

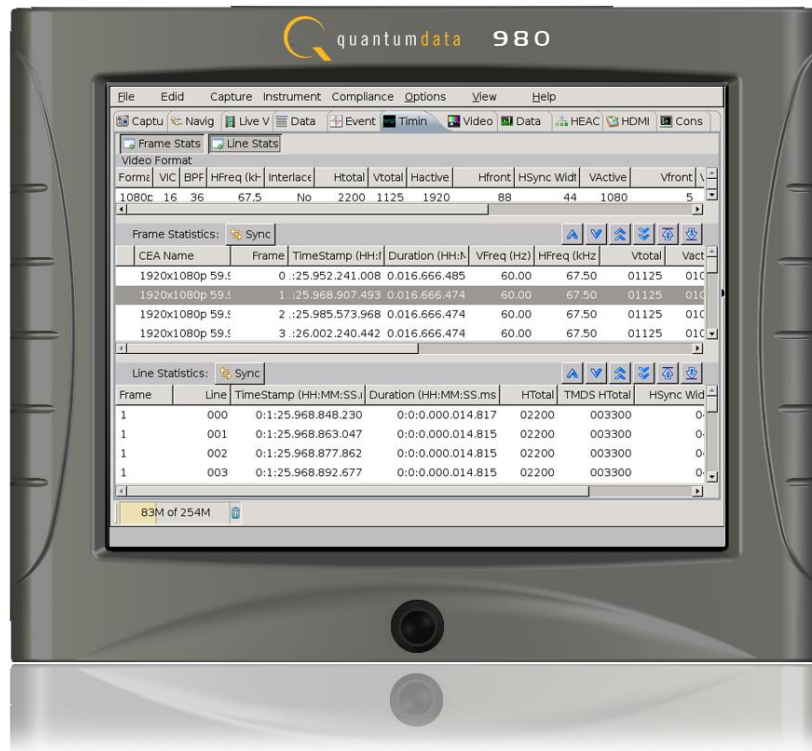


# User Guide

## 980 HDMI Protocol Analyzer Module

### HDMI & MHL Source Compliance Tests

Rev: A4



## Table of Contents

<b>1</b>	<b>About the 980 HDMI Protocol Analyzer Module</b>	<b>3</b>
1.1	What makes the 980 HDMI Protocol Analyzer Unique?	3
1.2	Scope of this User Guide	4
1.3	Changes to this User Guide	5
1.4	What options are available with the 980?	5
1.5	980 User Interface	7
1.6	What kinds of data does the 980 Protocol Analyzer module allow you to view?	11
<b>2</b>	<b>Getting Started</b>	<b>13</b>
<b>3</b>	<b>HDMI Source Compliance Tests</b>	<b>14</b>
3.1	Workflow for running the HDMI Source Compliance Tests	15
3.2	Making the HDMI connections	15
3.3	Setting the 980 mode to HDMI	17
3.4	Setting the Configuration of the Link Mode	18
3.5	Setting the +5V levels	20
3.6	Completing the CDF	22
3.7	Selecting which tests to run	43
3.8	Executing the HDMI Source Compliance Tests	49
3.9	Viewing Details of Source Compliance Test Failures	63
3.10	Canceling and Resuming the HDMI Source Compliance after cancel	65
3.11	Viewing the HDMI Source Compliance HTML test report	67
<b>4</b>	<b>MHL Source Compliance Tests</b>	<b>71</b>
4.1	Workflow for running the MHL Source Compliance Tests	71
4.2	Making the physical MHL connections	73
4.3	Setting the 980 Mode to MHL	76
4.4	Completing the CDF	78
4.5	Selecting which tests to run	87
4.6	Executing the MHL Source Compliance Tests	95
4.7	Canceling and Resuming the MHL Source Compliance after cancel	106
4.8	Viewing Details of Source Compliance Test Failures	109
4.9	Viewing the MHL Source Compliance HTML test report	111

# 1 About the 980 HDMI Protocol Analyzer Module

This chapter provides an overview of features of the 980 HDMI Protocol Analyzer module and the 980 GUI Manager. The 980 HDMI Protocol Analyzer module is an analyzer for HDMI/MHL source devices. It provides 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 module can be equipped in either of two 980 Advanced Test Platforms:

- 1) The 980 Advanced Test Platform – 2-slot chassis with a 10.4 inch touch display
- 2) The 980B Advanced Test Platform – 5-slot chassis with a 15 inch touch display

**Note:** The module is always equipped in the first slot of the 980 platform from the factory.

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 Unique?

The 980 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 supports capture, store and analysis 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 source Protocol tests in Test 7-17 of the HDMI Compliance Test Specification and the Basic Protocol source 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 compliance test options for testing HDMI sources and sinks.

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-based 980 GUI Manager. The procedures are nearly 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 sink compliance tests. This HDMI compliance test user guide can be found on the Quantum Data website at: [http://www.quantumdata.com/products/980\\_PA.asp](http://www.quantumdata.com/products/980_PA.asp).

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 HDMI Protocol Analyzer module – This User Guide covers source analysis features of the 980 HDMI Protocol Analyzer module. Used in conjunction with the 980 Advanced Test Platform Quick Start Guide for purchases in 2013.
- 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 for purchases in 2013.
- 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 HDCP Source Compliance Test – This User Guide covers source compliance HDCP testing for 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 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. (This User 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.

- 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

This is a new document which combines the HDMI and MHL source compliance tests. The following updates have been added to the HDMI and MHL source compliance test descriptions and procedures:

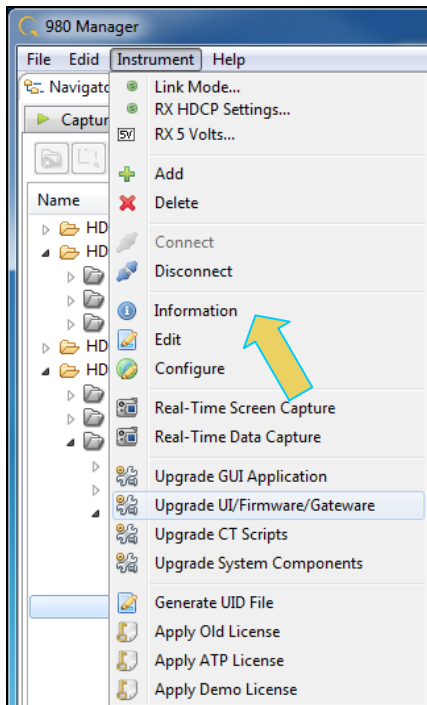
- The MHL source compliance test was updated to indicate support for MHL 1.3 & 2.1 CTS.
- The updated GUI for the 980B Advanced Test Platform.

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

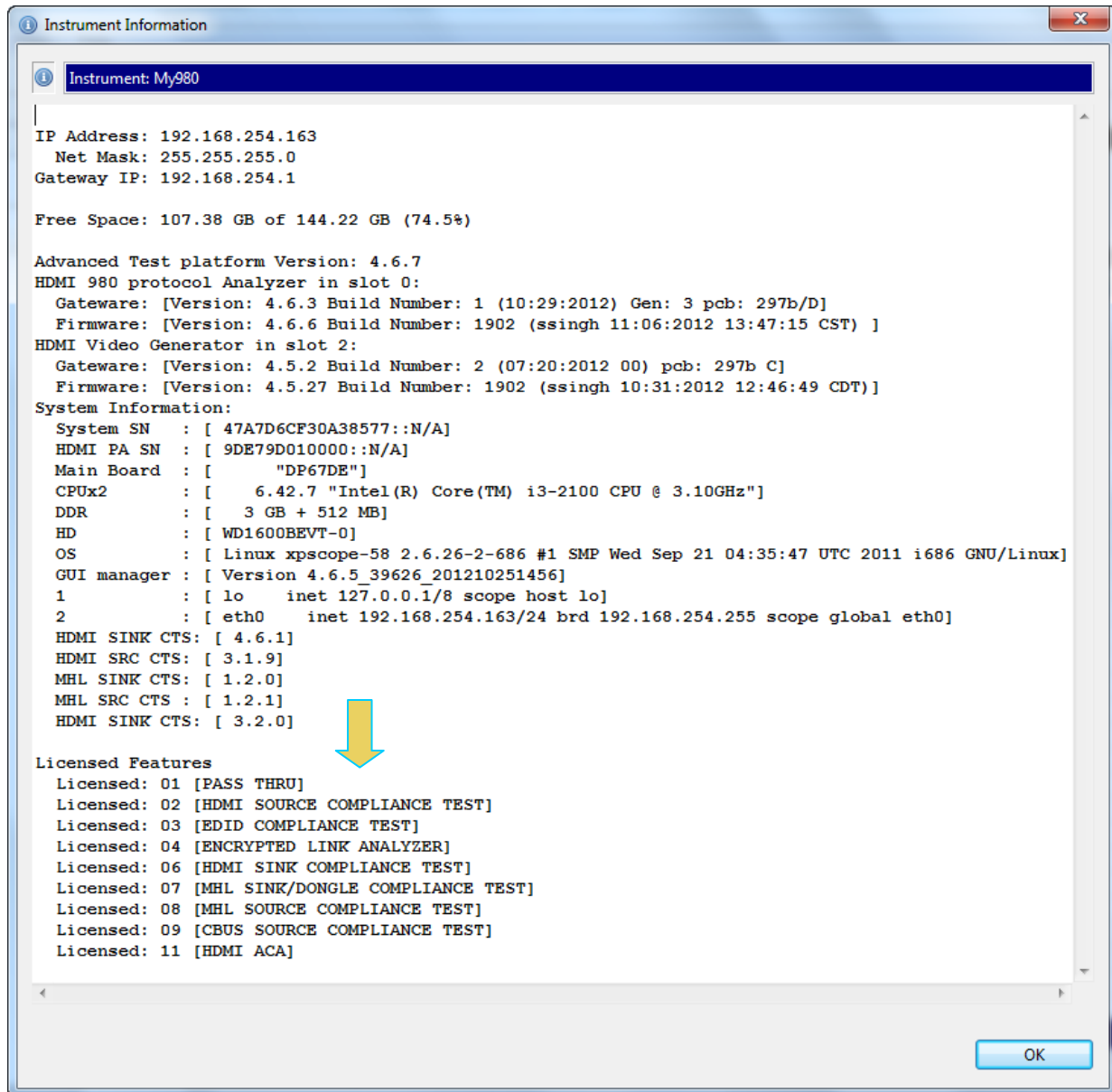
### 1.4 What options are available with the 980?

