tab of the **Test Selection** panel shown below.

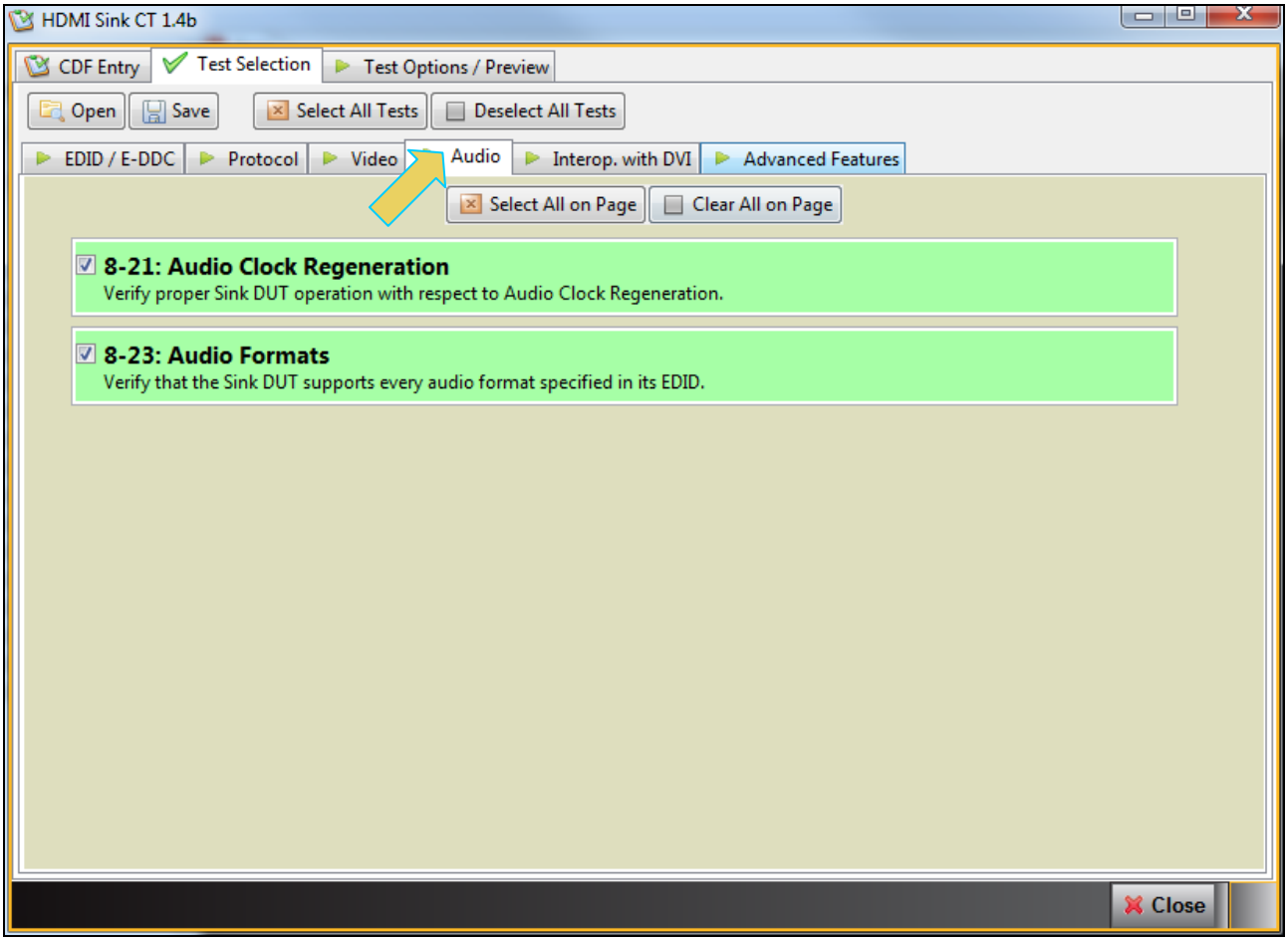
   For convenience you can **Select All** or **Clear All** tests using the activation buttons provided.



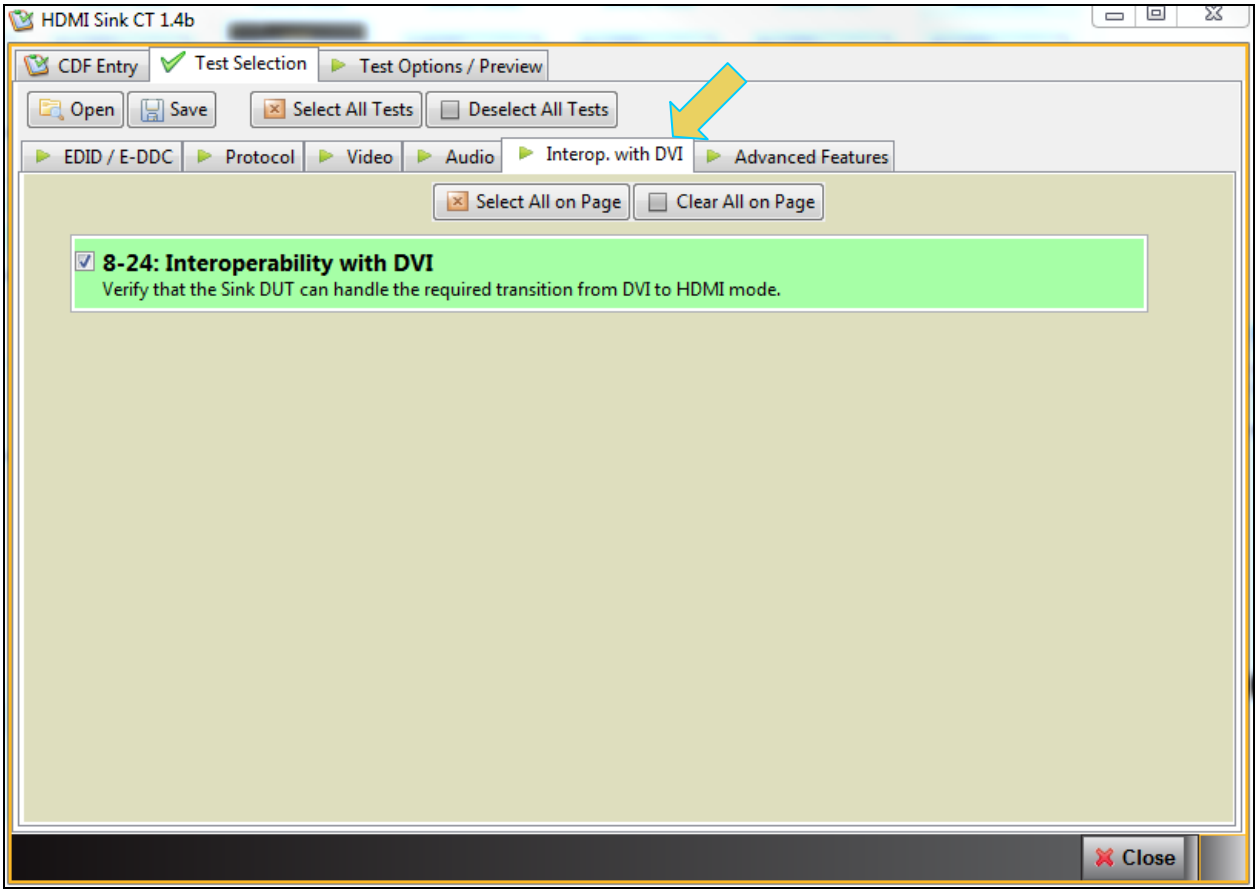
5. Select the tests in the **Video** tab of the **Test Selection** panel shown below.



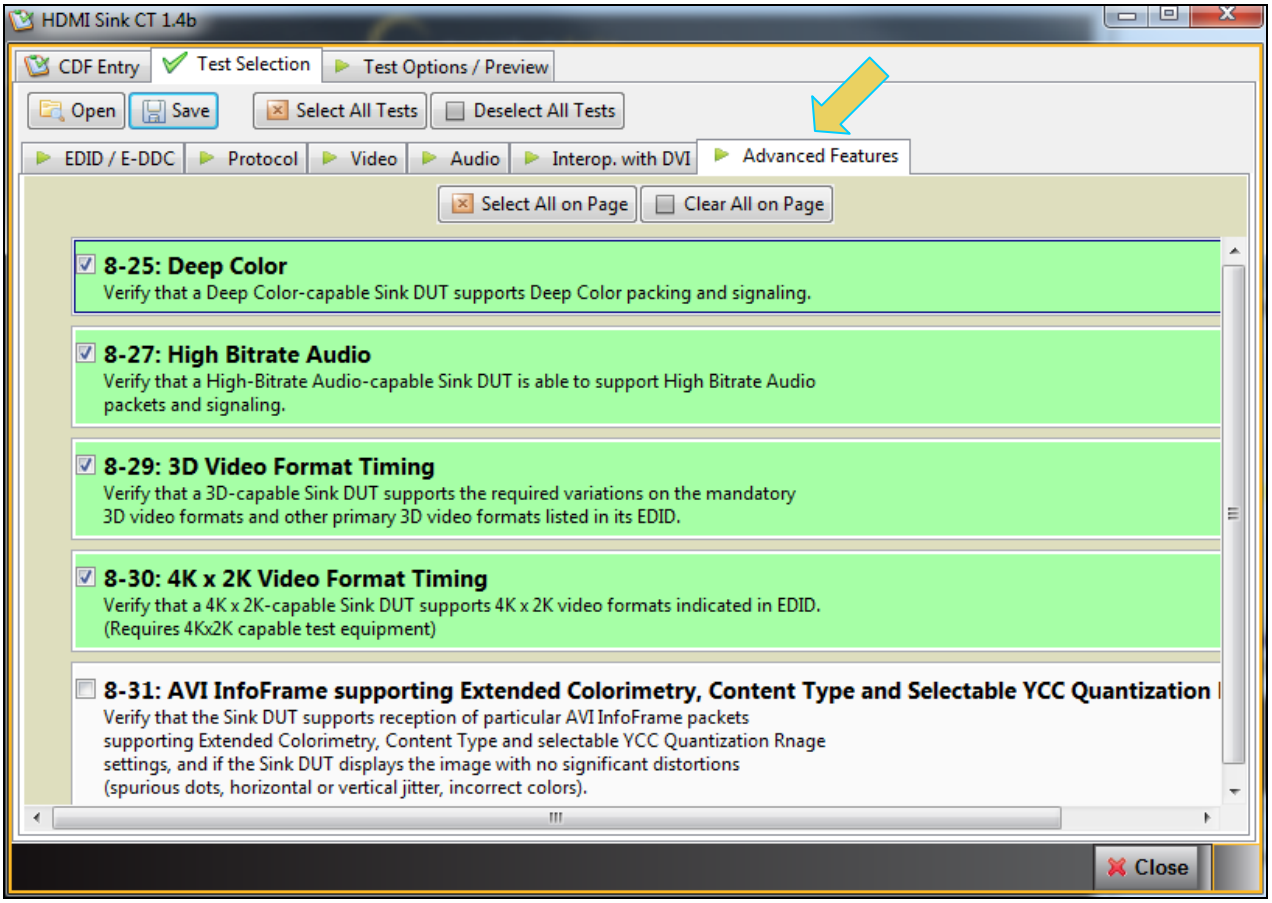
6. Select the tests in the **Audio** tab of the **Test Selection** panel shown below.



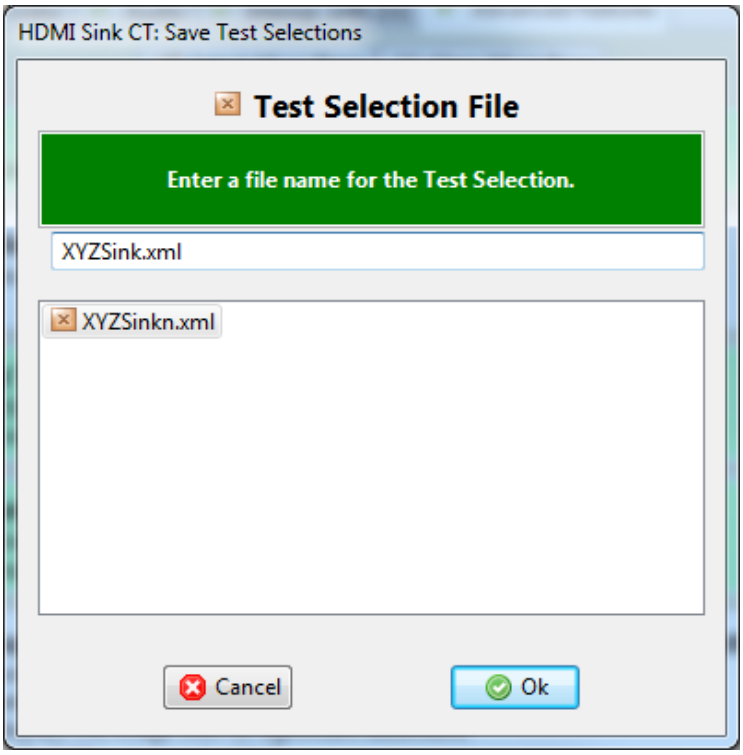
7. Select the tests in the **Interop. With DVI** tab of the **Test Selection** panel shown below.



8. Select the tests in the **Advanced Features** tab of the **Test Selection** panel shown below.



9. When you are done with the **Test Selection** panel you may choose to save these selections. Click on the **Save** activation button to save these selection. The dialog box below appears enabling you to assign a name. Enter the name and then click on the OK button to save or Cancel to exit without saving.

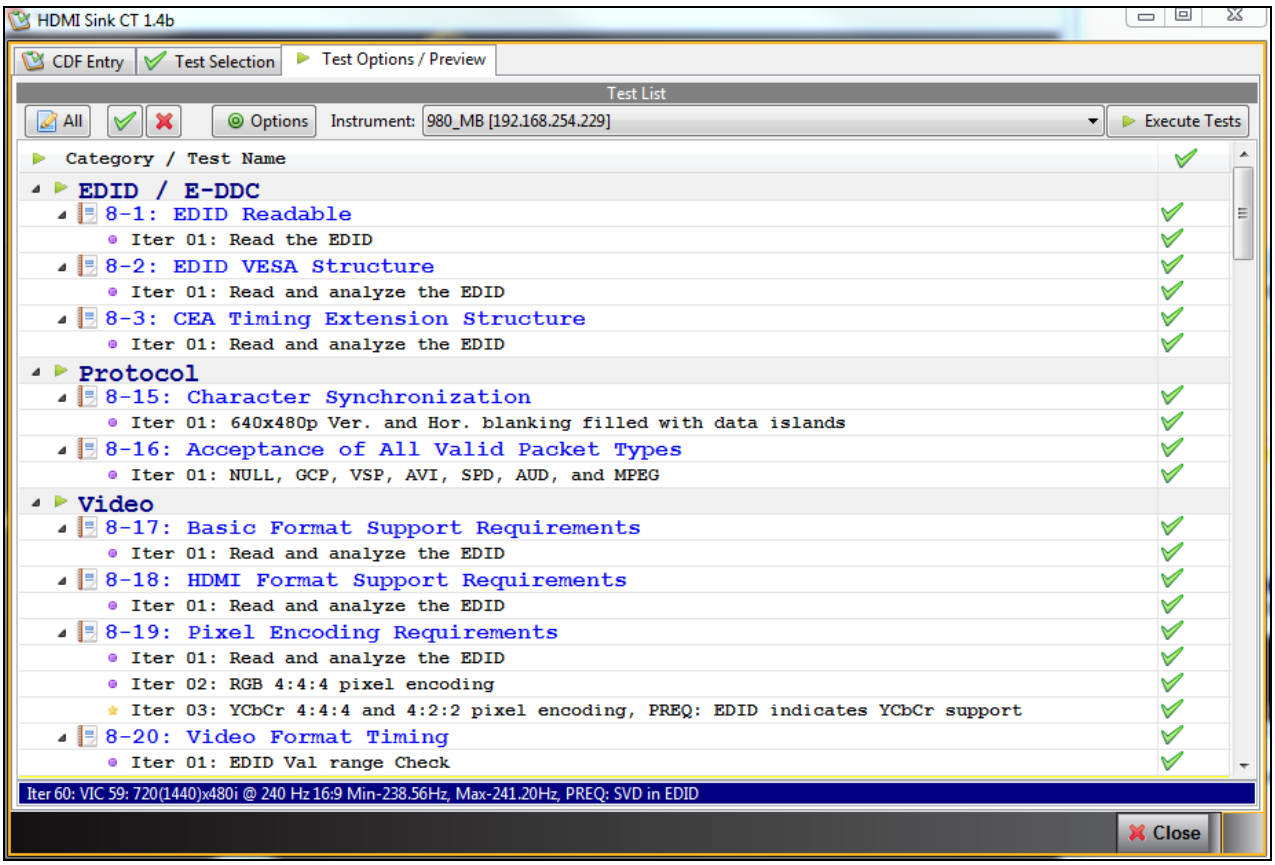


3.6 Executing the HDMI Sink Compliance Tests

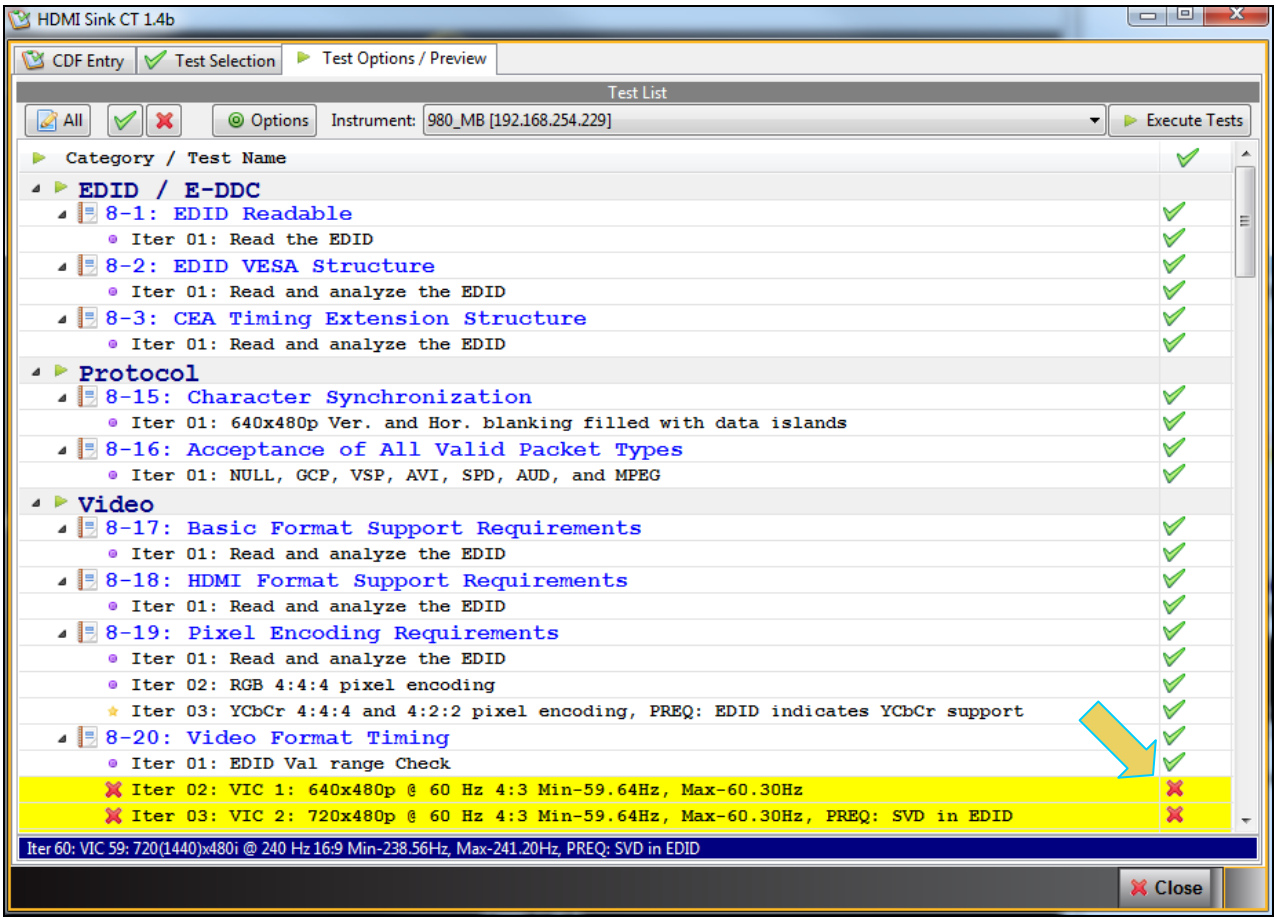
Use the following procedures to initiate the execution of an HDMI Sink Compliance test series.

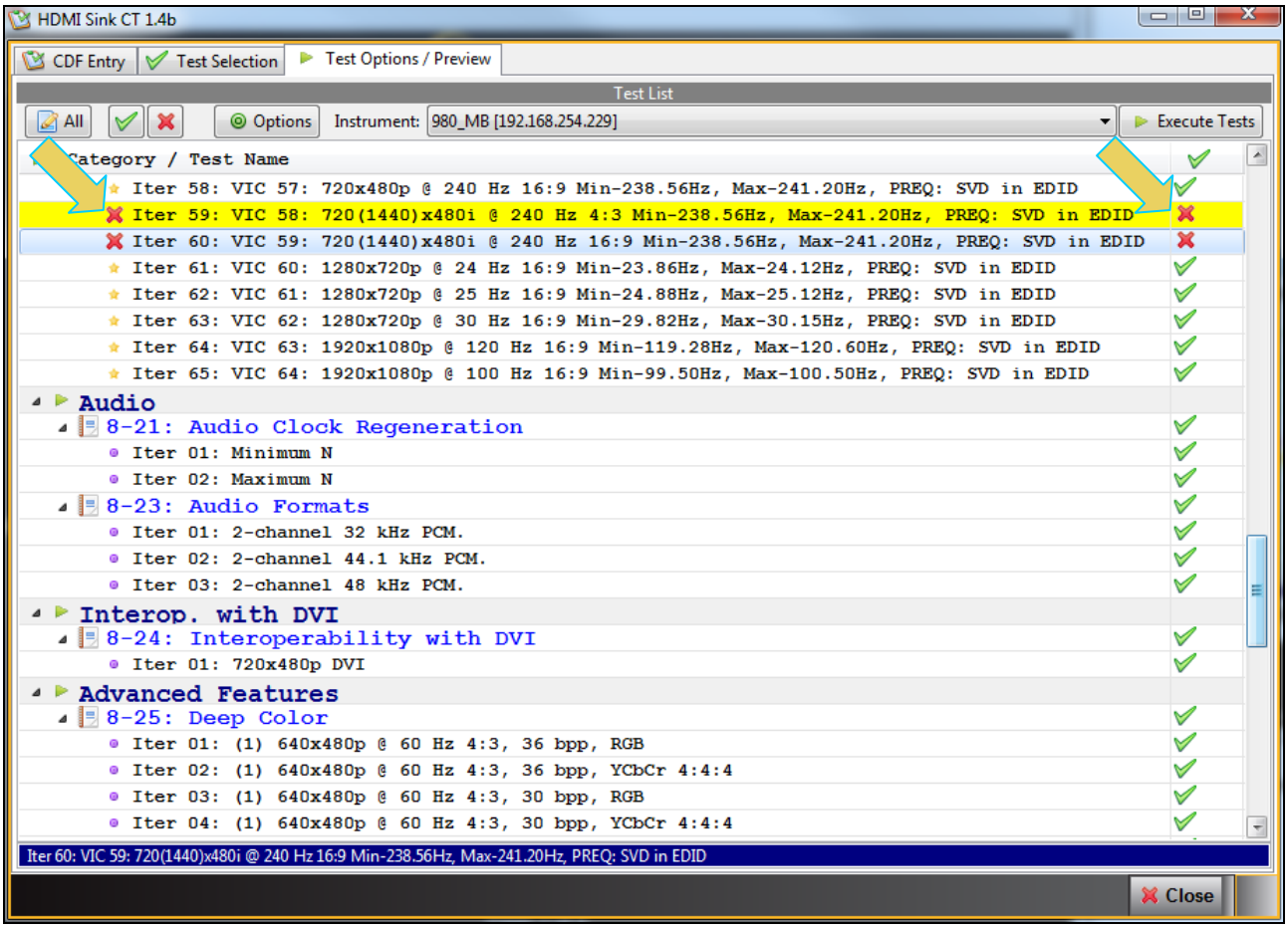
To initiate a test series:

1. Select the **Test Options / Preview** panel as shown below.



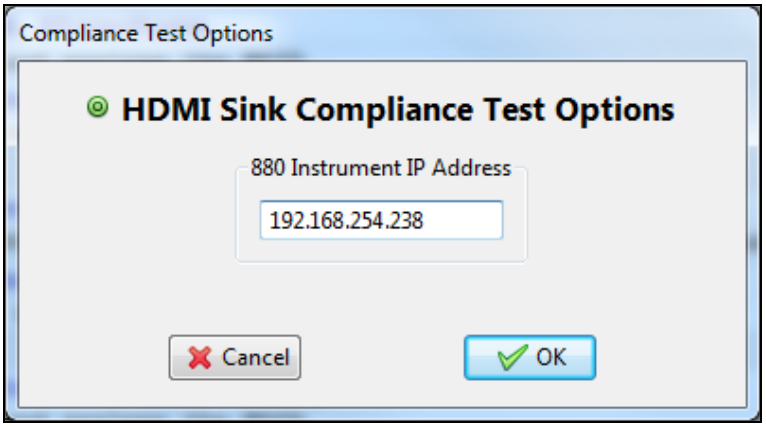
2. (Optional) Review the list of tests for each category. If you wish to skip some of the tests. You can skip tests by clicking on the Check mark on the right side of the **Test Options / Preview** panel. You can choose to skip all or test all with the associated activation buttons in the upper left. These are shown in the screen images below along with a sample selection of tests. The tests that have been skipped (highlighted in yellow with a red X).


HDMI Sink CT 1.4b
CDF Entry
Test Selection
Test Options / Preview
Test List
All
Options
Instrument:
980_MB [192.168.254.229]
Execute Tests
Category / Test Name
EDID / E-DDC
8-1: EDID Readable
Iter 01: Read the EDID
8-2: EDID VESA Structure
Iter 01: Read and analyze the EDID
8-3: CEA Timing Extension Structure
Iter 01: Read and analyze the EDID
Protocol
8-15: Character Synchronization
Iter 01: 640x480p Ver. and Hor. blanking filled with data islands
8-16: Acceptance of All Valid Packet Types
Iter 01: NULL, GCP, VSP, AVI, SPD, AUD, and MPEG
Video
8-17: Basic Format Support Requirements
Iter 01: Read and analyze the EDID
8-18: HDMI Format Support Requirements
Iter 01: Read and analyze the EDID
8-19: Pixel Encoding Requirements
Iter 01: Read and analyze the EDID
Iter 02: RGB 4:4:4 pixel encoding
Iter 03: YCbCr 4:4:4 and 4:2:2 pixel encoding, PREQ: EDID indicates YCbCr support
8-20: Video Format Timing
Iter 01: EDID Val range Check
Iter 02: VIC 1: 640x480p @ 60 Hz 4:3 Min-59.64Hz, Max-60.30Hz
Iter 03: VIC 2: 720x480p @ 60 Hz 4:3 Min-59.64Hz, Max-60.30Hz, PREQ: SVD in EDID
Iter 60: VIC 59: 720(1440)x480i @ 240 Hz 16:9 Min-238.56Hz, Max-241.20Hz, PREQ: SVD in EDID
Close



Set the **Options** for the tests. The following dialog box appears.

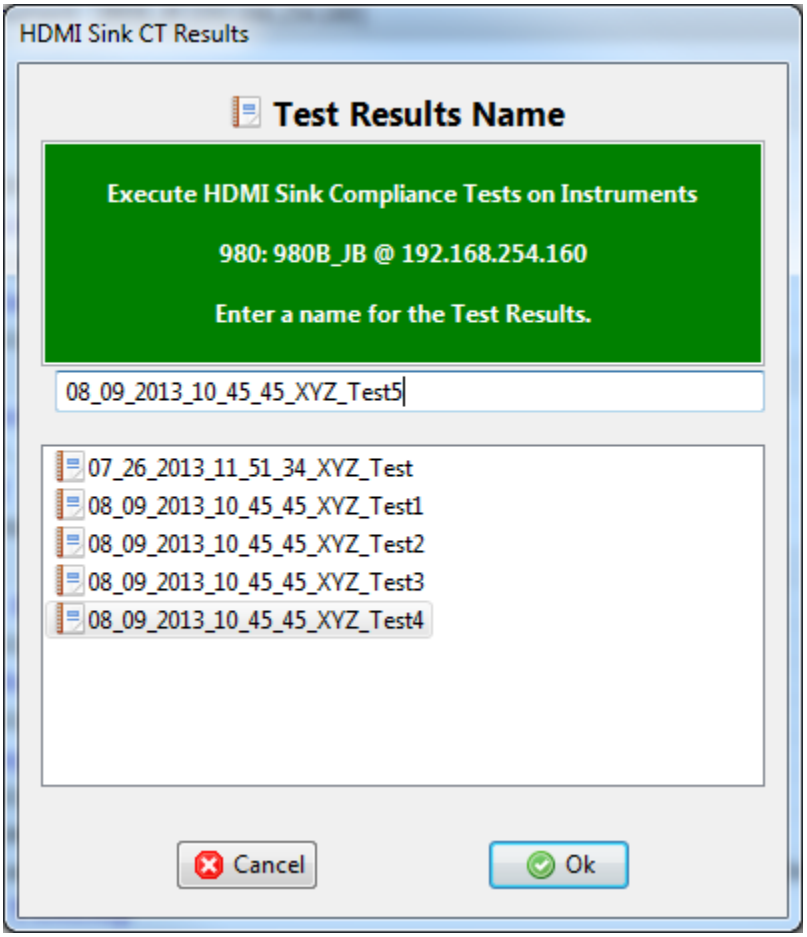
Note: In order to run the 8-27 High Bitrate Audio test, you will have to specify the IP address of the 882E or 882EA.



When you have entered the IP address, click **OK**. Click **Cancel** to exit.

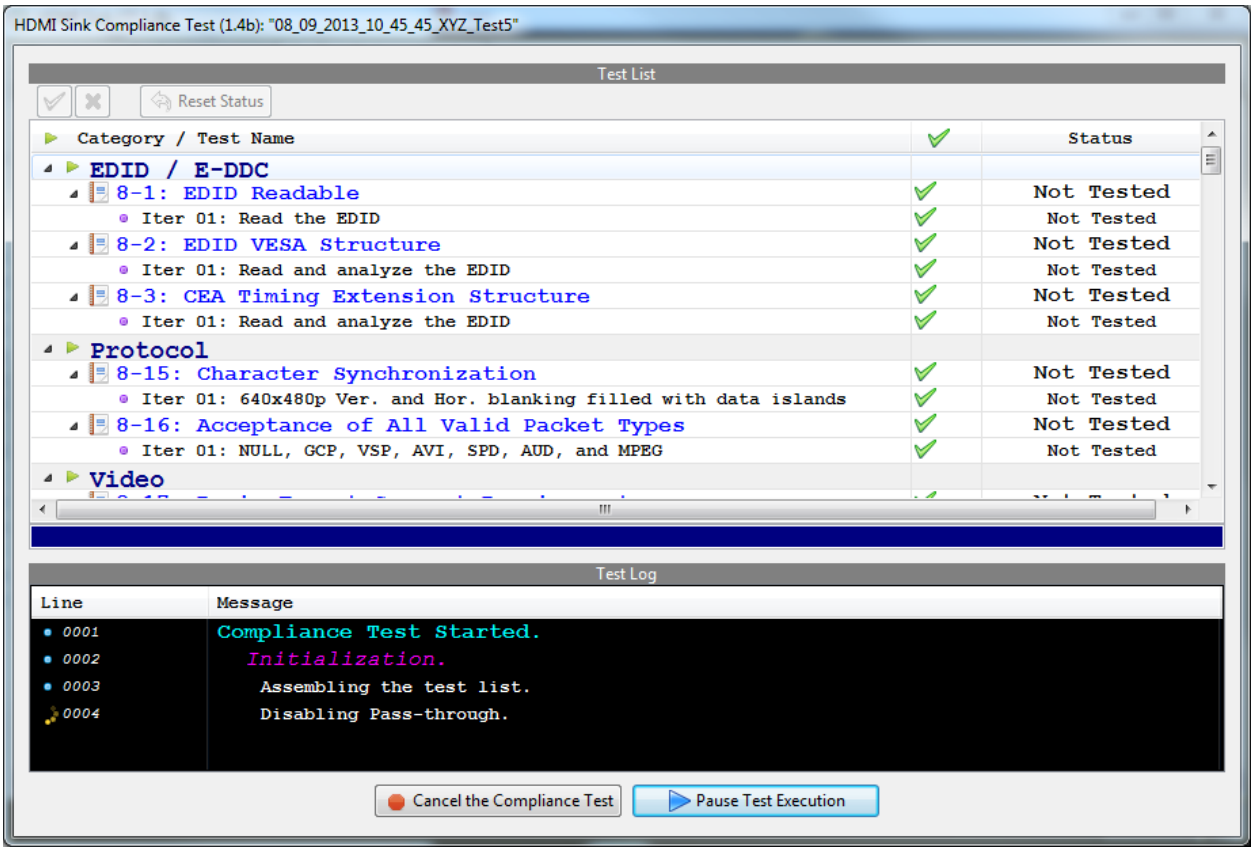
Click on the **Execute Tests** 

activation button to initiate the test suite. You will be prompted for a name for the tests. This dialog box is shown below.

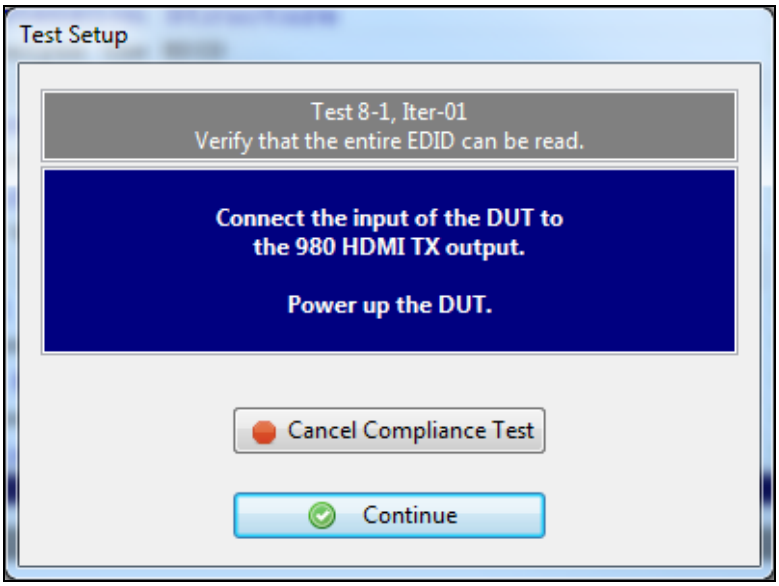


When you press OK the tests will begin in a new window. This window provides a listout of the tests and the lower **Test Log** panel showing the test activity as it occurs.

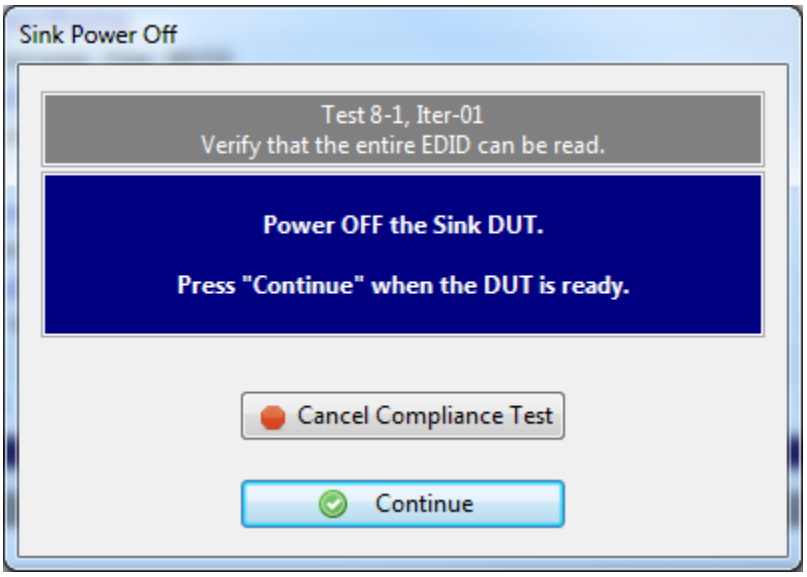
Refer to the following two screen examples.

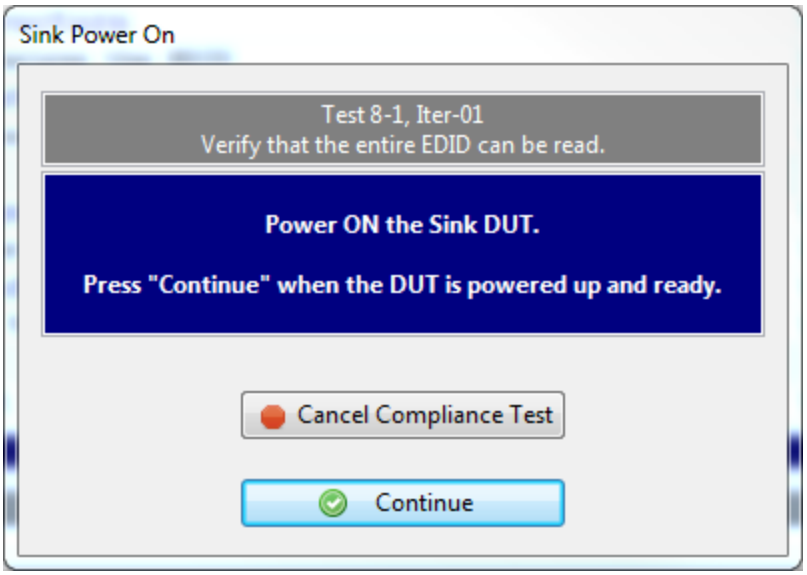


During the tests a **Required DUT Configuration** dialog box will appear which requires that you to verify that the sink device under test is in the correct state. The following screen shot depicts this. Press **Continue** when you have the source device in the correct mode. You can cancel the test using the **Cancel Compliance** Test button.

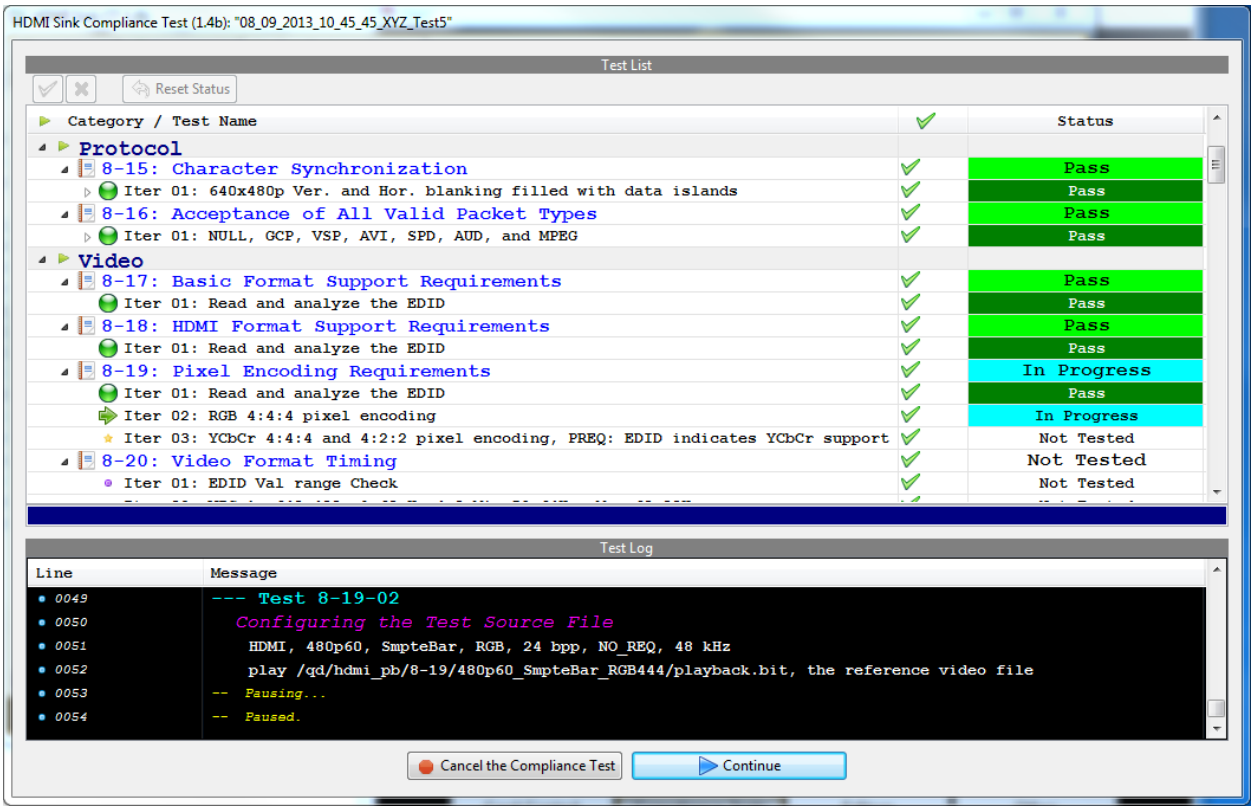


You will be instructed to power cycle the sink device under test for the EDID tests as indicated in the following two screen shots.



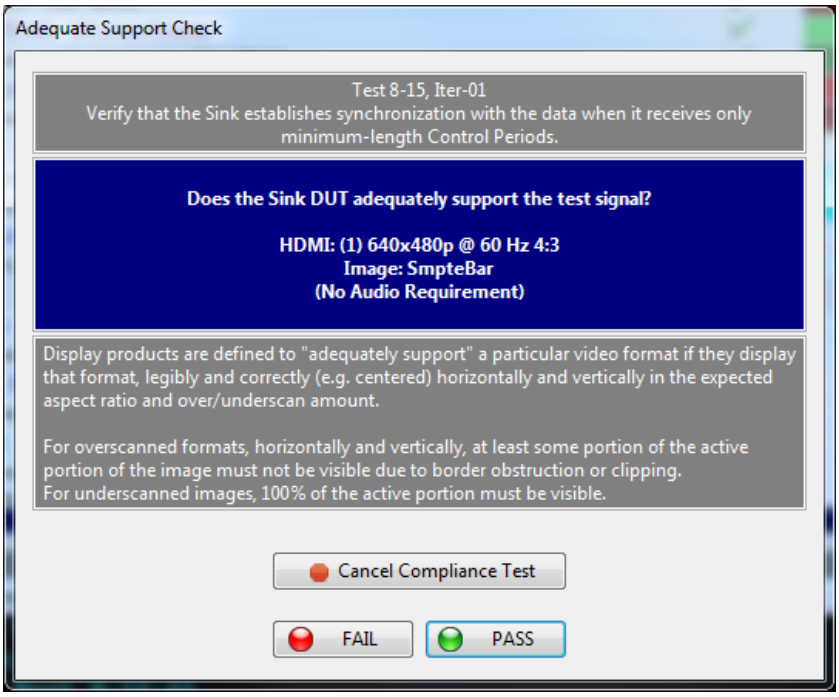


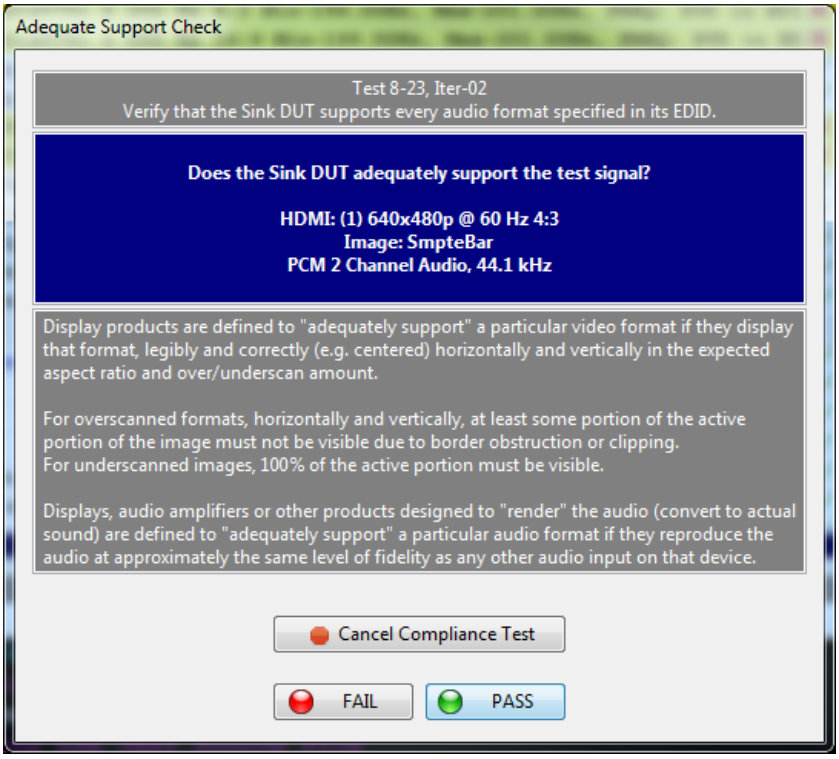
You can cancel the compliance test or pause at any time. If you pause the test you can resume later at any time even if you exit the 980 GUI Manager application.



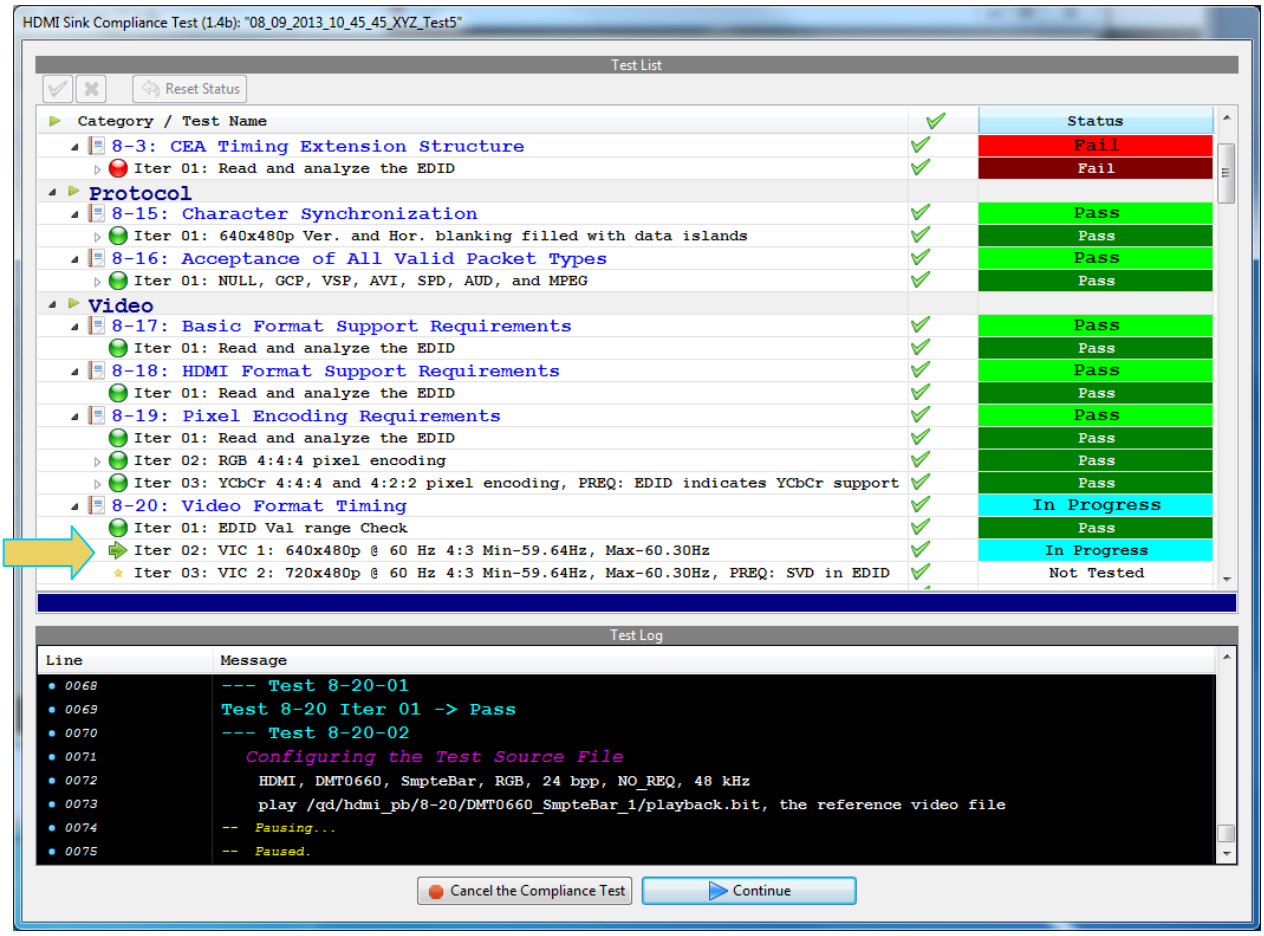
The pass/fail assessment requires that you observe the video image on the HDTV and indicate Pass or Fail. You will be prompted with a dialog box as shown below. The dialog box also enables you to cancel the tests.

Refer to the following two screen examples.

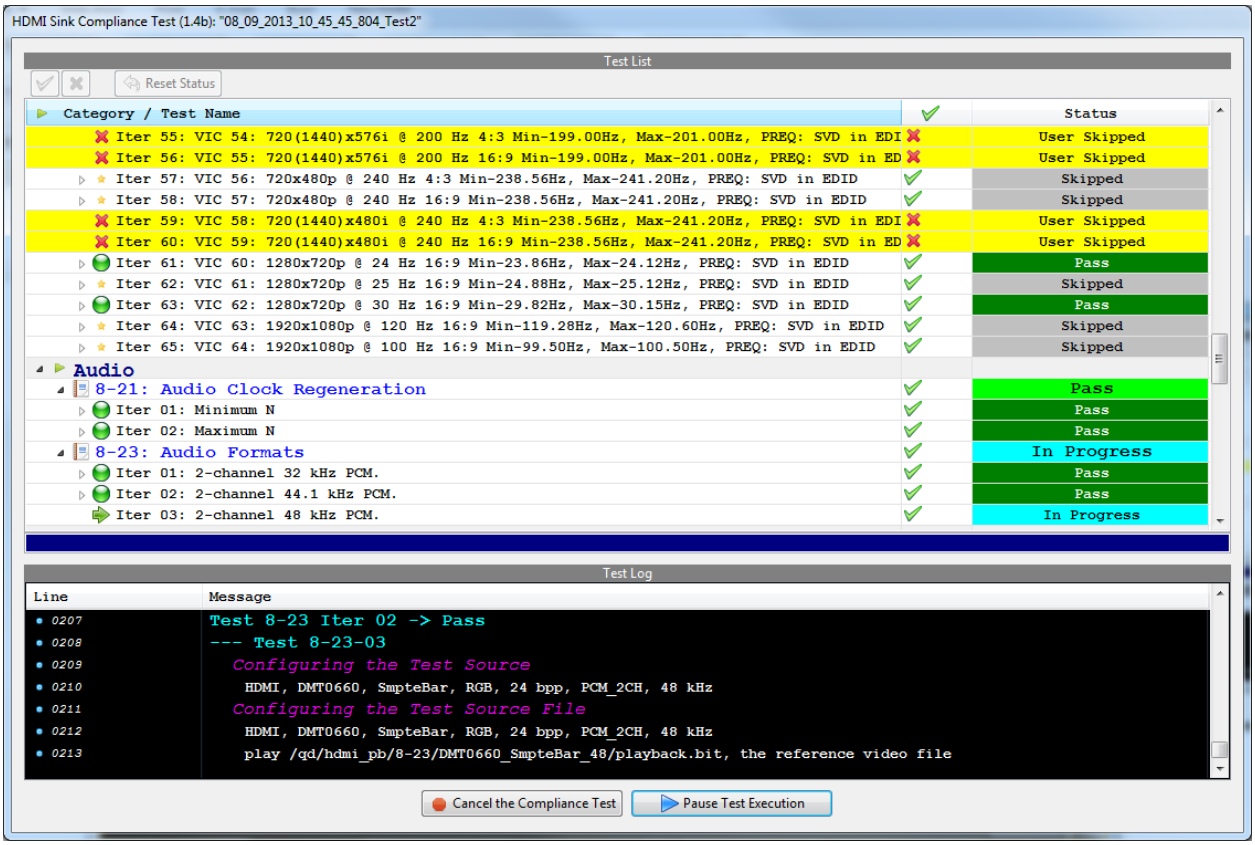


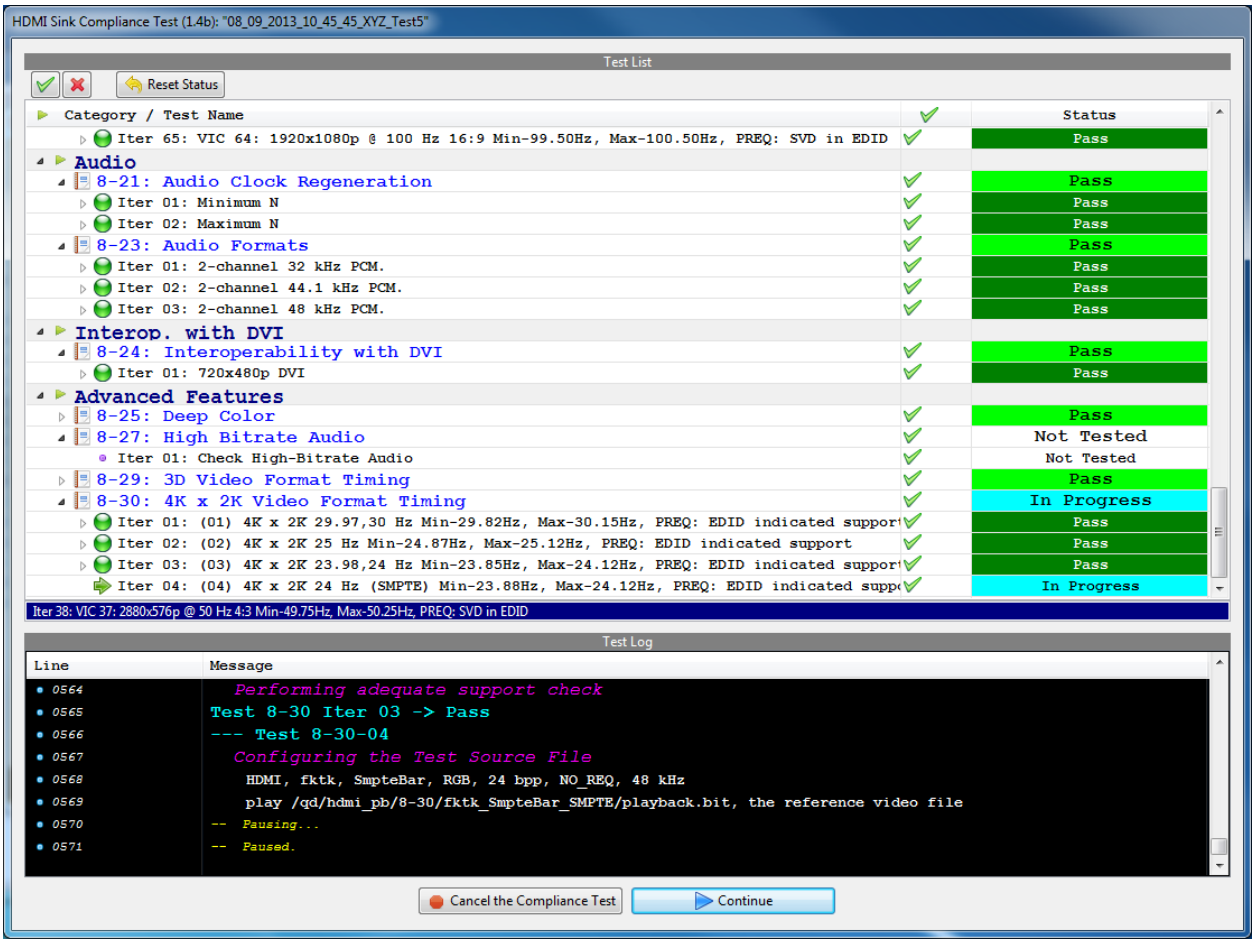


There is a progress arrow which points to the test that is currently being run.

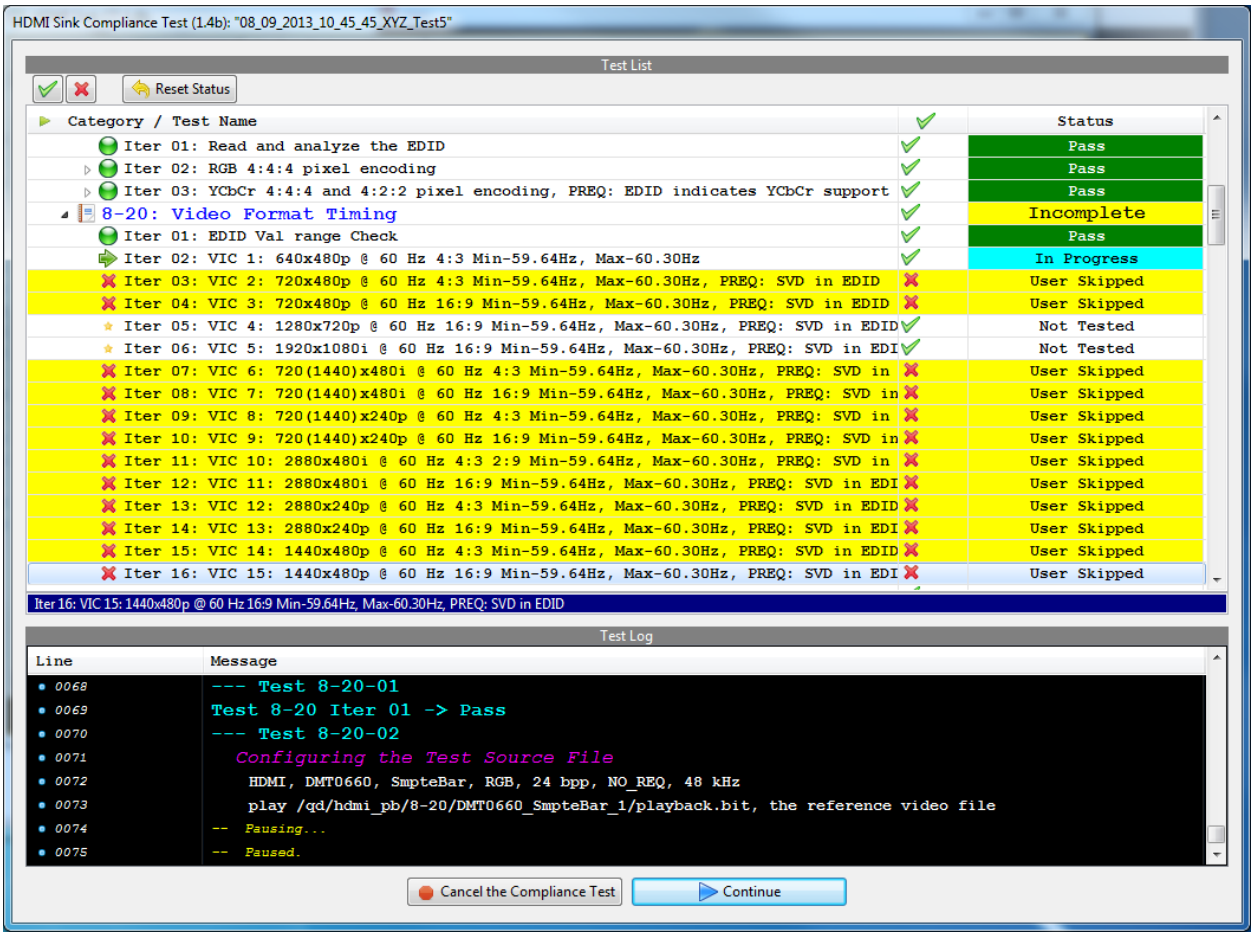


If the Compliance test application determines that a function is not supported by reading its EDID, the test will skip the related tests. For example, if you specify feature in the CDF but the HDTV does not support this format, the test will be skipped. The test will indicate “Skipped” in the test list panel and the reason the test was skipped with be shown. Refer to the example below.

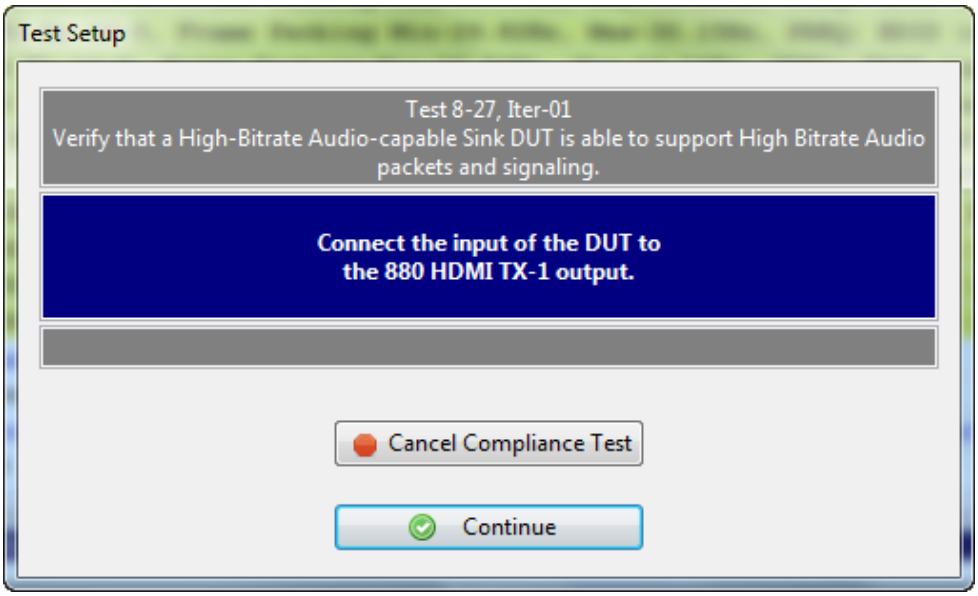


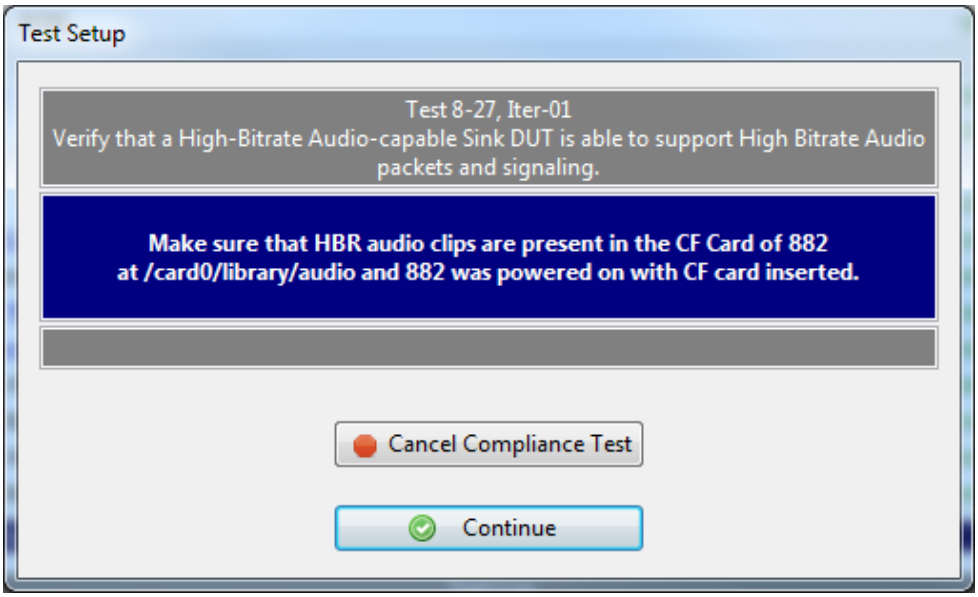

HDMI Sink Compliance Test (1.4b): "08_09_2013_10_45_45_XYZ_Test5"
Test List
Reset Status
Category / Test Name
Status
Iter 65: VIC 64: 1920x1080p @ 100 Hz 16:9 Min-99.50Hz, Max-100.50Hz, PREQ: SVD in EDID
Pass
Audio
8-21: Audio Clock Regeneration
Pass
Iter 01: Minimum N
Pass
Iter 02: Maximum N
Pass
8-23: Audio Formats
Pass
Iter 01: 2-channel 32 kHz PCM.
Pass
Iter 02: 2-channel 44.1 kHz PCM.
Pass
Iter 03: 2-channel 48 kHz PCM.
Pass
Interop. with DVI
8-24: Interoperability with DVI
Pass
Iter 01: 720x480p DVI
Pass
Advanced Features
8-25: Deep Color
Pass
8-27: High Bitrate Audio
Not Tested
Iter 01: Check High-Bitrate Audio
Not Tested
8-29: 3D Video Format Timing
Pass
8-30: 4K x 2K Video Format Timing
In Progress
Iter 01: (01) 4K x 2K 29.97,30 Hz Min-29.82Hz, Max-30.15Hz, PREQ: EDID indicated support
Pass
Iter 02: (02) 4K x 2K 25 Hz Min-24.87Hz, Max-25.12Hz, PREQ: EDID indicated support
Pass
Iter 03: (03) 4K x 2K 23.98,24 Hz Min-23.85Hz, Max-24.12Hz, PREQ: EDID indicated support
Pass
Iter 04: (04) 4K x 2K 24 Hz (SMPTE) Min-23.88Hz, Max-24.12Hz, PREQ: EDID indicated supp
In Progress
Iter 38: VIC 37: 2880x576p @ 50 Hz 4:3 Min-49.75Hz, Max-50.25Hz, PREQ: SVD in EDID
Test Log
Line
Message
0564 Performing adequate support check
0565 Test 8-30 Iter 03 -> Pass
0566 --- Test 8-30-04
0567 Configuring the Test Source File
0568 HDMI, fktk, SmpteBar, RGB, 24 bpp, NO_REQ, 48 kHz
0569 play /qd/hdmi_pb/8-30/fktk_SmpteBar_SMPTE/playback.bit, the reference video file
0570 -- Pausing...
0571 -- Paused.
Cancel the Compliance Test
Continue

You can skip portions of the test even once the tests begin by clicking on the check icon on the right side of a particular test. This is shown in the sample screen shot below.

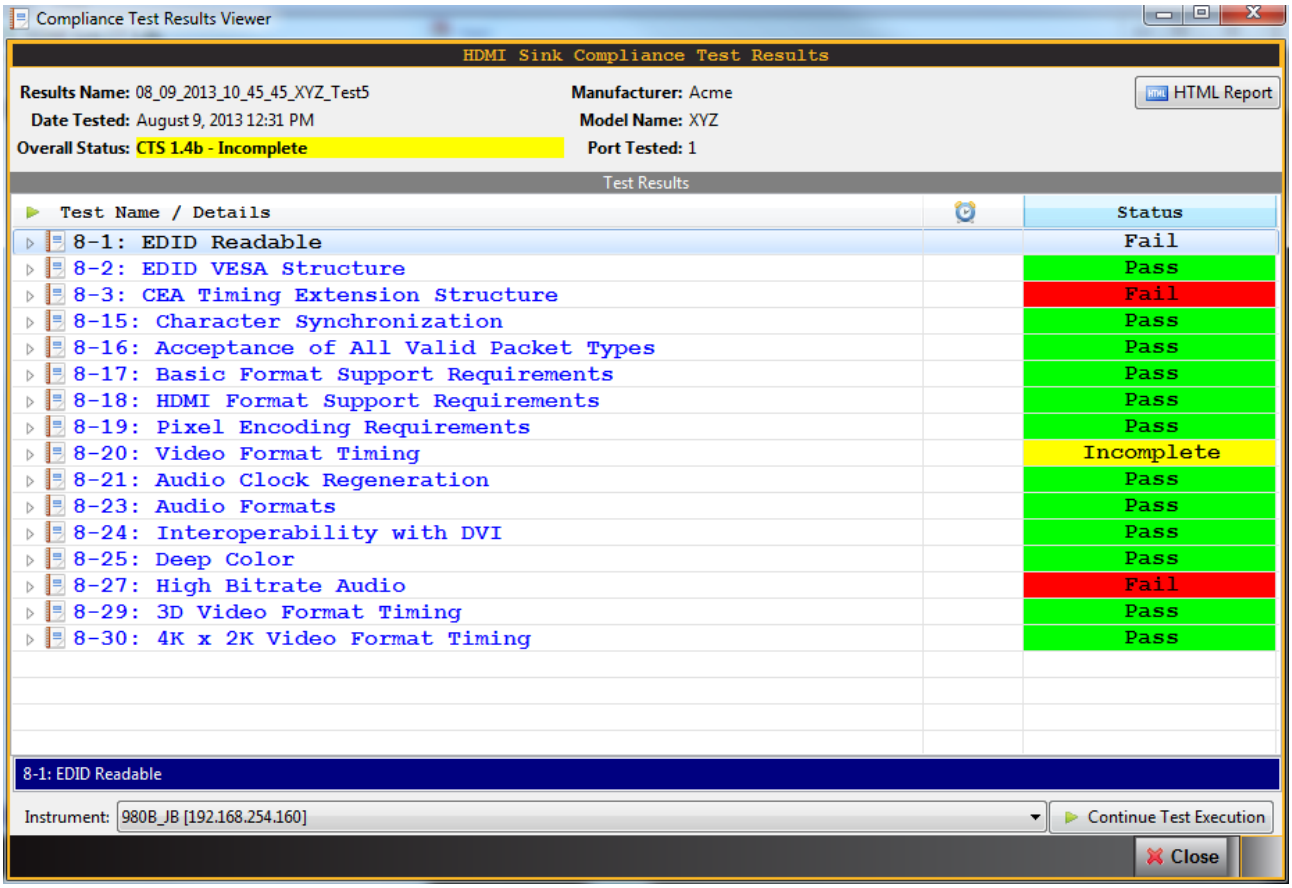


The test will run the High-Bit Rate audio test separately as it requires the Quantum Data 882 Test Instrument to complete. Refer to the section above in the beginning discussion of: Making the HDMI connections.

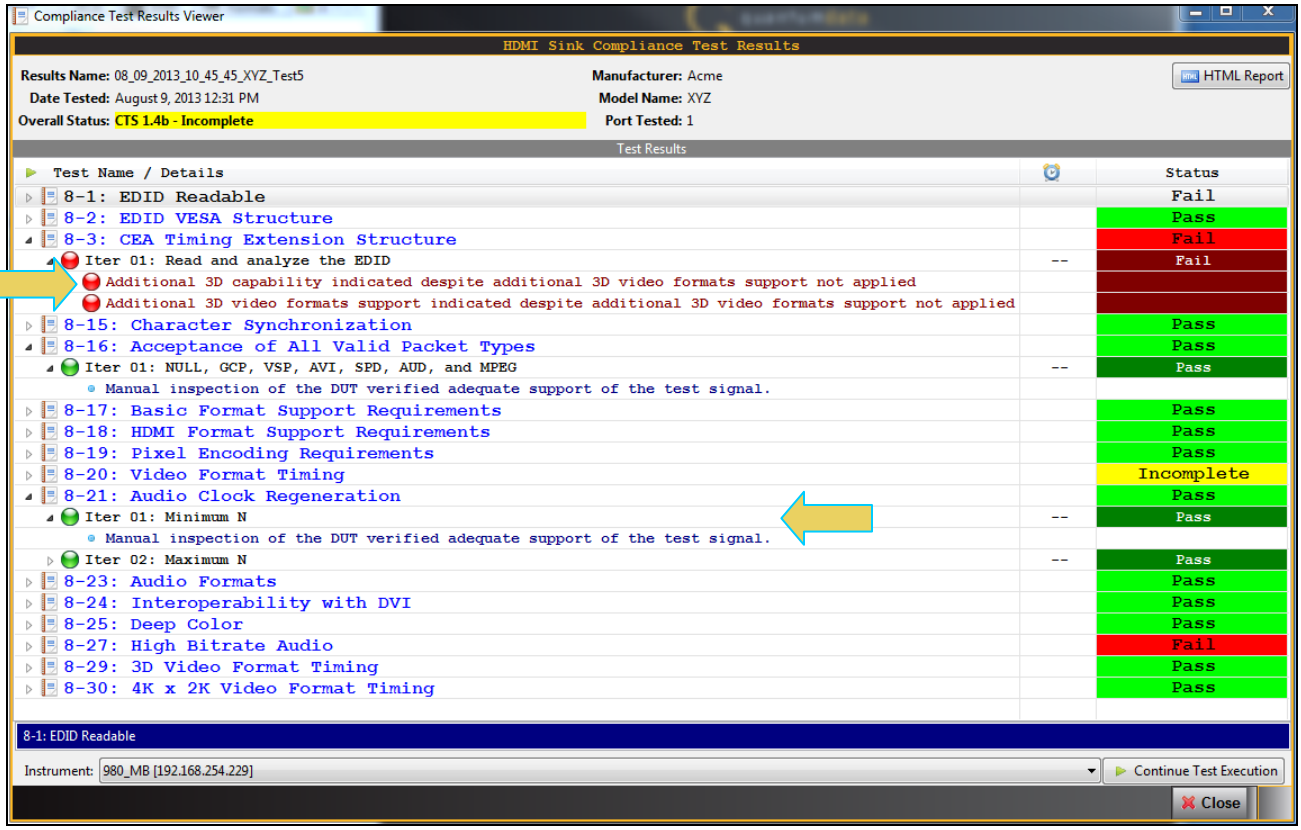




When the tests are completed the test window that shows the current activity will close. A new tab and panel will appear next to the **HDMI CT 1.4** tab called the **CT Results** tab. You can view the test results in this panel. Refer to the following screen to see an example of the **CT Results** panel. You can view the details of any test as shown in the following example.



You can view the details of any test as shown in the following example.

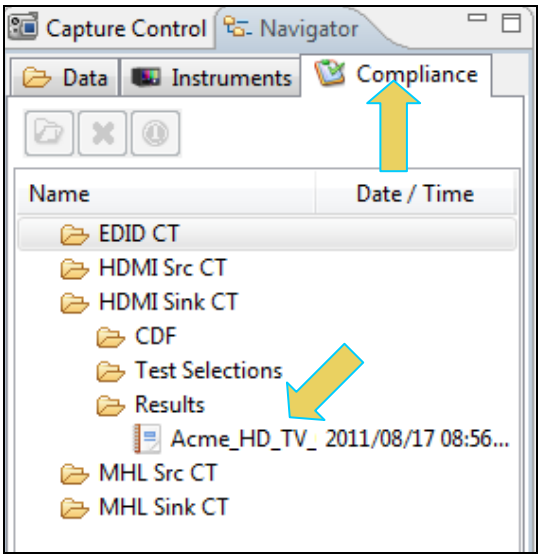


3.7 Resuming the HDMI Sink Compliance after cancel

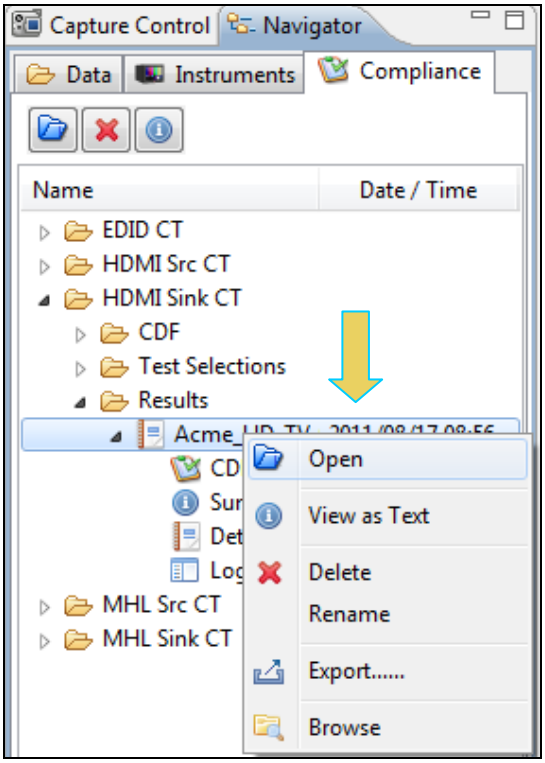
You can complete a series of tests that was canceled. The test results are saved in a directory that is accessible through the 980 GUI Manager interface. Use the following procedures to resume a canceled test.

To resume a canceled test:

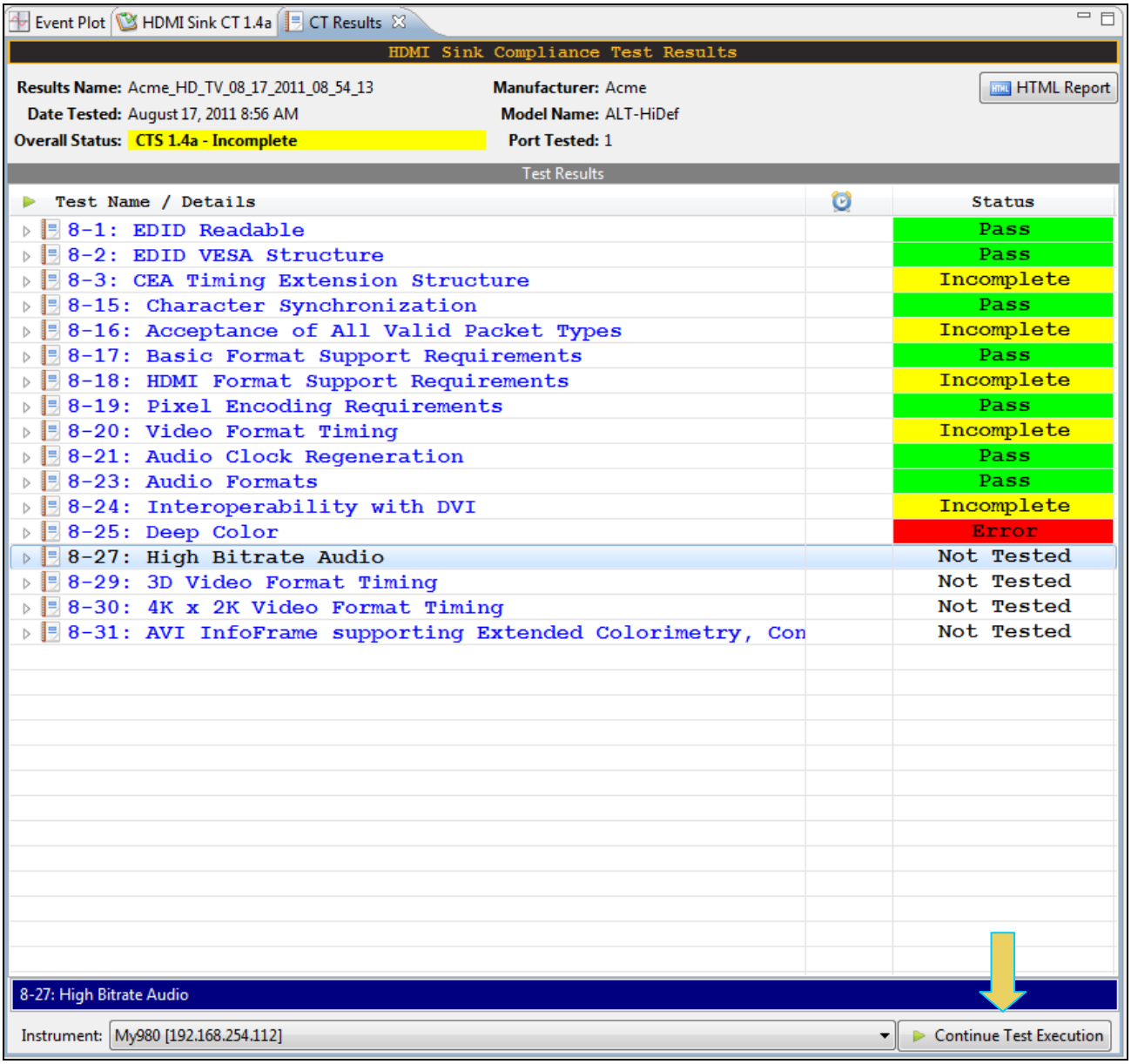
1. Navigate to the **Navigator/Compliance** panel and open the HDMI Sink CT/Results directory as shown below.



2. Right click on the results file and select Open as shown below.



The CT Results window appears as shown below.



3. Click on the **Continue Test Execution** button on the lower left (above) to resume the tests.

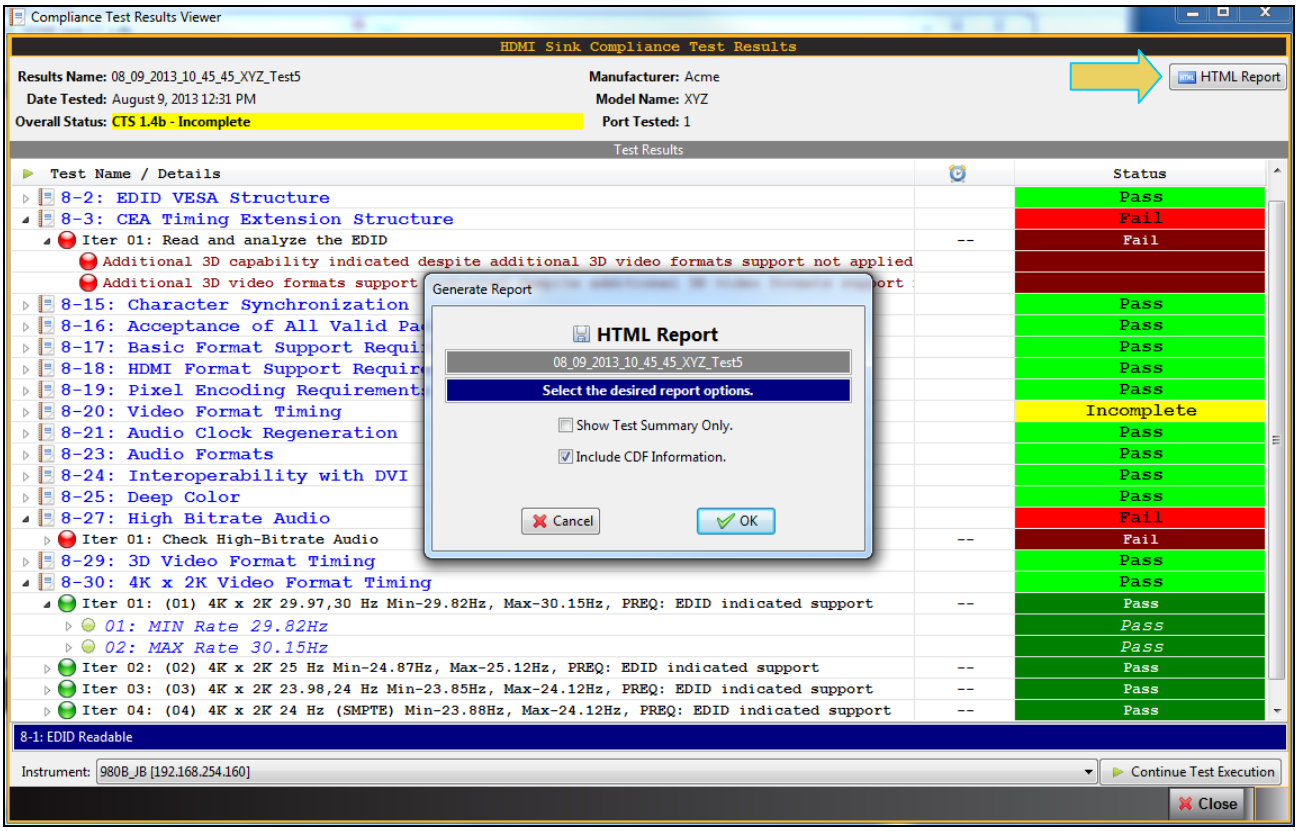
3.8 Viewing the HDMI Sink Compliance HTML test report

After you have completed the tests, an HTML Report activation button will appear in the upper right of the screen which enables you to access the HTML report of the test results. Use the following procedures to view the HTML test report.

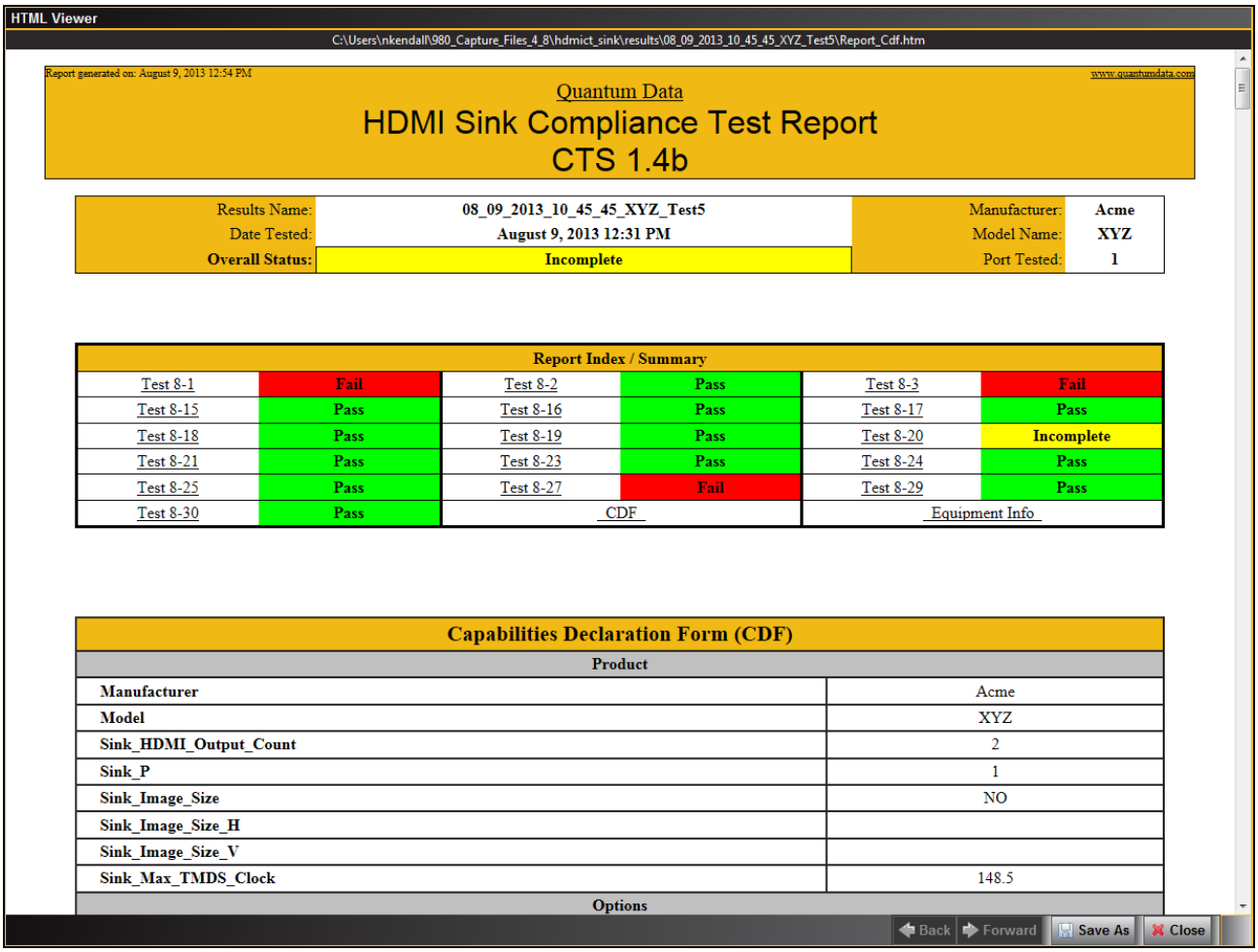
To view the HTML test report:

1. Select the **CT Results** panel as shown below.
2. Click on the **HTML Report** activation button.

   A dialog box will appear asking if you want a summary of the test results or a version that includes the CDF. This dialog box is shown in the screen shot below.