The 980 offers four options that you can purchase with the 980 HDMI Protocol Analyzer module. You must have a license to use these optional features: 1) Encrypted Link Analyzer mode for monitoring encrypted data between an HDMI source and sink device. 2) HDMI Source Compliance tests in accordance with HDMI 1.4 CTS Sections 7.4 through 7.8. 3) EDID Compliance test in accordance with Sections 8.2 and 8.5 of the HDMI 1.4 CTS. 4) HDMI Sink Compliance tests in accordance with HDMI 1.4 CTS Sections 8.2 and 8.4 through 8.8. 5) MHL Source Compliance tests in accordance with MHL 1.2, 1.3, 2.0 & 2.1 CTS Section 3. 6) MHL Sink Compliance tests in accordance with MHL 1.2, 1.3, 2.0 & 2.1 CTS Section 4.

You can determine what options the 980 is provisioned with by looking at the label on the bottom of the 980 or by accessing the Instrument Information screen on either the built-in or external 980 GUI manager. You will need to access the Instrument Information panel through embedded 980 GUI Manager as shown below.



The information is then displayed in a separate window. The information on the **Instrument Information** window will provide you with the information about what options are supported and will also be helpful if you call Quantum Data customer support during an upgrade process.



## 1.5 980 User Interface

The 980 Protocol Analyzer module 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.

### 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 through a larger interface which allows you to use multiple panels at the same time.

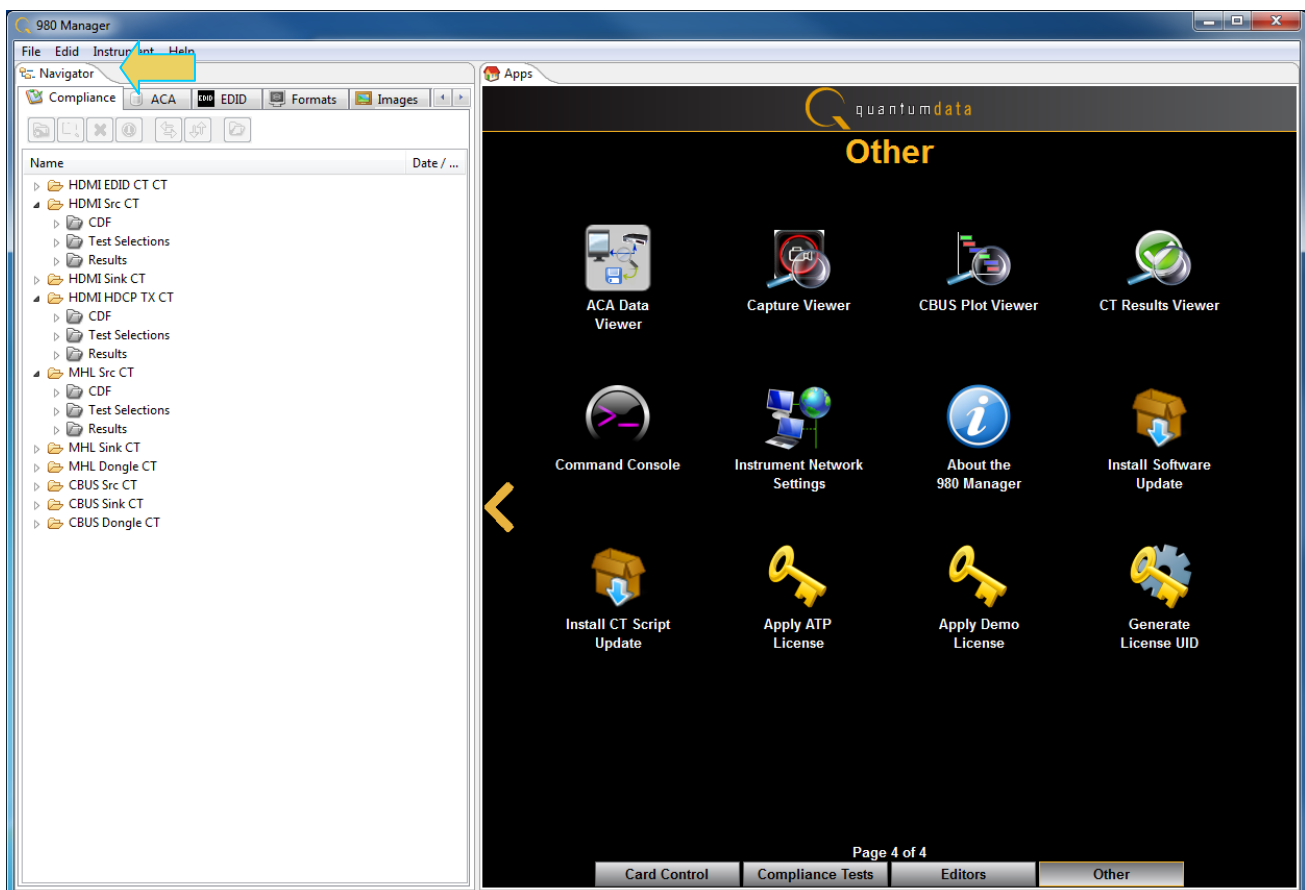
### 1.5.2 Embedded 980 GUI Manager

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 module 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 using the receiver there are a few other differences in the layouts between the embedded 980 GUI Manager and the External 980 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.



quantumdata

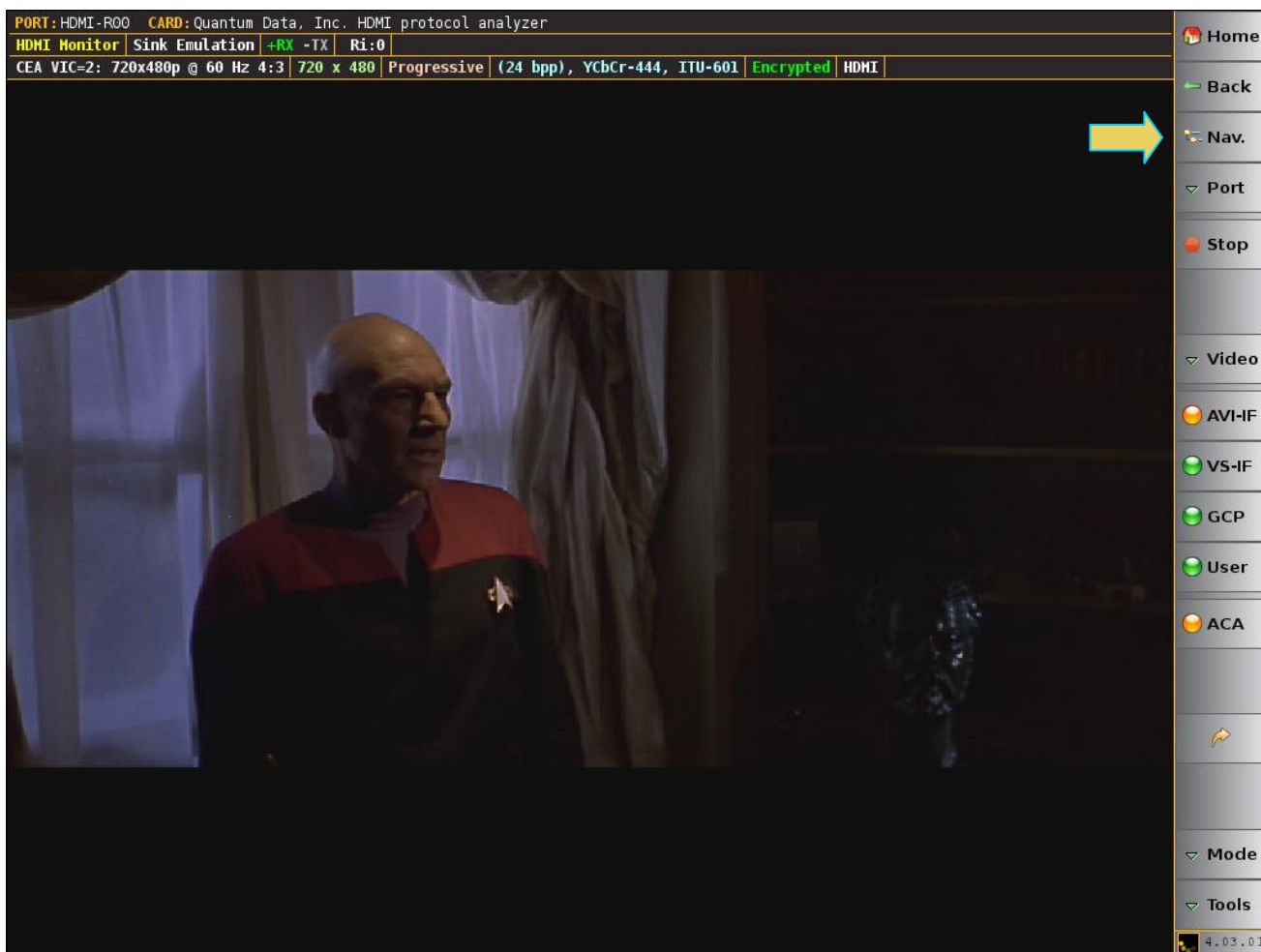
## Other

- Navigator
- Capture Viewer
- CBUS Plot Viewer
- CT Results Viewer
- Command Console
- Instrument Network Settings
- About the 980 Manager
- Calibrate the LCD
- Apply ATP License
- Apply Demo License