The HTML report is shown in the following screens.



HTML Viewer

C:\Users\nkendall\980_Capture_Files_4_8\hdmict_sink\results\08_09_2013_10_45_45_XYZ_Test5\Report_Cdf.htm

Report generated on: August 9, 2013 12:54 PM

www.quantumdata.com

Quantum Data

HDMI Sink Compliance Test Report

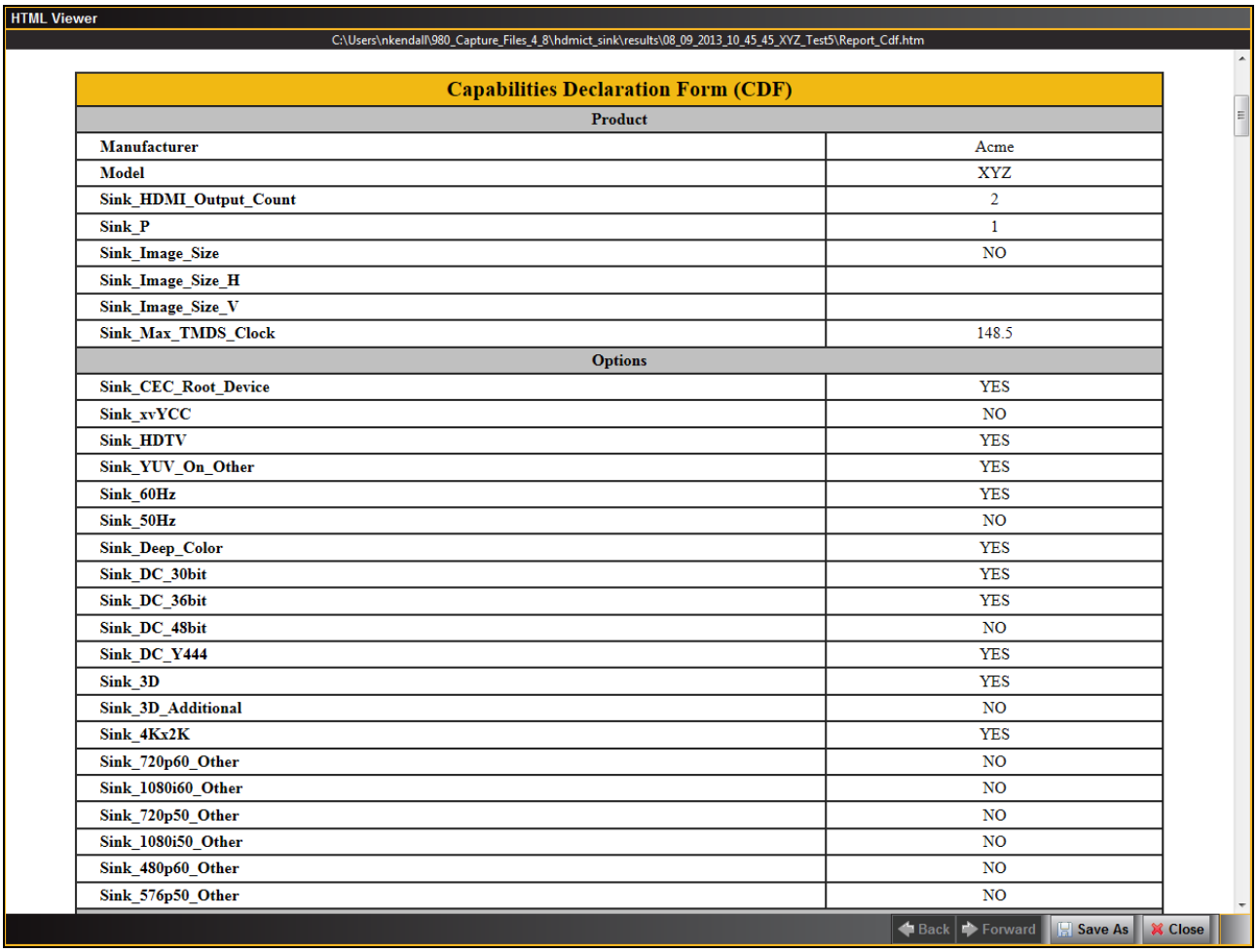
CTS 1.4b

Results Name:	08_09_2013_10_45_45_XYZ_Test5	Manufacturer:	Acme
Date Tested:	August 9, 2013 12:31 PM	Model Name:	XYZ
Overall Status:	Incomplete	Port Tested:	1

Report Index / Summary					
Test 8-1	Fail	Test 8-2	Pass	Test 8-3	Fail
Test 8-15	Pass	Test 8-16	Pass	Test 8-17	Pass
Test 8-18	Pass	Test 8-19	Pass	Test 8-20	Incomplete
Test 8-21	Pass	Test 8-23	Pass	Test 8-24	Pass
Test 8-25	Pass	Test 8-27	Fail	Test 8-29	Pass
Test 8-30	Pass	CDF		Equipment Info	

Capabilities Declaration Form (CDF)	
Product	
Manufacturer	Acme
Model	XYZ
Sink_HDMI_Output_Count	2
Sink_P	1
Sink_Image_Size	NO
Sink_Image_Size_H	
Sink_Image_Size_V	
Sink_Max_TMDS_Clock	148.5
Options	

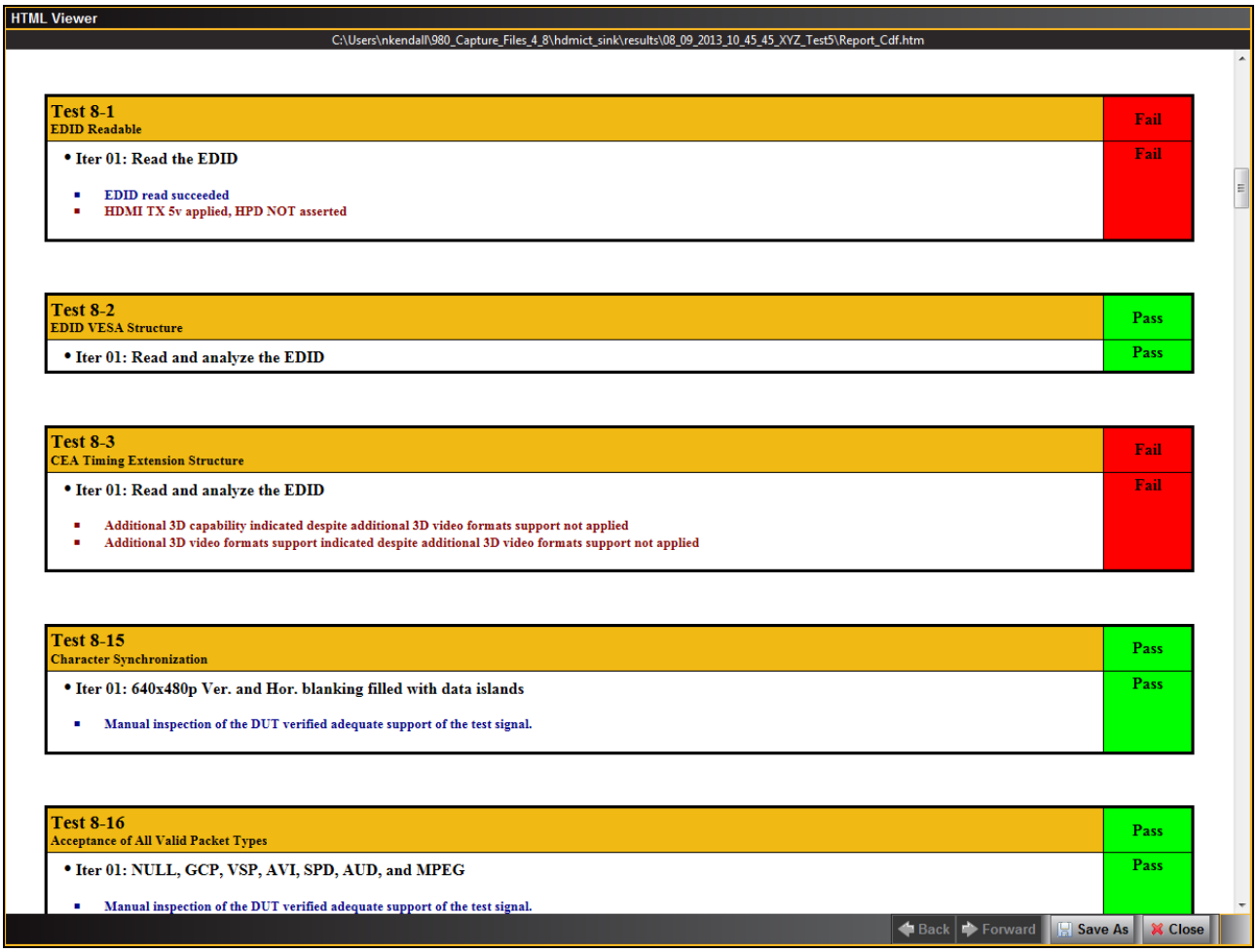
Back Forward Save As Close

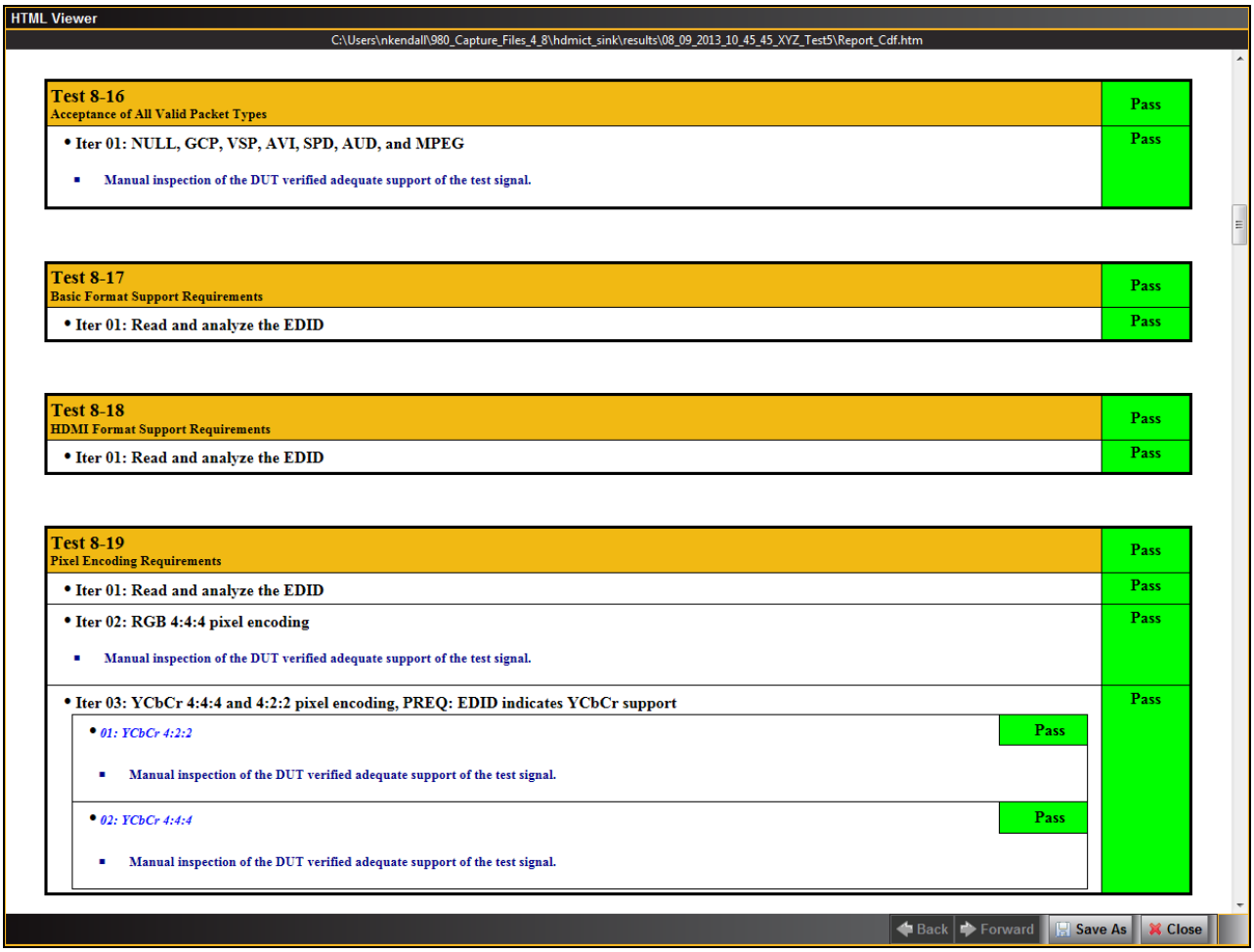

HTML Viewer

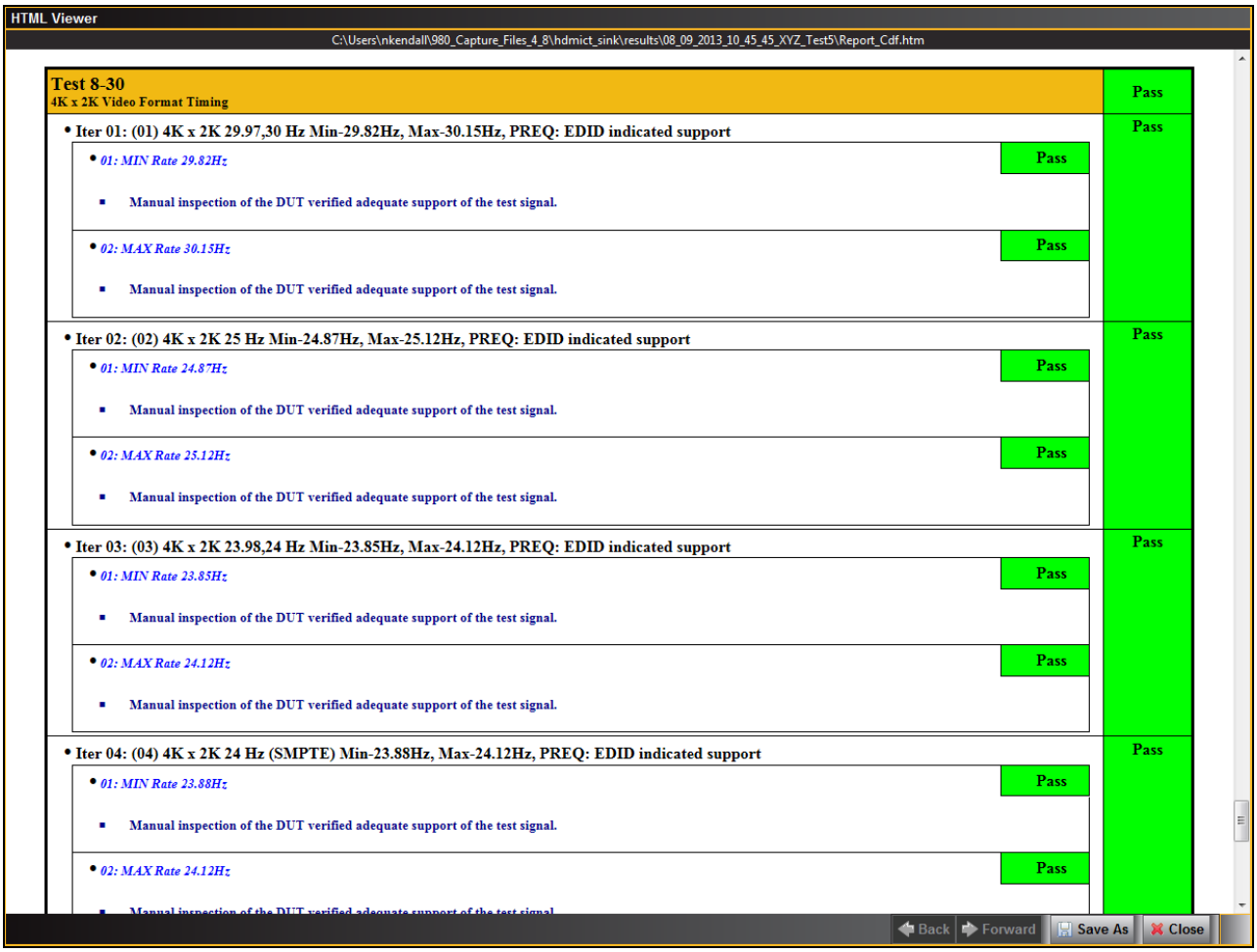
C:\Users\nkendall\980_Capture_Files_4_8\hdmict_sink\results\08_09_2013_10_45_45_XYZ_Test5\Report_Cdf.htm

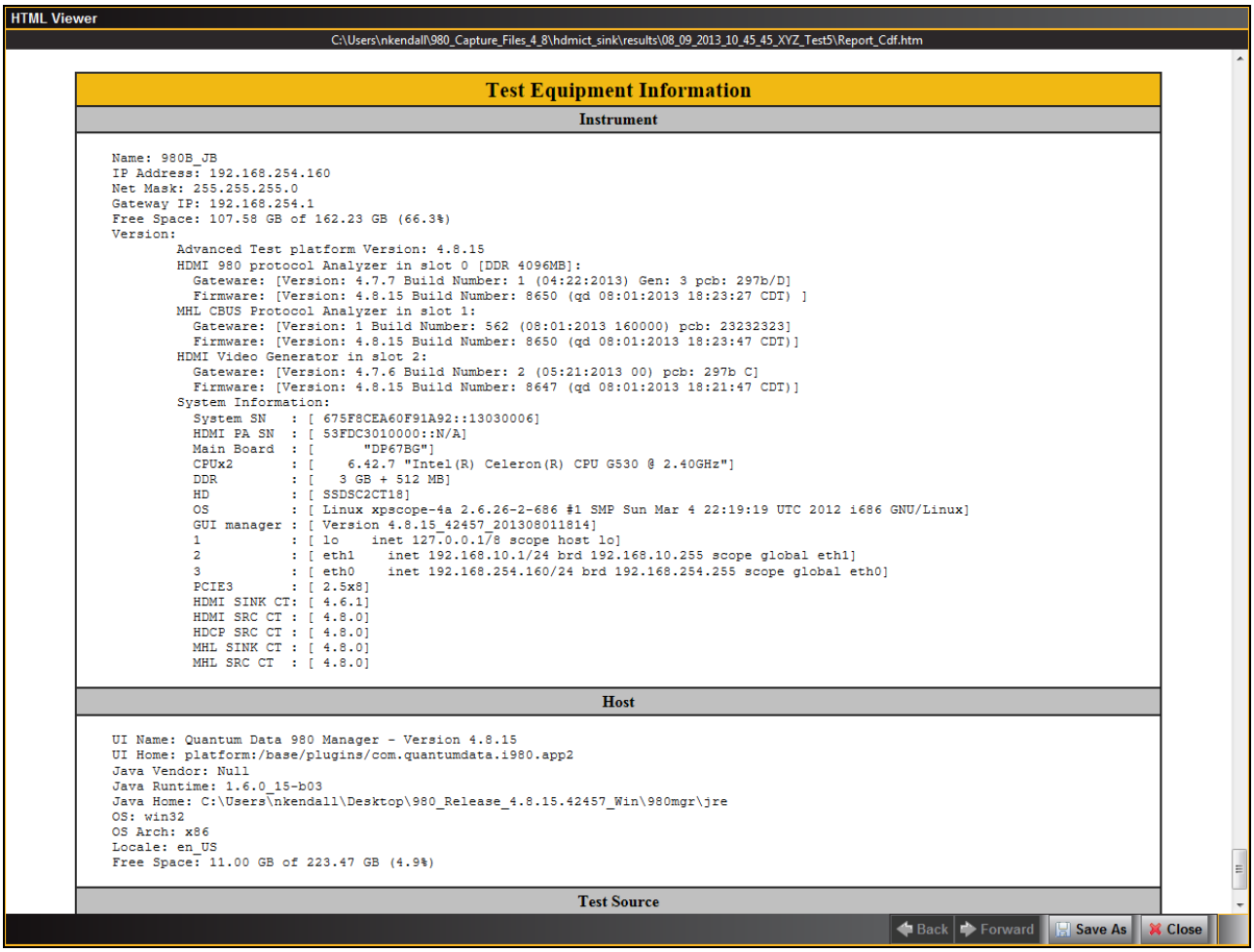
Capabilities Declaration Form (CDF)	
Product	
Manufacturer	Acme
Model	XYZ
Sink_HDMI_Output_Count	2
Sink_P	1
Sink_Image_Size	NO
Sink_Image_Size_H	
Sink_Image_Size_V	
Sink_Max_TMDS_Clock	148.5
Options	
Sink_CEC_Root_Device	YES
Sink_xvYCC	NO
Sink_HDTV	YES
Sink_YUV_On_Other	YES
Sink_60Hz	YES
Sink_50Hz	NO
Sink_Deep_Color	YES
Sink_DC_30bit	YES
Sink_DC_36bit	YES
Sink_DC_48bit	NO
Sink_DC_Y444	YES
Sink_3D	YES
Sink_3D_Additional	NO
Sink_4Kx2K	YES
Sink_720p60_Other	NO
Sink_1080i60_Other	NO
Sink_720p50_Other	NO
Sink_1080i50_Other	NO
Sink_480p60_Other	NO
Sink_576p50_Other	NO

Back Forward Save As Close


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\hdmict_sink\results\08_09_2013_10_45_45_XYZ_Test5\Report_Cdf.htm
Test 8-1
EDID Readable
Fail
• Iter 01: Read the EDID
Fail
▪ EDID read succeeded
▪ HDMI TX 5v applied, HPD NOT asserted
Test 8-2
EDID VESA Structure
Pass
• Iter 01: Read and analyze the EDID
Pass
Test 8-3
CEA Timing Extension Structure
Fail
• Iter 01: Read and analyze the EDID
Fail
▪ Additional 3D capability indicated despite additional 3D video formats support not applied
▪ Additional 3D video formats support indicated despite additional 3D video formats support not applied
Test 8-15
Character Synchronization
Pass
• Iter 01: 640x480p Ver. and Hor. blanking filled with data islands
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Test 8-16
Acceptance of All Valid Packet Types
Pass
• Iter 01: NULL, GCP, VSP, AVI, SPD, AUD, and MPEG
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Back
Forward
Save As
Close


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\hdmict_sink\results\08_09_2013_10_45_45_XYZ_Test5\Report_Cdf.htm
Test 8-16
Acceptance of All Valid Packet Types
Pass
• Iter 01: NULL, GCP, VSP, AVI, SPD, AUD, and MPEG
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Test 8-17
Basic Format Support Requirements
Pass
• Iter 01: Read and analyze the EDID
Pass
Test 8-18
HDMI Format Support Requirements
Pass
• Iter 01: Read and analyze the EDID
Pass
Test 8-19
Pixel Encoding Requirements
Pass
• Iter 01: Read and analyze the EDID
Pass
• Iter 02: RGB 4:4:4 pixel encoding
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 03: YCbCr 4:4:4 and 4:2:2 pixel encoding, PREQ: EDID indicates YCbCr support
Pass
• 01: YCbCr 4:2:2
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• 02: YCbCr 4:4:4
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Back
Forward
Save As
Close


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\hdmict_sink\results\08_09_2013_10_45_45_XYZ_Test5\Report_Cdf.htm
Test 8-30
4K x 2K Video Format Timing
Pass
• Iter 01: (01) 4K x 2K 29.97,30 Hz Min-29.82Hz, Max-30.15Hz, PREQ: EDID indicated support
Pass
• 01: MIN Rate 29.82Hz
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• 02: MAX Rate 30.15Hz
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 02: (02) 4K x 2K 25 Hz Min-24.87Hz, Max-25.12Hz, PREQ: EDID indicated support
Pass
• 01: MIN Rate 24.87Hz
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• 02: MAX Rate 25.12Hz
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 03: (03) 4K x 2K 23.98,24 Hz Min-23.85Hz, Max-24.12Hz, PREQ: EDID indicated support
Pass
• 01: MIN Rate 23.85Hz
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• 02: MAX Rate 24.12Hz
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 04: (04) 4K x 2K 24 Hz (SMPTE) Min-23.88Hz, Max-24.12Hz, PREQ: EDID indicated support
Pass
• 01: MIN Rate 23.88Hz
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• 02: MAX Rate 24.12Hz
Pass
Back
Forward
Save As
Close

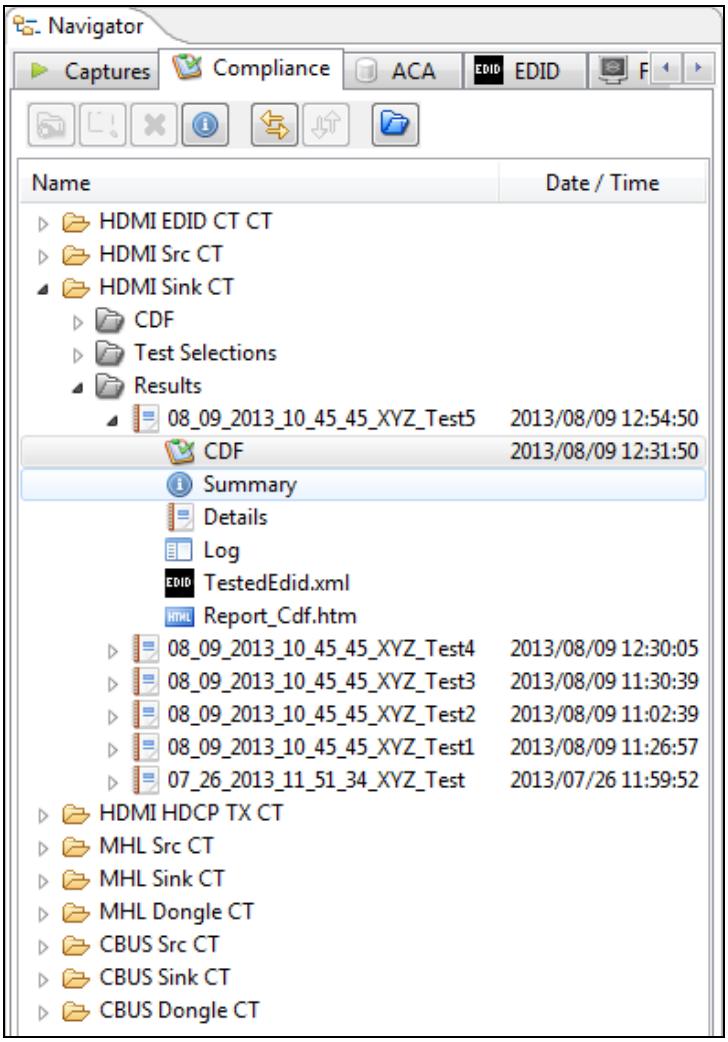

HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\hdmict_sink\results\08_09_2013_10_45_45_XYZ_Test5\Report_Cdf.htm
Test Equipment Information
Instrument
Name: 980B_JB
IP Address: 192.168.254.160
Net Mask: 255.255.255.0
Gateway IP: 192.168.254.1
Free Space: 107.58 GB of 162.23 GB (66.3%)
Version:
Advanced Test platform Version: 4.8.15
HDMI 980 protocol Analyzer in slot 0 [DDR 4096MB]:
Gateware: [Version: 4.7.7 Build Number: 1 (04:22:2013) Gen: 3 pcb: 297b/D]
Firmware: [Version: 4.8.15 Build Number: 8650 (qd 08:01:2013 18:23:27 CDT)]
MHL CBUS Protocol Analyzer in slot 1:
Gateware: [Version: 1 Build Number: 562 (08:01:2013 160000) pcb: 23232323]
Firmware: [Version: 4.8.15 Build Number: 8650 (qd 08:01:2013 18:23:47 CDT)]
HDMI Video Generator in slot 2:
Gateware: [Version: 4.7.6 Build Number: 2 (05:21:2013 00) pcb: 297b C]
Firmware: [Version: 4.8.15 Build Number: 8647 (qd 08:01:2013 18:21:47 CDT)]
System Information:
System SN : [675F8CEA60F91A92::13030006]
HDMI PA SN : [53FDC3010000::N/A]
Main Board : ["DP67BG"]
CPUx2 : [6.42.7 "Intel(R) Celeron(R) CPU G530 @ 2.40GHz"]
DDR : [3 GB + 512 MB]
HD : [SSDSC2CT18]
OS : [Linux xpscope-4a 2.6.26-2-686 #1 SMP Sun Mar 4 22:19:19 UTC 2012 i686 GNU/Linux]
GUI manager : [Version 4.8.15_42457_201308011814]
1 : [lo inet 127.0.0.1/8 scope host lo]
2 : [eth1 inet 192.168.10.1/24 brd 192.168.10.255 scope global eth1]
3 : [eth0 inet 192.168.254.160/24 brd 192.168.254.255 scope global eth0]
PCIE3 : [2.5x8]
HDMI SINK CT: [4.6.1]
HDMI SRC CT : [4.8.0]
HDCP SRC CT : [4.8.0]
MHL SINK CT : [4.8.0]
MHL SRC CT : [4.8.0]
Host
UI Name: Quantum Data 980 Manager - Version 4.8.15
UI Home: platform:/base/plugins/com.quantumdata.i980.app2
Java Vendor: Null
Java Runtime: 1.6.0_15-b03
Java Home: C:\Users\nkendall\Desktop\980_Release_4.8.15.42457_Win\980mgr\jre
OS: win32
OS Arch: x86
Locale: en_US
Free Space: 11.00 GB of 223.47 GB (4.9%)
Test Source
Back
Forward
Save As
Close

3.9 Viewing the HDMI Sink Compliance test results and disseminating to others

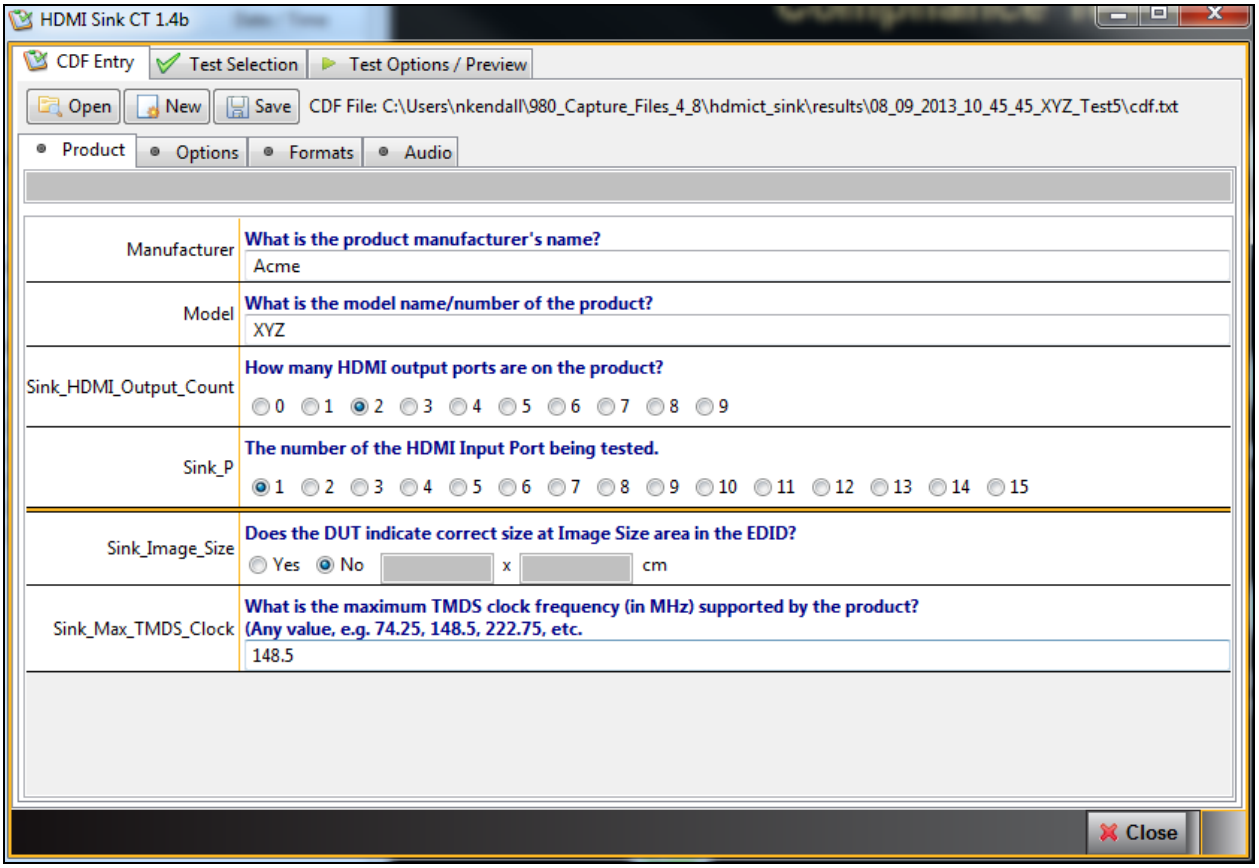
After you have completed the tests, you can view the CDF, test results, HTML report and detailed log at any time. Assuming you have run the tests from the external 980 GUI Manager from your PC, you can easily disseminate the results to other colleagues or subject matter experts or officials at the HDMI Authorized Test Centers. Instructions for viewing the test results and disseminating to others are provided below.

To view the CDF for the device under test:

1. From the **Navigator/Compliance** panel, select the **HDMI Sink CT** results directory.
2. Select CDF and either double click or click on the **Open**  icon as shown below.



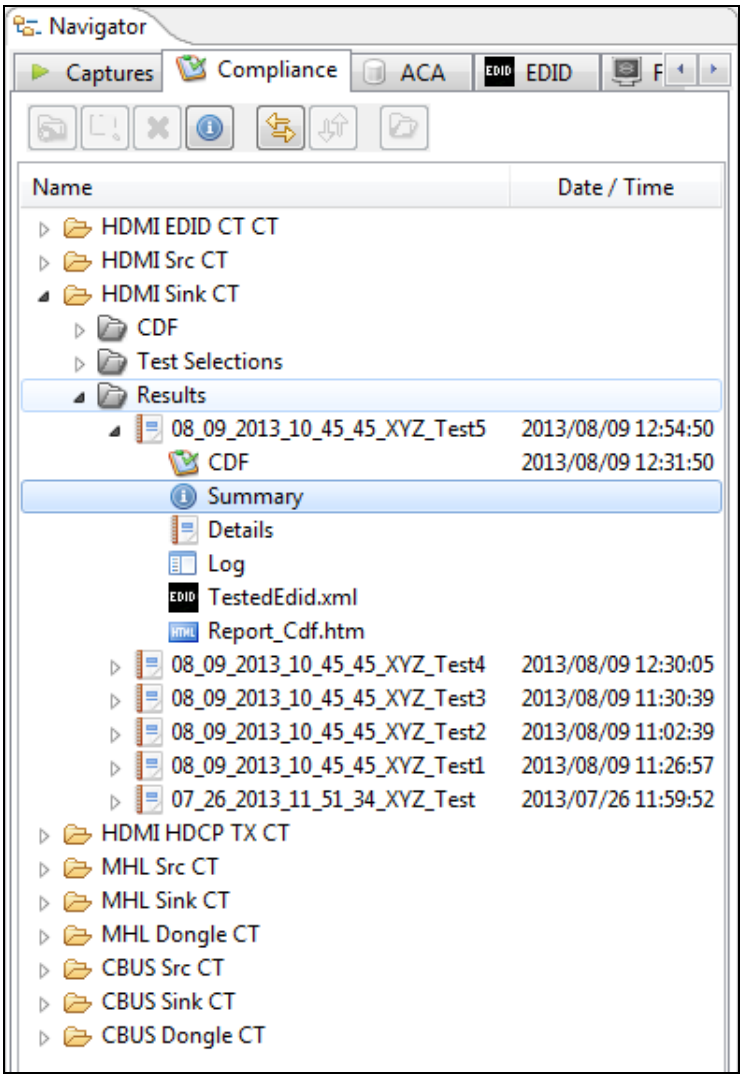
The CDF appears in a new window as shown below.



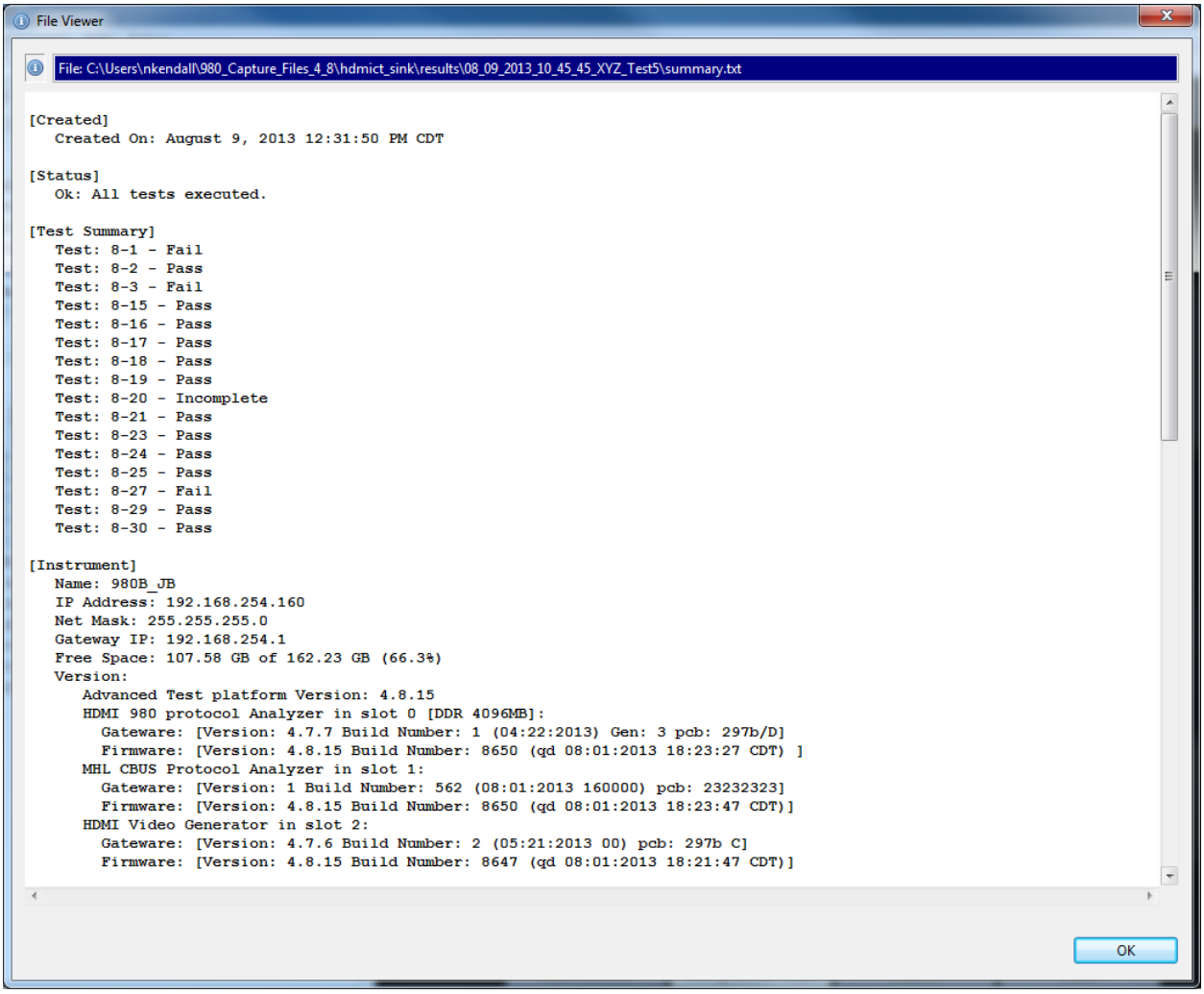
To view a Summary of the results:

1. From the **Navigator/Compliance** panel, select the **HDMI Sink CT** results directory.

2. Select Summary and either double click or click on the **Open**  icon as shown below.



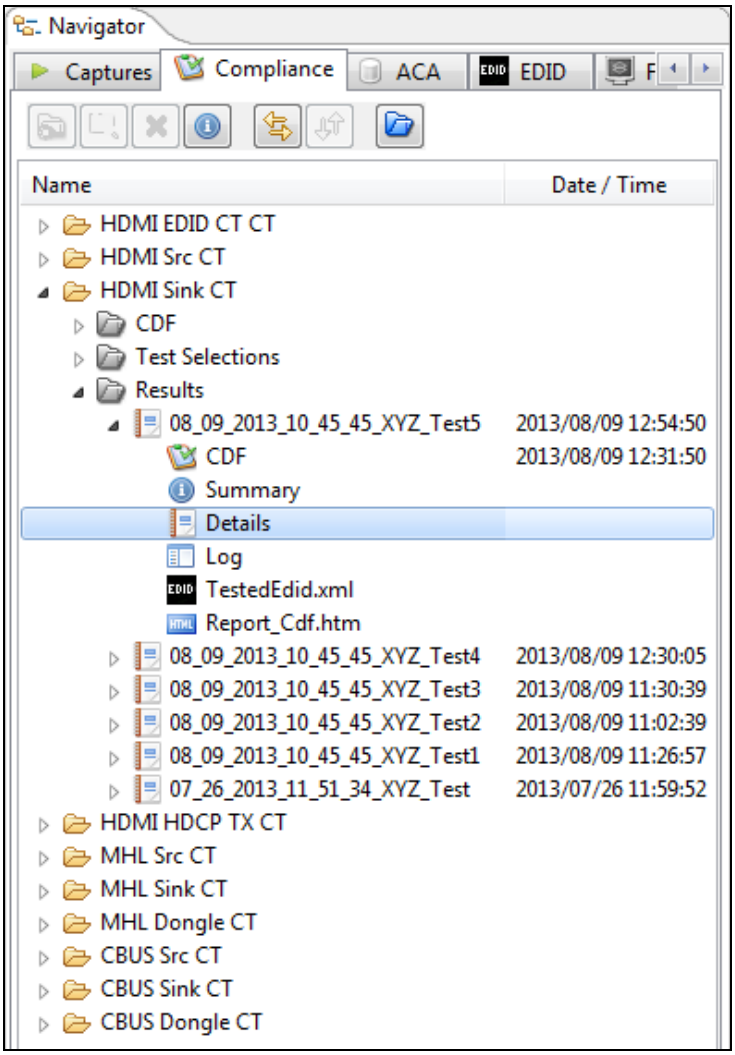
The Summary file appears in a new window as shown below.



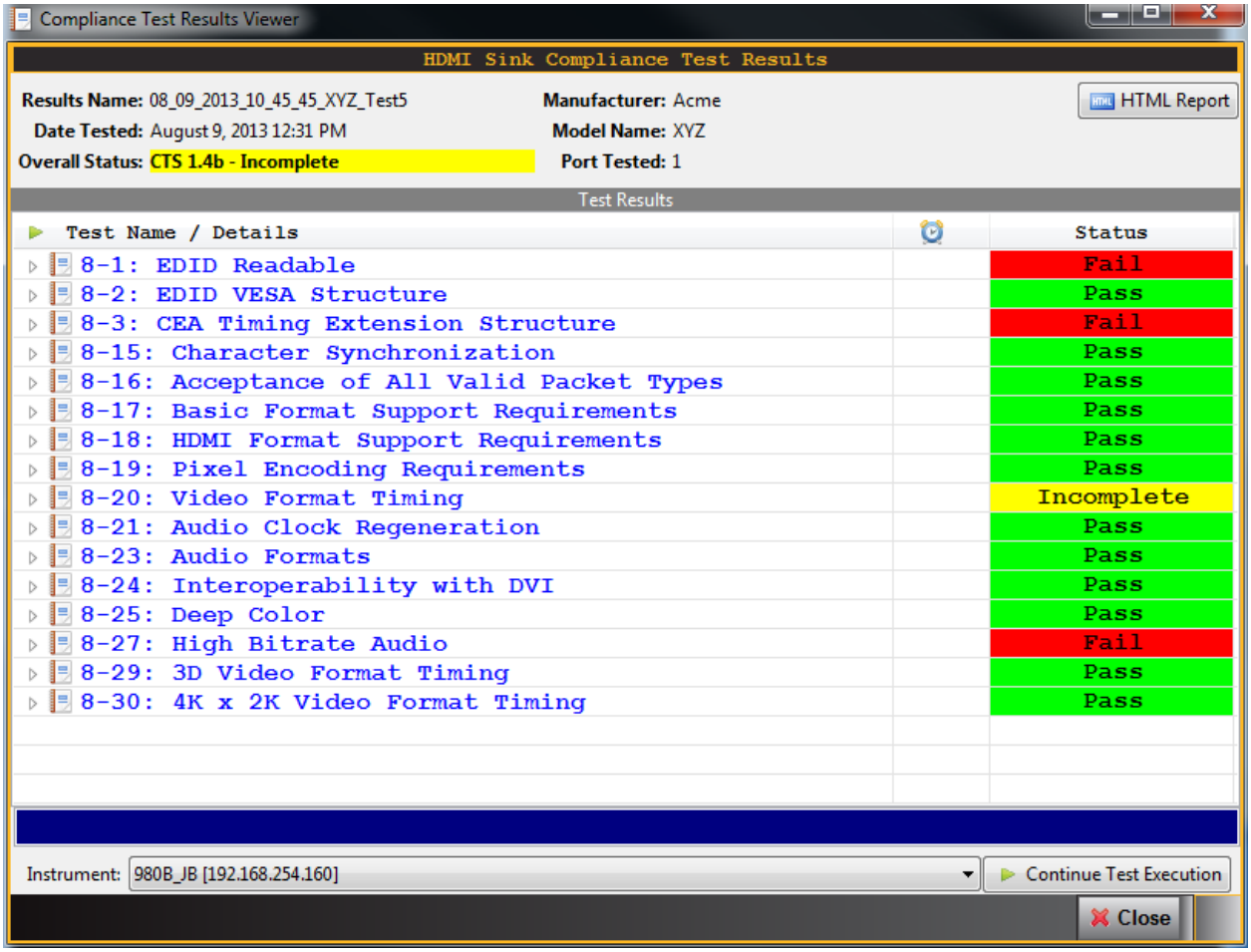
To view a Details results:

1. From the **Navigator/Compliance** panel, select the **HDMI Sink CT** results directory.

2. Select Details and either double click or click on the **Open**  icon as shown below.



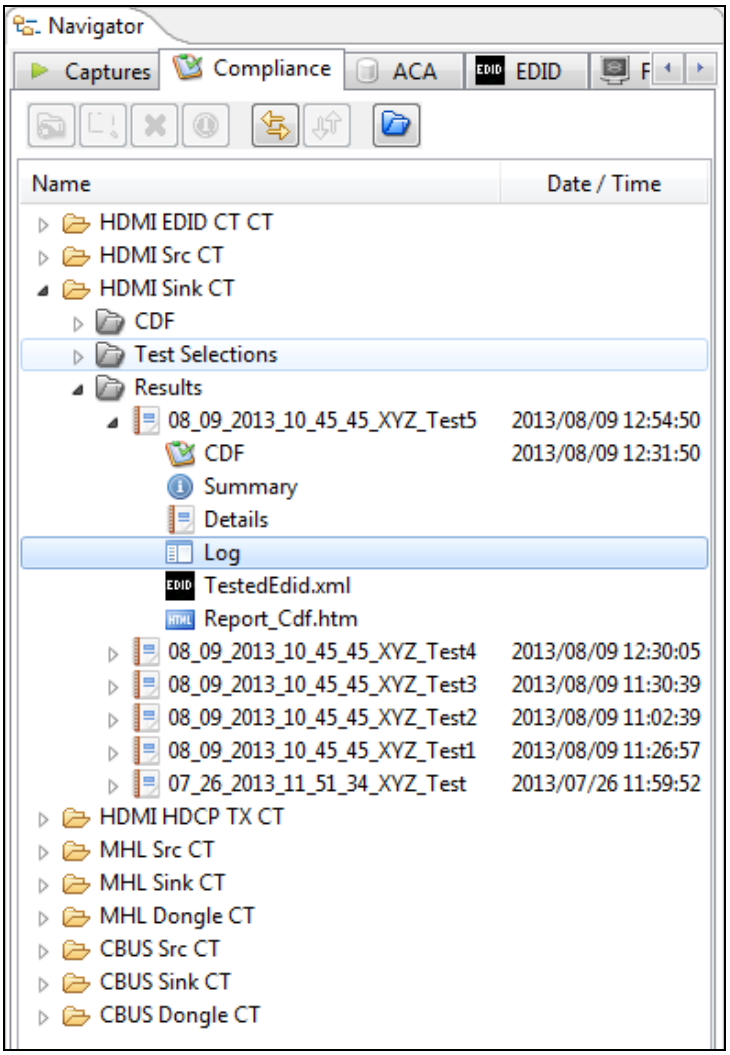
The Details file appears in a new window as shown below.



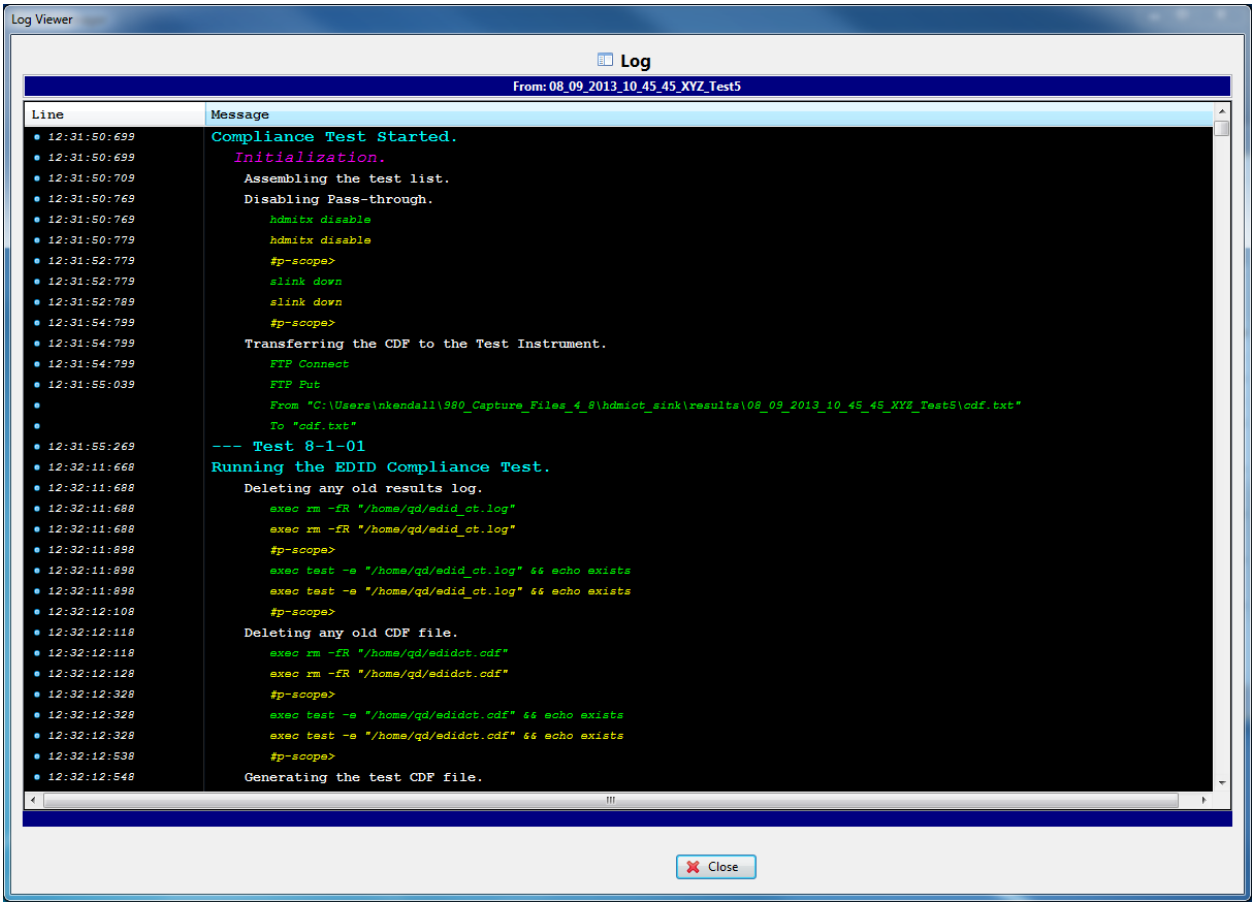
To view the detailed Log of the results:

1. From the **Navigator/Compliance** panel, select the **HDMI Sink CT** results directory.

2. Select Log and either double click or click on the **Open**  icon as shown below.

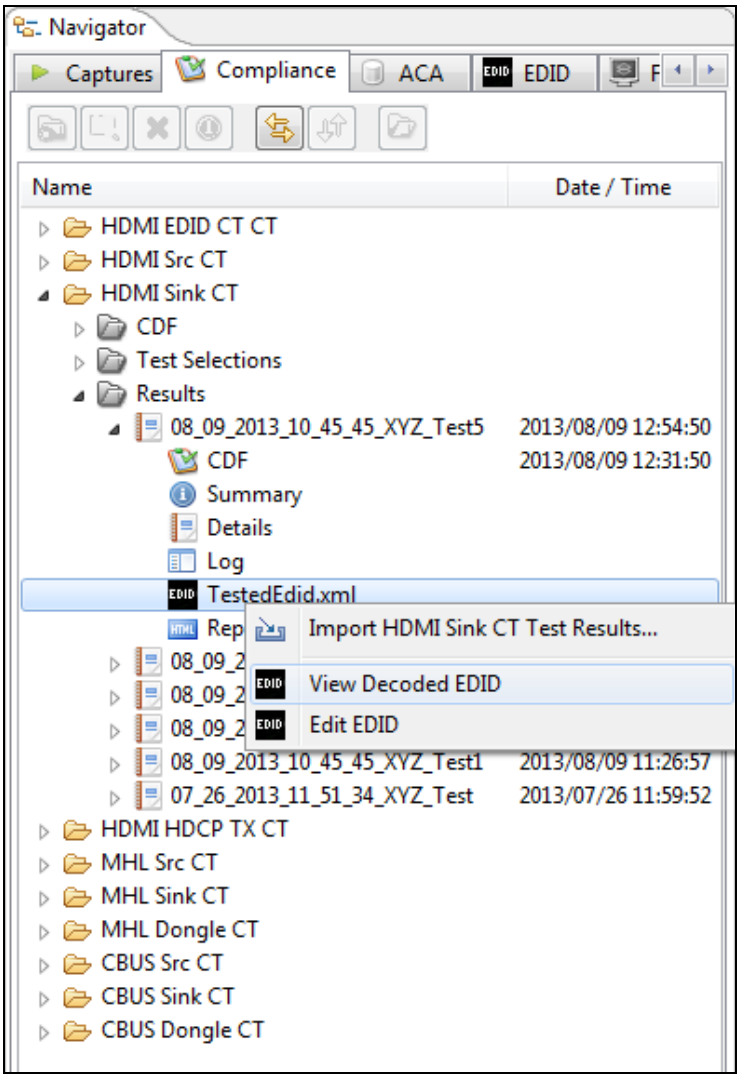


The detail Log appears in a new window as shown below.

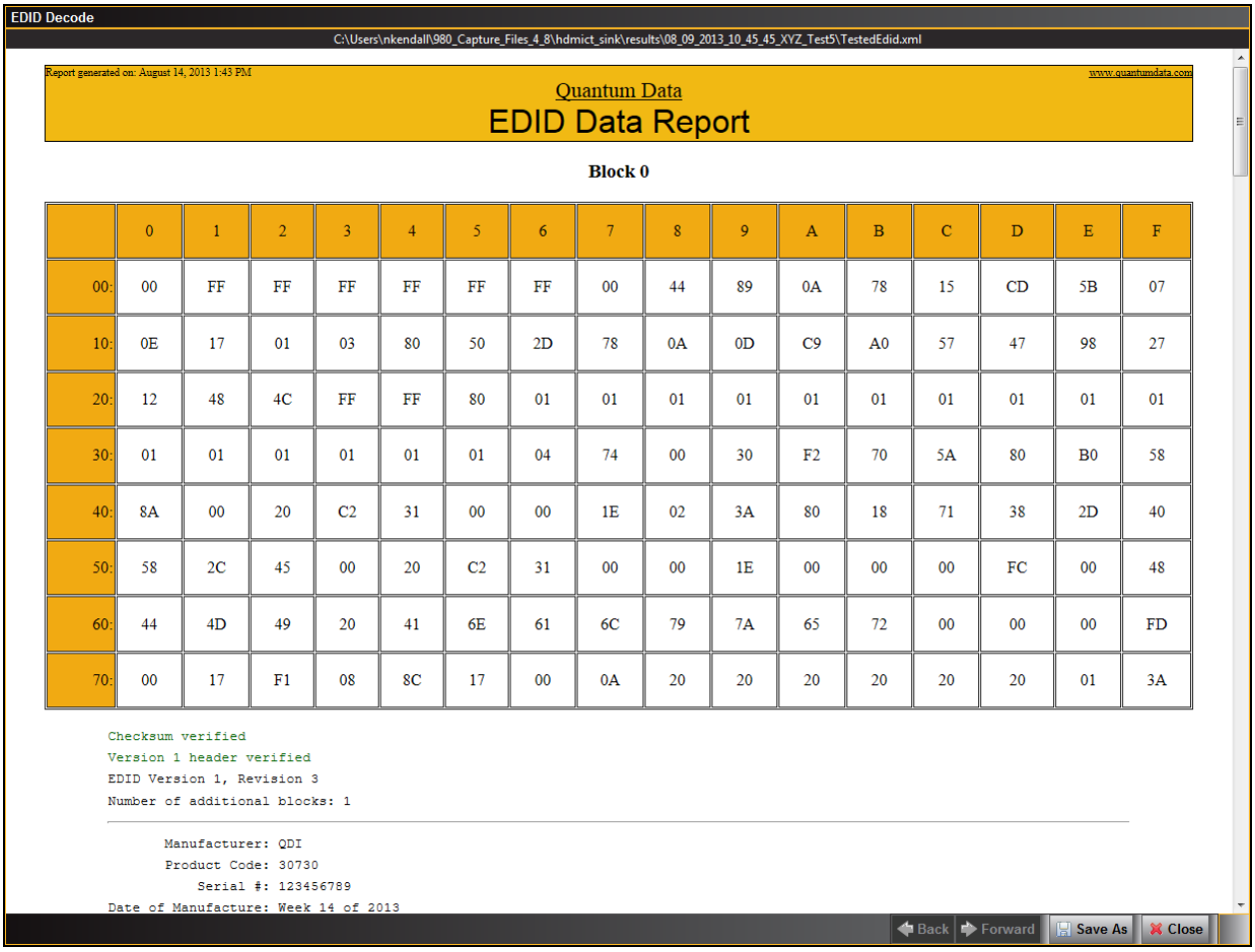


To view the EDID of the sink device:

1. From the **Navigator/Compliance** panel, select the **HDMI Sink CT** results directory.
2. Right click on **Tested EDID** and select **View Decoded EDID** as shown below.



The EDID report appears in a new window as shown below.

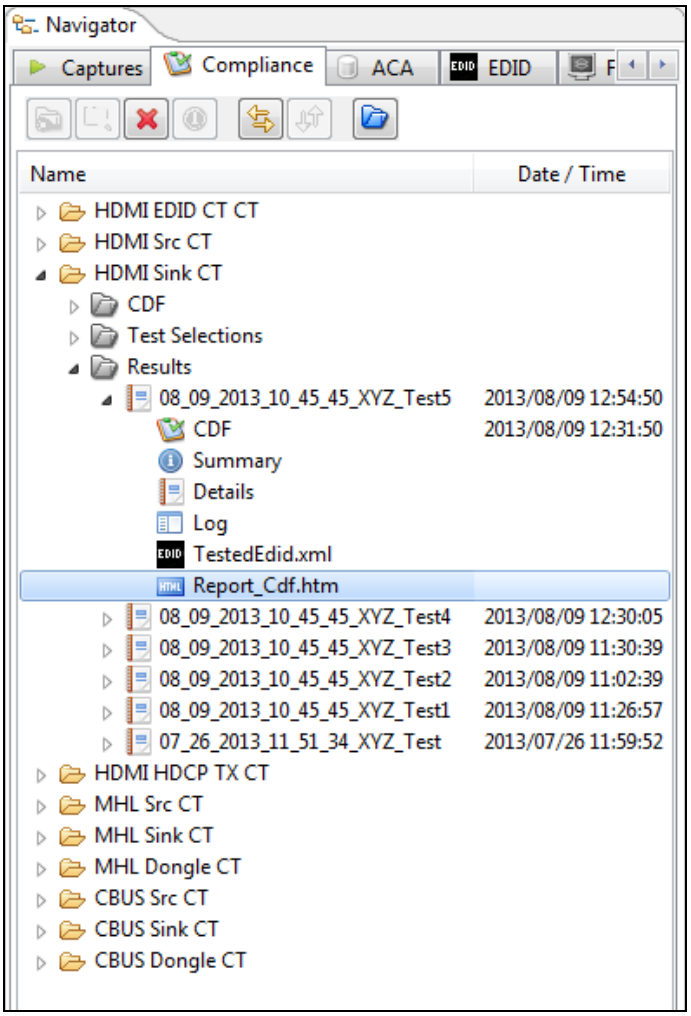


	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00:	00	FF	FF	FF	FF	FF	FF	00	44	89	0A	78	15	CD	5B	07
10:	0E	17	01	03	80	50	2D	78	0A	0D	C9	A0	57	47	98	27
20:	12	48	4C	FF	FF	80	01	01	01	01	01	01	01	01	01	01
30:	01	01	01	01	01	01	04	74	00	30	F2	70	5A	80	B0	58
40:	8A	00	20	C2	31	00	00	1E	02	3A	80	18	71	38	2D	40
50:	58	2C	45	00	20	C2	31	00	00	1E	00	00	00	FC	00	48
60:	44	4D	49	20	41	6E	61	6C	79	7A	65	72	00	00	00	FD
70:	00	17	F1	08	8C	17	00	0A	20	20	20	20	20	20	01	3A

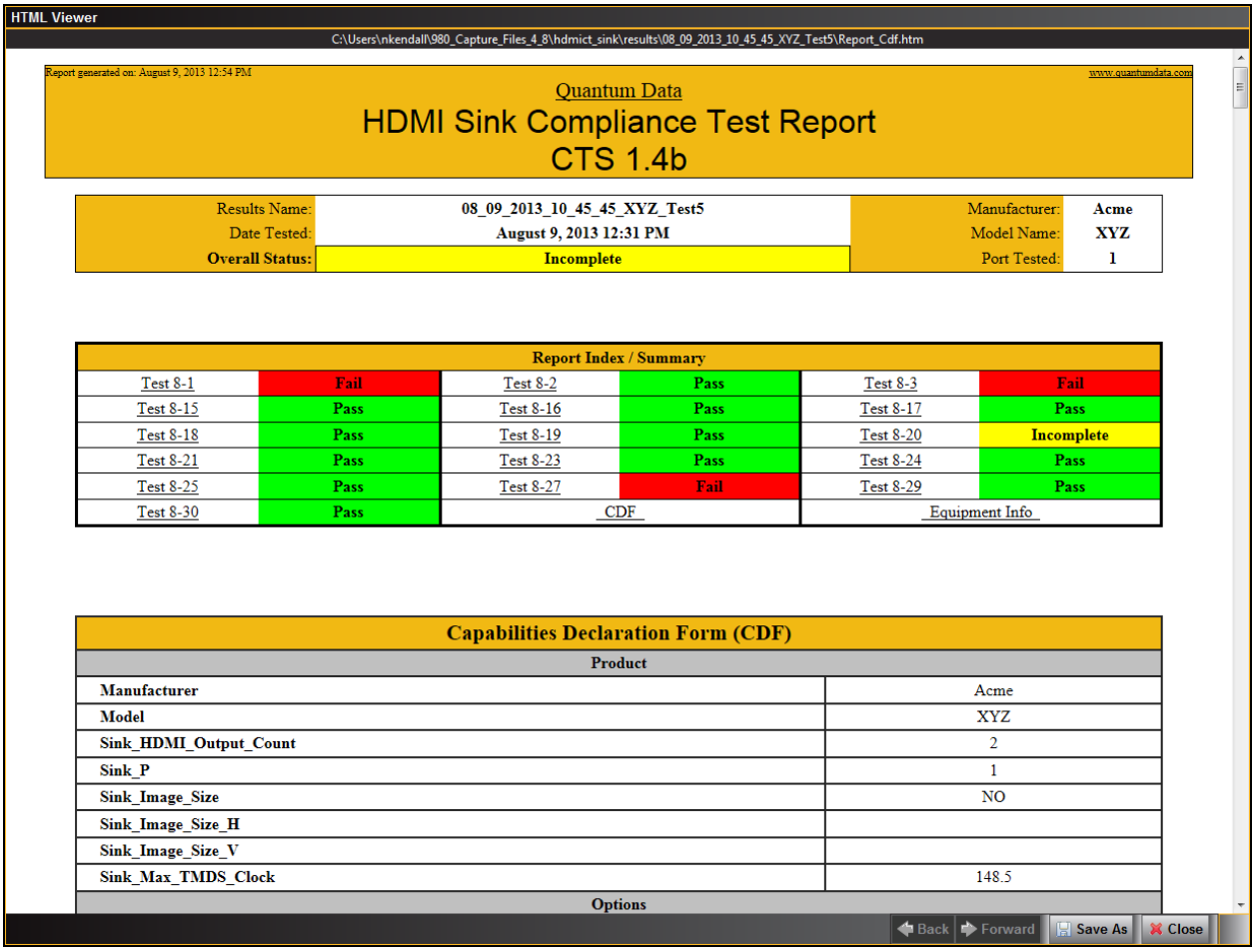
To view the HTML report:

1. From the **Navigator/Compliance** panel, select the **HDMI Sink CT** results directory.

2. Select Report_CDF and either double click or click on the **Open**  icon as shown below.



The HTML report appears in a new window as shown below.



HTML Viewer

C:\Users\nkendall\980_Capture_Files_4_8\hdmict_sink\results\08_09_2013_10_45_45_XYZ_Test5\Report_Cdf.htm

Report generated on: August 9, 2013 12:54 PM www.quantumdata.com

Quantum Data

HDMI Sink Compliance Test Report

CTS 1.4b

Results Name:	08_09_2013_10_45_45_XYZ_Test5	Manufacturer:	Acme
Date Tested:	August 9, 2013 12:31 PM	Model Name:	XYZ
Overall Status:	Incomplete	Port Tested:	1

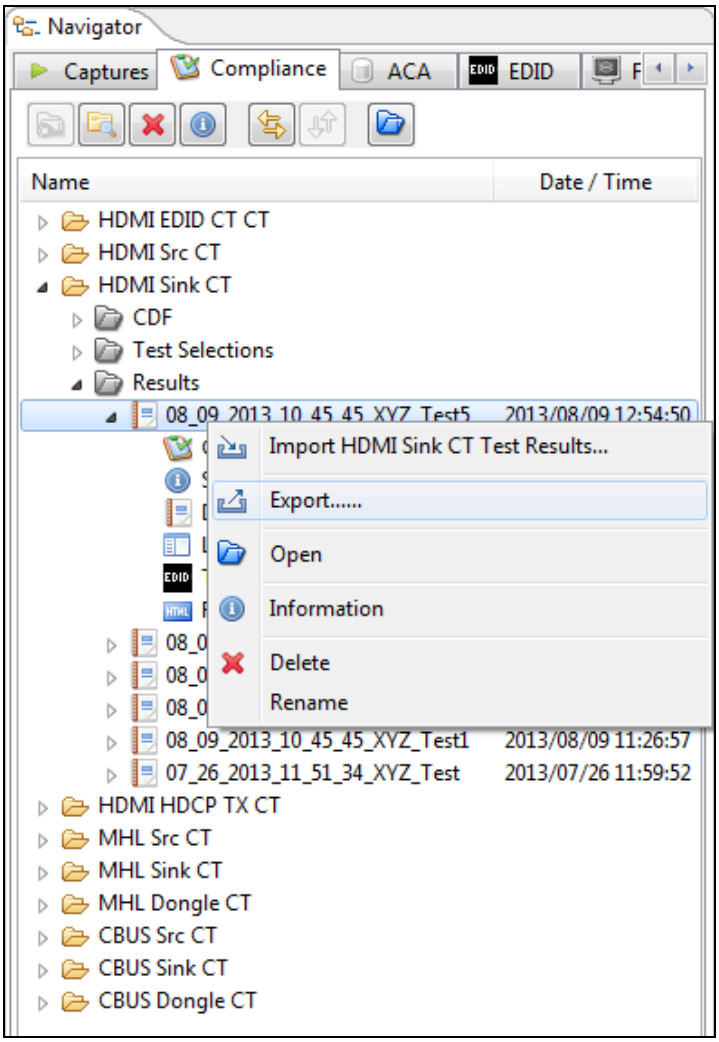
Report Index / Summary					
Test 8-1	Fail	Test 8-2	Pass	Test 8-3	Fail
Test 8-15	Pass	Test 8-16	Pass	Test 8-17	Pass
Test 8-18	Pass	Test 8-19	Pass	Test 8-20	Incomplete
Test 8-21	Pass	Test 8-23	Pass	Test 8-24	Pass
Test 8-25	Pass	Test 8-27	Fail	Test 8-29	Pass
Test 8-30	Pass	CDF		Equipment Info	

Capabilities Declaration Form (CDF)	
Product	
Manufacturer	Acme
Model	XYZ
Sink_HDMI_Output_Count	2
Sink_P	1
Sink_Image_Size	NO
Sink_Image_Size_H	
Sink_Image_Size_V	
Sink_Max_TMDS_Clock	148.5
Options	

Back Forward Save As Close

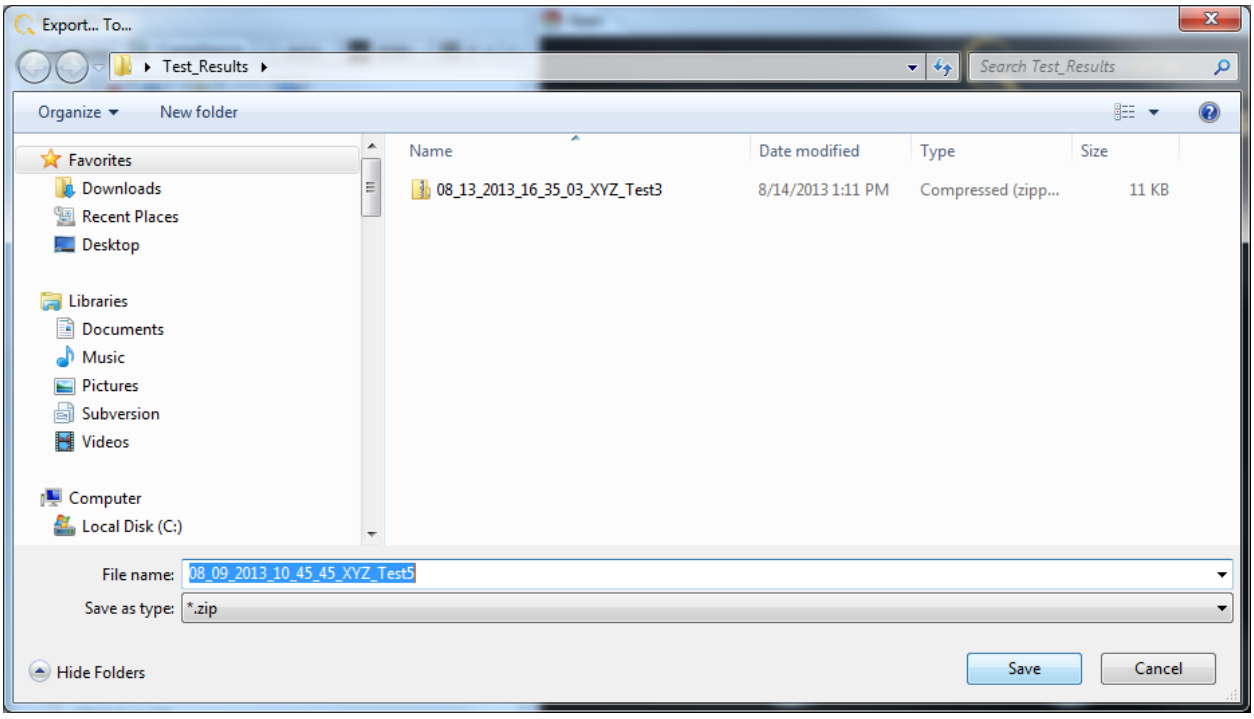
To disseminate the results to others:

1. From the **Navigator/Compliance** panel, select the **HDMI Sink CT** results directory.
2. Right click on the set of results you wish to disseminate and select Export as shown below.



A Window opens up for you to browse to a directory to store the files.

3. Select **Save** to save the result files. A zip file is created and stored in the directory. You can now email the file or post the file on an FTP site or store on a storage service (e.g. dropbox).


Export... To...
Test_Results
Search Test_Results
Organize
New folder
Favorites
Downloads
Recent Places
Desktop
Libraries
Documents
Music
Pictures
Subversion
Videos
Computer
Local Disk (C:)
Name
Date modified
Type
Size
08_13_2013_16_35_03_XYZ_Test3
8/14/2013 1:11 PM
Compressed (zipp...
11 KB
File name:
08_09_2013_10_45_45_XYZ_Test5
Save as type:
*.zip
Hide Folders
Save
Cancel

4 HDMI EDID Sink Compliance Tests

This chapter describes how to use the ***optional*** HDMI EDID sink compliance test feature. The EDID Compliance Test supports the following test sections in the HDMI 1.4 EDID Compliance Test specification:

- 8.2 Sink - EDID/E-DDC Tests
  - Test ID 8-1 – EDID Readable
  - Test ID 8-2 – VESA Structure
  - Test ID 8-3 – CEA Timing Extension
- 8.5 Video – Video Timing Tests
  - Test ID 8-17 – Basic Format Support
  - Test ID 8-18 – HDMI Format Support
  - Test ID 8-19 – Pixel Encoding
  - Test ID 8-20 – Video Format Timing

4.1 Workflow for running the HDMI EDID Compliance Tests

The following is the high level workflow for running the HDMI EDID Compliance Tests.

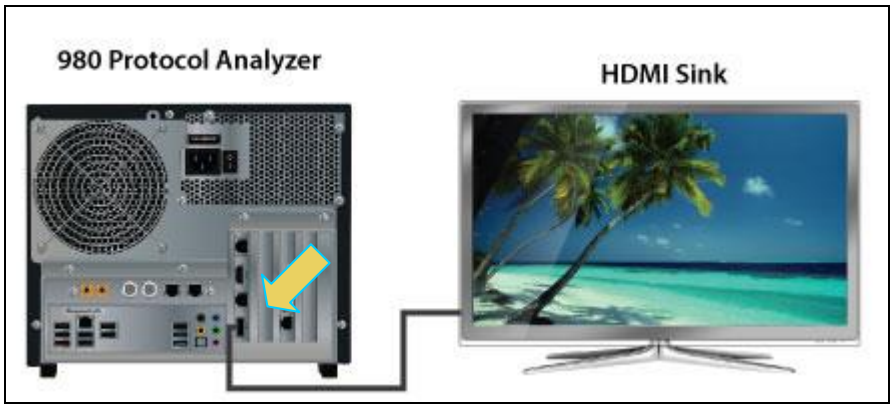
1. Make the physical connections between the 980 and the HDMI sink device under test.
2. Launch either the embedded 980 GUI Manager or the external 980 GUI Manager and access the EDID Compliance Test Panel.
3. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.
4. Execute the tests through EDID compliance window.
5. View the detailed data for test failures if failures occur.
6. View the results in the **Test Results** panel under the **Navigator** panel.

4.2 Making the HDMI connections

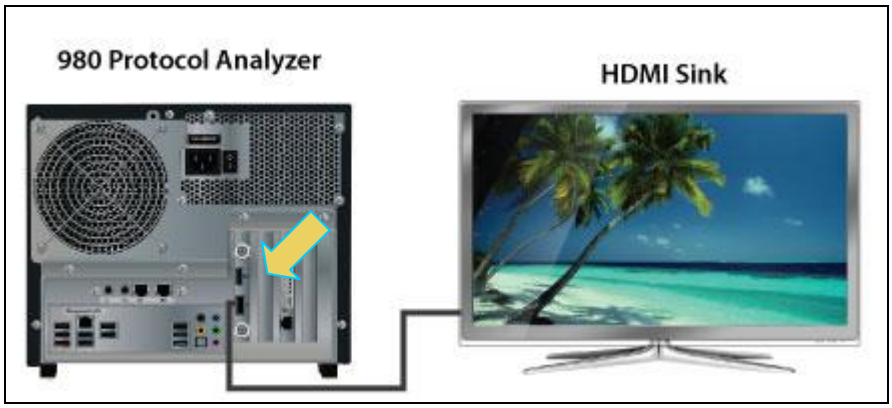
This subsection describes the HDMI connections required to run the HDMI EDID compliance tests. This procedure assumes that you have assembled the 980 Protocol Analyzer and sink device under test into your work area.

To make the physical HDMI connections:

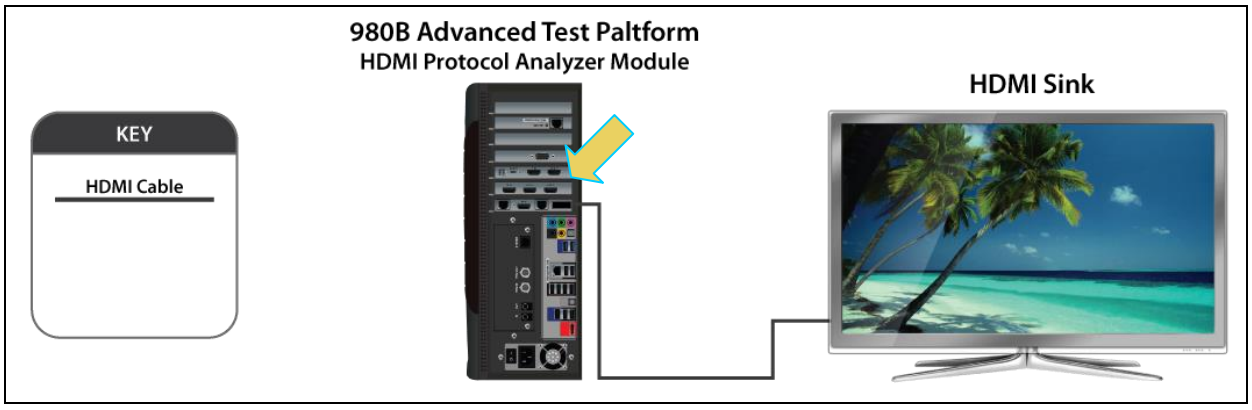
This procedure assumes that you have assembled the 980 Protocol Analyzer and source device under test and applied power to all these devices. Refer to the procedures and diagram below.



Connection for HDMI Sink Testing – 980 Rev D Protocol Analyzer module



Connection for HDMI Sink Testing – 980 Rev C Protocol Analyzer module)



Connection for HDMI Sink Testing 980B

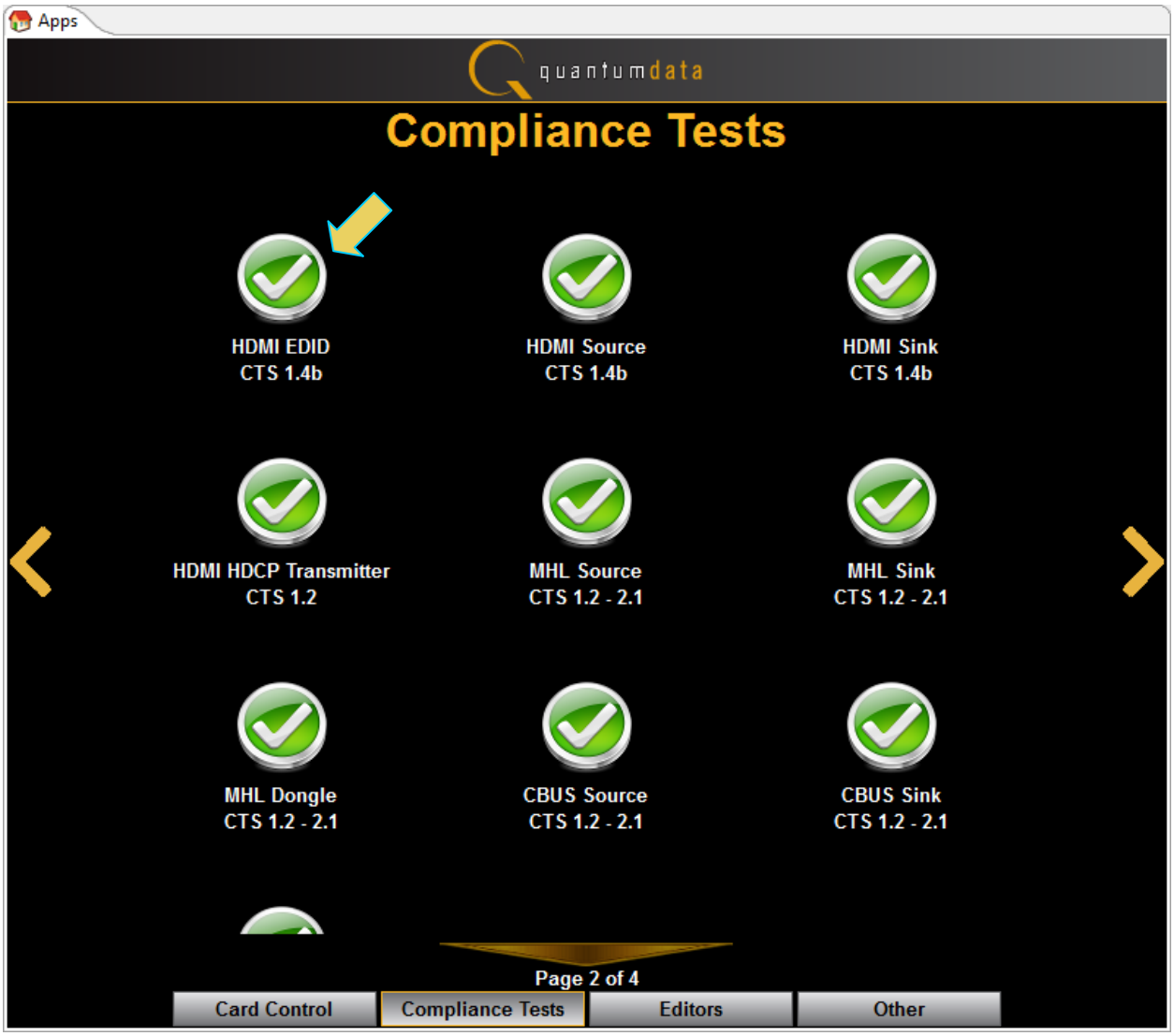
1. Connect your HDMI sink device under test to the HDMI Tx connector (the bottom most HDMI connector shown in the figure above) on the 980 Protocol Analyzer. Use a high speed HDMI cable.

4.3 Completing the CDF

Use the following procedures to complete the CDF for the EDID compliance test.