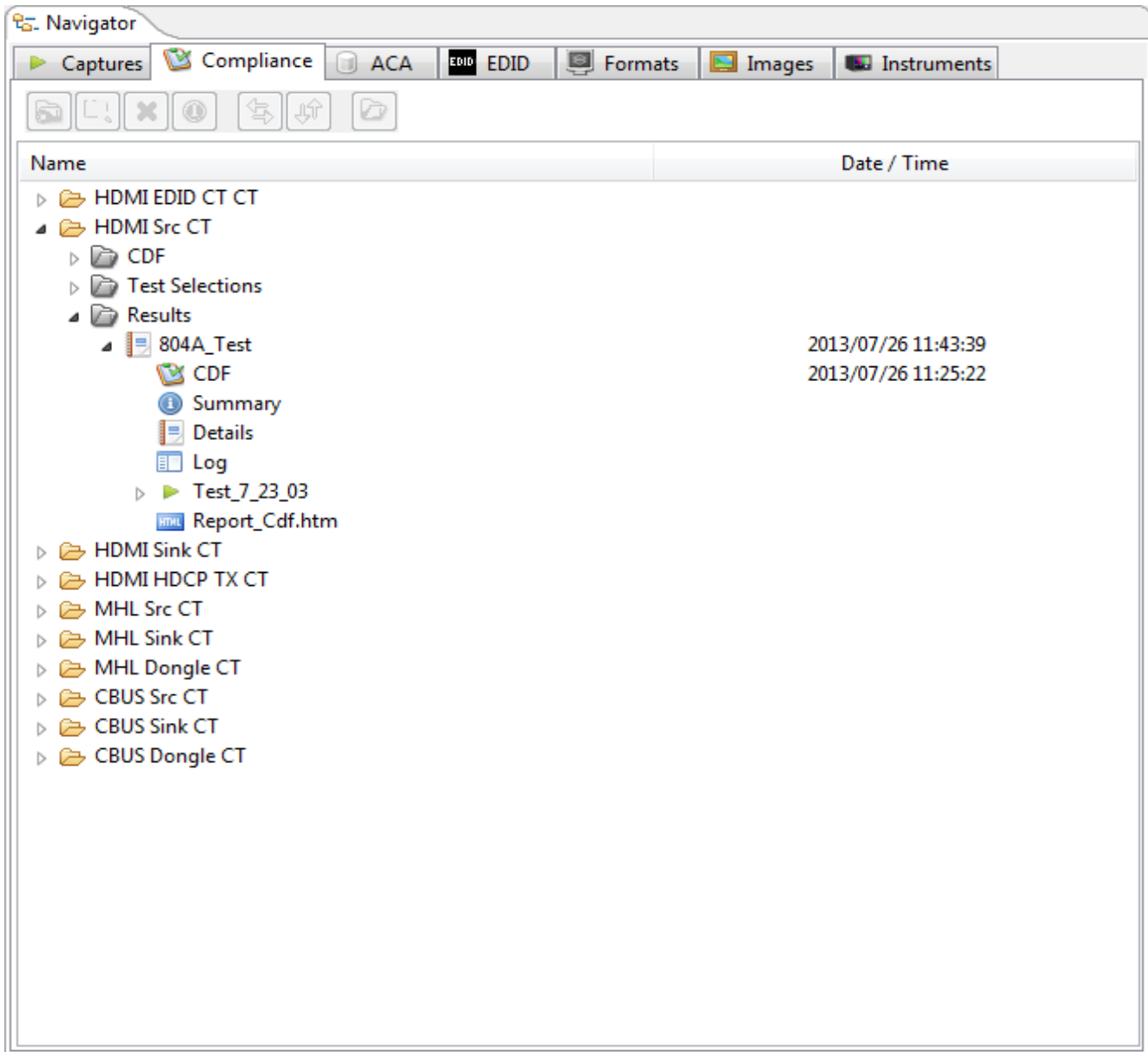
Page 4 of 4

Card Control | Compliance Tests | Editors | **Other**

Back | Navigator | DHCP: 192.168.254.160 | ATP Version: 4.8.15 (3 cards detected) | X



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



## 1.6 What kinds of data does the 980 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 Source Compliance Tests

---

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

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

The 980 supports the following test sections in the HDMI 1.4b Compliance Test specification:

- 7.4 Source Protocol Tests
  - 7-16 Legal Codes
  - 7-17 Basic Protocol
  - 7-18 Extended Control Period
  - 7-19 Packet Types
- 7.5 Source Video Tests
  - 7-21 Minimum Format Support
  - 7-22 Additional Format Support
  - 7-23 Pixel Encoding (RGB)
  - 7-24 Pixel Encoding (YCbCr)
  - 7-25 Video Format Timing
  - 7-26 Pixel Repetition
  - 7-27 AVI Infoframe
- 7.6 Source Audio Tests
  - 7-28 IEC 60958/61937
  - 7-29 ACR
  - 7-30 Audio Sample Packet Jitter
  - 7-31 Audio Infoframe
  - 7-32 Audio Sample Packet Layout
- 7.7 Source Interoperability with DVI Tests
  - 7-32 Interoperability with DVI
- 7.8 Source Advanced Features Tests
  - 7-34 Deep Color
  - 7-35 Gammat Metadata Transmission
  - 7-36 High Bitrate Audio
  - 7-37 One Bit Audio
  - 7-38 3D Video Format Timing
  - 7-39 4K x 2K Video Format Timing
  - 7-40 Extended Colorimetry Transmission

### 3.1 Workflow for running the HDMI Source Compliance Tests

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

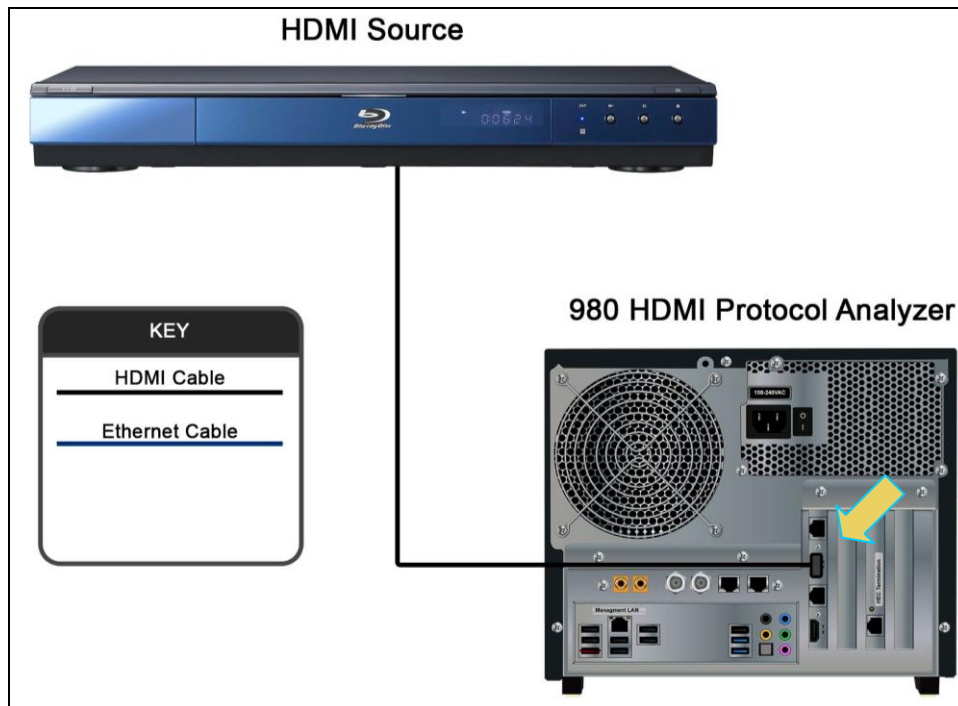
1. Connect the source device under test to the 980 HDMI Protocol Analyzer via HDMI.
2. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.

**Note:** You can now select additional 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.

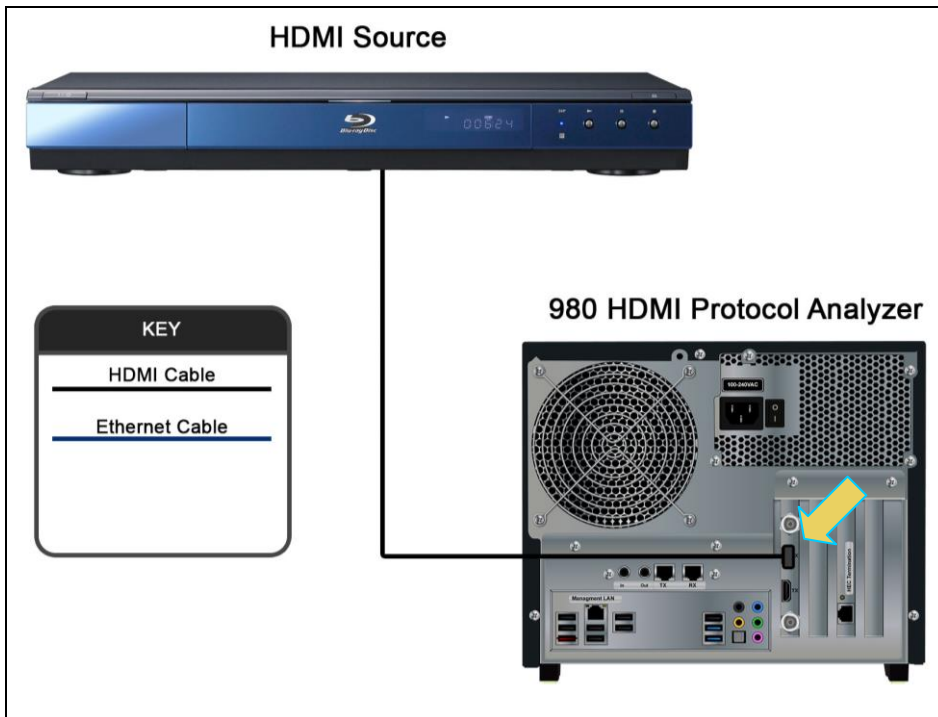
3. Select the tests that you wish to run from the **Test Selection** panel.
4. Initiate the tests through the **Test Options / Review** panel.
5. View the detailed data for test failures if failures occur.
6. View the results in the **Test Results** panel under the **Navigator** panel.

### 3.2 Making the HDMI connections

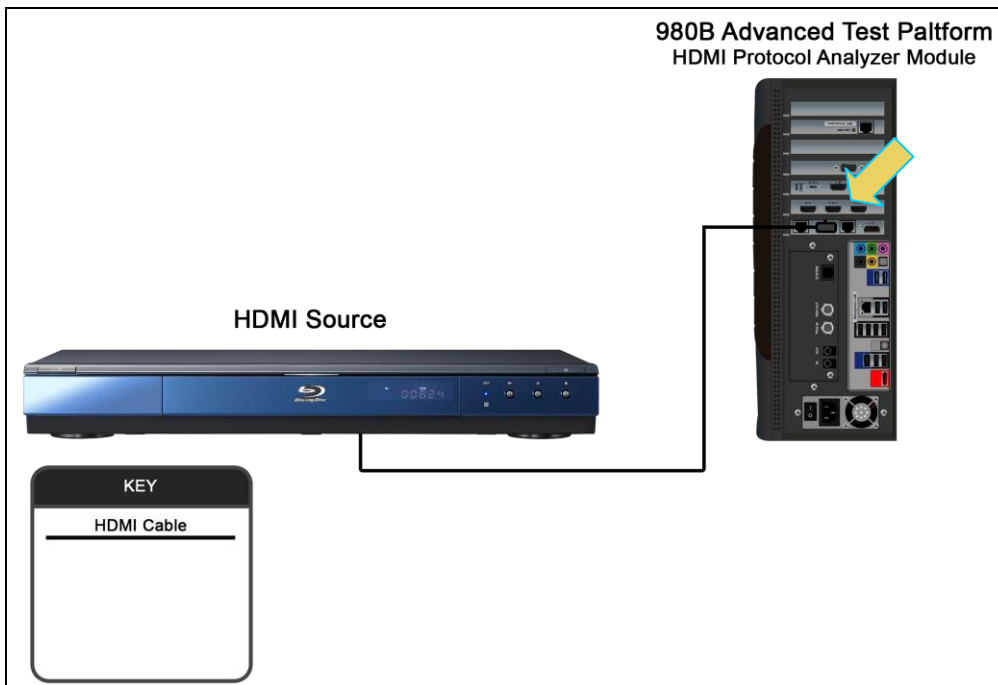
This procedure describes how to establish an HDMI connection between the HDMI source device under test and the 980. This procedure assumes that you have assembled the 980 and source device under test and applied power to all these devices. Refer to the procedures and diagram below.



HDMI connection for source compliance test – 980 Rev D Protocol Analyzer module



**HDMI connection for source compliance test – 980 Rev C Protocol Analyzer module**



**HDMI connection for source compliance test – 980B**

1. Connect your HDMI source device under test to the HDMI Rx connector (the top most HDMI connector shown in the figure below) on the 980 HDMI Protocol Analyzer module. Use a high speed HDMI cable.

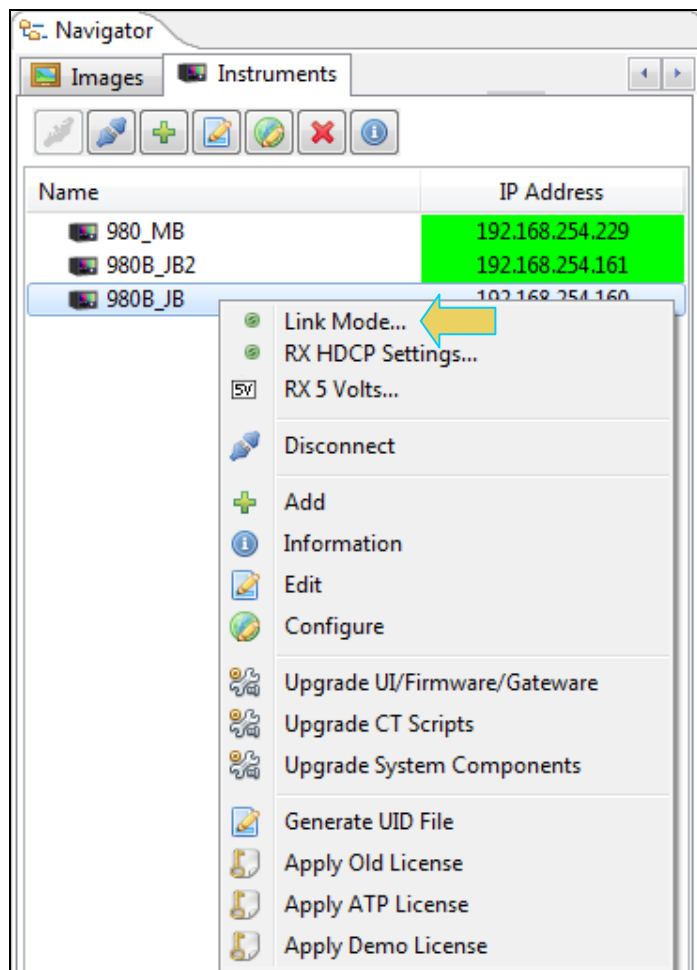


### 3.3 Setting the 980 mode to HDMI

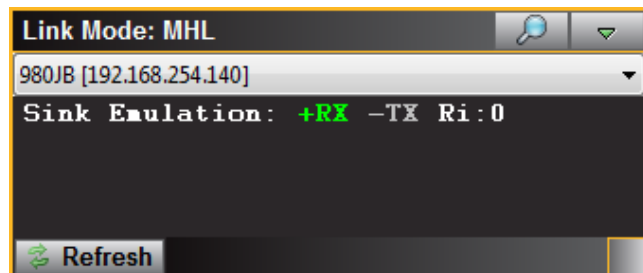
Use the following procedures to set the 980 HDMI Protocol Analyzer module to the HDMI mode.

**To set the 980 mode to HDMI:**

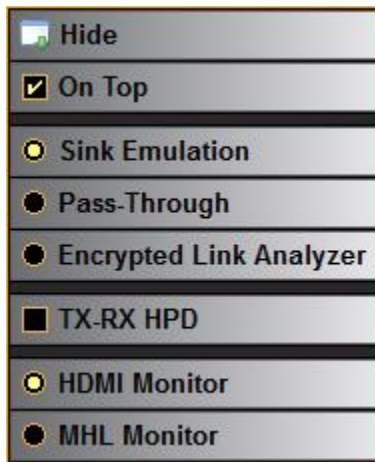
1. From the **Instrument** menu, select the **Link Mode**.



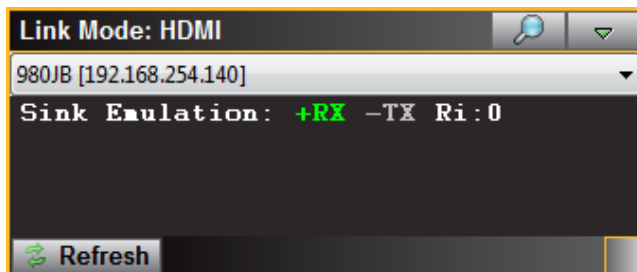
The following menu appears:



2. Select the pull-down menu as shown below and select the HDMI Monitor checkbox. The default mode is HDMI.



The Link Mode menu will show HDMI (or MHL accordingly) as the Link Mode.

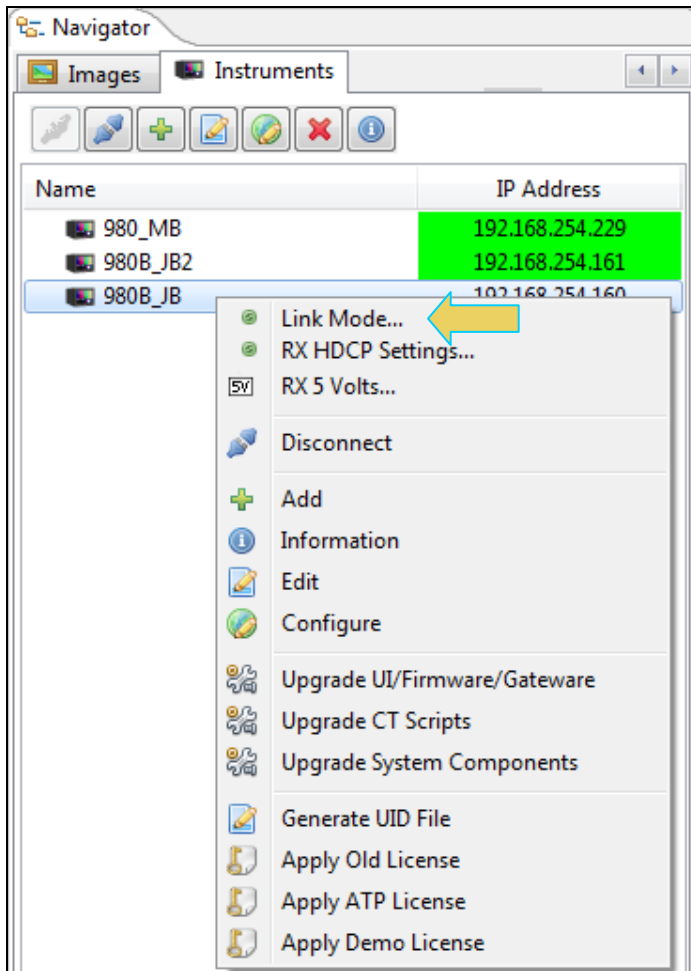


### 3.4 Setting the Configuration of the Link Mode

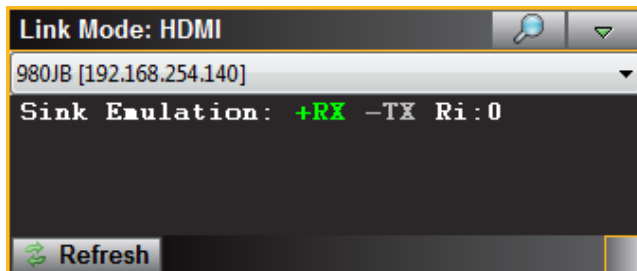
When running the HDMI or MHL source compliance tests you will need to set the configuration of the **Link Mode** to Sink Emulation.

**To set the 980 link configuration mode:**

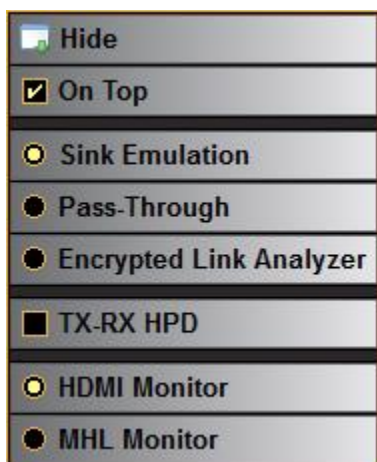
1. Ensure that you are sending video from your source device under test.
2. Select the configuration of the **Link Mode** item from the Instrument pull-down menu on the built-in front panel as shown below.



The mode dialog box appears as shown below.



3. Select the **Link Mode** item from the pull-down menu on the built-in front panel as shown below.  
A pop out menu will appear enabling you to select the desired mode using the check boxes provided.