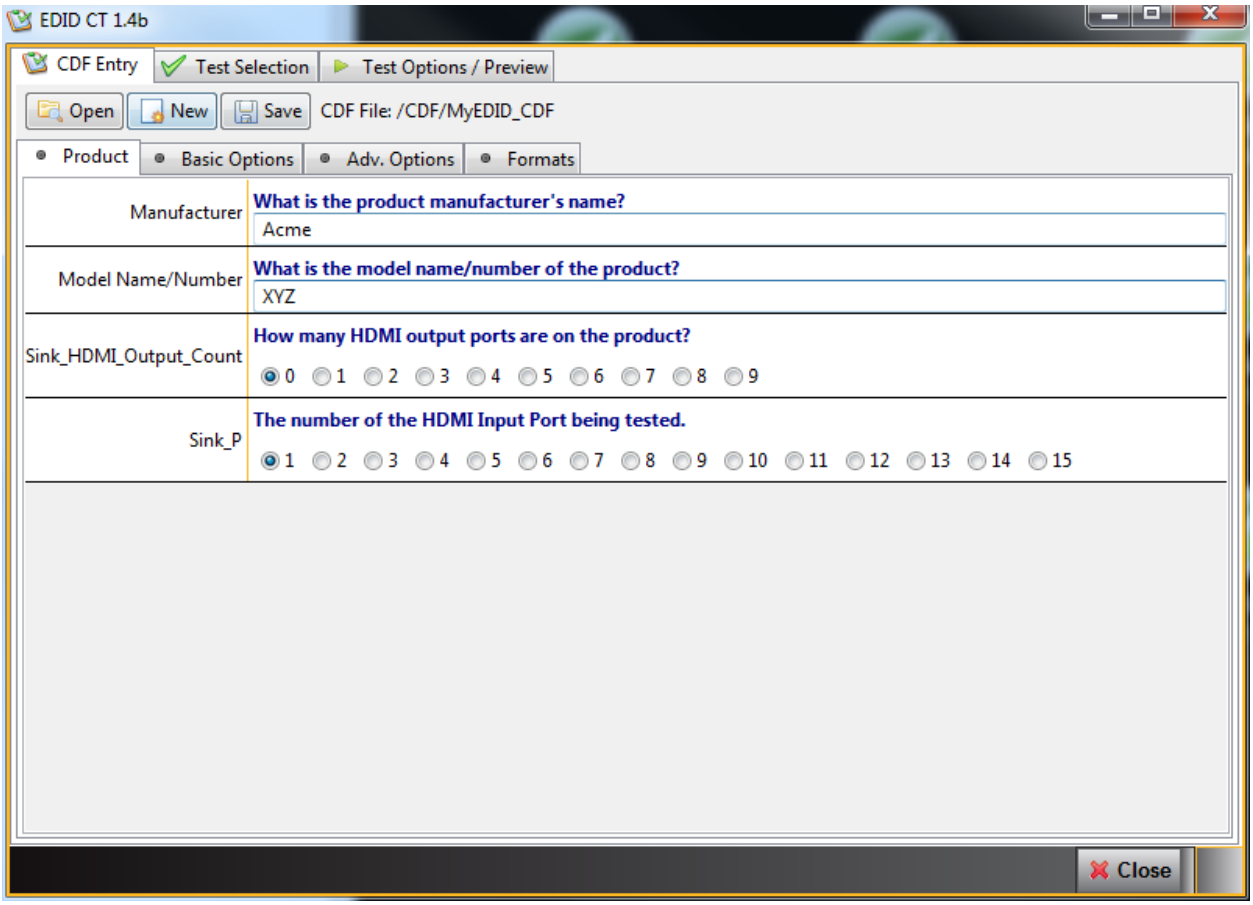
To complete the CDF:

1. From the **View** menu, enable viewing of the **EDID Compliance Test** panel.

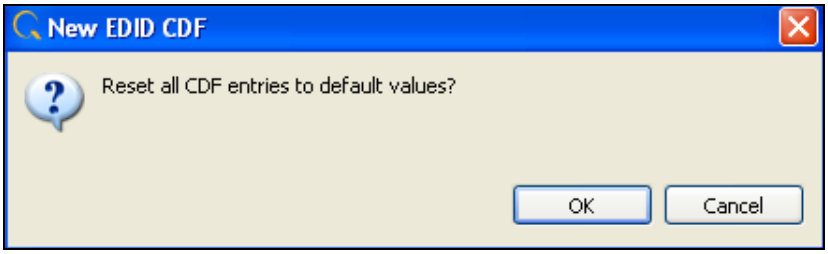


2. Select the **CDF Entry** panel as shown below.

   The following screen appears:

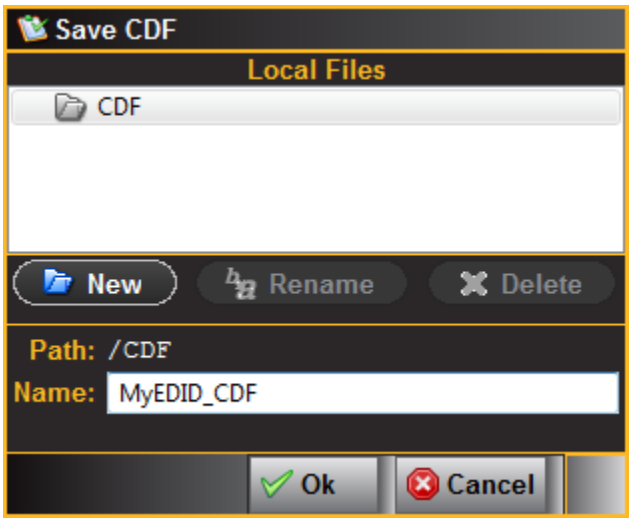


3. You can either create a new CDF or you can load an existing CDF. To create a new CDF you click on the **New** activation button. A confirmation dialog box will open as shown below:



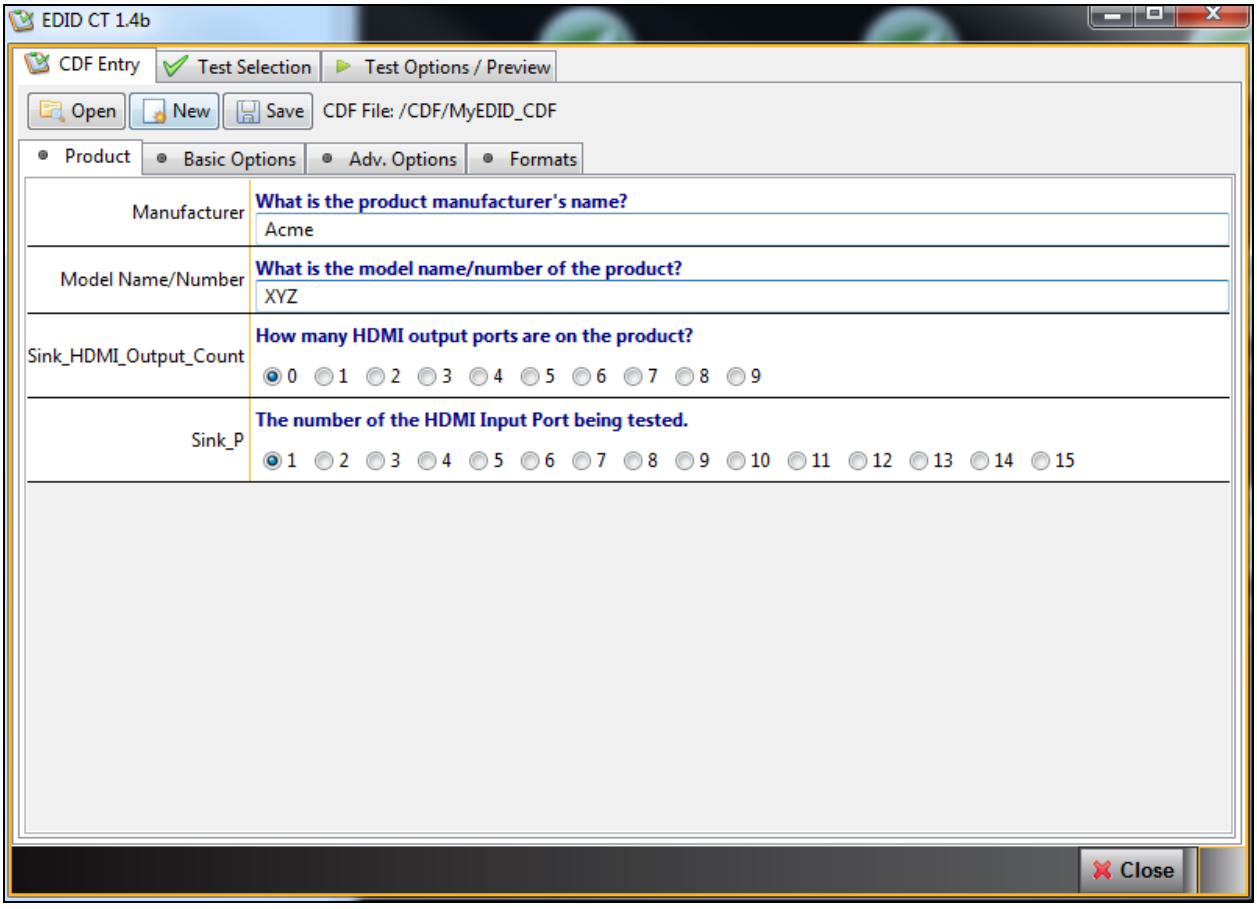
Click **OK** to continue with a new CDF.

4. You can save the CDF using the **Save** activation button. A confirmation box with a default name will appear as shown below. Edit the name if necessary and click **OK**.

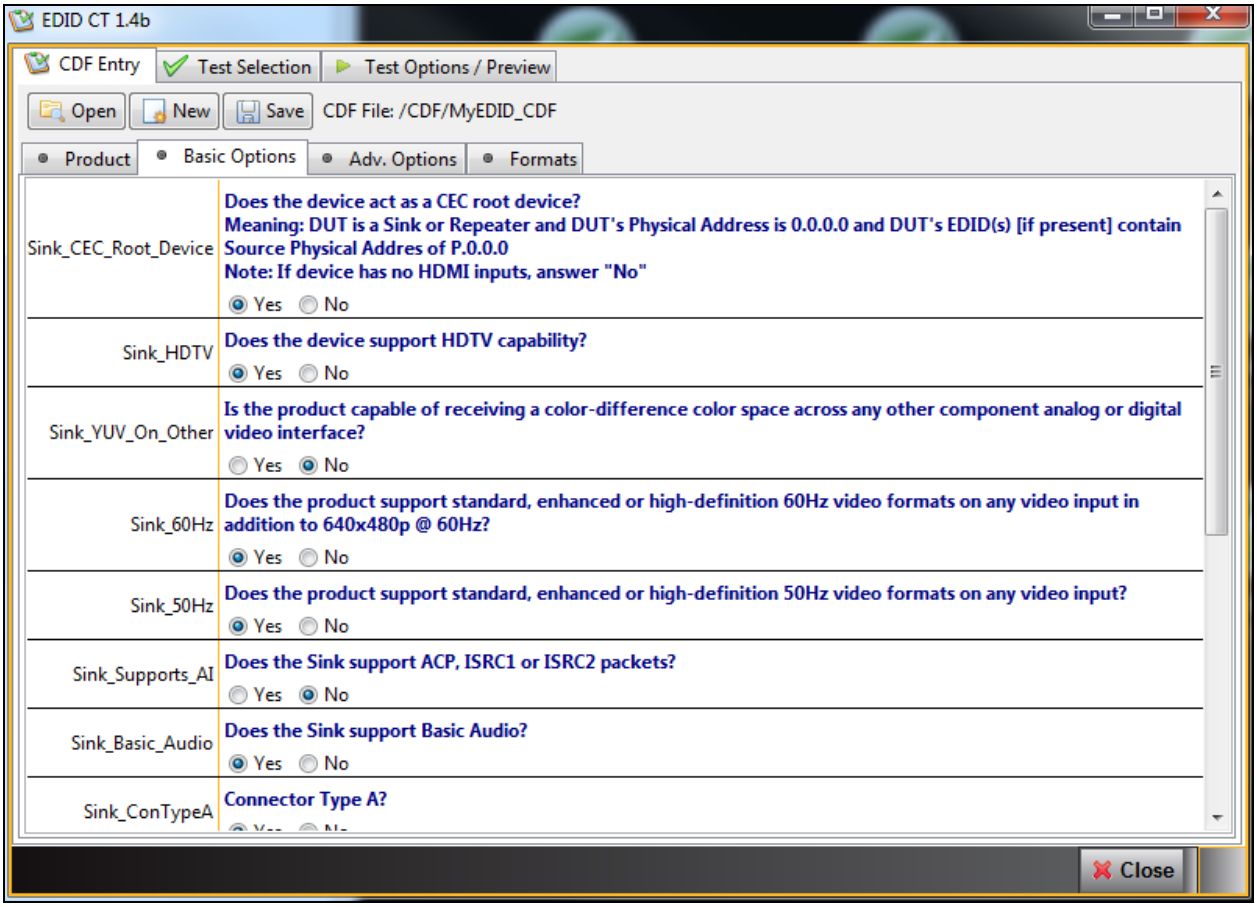


The name will appear next to the **Save** button as shown below.

5. Complete the items in the CDF Product tab using the radio buttons and text fields. An example is shown below:

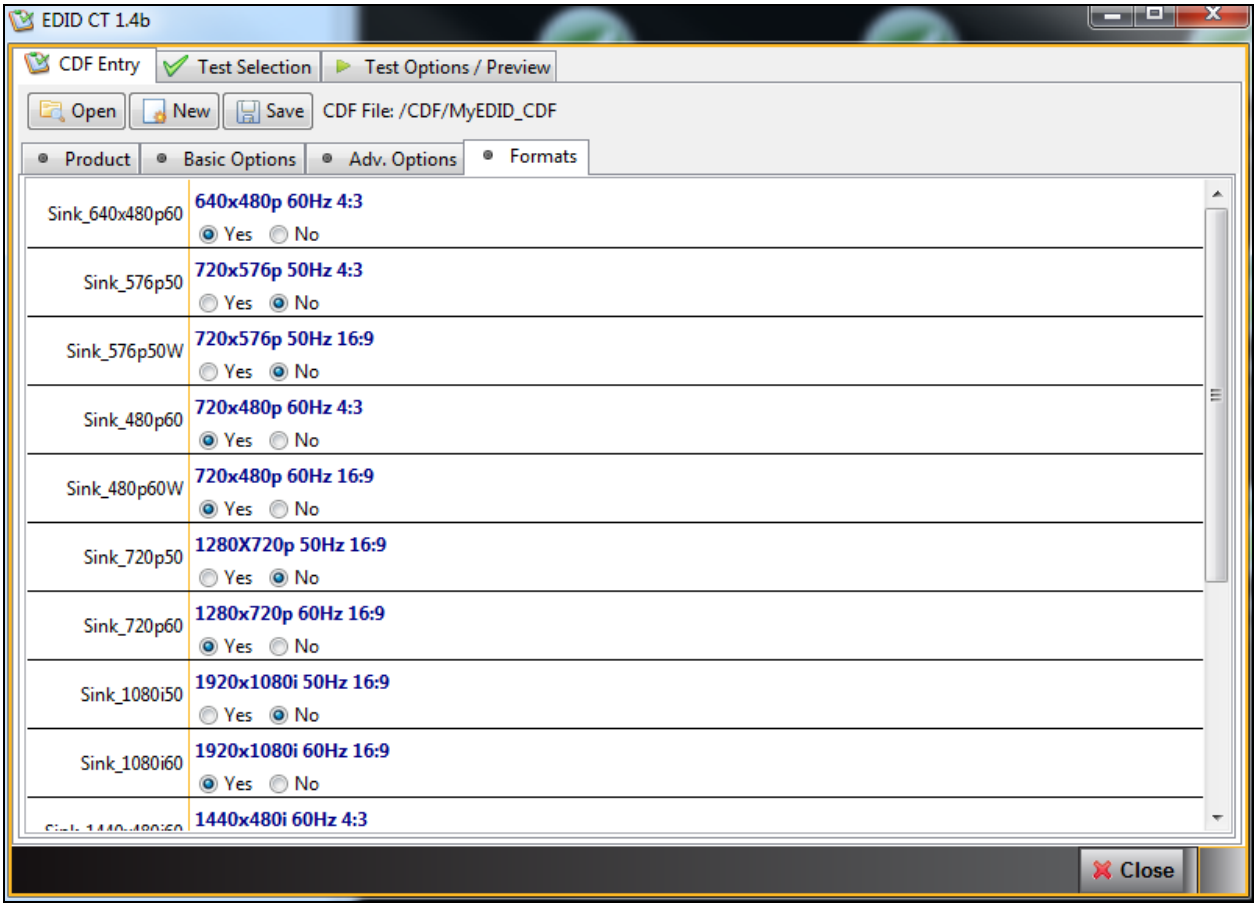


6. Complete the items in the CDF Basic Options tab using the radio buttons. An example is shown below:

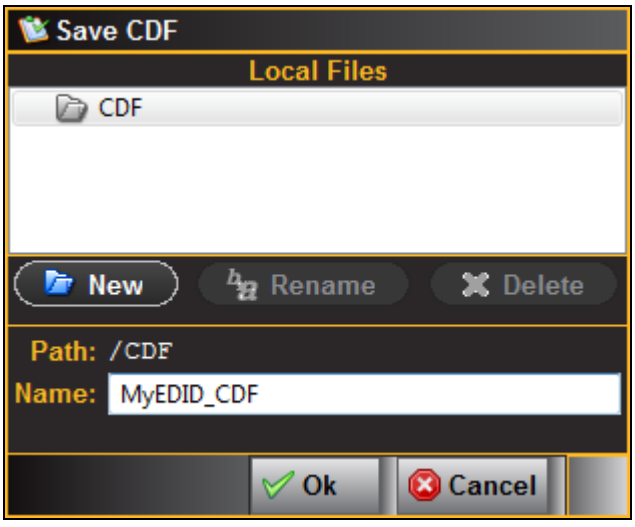


7. Complete the items in the CDF Advanced Options tab using the radio buttons. An example is shown below:

8. Complete the items in the CDF Formats tab using the radio buttons. An example is shown below:



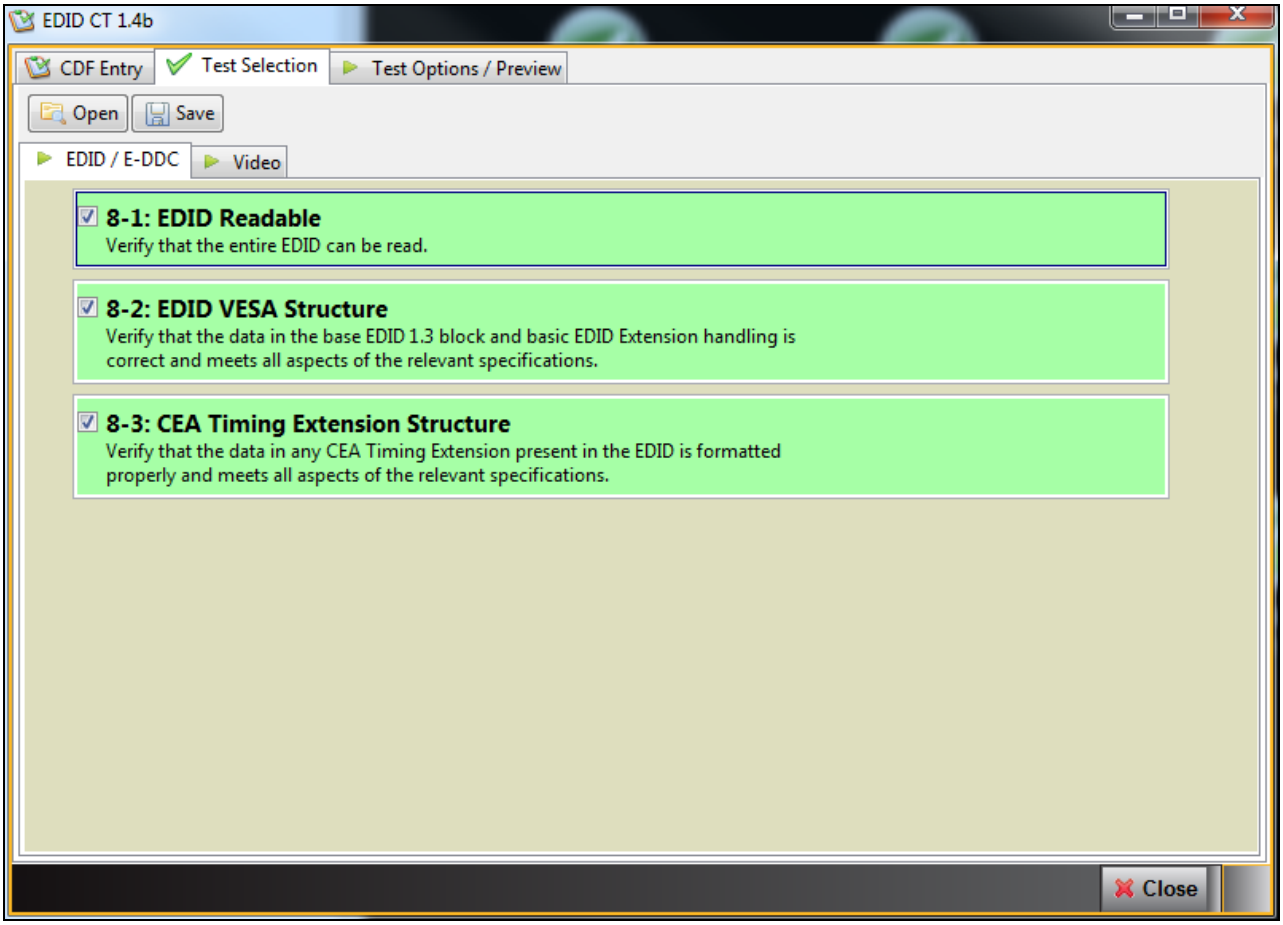
9. Save the CDF using the **Save** activation button. A confirmation box with a default name will appear as shown below. Edit the name if necessary and click **OK**.



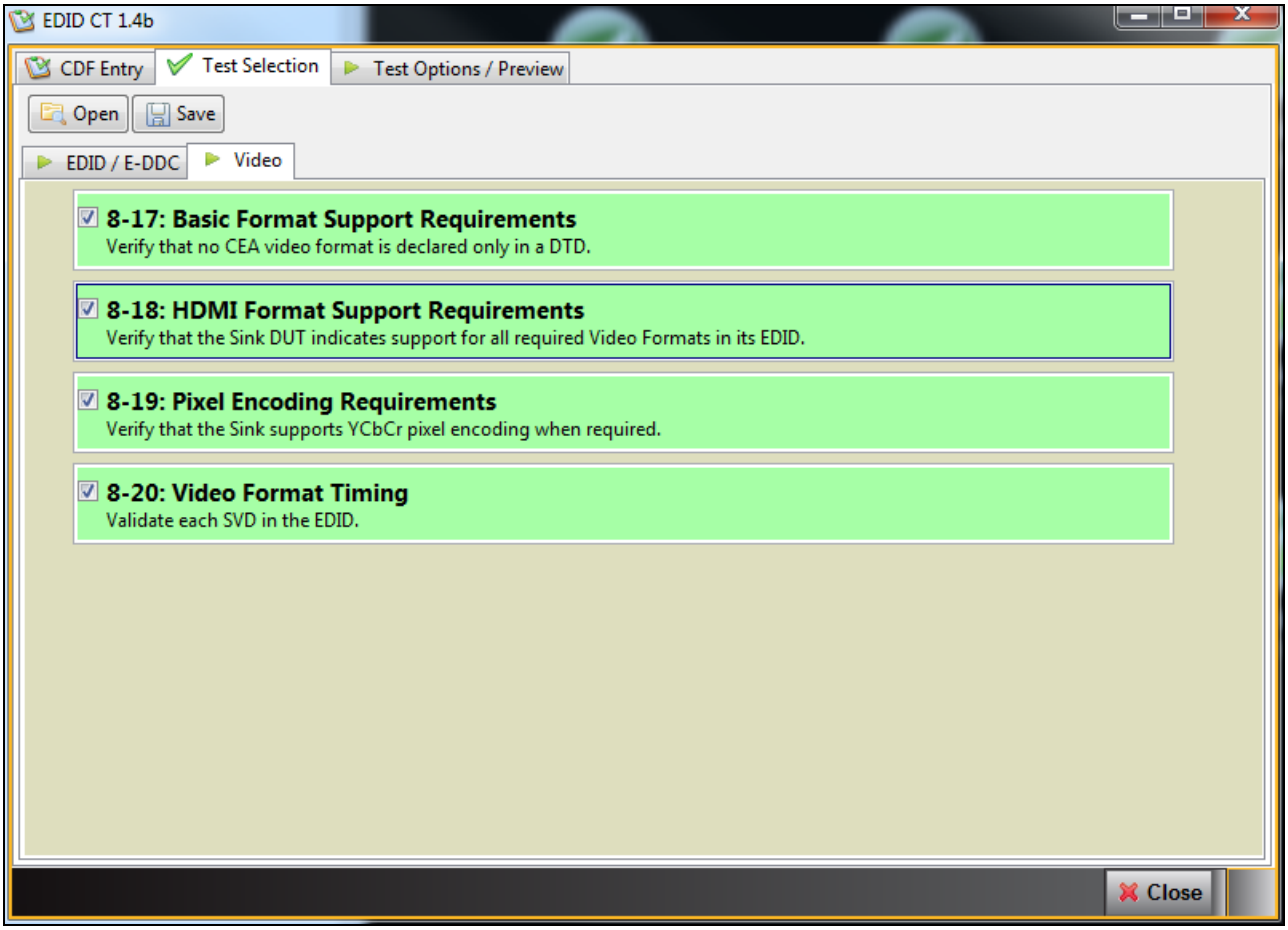
4.4 Selecting the Tests to Run

Use the following procedures to select which of the EDID related tests to run.

1. Select the tests from the **EDID / E-DDC** tab that you wish to run.



2. Select the tests from the **EDID / E-DDC** tab that you wish to run.

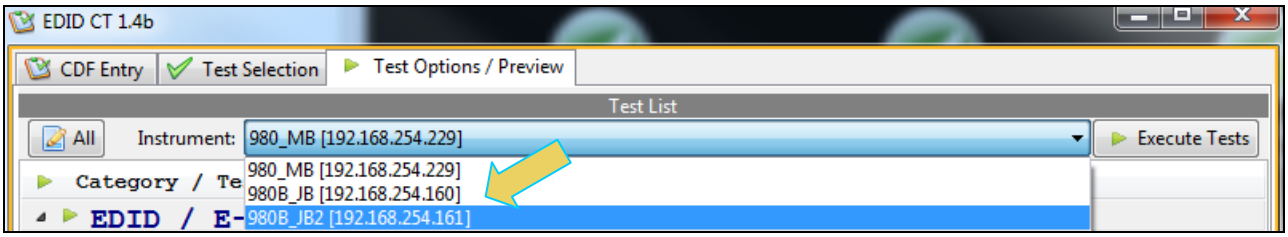


4.5 Executing the EDID Compliance Tests

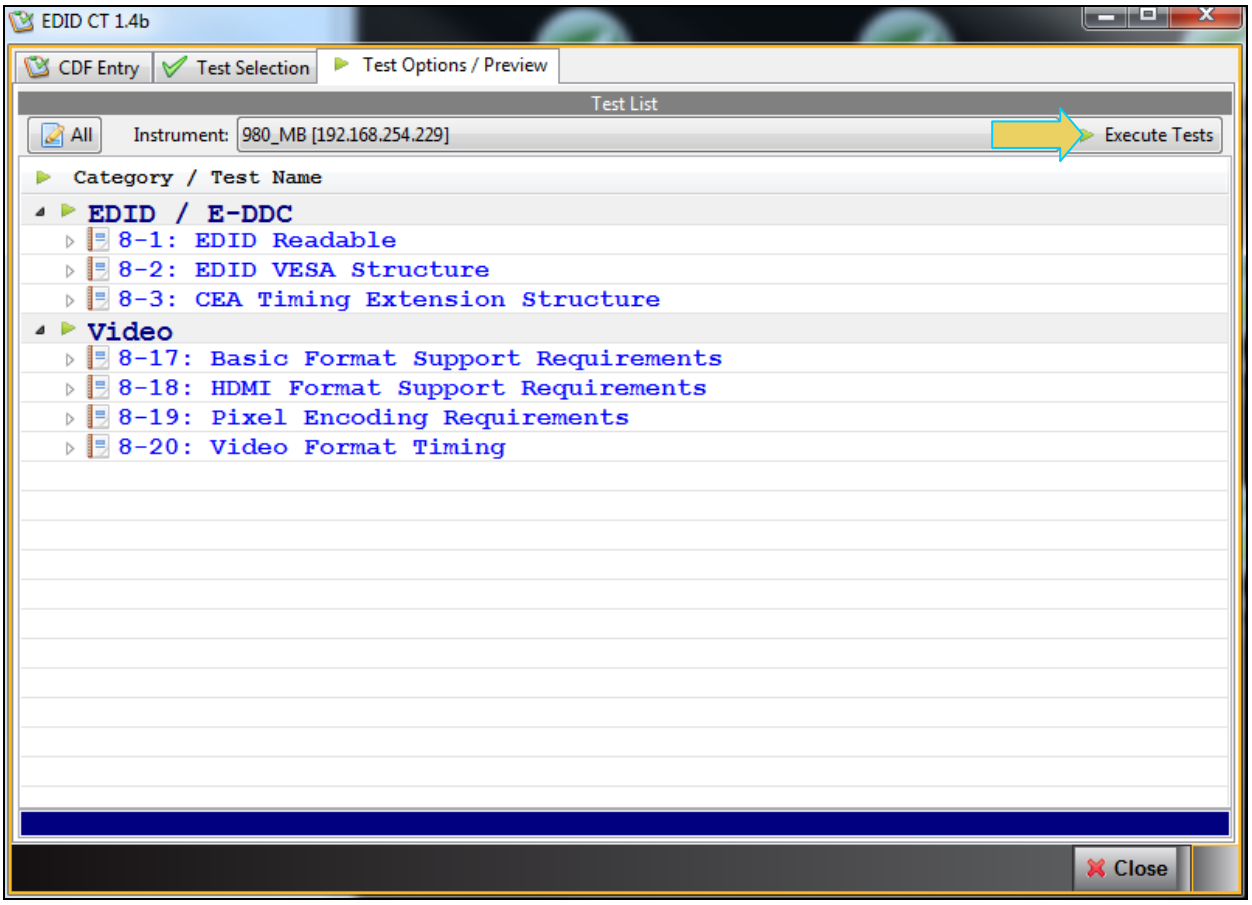
Use the following procedures to initiate the execution of an EDID Compliance test series.

To initiate a test series:

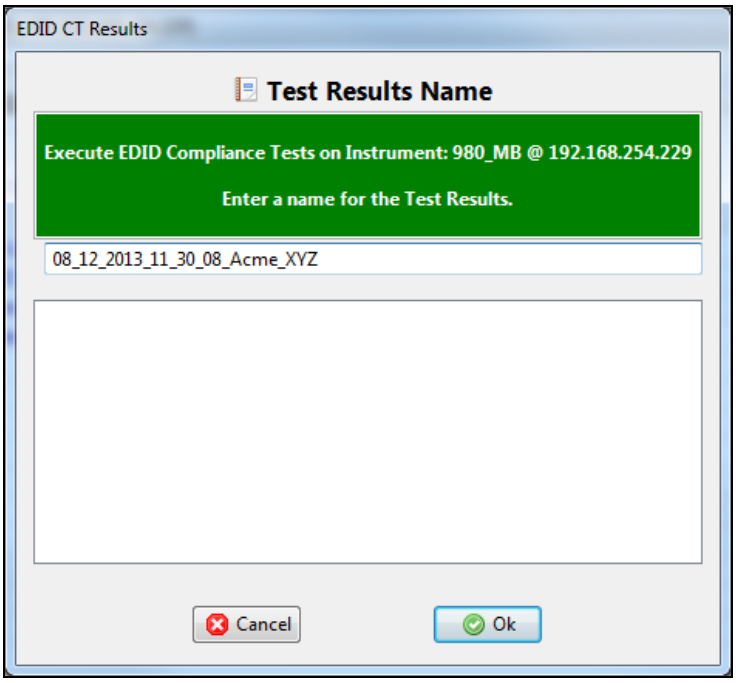
1. If you are connected to more than one 980, select the desired device from the pull-down menu as shown below.



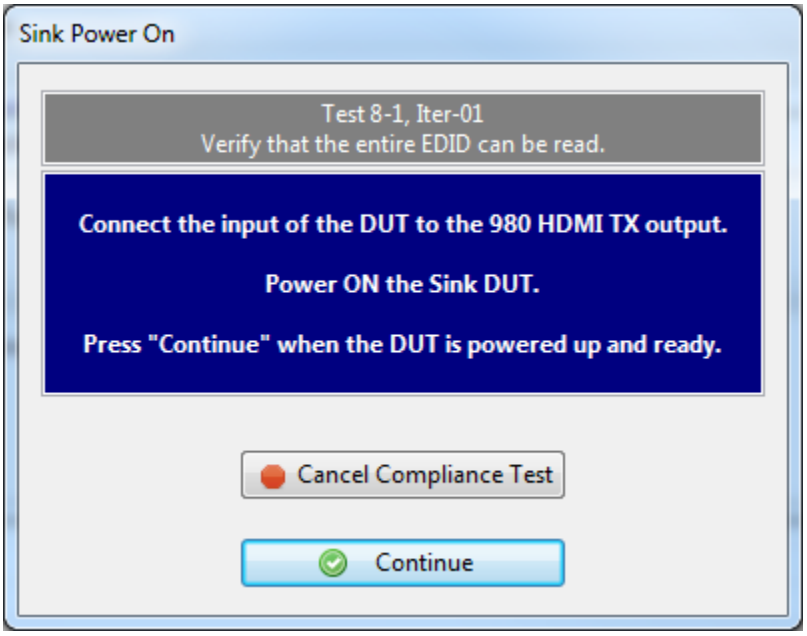
2. Select the **Execute Tests** activation button on the top panel.

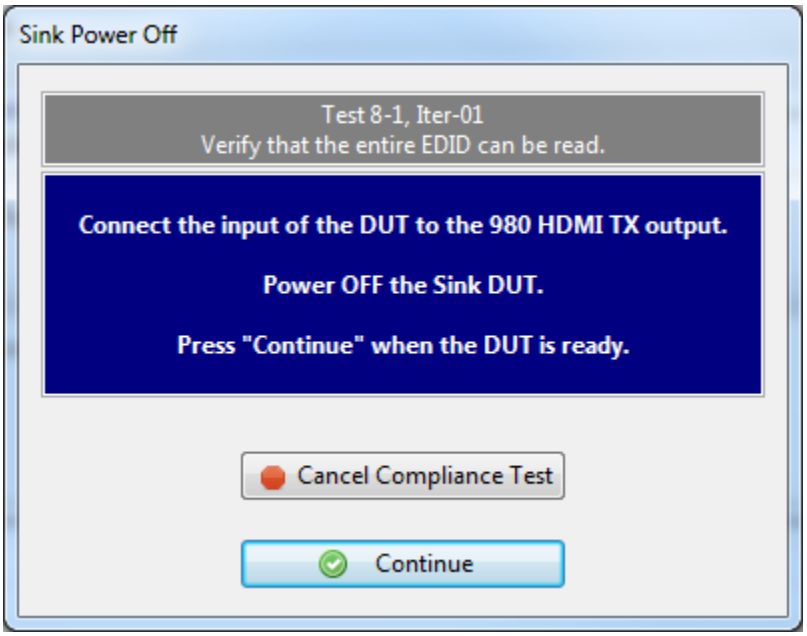


The application will present a dialog box asking you to assign a name to the EDID test results. Refer to the sample screen shot below:

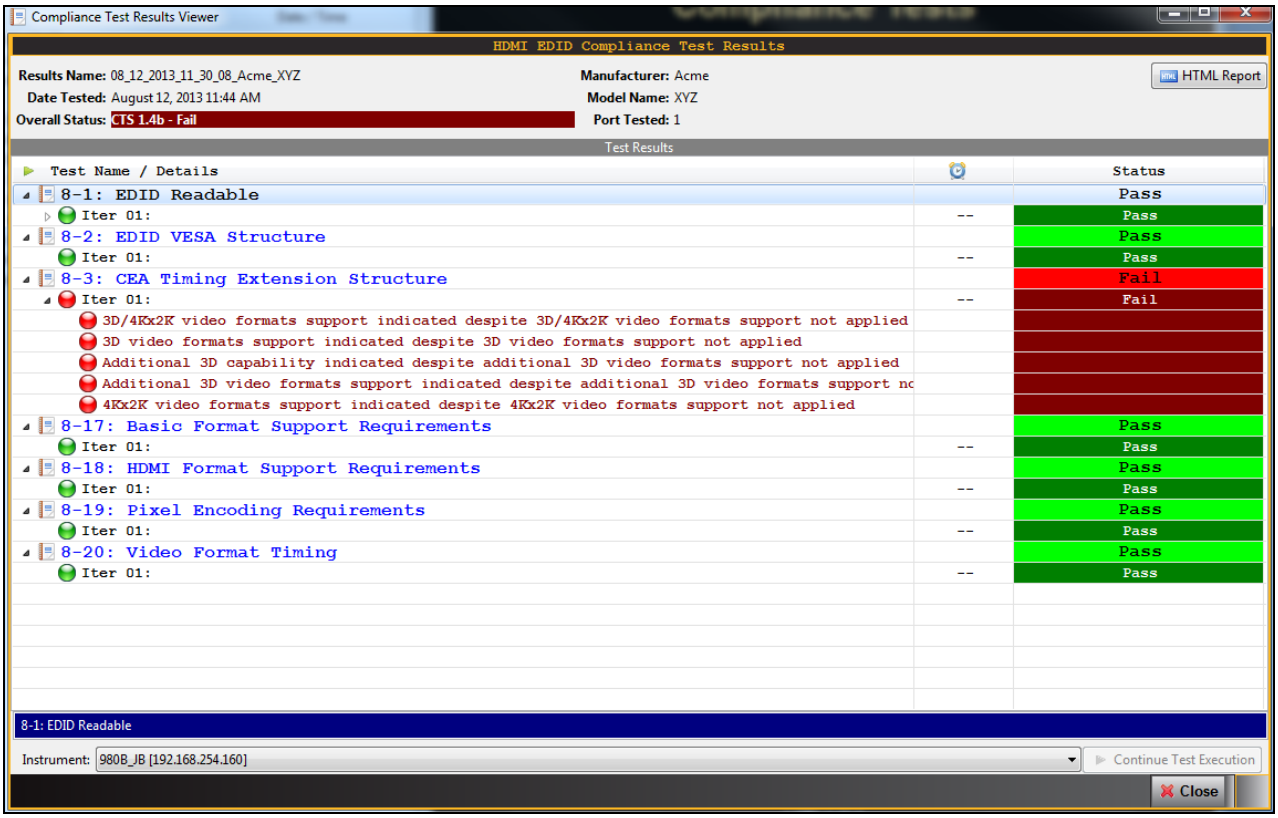


The tests will begin when you click **Ok** on the preceding dialog box. A new dialog box will appear instructing you to connect the 980 to the sink device under test. Refer to the following screen example.





The test results are shown in a new window when the test is completed. You can view the details of any test including the failures as shown below.

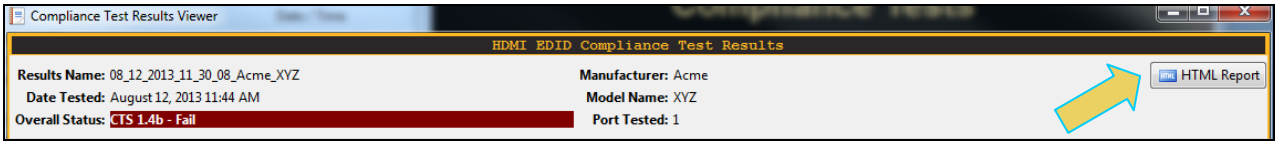


4.6 Viewing the HTML Test Report

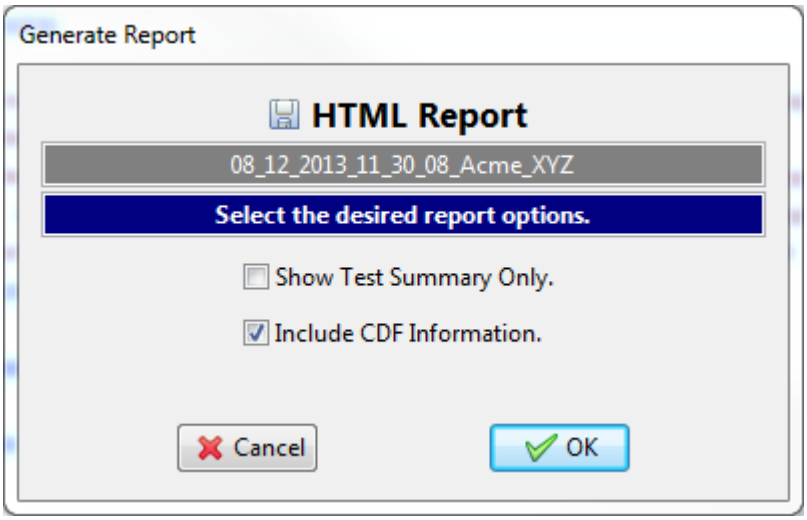
Use the following procedures to view the HTML test report for the EDID Compliance test.

To view the test report:

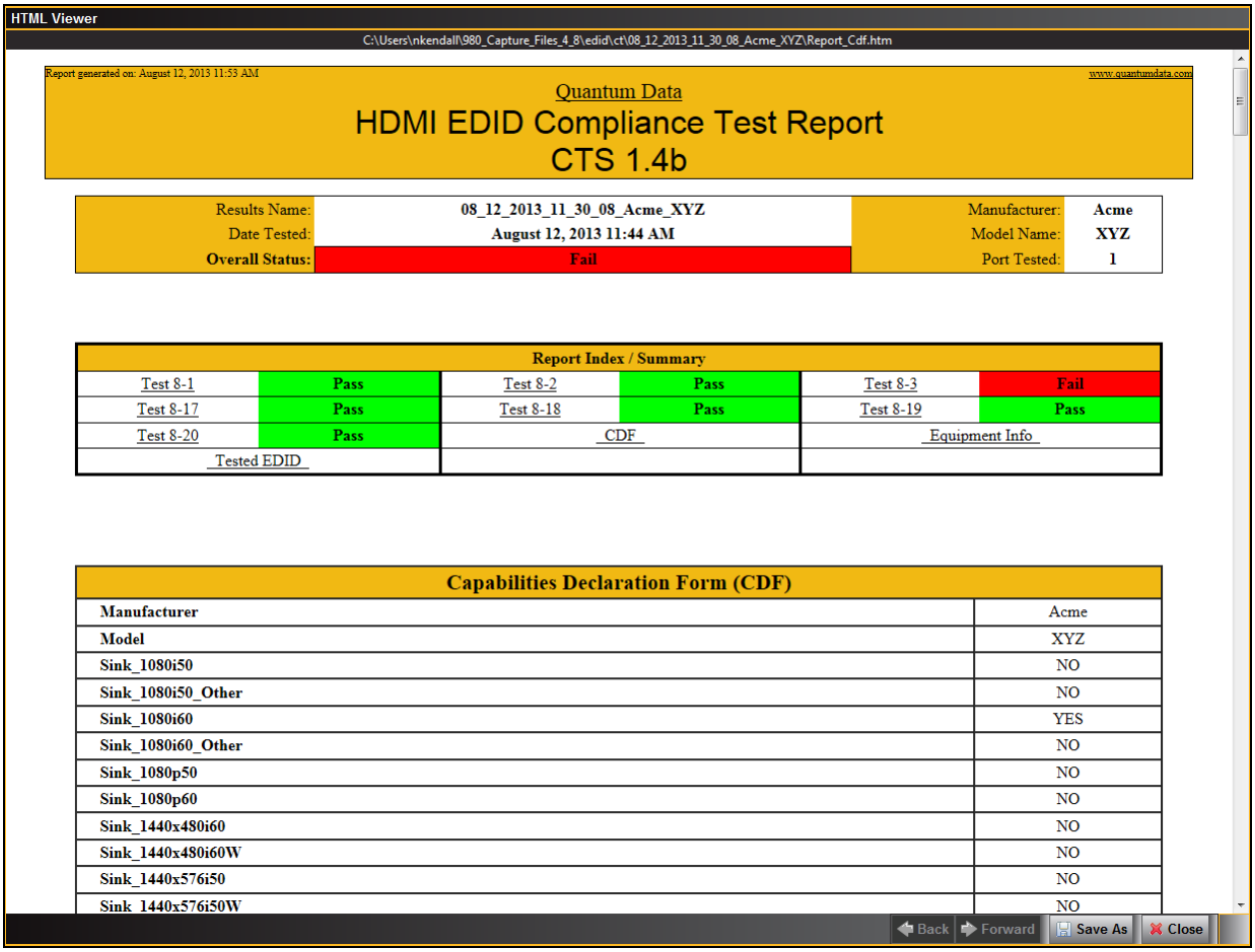
1. Click on the HTML Report activation button as shown below.



2. Select whether you wish to also include the sink device CDF information in the report. This is shown in the following dialog box.


Generate Report
HTML Report
08_12_2013_11_30_08_Acme_XYZ
Select the desired report options.
Show Test Summary Only.
Include CDF Information.
Cancel
OK

The beginning of the report shows some basic information about when the test was run, the model number and a summary of the results. The CDF is shown and then the detailed results. The hex readout of each block is also shown before the human readable text. Refer to the following screen examples.



HTML Viewer

C:\Users\nkendall\980_Capture_Files_4_8\edid\ct\08_12_2013_11_30_08_Acme_XYZ\Report_Cdf.htm

Report generated on: August 12, 2013 11:53 AM www.quantumdata.com

Quantum Data

HDMI EDID Compliance Test Report

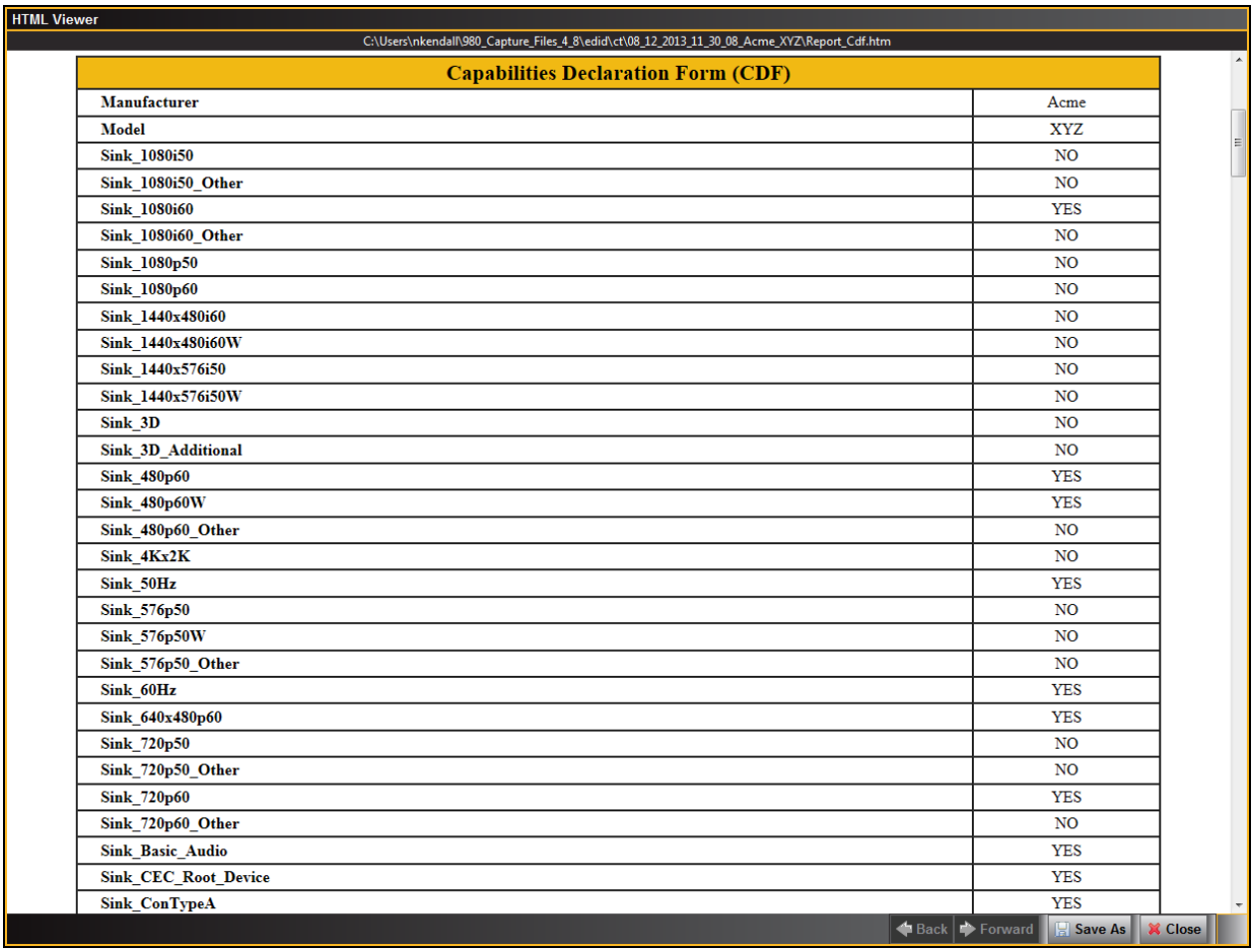
CTS 1.4b

Results Name:	08_12_2013_11_30_08_Acme_XYZ	Manufacturer:	Acme
Date Tested:	August 12, 2013 11:44 AM	Model Name:	XYZ
Overall Status:	Fail	Port Tested:	1

Report Index / Summary					
Test 8-1	Pass	Test 8-2	Pass	Test 8-3	Fail
Test 8-17	Pass	Test 8-18	Pass	Test 8-19	Pass
Test 8-20	Pass	CDF		Equipment Info	
Tested EDID					

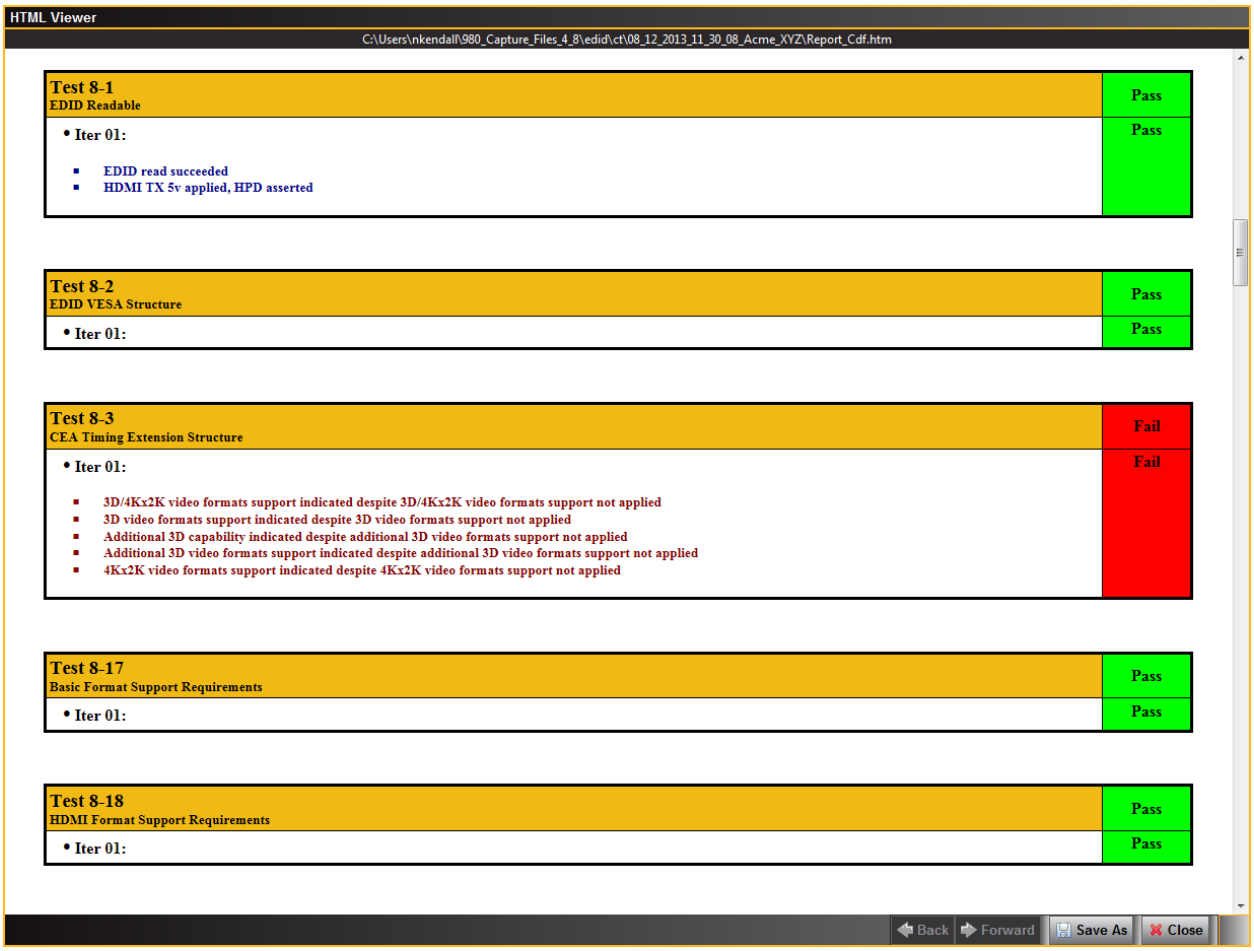
Capabilities Declaration Form (CDF)	
Manufacturer	Acme
Model	XYZ
Sink_1080i50	NO
Sink_1080i50_Other	NO
Sink_1080i60	YES
Sink_1080i60_Other	NO
Sink_1080p50	NO
Sink_1080p60	NO
Sink_1440x480i60	NO
Sink_1440x480i60W	NO
Sink_1440x576i50	NO
Sink_1440x576i50W	NO

Back Forward Save As Close

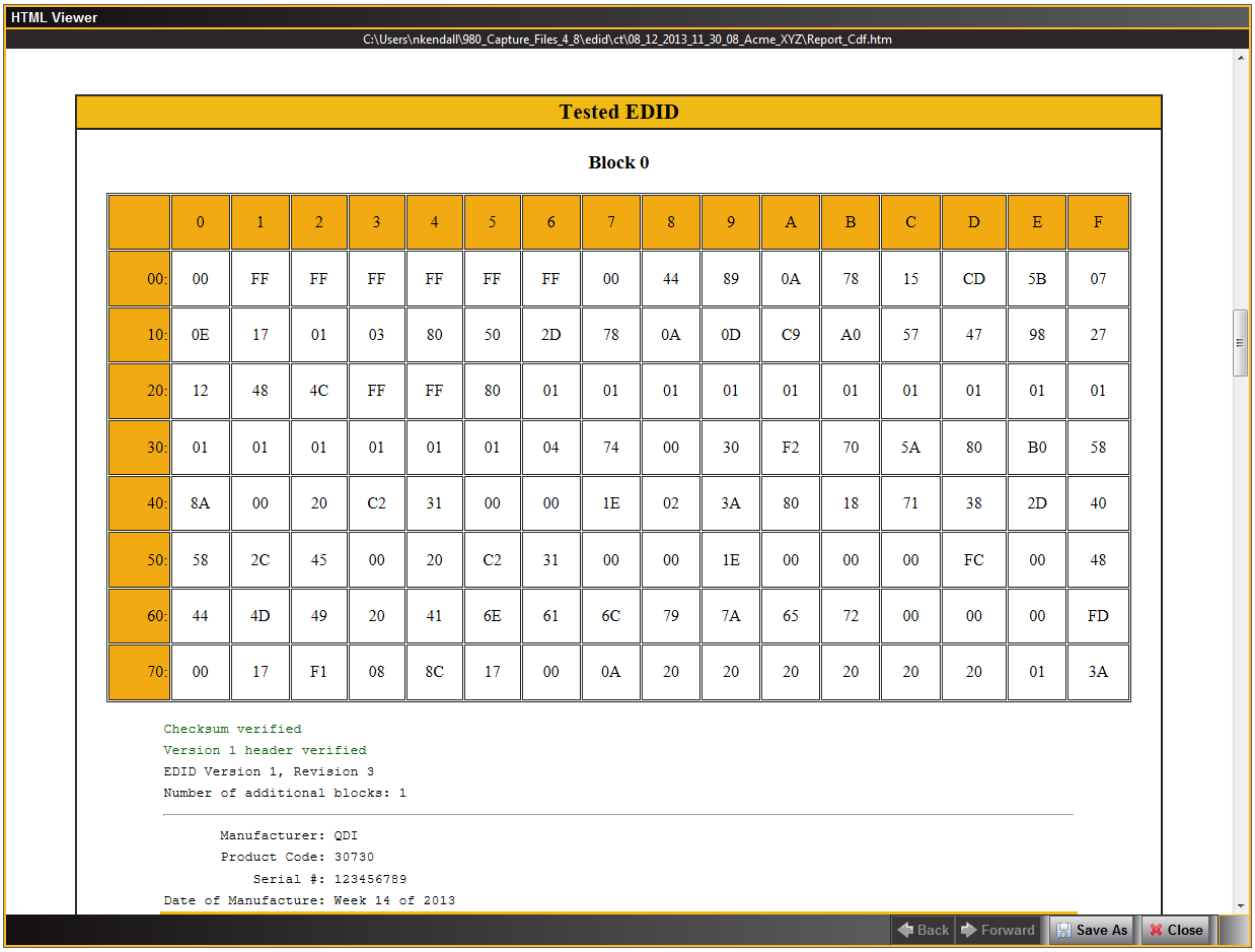


Capabilities Declaration Form (CDF)

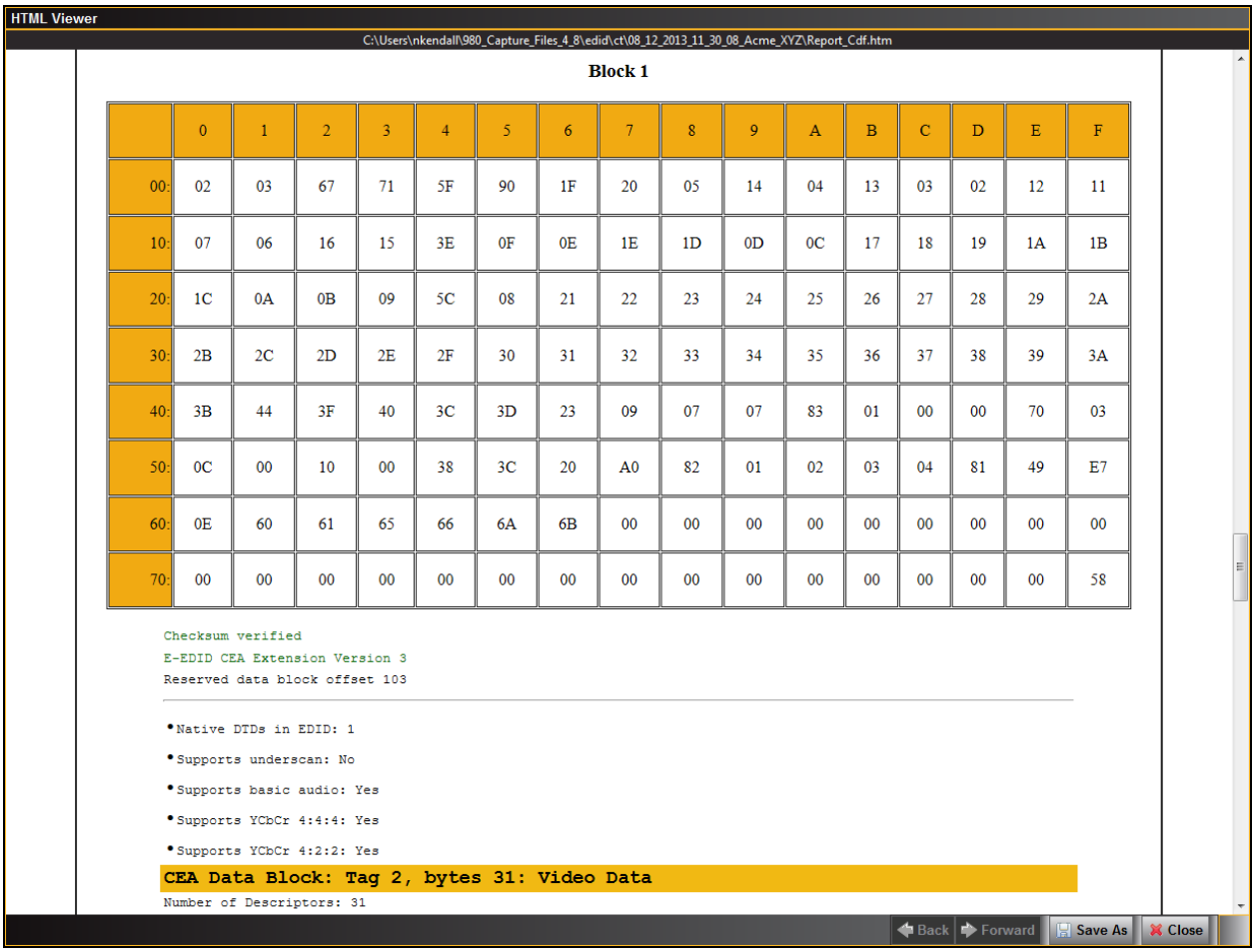
Manufacturer	Acme
Model	XYZ
Sink_1080i50	NO
Sink_1080i50_Other	NO
Sink_1080i60	YES
Sink_1080i60_Other	NO
Sink_1080p50	NO
Sink_1080p60	NO
Sink_1440x480i60	NO
Sink_1440x480i60W	NO
Sink_1440x576i50	NO
Sink_1440x576i50W	NO
Sink_3D	NO
Sink_3D_Additional	NO
Sink_480p60	YES
Sink_480p60W	YES
Sink_480p60_Other	NO
Sink_4Kx2K	NO
Sink_50Hz	YES
Sink_576p50	NO
Sink_576p50W	NO
Sink_576p50_Other	NO
Sink_60Hz	YES
Sink_640x480p60	YES
Sink_720p50	NO
Sink_720p50_Other	NO
Sink_720p60	YES
Sink_720p60_Other	NO
Sink_Basic_Audio	YES
Sink_CEC_Root_Device	YES
Sink_ConTypeA	YES


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\edid\ct\08_12_2013_11_30_08_Acme_XYZ\Report_Cdf.htm
Test 8-1
EDID Readable
Pass
• Iter 01:
Pass
EDID read succeeded
HDMI TX 5v applied, HPD asserted
Test 8-2
EDID VESA Structure
Pass
• Iter 01:
Pass
Test 8-3
CEA Timing Extension Structure
Fail
• Iter 01:
Fail
3D/4Kx2K video formats support indicated despite 3D/4Kx2K video formats support not applied
3D video formats support indicated despite 3D video formats support not applied
Additional 3D capability indicated despite additional 3D video formats support not applied
Additional 3D video formats support indicated despite additional 3D video formats support not applied
4Kx2K video formats support indicated despite 4Kx2K video formats support not applied
Test 8-17
Basic Format Support Requirements
Pass
• Iter 01:
Pass
Test 8-18
HDMI Format Support Requirements
Pass
• Iter 01:
Pass
Back
Forward
Save As
Close

Each EDID block, block 0 VESA and block 1 CEA are shown in hex before the data in human readable text.



	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00:	00	FF	FF	FF	FF	FF	FF	00	44	89	0A	78	15	CD	5B	07
10:	0E	17	01	03	80	50	2D	78	0A	0D	C9	A0	57	47	98	27
20:	12	48	4C	FF	FF	80	01	01	01	01	01	01	01	01	01	01
30:	01	01	01	01	01	01	04	74	00	30	F2	70	5A	80	B0	58
40:	8A	00	20	C2	31	00	00	1E	02	3A	80	18	71	38	2D	40
50:	58	2C	45	00	20	C2	31	00	00	1E	00	00	00	FC	00	48
60:	44	4D	49	20	41	6E	61	6C	79	7A	65	72	00	00	00	FD
70:	00	17	F1	08	8C	17	00	0A	20	20	20	20	20	20	01	3A



Block 1

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00:	02	03	67	71	5F	90	1F	20	05	14	04	13	03	02	12	11
10:	07	06	16	15	3E	0F	0E	1E	1D	0D	0C	17	18	19	1A	1B
20:	1C	0A	0B	09	5C	08	21	22	23	24	25	26	27	28	29	2A
30:	2B	2C	2D	2E	2F	30	31	32	33	34	35	36	37	38	39	3A
40:	3B	44	3F	40	3C	3D	23	09	07	07	83	01	00	00	70	03
50:	0C	00	10	00	38	3C	20	A0	82	01	02	03	04	81	49	E7
60:	0E	60	61	65	66	6A	6B	00	00	00	00	00	00	00	00	00
70:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	58

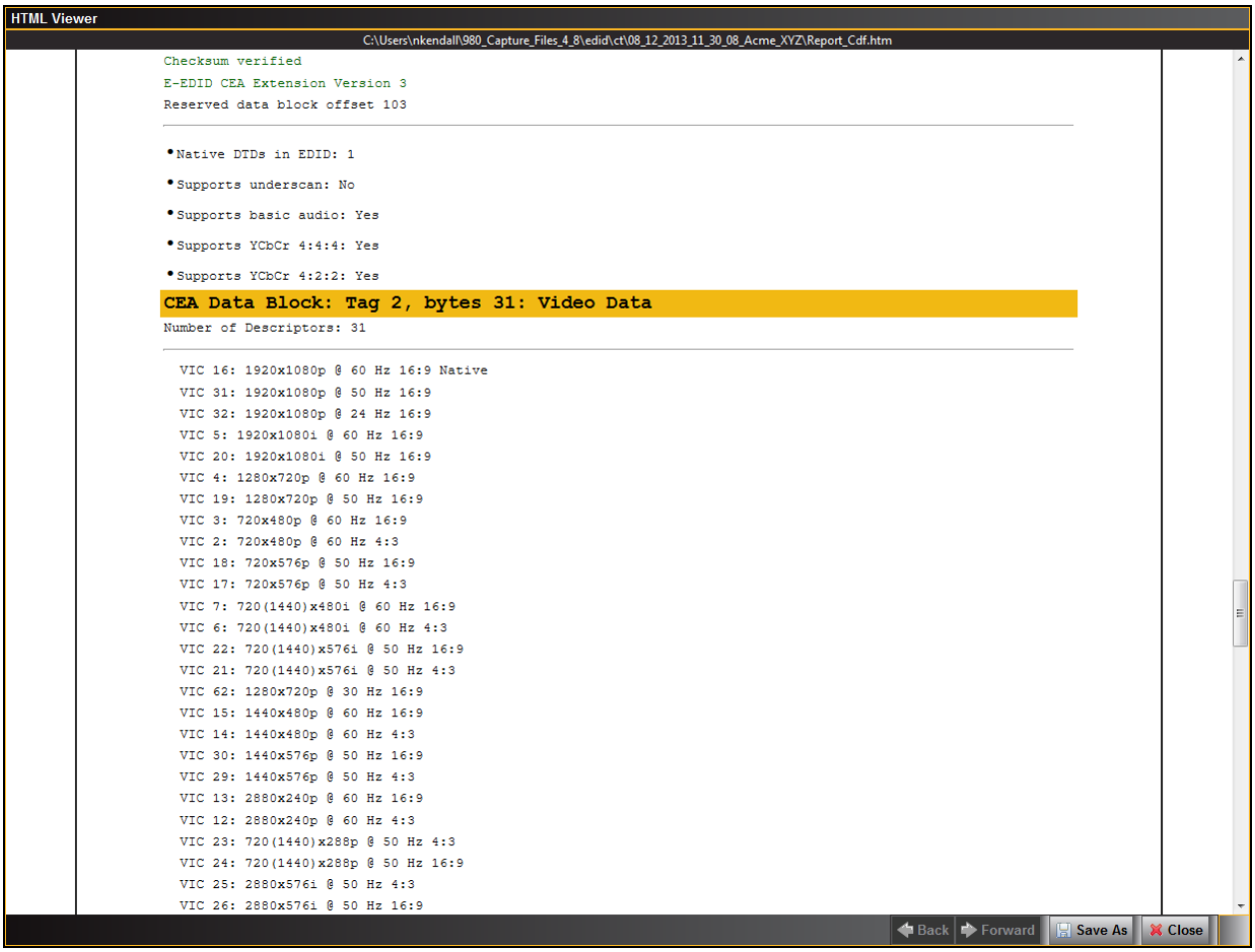
Checksum verified
E-EDID CEA Extension Version 3
Reserved data block offset 103

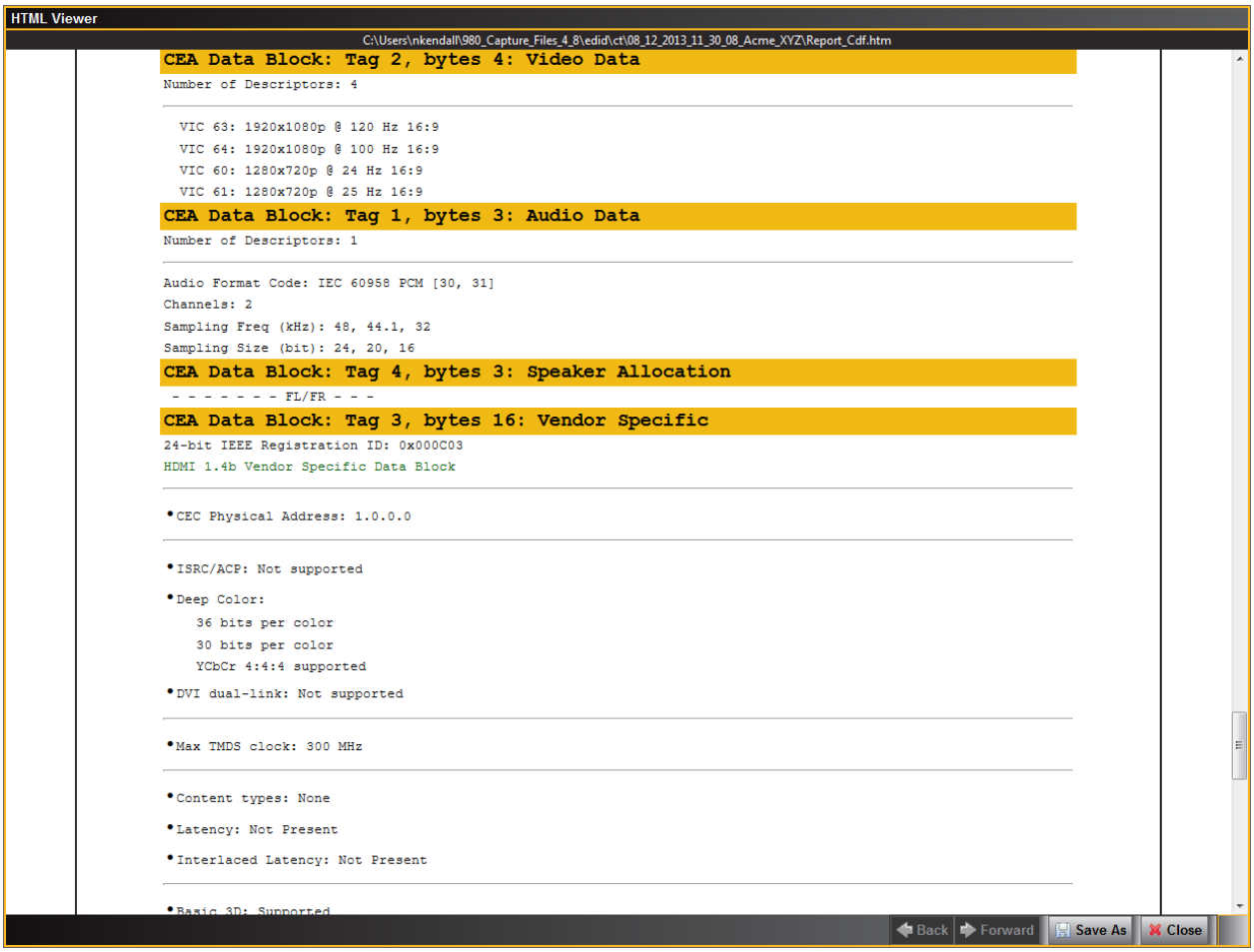
- Native DTDs in EDID: 1
- Supports underscan: No
- Supports basic audio: Yes
- Supports YCbCr 4:4:4: Yes
- Supports YCbCr 4:2:2: Yes

CEA Data Block: Tag 2, bytes 31: Video Data

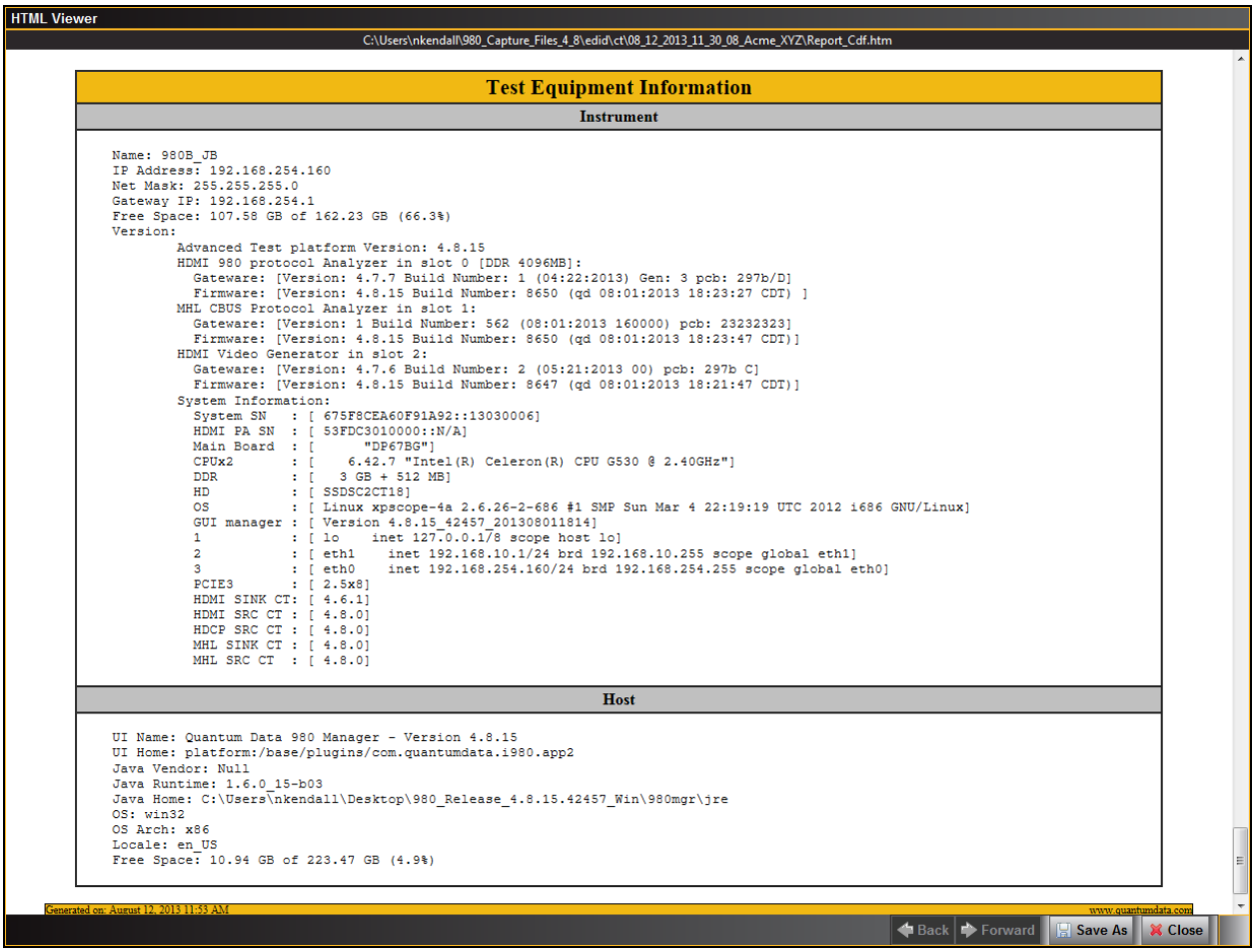
Number of Descriptors: 31

Each EDID block, block 0 VESA and block 1 CEA are shown in hex before the data in human readable text.




HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\edid\ct\08_12_2013_11_30_08_Acme_XYZ\Report_Cdf.htm
CEA Data Block: Tag 2, bytes 4: Video Data
Number of Descriptors: 4
VIC 63: 1920x1080p @ 120 Hz 16:9
VIC 64: 1920x1080p @ 100 Hz 16:9
VIC 60: 1280x720p @ 24 Hz 16:9
VIC 61: 1280x720p @ 25 Hz 16:9
CEA Data Block: Tag 1, bytes 3: Audio Data
Number of Descriptors: 1
Audio Format Code: IEC 60958 PCM [30, 31]
Channels: 2
Sampling Freq (kHz): 48, 44.1, 32
Sampling Size (bit): 24, 20, 16
CEA Data Block: Tag 4, bytes 3: Speaker Allocation
- - - - - - - FL/FR - - -
CEA Data Block: Tag 3, bytes 16: Vendor Specific
24-bit IEEE Registration ID: 0x000C03
HDMI 1.4b Vendor Specific Data Block
•CEC Physical Address: 1.0.0.0
•ISRC/ACP: Not supported
•Deep Color:
36 bits per color
30 bits per color
YCbCr 4:4:4 supported
•DVI dual-link: Not supported
•Max TMDS clock: 300 MHz
•Content types: None
•Latency: Not Present
•Interlaced Latency: Not Present
•Basic 3D: Supported
Back
Forward
Save As
Close

The last page in the report shows the version information about the 980 used for the test.



3. To close the window click on the **Close** activation button on the lower left.

5 MHL Sink Compliance Tests

This chapter describes how to use the MHL sink compliance test feature. Please note you will have to purchase the 980 MHL Sink Compliance Test option in order to run these tests. ***Also note that this test suite requires the Quantum Data 882 instrument, release 2.25.0 which uses firmware version 20.1887600.*** The 980 HDMI Protocol Analyzer serves only as a controller for running the MHL sink/dongle compliance tests (except where noted) as a convenience to owners of the 882 test instrument. The following test sections in the MHL 1.2, 1.3, 2.0 & 2.1 Sink Compliance Test specification are supported through the 980 GUI Manager:

Sink Compliance Tests

- 4.2.1 Sink - System Tests
  - Test ID 4.2.1.1 – Character Synchronization Normal Mode
  - Test ID 4.2.1.2 – Packet Types Normal Mode
  - Test ID 4.2.1.3 – Character Synchronization Packed Pixel Mode (MHL 1.3, 2.0, 2.1 only)
  - Test ID 4.2.1.4 – Packet Types Packed Pixel Mode (MHL 1.3, 2.0, 2.1 only)
- 4.2.2 Sink - Video Tests
  - Test ID 4.2.2.1 – Video Formats Normal Mode
  - Test ID 4.2.2.2 – Pixel Encoding Normal Mode
  - Test ID 4.2.2.3 – Video Quantization
  - Test ID 4.2.2.4 – Video Formats Packed Pixel Mode (MHL 1.3, 2.0, 2.1 only)
  - Test ID 4.2.2.5 – Pixel Encoding Packed Pixel Mode (MHL 1.3, 2.0, 2.1 only)
- 4.2.3 Sink - Audio Tests
  - Test ID 4.2.3.1 – IEC 60958 / IEC 61937
  - Test ID 4.2.3.2 – Audio Clock Regeneration
- 4.2.7 Sink – RAP and RAPK Sub-Commands Test
  - Test ID 4.2.7.1 – RAP and RAPK Sub-Commands Test (MHL 1.3, 2.0, 2.1 only)
- 4.2.8 Sink – RAP and RAPK Sub-Commands Test
  - Test ID 4.2.8.2 – Video Format in Normal Mode
  - Test ID 4.2.8.3 – Video Format in PackedPixel Mode (MHL 1.3, 2.0, 2.1 only)

5.1 Workflow for running the MHL Sink Compliance Tests

The following is the high level workflow for running the MHL Sink Compliance Tests. This workflow assumes that you have powered up the 980/980B and established an Ethernet session with the 980/980B as described in Connection for 980 GUI Manager and 980.

The following is the high level workflow for running the HDMI Sink Compliance Tests.

1. Connect the sink device under test to the 980 HDMI Protocol Analyzer via HDMI.
2. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.
3. Select the tests that you wish to run from the **Test Selection** panel.
4. Initiate the tests through the **Test Options / Review** panel.
5. View the detailed data for test failures if failures occur.

6. View the results in the **Test Results** panel under the **Navigator** panel.

5.2 Making the physical connections for 980 GUI Manager control

This subsection describes the physical connections required to run the MHL sink compliance tests. The 980 HDMI Protocol Analyzer and the 980 GUI Manager serve only as a controller for running the MHL Sink Compliance Tests. The tests are executed by the 882E/EA (except where noted).

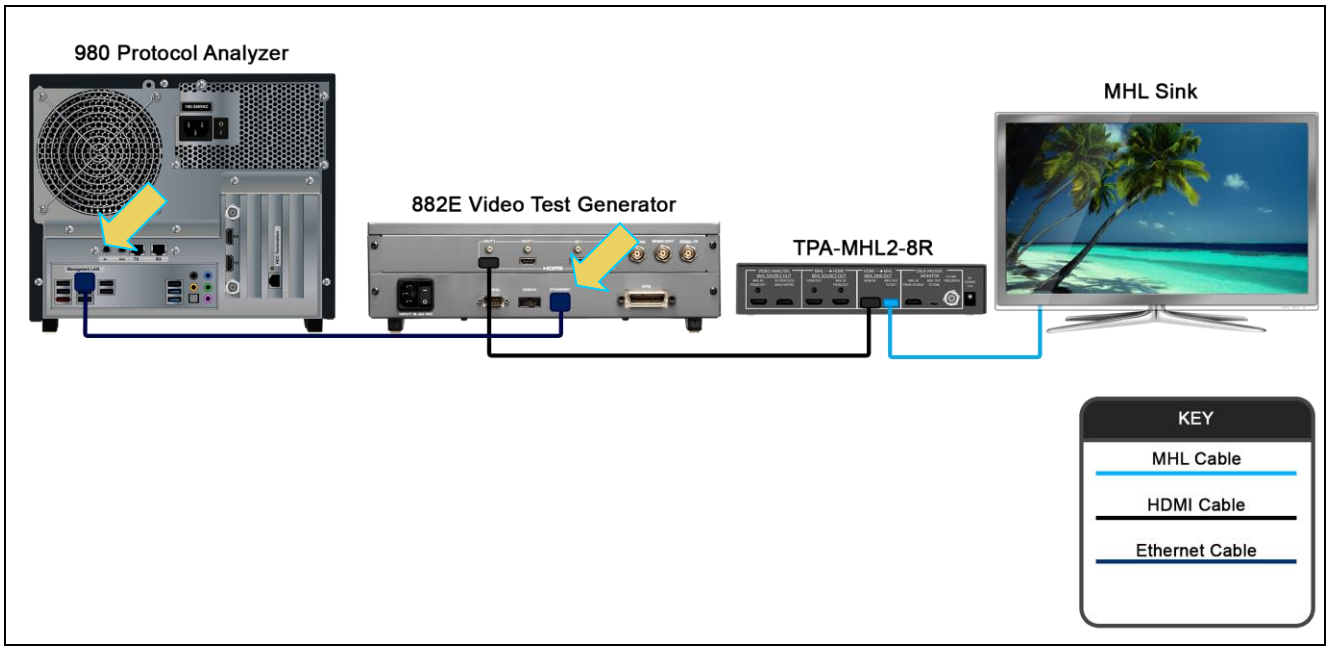
There are three connection scenarios for running and controlling the tests through the 980 GUI Manager application. These scenarios are described below and shown in the set up diagrams that follow:

- Using the embedded 980 GUI Manager running on the 980.
- Using the external 980 GUI Manager with point to point Ethernet configurations between the 980 and the Host PC (where the external 980 GUI Manager resides) and between the 980 and the 882.
- Using the external 980 GUI Manager and connecting from a Host PC to the 980 and 882 through a corporate Ethernet LAN.

To make the physical Ethernet connections when using the embedded GUI Manager:

Use this procedure when you are running the MHL sink compliance test suite through the embedded 980 GUI Manager. This procedure assumes that you have assembled the 882, 980 Protocol Analyzer and sink device under test and applied power to all these devices. Refer to the procedures and diagram below.

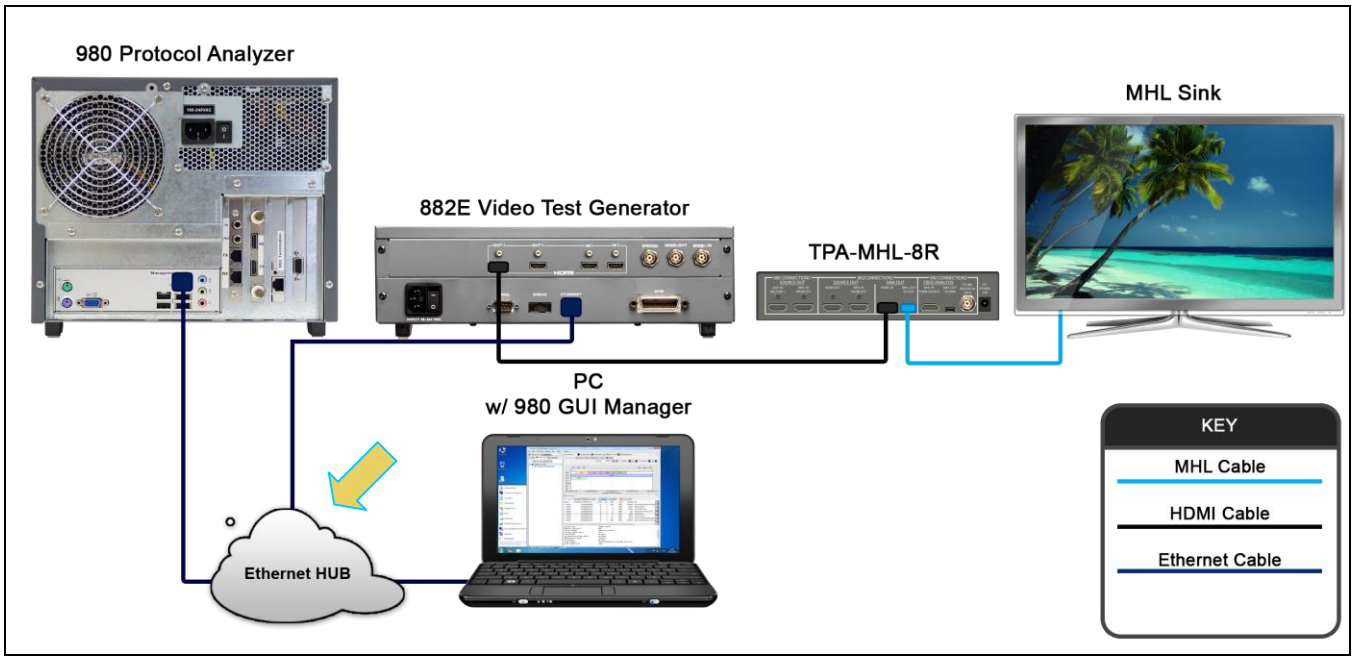
1. Connect an Ethernet cable from the 980 Ethernet jack on the lower left half of the back panel of the 980 Protocol Analyzer frame (refer to the diagram below) to the 882EA Ethernet jack. The IP address on this port can be configured using the procedures at Connection Scenarios for 980 Manager to 980 Protocol Analyzer.



Ethernet connection for MHL sink compliance testing (MHL 1.3/2.0/2.1 example with TPA-MHL2-8R)

To make the physical connections using Ethernet network connections with the external GUI Manager:

This procedure assumes that you have assembled the 882, Host PC, 980 HDMI Protocol Analyzer and sink device under test and applied power to all these devices. Refer to the procedures and diagram below.



Ethernet connection for MHL sink compliance testing (MHL 1.2 example with TPA-MHL-8R)

1. Connect an Ethernet cable from your PC hosting the external 980 GUI Manager to an Ethernet jack on your corporate network or Ethernet hub.
2. Connect an Ethernet cable from the 882 to an Ethernet jack on your corporate network or Ethernet hub.
3. Connect an Ethernet cable from the 980 Ethernet jack on the lower left half of the back panel of the 980/980B frame to an Ethernet jack on your corporate network or Ethernet hub. The IP address on this 980 port is configurable using the procedures at: Setting the IP address of the 980 Protocol Analyzer. Refer to the diagram below.

5.2.1 Setting the IP address of the 980/980B

This procedure describes how to set the IP address of the 980 HDMI Protocol Analyzer module. You can change the 980's IP address through the 980's front panel touch screen display. You can also allow the network DHCP server to assign an IP address. This procedure assumes that you have powered up the 980, have the physical Ethernet connections in place and that the embedded 980 GUI Manager has been launched.

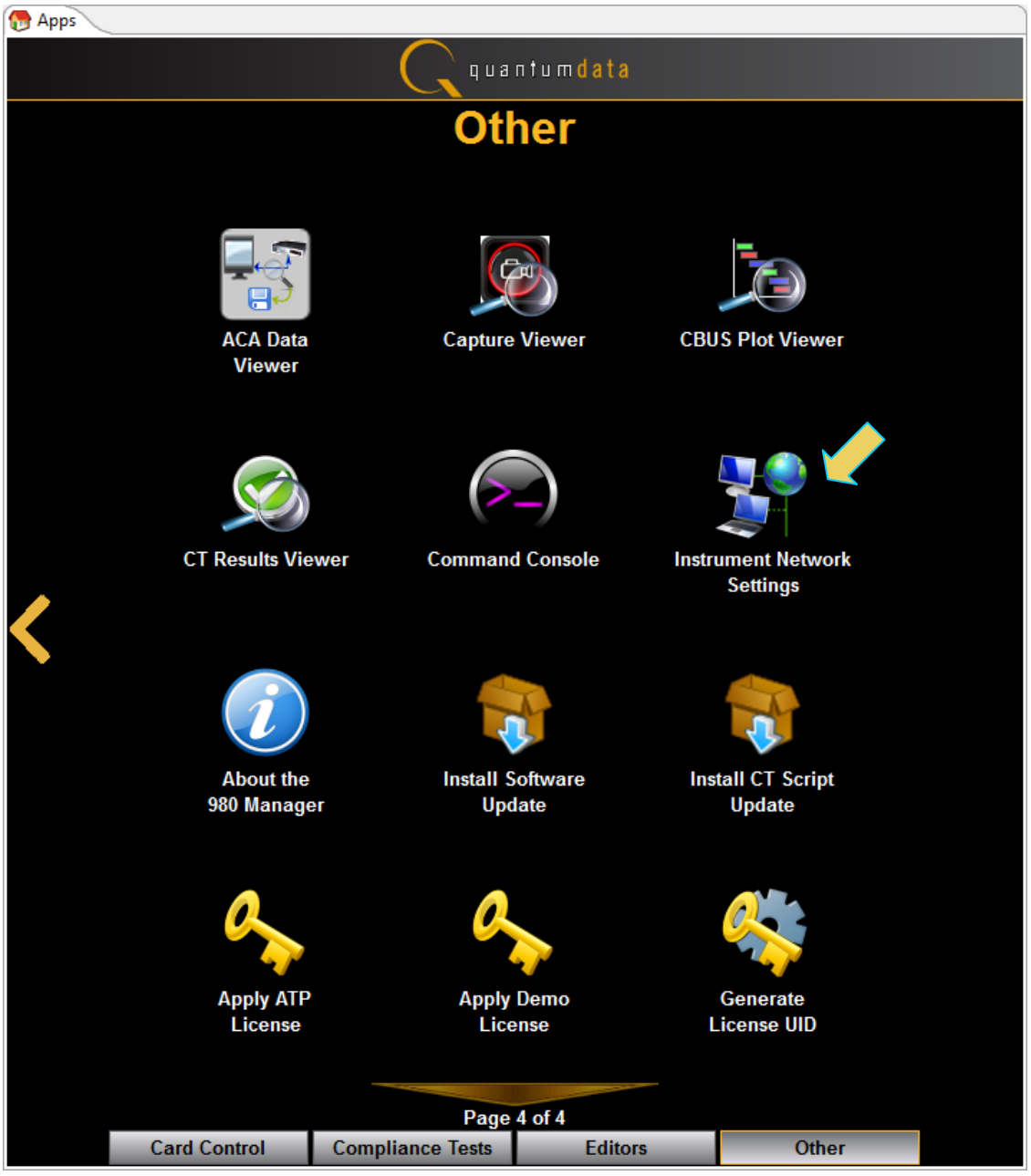
If you are using the external 980 GUI Manager it will be running on your laptop or host PC you will be connecting the 980 GUI Manager to the 980/980B through your corporate LAN network or a local Ethernet hub. You will need to ensure that the IP addresses of the 980 and the network interface card on your host PC and the 882 are compatible. To be compatible, the IP addresses must have the same network portions of their IP address but different host portions. The 980 is provisioned with a default IP address (192.168.1.10). You can either assign an IP address to the 980 directly or allow the network DHCP server to assign one to the 980 that is compatible with your corporate network. The procedures for changing the IP address of the 980 are provided in the following subsection.

If you are using the embedded 980 GUI Manager you will only have to ensure that the IP address of the 980 is compatible with the IP address of the 882. But you can set the IP address of the 882 through the 980 GUI Manager.

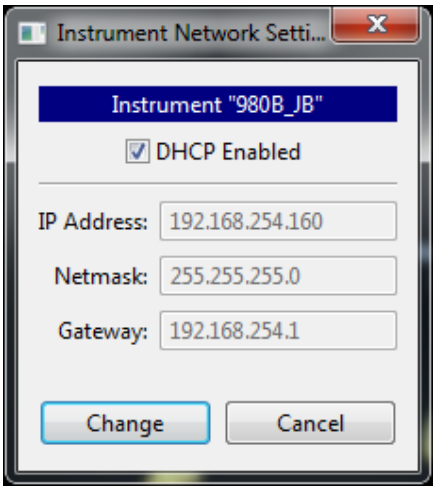
To set the IP address of the 980 through the embedded 980 GUI Manager:

This procedure assumes that you have established a physical Ethernet connection between your PC and the 980. Note that you will have to use the embedded 980 GUI Manager to set the IP address for the initial connection.

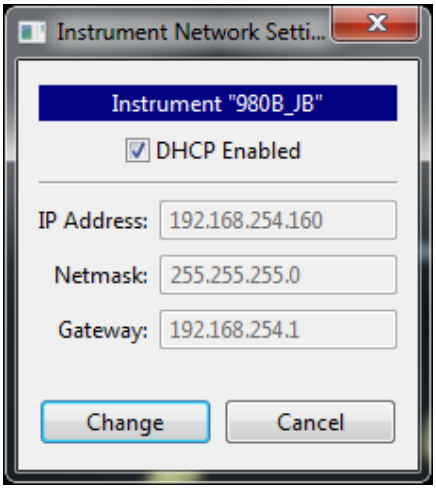
1. Touch select the Instrument Network Settings icon on Page 4 (Other apps) page as shown below.



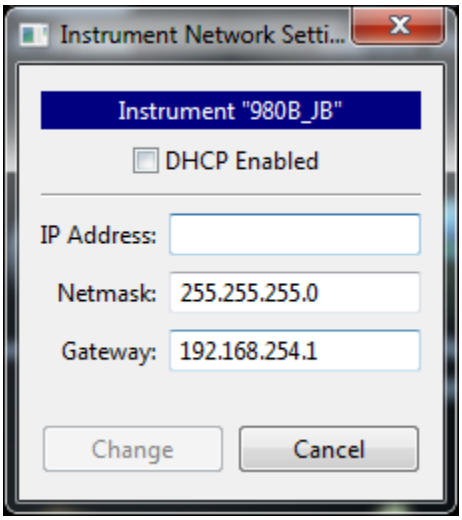
A dialog box will appear showing the current IP address and enabling you to reset the IP address.



2. If the IP address of the 980 is compatible with IP address of your PC and corporate network, no further action is required. If you wish to change the IP address, continue.
3. If you are wish to allow the 980/980B's IP address to be set through DHCP services, select the DHCP Checkbox as shown below.

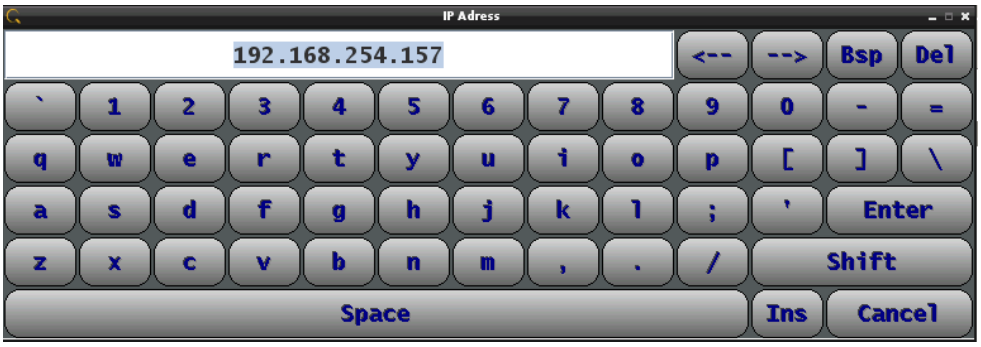


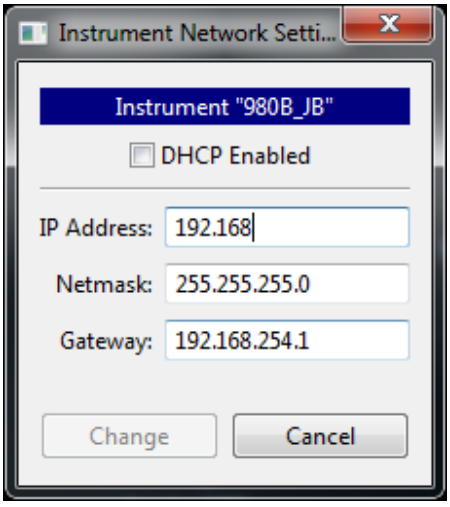
4. Touch select the **Change** activation button to initiate the change. You do not have to reboot the 980 for the IP address change to take effect.
5. Alternatively, if you wish to set the IP address without DHCP, deselect DHCP checkbox (below).



6. Touch select the IP address field to access the on-line keyboard which enables you to change the IP address. Edit the IP address and press the **Enter** key on the on-line keyboard.

   Note: Be sure to use an IP address that is compatible with your corporate LAN as described above.





7. Touch select the **Change** activation button to initiate the change.

   You do not have to reboot the 980 for the IP address change to take effect.

A dialog box will appear indicating that the IP address is being changed and you will be able to view the new IP address on the bottom status strip next to the **Navigator** button. The information provided will tell you if the IP was set through DHCP or if it was set manually "Static."

To set the IP address of the 980 through the command line

1. Open up a DOS window on your PC.

   Note: This procedure requires a telnet session. Use standards Windows OS utilities or third party utilities.

2. Establish a telnet session to the 980 using the default IP address as follows:

   `telnet 192.168.1.10`

   You will be prompted with the `Pscope login`: prompt. Enter the following for a user name and password:

   `Pscope login: qd`

   `Password: qd`

   When the `p-scope` prompt appears, you will need to execute a command to change its IP address using the following command:

   `Setip <IP_address> <subnet mask> <gateway>`

   Note: You will have to include the subnet mask and gateway address as arguments.

   The following is an example:

   `p-scope> setip 192.168.254.100 255.255.255.0 192.168.254.1`

   `If you wish to use DHCP to set the IP address, use the following command:`

```
p-scope> setip dhcp
```

Reboot the 980 by pressing the power button on the lower middle part of the front panel bezel. When the 980 initializes, you will be able to view the new IP address on the bottom status strip next to the **Navigator** button.

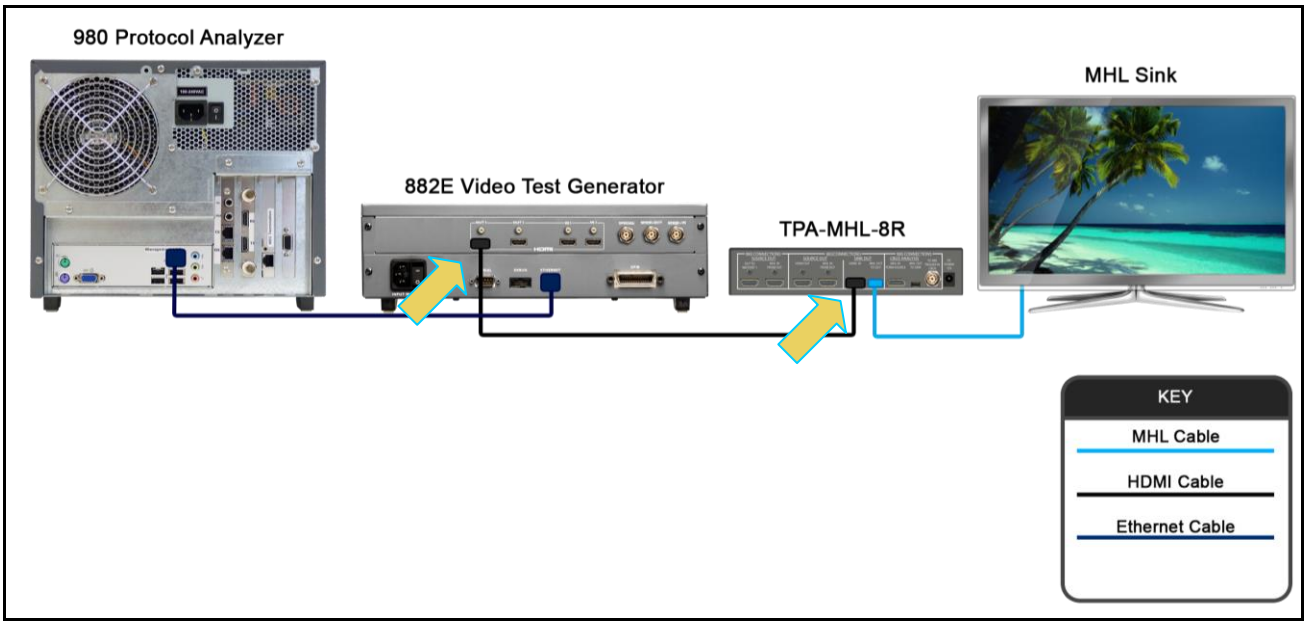
5.3 Making the physical connections for the MHL Sink Device Under Test

This subsection describes the physical connections required to run the MHL sink compliance tests. The 980 HDMI Protocol Analyzer and the 980 GUI Manager serve only as a controller for running the MHL Sink Compliance Tests. The tests are executed by the 882E/EA (except where noted).

You will use one of the Quantum Data Test Point Adapters (TPAs) between the MHL sink device under test and the 882 for these tests. There are two TPAs: 1) for MHL CTS 1.2 testing you will use the TPA-MHL-8R Test Point Adapter; 2) for MHL CTS 1.3, 2.0 and 2.1 testing you will use the TPA-MHL2-8R Test Point Adapter. The tests are executed by the 882.

Making the physical HDMI and MHL connections for MHL 1.2 CTS testing

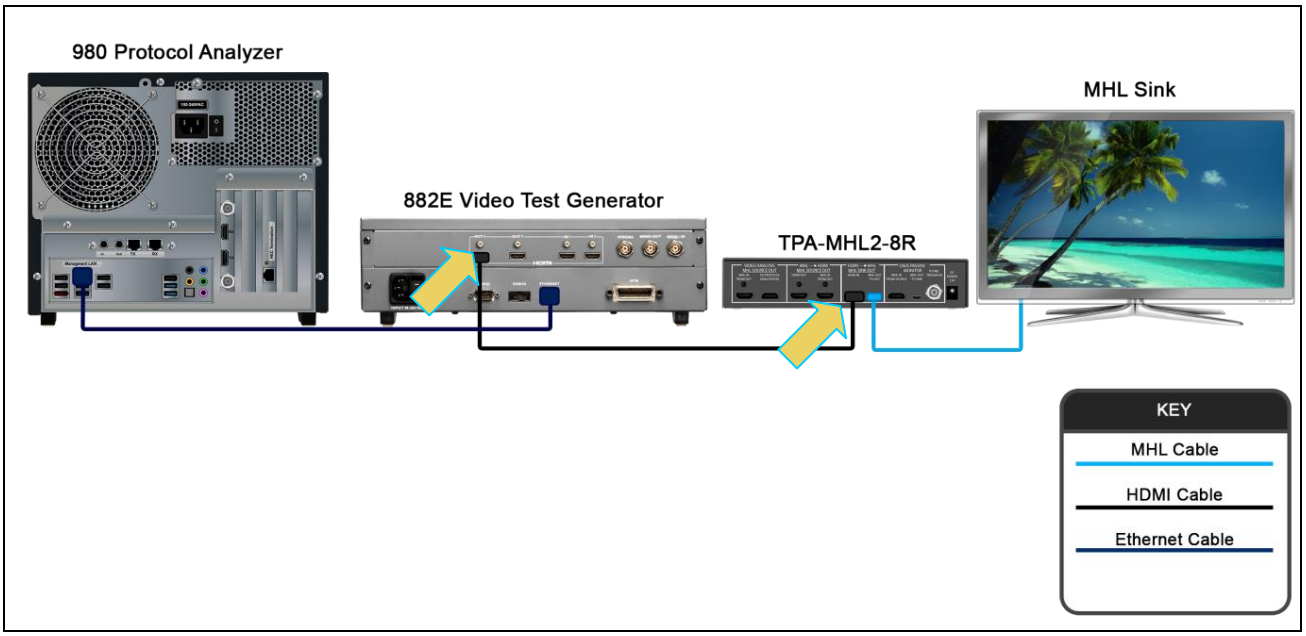
1. Connect an HDMI cable from the Quantum Data 882 HDMI Out 1 port to the TPA-MHL-8R Test Point Adapter. Use the **HDMI IN** connector on the section on the TPA labeled **882 CONNECTIONS – SINK DUT**.
2. Connect the TPA-MHL-8R Test Point Adapter to the MHL sink device under test. Use the **MHL OUT TO DUT** connector on the section on the TPA labeled **882 CONNECTIONS – SINK DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.



Connection for MHL 1.2 sink compliance testing

Making the physical HDMI and MHL connections for MHL 1.3, 2.0, 2.1 CTS testing

1. Connect an HDMI cable from the Quantum Data 882 HDMI Out 1 port to the TPA-MHL2-8R Test Point Adapter. Use the **HDMI IN** connector on the section on the TPA labeled **HDMI → MHL – MHL SINK DUT**.
2. Connect the TPA-MHL2-8R Test Point Adapter to the MHL sink device under test. Use the **MHL OUT TO DUT** connector on the section on the TPA labeled **HDMI → MHL – MHL SINK DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.



Connection for MHL 1.2, 2.0, 2.1 sink compliance testing

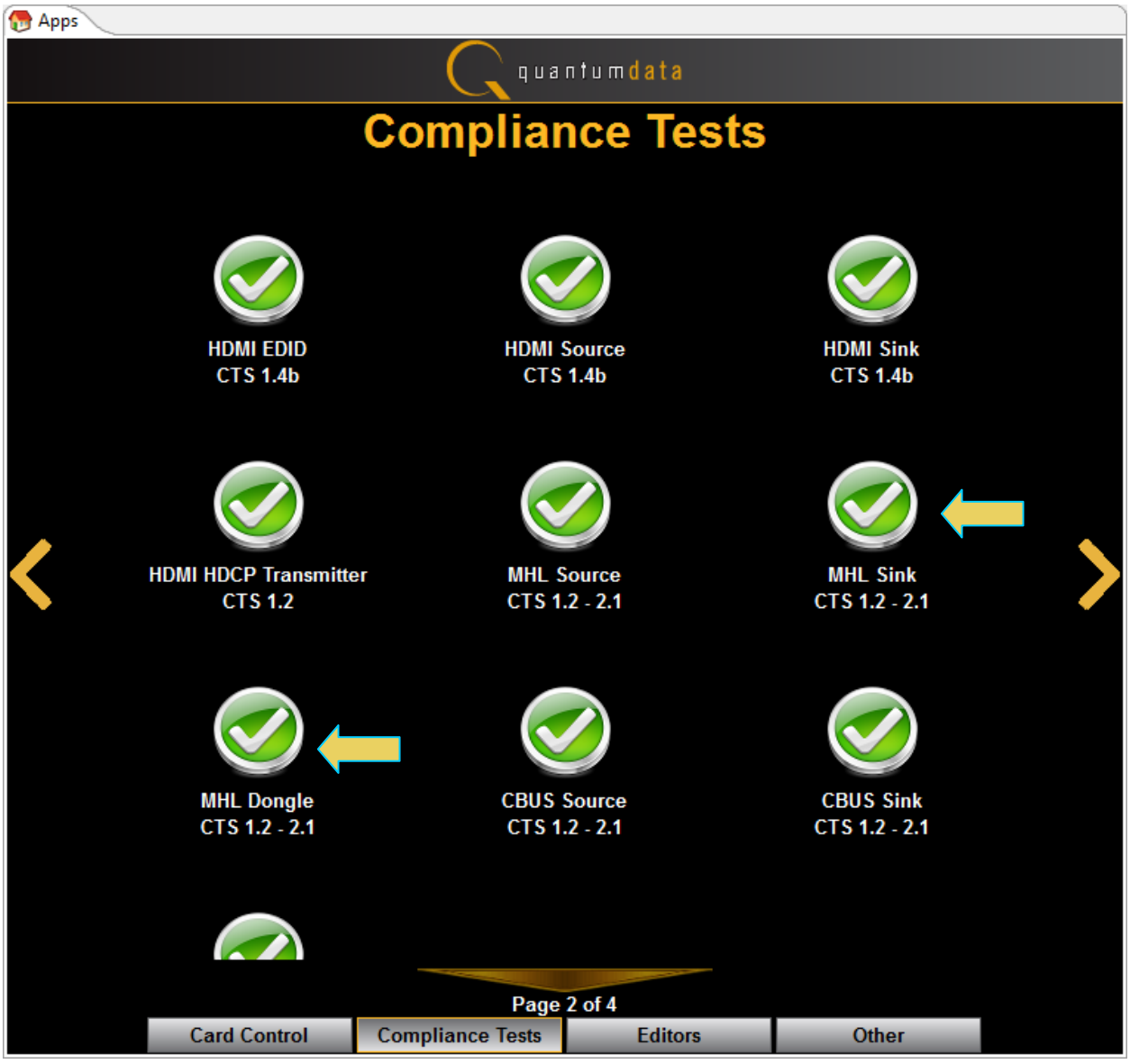
5.4 Completing the CDF

Use the following procedures to complete the CDF for your MHL sink device under test.

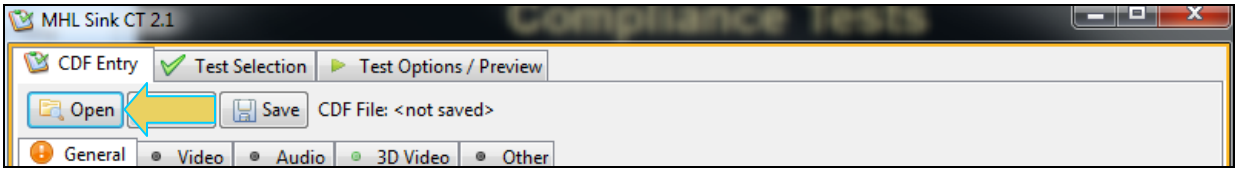
Note: The examples used in this workflow are MHL 2.0 except where noted. The MHL 1.2 workflow is similar.

To complete the CDF:

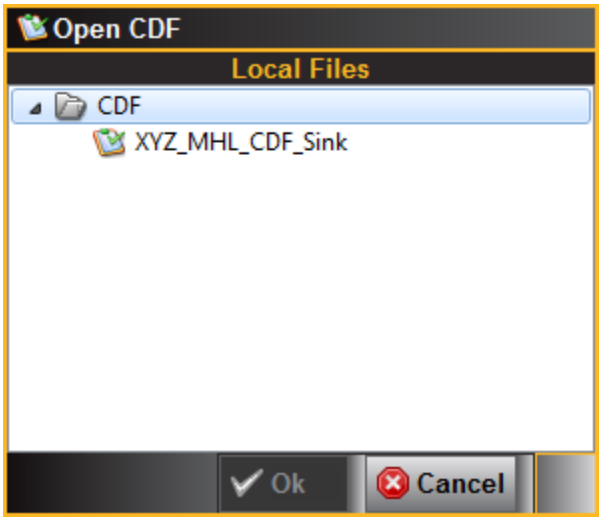
1. From the **View** menu, enable viewing of the **MHL Sink Compliance Test** panel.



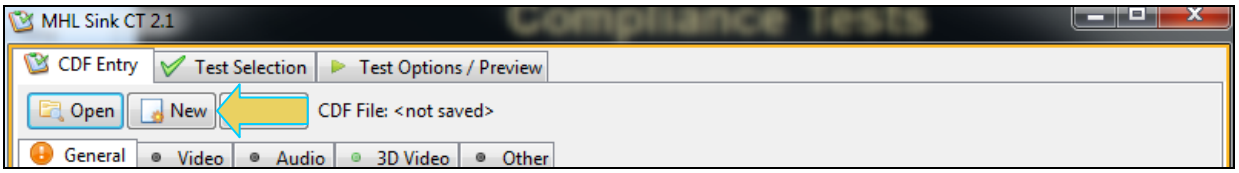
2. To open an existing CDF, click on the **Open** activation button.



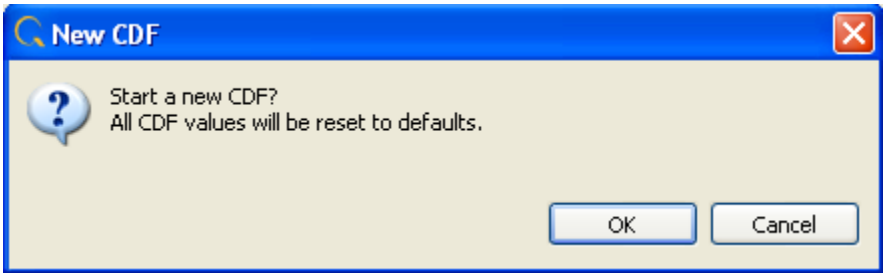
You will be prompted with a dialog box that enables you to open a CDF. Select a CDF and then **OK** to proceed.



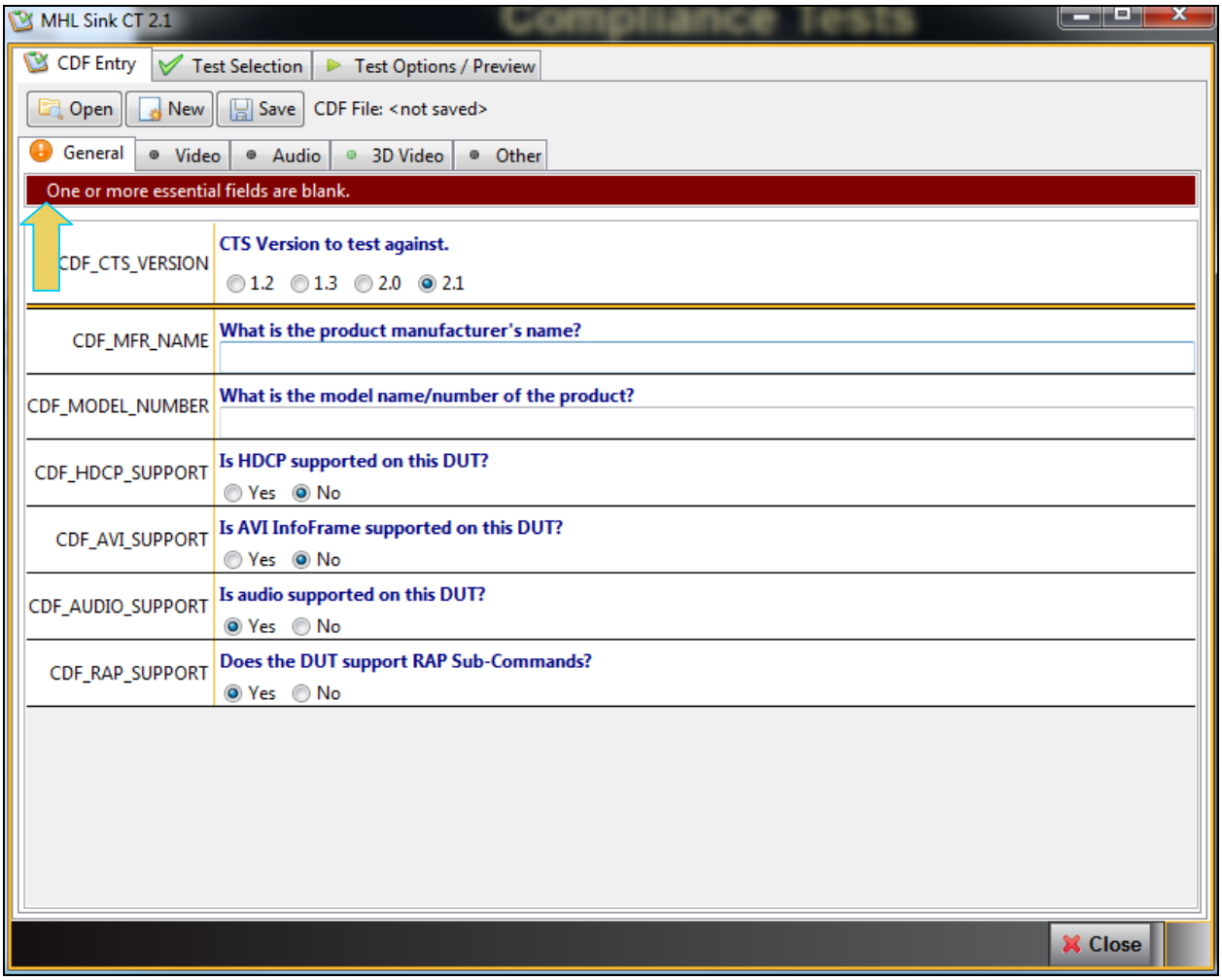
3. To create a new CDF, click on the **New** activation button.



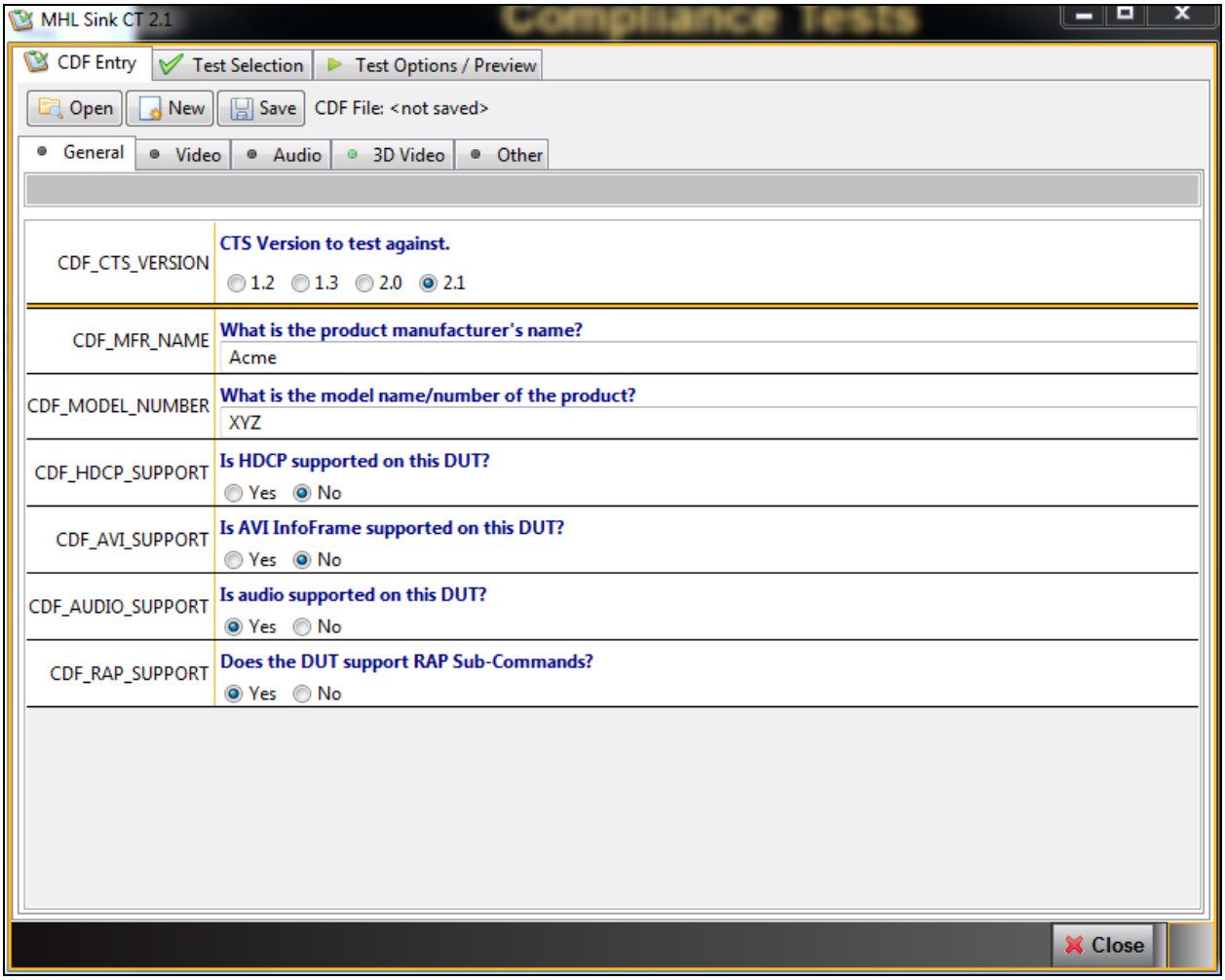
You will be prompted with a confirmation that you want to start a new CDF and reset the values. Click **OK** to proceed.



4. Select the **CDF Entry** panel as shown below. Note that a status message and an exclamation point will appear indicating that not all required fields have been completed.

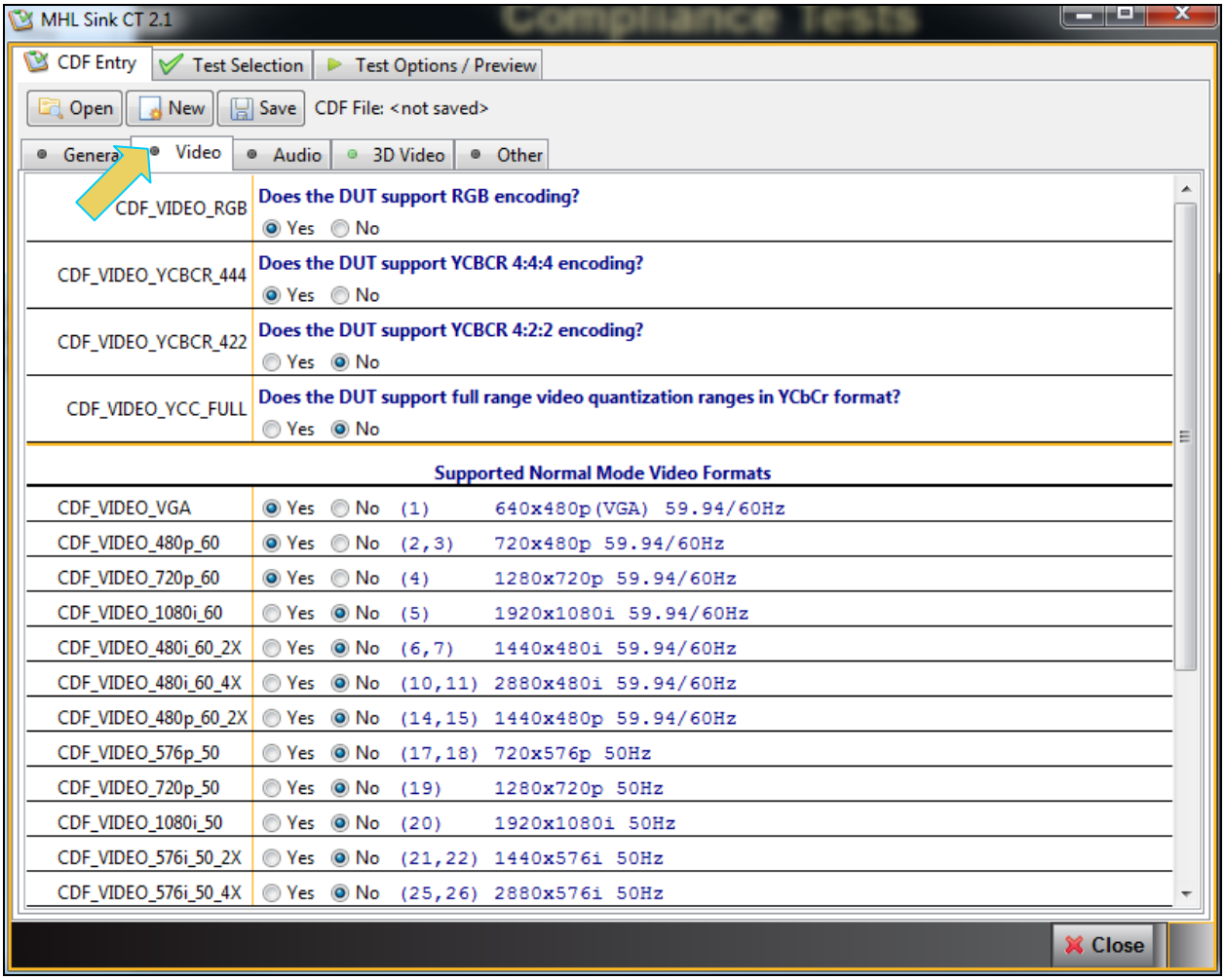

MHL Sink CT 2.1
CDF Entry
Test Selection
Test Options / Preview
Open
New
Save
CDF File: <not saved>
General
Video
Audio
3D Video
Other
One or more essential fields are blank.
CDF_CTS_VERSION
CTS Version to test against.
1.2 1.3 2.0 2.1
CDF_MFR_NAME
What is the product manufacturer's name?
CDF_MODEL_NUMBER
What is the model name/number of the product?
CDF_HDCP_SUPPORT
Is HDCP supported on this DUT?
Yes No
CDF_AVI_SUPPORT
Is AVI InfoFrame supported on this DUT?
Yes No
CDF_AUDIO_SUPPORT
Is audio supported on this DUT?
Yes No
CDF_RAP_SUPPORT
Does the DUT support RAP Sub-Commands?
Yes No
Close

Once you have entered in all the required fields the error indication disappears as shown below:

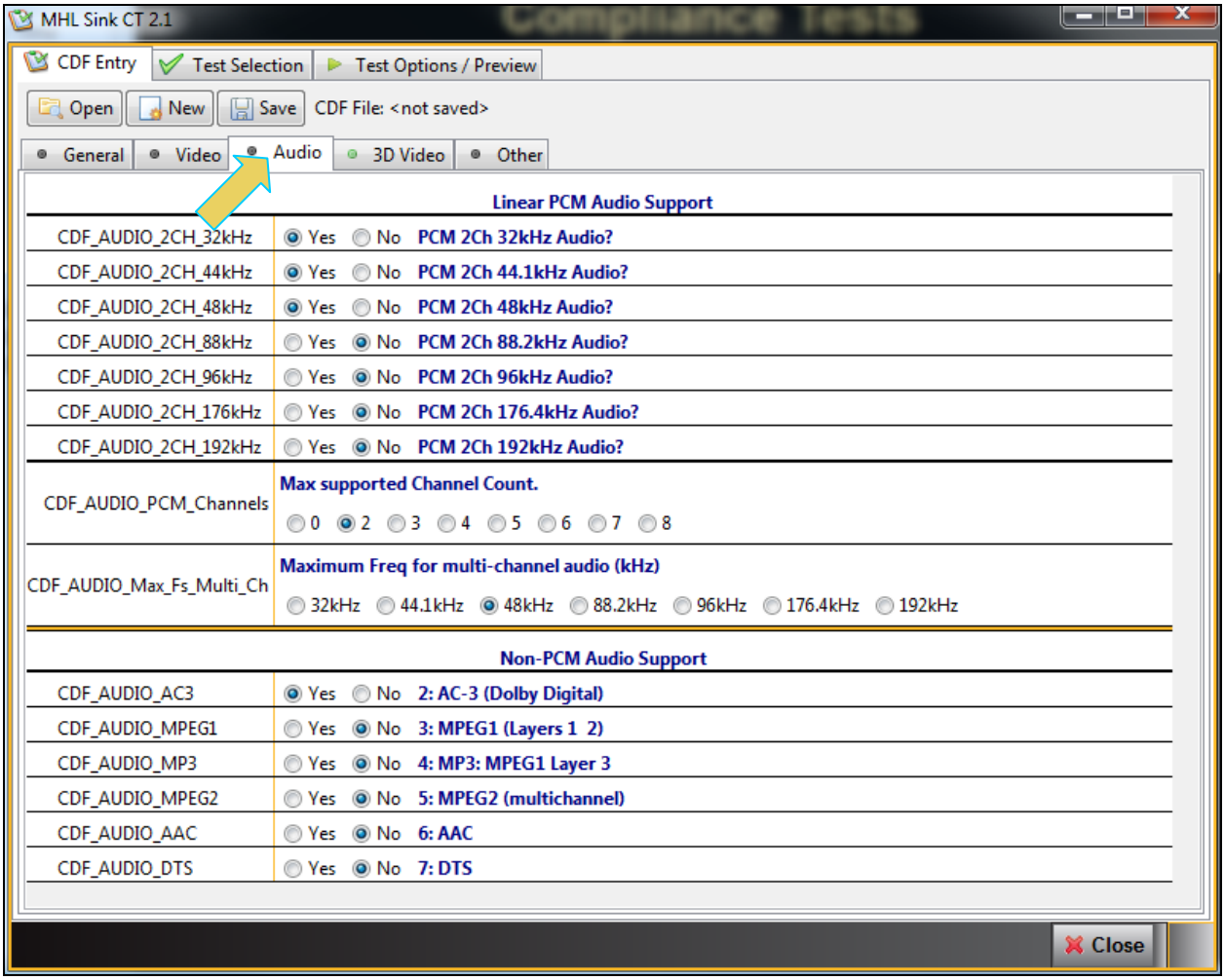


5. Complete the items in the **General** tab of the **CDF Entry** panel shown above.

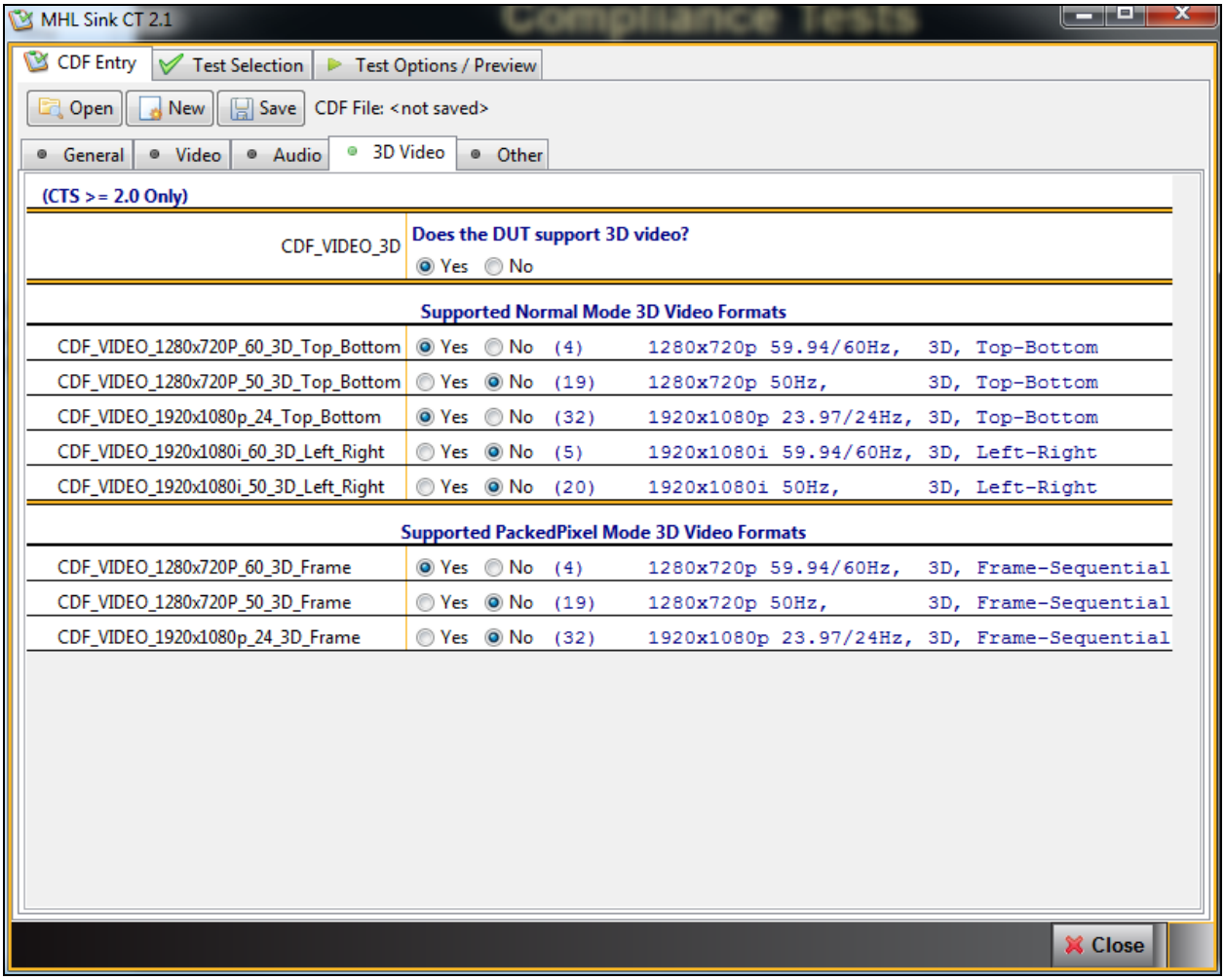
6. Complete the items in the **Video** tab.



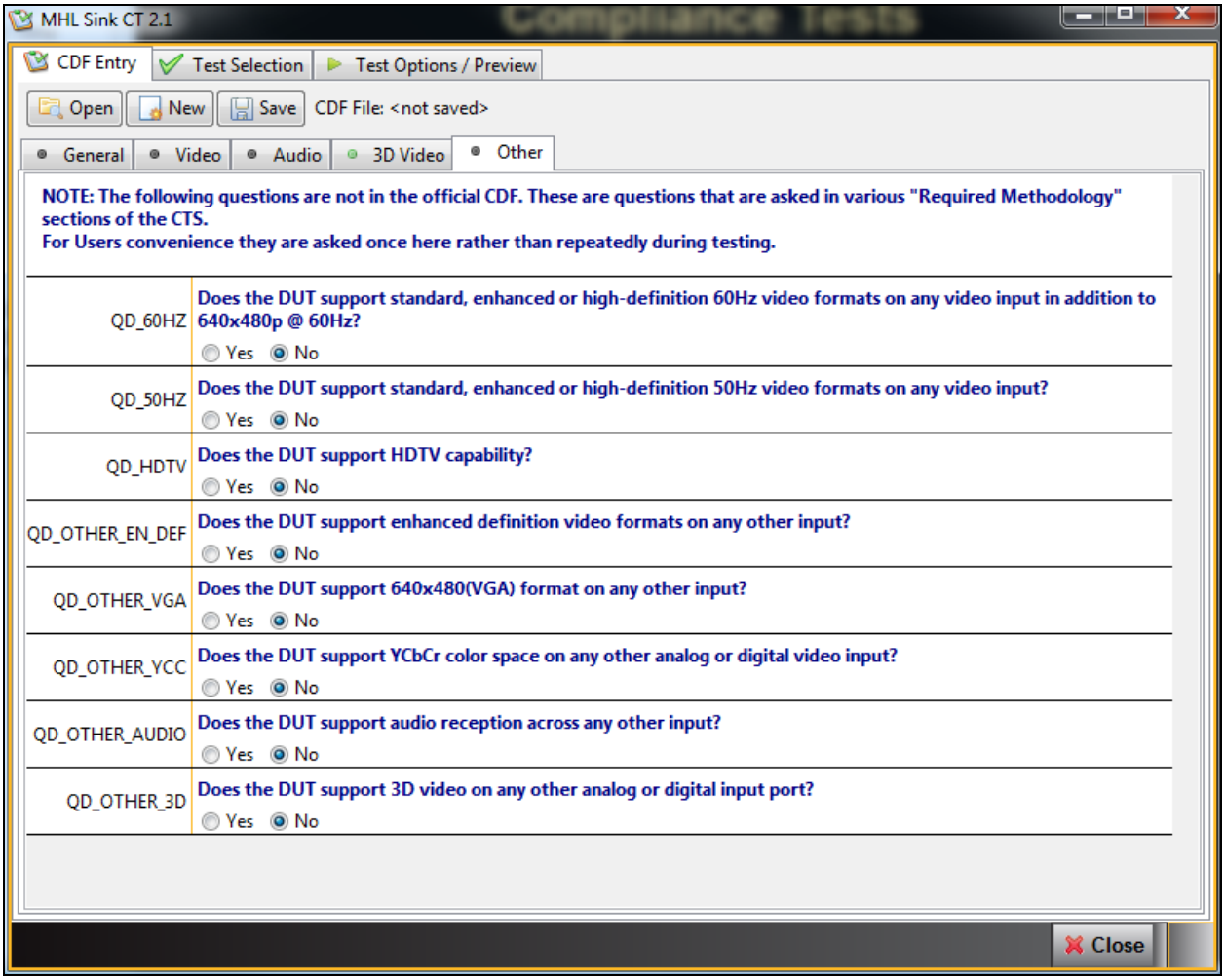
7. Complete the items in the **Audio** tab.



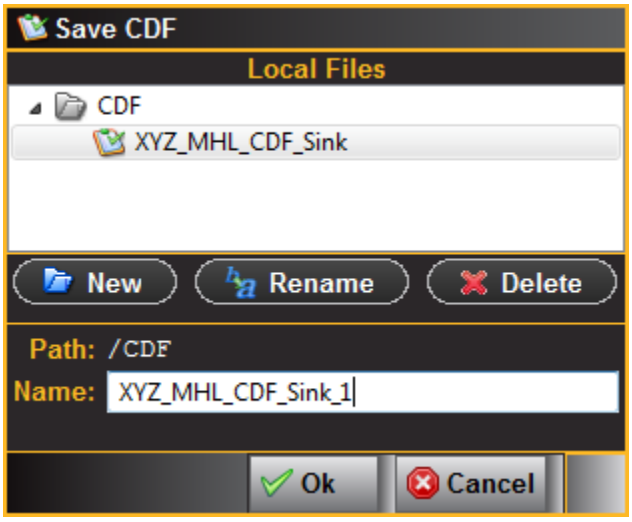
8. Complete the items in the **3D Video** tab.



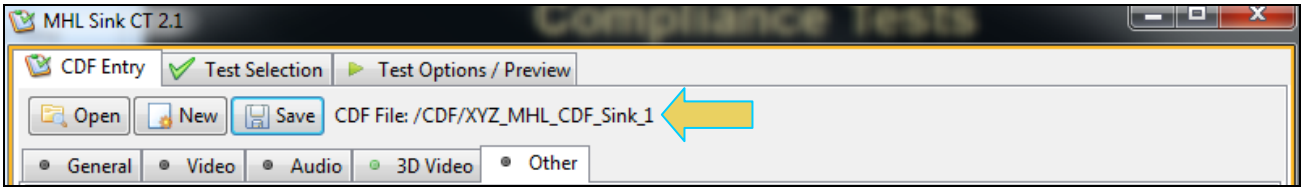
9. Complete the items in the **Other** tab.



10. Save the CDF. A confirmation box with a default name will appear as shown below. Edit the name if necessary and click OK.



When you save the CDF the name will appear next to the **Save** button as shown below.

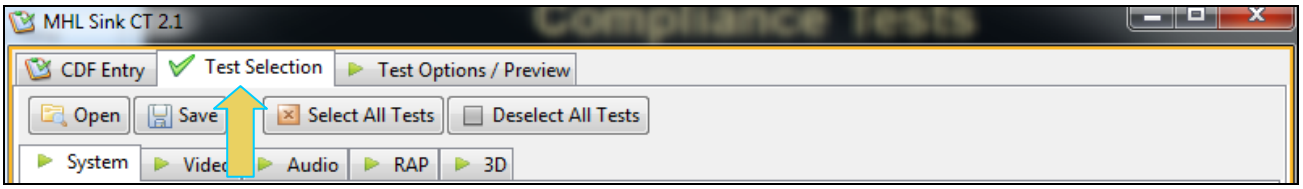


5.5 Selecting which tests to run

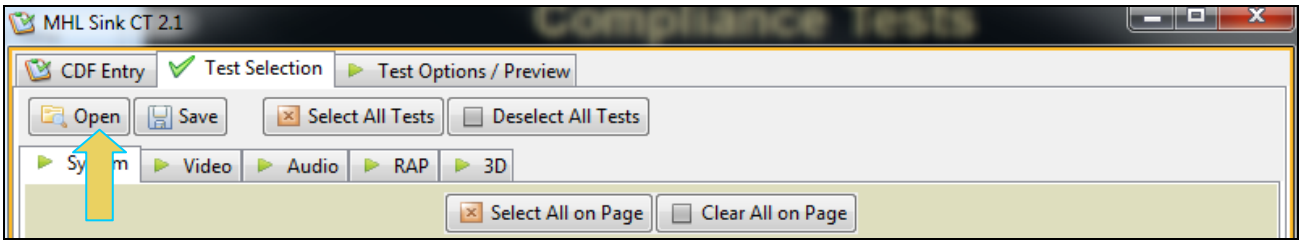
Use the following procedures to select the tests to run. There are multiple tabs which correspond to each section in the CTS.

To select the tests to run:

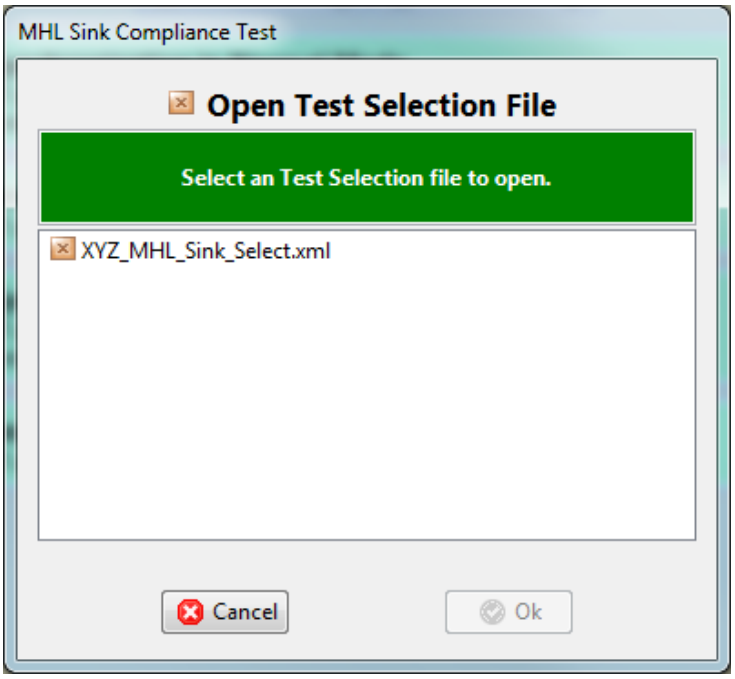
1. Select the **Test Selection** panel as shown below.



2. If you have an existing **Test Selection** option file saved you can recall that for use in your testing. Simply click on the **Open** activation button.

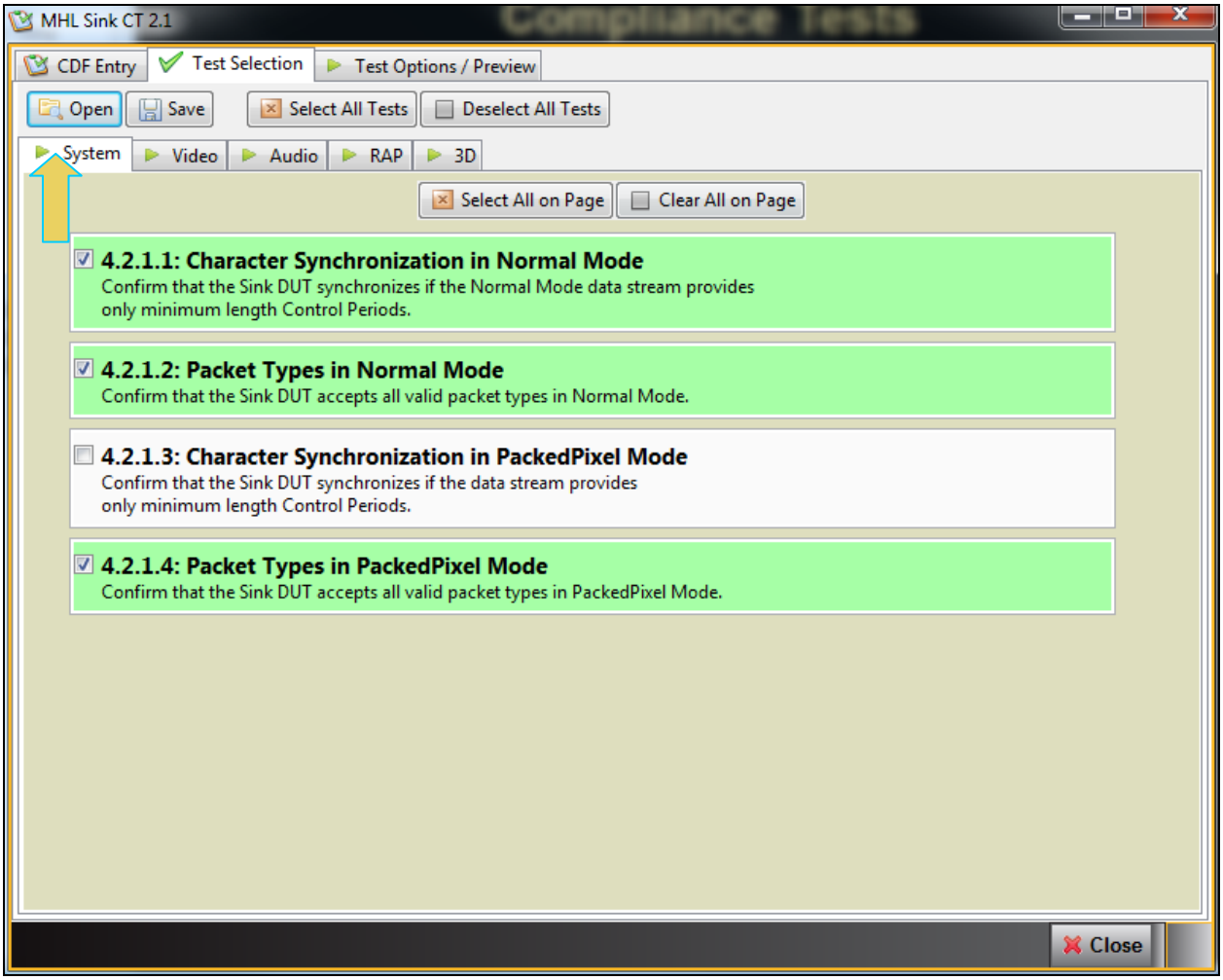


A dialog box will appear as follows. Simply select the file and click on the **OK** activation button.


MHL Sink Compliance Test
Open Test Selection File
Select an Test Selection file to open.
XYZ_MHL_Sink_Select.xml
Cancel
Ok

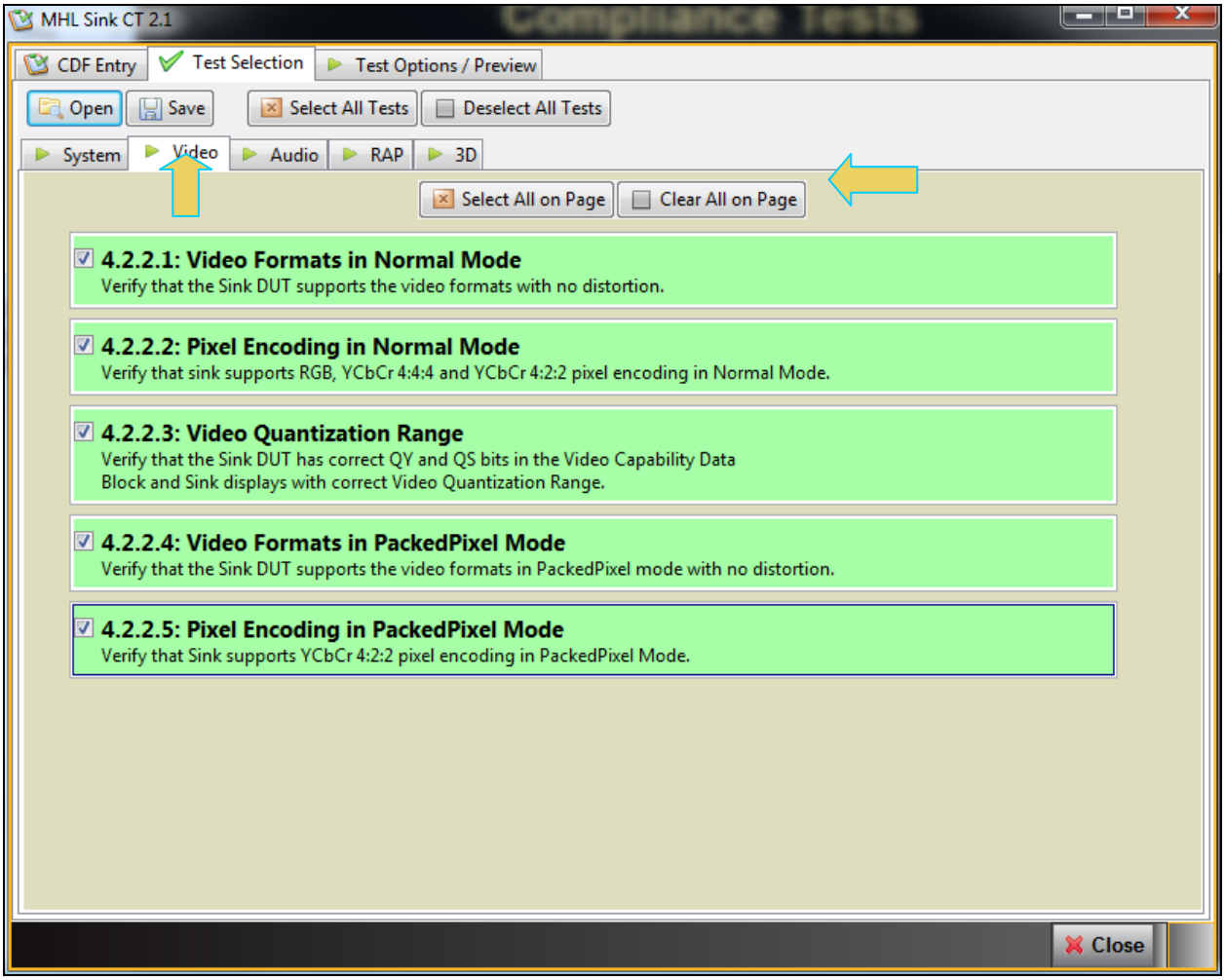
3. Complete the items in the **System** tab of the **Test Selection** panel shown below.

   Note: The Character Sync tests require a direction connection from the 980 to the sink device under test. The 882E is not used. The 980 GUI Manager will instruct you to change the connection.

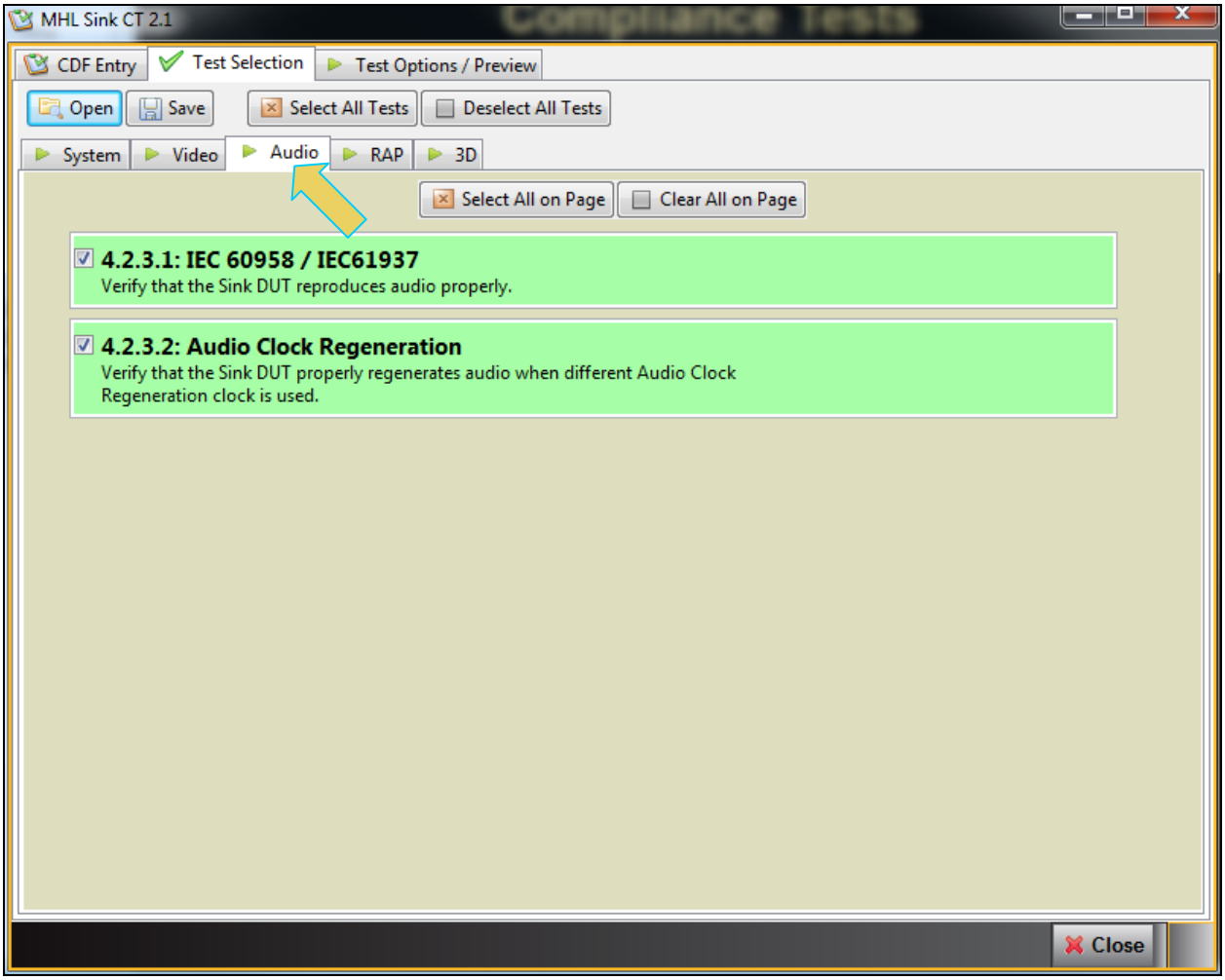


4. Complete the items in the **Video** tab of the **Test Selection** panel shown below.

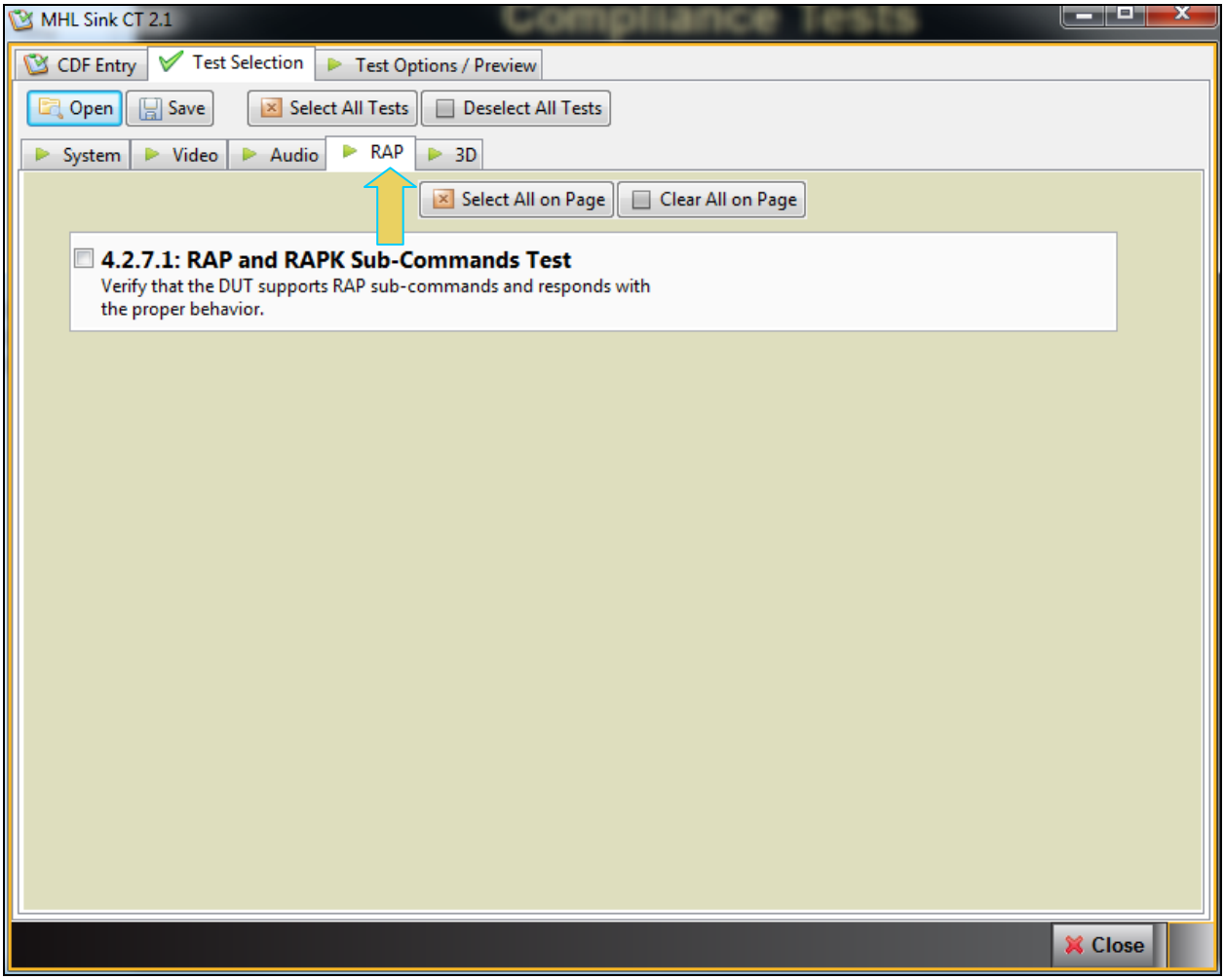
   For convenience you can **Select All** or **Deselect All** tests using the activation buttons provided.



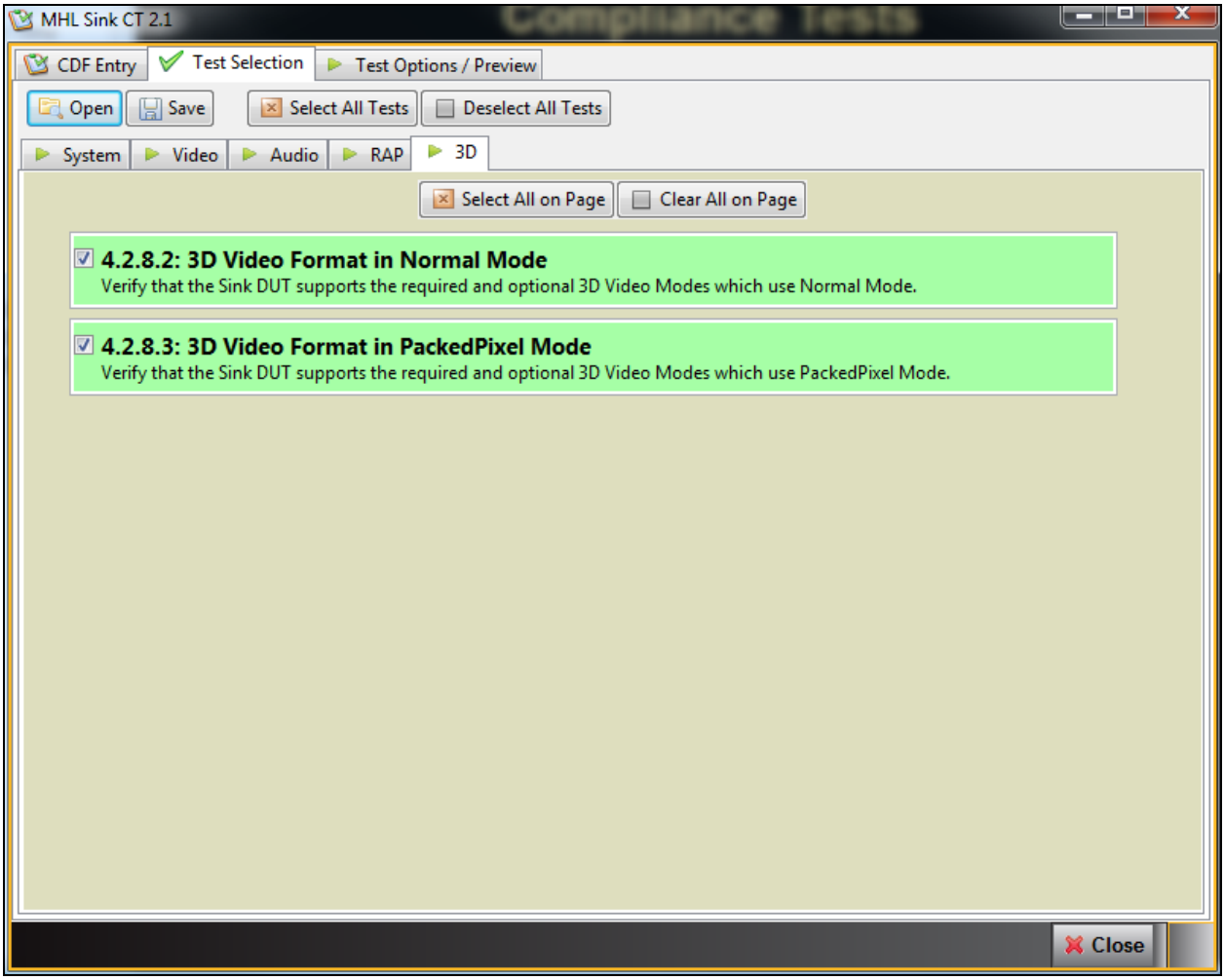
5. Complete the items in the **Audio** tab of the **Test Selection** panel shown below.



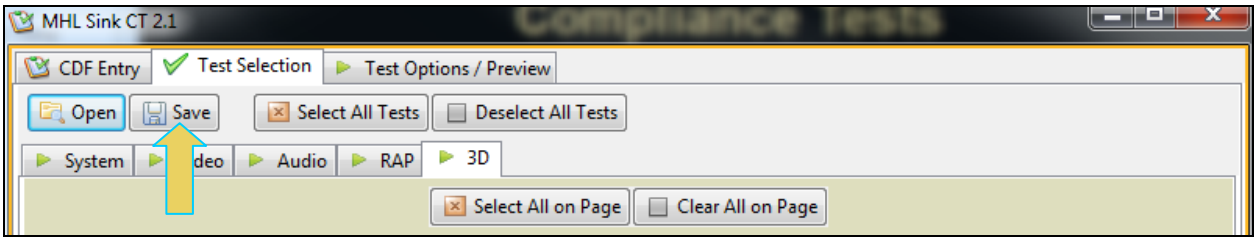
6. Complete the items in the **RAP** tab of the **Test Selection** panel shown below.



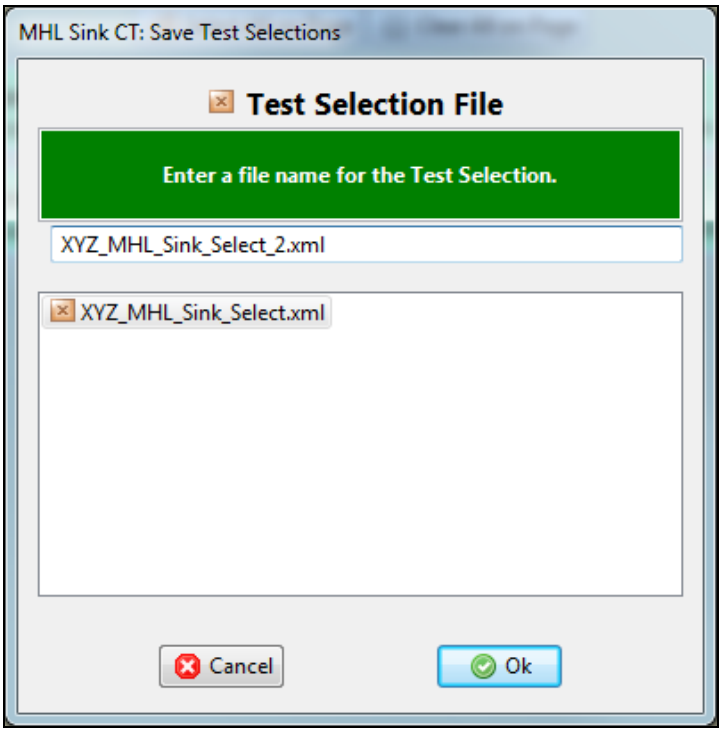
7. Complete the items in the **3D** tab of the **Test Selection** panel shown below.



8. You can save the Test Selection options using the **Save** activation button.



A dialog box will appear as follows. Simply assign a name and click on the **OK** activation button. Click **Cancel** to exit.


MHL Sink CT: Save Test Selections
Test Selection File
Enter a file name for the Test Selection.
XYZ_MHL_Sink_Select_2.xml
XYZ_MHL_Sink_Select.xml
Cancel
Ok

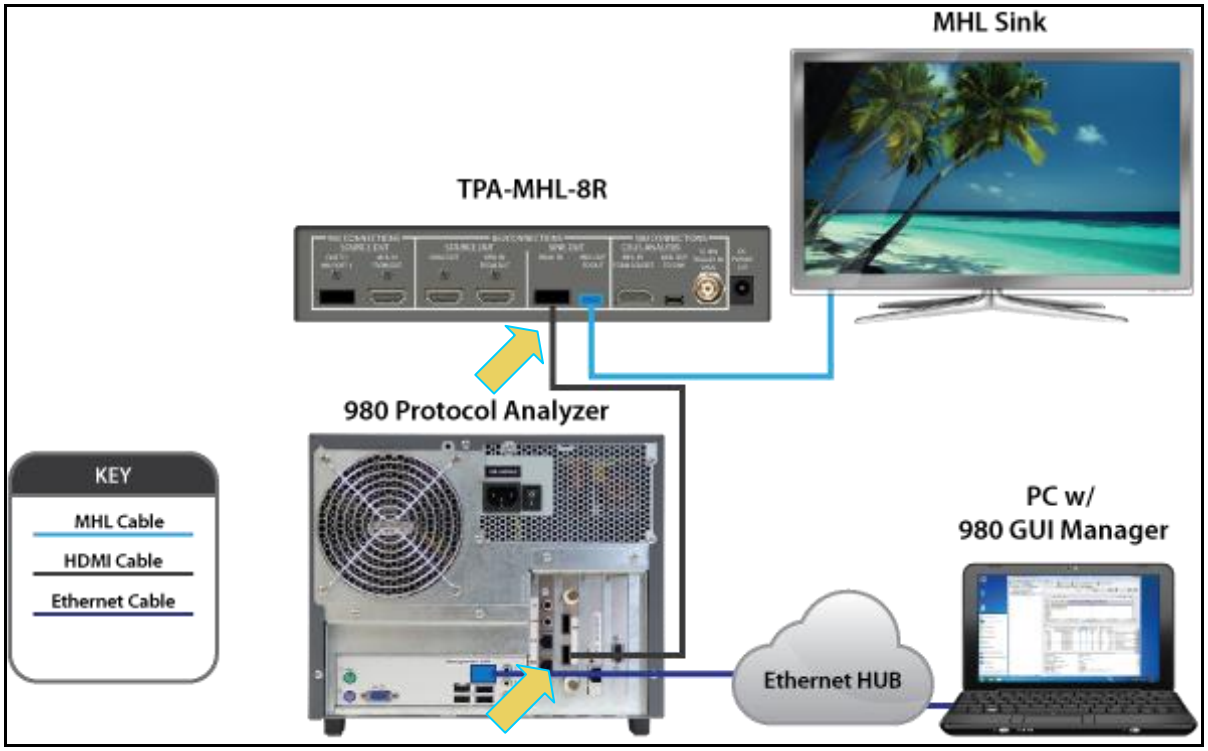
5.6 Executing the MHL Sink Compliance Tests

Use the following procedures to initiate the execution of an MHL Sink Compliance test series. The 980 HDMI Protocol Analyzer and the 980 GUI Manager serve only as a controller for running the MHL Sink Compliance Tests. The tests are executed by the 882E/EA except for the Character Synchronization Test discussed immediately below.

5.6.1 Character Synchronization and 3D Formats Test

The Character Synchronization and 3D Format tests are run directly from the 980 (not through the 882). The following diagram is a depiction of the test setup for the Character Synchronization and 3D Format tests. The first diagram shows the MHL 1.2 test setup with the TPA-MHL-8R. The second diagram shows the MHL 1.3, 2.0, 2.1 test setup with the TPA-MHL2-8R.

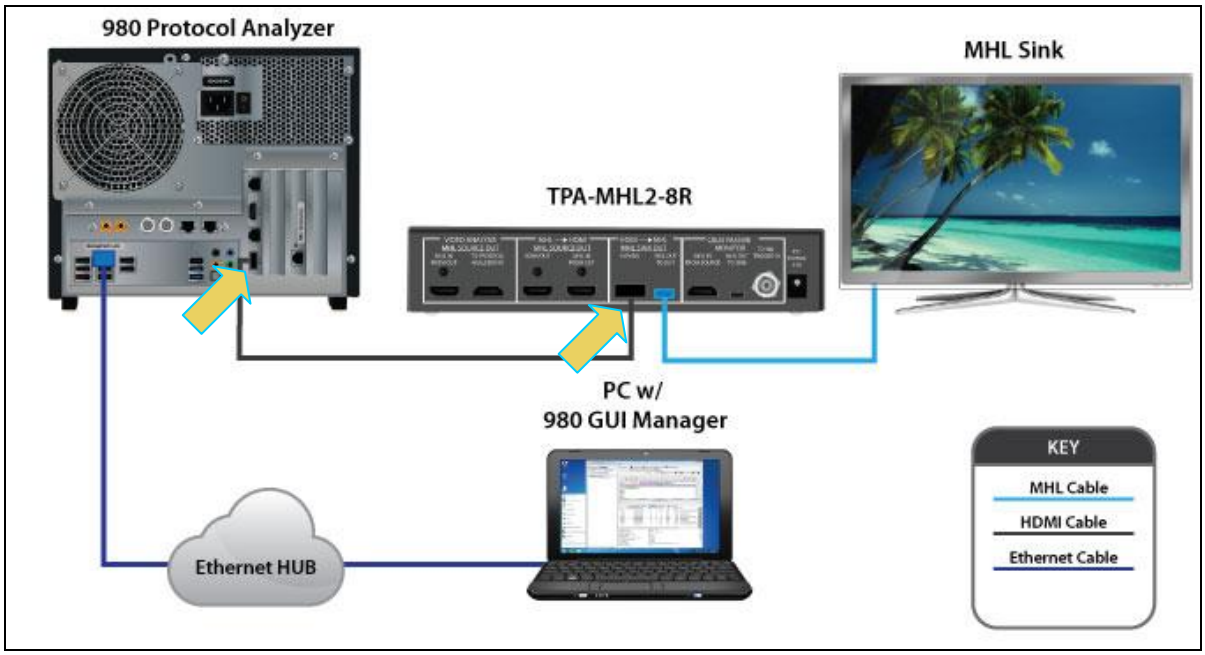
To make the connections for the MHL Character Synchronization/3D Format Tests for MHL 1.2 CTS:



Connection for MHL 1.2 Character Synchronization/3D Format Compliance Tests

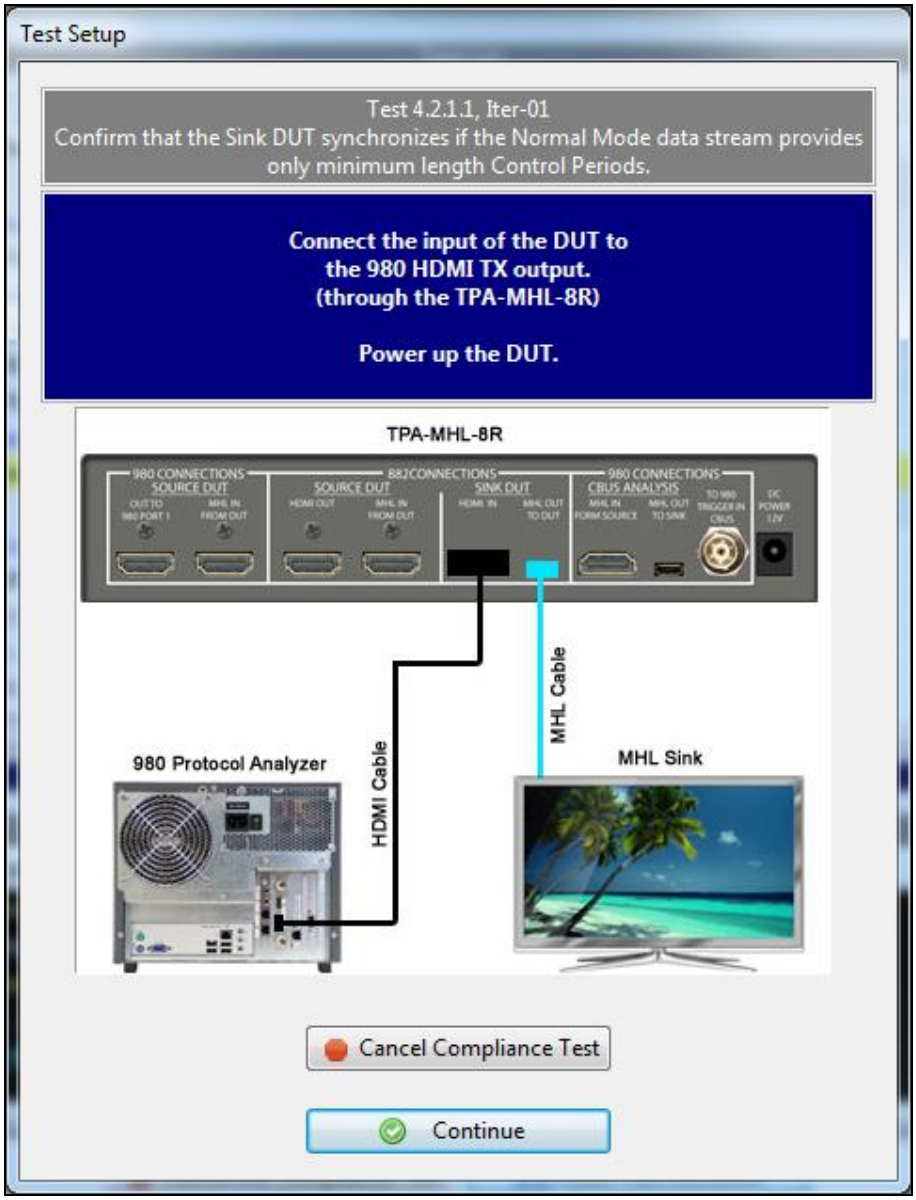
1. Connect an HDMI cable from the Quantum Data 980 Tx port to the TPA-MHL-8R Test Point Adapter. Use the **HDMI IN** connector on the section on the TPA labeled **882 CONNECTIONS – SINK DUT**. Refer to the illustration below for the 980 Tx port.
2. Connect the TPA-MHL-8R Test Point Adapter to the MHL sink device under test. Use the **MHL OUT TO DUT** connector on the section on the TPA labeled **882 CONNECTIONS – SINK DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.

To make the connections for the MHL Character Synchronization/3D Format Tests for MHL 1.3, 2.0, 2.1 CTS:



Connection for MHL 1.3, 2.0, 2.1 Character Synchronization/3D Format Compliance Tests

When the 980 GUI Manager controller is ready to run the Character Synchronization 4.2.1.1/3 and 3D Format 4.2.8.2/3 tests during the test execution, it will instruct you to reconfigure the test setup such that the 980 Tx port is directly connected to the MHL sink device under test. The following dialog box is presented.