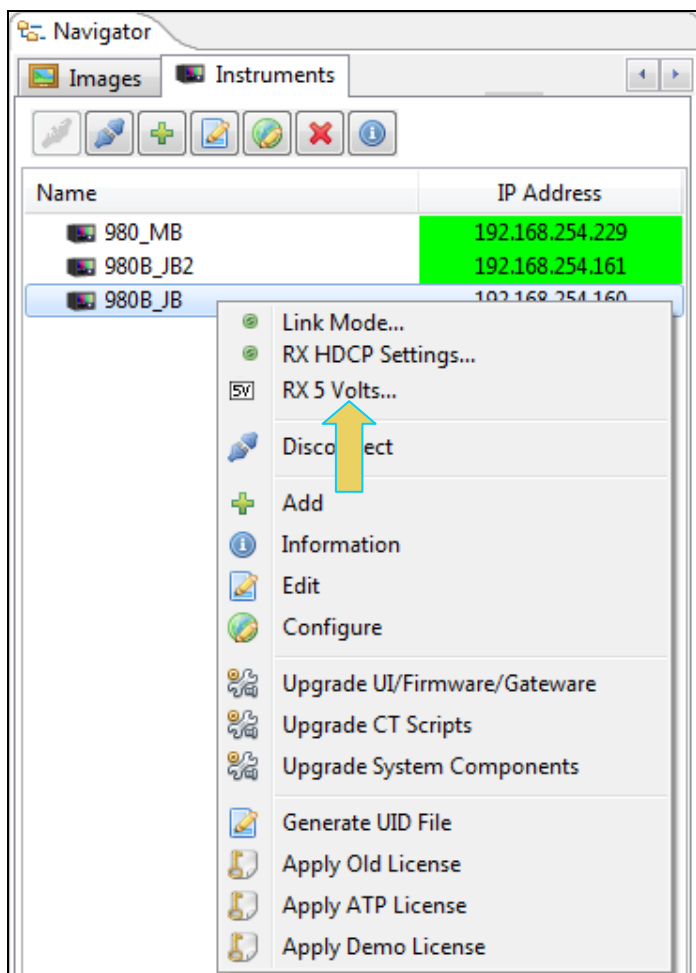


- **Sink emulation** – In the sink emulation monitoring configuration the 980 HDMI Protocol Analyzer module’s HDMI Rx port is connected directly to the source device under test. The 980 HDMI Protocol Analyzer module is emulating an HDMI/MHL sink device. The sink emulation mode is the typical mode of operation. You can monitor the HDMI/MHL transactions between the source device under test and the 980 HDMI Protocol Analyzer Rx port. All of the data types described in this manual can be monitored in the sink emulation mode unless noted otherwise. ***This is the mode used for the HDMI or MHL source compliance tests.***
- **Pass-Through Monitor** – In the Pass-Through monitoring configuration the 980 HDMI Protocol Analyzer module’s HDMI Rx port is connected to the source device under test and the 980 HDMI Protocol Analyzer HDMI Tx port is connected to a sink device. The pass-through mode enables you to monitor the HDMI traffic passively between an HDMI/MHL source and an HDMI/MHL sink device. *This mode is **not used** for the HDMI or MHL source compliance tests.*
- **Encrypted Link Analyzer** - (Optional) In the Encrypted Link Analyzer configuration the 980 HDMI Protocol Analyzer HDMI Rx port is connected to the source device under test and the 980 HDMI Protocol Analyzer HDMI Tx port is connected to a sink device. The Encrypted Link Analyzer configuration enables you to monitor and analyze HDCP encrypted protocol data transmitted between an HDMI source device and sink device. *This mode is **not used** for the HDMI or MHL source compliance tests.*
- **TX-RX HPD** - Enabling this option will replicate the hot plug signal from the TX side (an attached sink device) on the RX side (like a hot plug repeater). *This is the mode used for the HDMI or MHL source compliance tests.*

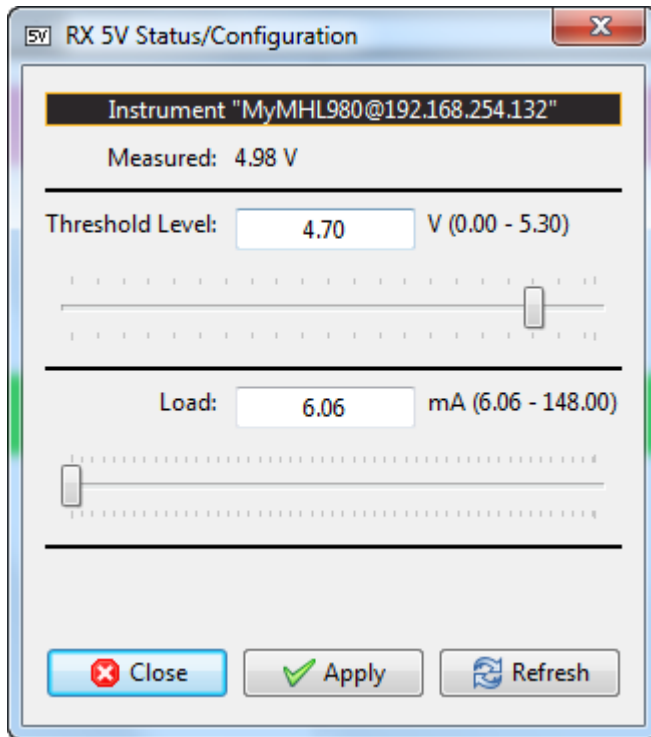
### 3.5 Setting the +5V levels

The 980 enables you to view the +5V levels from the source device under test and to set the current load on the +5V lead.

1. Select the **RX 5 Volts...** item from the **Instrument** pull-down menu on the built-in front panel as shown below.



The RX 5V Status/Configuration dialog box is displayed as shown below.



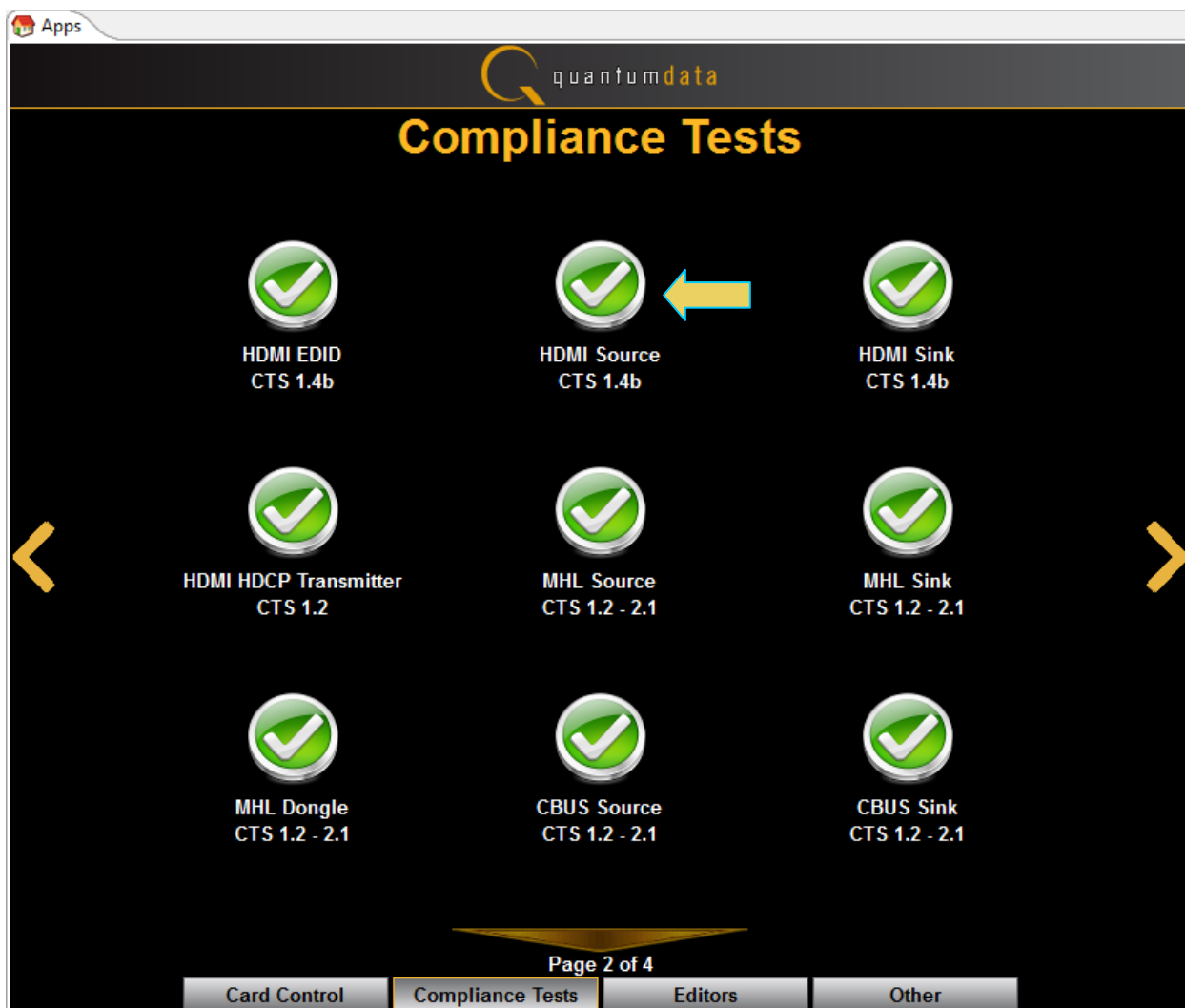
2. Note the current Measured 5V level (4.98 in the example above).
3. Select the Threshold Level using the upper sliderbar (0.0 to 5.3V). Be sure to select the **Apply** button. Then hit **Refresh** to view the new value. You may wish to lower the threshold to enable testing of a source whose 5V level is too low. If you specify a threshold higher than the voltage detected there will be no effect on the ability to test.
4. Select the current Load using the lower sliderbar provided. Increasing the current load will cause the detected voltage to fall. Be sure to select the **Apply** button. Then hit **Refresh** to view the new value.

### 3.6 Completing the CDF

Use the following procedures to complete the CDF for the HDMI source compliance tests.

#### To complete the CDF:

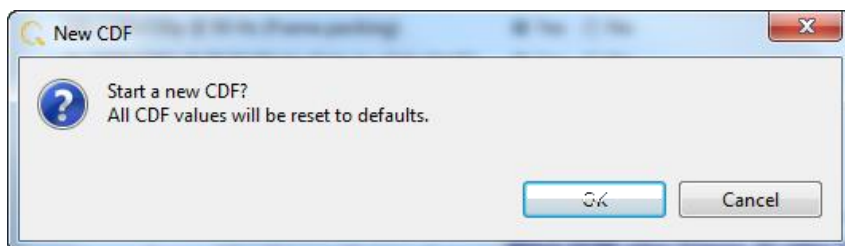
1. From the **Compliance Tests** page of the **Apps** panel, enable viewing of the **HDMI Source Compliance Test**.



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

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

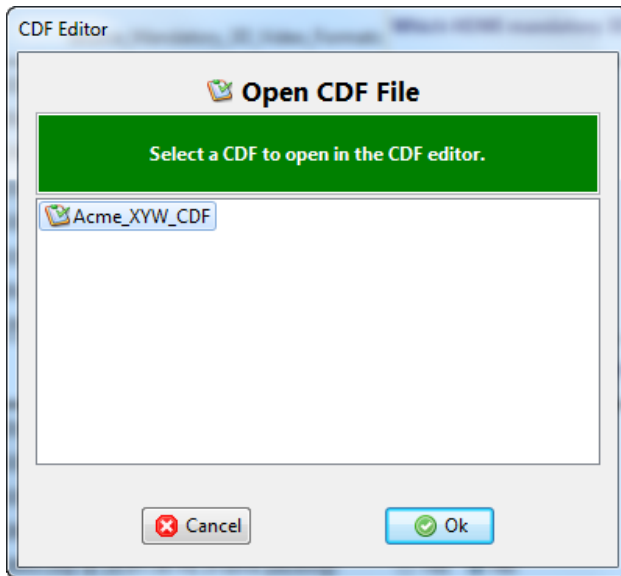
You will be prompted with a confirmation that you want to start a new CDF and reset the values. Click **OK** to proceed.



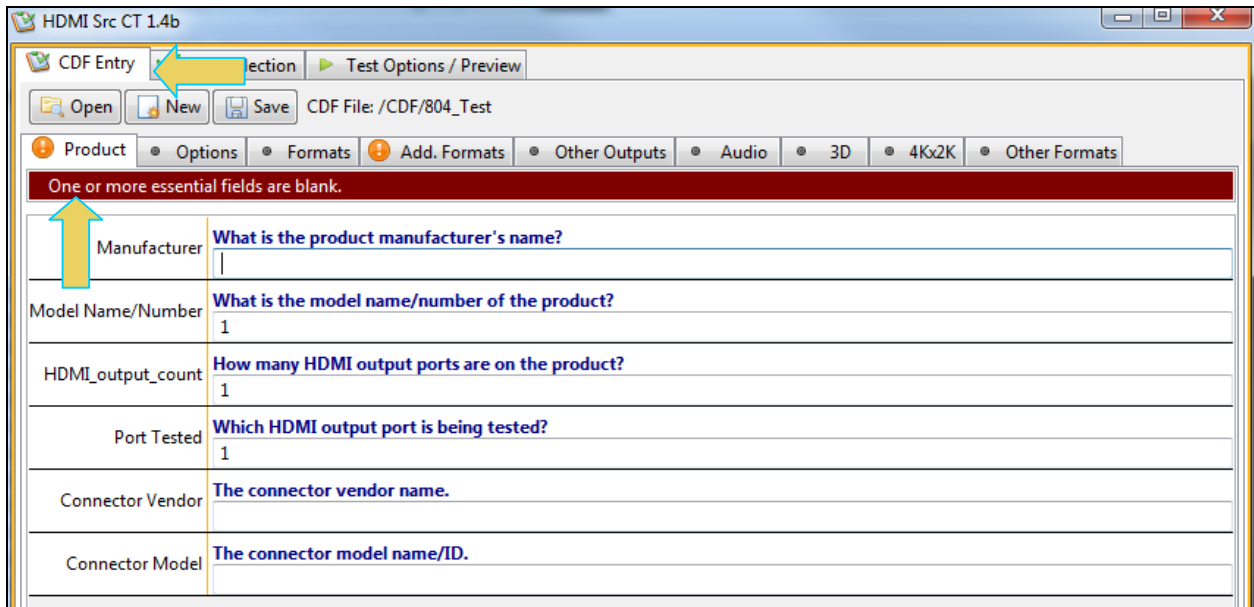
- To open an existing CDF, click on the **Open** activation button.

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

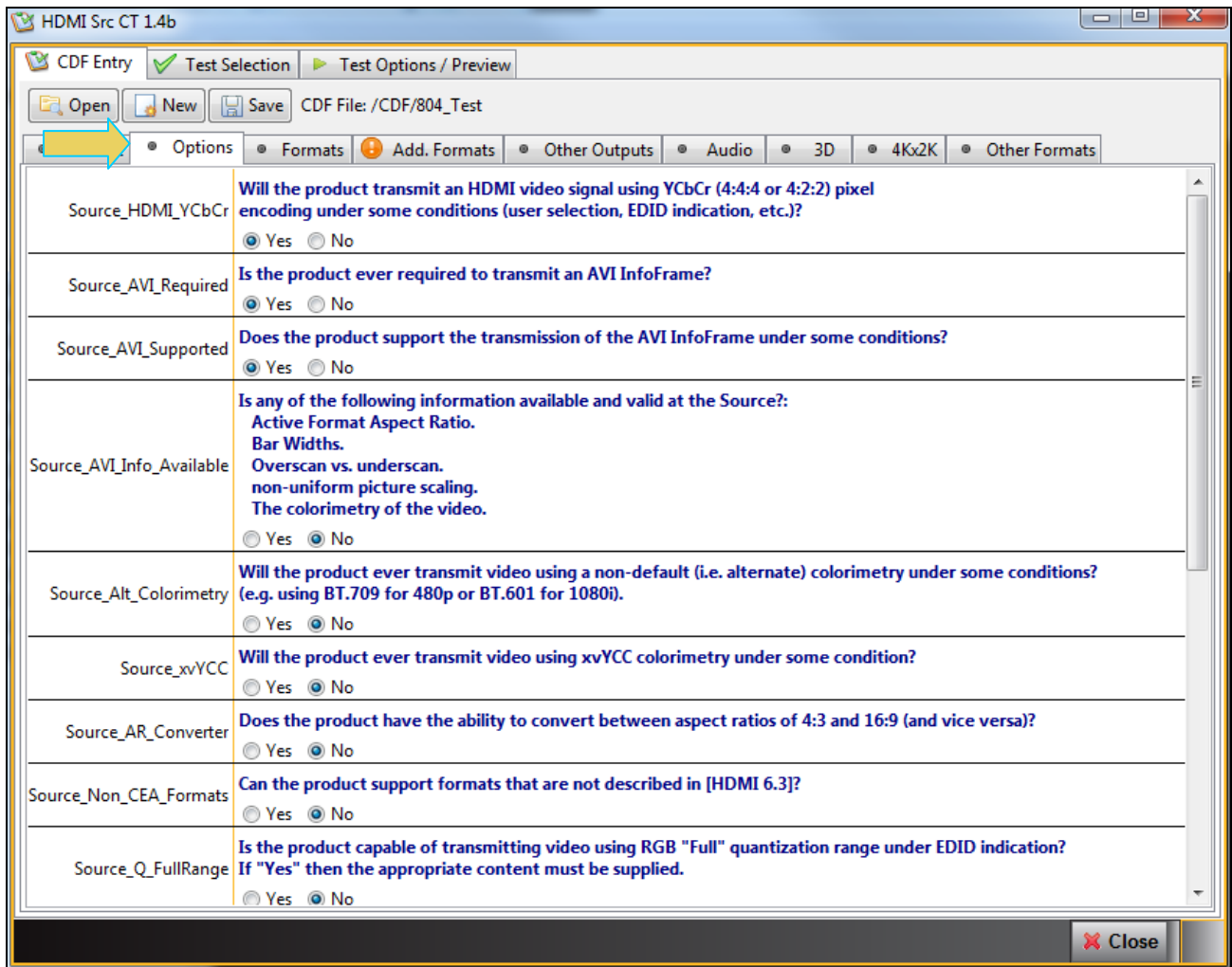




5. Complete the items in the **Products** tab of the CDF Entry panel shown below. Note that you will have to complete the essential fields in order to proceed. A read status message will appear indicating if you have not completed all the essential fields.



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



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

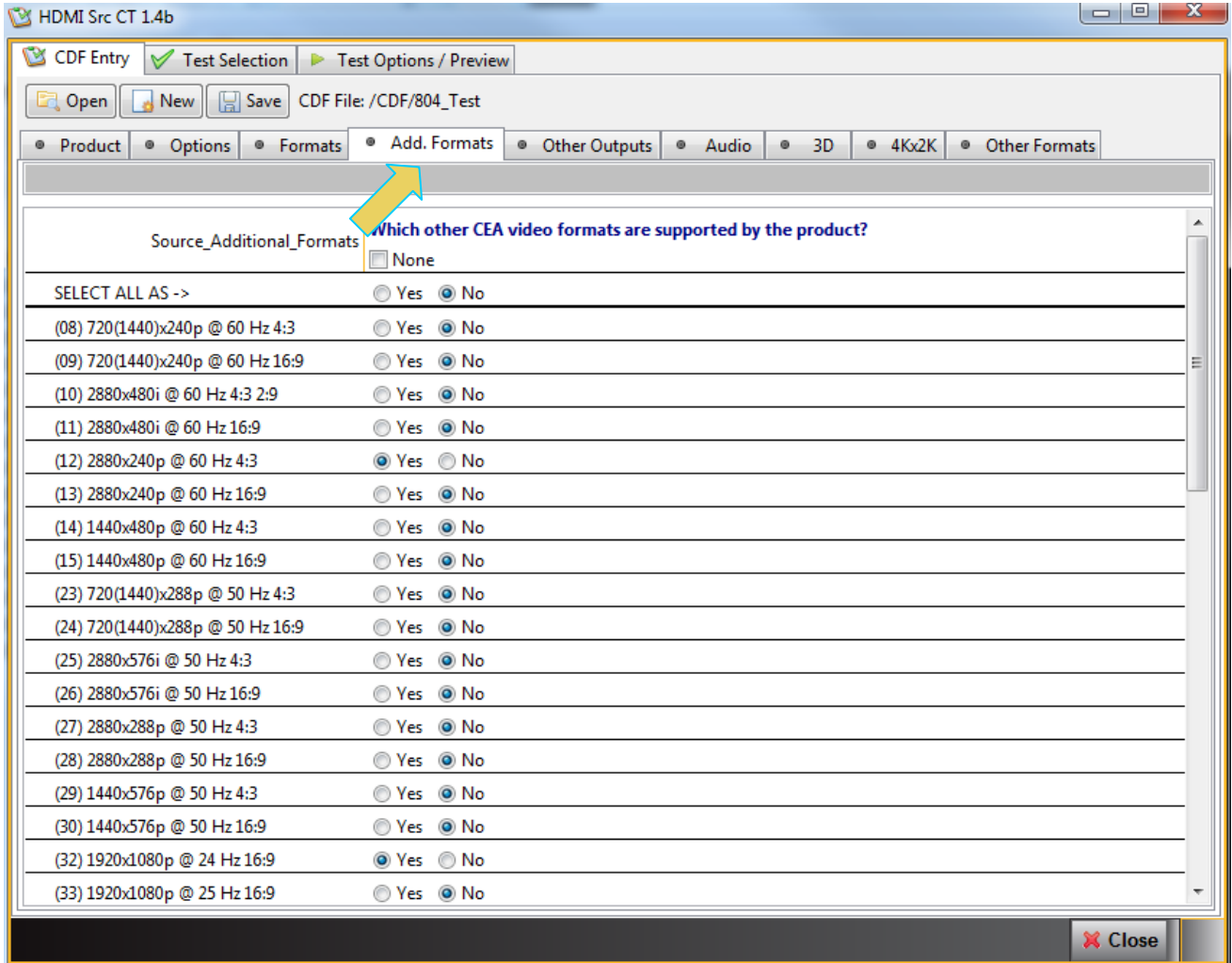
Source\_Video\_Formats Which HDMI video formats are supported by the product and at which color depths?  
(Select supported items below.)