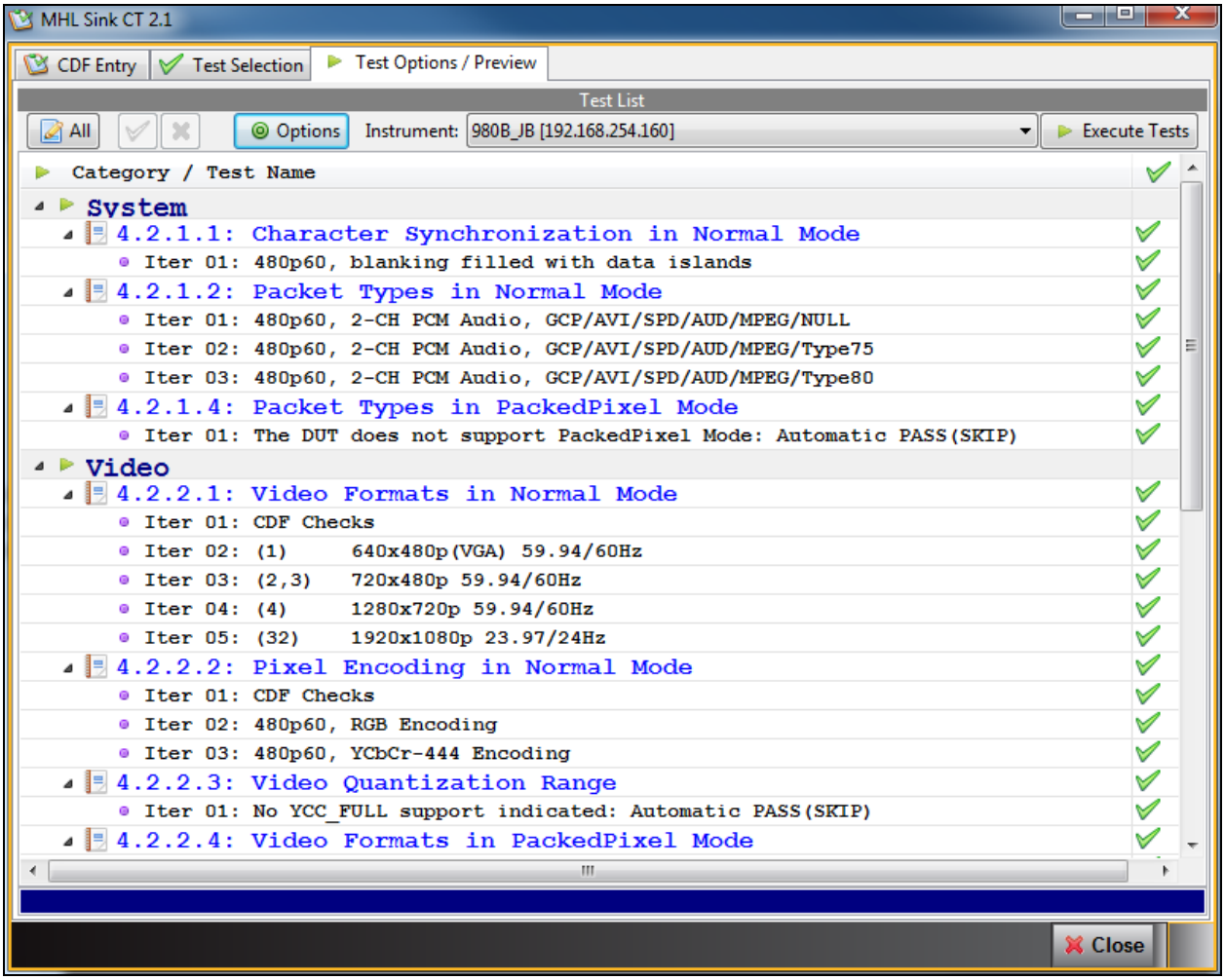


1. Connect an HDMI cable from the Quantum Data 980 Tx port to the TPA-MHL2-8R Test Point Adapter. Use the HDMI IN connector on the section on the TPA labeled **HDMI → MHL - MHL SINK DUT**. Refer to the illustration below for the 980 Tx port.
2. Connect the TPA-MHL2-8R Test Point Adapter to the MHL sink device under test. Use the **MHL OUT TO DUT** connector on the section on the TPA labeled **HDMI → MHL - MHL SINK DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.

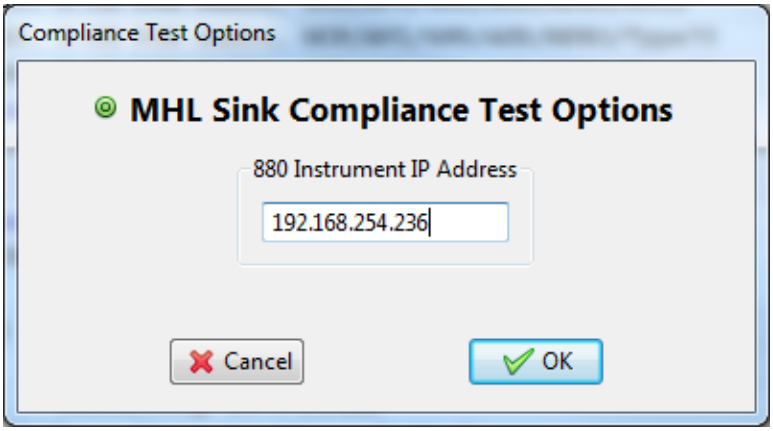
   When the Character Synchronization and 3D Format tests are complete, you will be instructed to re-connect the 882 with a dialog box (below).

To initiate a test series:

1. Select the **Test Options / Preview** panel as shown below.



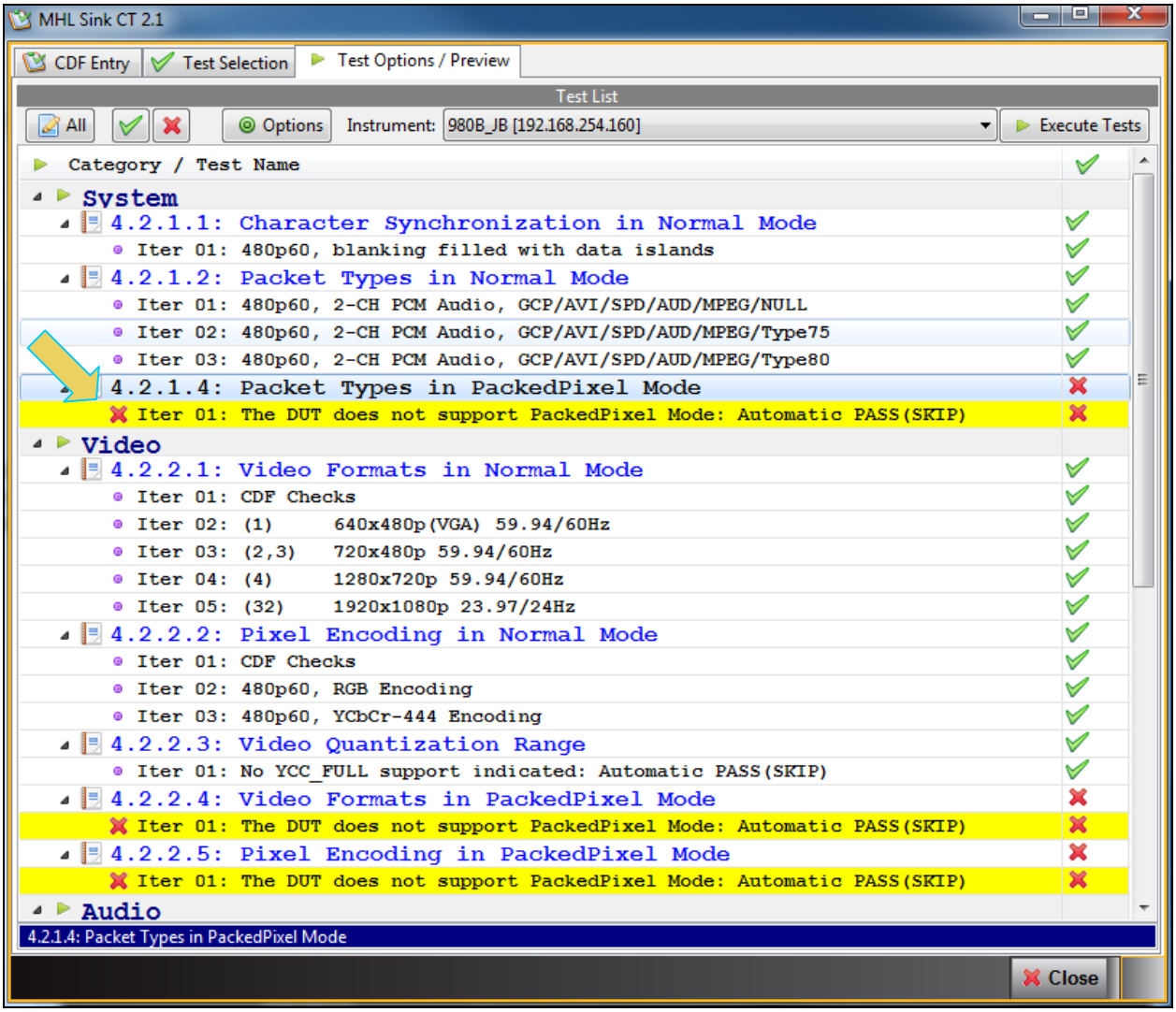
2. Set the **Options** for the tests. The following dialog box below appears. Note that you will have to specify the IP address of the 882 that you are using to initiate these tests in this dialog box.



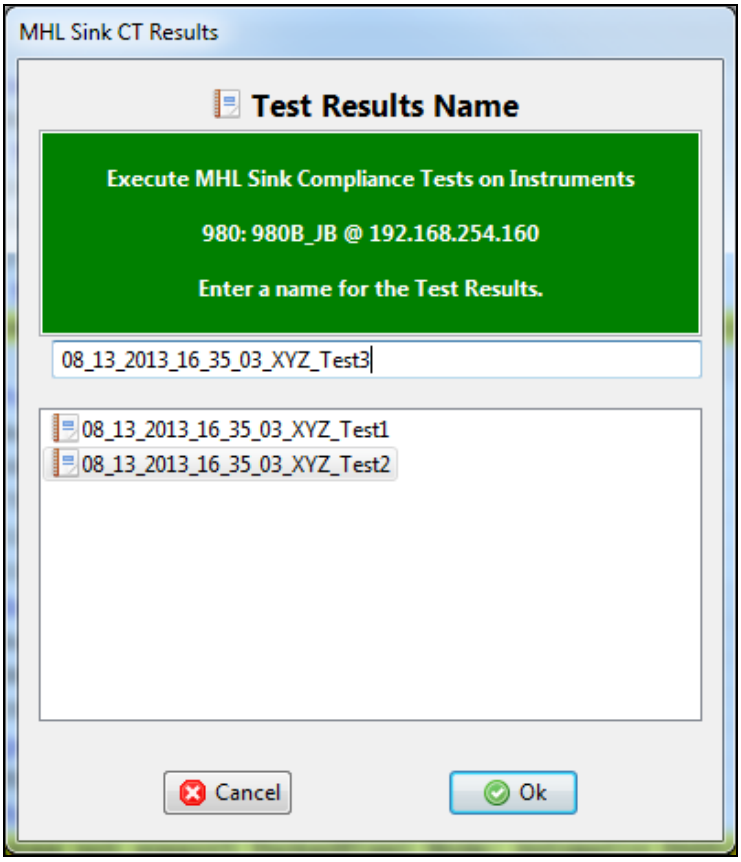
When you have completed entering the IP address, click the OK activation button.

3. (Optional) Review the list of tests for each category. If you wish to skip some of the tests. You can skip tests by clicking on the Check mark on the right side of the **Test Options / Preview** panel.

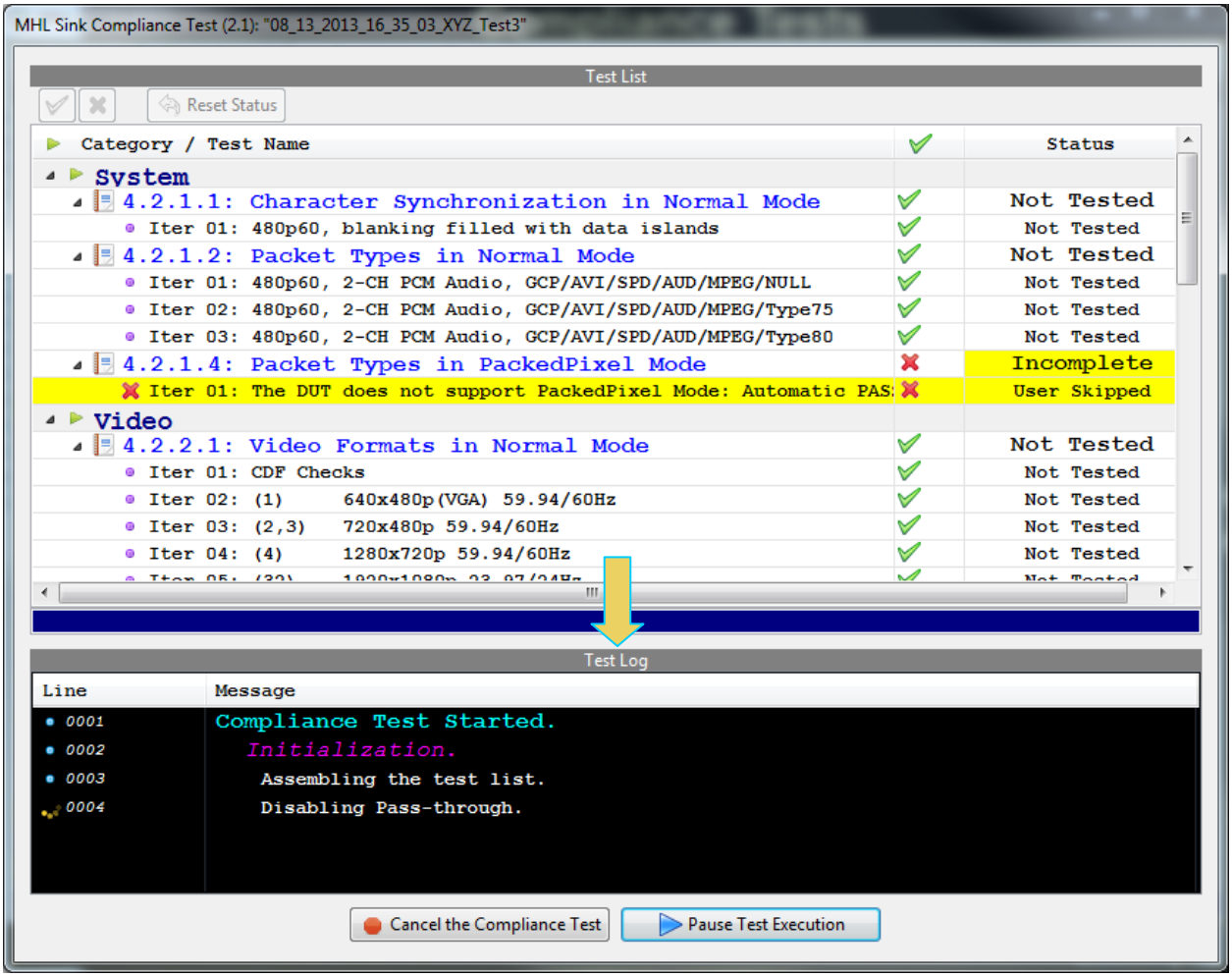
   The screen shot below shows some of the tests that have been skipped (highlighted in yellow with a red X).



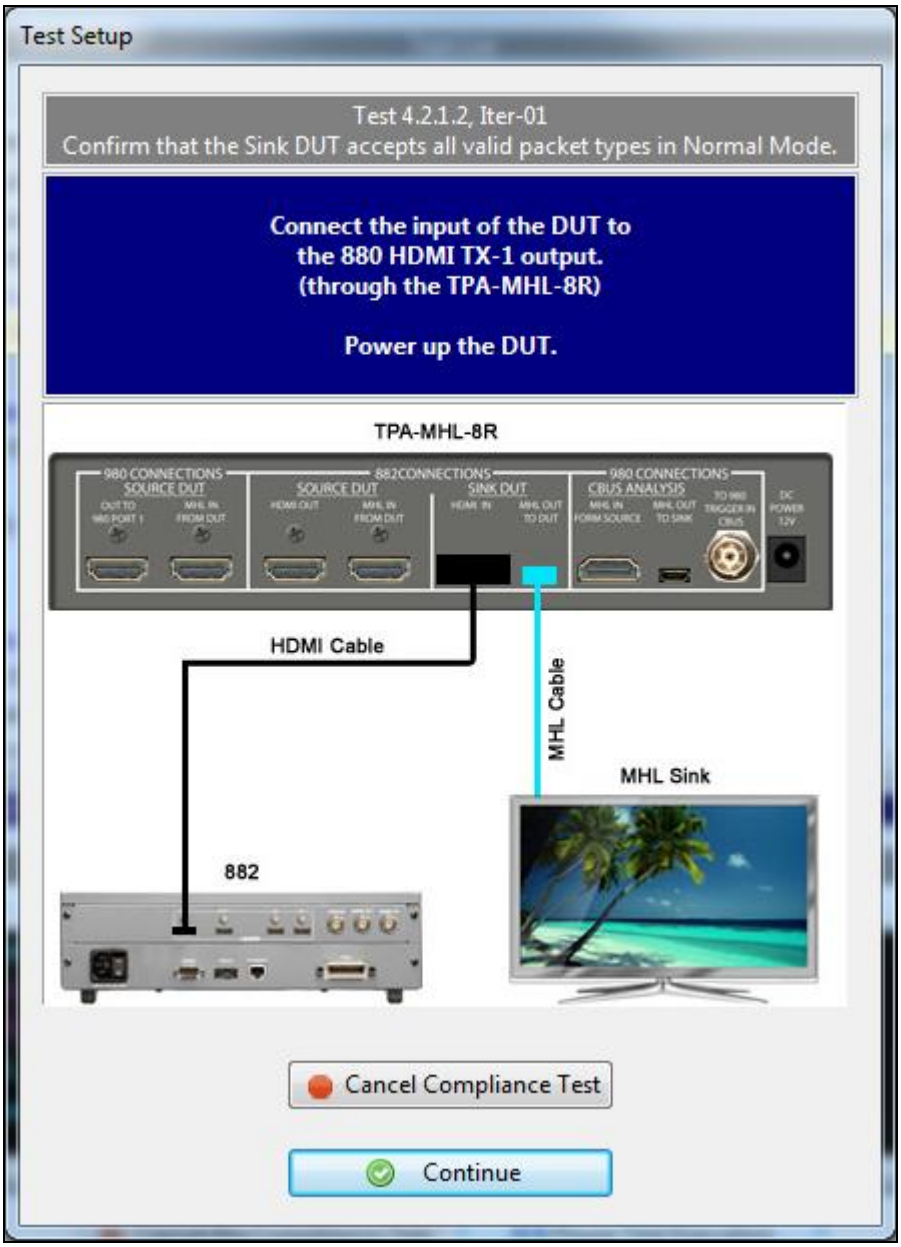
Click on the **Execute Tests**  activation button to initiate the test suite. You will be prompted for a name for the tests. This dialog box is shown below.



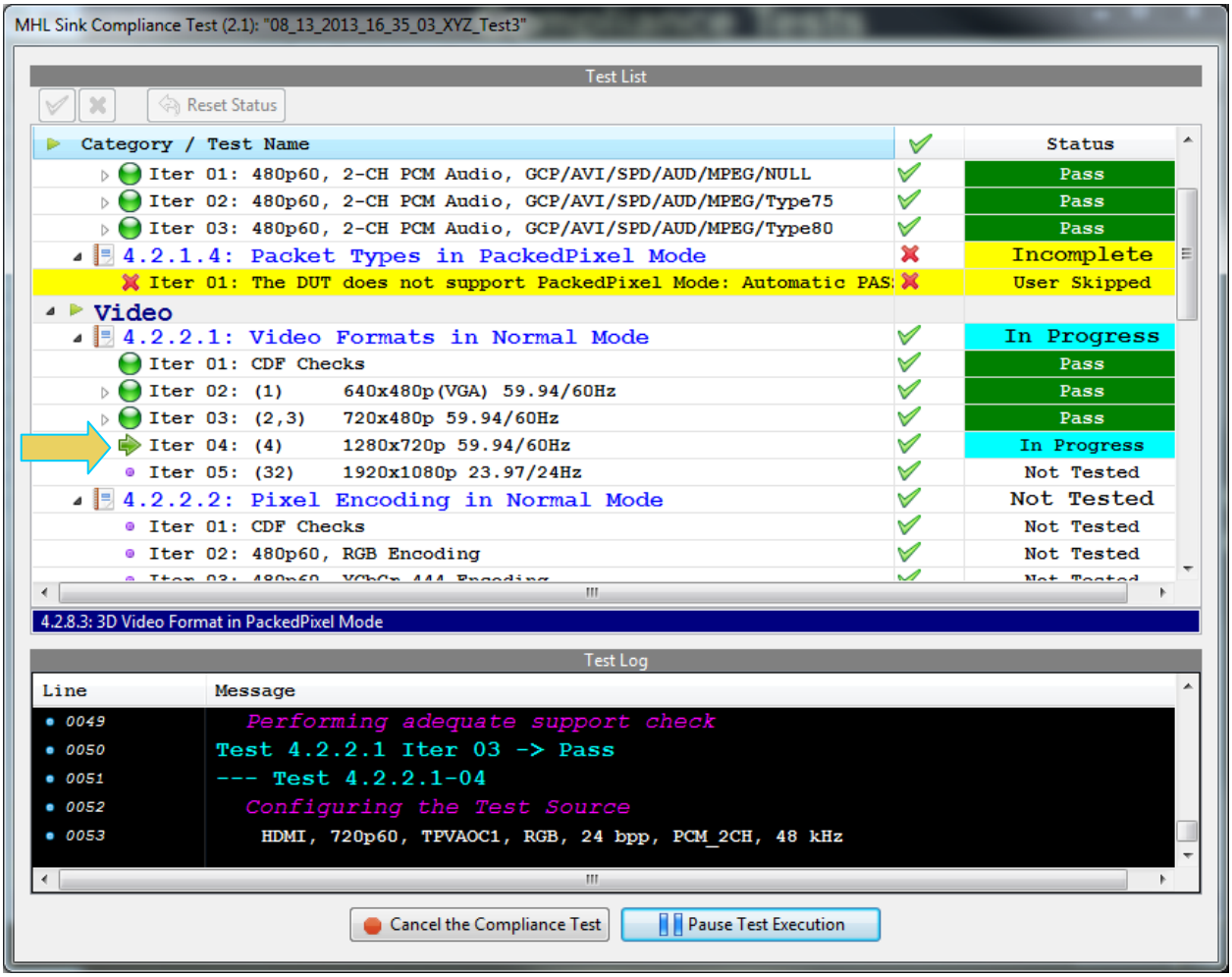
A new window appears showing the test results status with a Test Log panel on the bottom (below).



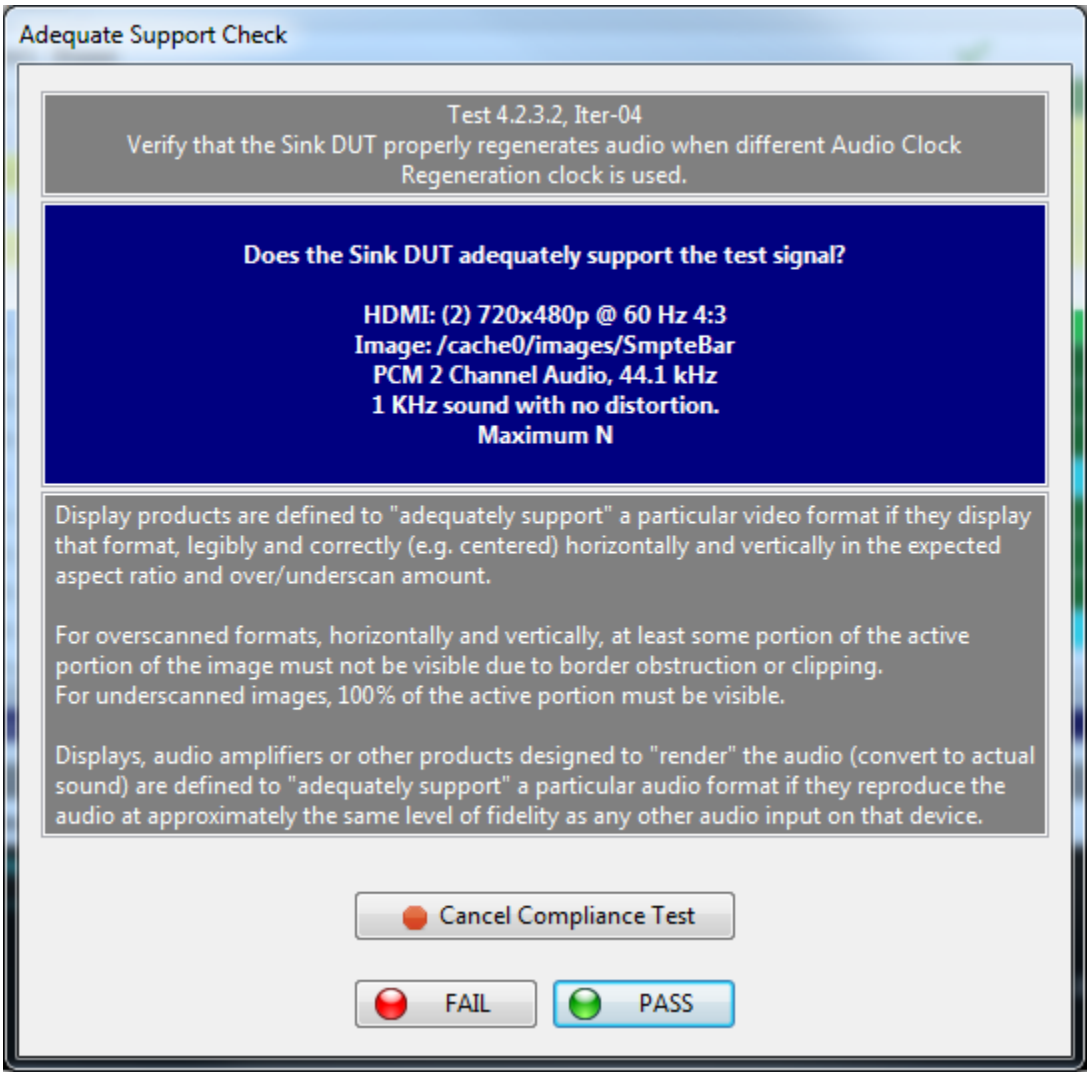
During the tests a **Test Setup** dialog box will appear instructing you how to set up for the tests if there is a change from the original configuration. Refer to the following dialog box for an example. Press **Continue** when you have the source device in the correct mode. You can cancel the test using the **Cancel Compliance** Test button.



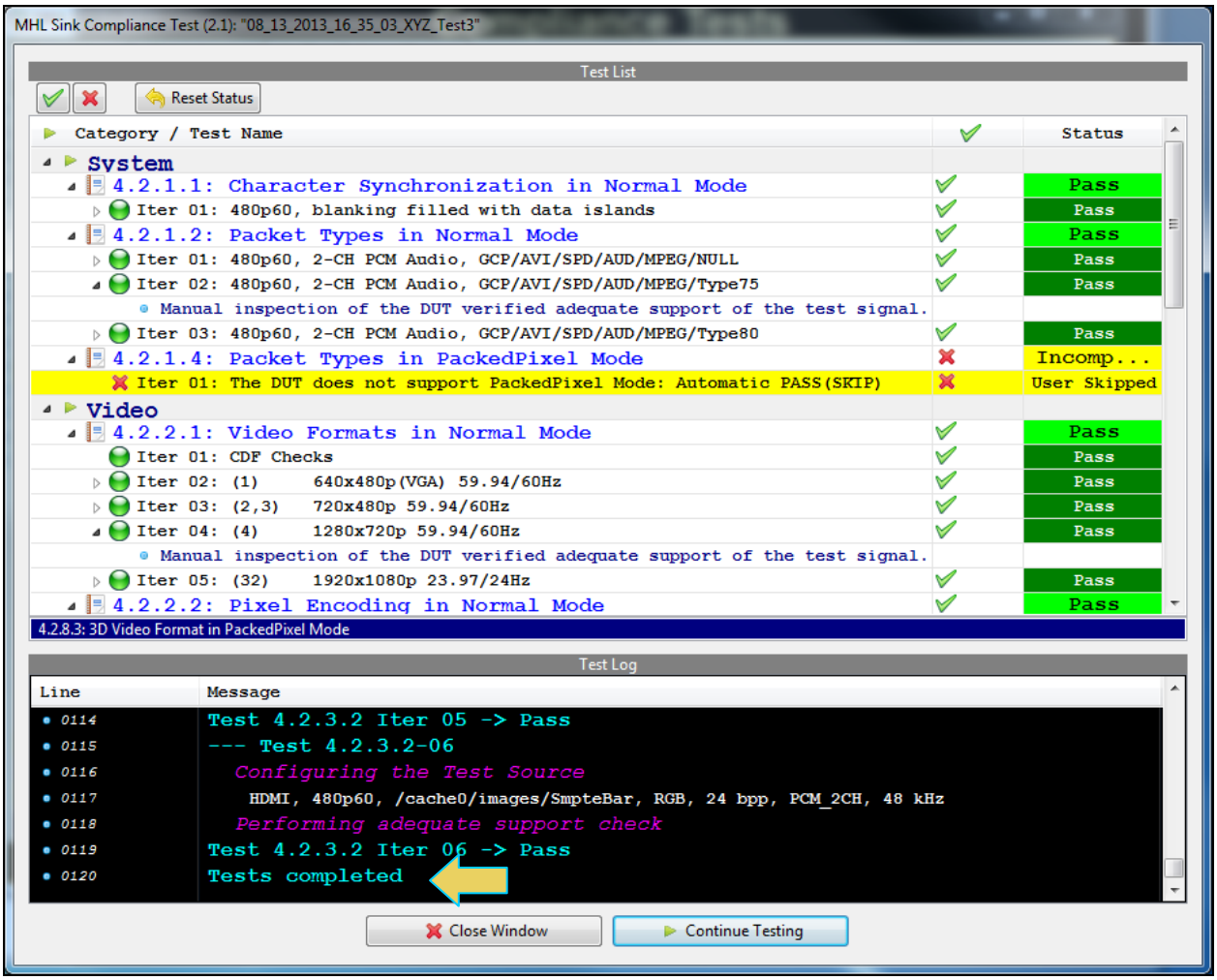
A green progress arrow shows which test is currently being run. Refer to the screen example below.



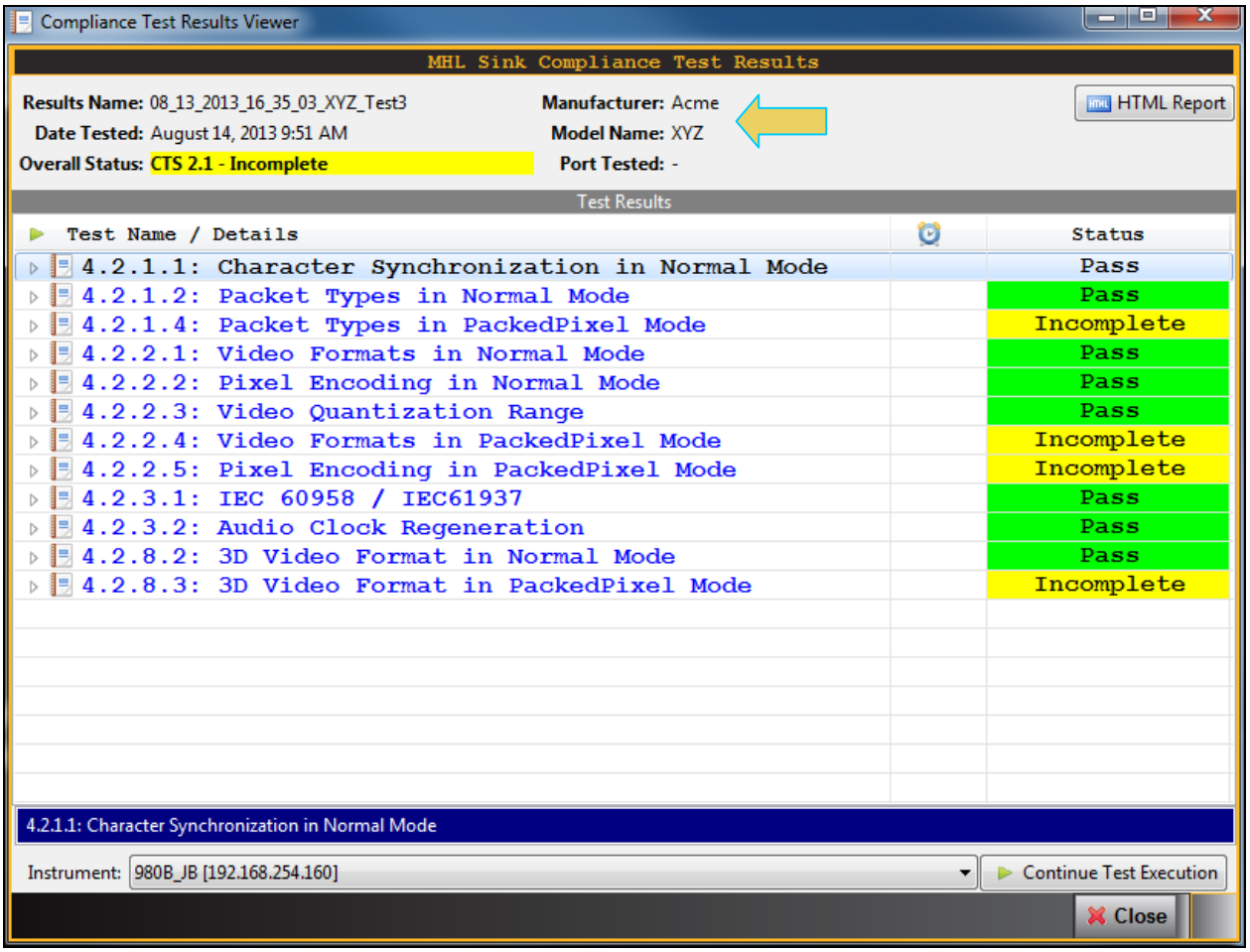
During the test, you will be asked to observe your sink device under test and select Pass or Fail depending on whether your sink device is displaying the video properly. The following dialog box is an example.

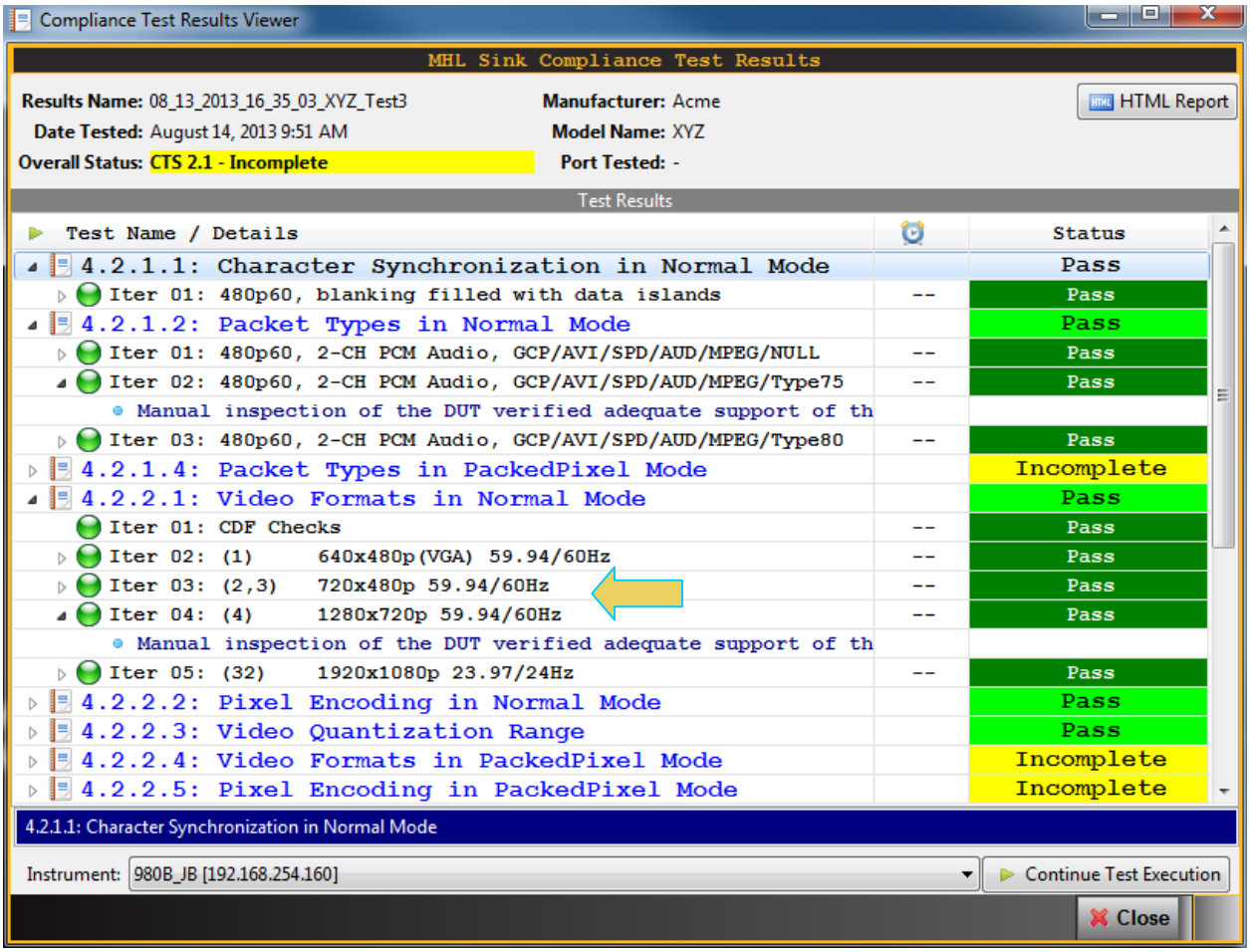


When the test is complete a message will indicate this on Test Log as shown in the following screen example.



When the tests are completed and you select **Close Window** the test window that shows the current activity will close. A new **Compliance Test Viewer** window will appear showing the results. Refer to the following screen shots. The second example shows some of the test details exposed.



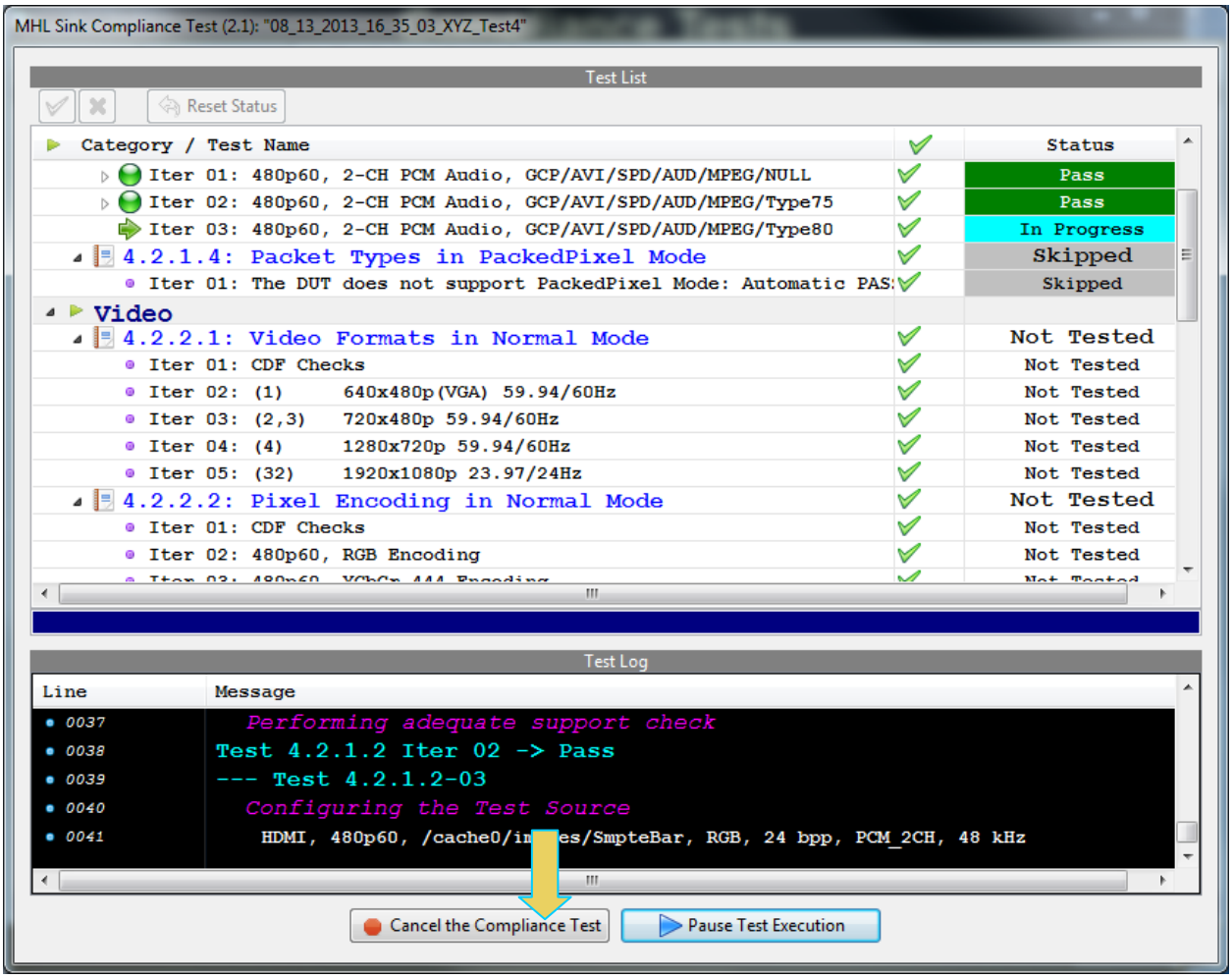

Compliance Test Results Viewer
MHL Sink Compliance Test Results
Results Name: 08_13_2013_16_35_03_XYZ_Test3
Date Tested: August 14, 2013 9:51 AM
Overall Status: CTS 2.1 - Incomplete
Manufacturer: Acme
Model Name: XYZ
Port Tested: -
HTML Report
Test Results
Test Name / Details
Status
4.2.1.1: Character Synchronization in Normal Mode Pass
Iter 01: 480p60, blanking filled with data islands -- Pass
4.2.1.2: Packet Types in Normal Mode Pass
Iter 01: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/NULL -- Pass
Iter 02: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/Type75 -- Pass
Manual inspection of the DUT verified adequate support of th
Iter 03: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/Type80 -- Pass
4.2.1.4: Packet Types in PackedPixel Mode Incomplete
4.2.2.1: Video Formats in Normal Mode Pass
Iter 01: CDF Checks -- Pass
Iter 02: (1) 640x480p(VGA) 59.94/60Hz -- Pass
Iter 03: (2,3) 720x480p 59.94/60Hz -- Pass
Iter 04: (4) 1280x720p 59.94/60Hz -- Pass
Manual inspection of the DUT verified adequate support of th
Iter 05: (32) 1920x1080p 23.97/24Hz -- Pass
4.2.2.2: Pixel Encoding in Normal Mode Pass
4.2.2.3: Video Quantization Range Pass
4.2.2.4: Video Formats in PackedPixel Mode Incomplete
4.2.2.5: Pixel Encoding in PackedPixel Mode Incomplete
4.2.1.1: Character Synchronization in Normal Mode
Instrument: 980B_JB [192.168.254.160]
Continue Test Execution
Close

5.7 Canceling and Resuming the MHL Sink Compliance after cancel

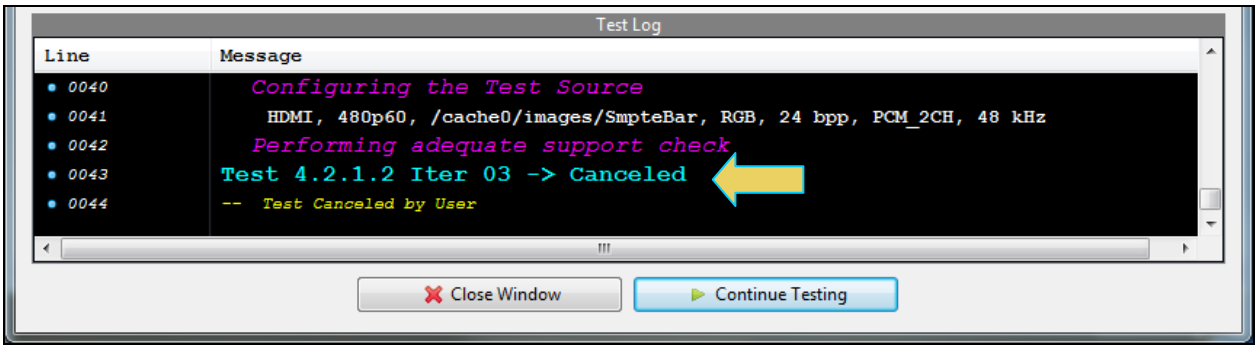
You can complete or resume a test series that was canceled earlier. The test results are saved in a directory that is accessible through the 980 GUI Manager interface. Use the following procedures to cancel and resume a canceled test.

To cancel a test:

1. Click on the **Cancel Compliance Test** activation button either on the popup dialog box or the bottom of the test log panel. See the screen example below.

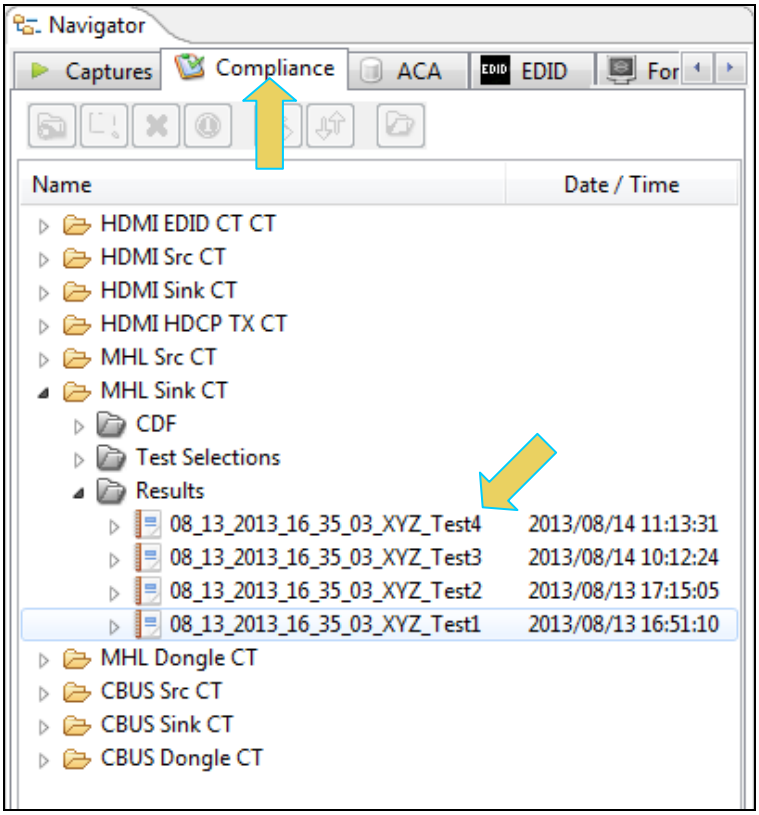


An indication that the test was canceled with be shown in the Test Log lower panel.

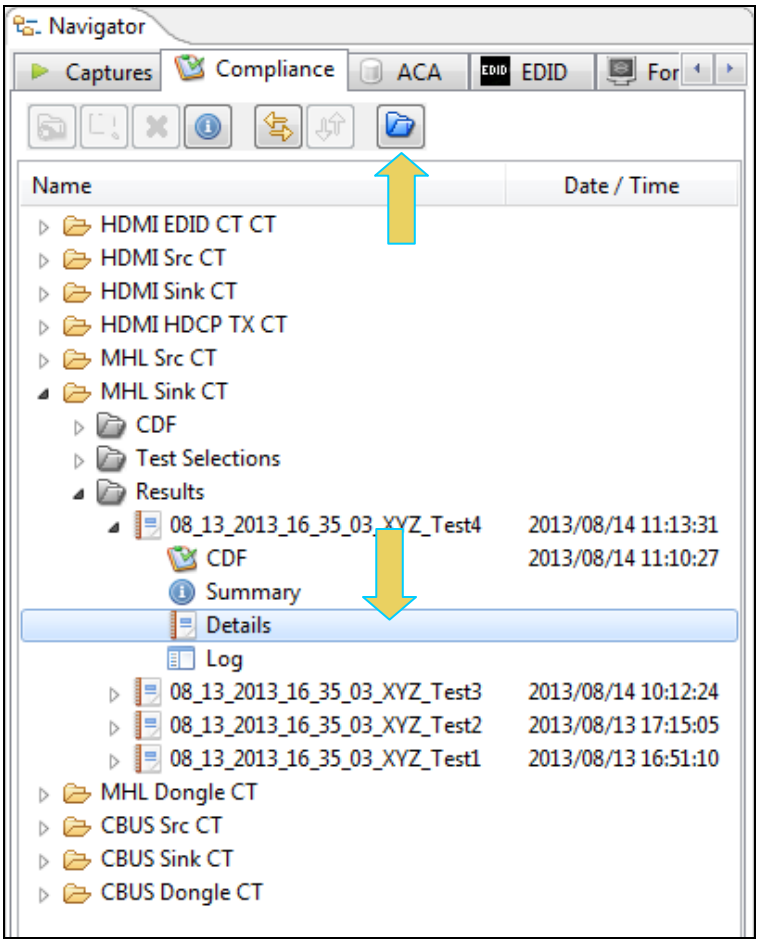


To resume a canceled test:

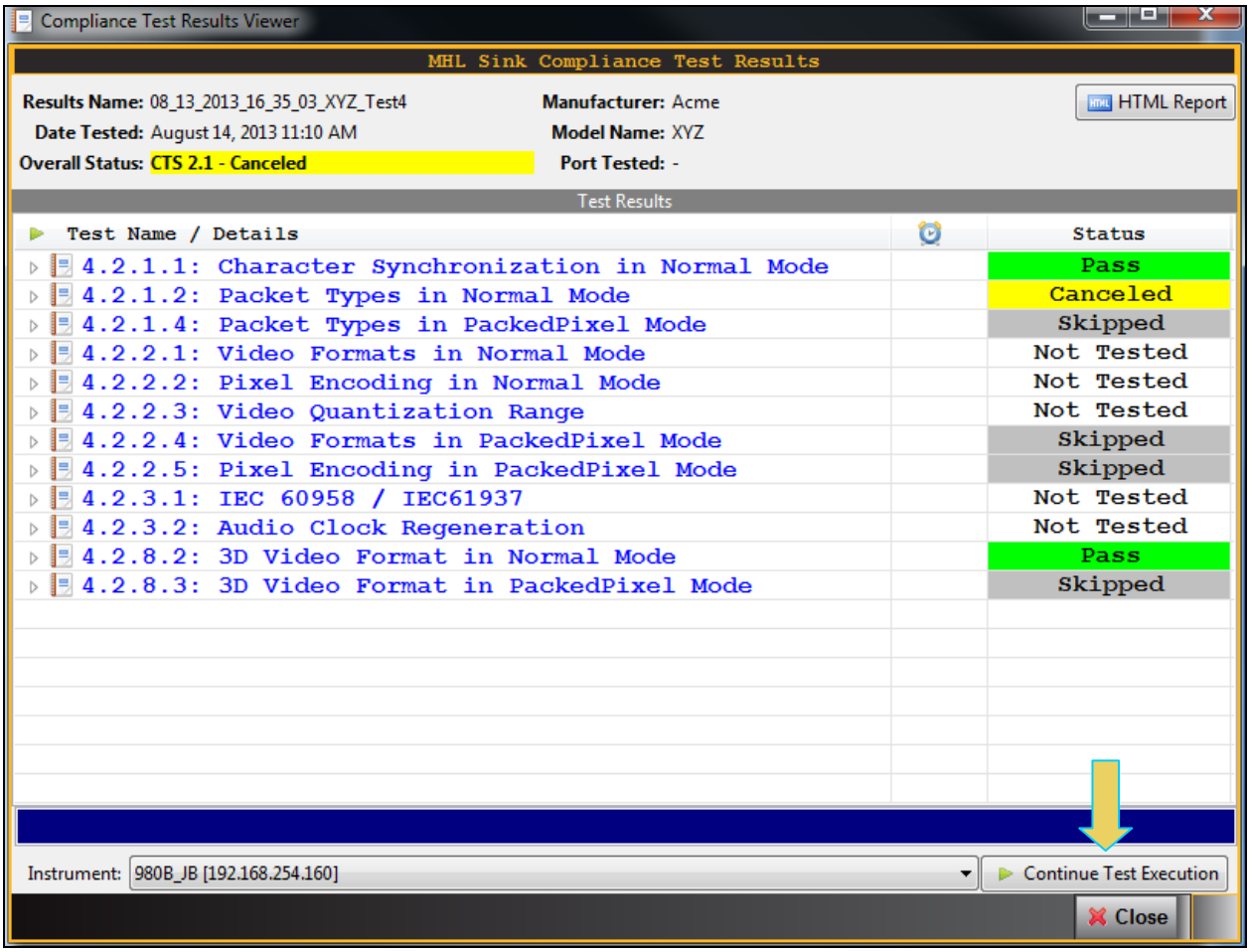
1. Navigate to the **Navigator/Compliance** panel and open the MHL Sink CT Results directory as shown below.



2. Expose the details of the test results and either double click on the **Details** or select **Open** icon (below).



The results will appear in the **Compliance Test Results Viewer** window as shown below.



3. Click on the **Continue Test Execution** button on the lower left (above) to resume the tests.

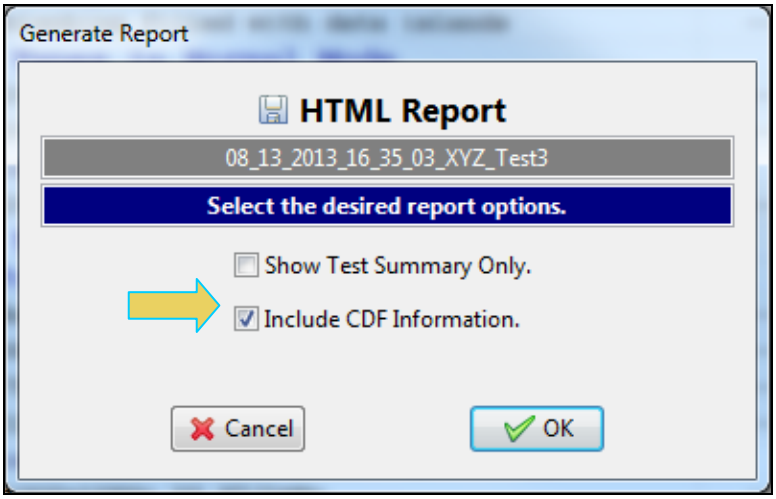
5.8 Viewing the MHL Sink Compliance HTML test report

After you have completed the tests, an HTML Report activation button will appear in the upper right of the screen which enables you to access the HTML report of the test results. Use the following procedures to view the HTML test report.

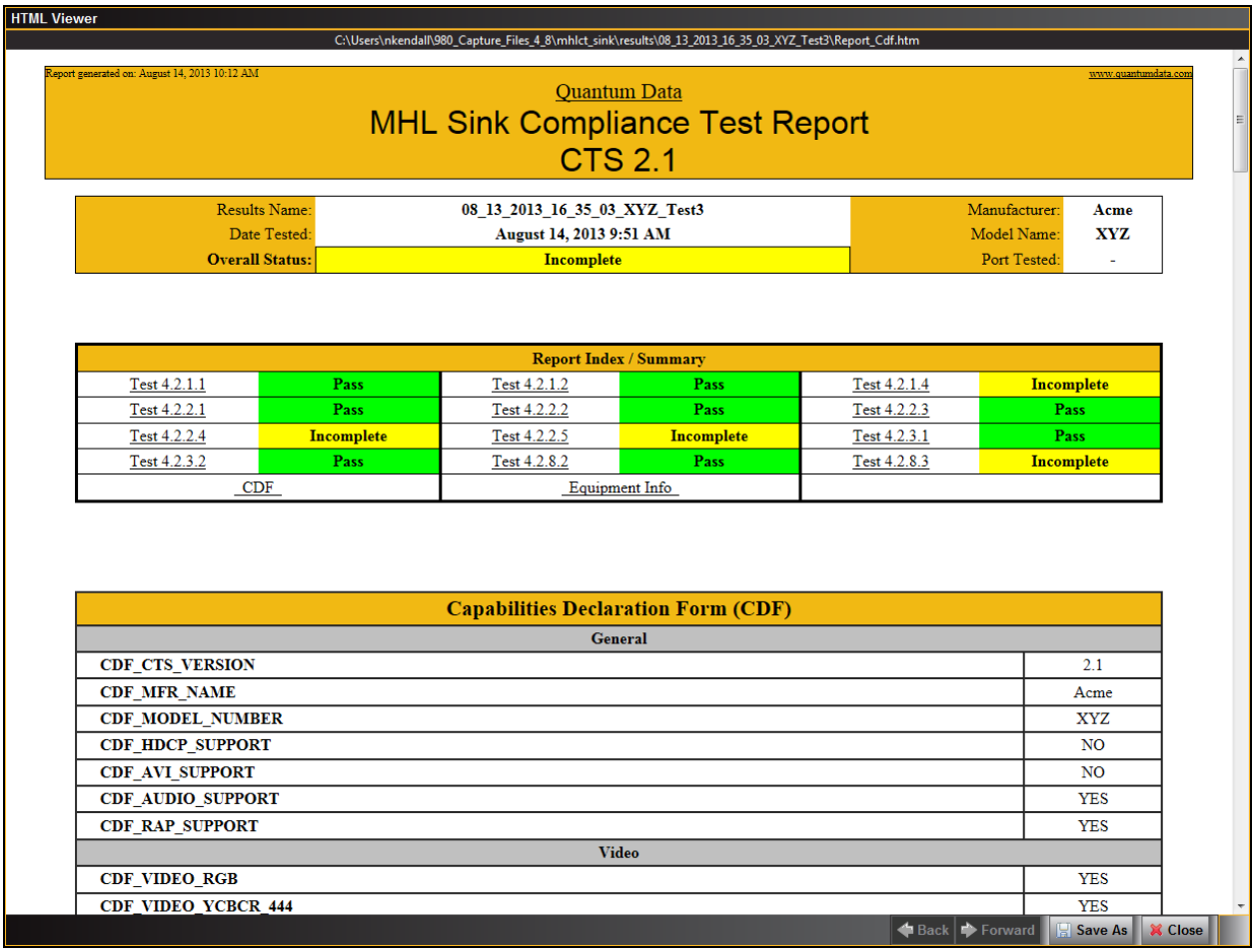
To view the html test report:

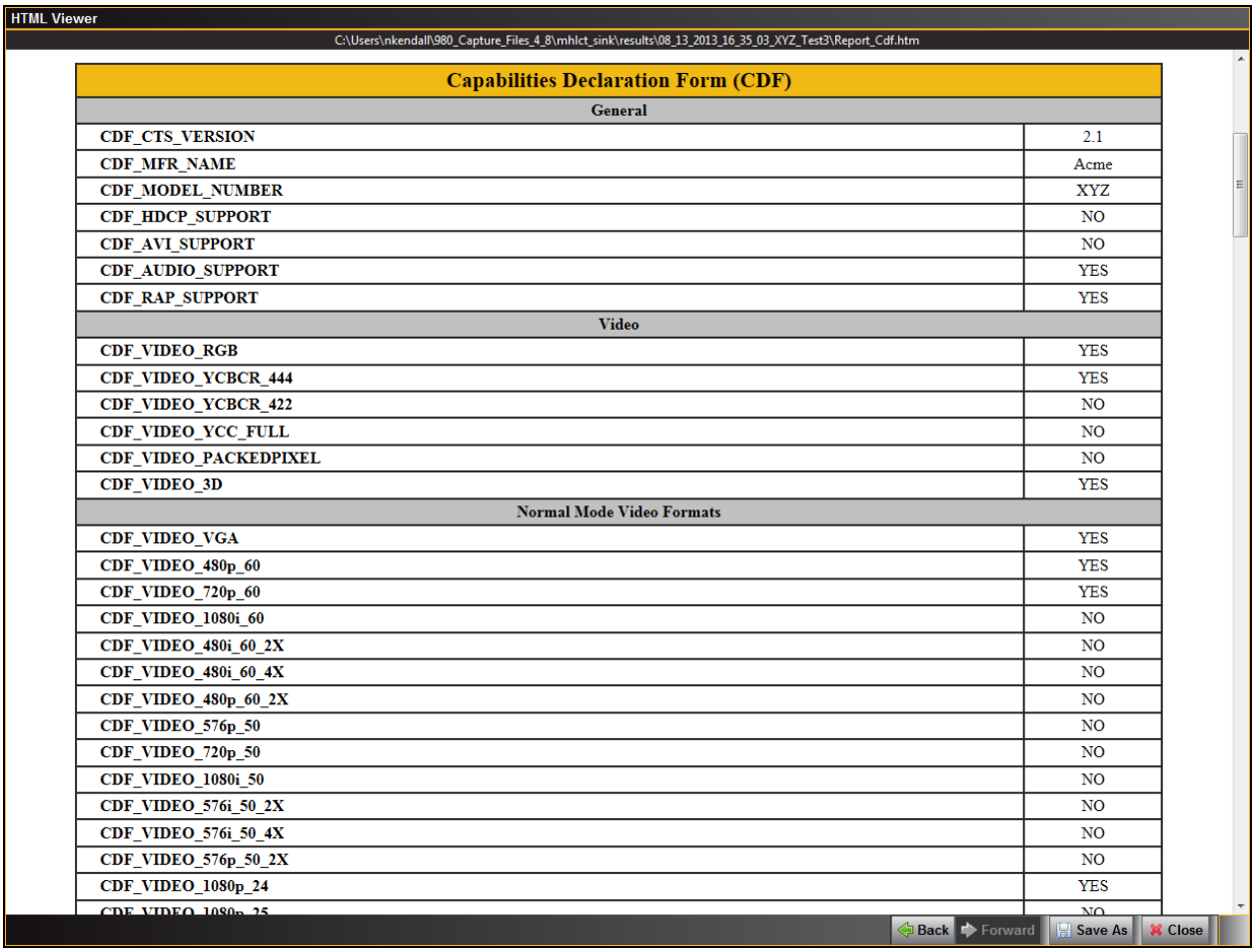
1. Select the **CT Results** panel as shown below.
2. Click on the **HTML Report** activation button.

   A dialog box will appear asking if you want a summary of the test results or a version that includes the CDF. This dialog box is shown in the screen shot below.



The HTML report is shown in the following screens.



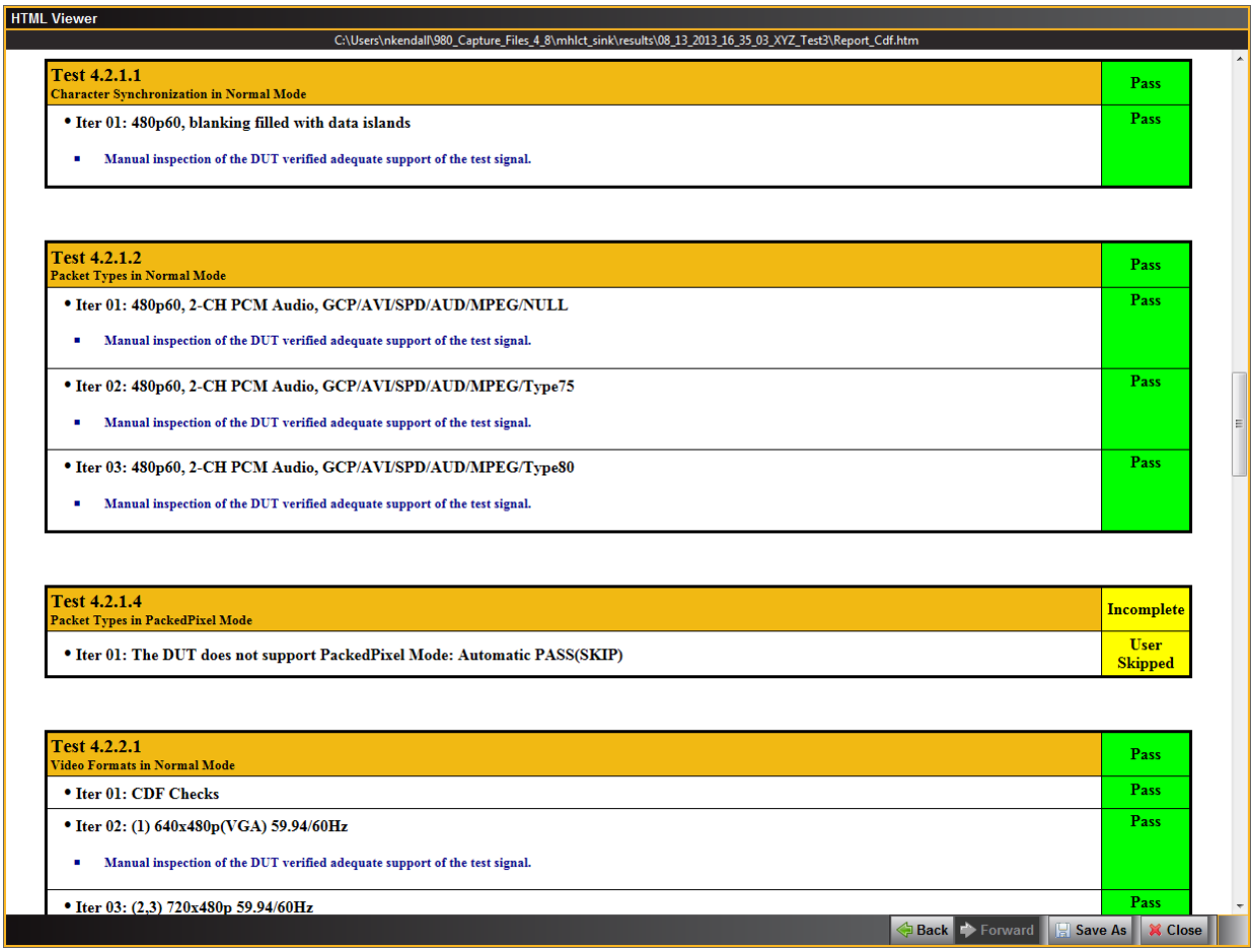

HTML Viewer

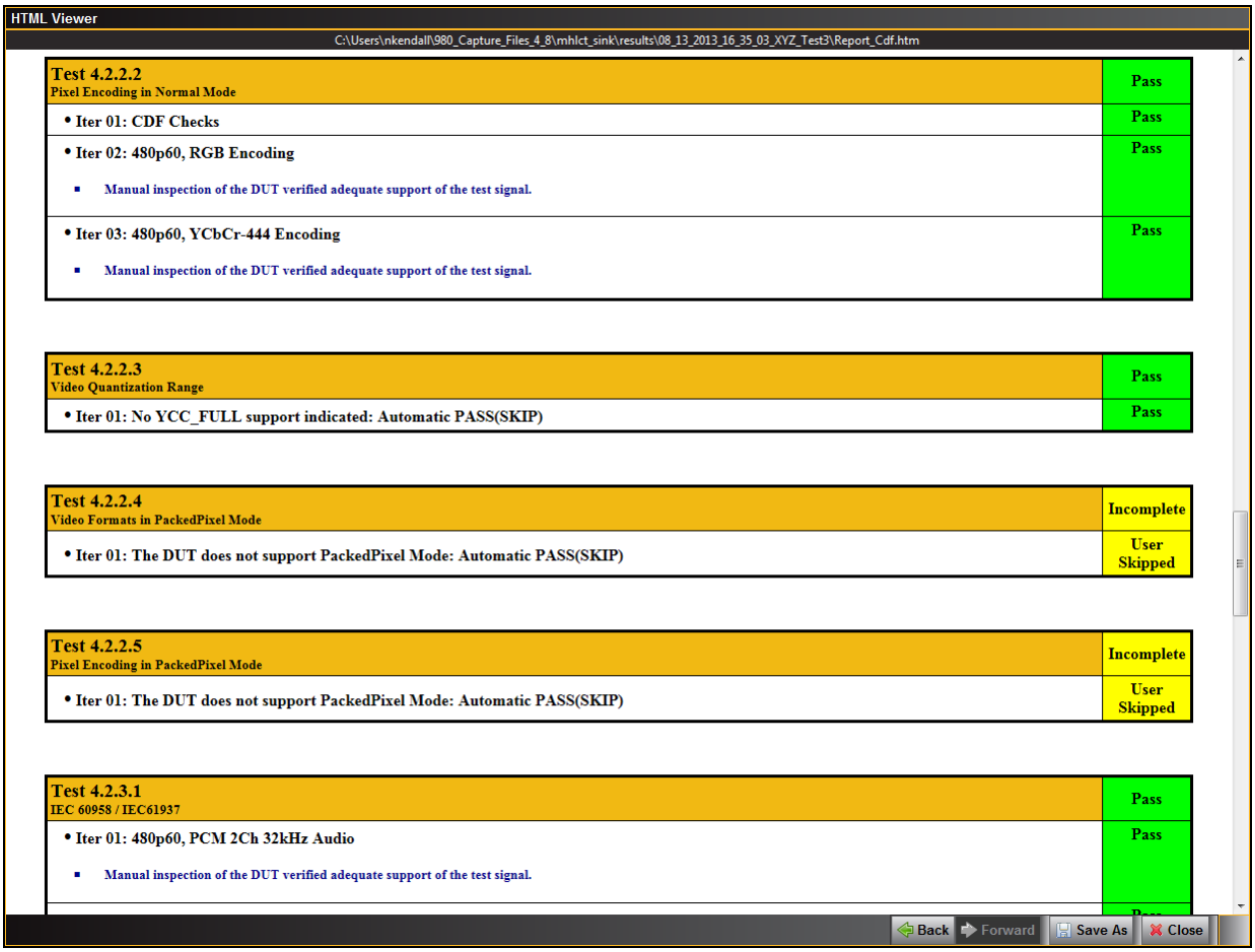
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_sink\results\08_13_2013_16_35_03_XYZ_Test3\Report_Cdf.htm

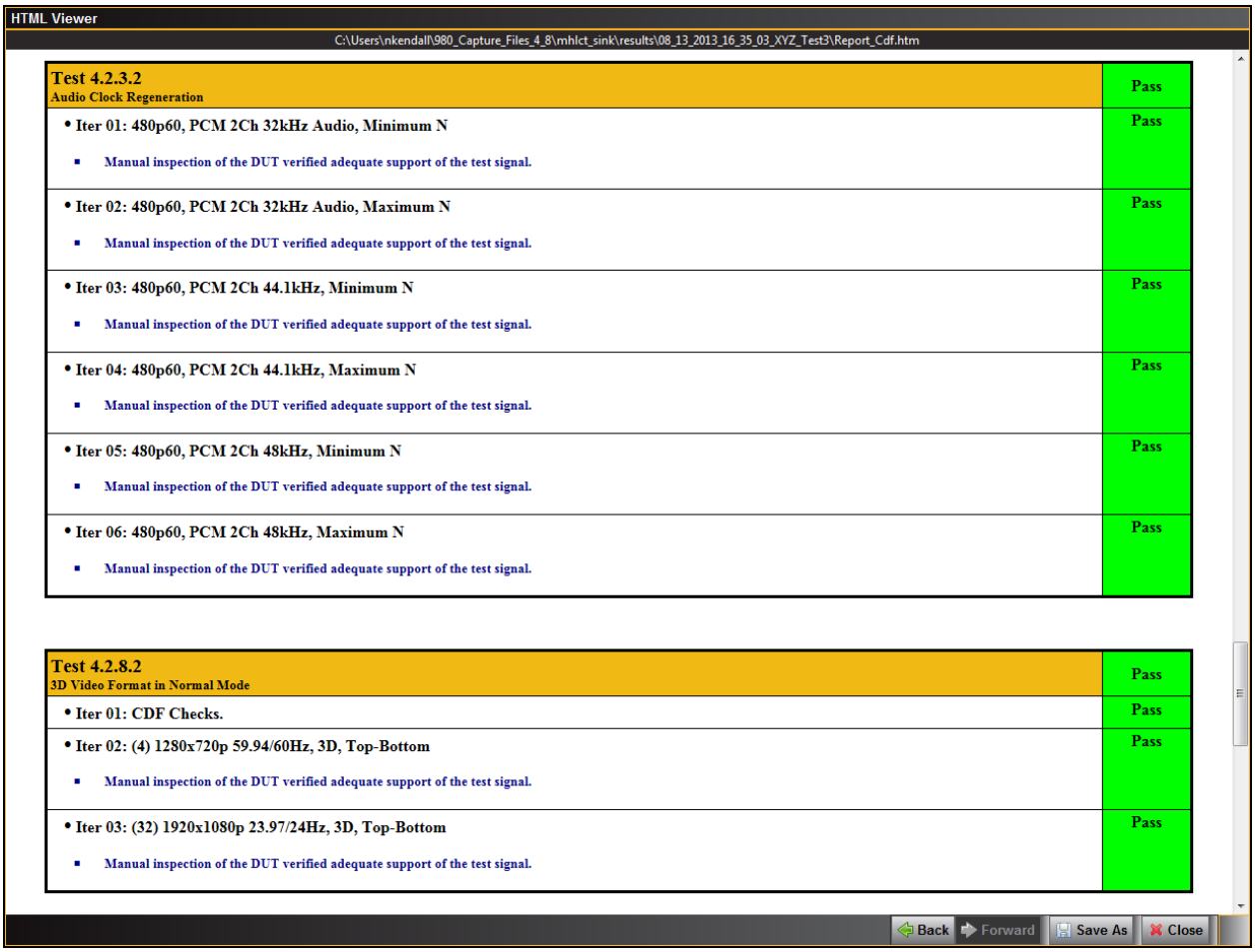
Capabilities Declaration Form (CDF)

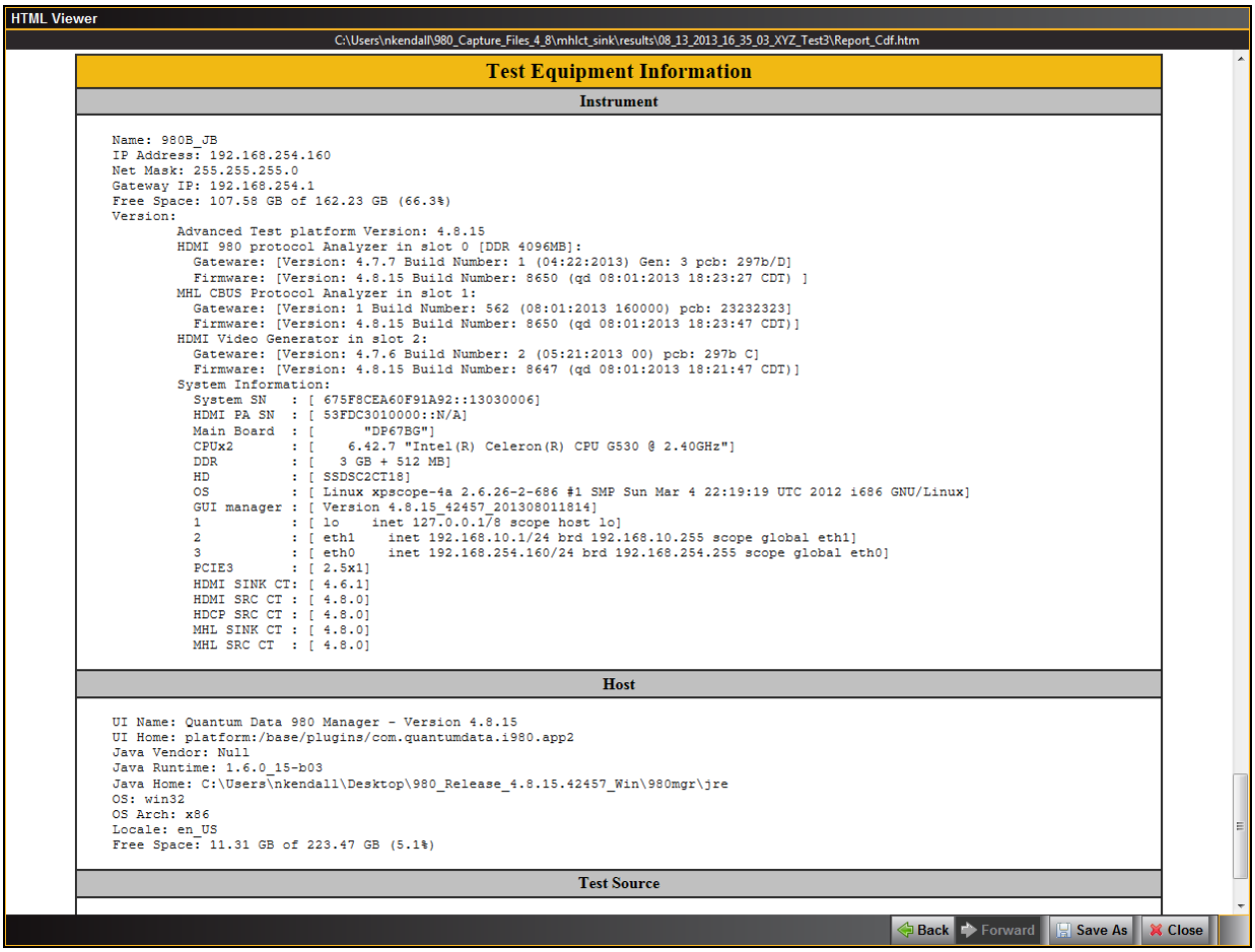
General	
CDF_CTS_VERSION	2.1
CDF_MFR_NAME	Acme
CDF_MODEL_NUMBER	XYZ
CDF_HDCP_SUPPORT	NO
CDF_AVI_SUPPORT	NO
CDF_AUDIO_SUPPORT	YES
CDF_RAP_SUPPORT	YES
Video	
CDF_VIDEO_RGB	YES
CDF_VIDEO_YCBCR_444	YES
CDF_VIDEO_YCBCR_422	NO
CDF_VIDEO_YCC_FULL	NO
CDF_VIDEO_PACKEDPIXEL	NO
CDF_VIDEO_3D	YES
Normal Mode Video Formats	
CDF_VIDEO_VGA	YES
CDF_VIDEO_480p_60	YES
CDF_VIDEO_720p_60	YES
CDF_VIDEO_1080i_60	NO
CDF_VIDEO_480i_60_2X	NO
CDF_VIDEO_480i_60_4X	NO
CDF_VIDEO_480p_60_2X	NO
CDF_VIDEO_576p_50	NO
CDF_VIDEO_720p_50	NO
CDF_VIDEO_1080i_50	NO
CDF_VIDEO_576i_50_2X	NO
CDF_VIDEO_576i_50_4X	NO
CDF_VIDEO_576p_50_2X	NO
CDF_VIDEO_1080p_24	YES
CDF_VIDEO_1080p_25	NO

Back Forward Save As Close


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_sink\results\08_13_2013_16_35_03_XYZ_Test3\Report_Cdf.htm
Test 4.2.1.1
Character Synchronization in Normal Mode
Pass
• Iter 01: 480p60, blanking filled with data islands
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Test 4.2.1.2
Packet Types in Normal Mode
Pass
• Iter 01: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/NULL
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 02: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/Type75
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 03: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/Type80
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Test 4.2.1.4
Packet Types in PackedPixel Mode
Incomplete
• Iter 01: The DUT does not support PackedPixel Mode: Automatic PASS(SKIP)
User Skipped
Test 4.2.2.1
Video Formats in Normal Mode
Pass
• Iter 01: CDF Checks
Pass
• Iter 02: (1) 640x480p(VGA) 59.94/60Hz
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 03: (2,3) 720x480p 59.94/60Hz
Pass
Back
Forward
Save As
Close


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_sink\results\08_13_2013_16_35_03_XYZ_Test3\Report_Cdf.htm
Test 4.2.2.2
Pixel Encoding in Normal Mode
Pass
• Iter 01: CDF Checks
Pass
• Iter 02: 480p60, RGB Encoding
▪ Manual inspection of the DUT verified adequate support of the test signal.
Pass
• Iter 03: 480p60, YCbCr-444 Encoding
▪ Manual inspection of the DUT verified adequate support of the test signal.
Pass
Test 4.2.2.3
Video Quantization Range
Pass
• Iter 01: No YCC_FULL support indicated: Automatic PASS(SKIP)
Pass
Test 4.2.2.4
Video Formats in PackedPixel Mode
Incomplete
• Iter 01: The DUT does not support PackedPixel Mode: Automatic PASS(SKIP)
User Skipped
Test 4.2.2.5
Pixel Encoding in PackedPixel Mode
Incomplete
• Iter 01: The DUT does not support PackedPixel Mode: Automatic PASS(SKIP)
User Skipped
Test 4.2.3.1
IEC 60958 / IEC61937
Pass
• Iter 01: 480p60, PCM 2Ch 32kHz Audio
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Back
Forward
Save As
Close


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_sink\results\08_13_2013_16_35_03_XYZ_Test3\Report_Cdf.htm
Test 4.2.3.2
Audio Clock Regeneration
Pass
• Iter 01: 480p60, PCM 2Ch 32kHz Audio, Minimum N
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 02: 480p60, PCM 2Ch 32kHz Audio, Maximum N
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 03: 480p60, PCM 2Ch 44.1kHz, Minimum N
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 04: 480p60, PCM 2Ch 44.1kHz, Maximum N
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 05: 480p60, PCM 2Ch 48kHz, Minimum N
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 06: 480p60, PCM 2Ch 48kHz, Maximum N
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Test 4.2.8.2
3D Video Format in Normal Mode
Pass
• Iter 01: CDF Checks.
Pass
• Iter 02: (4) 1280x720p 59.94/60Hz, 3D, Top-Bottom
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 03: (32) 1920x1080p 23.97/24Hz, 3D, Top-Bottom
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Back
Forward
Save As
Close

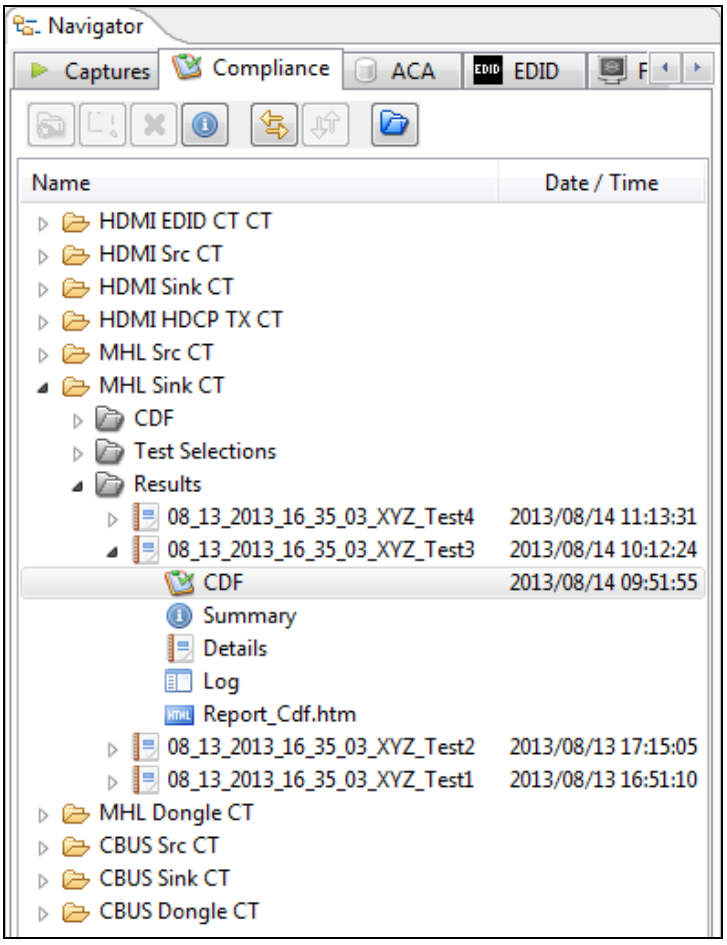

HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_sink\results\08_13_2013_16_35_03_XYZ_Test3\Report_Cdf.htm
Test Equipment Information
Instrument
Name: 980B_JB
IP Address: 192.168.254.160
Net Mask: 255.255.255.0
Gateway IP: 192.168.254.1
Free Space: 107.58 GB of 162.23 GB (66.3%)
Version:
Advanced Test platform Version: 4.8.15
HDMI 980 protocol Analyzer in slot 0 [DDR 4096MB]:
Gateware: [Version: 4.7.7 Build Number: 1 (04:22:2013) Gen: 3 pcb: 297b/D]
Firmware: [Version: 4.8.15 Build Number: 8650 (qd 08:01:2013 18:23:27 CDT)]
MHL CBUS Protocol Analyzer in slot 1:
Gateware: [Version: 1 Build Number: 562 (08:01:2013 160000) pcb: 23232323]
Firmware: [Version: 4.8.15 Build Number: 8650 (qd 08:01:2013 18:23:47 CDT)]
HDMI Video Generator in slot 2:
Gateware: [Version: 4.7.6 Build Number: 2 (05:21:2013 00) pcb: 297b C]
Firmware: [Version: 4.8.15 Build Number: 8647 (qd 08:01:2013 18:21:47 CDT)]
System Information:
System SN : [675F8CEA60F91A92::13030006]
HDMI PA SN : [53FDC3010000::N/A]
Main Board : ["DP67BG"]
CPUx2 : [6.42.7 "Intel(R) Celeron(R) CPU G530 @ 2.40GHz"]
DDR : [3 GB + 512 MB]
HD : [SSDSC2CT18]
OS : [Linux xpscope-4a 2.6.26-2-686 #1 SMP Sun Mar 4 22:19:19 UTC 2012 i686 GNU/Linux]
GUI manager : [Version 4.8.15_42457_201308011814]
1 : [lo inet 127.0.0.1/8 scope host lo]
2 : [eth1 inet 192.168.10.1/24 brd 192.168.10.255 scope global eth1]
3 : [eth0 inet 192.168.254.160/24 brd 192.168.254.255 scope global eth0]
PCIE3 : [2.5x1]
HDMI SINK CT: [4.6.1]
HDMI SRC CT : [4.8.0]
HDCP SRC CT : [4.8.0]
MHL SINK CT : [4.8.0]
MHL SRC CT : [4.8.0]
Host
UI Name: Quantum Data 980 Manager - Version 4.8.15
UI Home: platform:/base/plugins/com.quantumdata.i980.app2
Java Vendor: Null
Java Runtime: 1.6.0_15-b03
Java Home: C:\Users\nkendall\Desktop\980_Release_4.8.15.42457_Win\980mgr\jre
OS: win32
OS Arch: x86
Locale: en_US
Free Space: 11.31 GB of 223.47 GB (5.1%)
Test Source
Back
Forward
Save As
Close

5.9 Viewing the MHL Sink Compliance test results and disseminating to others

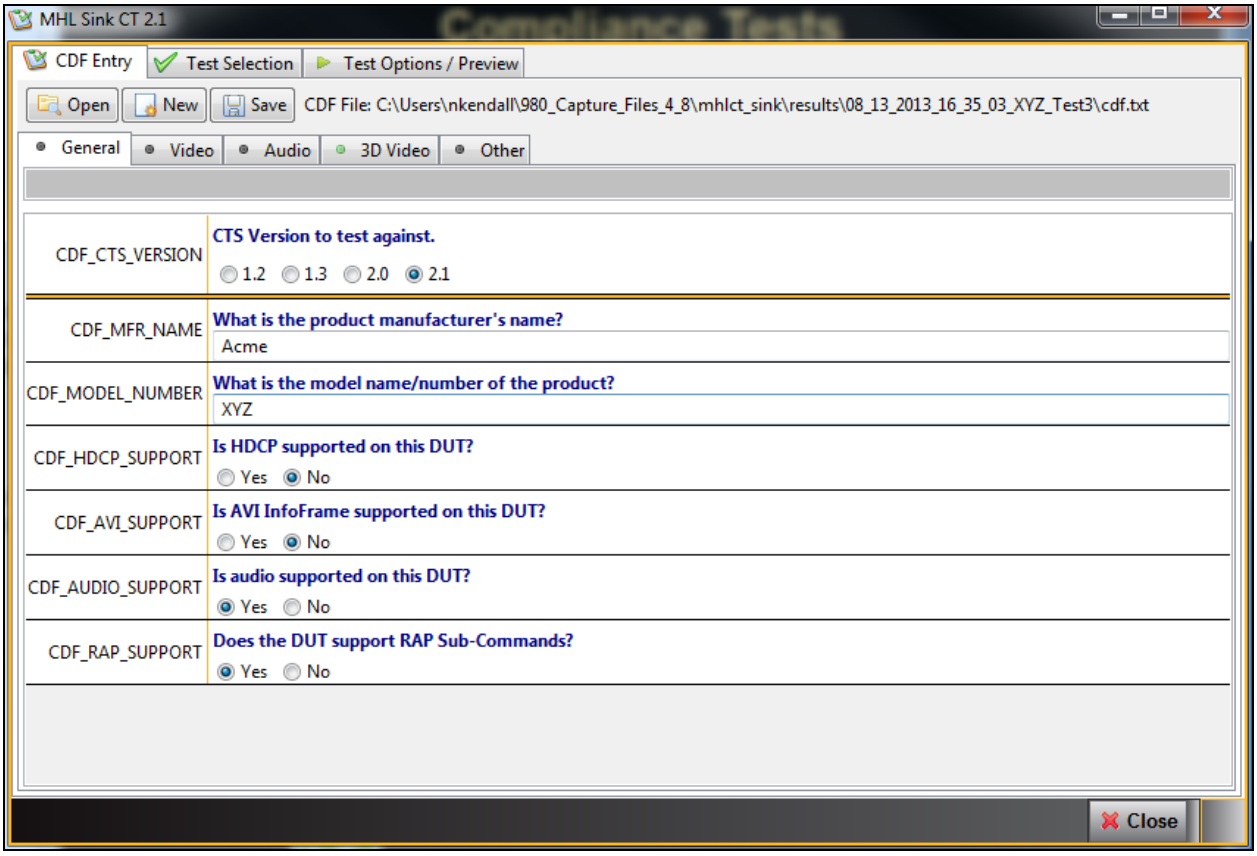
After you have completed the tests, you can view the CDF, test results, HTML report and detailed log at any time. Assuming you have run the tests from the external 980 GUI Manager from your PC, you can easily disseminate the results to other colleagues or subject matter experts or officials at the MHL Authorized Test Centers. Instructions for viewing the test results and disseminating to others are provided below.

To view the CDF for the device under test:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.
2. Select CDF and either double click or click on the **Open**  icon as shown below.



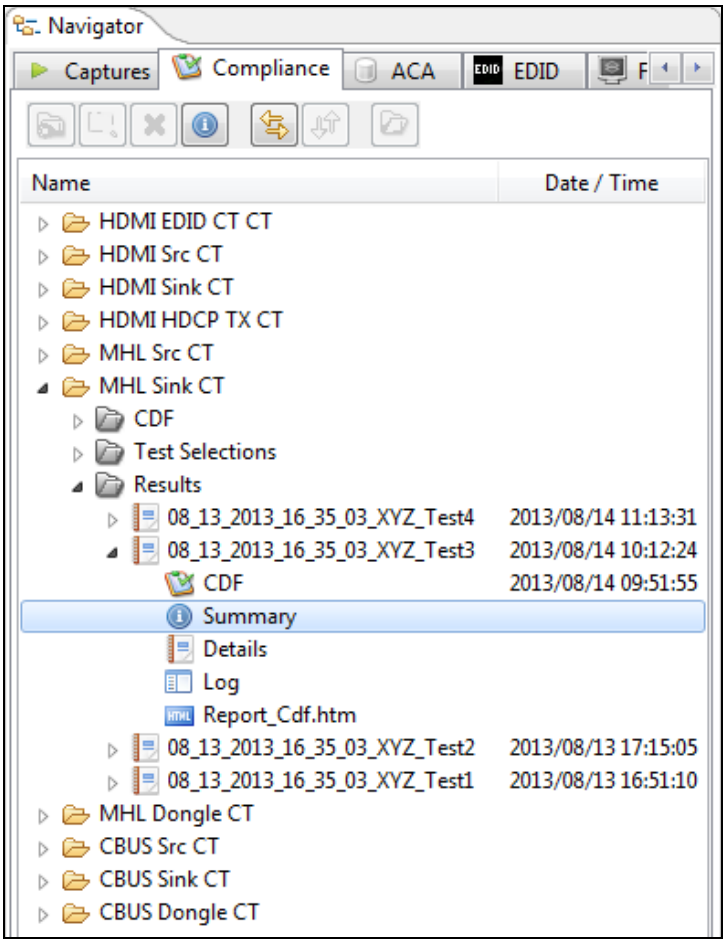
The CDF appears in a new window as shown below.



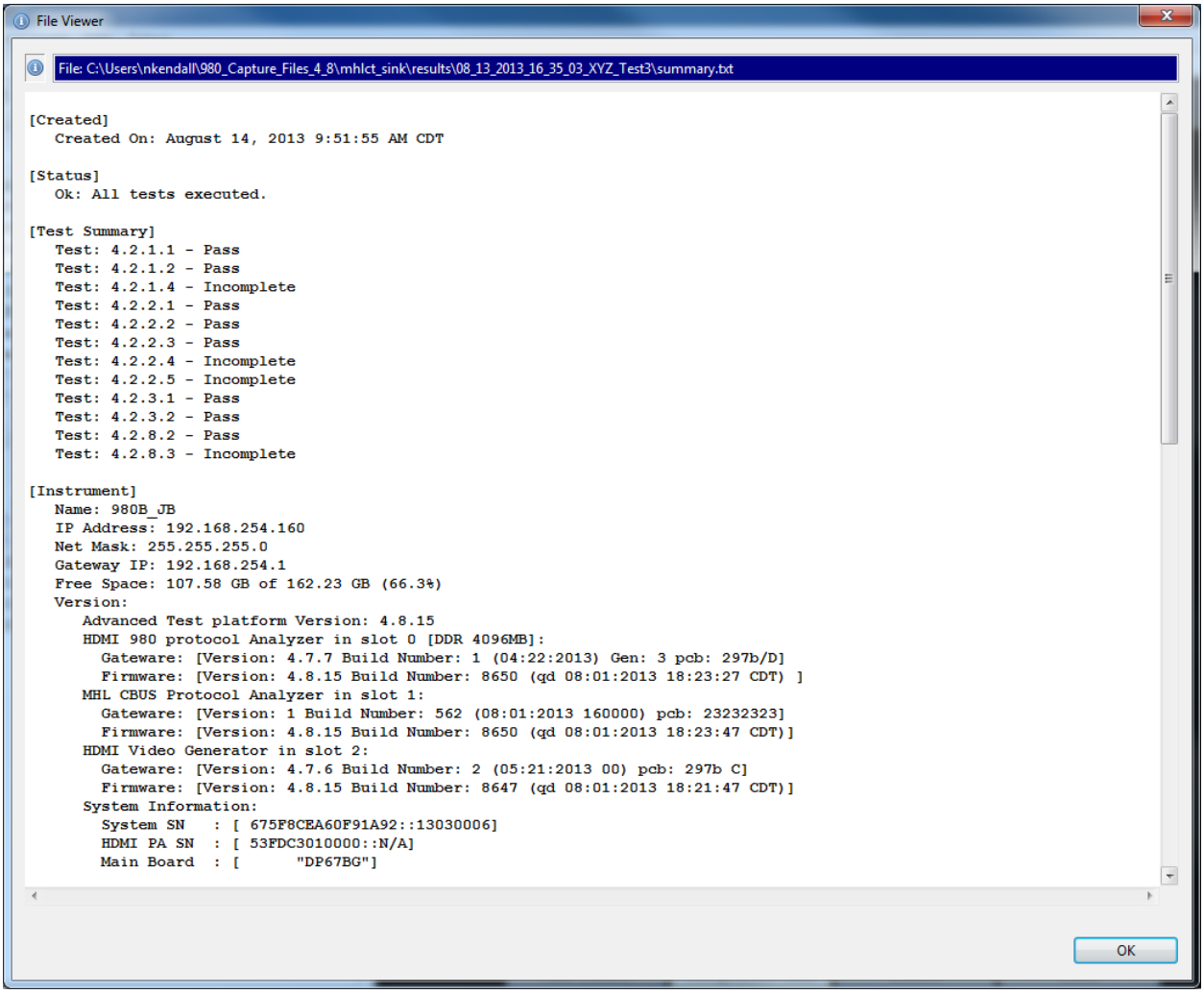
To view a Summary of the results:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.

2. Select Summary and either double click or click on the **Open**  icon as shown below.



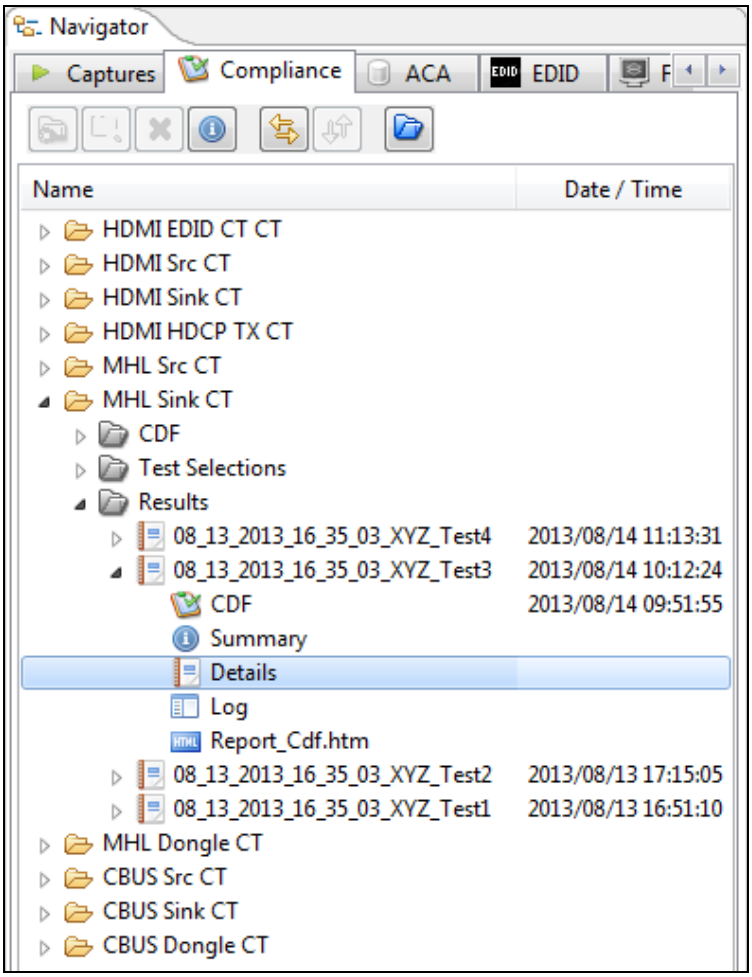
The Summary file appears in a new window as shown below.



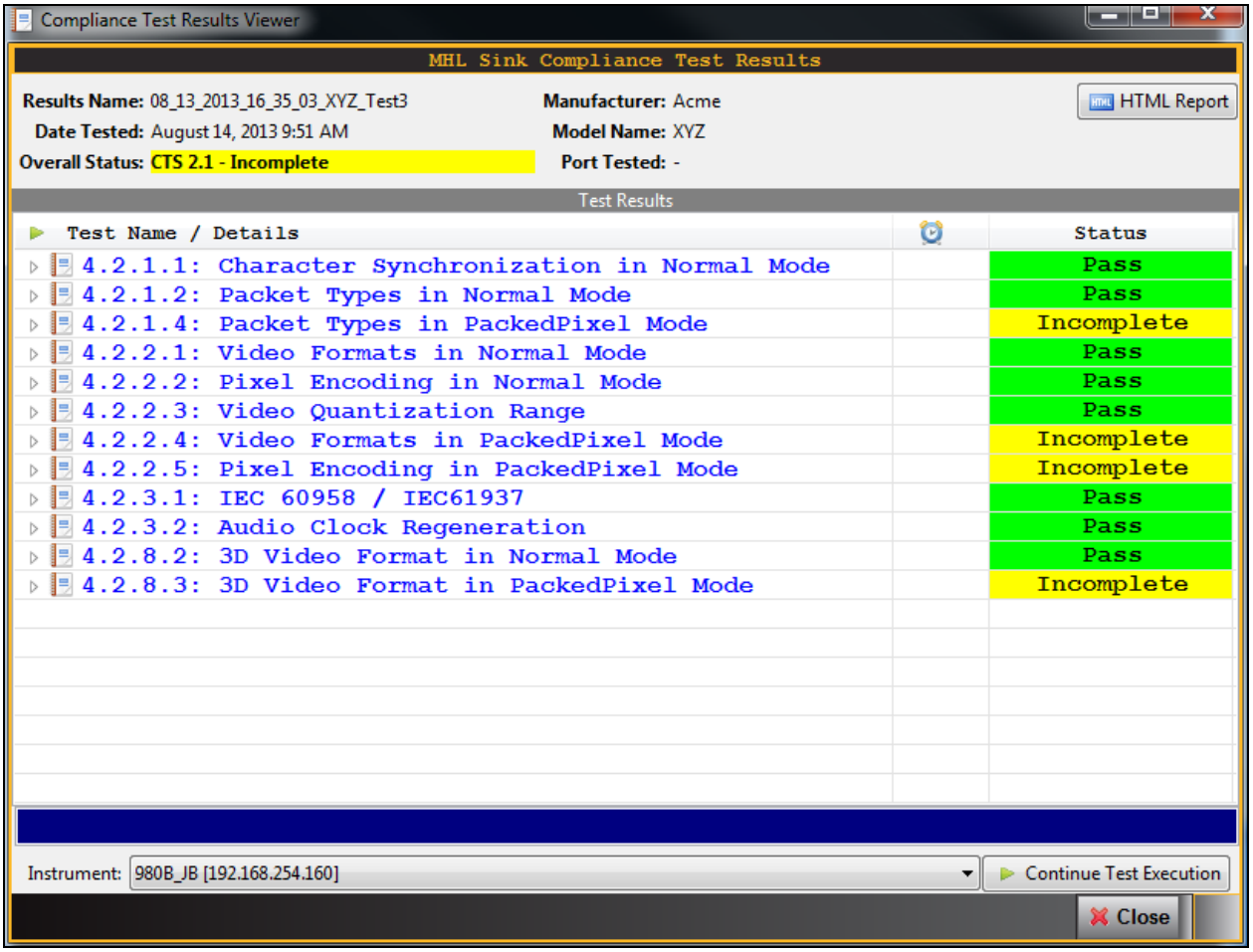
To view a Details results:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.

2. Select Details and either double click or click on the **Open**  icon as shown below.



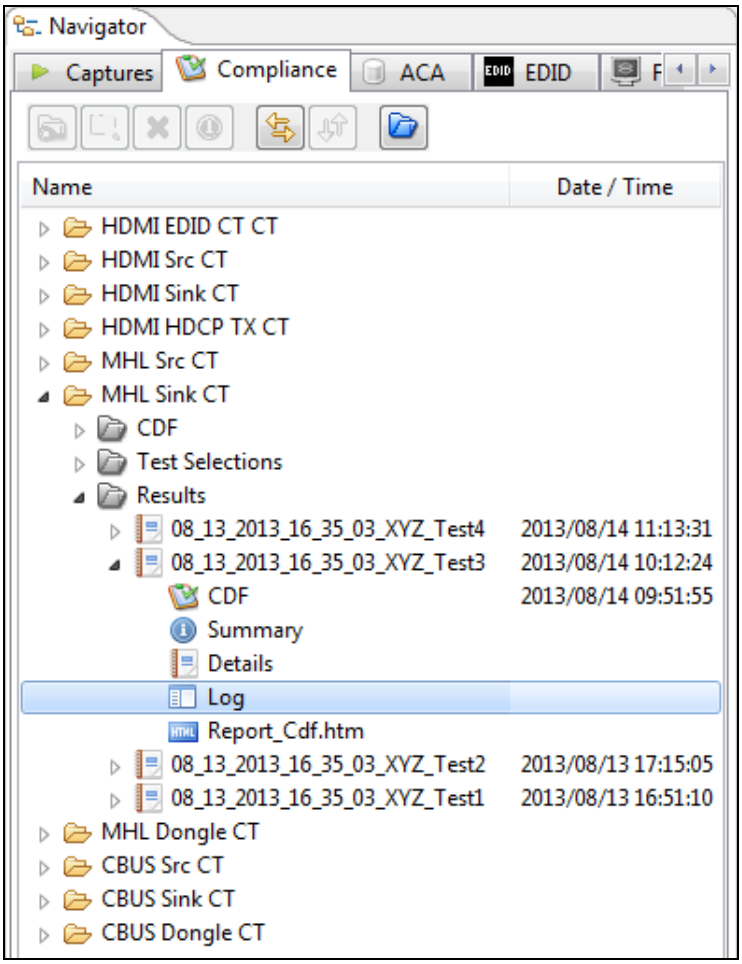
The Details file appears in a new window as shown below.



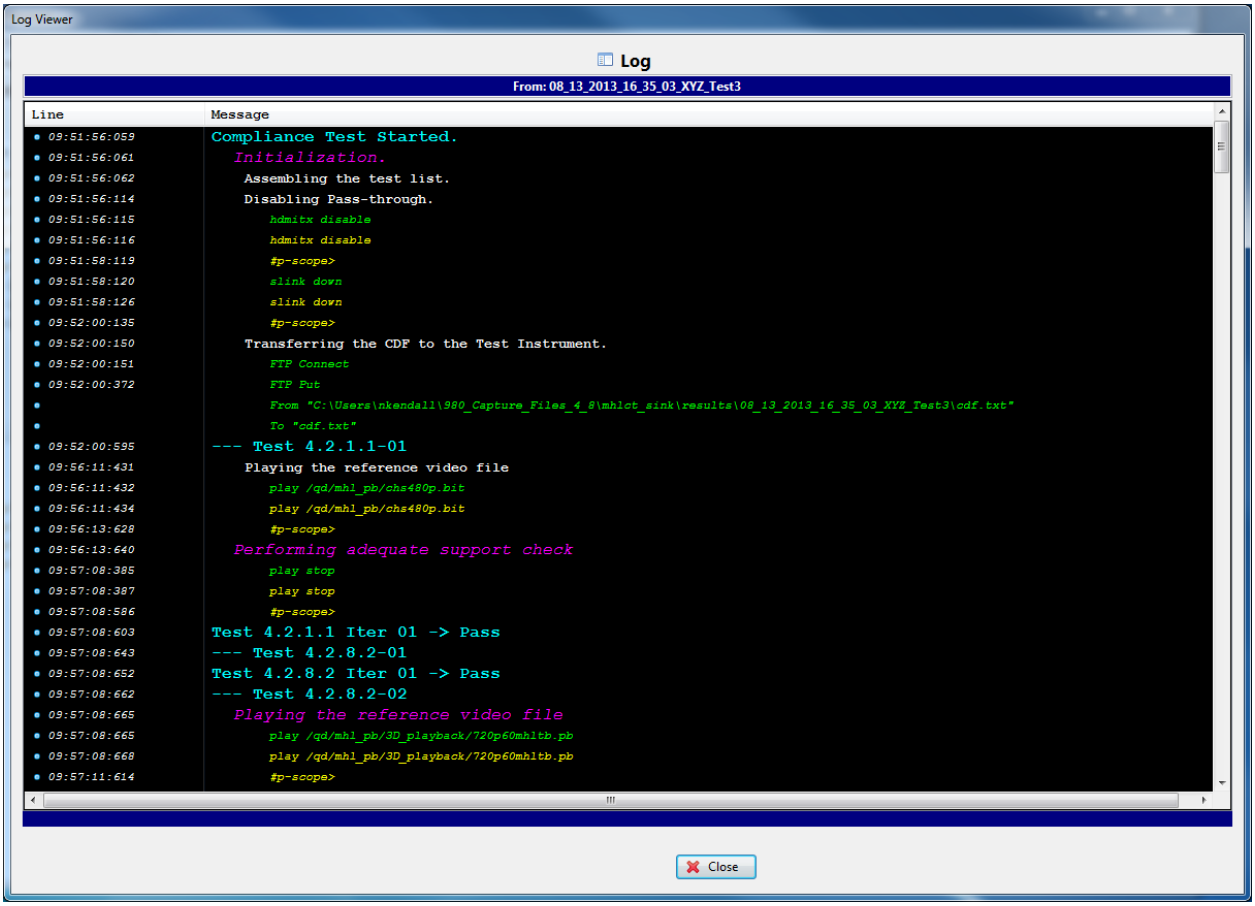
To view the detailed Log of the results:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.

2. Select Log and either double click or click on the **Open**  icon as shown below.



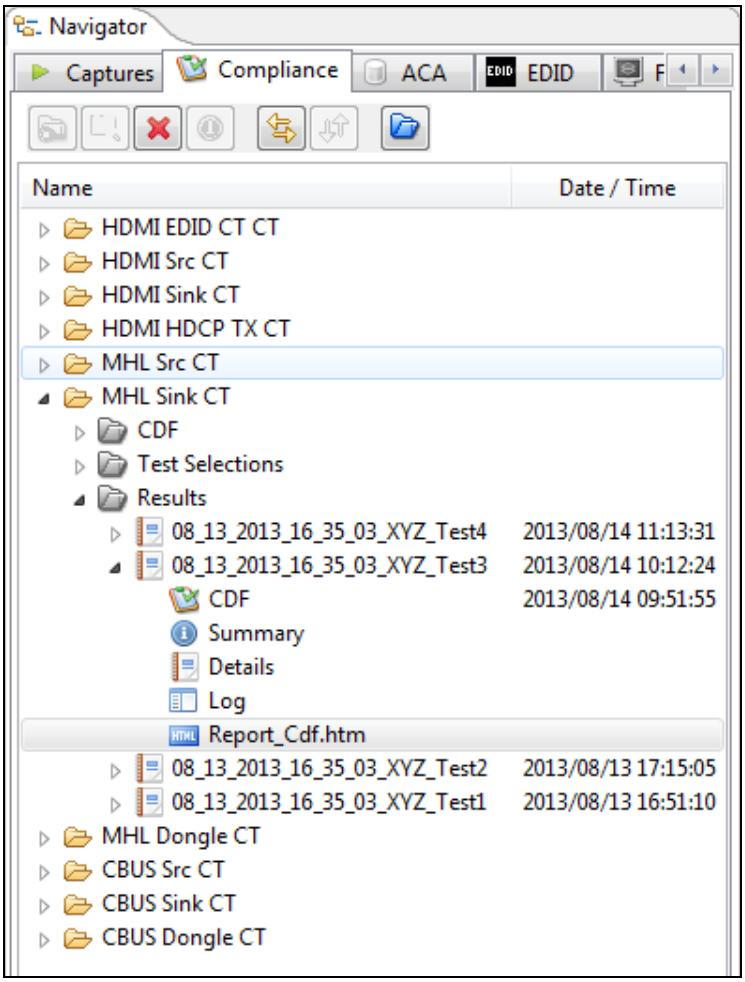
The detail Log appears in a new window as shown below.



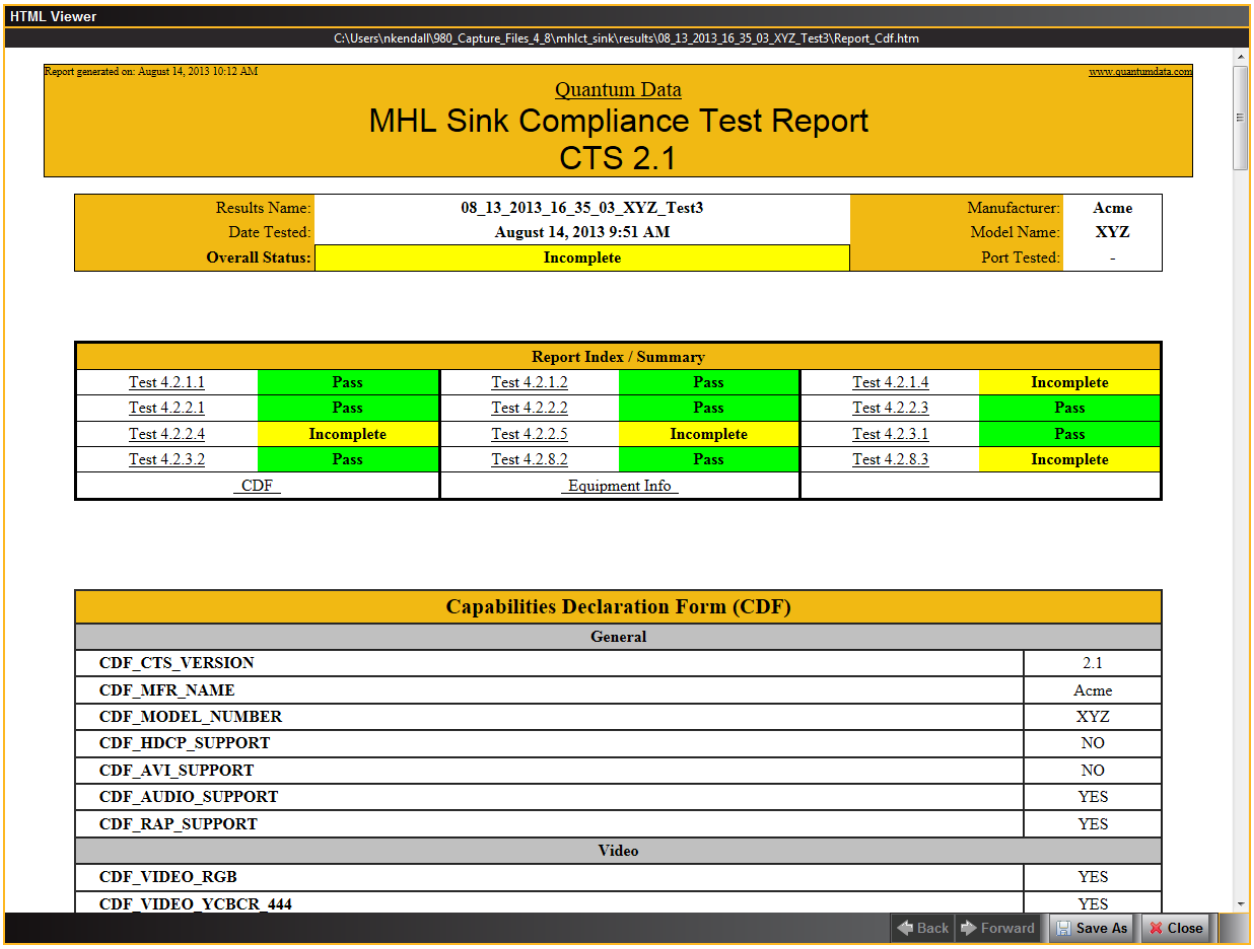
To view the HTML report:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.

2. Select Report_CDF and either double click or click on the **Open**  icon as shown below.

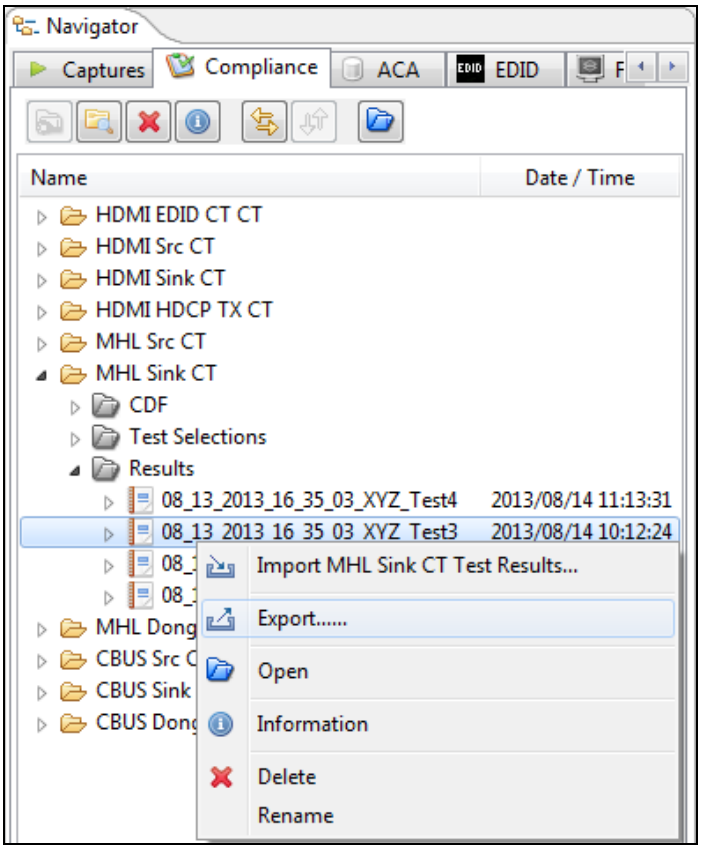


The HTML report appears in a new window as shown below.



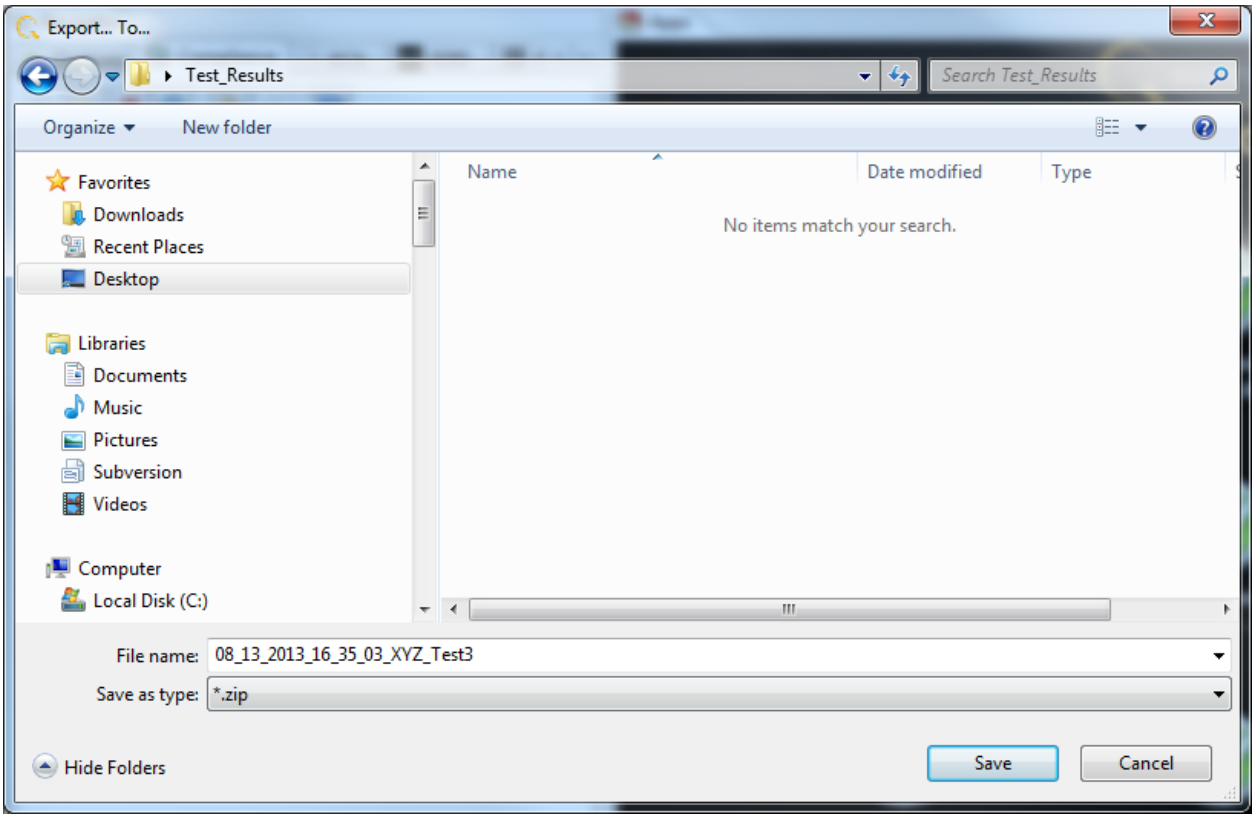
To disseminate the results to others:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.
2. Right click on the set of results you wish to disseminate and select Export as shown below.



A Window opens up for you to browse to a directory to store the files.

3. Select **Save** to save the result files. A zip file is created and stored in the directory. You can now email the file or post the file on an FTP site or store on a storage service (e.g. dropbox).


Export... To...
Test_Results
Search Test_Results
Organize
New folder
Favorites
Downloads
Recent Places
Desktop
Libraries
Documents
Music
Pictures
Subversion
Videos
Computer
Local Disk (C:)
Name
Date modified
Type
No items match your search.
File name:
08_13_2013_16_35_03_XYZ_Test3
Save as type:
*.zip
Hide Folders
Save
Cancel

6 MHL Dongle Compliance Tests

This chapter describes how to use the MHL dongle compliance test feature. Please note you will have to purchase the 980 MHL Sink Compliance Test option in order to run these tests. ***Also note that this test suite requires the Quantum Data 882 instrument, release 2.25.0 which uses firmware version 20.1887600.*** The 980 HDMI Protocol Analyzer serves only as a controller for running the MHL sink/dongle compliance tests (except where noted) as a convenience to owners of the 882 test instrument. The following test sections in the MHL 1.2, 1.3, 2.0 and 2.1 Dongle Compliance Test specification are supported through the 980 GUI Manager:

Dongle Compliance Tests

- 5.2.1 Dongle - System Tests
  - Test ID 5.2.1.1 – Character Synchronization Normal Mode
  - Test ID 5.2.1.2 – Packet Types Normal Mode
  - Test ID 5.2.1.3 – Character Synchronization Packed Pixel Mode (MHL 1.3, 2.0, 2.1 only)
  - Test ID 5.2.1.4 – Packet Types Packed Pixel Mode (MHL 1.3, 2.0, 2.1 only)
- 5.2.2 Dongle - Video Tests
  - Test ID 5.2.2.1 – Video Formats Normal Mode
  - Test ID 5.2.2.2 – Pixel Encoding Normal Mode
  - Test ID 5.2.2.3 – Video Quantization
  - Test ID 5.2.2.4 – Video Formats (MHL 1.3, 2.0, 2.1 only)
  - Test ID 5.2.2.5 – Pixel Encoding Packed Pixel Mode (MHL 1.3, 2.0, 2.1 only)
- 5.2.3 Dongle - Audio Tests
  - Test ID 5.2.3.1 – IEC 60958 / IEC 61937
  - Test ID 5.2.3.2 – Audio Clock Regeneration
- 5.2.7 Dongle - RAP Test
  - Test ID 5.2.7.1 – RAP and RAPK Sub-Commands Test (MHL 1.3, 2.0, 2.1 only)
- 5.2.8 Dongle - Audio Tests
  - Test ID 5.2.8.2 – 3D Video Format in Normal Mode (MHL 2.0, 2.1 only)
  - Test ID 5.2.8.3 – 3D Video Format in PackedPixel Mode (MHL 2.0, 2.1 only)

6.1 Workflow for running the MHL Dongle Compliance Tests

The following is the high level workflow for running the MHL Dongle Compliance Tests. This workflow assumes that you have powered up the 980 and established an Ethernet session with the 980 as described in Connection for 980 GUI Manager and 980.

The following is the high level workflow for running the MHL Dongle Compliance Tests.

1. Connect the source device under test to the 980 Protocol Analyzer.
2. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.

Note: You can now select addition formats for testing on an individual test basis. This enables you to run a particular test on a format that is not specified in the CTS.

3. Select the tests that you wish to run from the **Test Selection** panel.
4. Initiate the tests through the **Test Options / Review** panel.
5. View the detailed data for test failures if failures occur.
6. View the results in the **Test Results** panel under the **Navigator** panel.

6.2 Making the physical connections for 980 GUI Manager control

This subsection describes the physical connections required to run the MHL dongle compliance tests. The 980 HDMI Protocol Analyzer and the 980 GUI Manager serve only as a controller for running the MHL Dongle Compliance Tests. The tests are executed by the 882E/EA (except where noted).

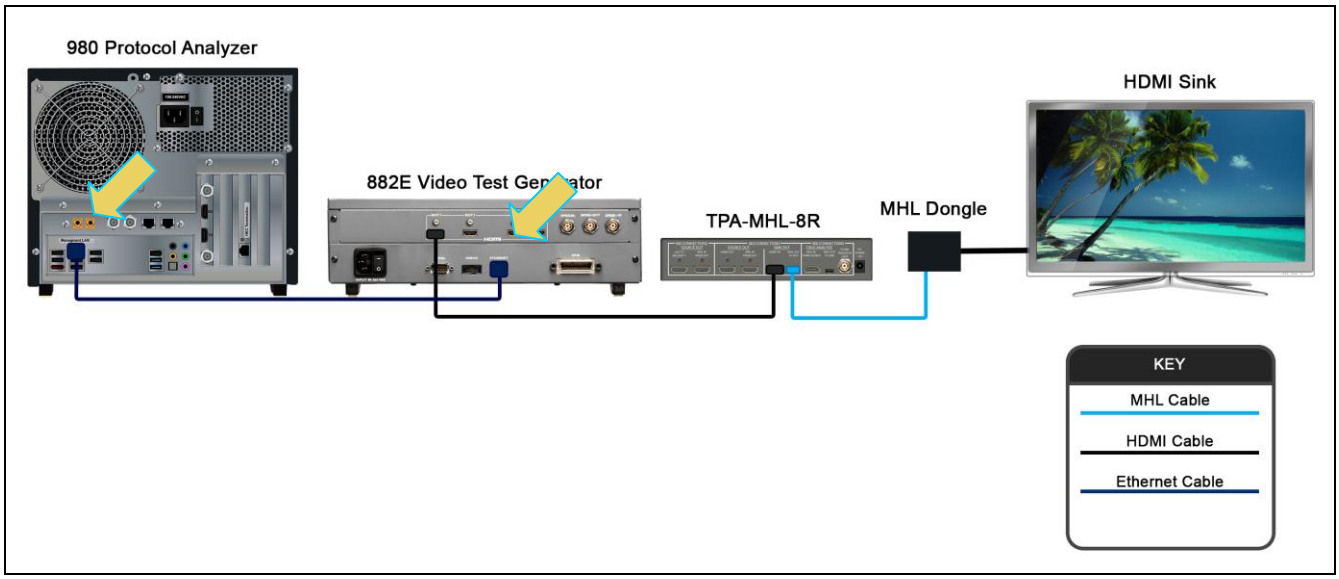
There are three connection scenarios for running and controlling the tests through the 980 GUI Manager application. These scenarios are described below and shown in the set up diagrams that follow:

- Using the embedded 980 GUI Manager running on the 980.
- Using the external 980 GUI Manager with point to point Ethernet configurations between the 980 and the Host PC (where the external 980 GUI Manager resides) and between the 980 and the 882.
- Using the external 980 GUI Manager and connecting from a Host PC to the 980 and 882 through a corporate Ethernet LAN.

To make the physical Ethernet connections when using the embedded GUI Manager:

Use this procedure when you are running the MHL sink compliance test suite through the embedded 980 GUI Manager. This procedure assumes that you have assembled the 882, 980 HDMI Protocol Analyzer and sink device under test and applied power to all these devices. Refer to the procedures and diagram below.

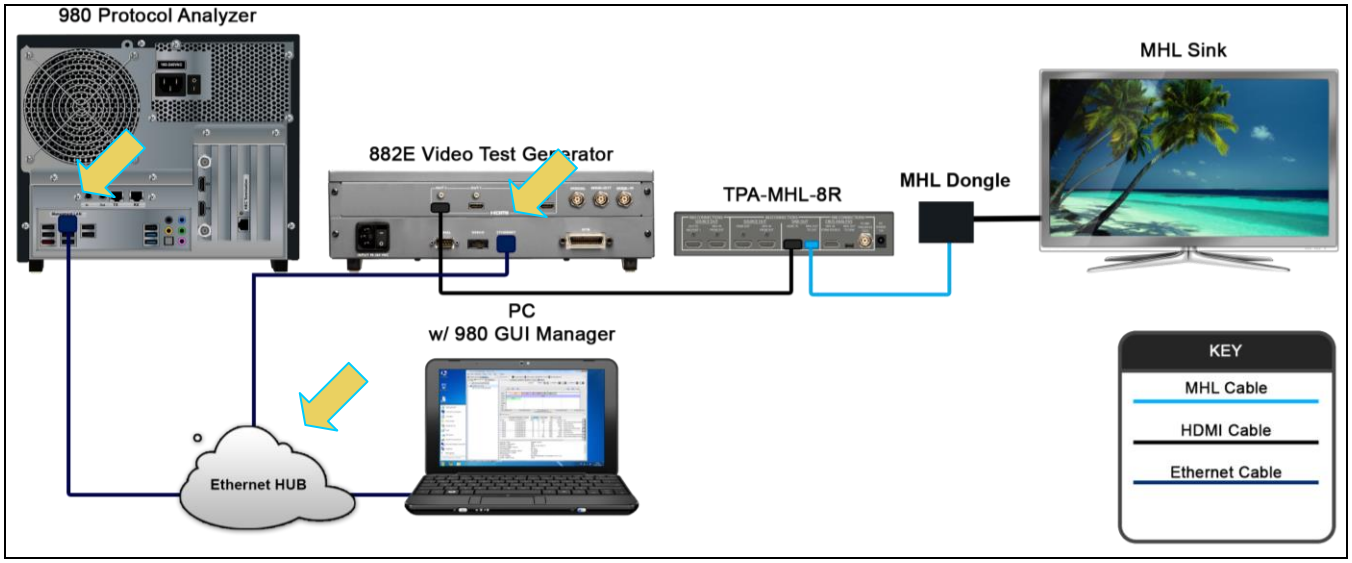
1. Connect an Ethernet cable from the 980 Ethernet jack on the lower left half of the back panel of the 980 HDMI Protocol Analyzer frame (refer to the diagram below) to the 882EA Ethernet jack. The IP address on this port can be configured using the procedures at Connection Scenarios for 980 Manager to 980 Protocol Analyzer.



Ethernet direct connection for MHL dongle compliance testing (MHL 1.2 example shown)

To make the physical connections using Ethernet network connections with the external GUI Manager:

This procedure assumes that you have assembled the 882, Host PC, 980 Protocol Analyzer and sink device under test and applied power to all these devices. Refer to the procedures and diagram below.



Ethernet connection through Hub for MHL dongle compliance testing (MHL 1.2 example shown)

1. Connect an Ethernet cable from your PC hosting the external 980 GUI Manager to an Ethernet jack on your corporate network or Ethernet hub.
2. Connect an Ethernet cable from the 882 to an Ethernet jack on your corporate network or Ethernet hub.
3. Connect an Ethernet cable from the 980 Ethernet jack on the lower left half of the back panel of the 980 Protocol Analyzer frame to an Ethernet jack on your corporate network or Ethernet hub. The IP address on this 980 port is configurable using the procedures at: Setting the IP address of the 980 Protocol Analyzer. Refer to the diagram below.

6.2.1 Setting the IP address of the 980/980B

This procedure describes how to set the IP address of the 980 HDMI Protocol Analyzer module. You can change the 980's IP address through the 980's front panel touch screen display. You can also allow the network DHCP server to assign an IP address. This procedure assumes that you have powered up the 980, have the physical Ethernet connections in place and that the embedded 980 GUI Manager has been launched.

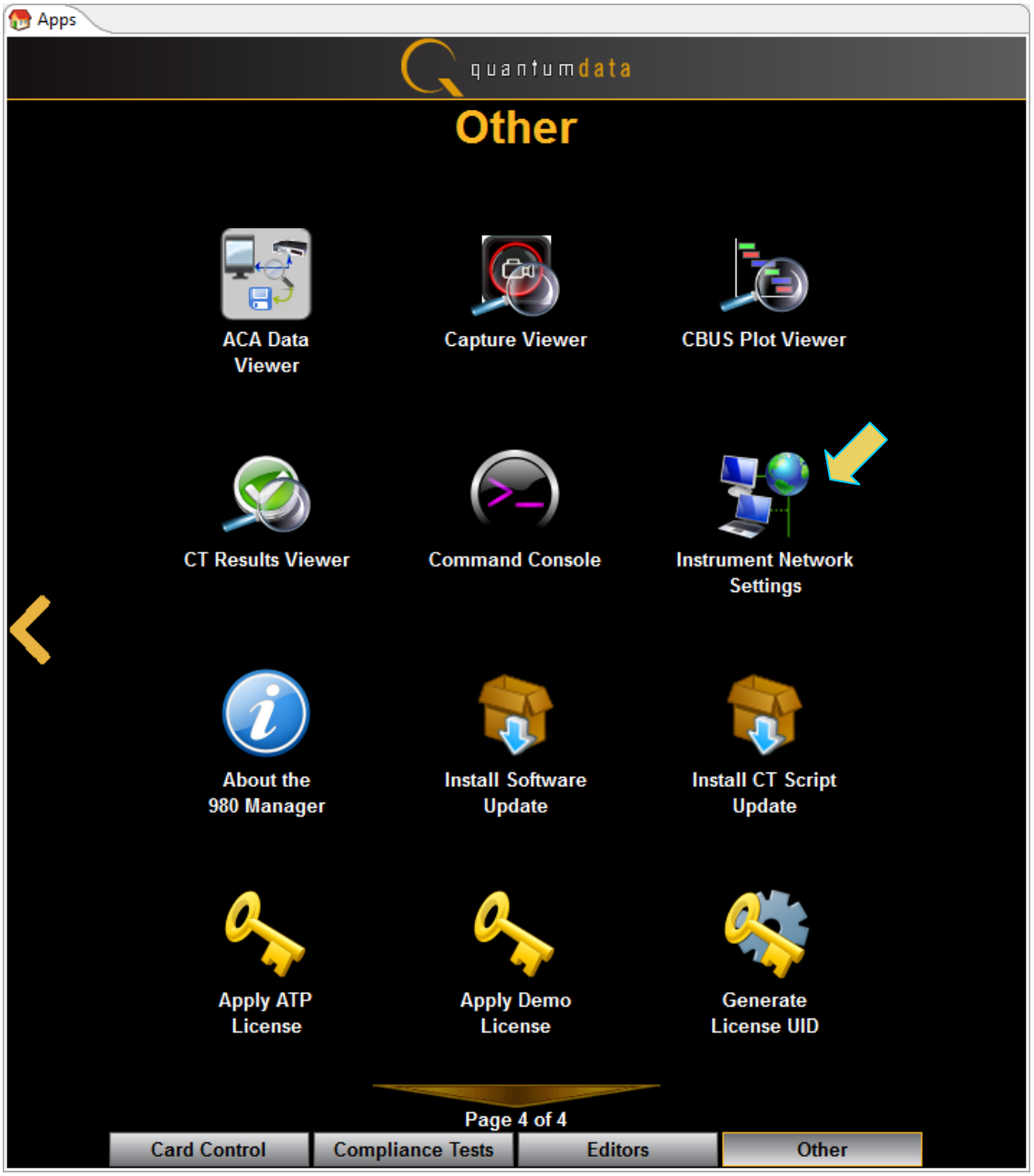
If you are using the external 980 GUI Manager it will be running on your laptop or host PC you will be connecting the 980 GUI Manager to the 980/980B through your corporate LAN network or a local Ethernet hub. You will need to ensure that the IP addresses of the 980 and the network interface card on your host PC and the 882 are compatible. To be compatible, the IP addresses must have the same network portions of their IP address but different host portions. The 980 is provisioned with a default IP address (192.168.1.10). You can either assign an IP address to the 980 directly or allow the network DHCP server to assign one to the 980 that is compatible with your corporate network. The procedures for changing the IP address of the 980 are provided in the following subsection.

If you are using the embedded 980 GUI Manager you will only have to ensure that the IP address of the 980 is compatible with the IP address of the 882. But you can set the IP address of the 882 through the 980 GUI Manager.

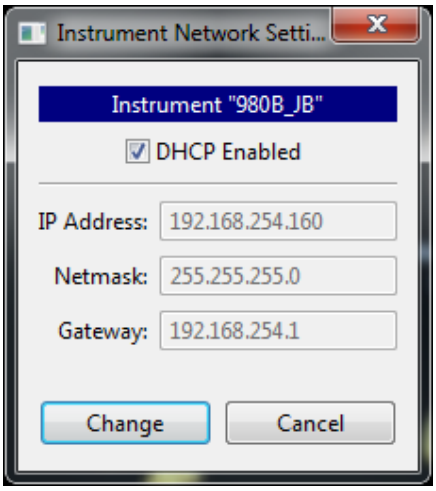
To set the IP address of the 980 through the embedded 980 GUI Manager:

This procedure assumes that you have established a physical Ethernet connection between your PC and the 980. Note that you will have to use the embedded 980 GUI Manager to set the IP address for the initial connection.

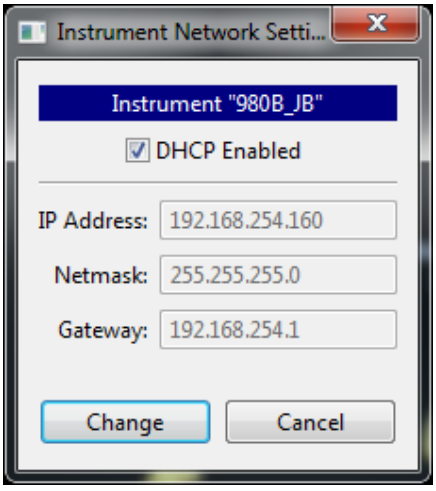
1. Touch select the Instrument Network Settings icon on Page 4 (Other apps) page as shown below.



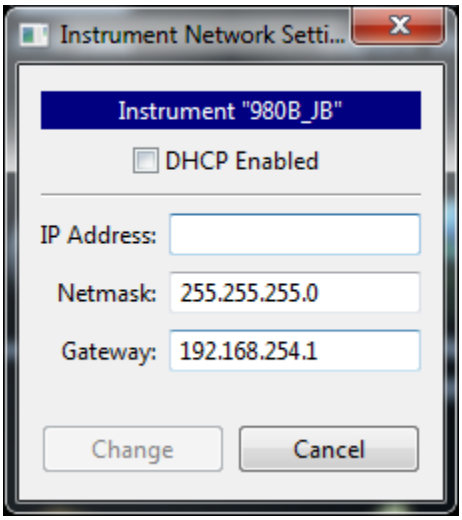
A dialog box will appear showing the current IP address and enabling you to reset the IP address.



2. If the IP address of the 980 is compatible with IP address of your PC and corporate network, no further action is required. If you wish to change the IP address, continue.
3. If you are wish to allow the 980/980B's IP address to be set through DHCP services, select the DHCP Checkbox as shown below.

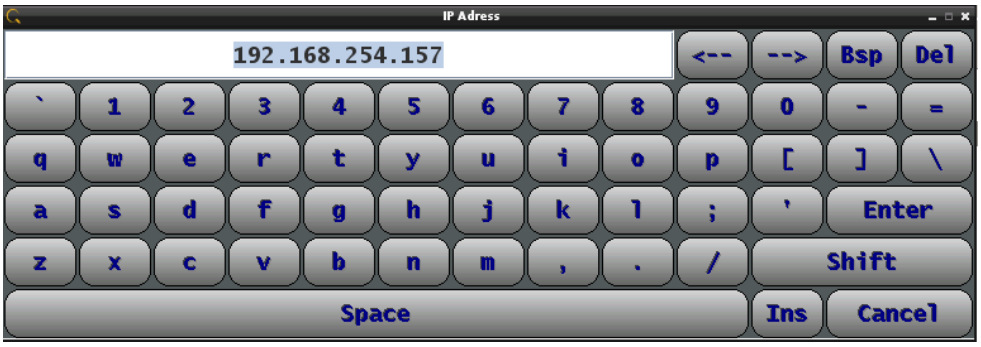


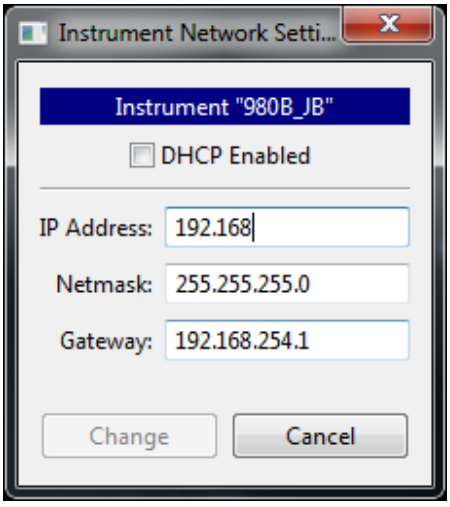
4. Alternatively, if you wish to set the IP address without DHCP, deselect DHCP checkbox (below).
5. Touch select the **Change** activation button to initiate the change. You do not have to reboot the 980 for the IP address change to take effect.



6. Touch select the IP address field to access the on-line keyboard which enables you to change the IP address. Edit the IP address and press the **Enter** key on the on-line keyboard.

   Note: Be sure to use an IP address that is compatible with your corporate LAN as described above.





7. Touch select the **Change** activation button to initiate the change.

   You do not have to reboot the 980 for the IP address change to take effect.

A dialog box will appear indicating that the IP address is being changed and you will be able to view the new IP address on the bottom status strip next to the **Navigator** button. The information provided will tell you if the IP was set through DHCP or if it was set manually "Static."

To set the IP address of the 980 through the command line

1. Open up a DOS window on your PC.

   Note: This procedure requires a telnet session. Use standards Windows OS utilities or third party utilities.

2. Establish a telnet session to the 980 using the default IP address as follows:

   ```
   telnet 192.168.1.10
   ```

   You will be prompted with the `Pscope login`: prompt. Enter the following for a user name and password:

   ```
   Pscope login: qd
   ```

   ```
   Password: qd
   ```

   When the `p-scope` prompt appears, you will need to execute a command to change its IP address using the following command:

   ```
   Setip <IP_address> <subnet mask> <gateway>
   ```

   Note: You will have to include the subnet mask and gateway address as arguments.

   The following is an example:

   ```
   p-scope> setip 192.168.254.100 255.255.255.0 192.168.254.1
   ```

   ```
   If you wish to use DHCP to set the IP address, use the following command:
   ```

```
p-scope> setip dhcp
```

Reboot the 980 by pressing the power button on the lower middle part of the front panel bezel. When the 980 initializes, you will be able to view the new IP address on the bottom status strip next to the **Navigator** button.

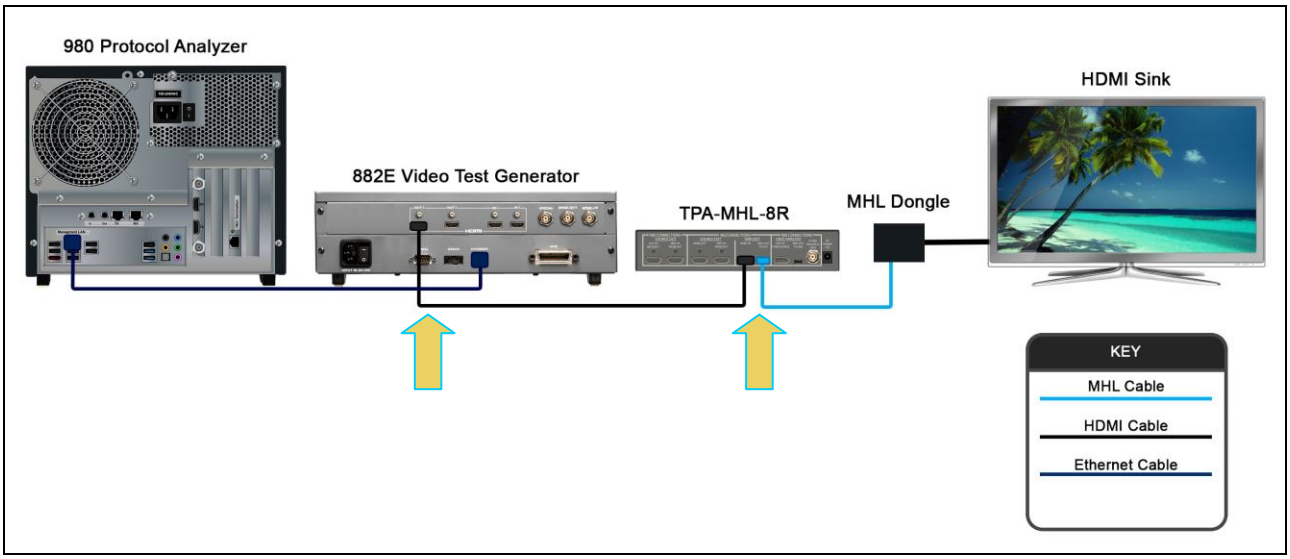
6.3 Making the physical connections for the MHL Dongle Device Under Test

This subsection describes the physical connections required to run the MHL dongle compliance tests. The 980 HDMI Protocol Analyzer and the 980 GUI Manager serve only as a controller for running the MHL dongle compliance Tests. The tests are executed by the 882E/EA (except where noted).

You will use one of the Quantum Data Test Point Adapters (TPAs) between the MHL sink device under test and the 882for these tests. There are two TPAs: 1) for MHL CTS 1.2 testing you will use the TPA-MHL-8R Test Point Adapter; 2) for MHLCTS 2.0 testing you will use the TPA-MHL2-8R Test Point Adapter. The tests are executed by the 882.

Making the physical HDMI and MHL connections for MHL 1.2 CTS testing

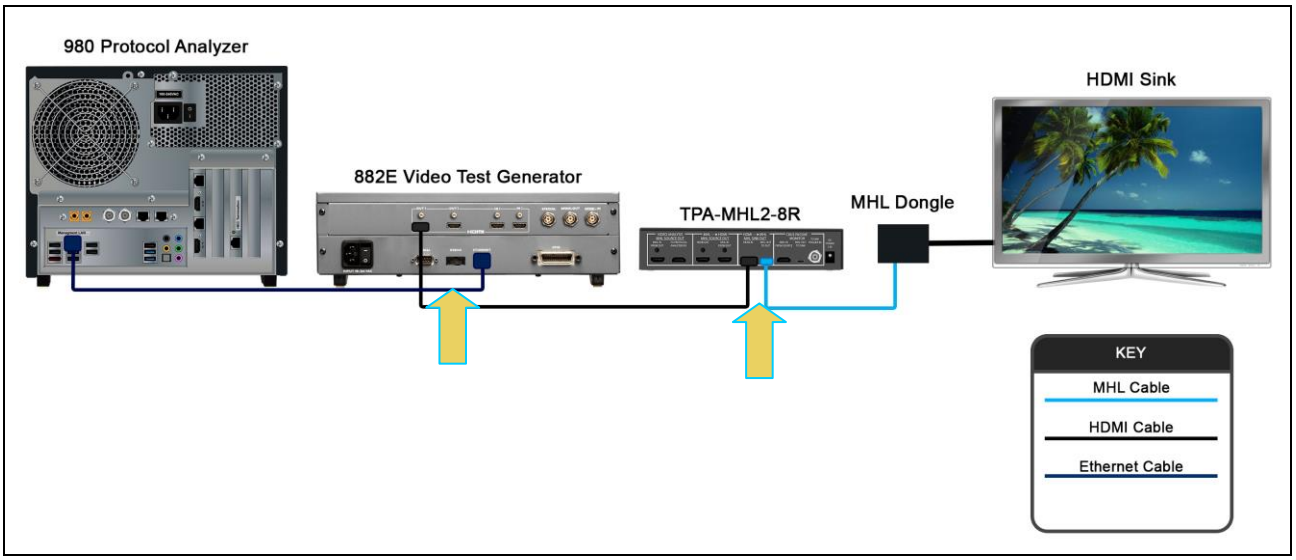
1. Connect an HDMI cable from the Quantum Data 882 HDMI Out 1 port to the TPA-MHL-8R Test Point Adapter. Use the **HDMI IN** connector on the section on the TPA labeled **882 CONNECTIONS – SINK DUT**.
2. Connect the TPA-MHL-8R Test Point Adapter to the MHL dongle device under test. Use the **MHL OUT TO DUT** connector on the section on the TPA labeled **882 CONNECTIONS – SINK DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.



Connection for MHL 1.2 dongle compliance testing

Making the physical HDMI and MHL connections for MHL 1.3, 2.0, 2.1 CTS testing

1. Connect an HDMI cable from the Quantum Data 882 HDMI Out 1 port to the TPA-MHL2-8R Test Point Adapter. Use the HDMI IN connector on the section on the TPA labeled **HDMI → MHL – MHL SINK DUT**.
2. Connect the TPA-MHL2-8R Test Point Adapter to the MHL sink device under test. Use the **MHL OUT TO DUT** connector on the section on the TPA labeled **HDMI → MHL – MHL SINK DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.



Connection for MHL 1.3, 2.0, 2.1 dongle compliance testing

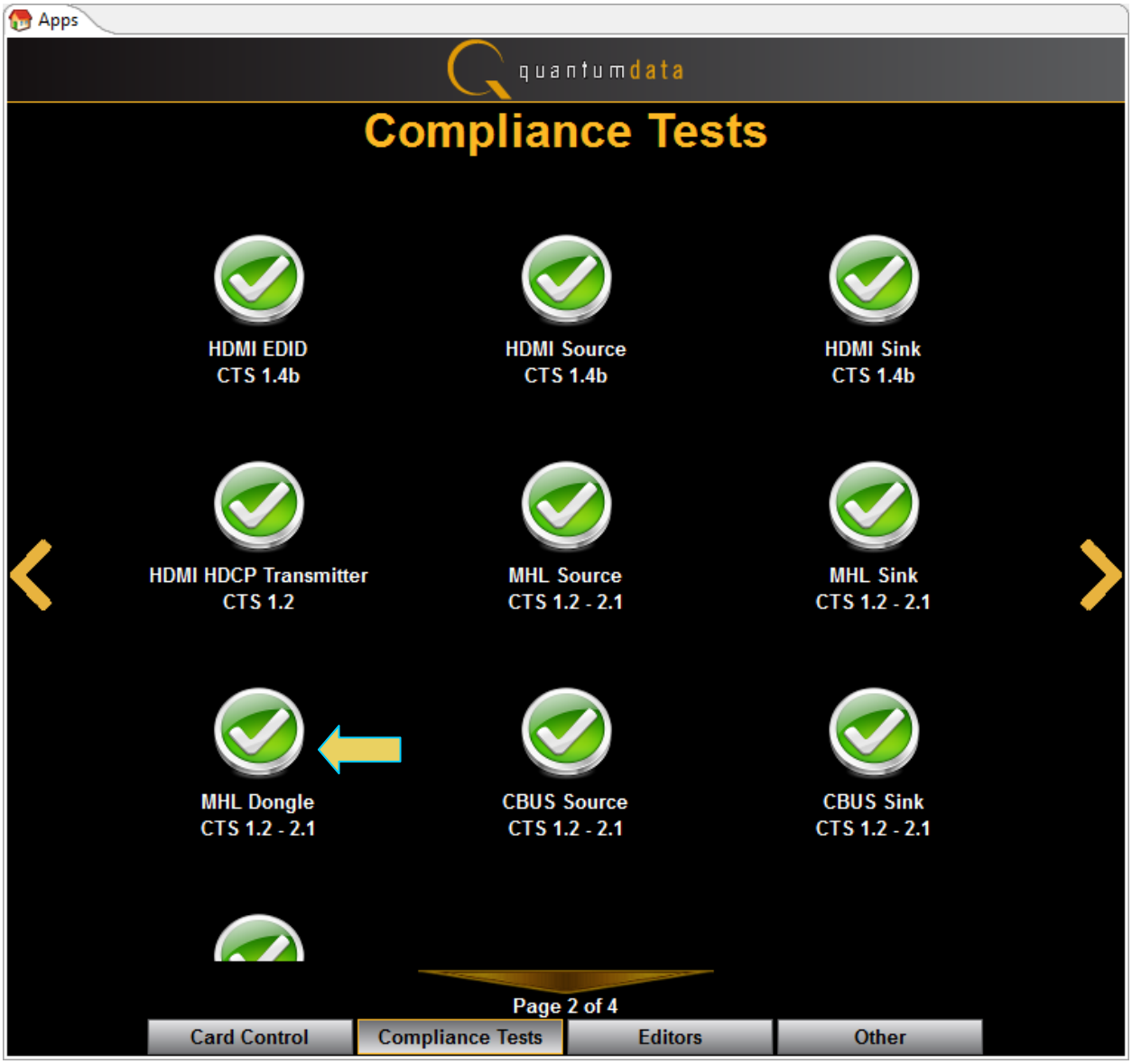
6.4 Completing the CDF

Use the following procedures to complete the CDF for your MHL sink device under test.

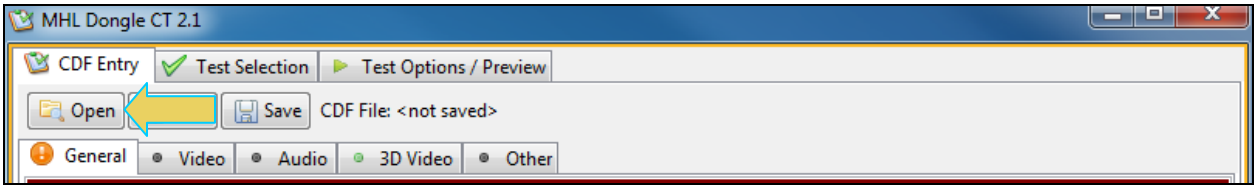
Note: The examples used in this workflow are MHL 2.0 except where noted. The MHL 1.2 workflow is similar.

To complete the CDF:

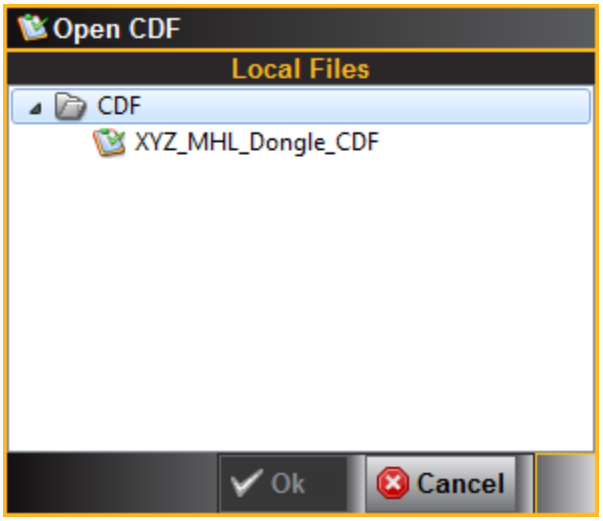
1. From the **View** menu, enable viewing of the **MHL Sink Compliance Test** panel.



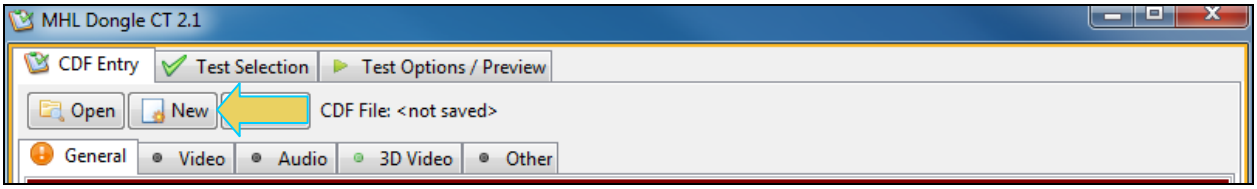
2. To open an existing CDF, click on the **Open** activation button.



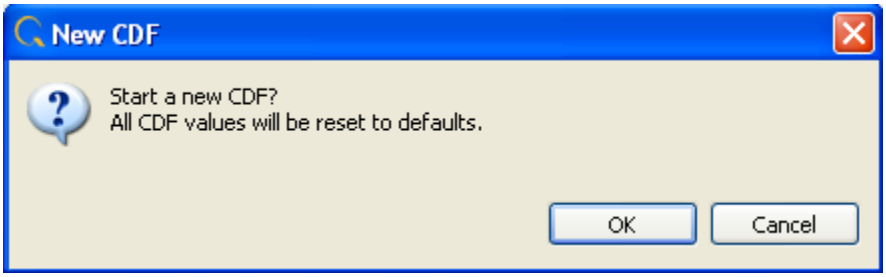
You will be prompted with a dialog box that enables you to open a CDF. Select a CDF and then **OK** to proceed.



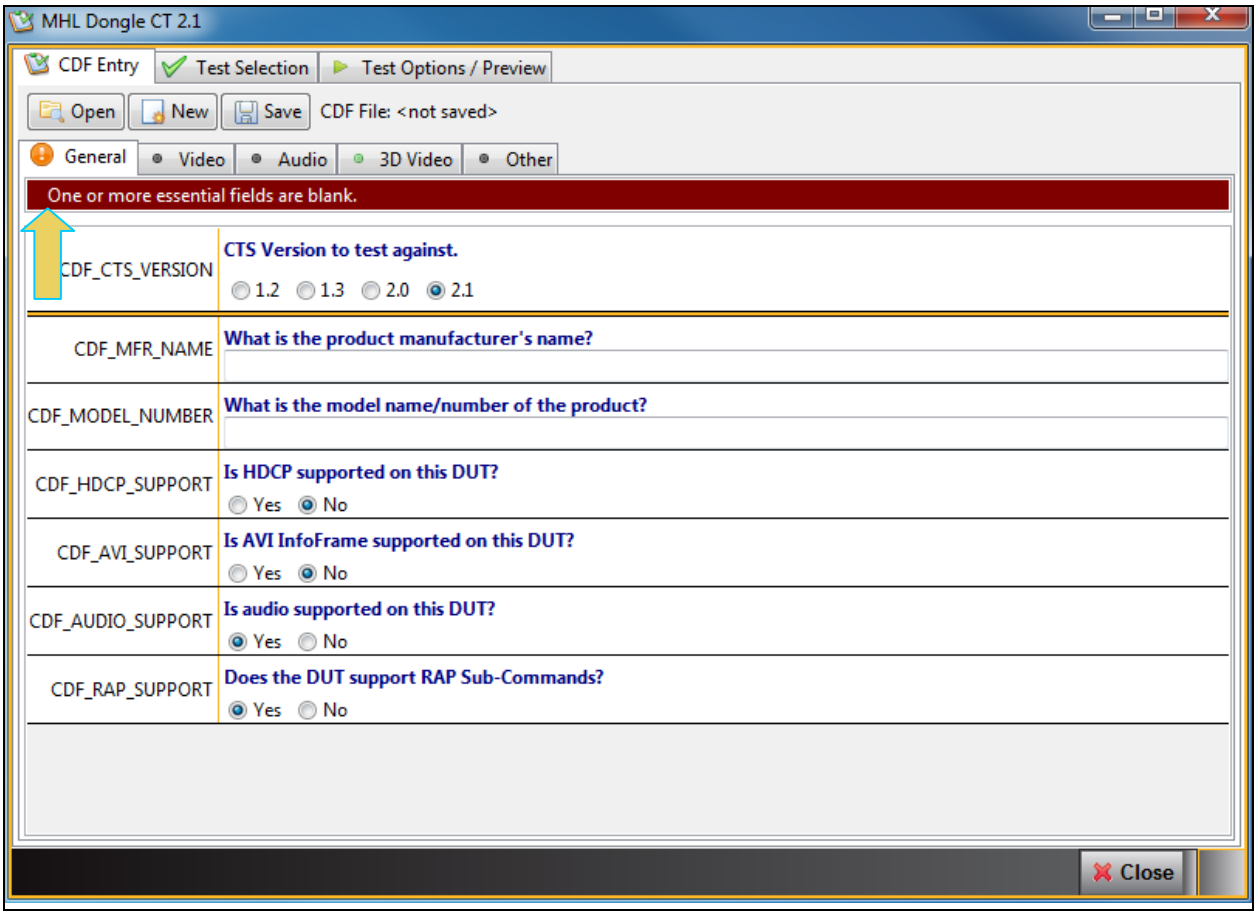
3. To create a new CDF, click on the **New** activation button.



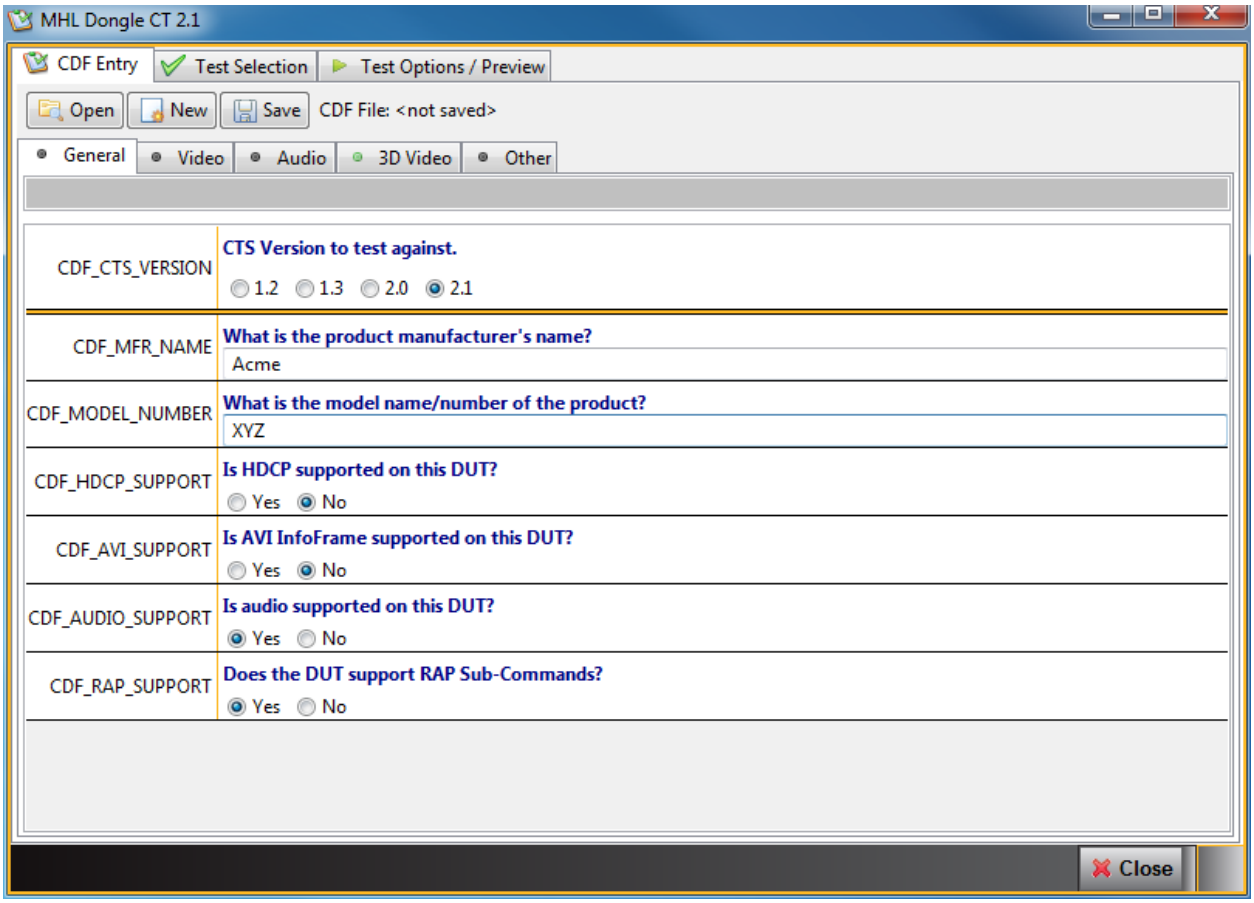
You will be prompted with a confirmation that you want to start a new CDF and reset the values. Click **OK** to proceed.



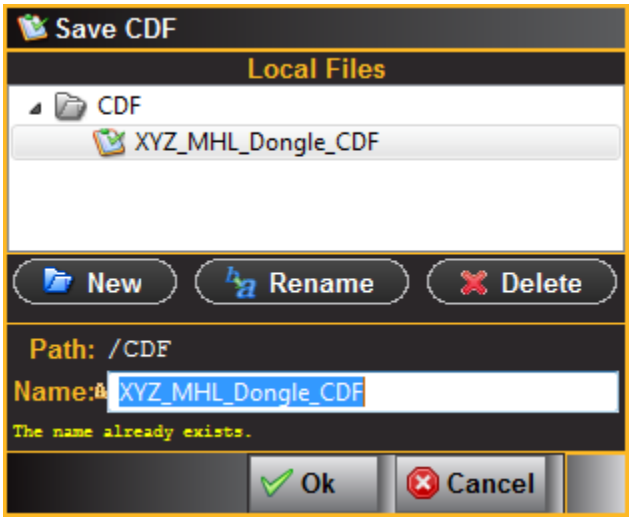
4. Select the **CDF Entry** panel as shown below. Note that a status message and an exclamation point will appear indicating that not all required fields have been completed.


MHL Dongle CT 2.1
CDF Entry
Test Selection
Test Options / Preview
Open
New
Save
CDF File: <not saved>
General
Video
Audio
3D Video
Other
One or more essential fields are blank.
CDF_CTS_VERSION
CTS Version to test against.
1.2 1.3 2.0 2.1
CDF_MFR_NAME
What is the product manufacturer's name?
CDF_MODEL_NUMBER
What is the model name/number of the product?
CDF_HDCP_SUPPORT
Is HDCP supported on this DUT?
Yes No
CDF_AVI_SUPPORT
Is AVI InfoFrame supported on this DUT?
Yes No
CDF_AUDIO_SUPPORT
Is audio supported on this DUT?
Yes No
CDF_RAP_SUPPORT
Does the DUT support RAP Sub-Commands?
Yes No
Close

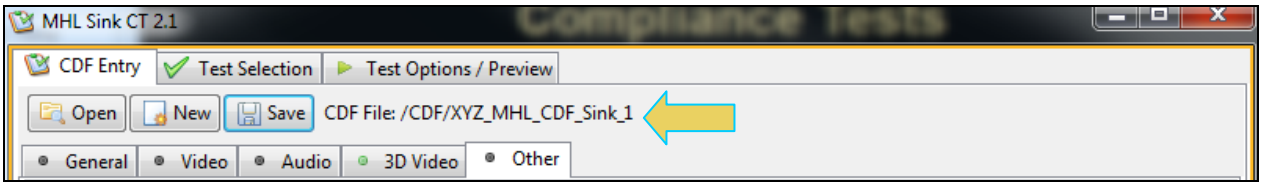
Once you have entered in all the required fields the error indication disappears as shown below:



5. Save the CDF. A confirmation box with a default name will appear as shown below. Edit the name if necessary and click OK.

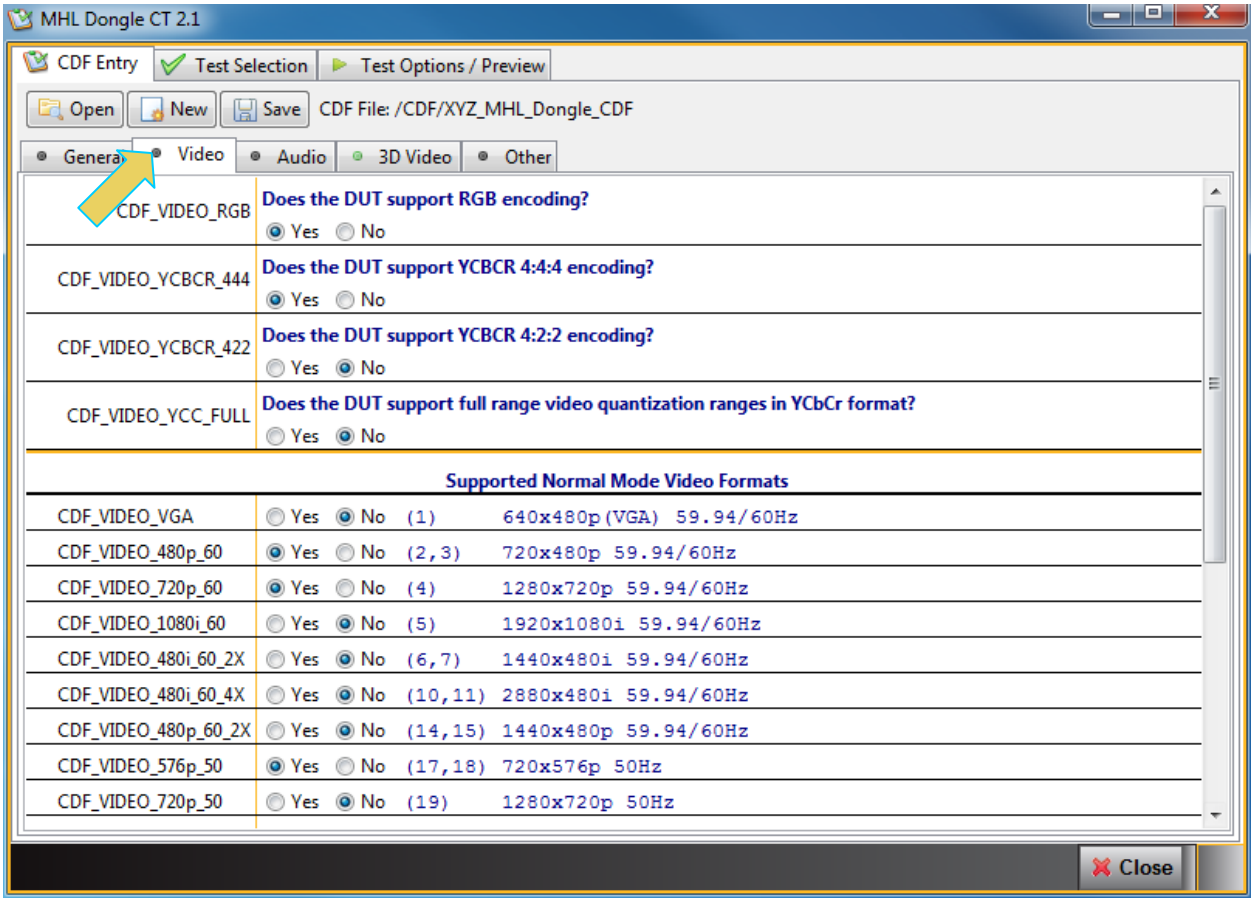


When you save the CDF the name will appear next to the **Save** button as shown below.

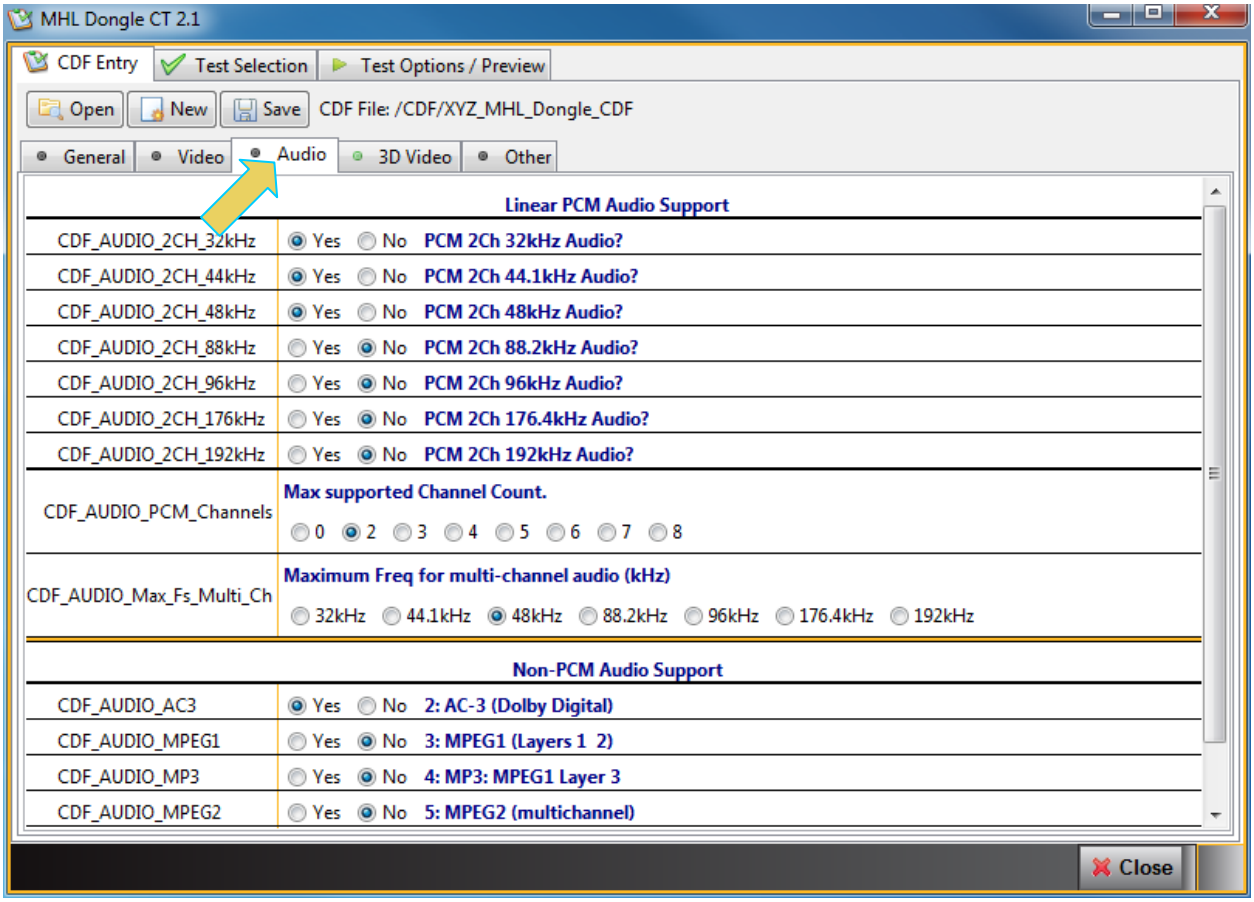


6. Complete the items in the **General** tab of the **CDF Entry** panel shown above.

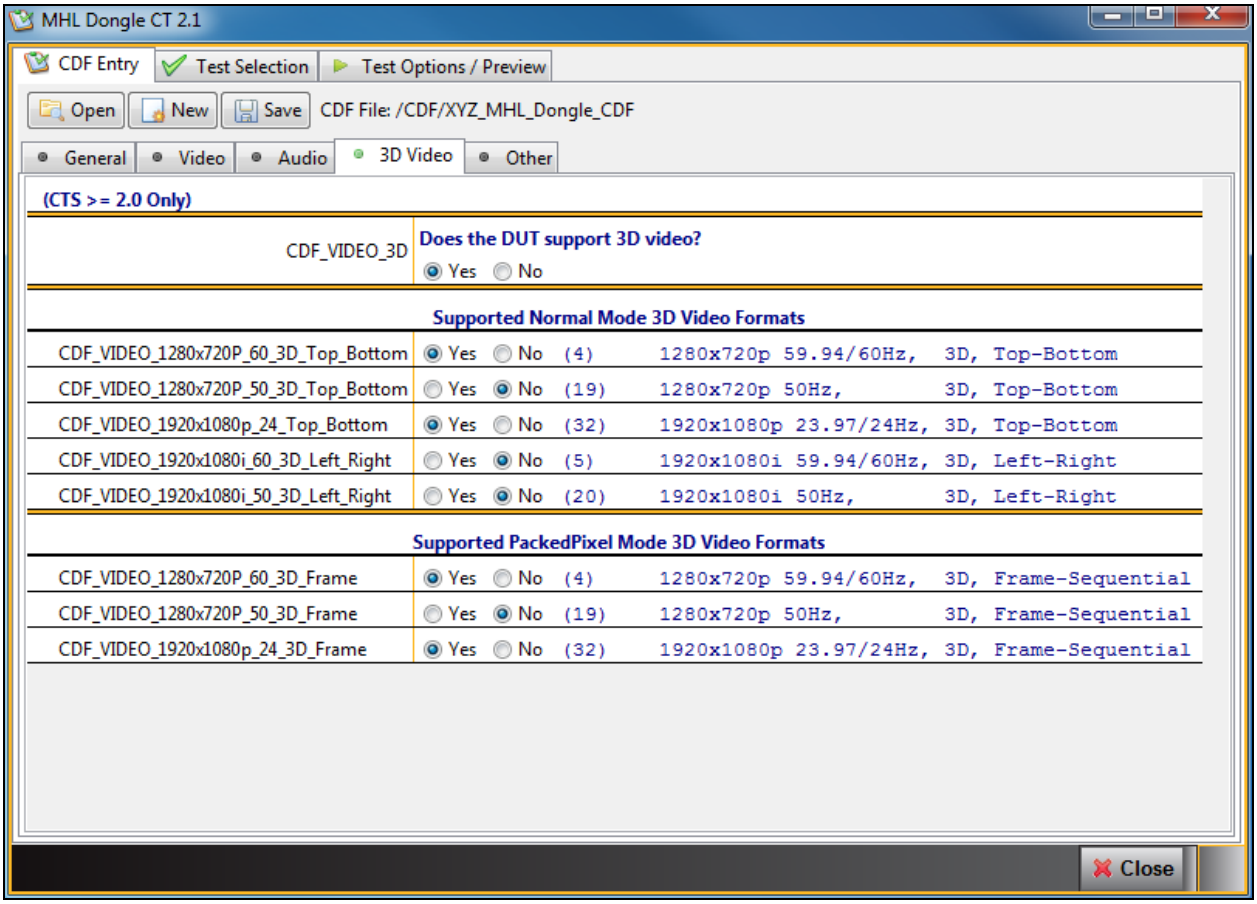
7. Complete the items in the **Video** tab.