Source\_Deep\_Color Does the product support any Deep Color modes?  
 Yes  No

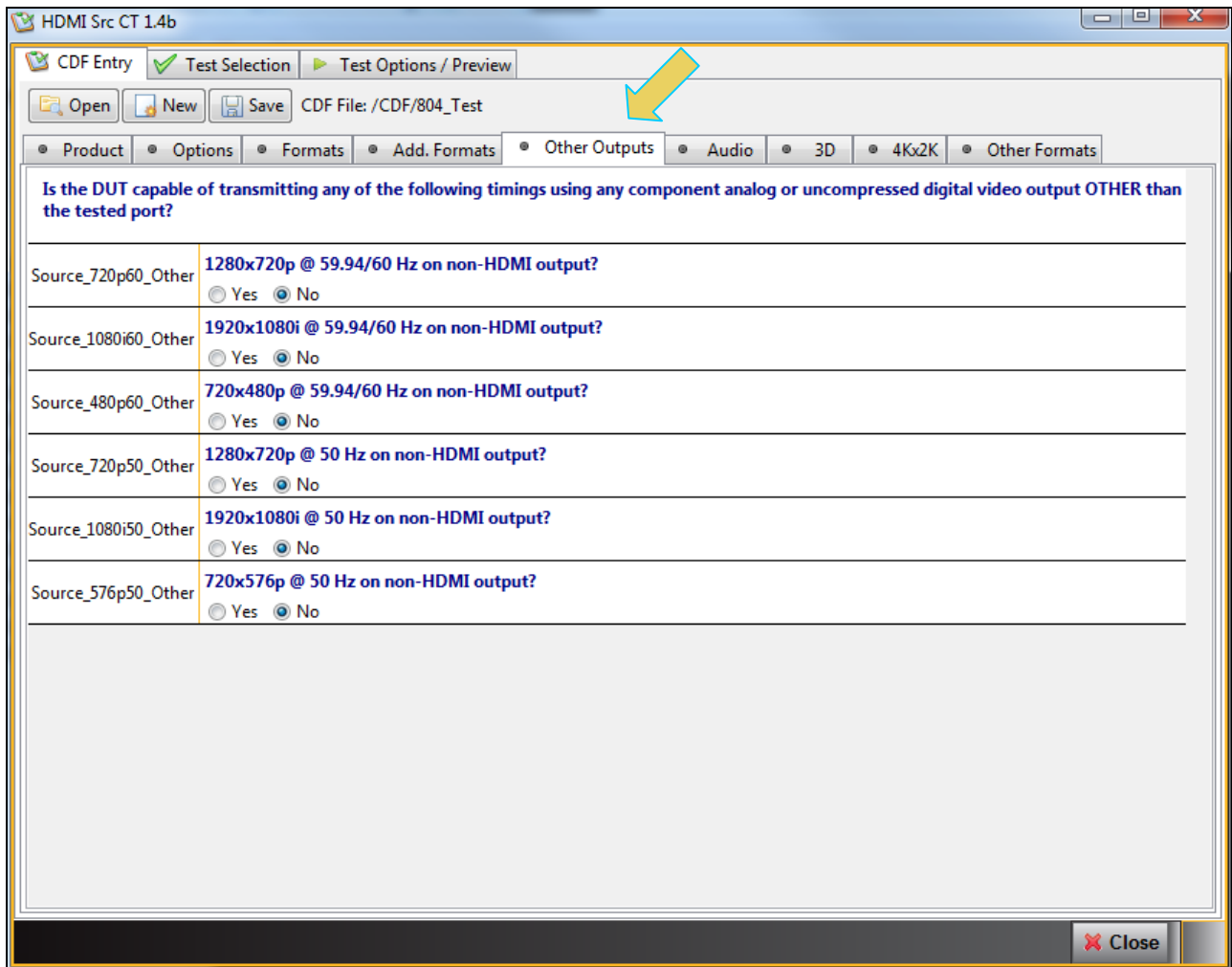
SELECT ALL AS ->	<input type="checkbox"/> 24	<input type="checkbox"/> 30	<input type="checkbox"/> 36	<input type="checkbox"/> 48	(bits per pixel)
(1) 640x480p @ 60 Hz 4:3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(2) 720x480p @ 60 Hz 4:3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(3) 720x480p @ 60 Hz 16:9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(4) 1280x720p @ 60 Hz 16:9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(5) 1920x1080i @ 60 Hz 16:9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(6) 1440x480i @ 60 Hz 4:3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(7) 1440x480i @ 60 Hz 16:9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(16) 1920x1080p @ 60 Hz 16:9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(17) 720x576p @ 50 Hz 4:3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(18) 720x576p @ 50 Hz 16:9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(19) 1280x720p @ 50 Hz 16:9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(20) 1920x1080i @ 50 Hz 16:9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(21) 1440x576i @ 50 Hz 4:3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(22) 1440x576i @ 50 Hz 16:9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)
(31) 1920x1080p @ 50 Hz 16:9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(bits per pixel)

Close

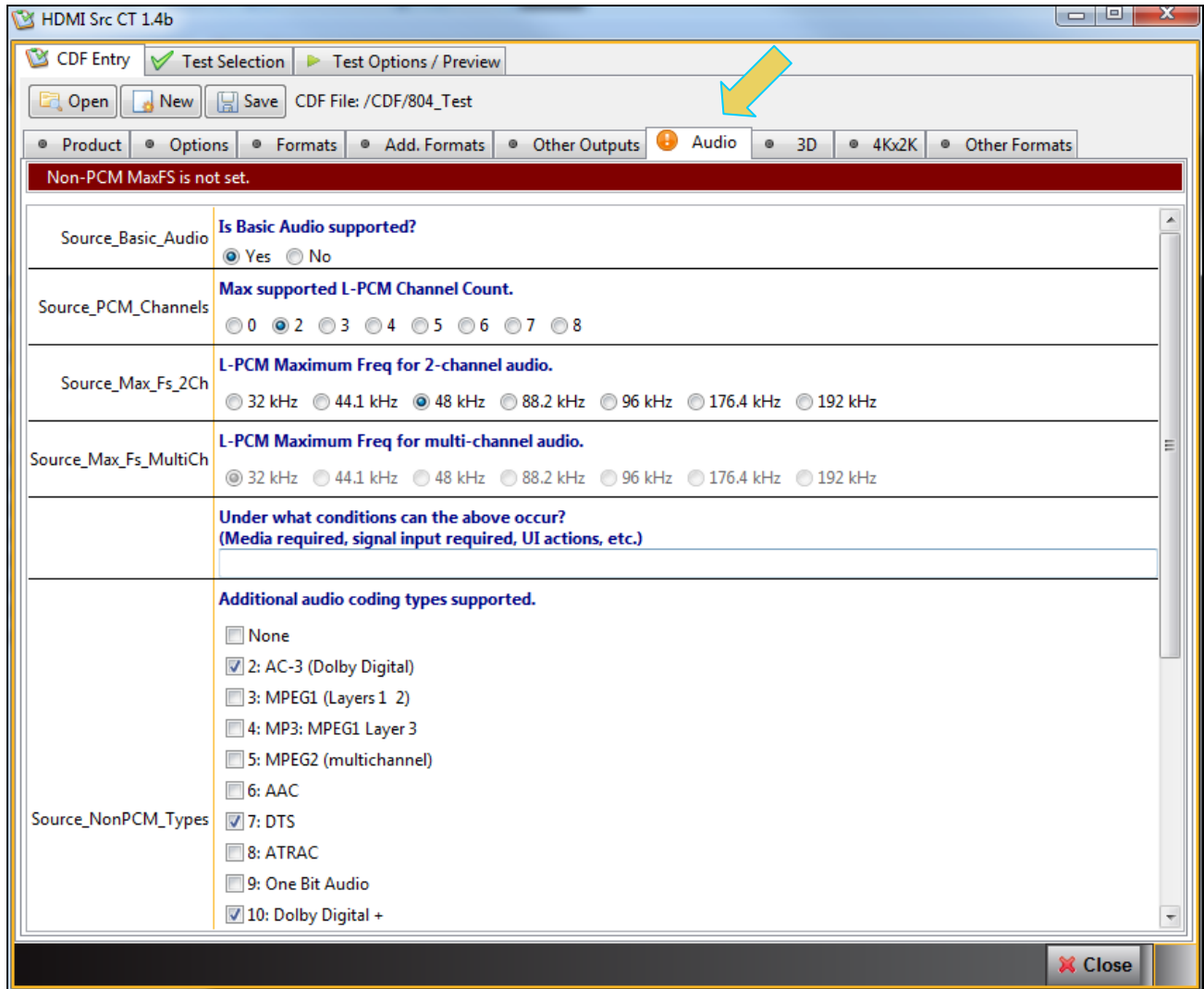
8. Complete the items in the **AddFormats** tab. These are the additional formats beyond the more common CEA formats.