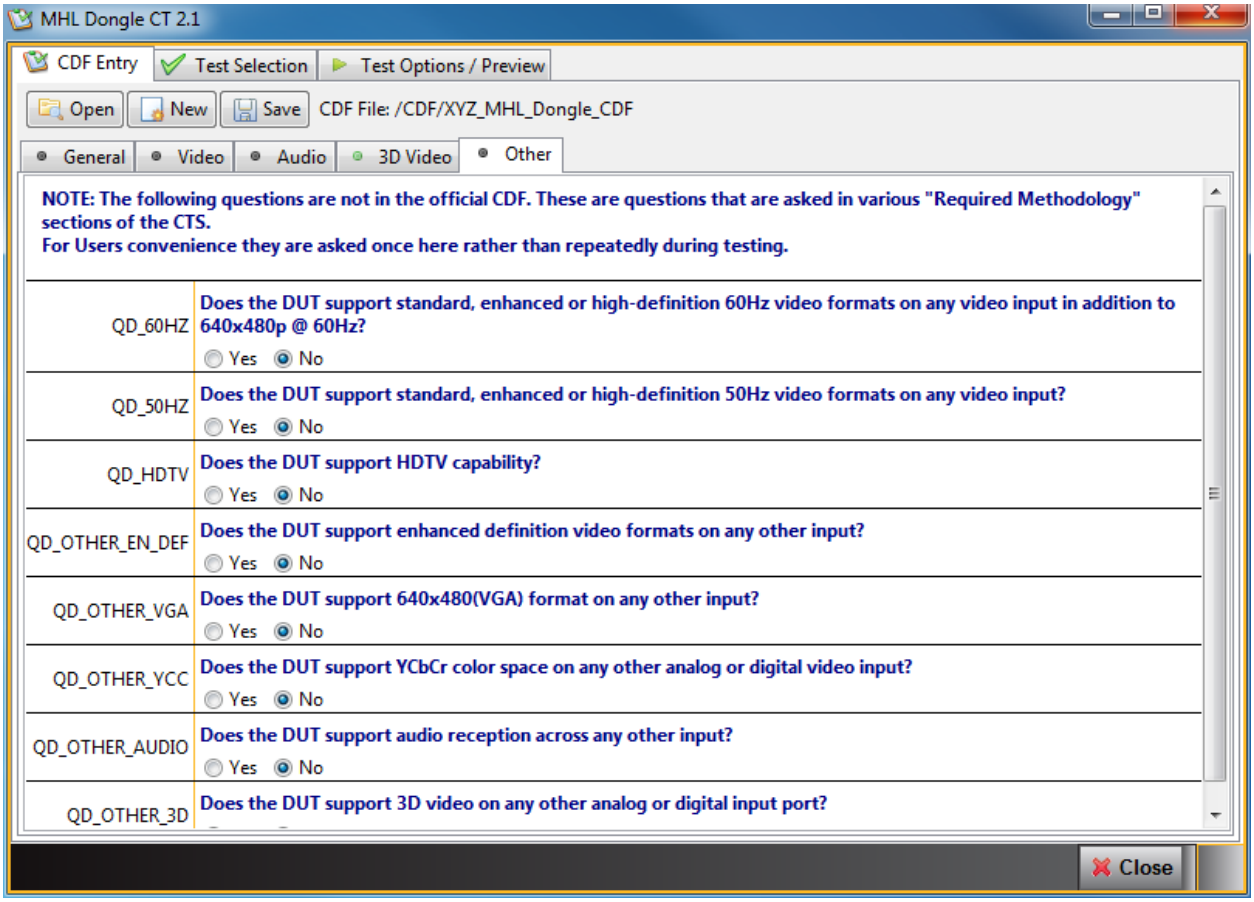
8. Complete the items in the **Audio** tab.



9. Complete the items in the **3D Video** tab.



10. Complete the items in the **Other** tab.

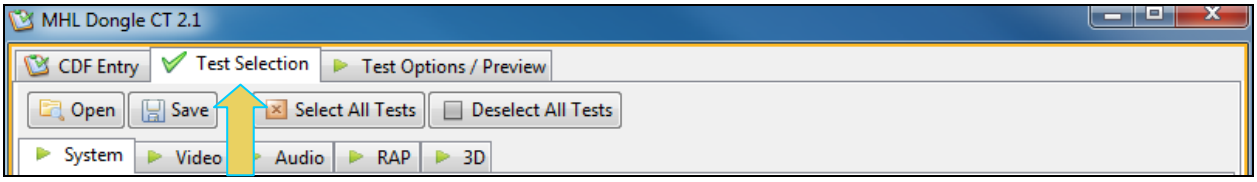


6.5 Selecting which tests to run

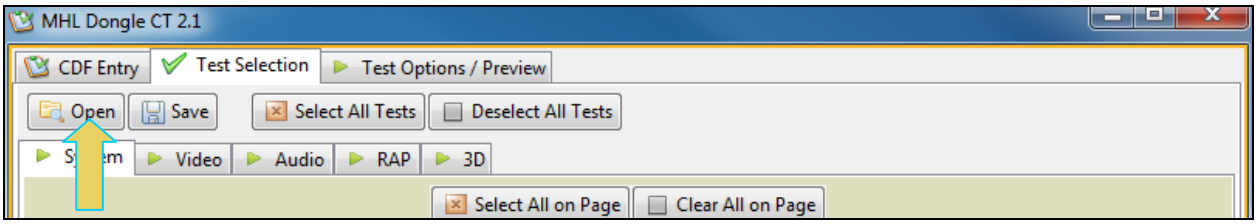
Use the following procedures to select the tests to run. There are multiple tabs which correspond to each section in the CTS.

To select the tests to run:

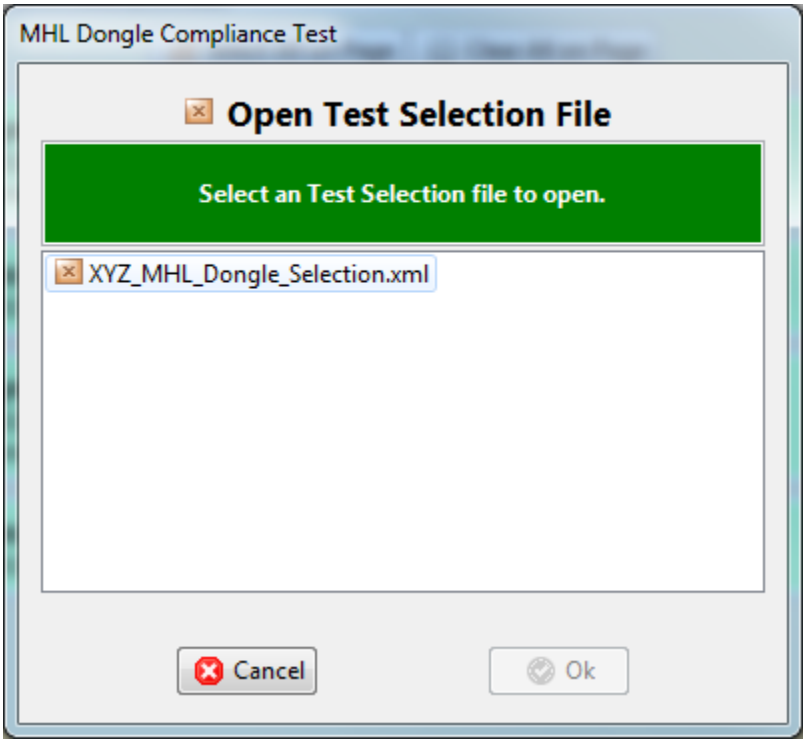
1. Select the **Test Selection** panel as shown below.



2. If you have an existing **Test Selection** option file saved you can recall that for use in your testing. Simply click on the **Open** activation button.

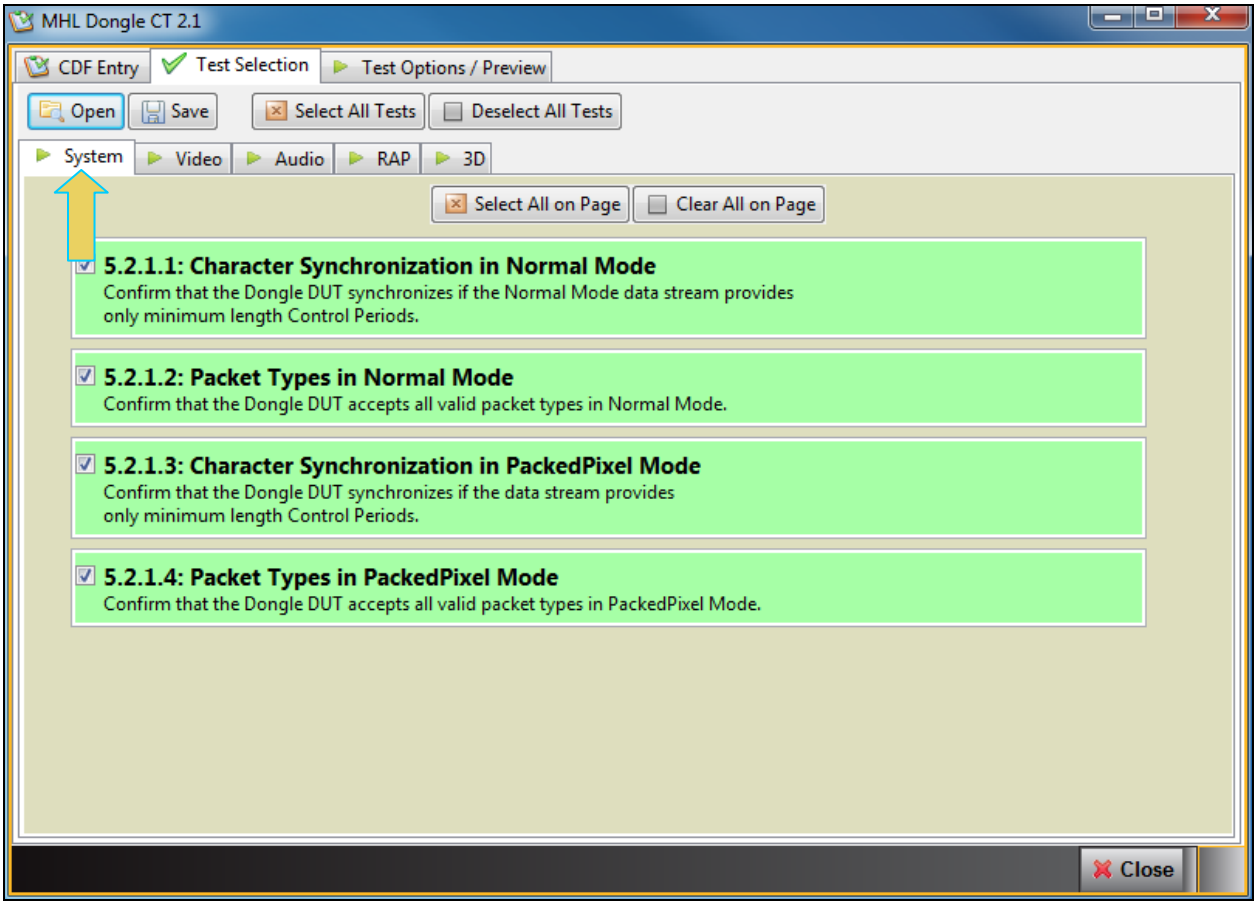


A dialog box will appear as follows. Simply select the file and click on the **OK** activation button.



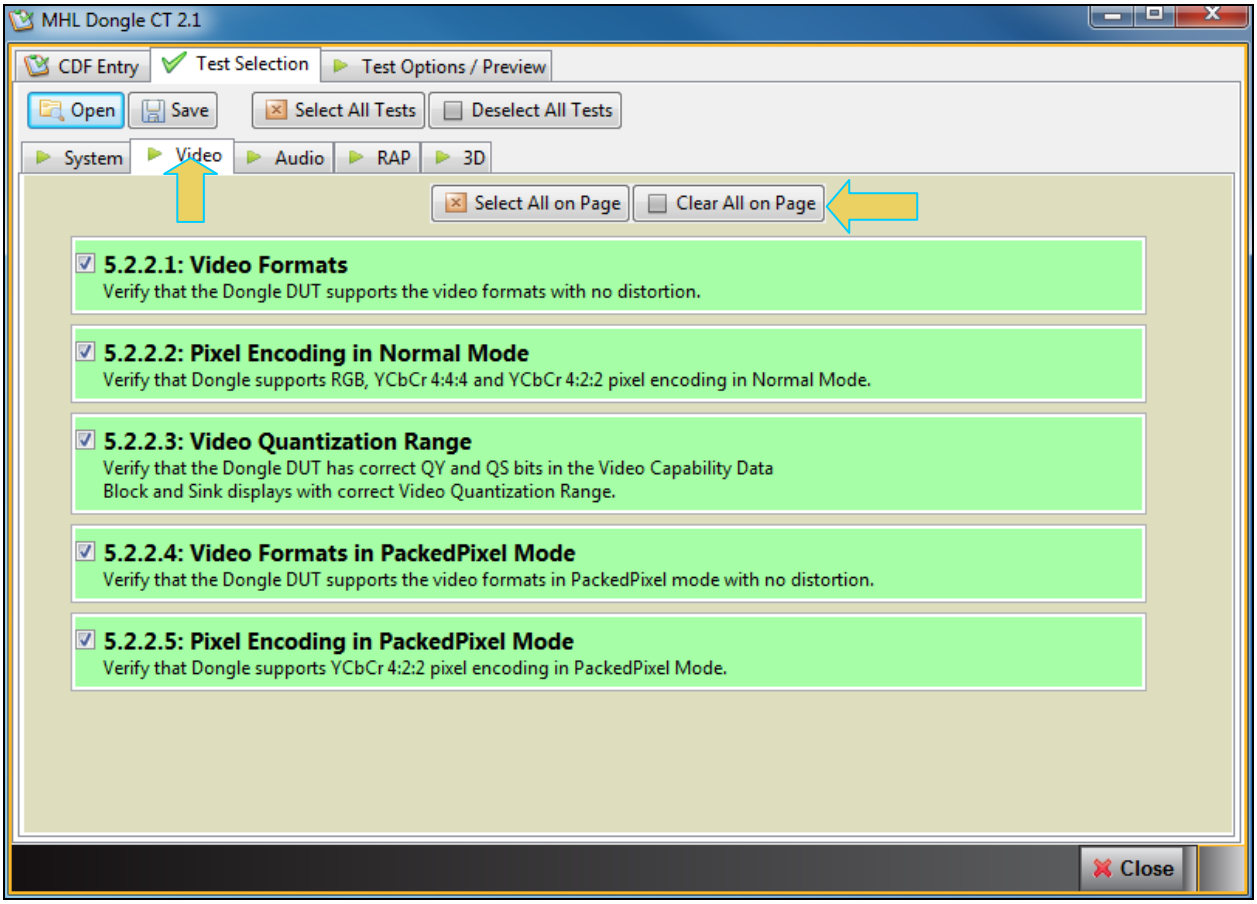
3. Complete the items in the **System** tab of the **Test Selection** panel shown below.

   Note: The Character Sync and 3D Format tests require a direction connection from the 980 to the sink device under test. The 882E is not used. The 980 GUI Manager will instruct you to change the connection.

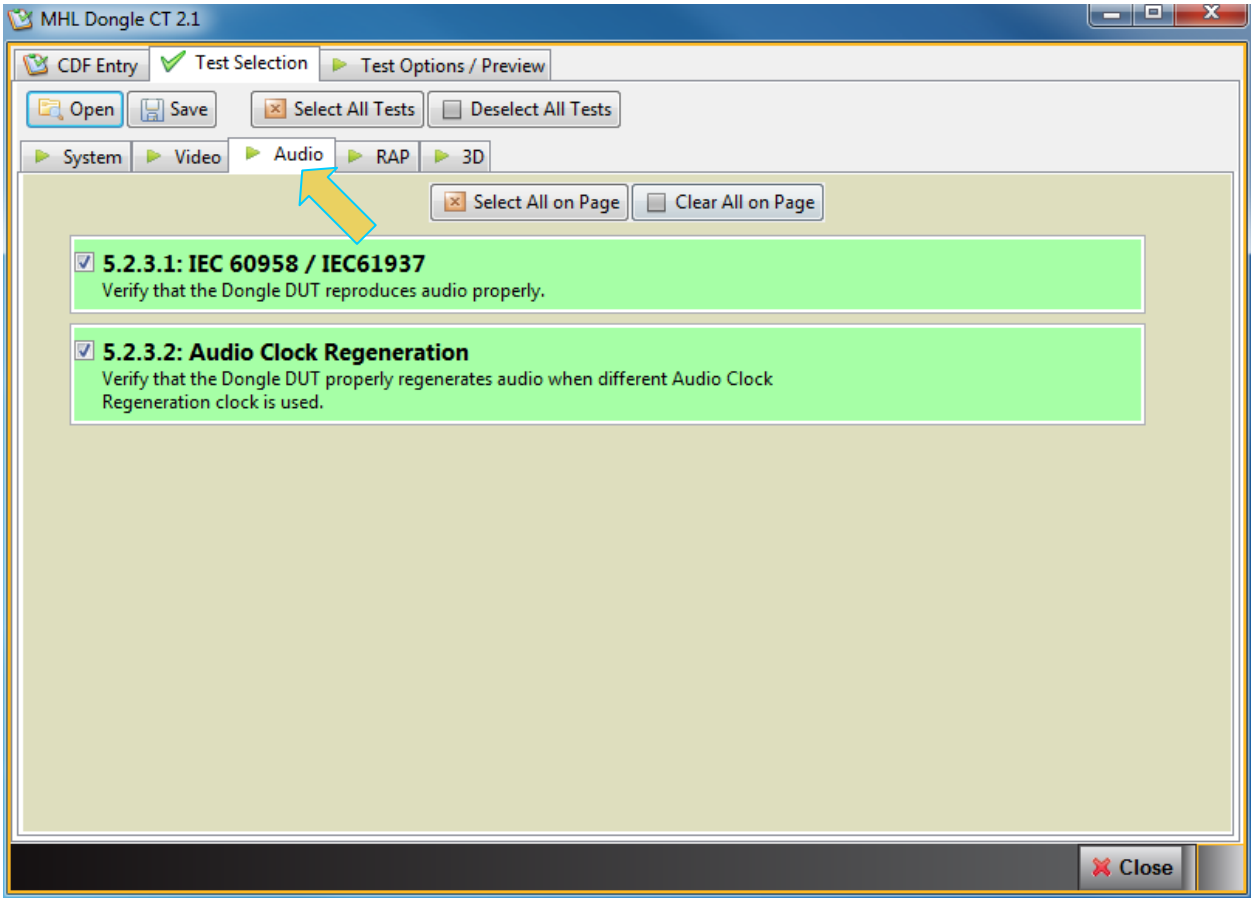


4. Complete the items in the **Video** tab of the **Test Selection** panel shown below.

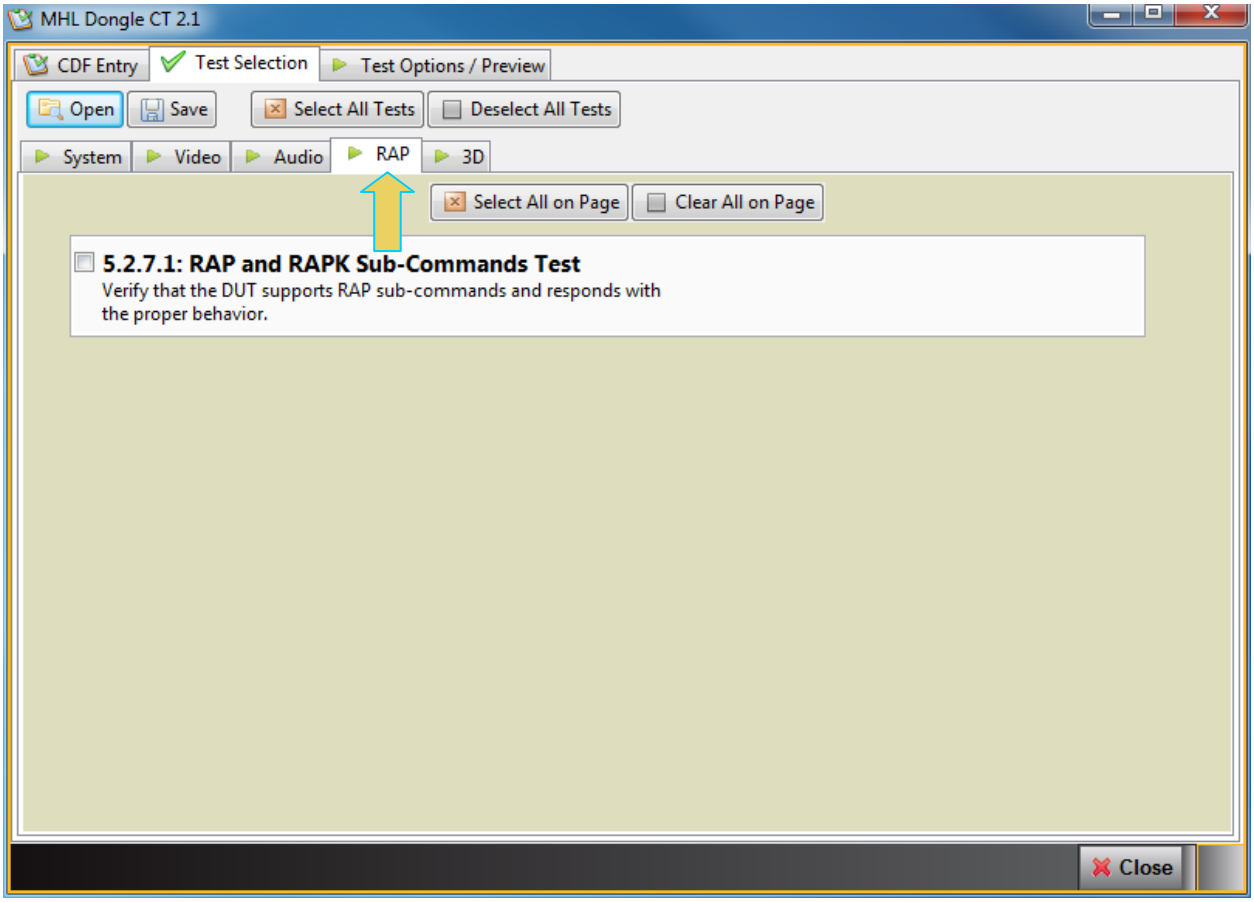
   For convenience you can **Select All** or **Deselect All** tests using the activation buttons provided.



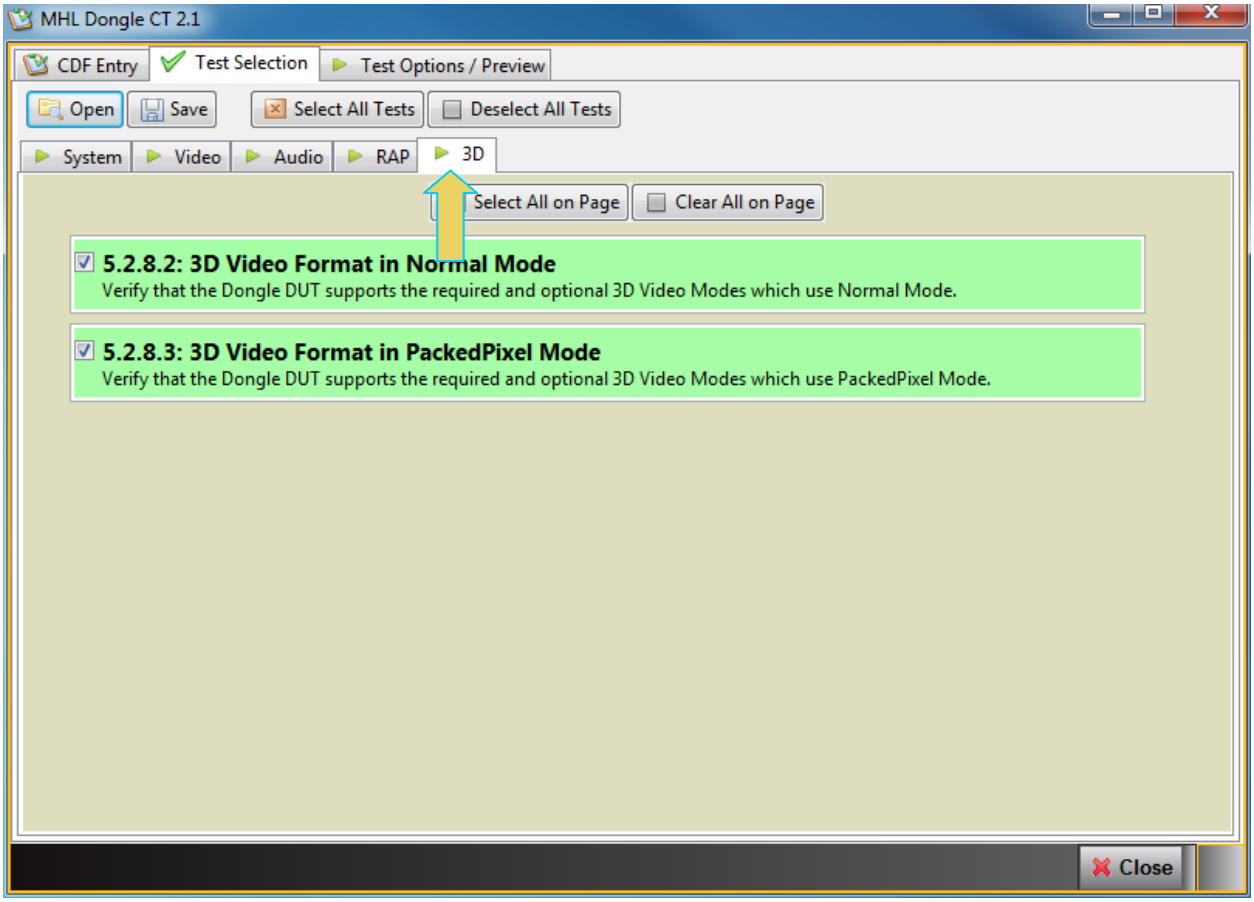
5. Complete the items in the **Audio** tab of the **Test Selection** panel shown below.



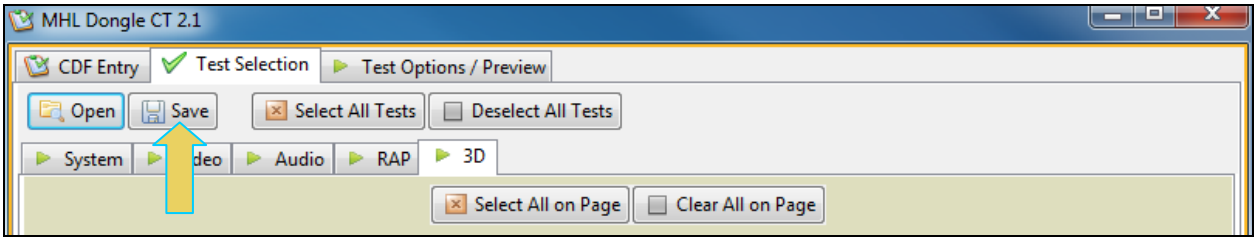
6. Complete the items in the **RAP** tab of the **Test Selection** panel shown below.



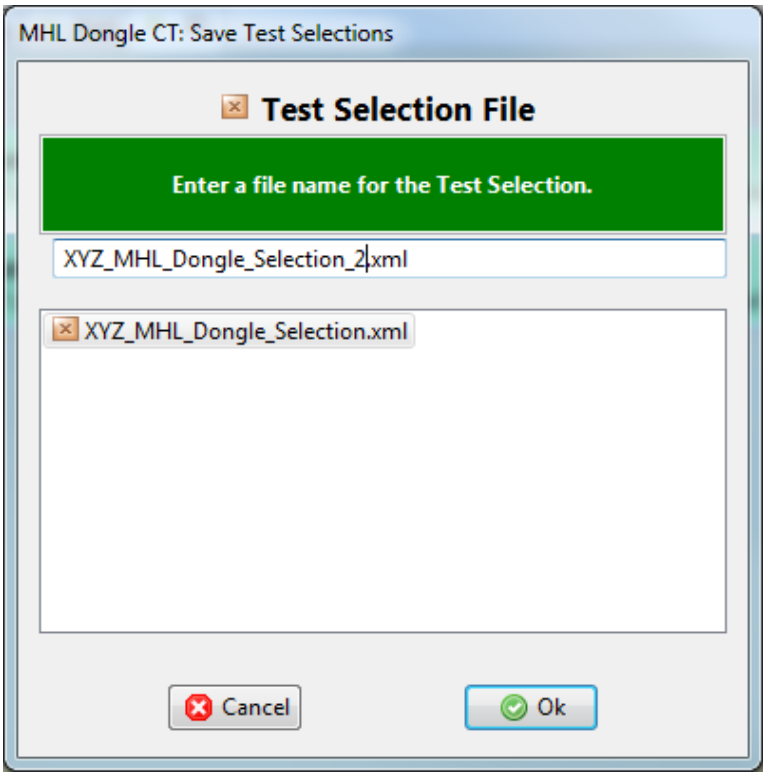
7. Complete the items in the **3D** tab of the **Test Selection** panel shown below.



8. You can save the Test Selection options using the **Save** activation button.



A dialog box will appear as follows. Simply assign a name and click on the **OK** activation button. Click **Cancel** to exit.

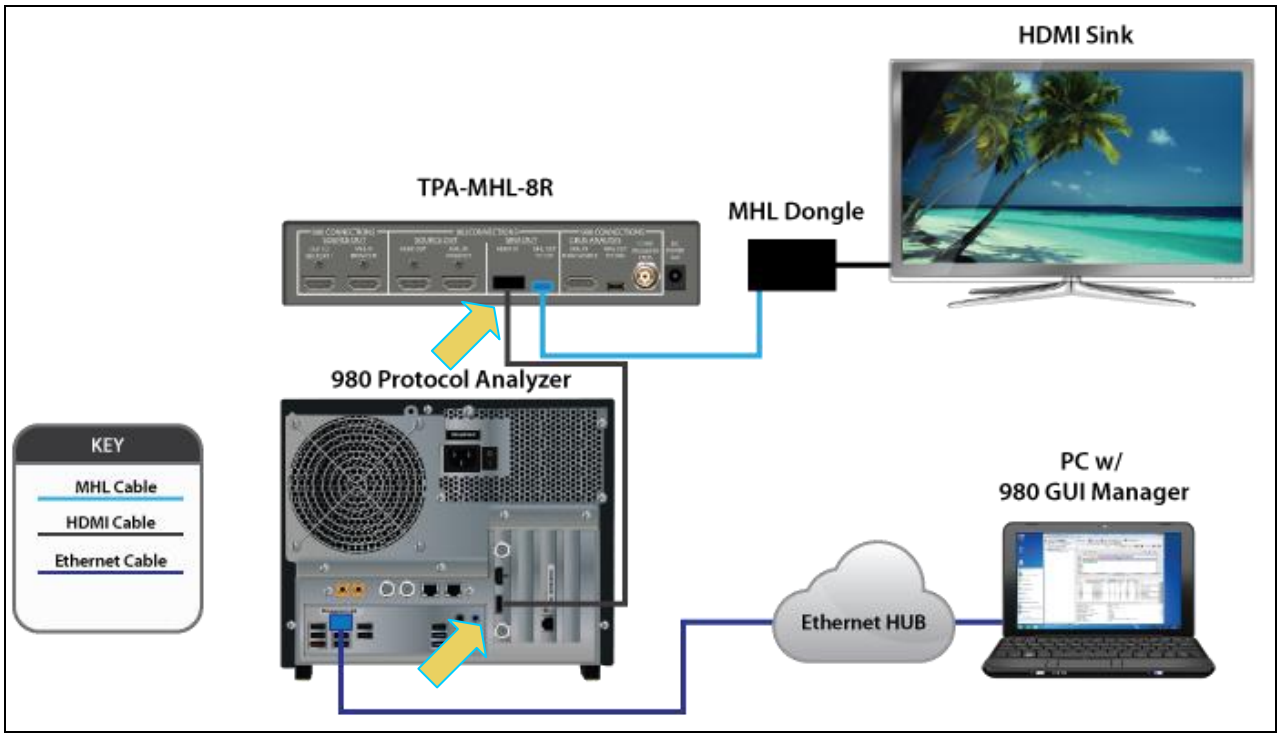

MHL Dongle CT: Save Test Selections
Test Selection File
Enter a file name for the Test Selection.
XYZ_MHL_Dongle_Selection_2.xml
XYZ_MHL_Dongle_Selection.xml
Cancel
Ok

6.6 Executing the MHL Dongle Compliance Tests

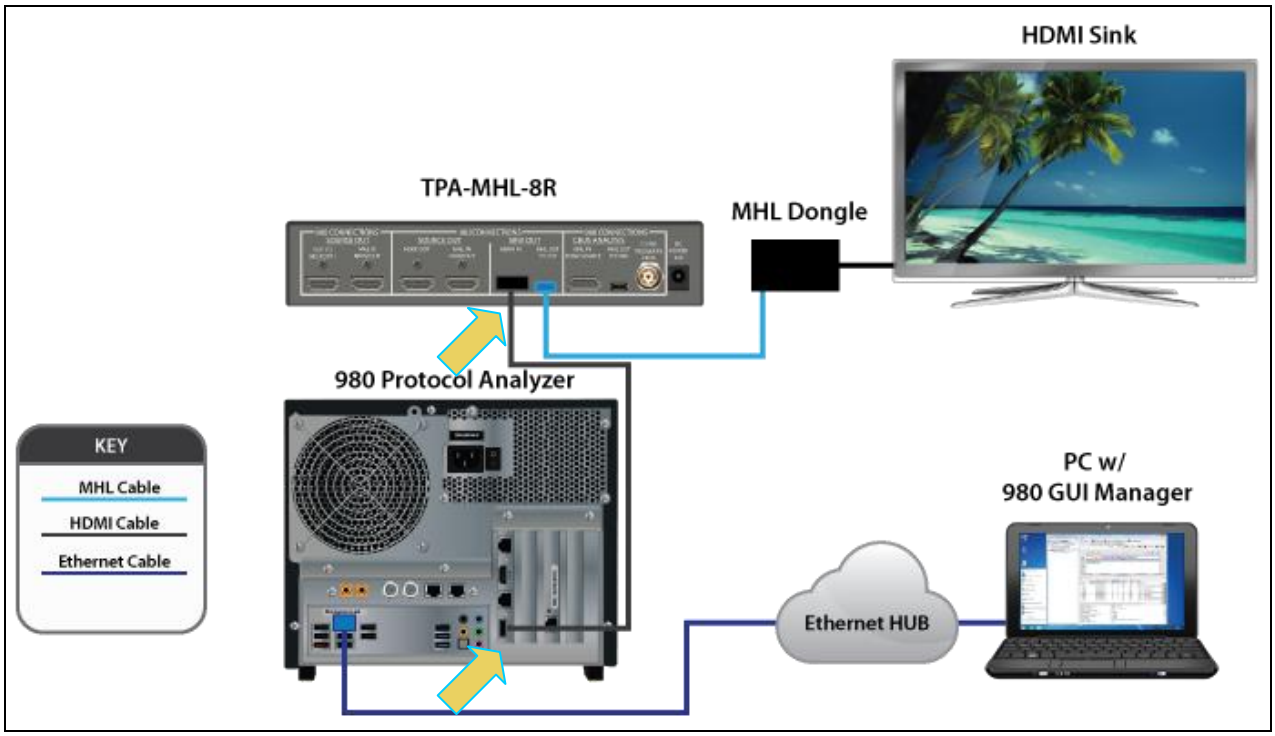
Use the following procedures to initiate the execution of an MHL Dongle Compliance test series.

Note: The example workflow in this section uses MHL 2.1 except where noted. The workflow for testing MHL 1.2, 1.3 and 2.0 devices is similar.

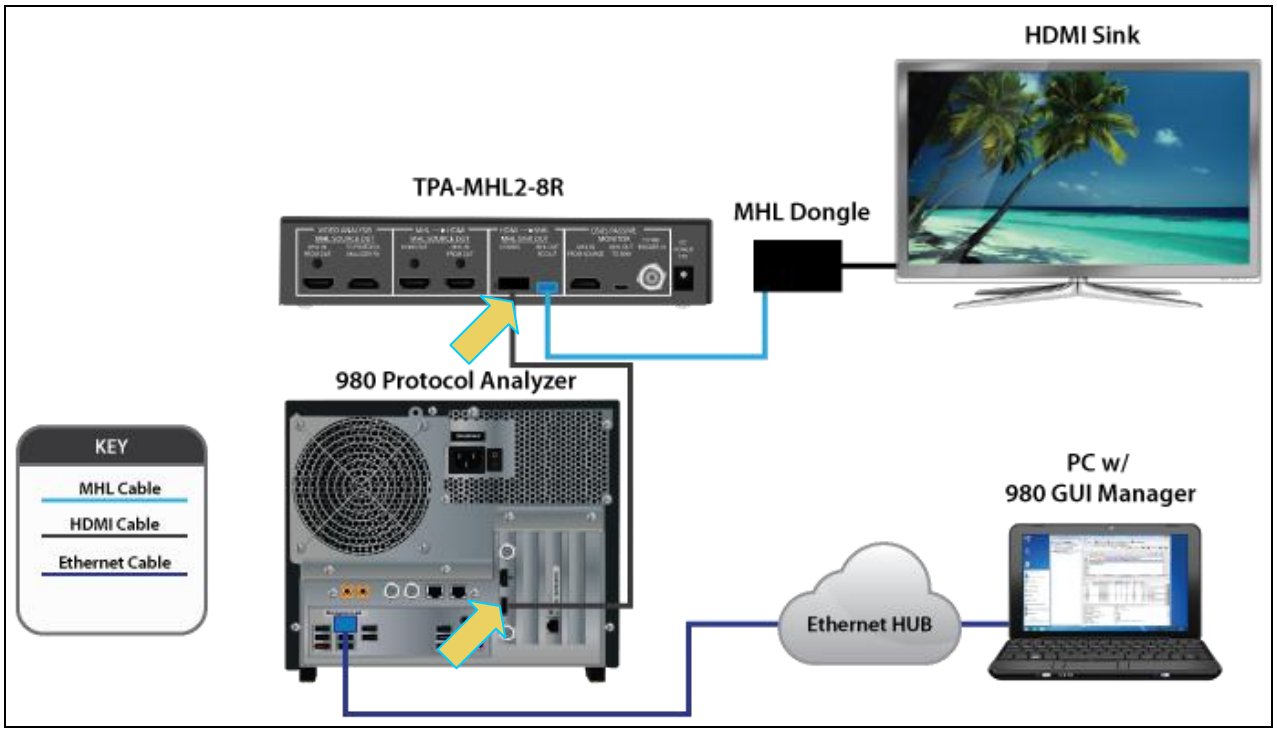
Special Note about Character Synchronization and 3D Format Tests: The Character Synchronization and 3D Format tests are run directly from the 980 (not through the 882). The following diagram is a depiction of the test setup for these tests.



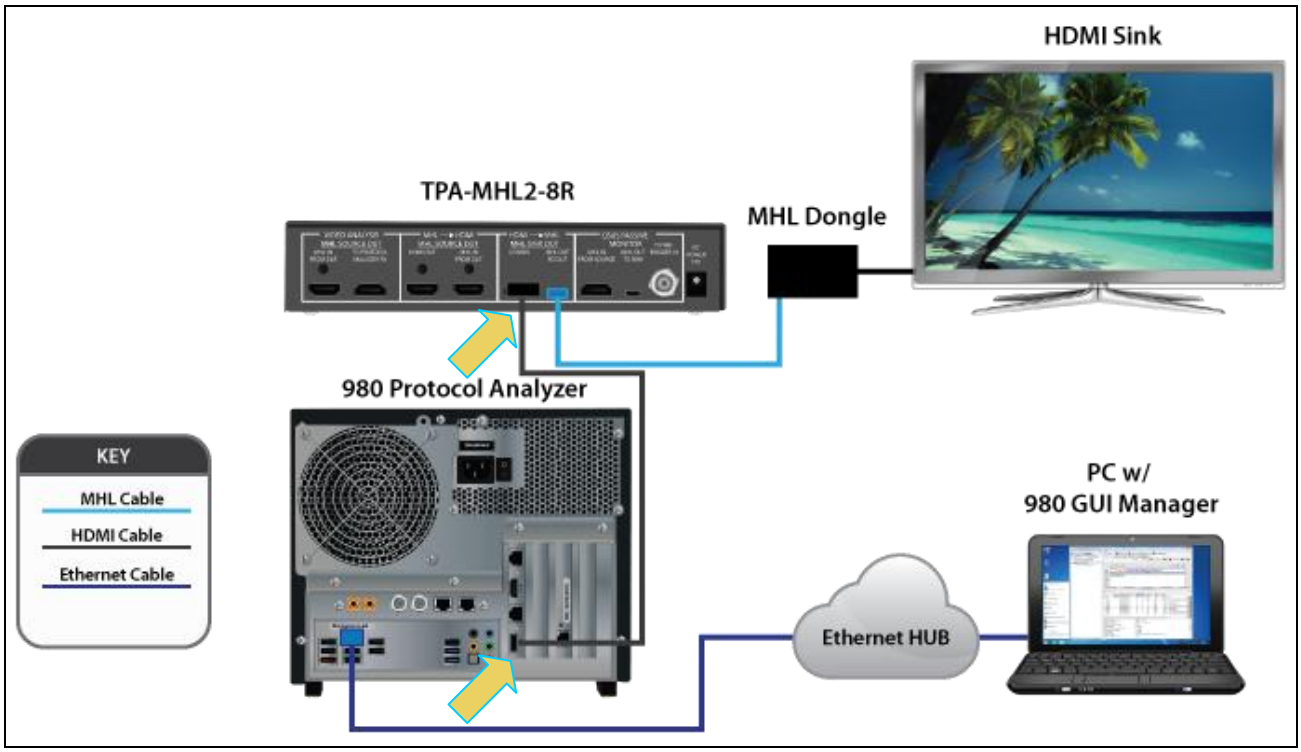
Connection for MHL 1.2 dongle compliance testing with Rev C Protocol Analyzer module



Connection for MHL 1.2 dongle compliance testing with Rev D Protocol Analyzer module

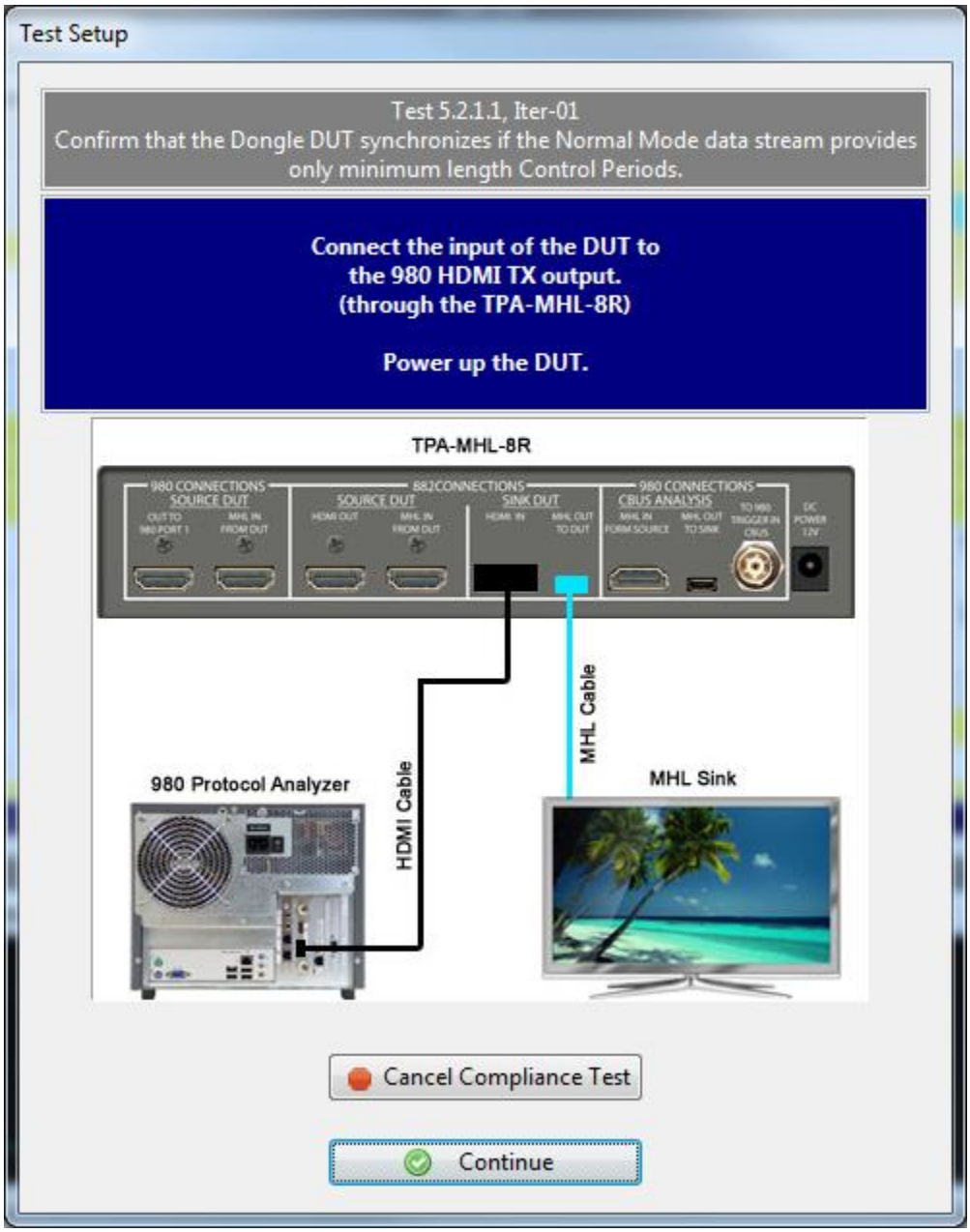


Connection for MHL 1.3, 2.0, 2.1 dongle compliance testing with Rev C Protocol Analyzer module



Connection for MHL 1.3, 2.0, 2.1 dongle compliance testing with Rev D Protocol Analyzer module

When the 980 GUI Manager controller is ready to run the Character Synchronization 5.2.1.1/3 and 3D Format 5.2.8.2/3 tests during the test execution, it will instruct you to reconfigure the test setup such that the 980 Tx port is directly connected to the MHL sink device under test. The following dialog box is presented.

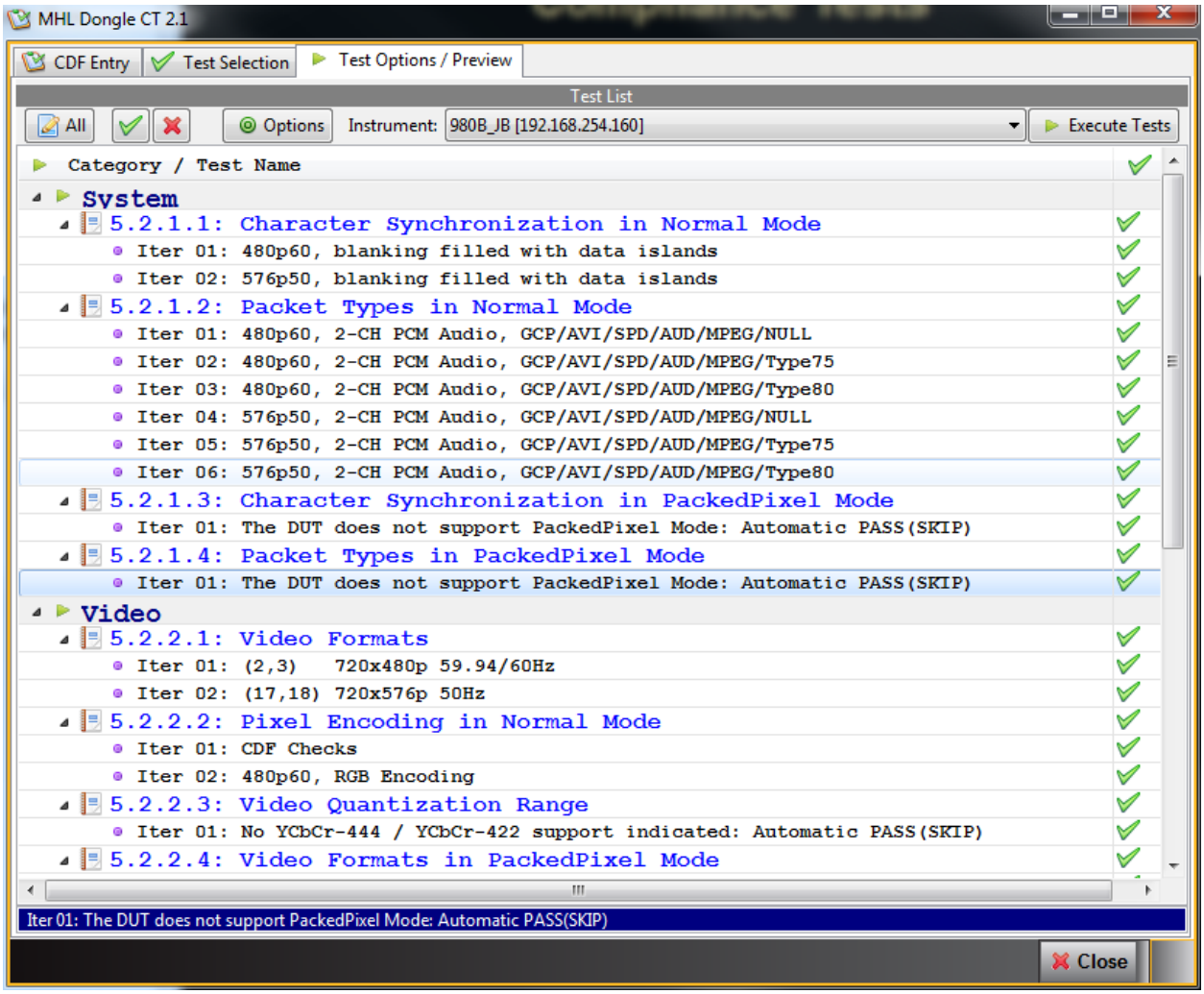


1. Connect an HDMI cable from the Quantum Data 980 Tx port to the TPA-MHL2-8R Test Point Adapter. Use the HDMI IN connector on the section on the TPA labeled **HDMI → MHL - MHL SINK DUT**. Refer to the illustration below for the 980 Tx port.
2. Connect the TPA-MHL2-8R Test Point Adapter to the MHL sink device under test. Use the **MHL OUT TO DUT** connector on the section on the TPA labeled **HDMI → MHL - MHL SINK DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.

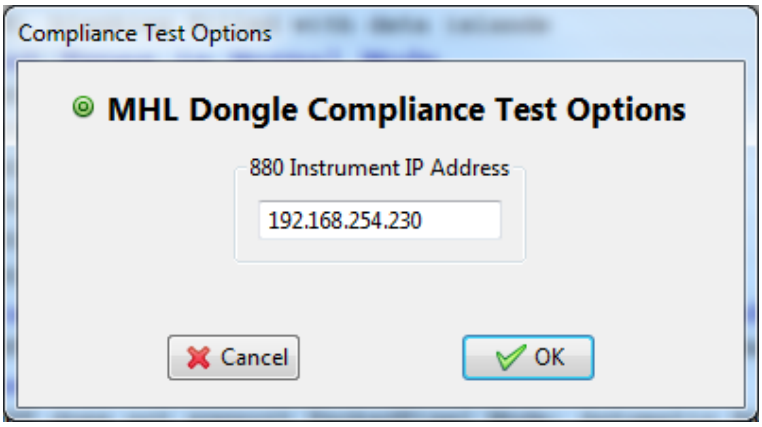
   When the Character Synchronization and 3D Format tests are complete, you will be instructed to re-connect the 882 with a dialog box (below).

To initiate a test series:

1. Select the **Test Options / Preview** panel as shown below.



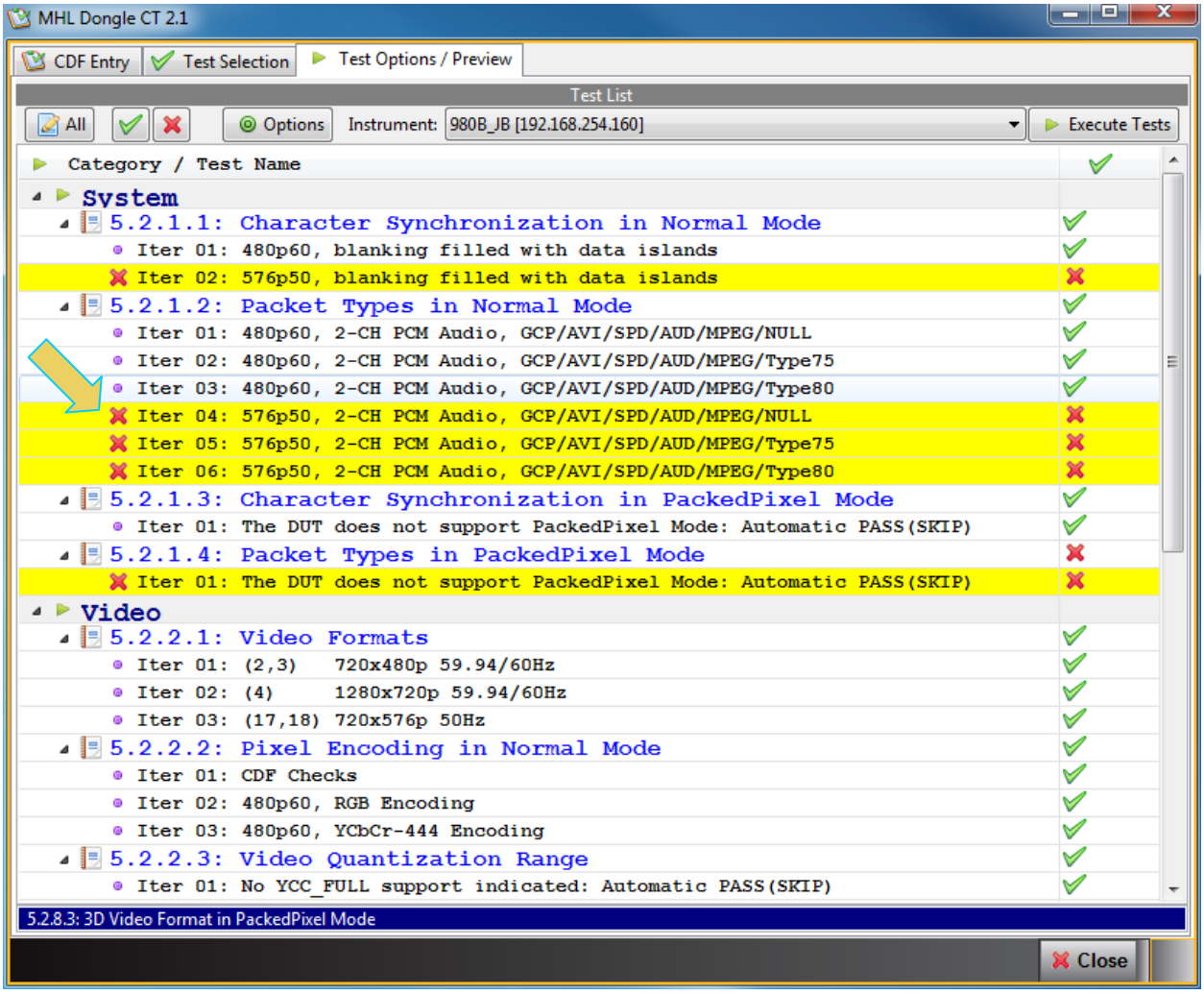
2. Set the **Options** for the tests. The following dialog box below appears. Note that you will have to specify the IP address of the 882 that you are using to initiate these tests in this dialog box.



When you have completed entering the IP address, click the OK activation button.

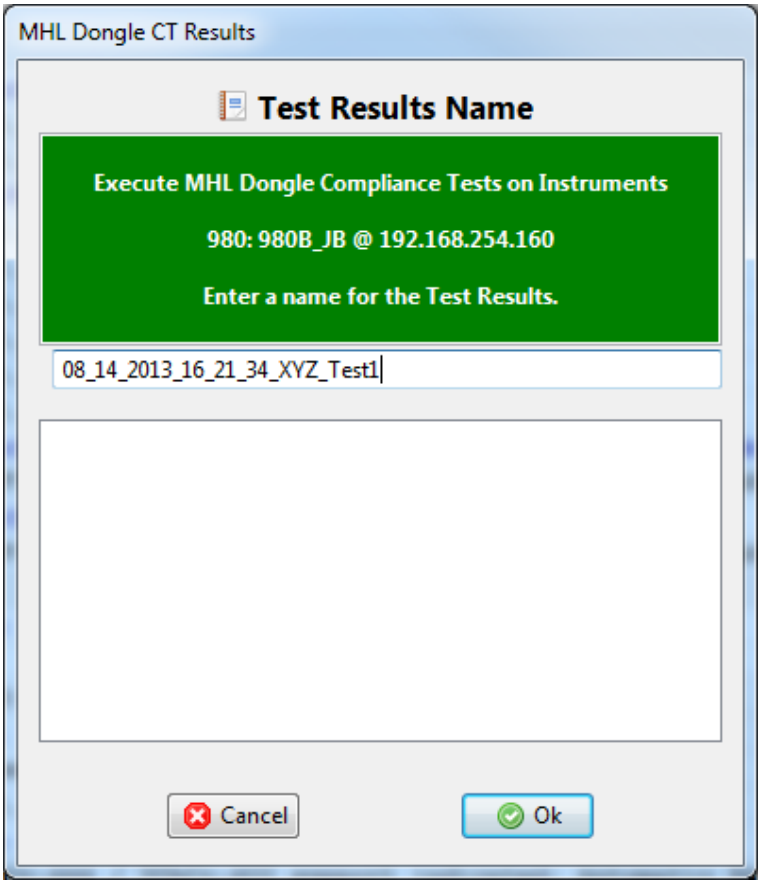
3. (Optional) Review the list of tests for each category. If you wish to skip some of the tests. You can skip tests by clicking on the Check mark on the right side of the **Test Options / Preview** panel.

   The screen shot below shows some of the tests that have been skipped (highlighted in yellow with a red X).

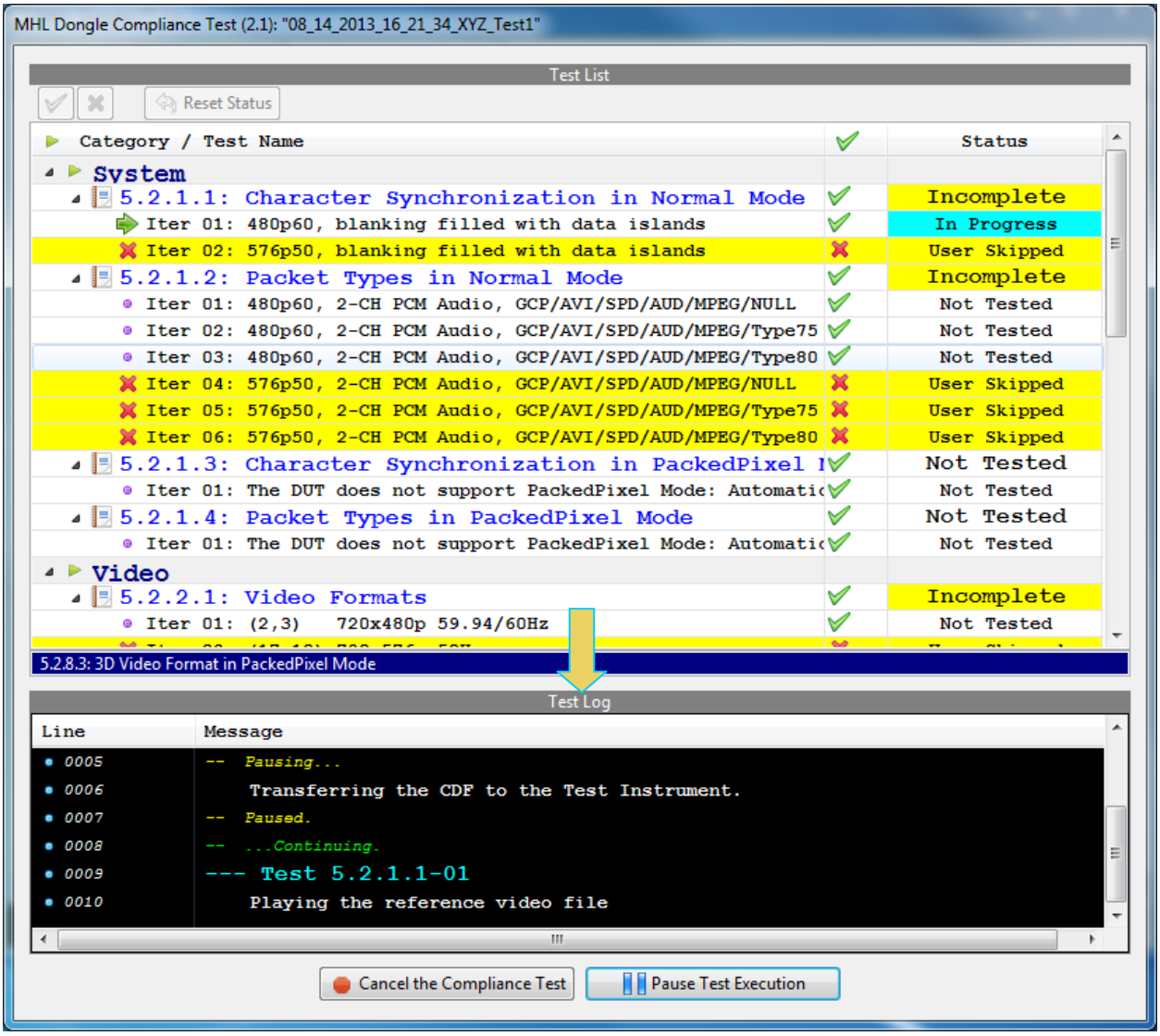


Click on the **Execute Tests** 

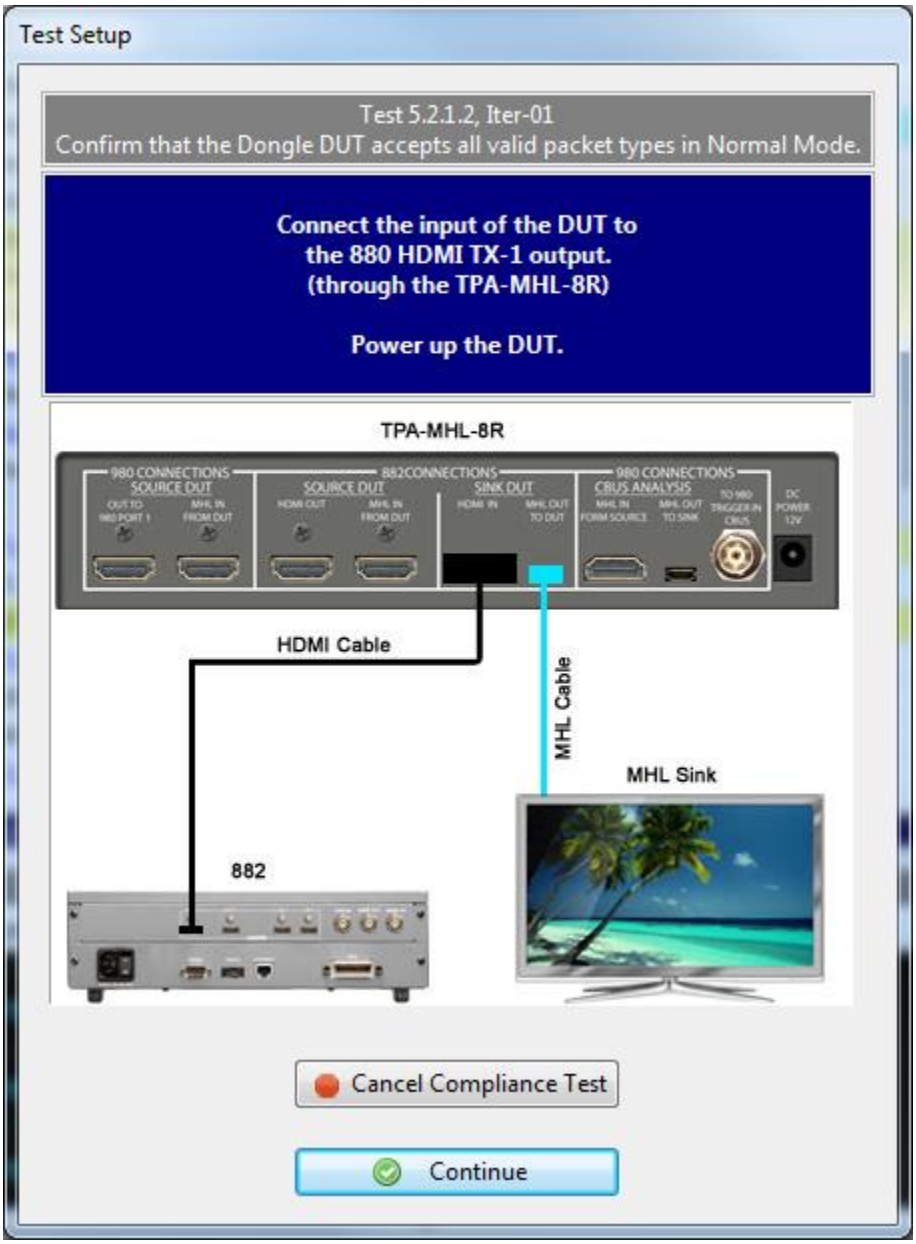
activation button to initiate the test suite. You will be prompted for a name for the tests. This dialog box is shown below.



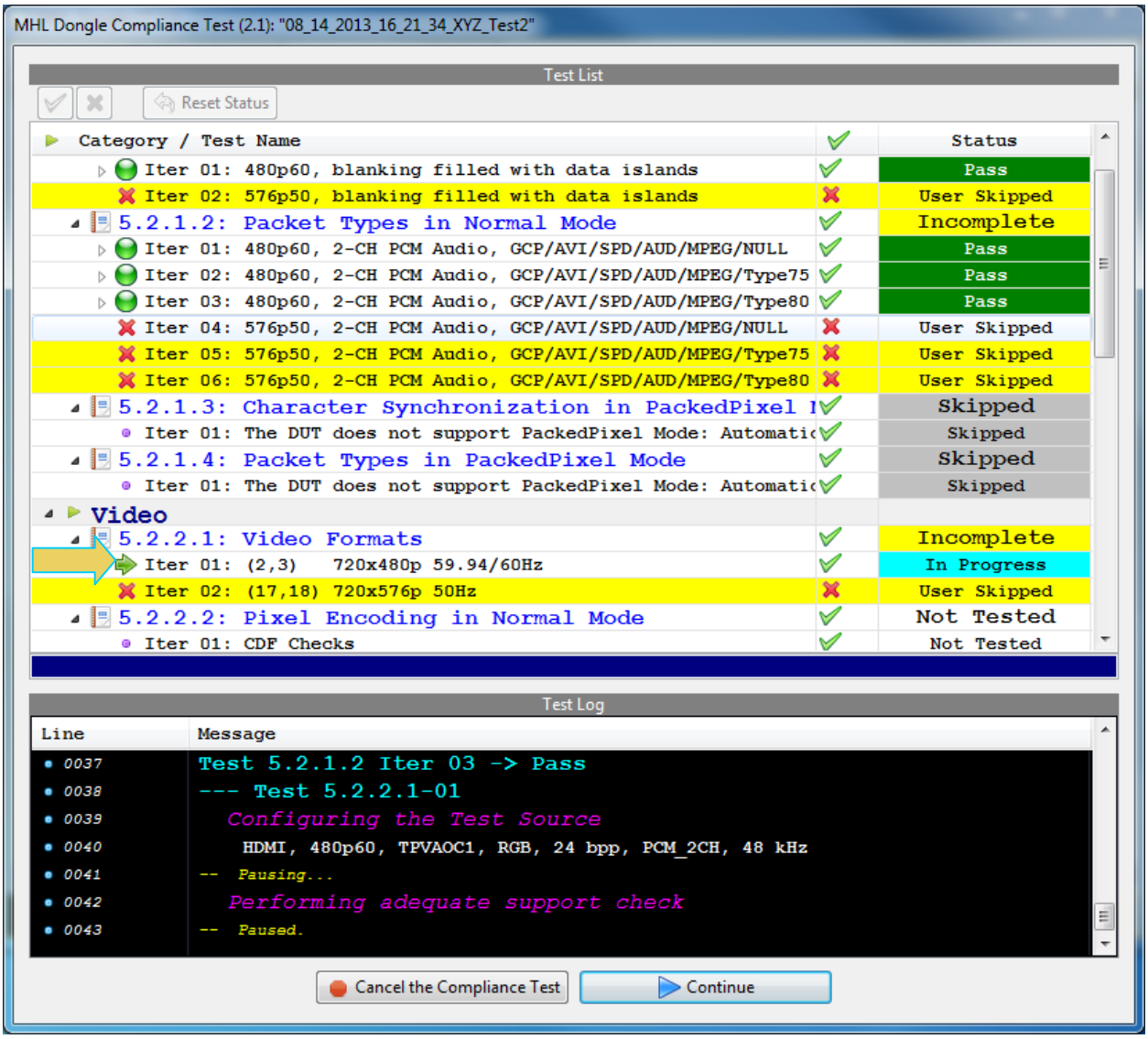
A new window appears showing the test results status with a **Test Log** panel on the bottom (below).



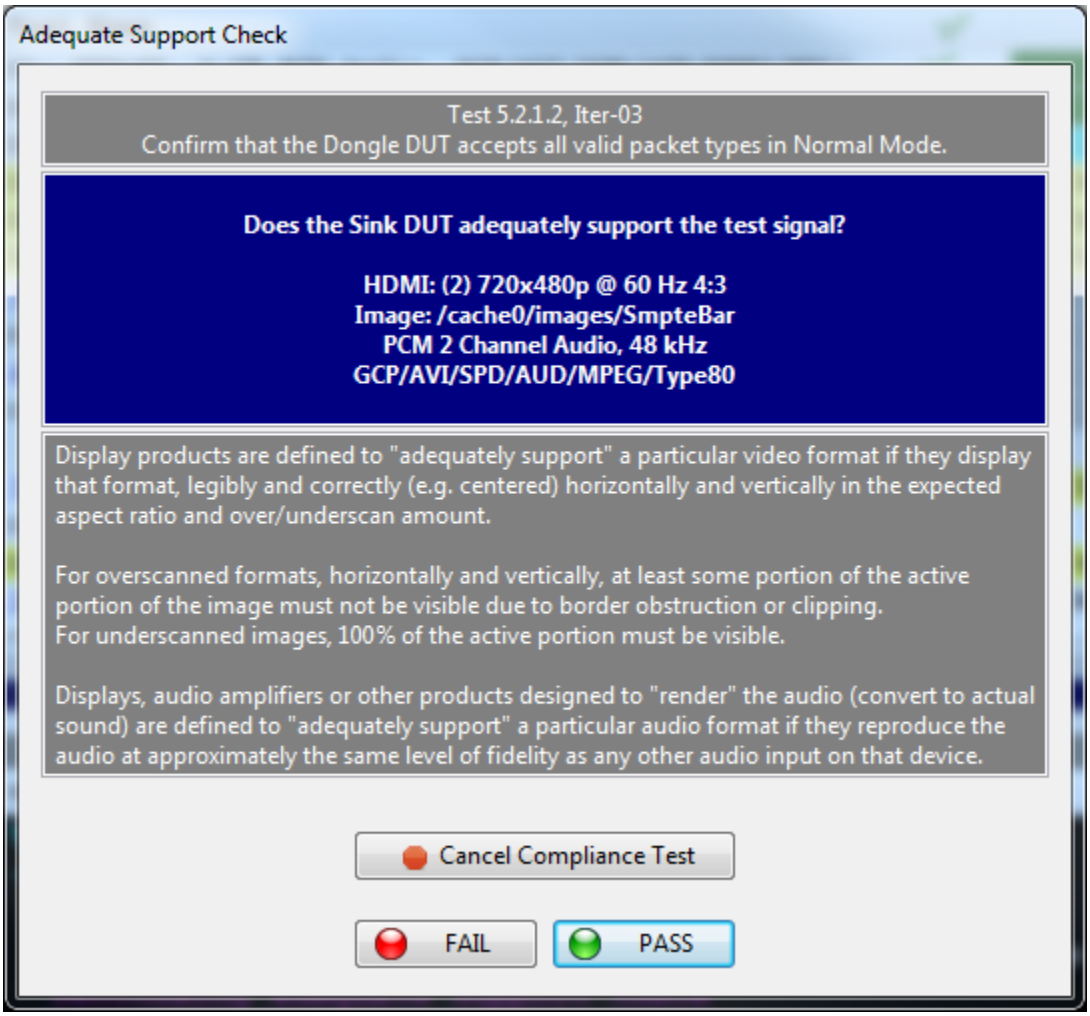
During the tests a **Test Setup** dialog box will appear instructing you how to set up for the tests if there is a change from the original configuration. Refer to the following dialog box for an example. Press **Continue** when you have the source device in the correct mode. You can cancel the test using the **Cancel Compliance** Test button.

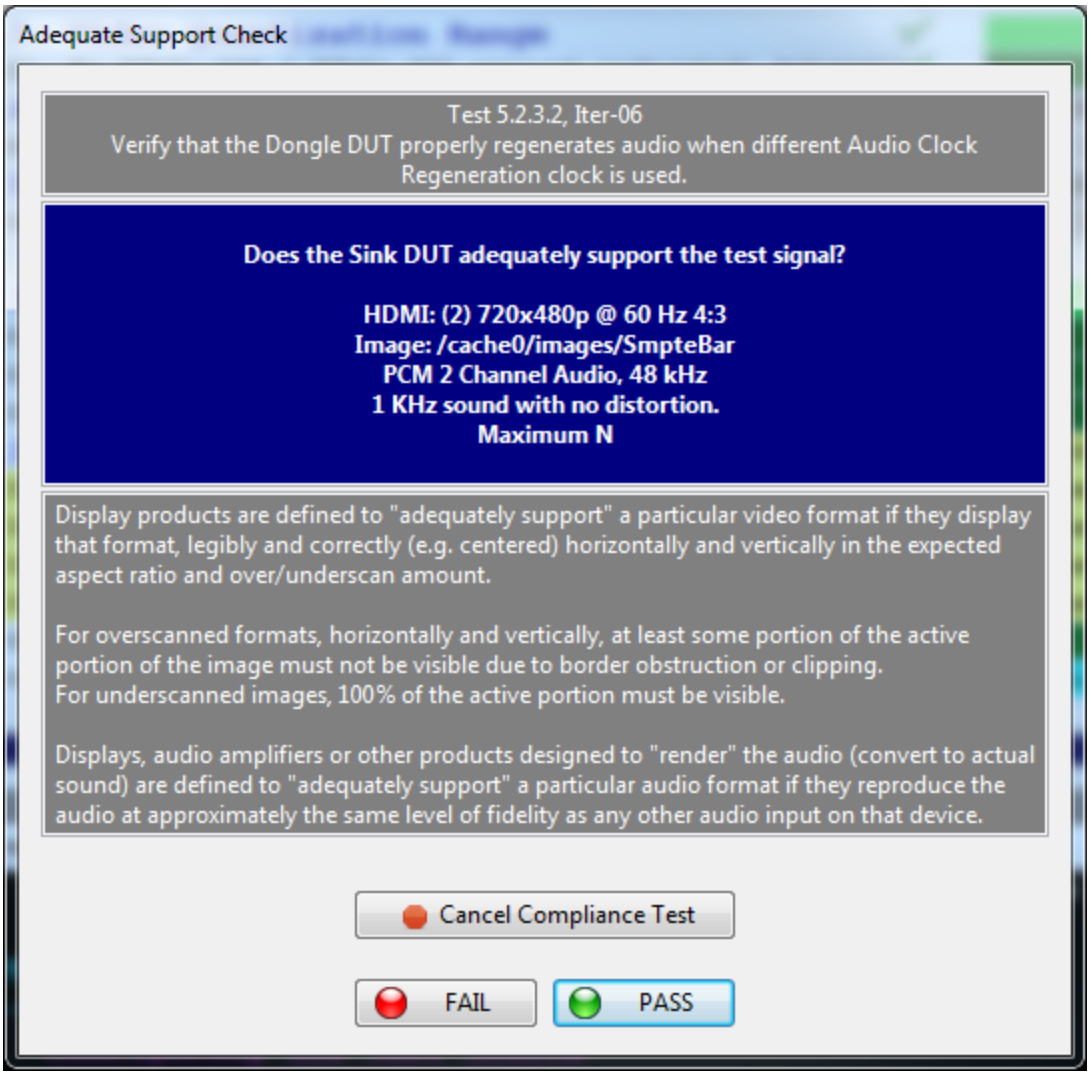


A green progress arrow shows which test is currently being run. Refer to the screen example below.

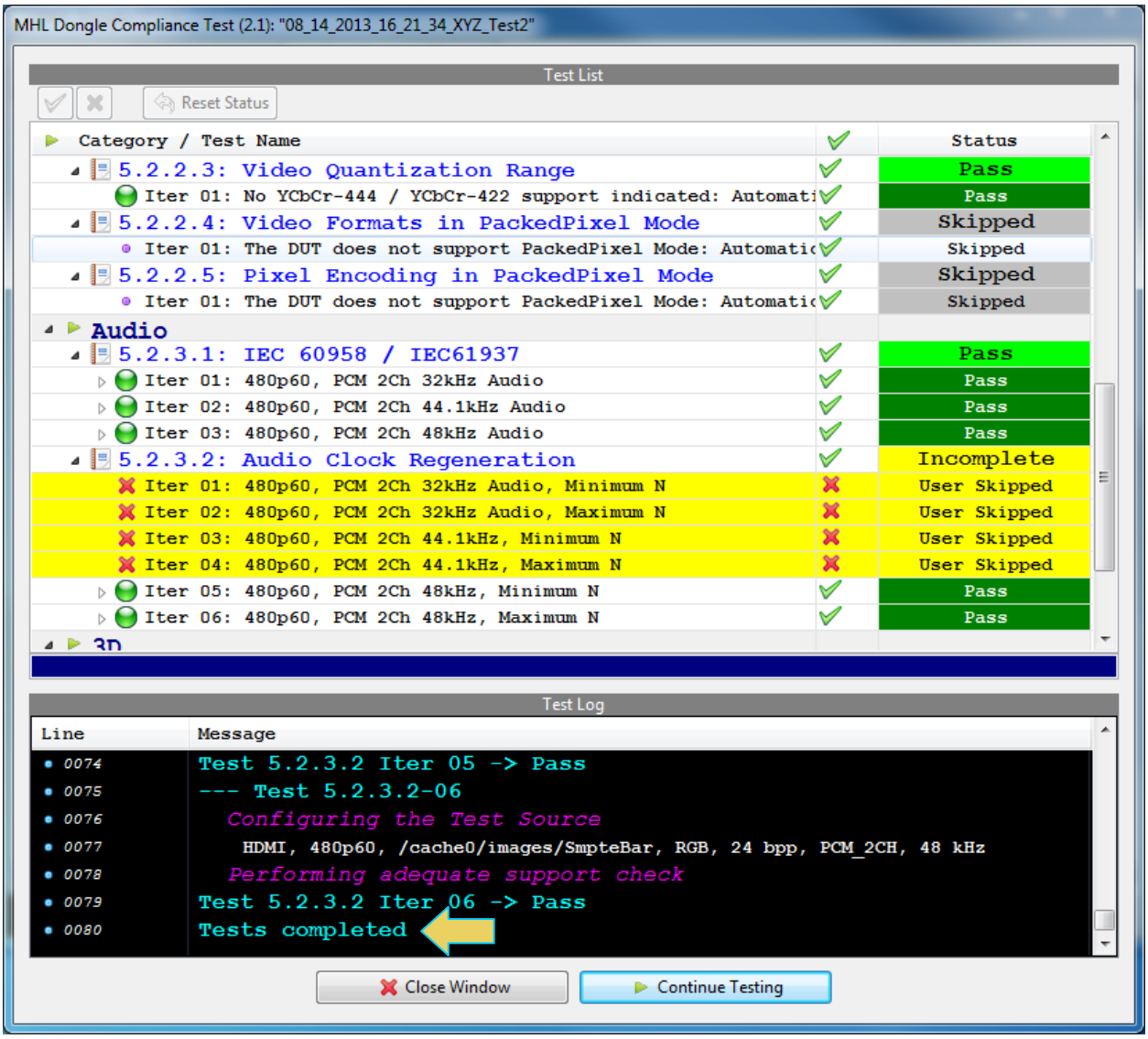


During the test, you will be asked to observe your sink device under test and select Pass or Fail depending on whether your sink device is displaying the video properly. The following dialog box is an example.

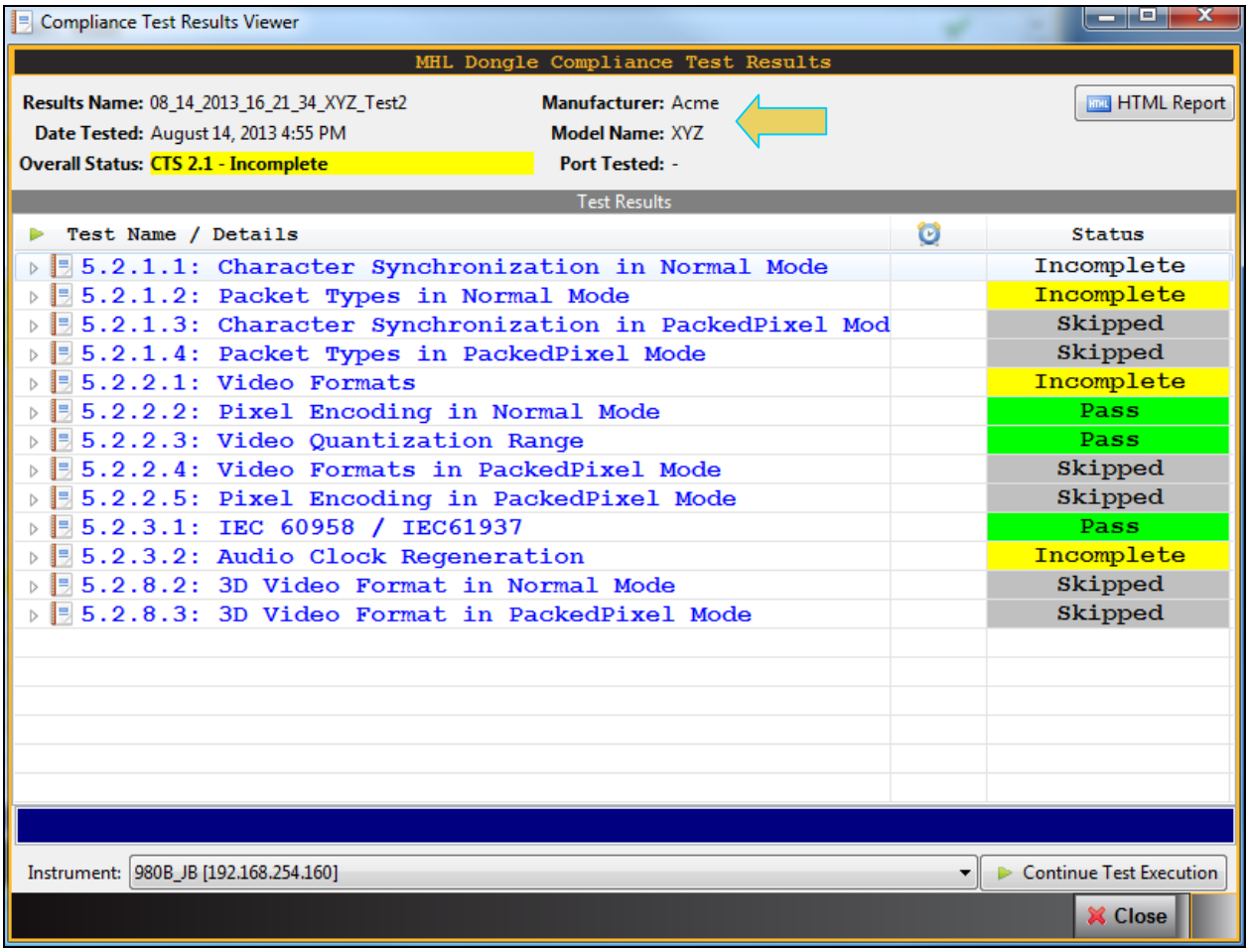


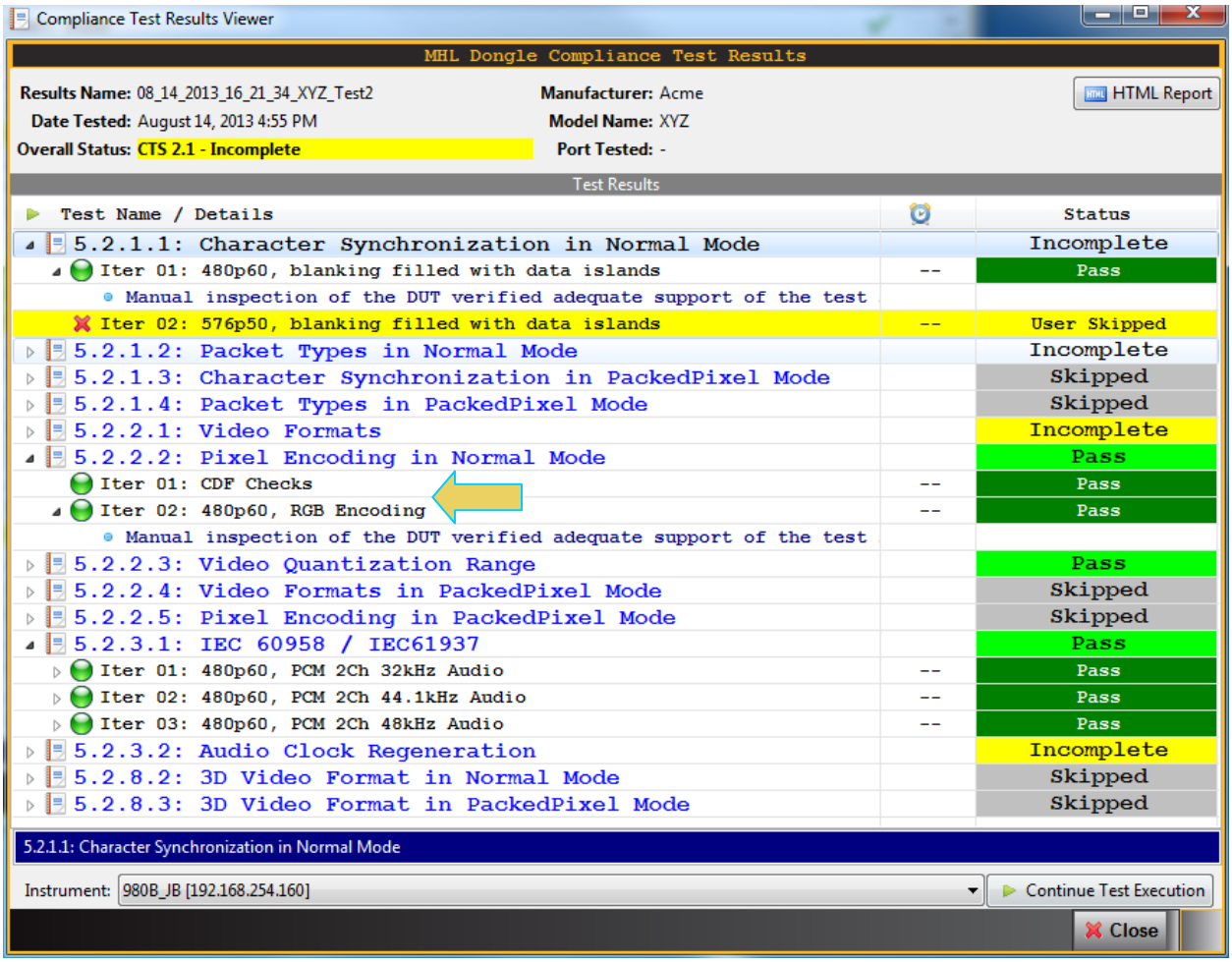

Adequate Support Check
Test 5.2.3.2, Iter-06
Verify that the Dongle DUT properly regenerates audio when different Audio Clock Regeneration clock is used.
Does the Sink DUT adequately support the test signal?
HDMI: (2) 720x480p @ 60 Hz 4:3
Image: /cache0/images/SmpteBar
PCM 2 Channel Audio, 48 kHz
1 KHz sound with no distortion.
Maximum N
Display products are defined to "adequately support" a particular video format if they display that format, legibly and correctly (e.g. centered) horizontally and vertically in the expected aspect ratio and over/underscan amount.
For overscanned formats, horizontally and vertically, at least some portion of the active portion of the image must not be visible due to border obstruction or clipping.
For underscanned images, 100% of the active portion must be visible.
Displays, audio amplifiers or other products designed to "render" the audio (convert to actual sound) are defined to "adequately support" a particular audio format if they reproduce the audio at approximately the same level of fidelity as any other audio input on that device.
Cancel Compliance Test
FAIL
PASS

When the test is complete a message will indicate this on Test Log as shown in the following screen example.



When the tests are completed and you select **Close Window** the test window that shows the current activity will close. A new Compliance Test Viewer window will appear showing the results. Refer to the following screen shots. The second example shows some of the test details exposed.



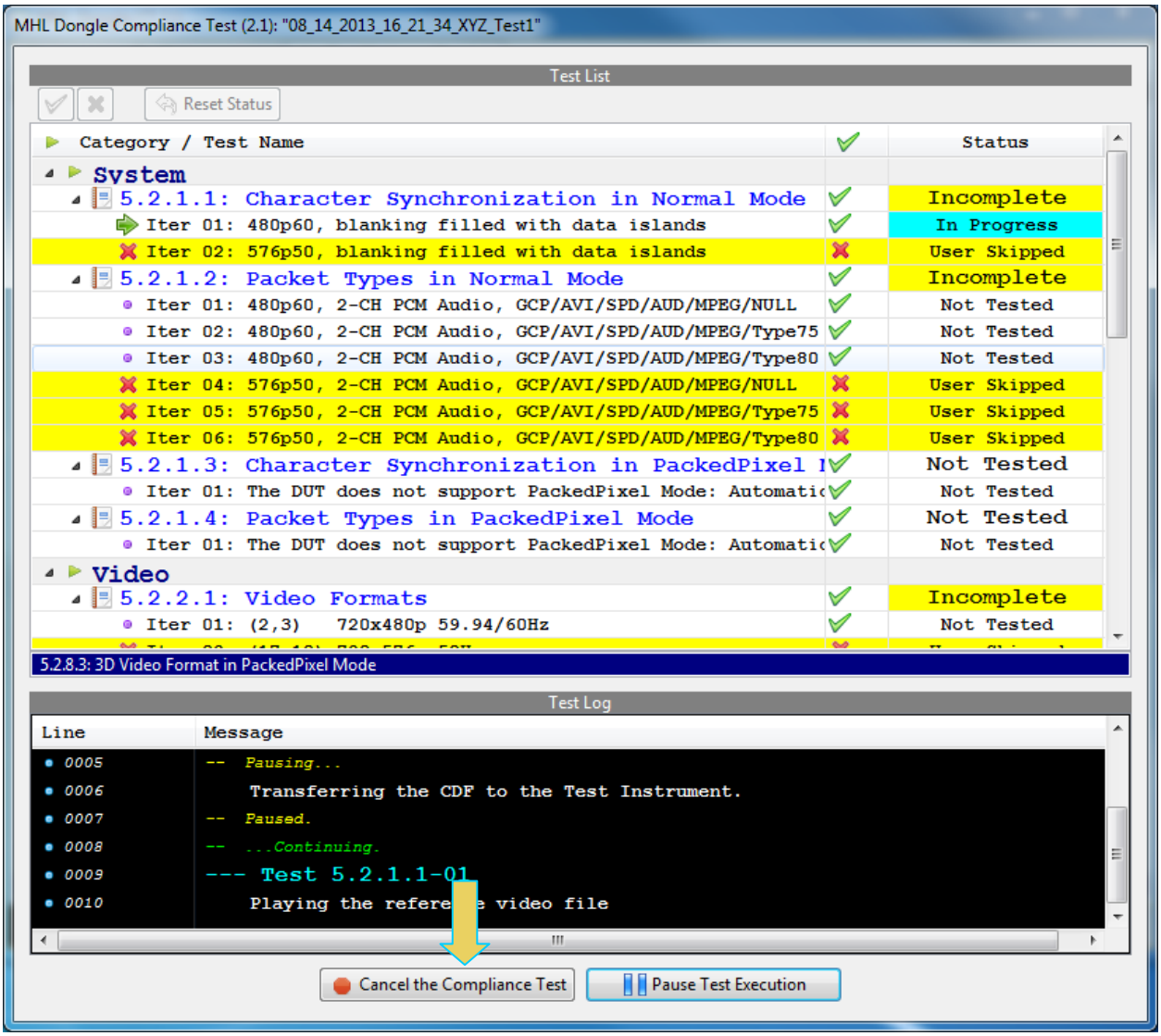

Compliance Test Results Viewer
MHL Dongle Compliance Test Results
Results Name: 08_14_2013_16_21_34_XYZ_Test2
Date Tested: August 14, 2013 4:55 PM
Overall Status: CTS 2.1 - Incomplete
Manufacturer: Acme
Model Name: XYZ
Port Tested: -
HTML Report
Test Results
Test Name / Details
Status
5.2.1.1: Character Synchronization in Normal Mode Incomplete
Iter 01: 480p60, blanking filled with data islands -- Pass
Manual inspection of the DUT verified adequate support of the test
Iter 02: 576p50, blanking filled with data islands -- User Skipped
5.2.1.2: Packet Types in Normal Mode Incomplete
5.2.1.3: Character Synchronization in PackedPixel Mode Skipped
5.2.1.4: Packet Types in PackedPixel Mode Skipped
5.2.2.1: Video Formats Incomplete
5.2.2.2: Pixel Encoding in Normal Mode Pass
Iter 01: CDF Checks -- Pass
Iter 02: 480p60, RGB Encoding -- Pass
Manual inspection of the DUT verified adequate support of the test
5.2.2.3: Video Quantization Range Pass
5.2.2.4: Video Formats in PackedPixel Mode Skipped
5.2.2.5: Pixel Encoding in PackedPixel Mode Skipped
5.2.3.1: IEC 60958 / IEC61937 Pass
Iter 01: 480p60, PCM 2Ch 32kHz Audio -- Pass
Iter 02: 480p60, PCM 2Ch 44.1kHz Audio -- Pass
Iter 03: 480p60, PCM 2Ch 48kHz Audio -- Pass
5.2.3.2: Audio Clock Regeneration Incomplete
5.2.8.2: 3D Video Format in Normal Mode Skipped
5.2.8.3: 3D Video Format in PackedPixel Mode Skipped
5.2.1.1: Character Synchronization in Normal Mode
Instrument: 980B_JB [192.168.254.160]
Continue Test Execution
Close

6.7 Canceling and Resuming the MHL Sink Compliance after cancel

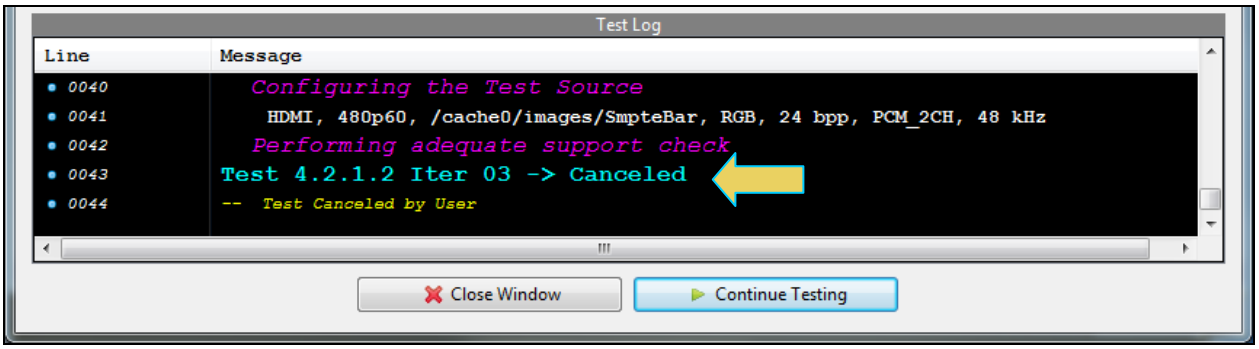
You can complete or resume a test series that was canceled earlier. The test results are saved in a directory that is accessible through the 980 GUI Manager interface. Use the following procedures to cancel and resume a canceled test.

To cancel a test:

1. Click on the **Cancel Compliance Test** activation button either on the popup dialog box or the bottom of the test log panel. See the screen example below.

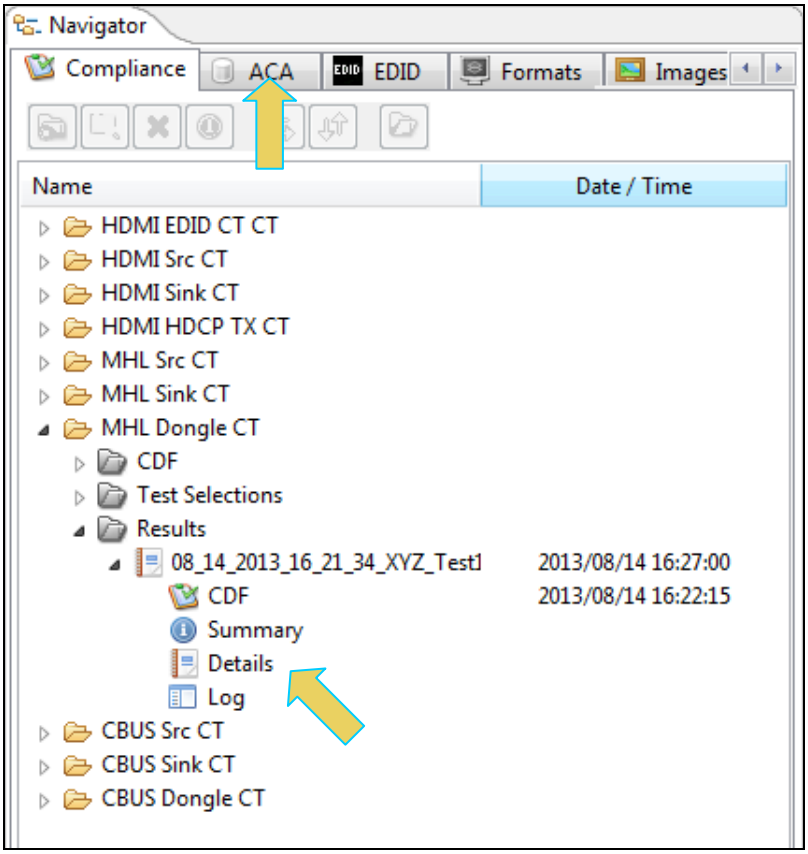


An indication that the test was canceled with be shown in the Test Log lower panel.

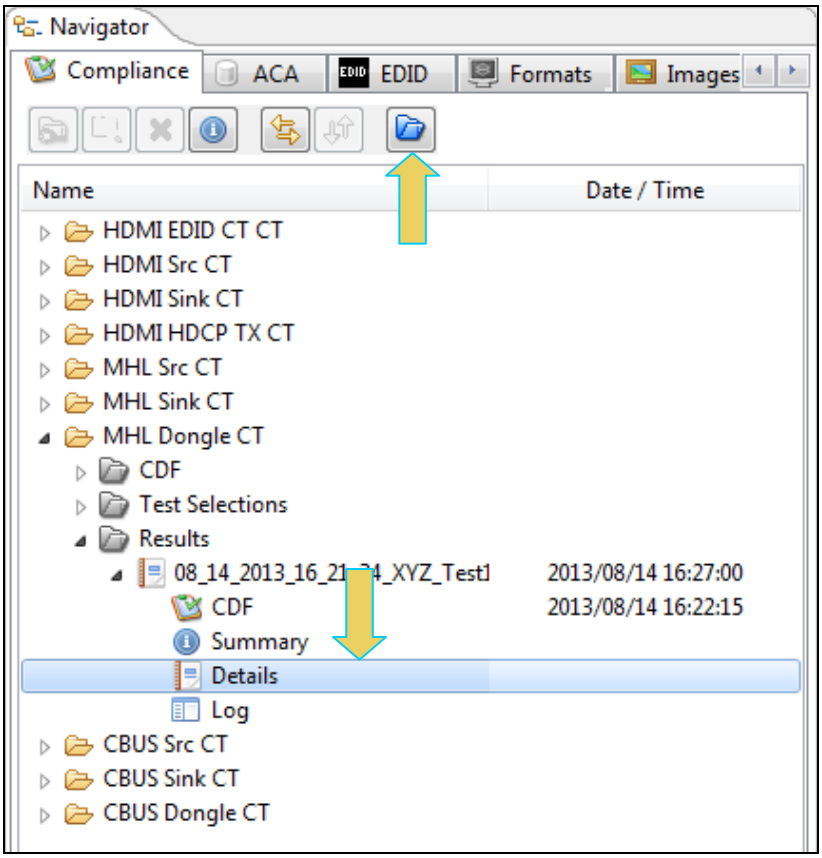


To resume a canceled test:

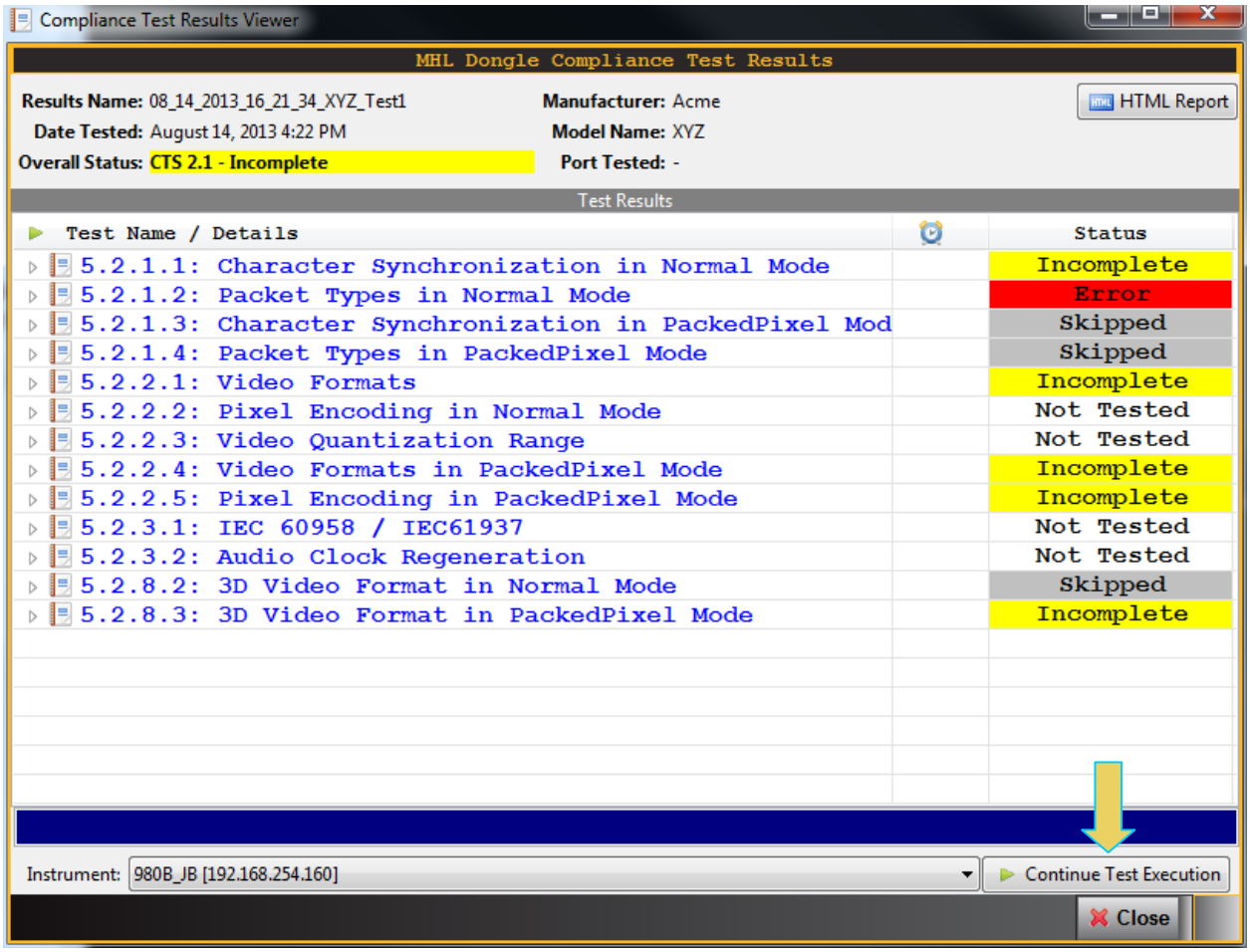
1. Navigate to the **Navigator/Compliance** panel and open the MHL Sink CT Results directory as shown below.



2. Expose the details of the test results and either double click on the **Details** or select **Open** icon (below).



The results will appear in the **Compliance Test Results Viewer** window as shown below.



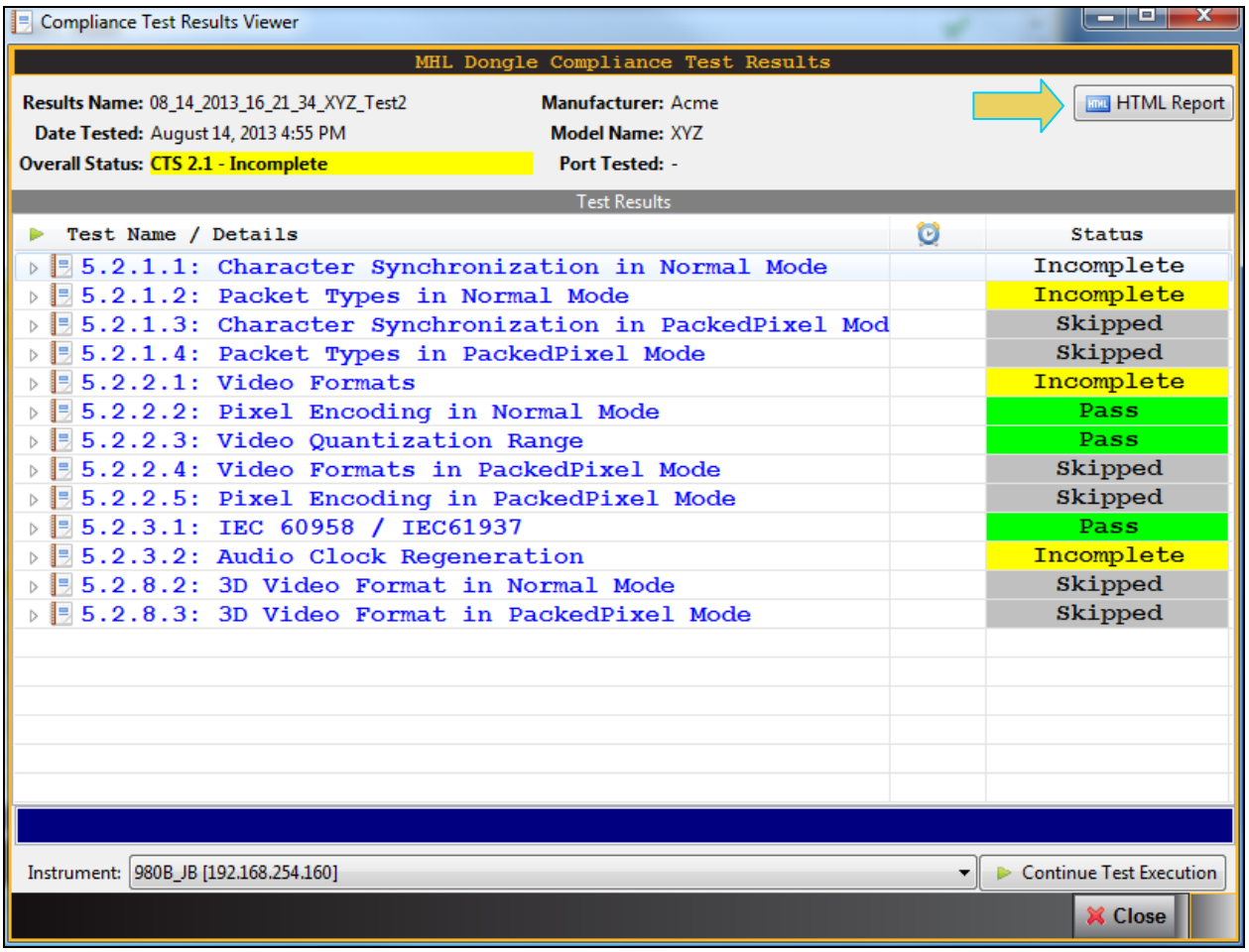
3. Click on the **Continue Test Execution** button on the lower left (above) to resume the tests.

6.8 Viewing the MHL Sink Compliance HTML test report

After you have completed the tests, an HTML Report activation button will appear in the upper right of the screen which enables you to access the html report of the test results. Use the following procedures to view the html test report.

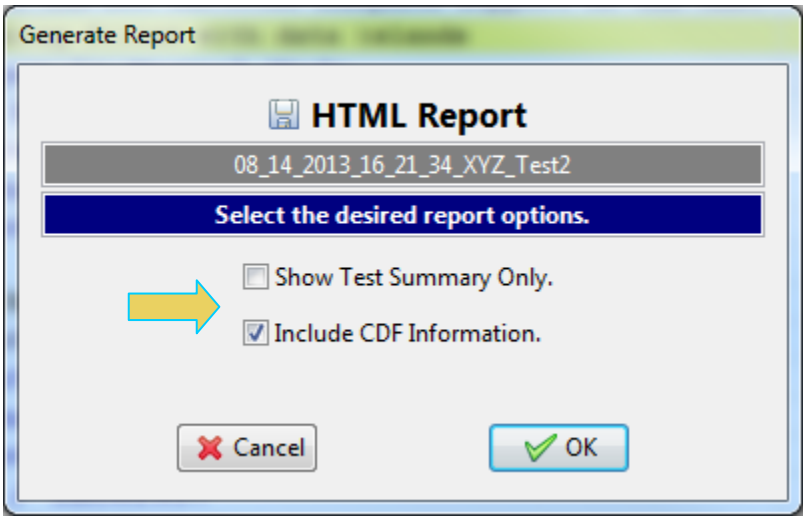
To view the html test report:

1. Select the **HTML Report** form the Compliance Test Results Viewer as shown below.

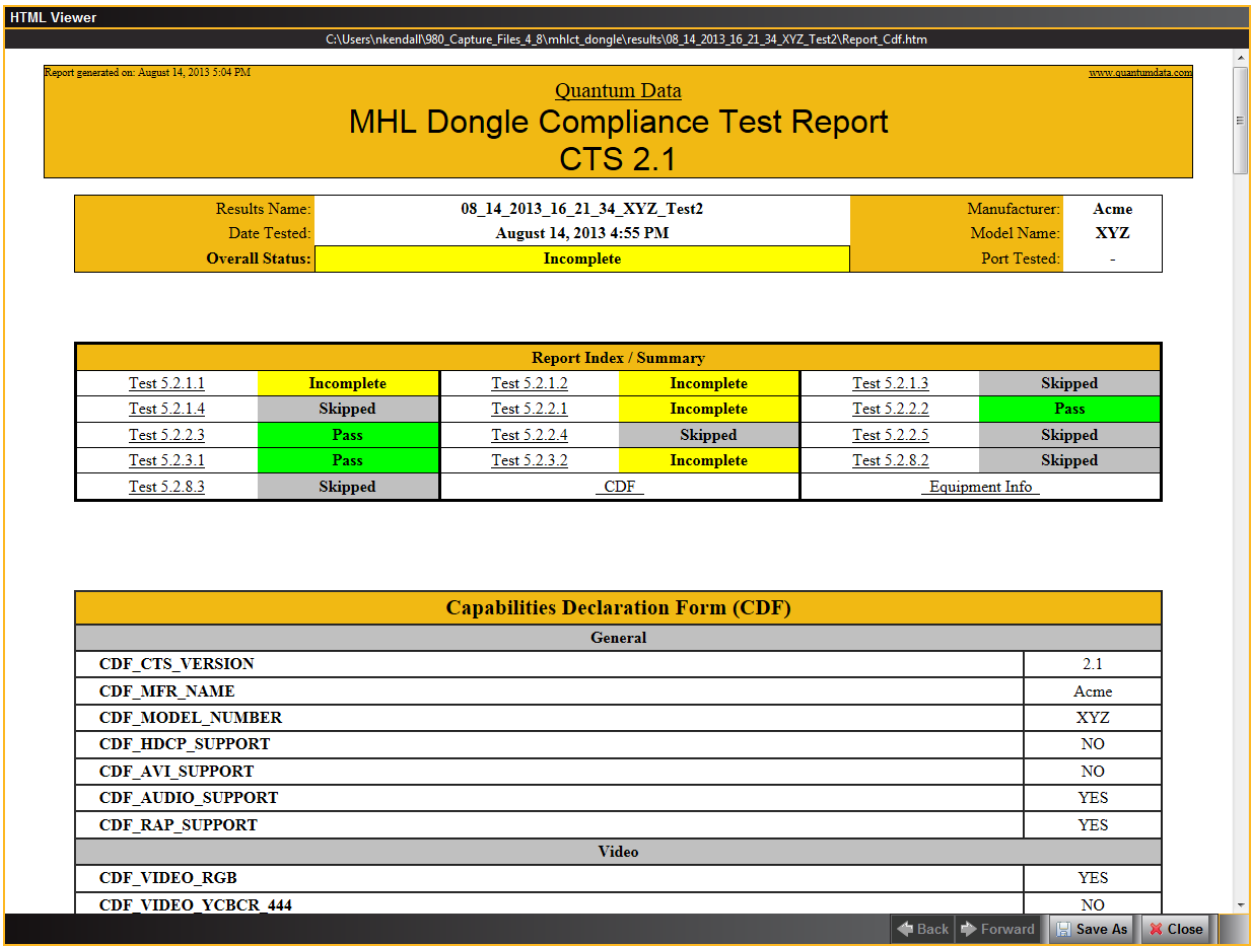


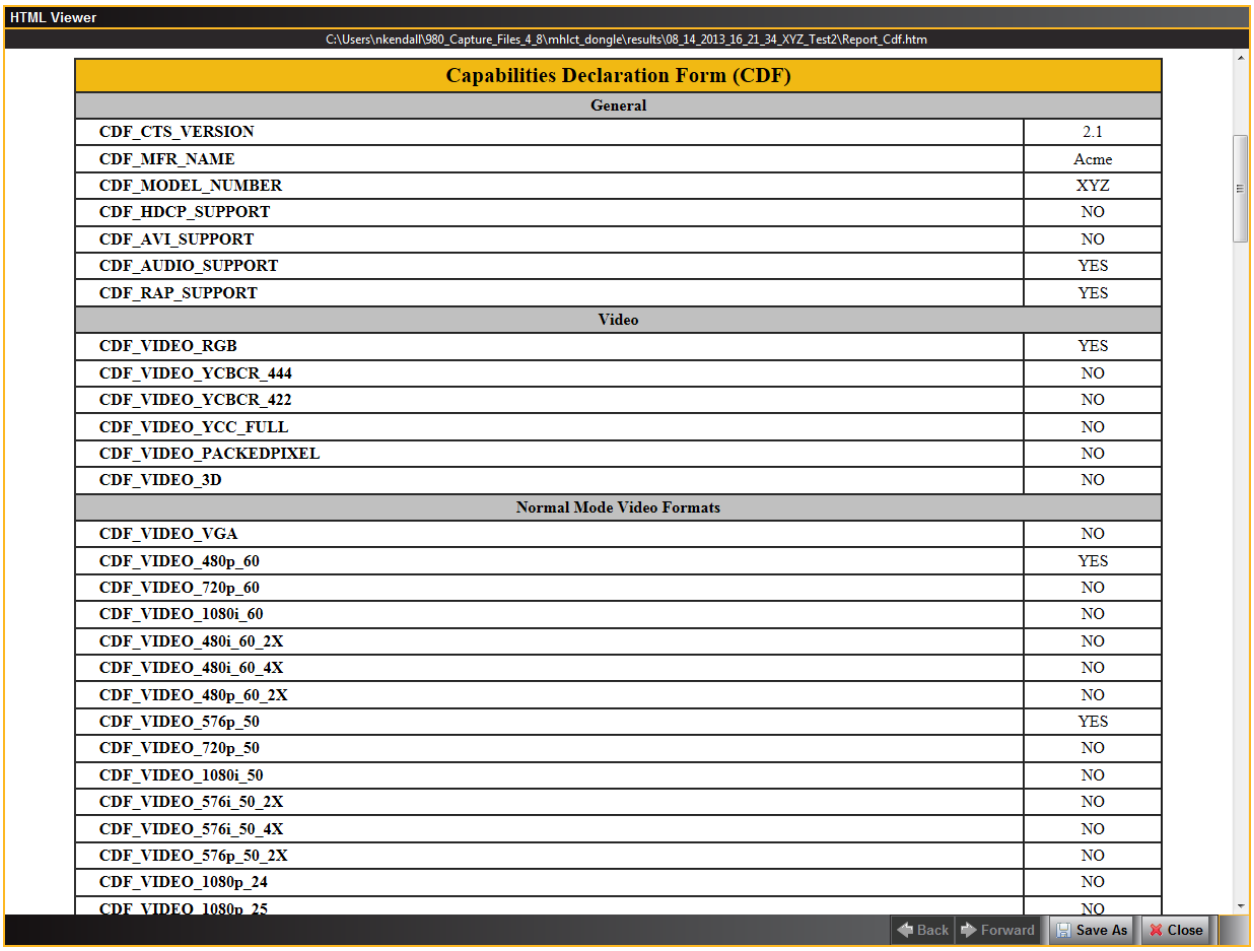
2. Click on the **HTML Report** activation button.

   A dialog box will appear asking if you want a summary of the test results or a version that includes the CDF. This dialog box is shown in the screen shot below.


Generate Report
HTML Report
08_14_2013_16_21_34_XYZ_Test2
Select the desired report options.
Show Test Summary Only.
Include CDF Information.
Cancel
OK

The html report is shown in the following screens.

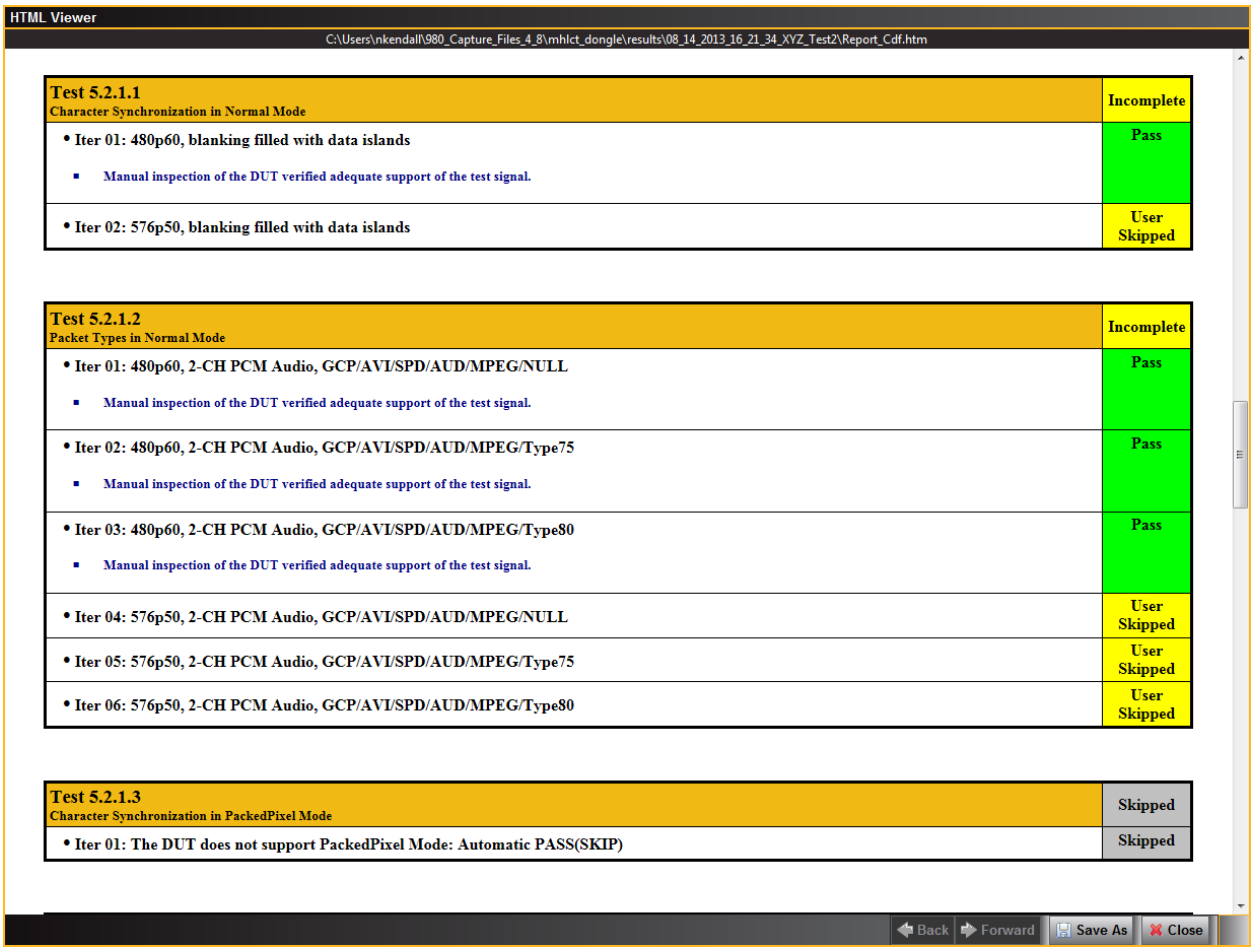


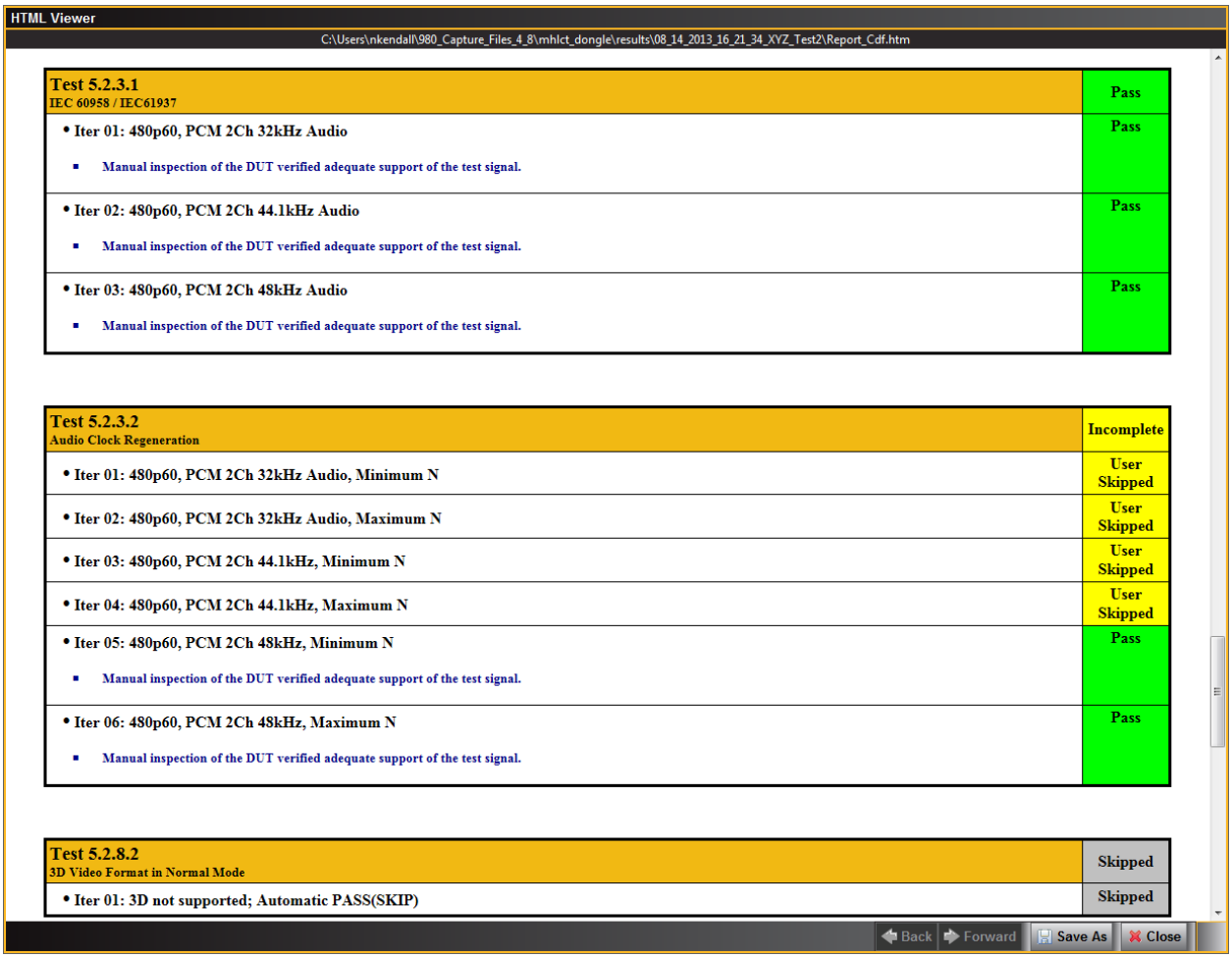

HTML Viewer

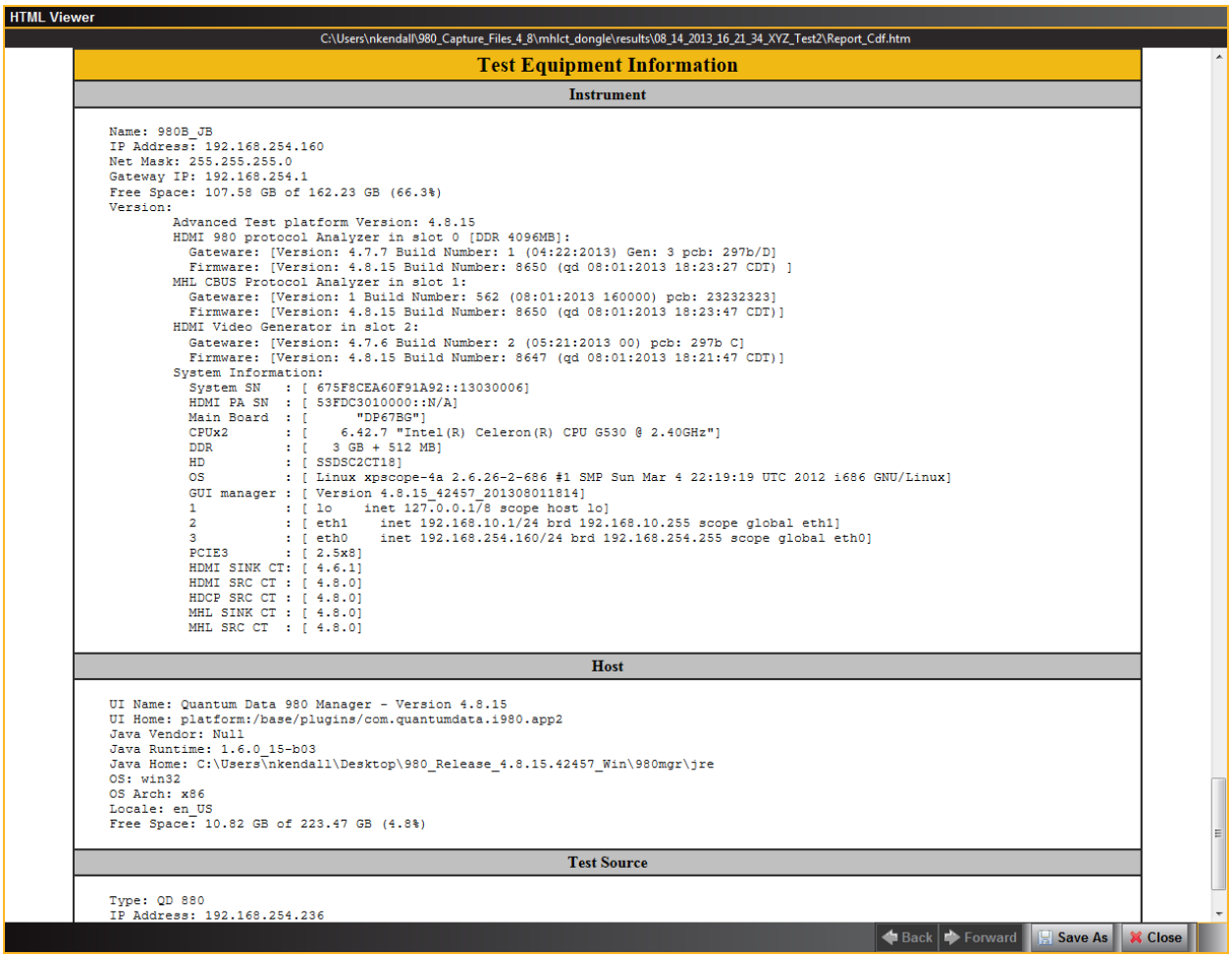
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_dongle\results\08_14_2013_16_21_34_XYZ_Test2\Report_Cdf.htm

Capabilities Declaration Form (CDF)	
General	
CDF_CTS_VERSION	2.1
CDF_MFR_NAME	Acme
CDF_MODEL_NUMBER	XYZ
CDF_HDCP_SUPPORT	NO
CDF_AVI_SUPPORT	NO
CDF_AUDIO_SUPPORT	YES
CDF_RAP_SUPPORT	YES
Video	
CDF_VIDEO_RGB	YES
CDF_VIDEO_YCBCR_444	NO
CDF_VIDEO_YCBCR_422	NO
CDF_VIDEO_YCC_FULL	NO
CDF_VIDEO_PACKEDPIXEL	NO
CDF_VIDEO_3D	NO
Normal Mode Video Formats	
CDF_VIDEO_VGA	NO
CDF_VIDEO_480p_60	YES
CDF_VIDEO_720p_60	NO
CDF_VIDEO_1080i_60	NO
CDF_VIDEO_480i_60_2X	NO
CDF_VIDEO_480i_60_4X	NO
CDF_VIDEO_480p_60_2X	NO
CDF_VIDEO_576p_50	YES
CDF_VIDEO_720p_50	NO
CDF_VIDEO_1080i_50	NO
CDF_VIDEO_576i_50_2X	NO
CDF_VIDEO_576i_50_4X	NO
CDF_VIDEO_576p_50_2X	NO
CDF_VIDEO_1080p_24	NO
CDF_VIDEO_1080p_25	NO

Back Forward Save As Close


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_dongle\results\08_14_2013_16_21_34_XYZ_Test2\Report_Cdf.htm
Test 5.2.1.1
Character Synchronization in Normal Mode
Incomplete
• Iter 01: 480p60, blanking filled with data islands
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 02: 576p50, blanking filled with data islands
User Skipped
Test 5.2.1.2
Packet Types in Normal Mode
Incomplete
• Iter 01: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/NULL
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 02: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/Type75
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 03: 480p60, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/Type80
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 04: 576p50, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/NULL
User Skipped
• Iter 05: 576p50, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/Type75
User Skipped
• Iter 06: 576p50, 2-CH PCM Audio, GCP/AVI/SPD/AUD/MPEG/Type80
User Skipped
Test 5.2.1.3
Character Synchronization in PackedPixel Mode
Skipped
• Iter 01: The DUT does not support PackedPixel Mode: Automatic PASS(SKIP)
Skipped
Back
Forward
Save As
Close


HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_dongle\results\08_14_2013_16_21_34_XYZ_Test2\Report_Cdf.htm
Test 5.2.3.1
IEC 60958 / IEC61937
Pass
• Iter 01: 480p60, PCM 2Ch 32kHz Audio
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 02: 480p60, PCM 2Ch 44.1kHz Audio
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 03: 480p60, PCM 2Ch 48kHz Audio
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Test 5.2.3.2
Audio Clock Regeneration
Incomplete
• Iter 01: 480p60, PCM 2Ch 32kHz Audio, Minimum N
User Skipped
• Iter 02: 480p60, PCM 2Ch 32kHz Audio, Maximum N
User Skipped
• Iter 03: 480p60, PCM 2Ch 44.1kHz, Minimum N
User Skipped
• Iter 04: 480p60, PCM 2Ch 44.1kHz, Maximum N
User Skipped
• Iter 05: 480p60, PCM 2Ch 48kHz, Minimum N
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
• Iter 06: 480p60, PCM 2Ch 48kHz, Maximum N
Pass
▪ Manual inspection of the DUT verified adequate support of the test signal.
Test 5.2.8.2
3D Video Format in Normal Mode
Skipped
• Iter 01: 3D not supported; Automatic PASS(SKIP)
Skipped
Back
Forward
Save As
Close

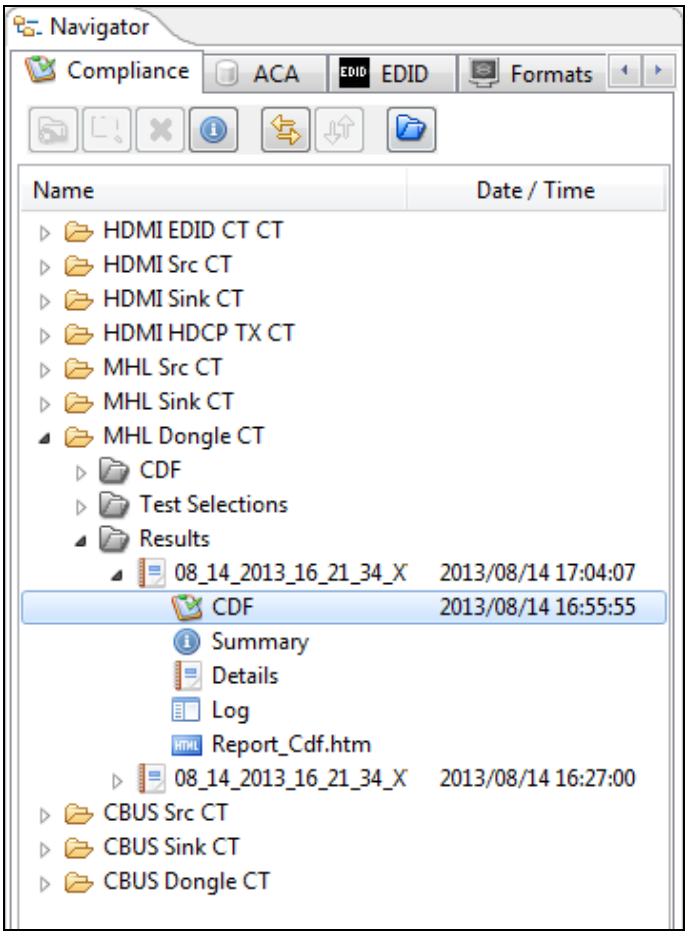

HTML Viewer
C:\Users\nkendall\980_Capture_Files_4_8\mhlct_dongle\results\08_14_2013_16_21_34_XYZ_Test2\Report_Cdf.htm
Test Equipment Information
Instrument
Name: 980B_JB
IP Address: 192.168.254.160
Net Mask: 255.255.255.0
Gateway IP: 192.168.254.1
Free Space: 107.58 GB of 162.23 GB (66.3%)
Version:
Advanced Test platform Version: 4.8.15
HDMI 980 protocol Analyzer in slot 0 [DDR 4096MB]:
Gateware: [Version: 4.7.7 Build Number: 1 (04:22:2013) Gen: 3 pcb: 297b/D]
Firmware: [Version: 4.8.15 Build Number: 8650 (qd 08:01:2013 18:23:27 CDT)]
MHL CBUS Protocol Analyzer in slot 1:
Gateware: [Version: 1 Build Number: 562 (08:01:2013 160000) pcb: 23232323]
Firmware: [Version: 4.8.15 Build Number: 8650 (qd 08:01:2013 18:23:47 CDT)]
HDMI Video Generator in slot 2:
Gateware: [Version: 4.7.6 Build Number: 2 (05:21:2013 00) pcb: 297b C]
Firmware: [Version: 4.8.15 Build Number: 8647 (qd 08:01:2013 18:21:47 CDT)]
System Information:
System SN : [675F8CEA60F91A92::13030006]
HDMI PA SN : [53FDC3010000::N/A]
Main Board : ["DP67BG"]
CPUx2 : [6.42.7 "Intel(R) Celeron(R) CPU G530 @ 2.40GHz"]
DDR : [3 GB + 512 MB]
HD : [SSDSC2CT18]
OS : [Linux xpscope-4a 2.6.26-2-686 #1 SMP Sun Mar 4 22:19:19 UTC 2012 i686 GNU/Linux]
GUI manager : [Version 4.8.15_42457_201308011814]
1 : [lo inet 127.0.0.1/8 scope host lo]
2 : [eth1 inet 192.168.10.1/24 brd 192.168.10.255 scope global eth1]
3 : [eth0 inet 192.168.254.160/24 brd 192.168.254.255 scope global eth0]
PCIE3 : [2.5x8]
HDMI SINK CT: [4.6.1]
HDMI SRC CT : [4.8.0]
HDCP SRC CT : [4.8.0]
MHL SINK CT : [4.8.0]
MHL SRC CT : [4.8.0]
Host
UI Name: Quantum Data 980 Manager - Version 4.8.15
UI Home: platform:/base/plugins/com.quantumdata.i980.app2
Java Vendor: Null
Java Runtime: 1.6.0_15-b03
Java Home: C:\Users\nkendall\Desktop\980_Release_4.8.15.42457_Win\980mgr\jre
OS: win32
OS Arch: x86
Locale: en_US
Free Space: 10.82 GB of 223.47 GB (4.8%)
Test Source
Type: QD 880
IP Address: 192.168.254.236
Back
Forward
Save As
Close

6.9 Viewing the MHL Sink Compliance test results and disseminating to others

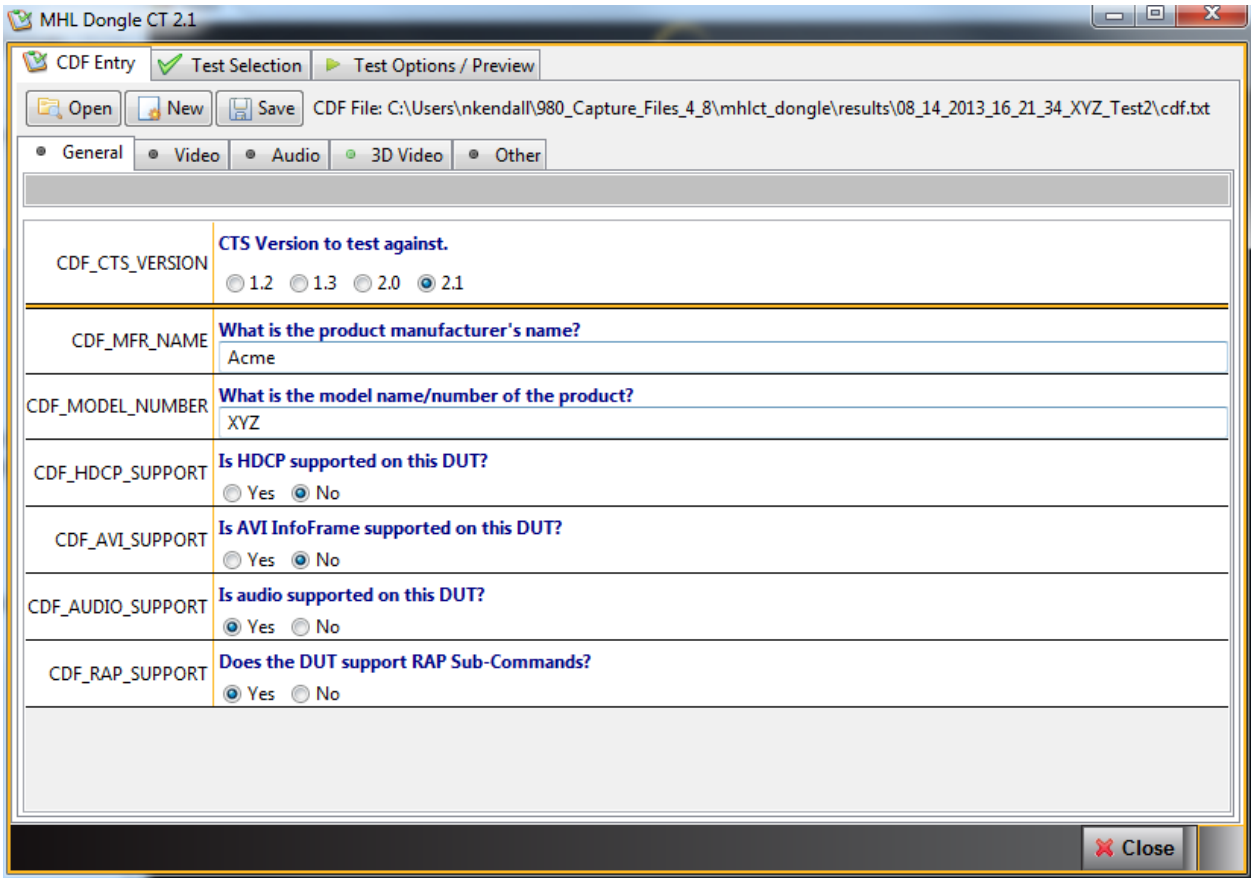
After you have completed the tests, you can view the CDF, test results, HTML report and detailed log at any time. Assuming you have run the tests from the external 980 GUI Manager from your PC, you can easily disseminate the results to other colleagues or subject matter experts or officials at the MHL Authorized Test Centers. Instructions for viewing the test results and disseminating to others are provided below.

To view the CDF for the device under test:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.
2. Select CDF and either double click or click on the **Open**  icon as shown below.



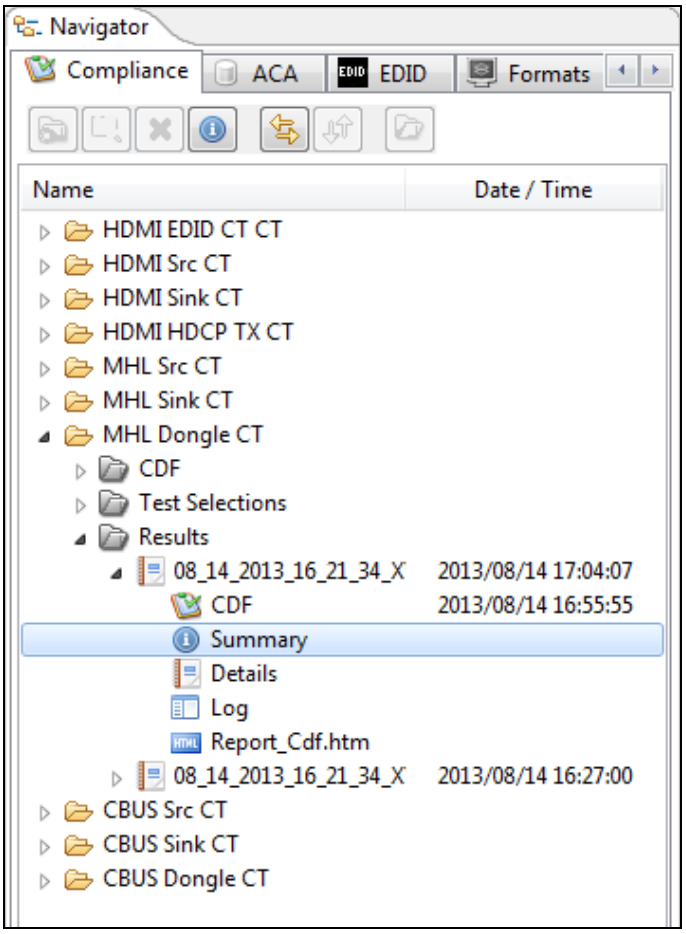
The CDF appears in a new window as shown below.



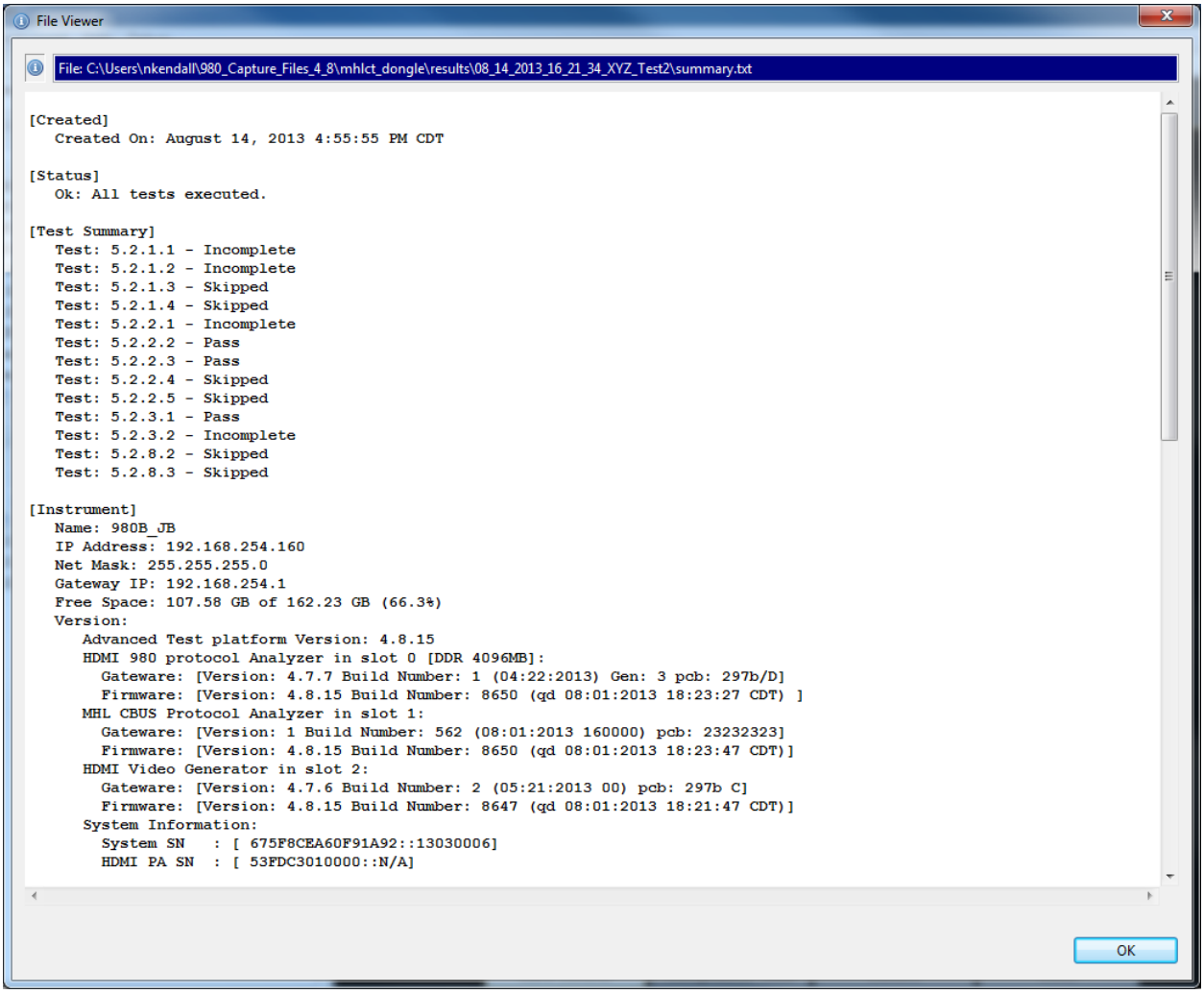
To view a Summary of the results:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.

2. Select Summary and either double click or click on the **Open**  icon as shown below.



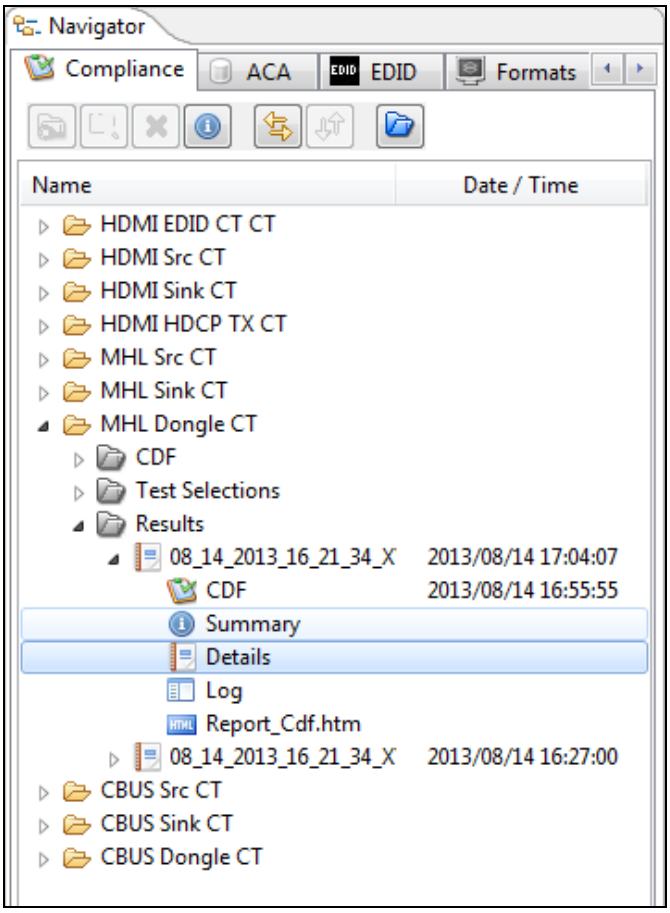
The Summary file appears in a new window as shown below.



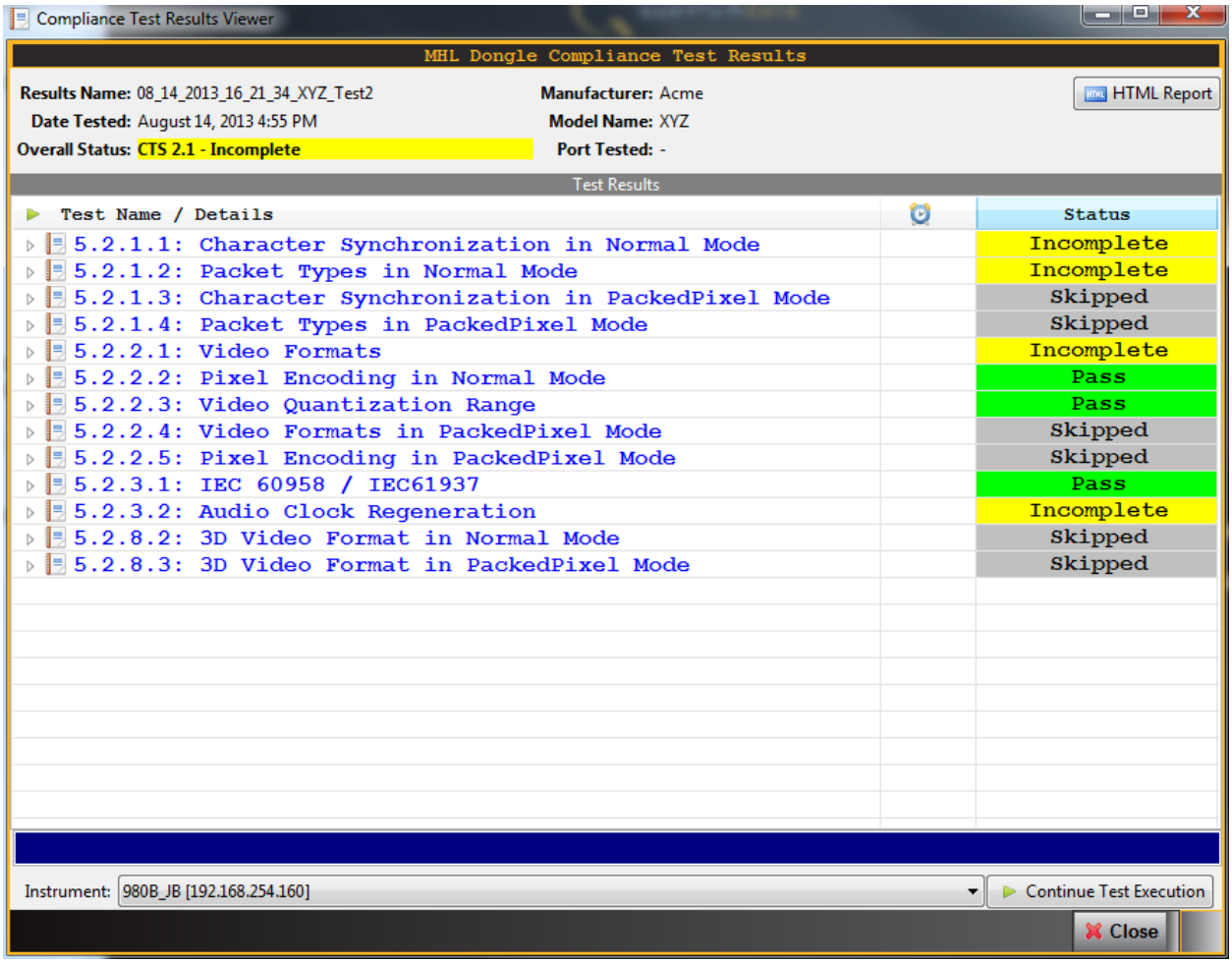
To view a Details results:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.

2. Select Details and either double click or click on the **Open**  icon as shown below.



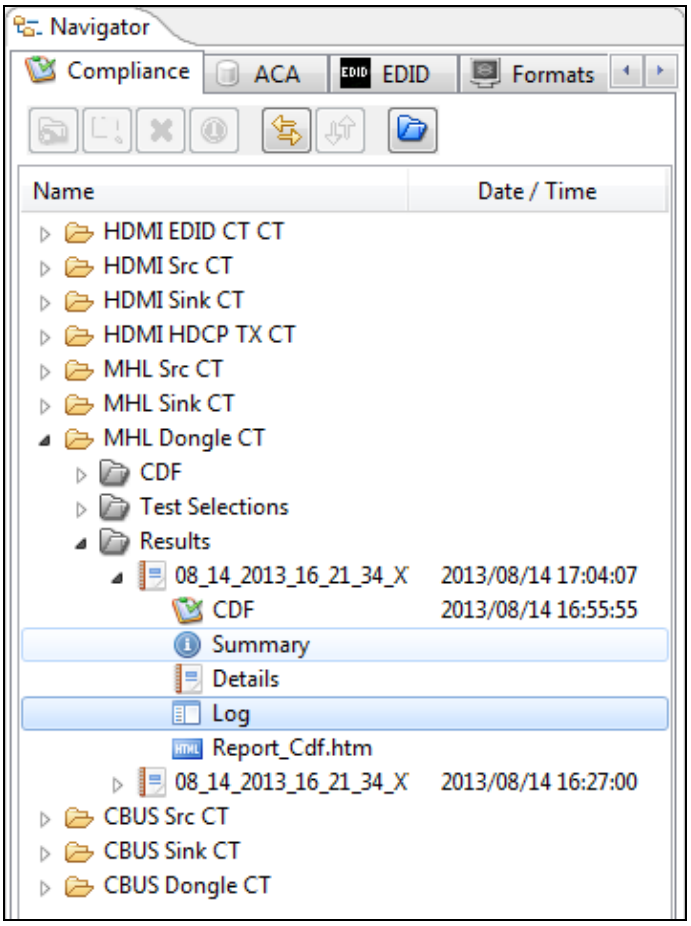
The Details file appears in a new window as shown below.



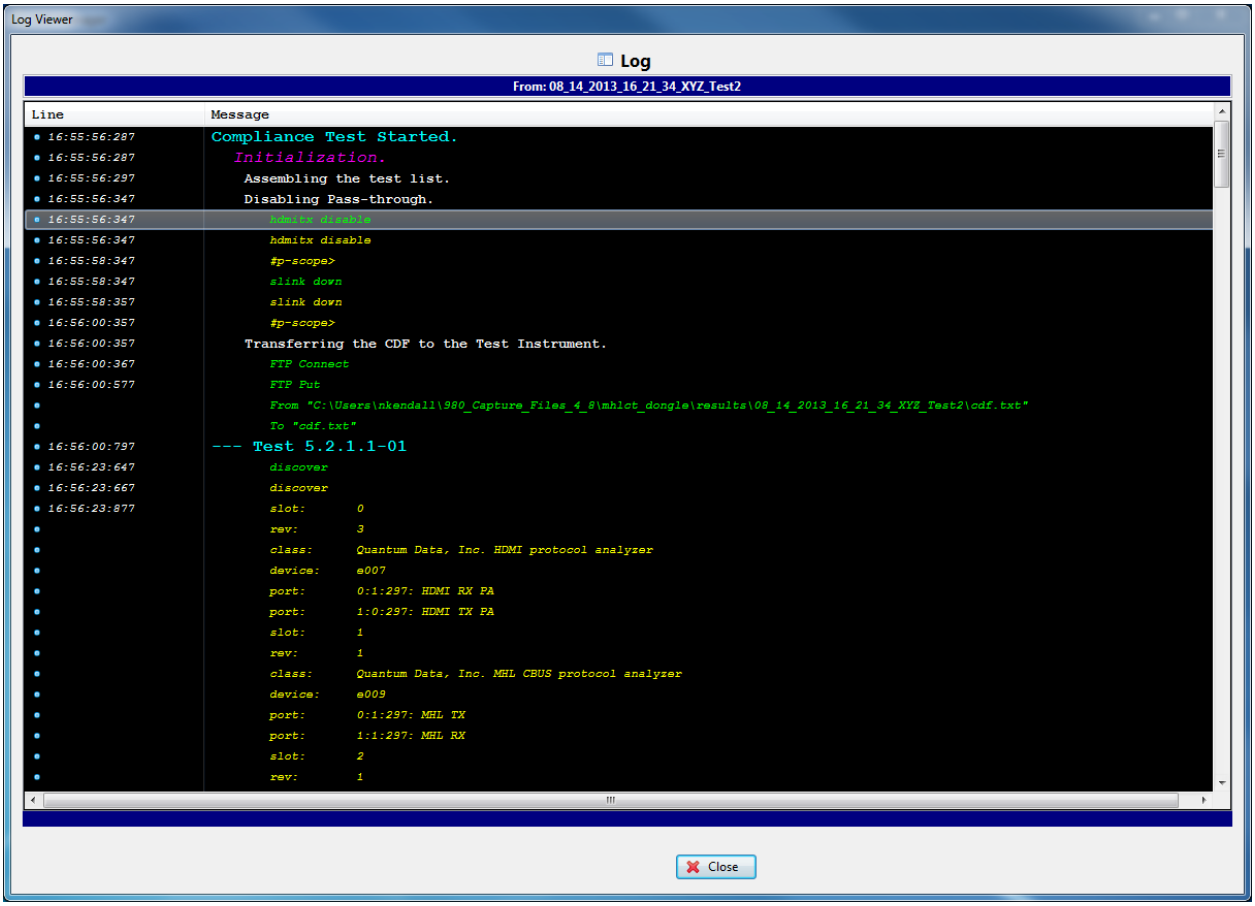
To view the detailed Log of the results:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.

2. Select Log and either double click or click on the **Open**  icon as shown below.



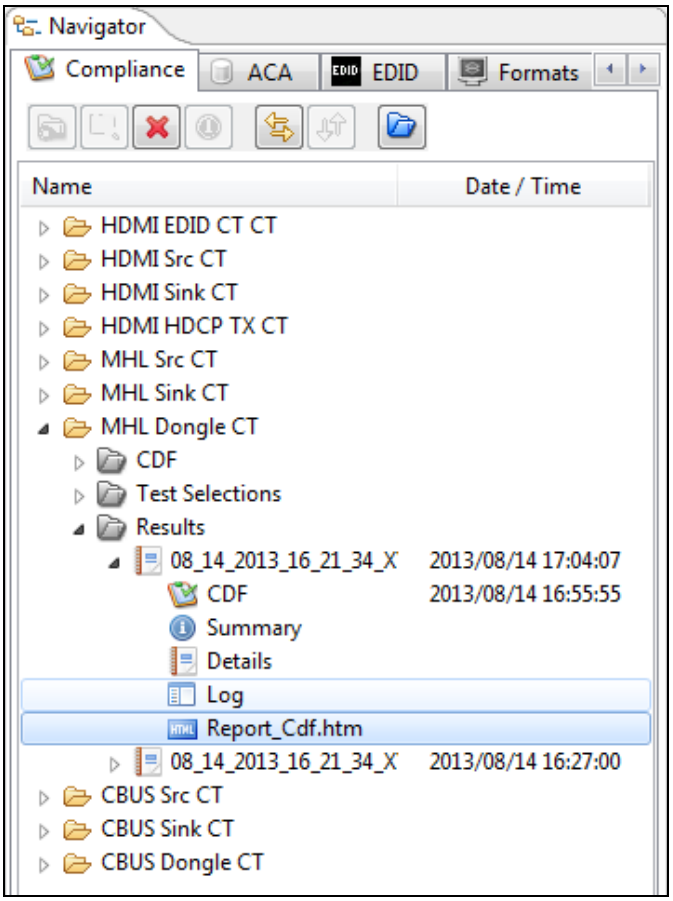
The detail Log appears in a new window as shown below.



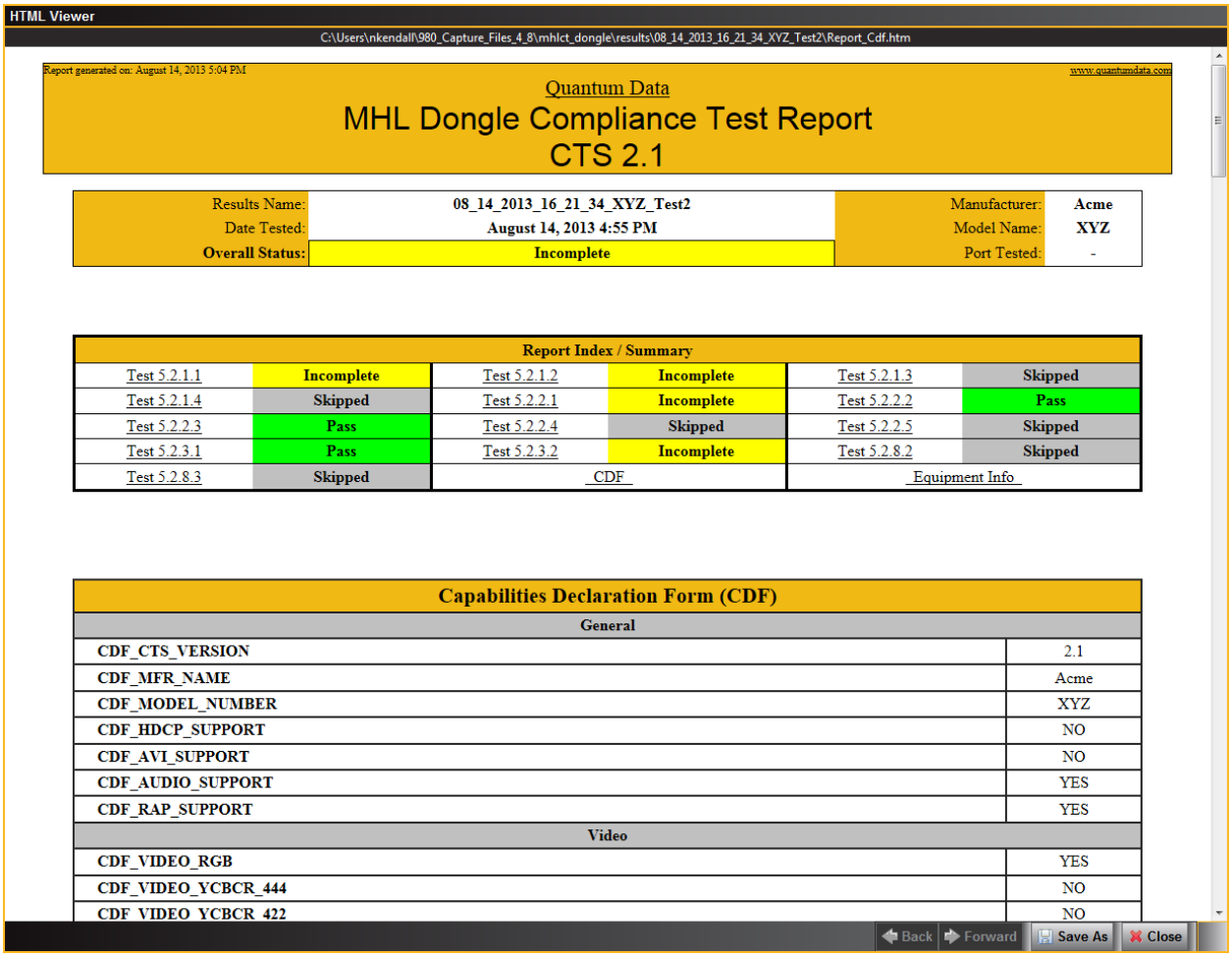
To view the HTML report:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.

2. Select Report_CDF and either double click or click on the **Open**  icon as shown below.

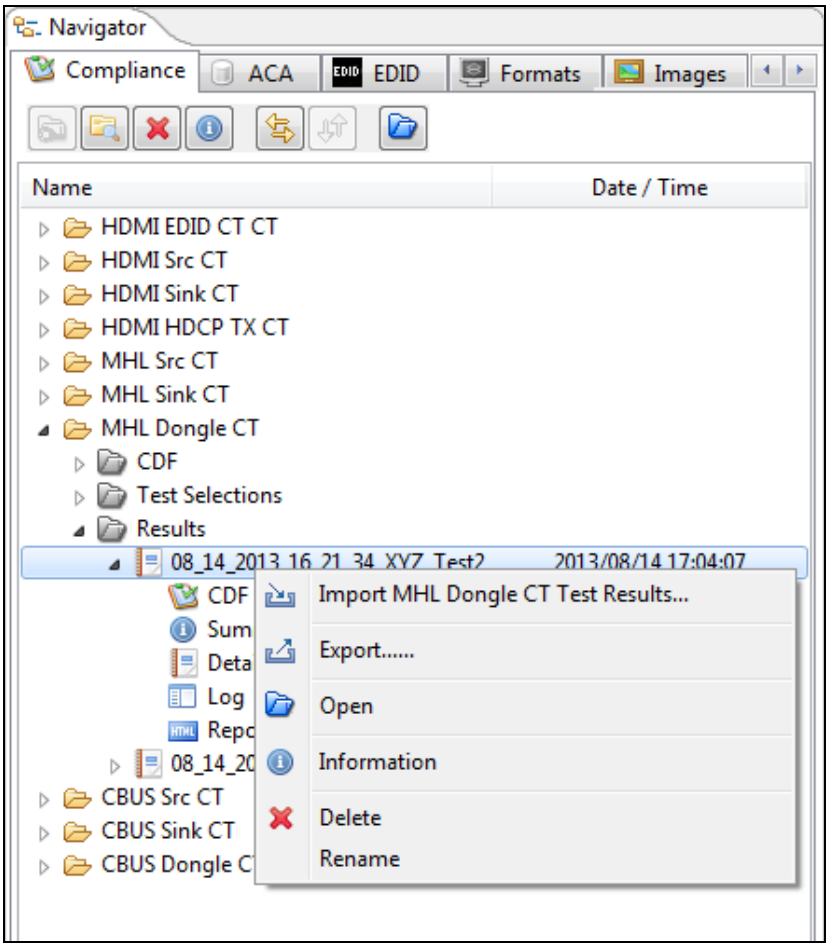


The HTML report appears in a new window as shown below.



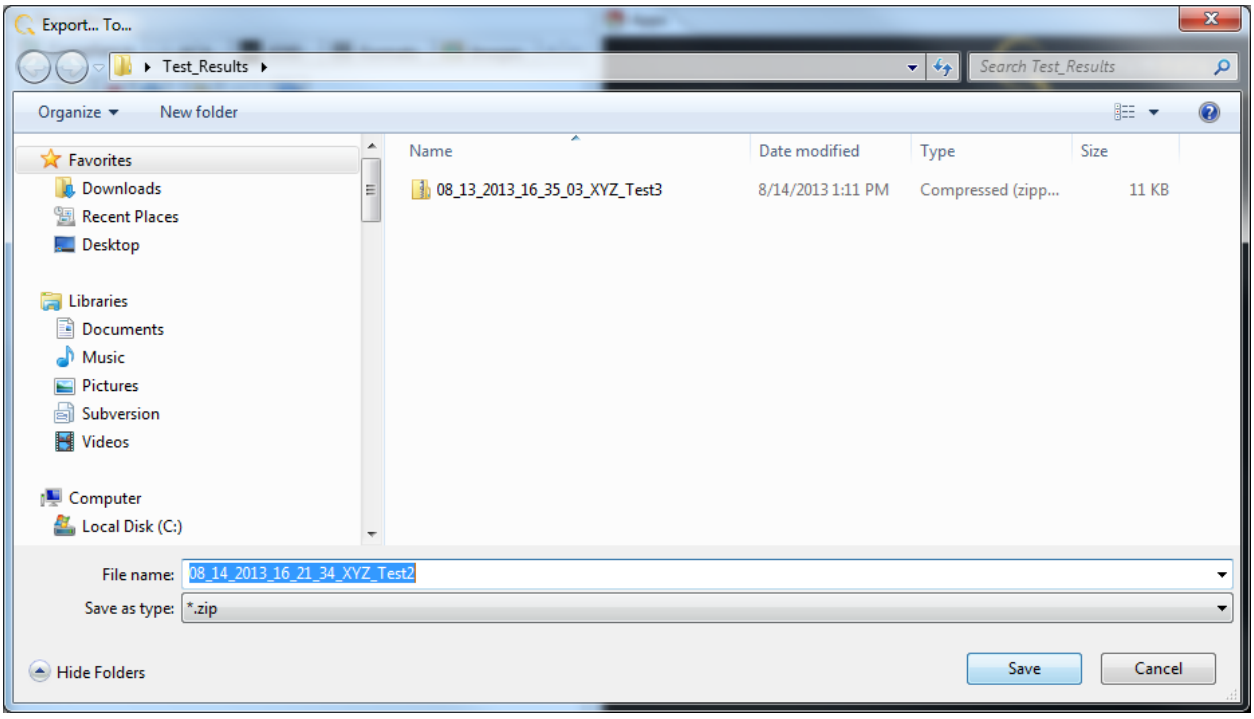
To disseminate the results to others:

1. From the **Navigator/Compliance** panel, select the **MHL Sink CT** results directory.
2. Right click on the set of results you wish to disseminate and select Export as shown below.



A Window opens up for you to browse to a directory to store the files.

3. Select **Save** to save the result files. A zip file is created and stored in the directory. You can now email the file or post the file on an FTP site or store on a storage service (e.g. dropbox).



END OF USER GUIDE