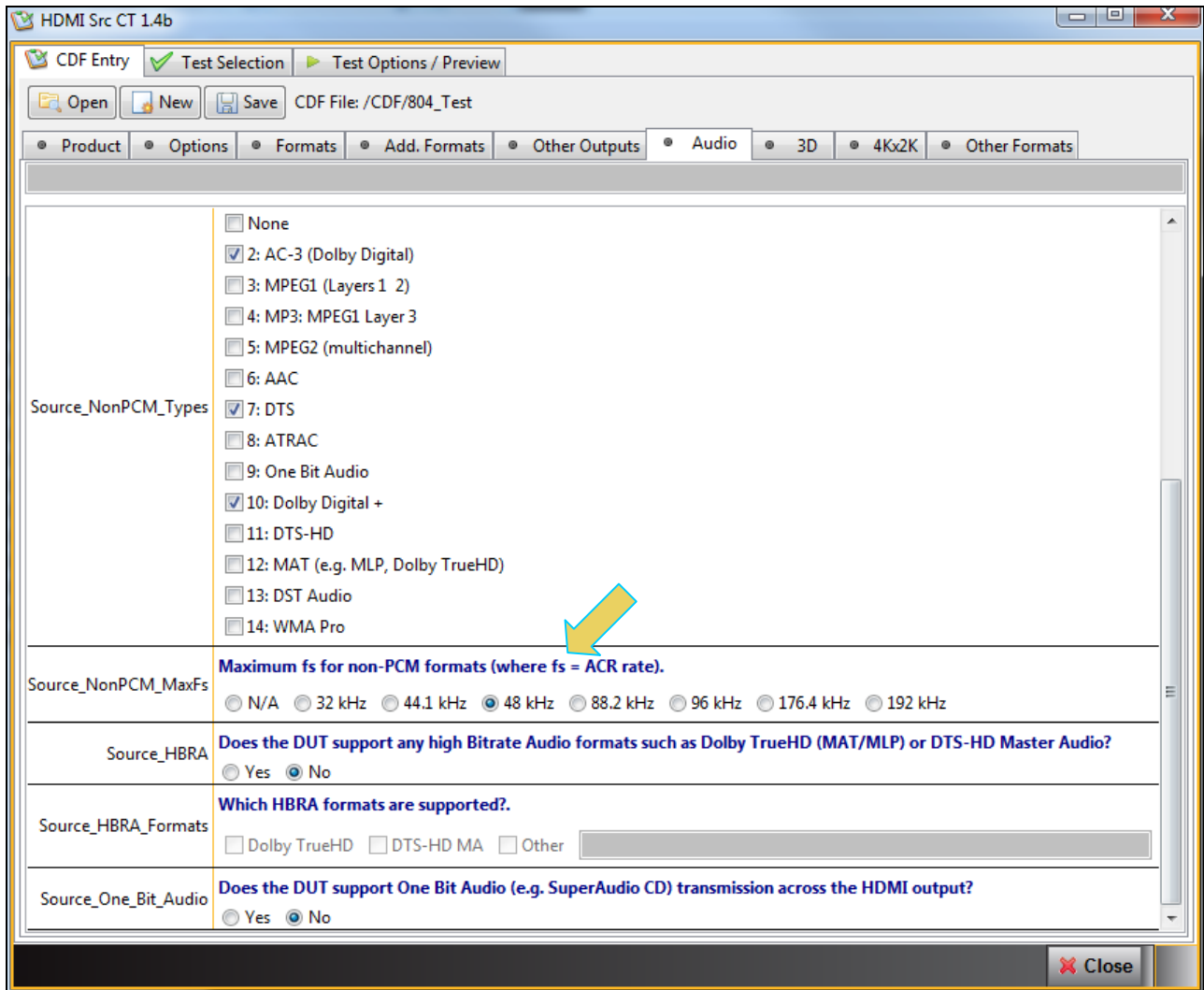


9. Complete the items in the **Other Outputs** tab. These are the formats available on the analog outputs.

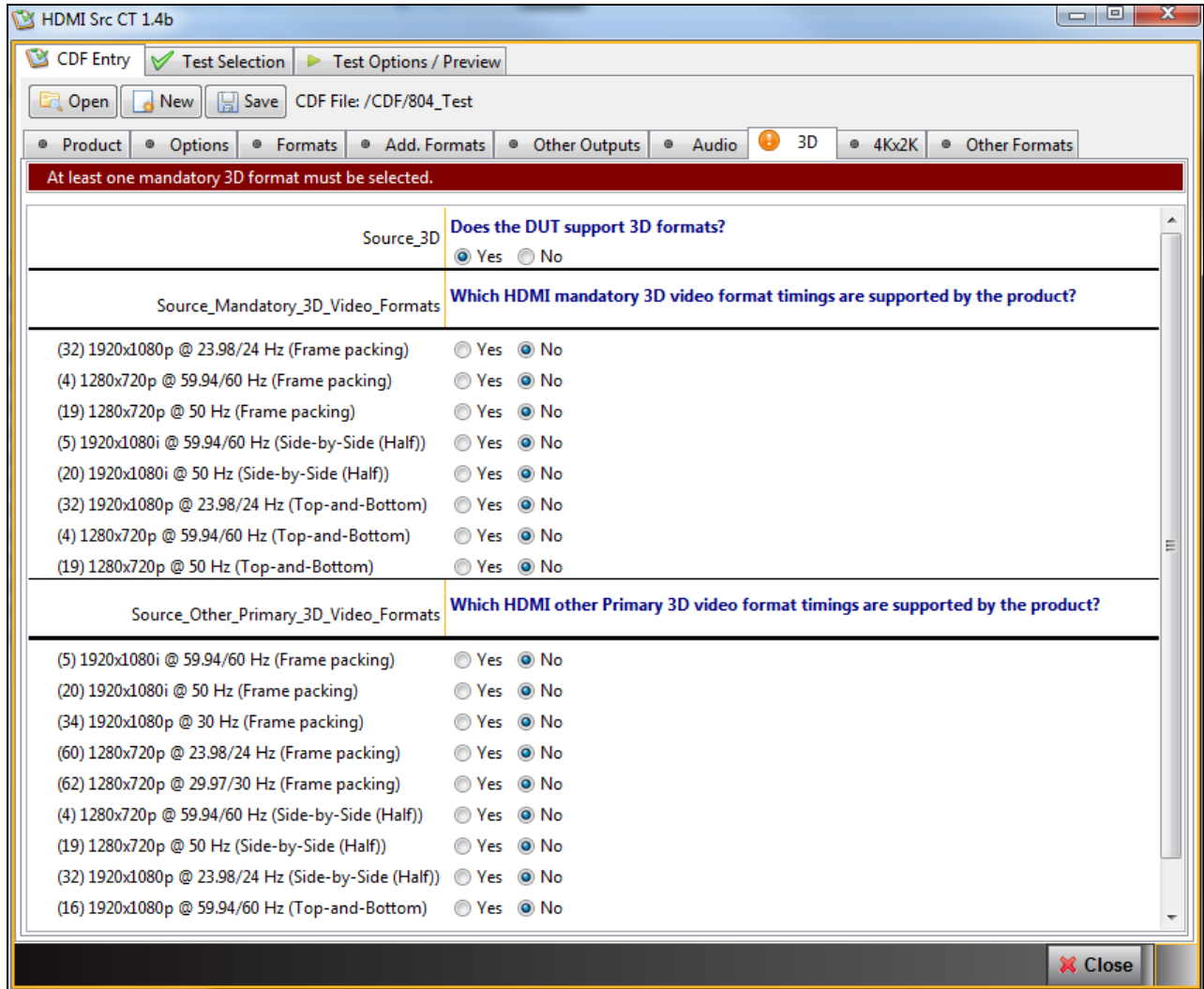


10. Complete the items in the **Audio** tab. Notice in the screen shot below there is an error flagged indicating that the format has not been completed properly. This can happen if for example you have specified compressed formats without specifying the permissible sampling rates for them. The second example slide below shows the error resolved by selecting a sampling rate for compressed audio.

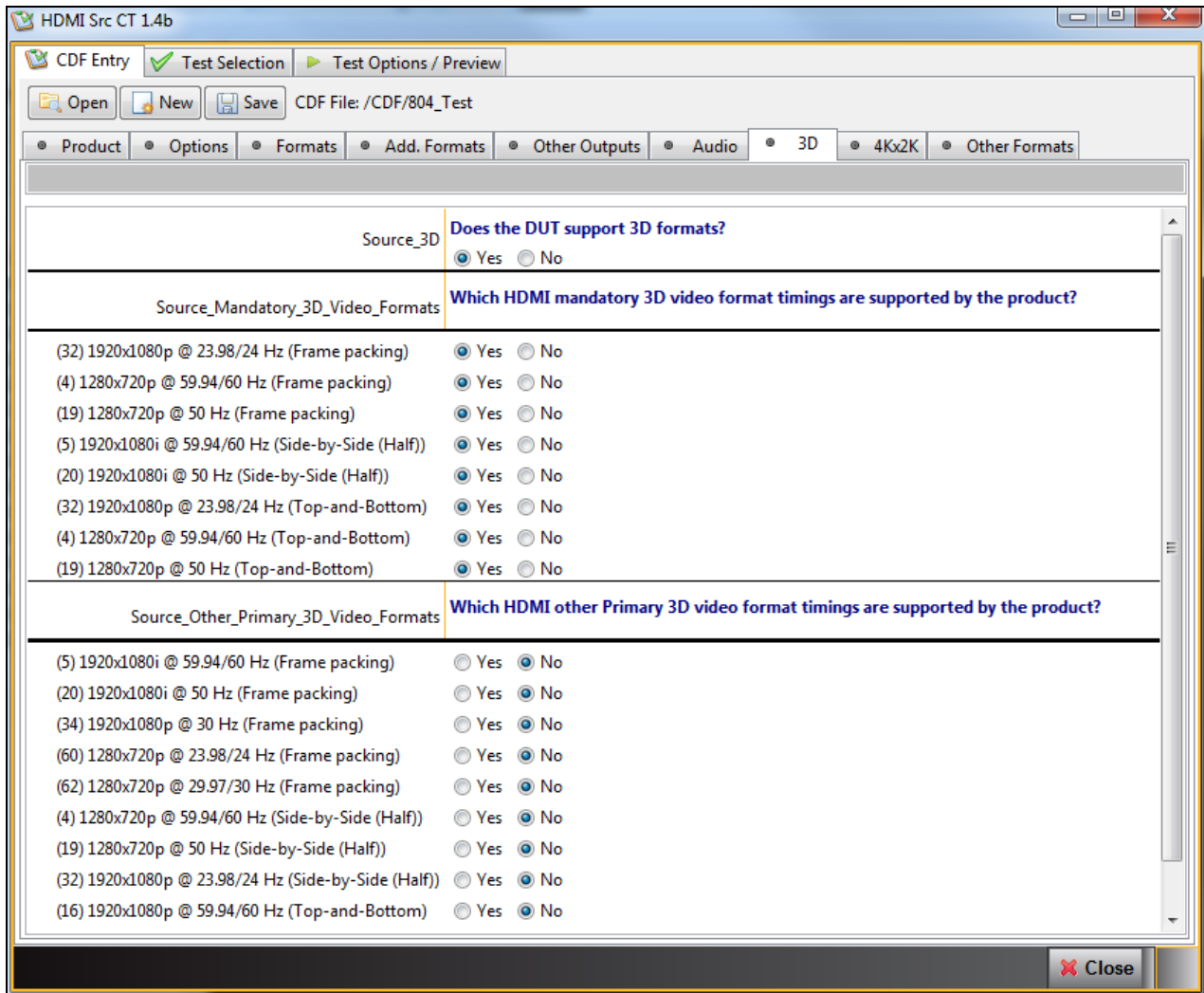




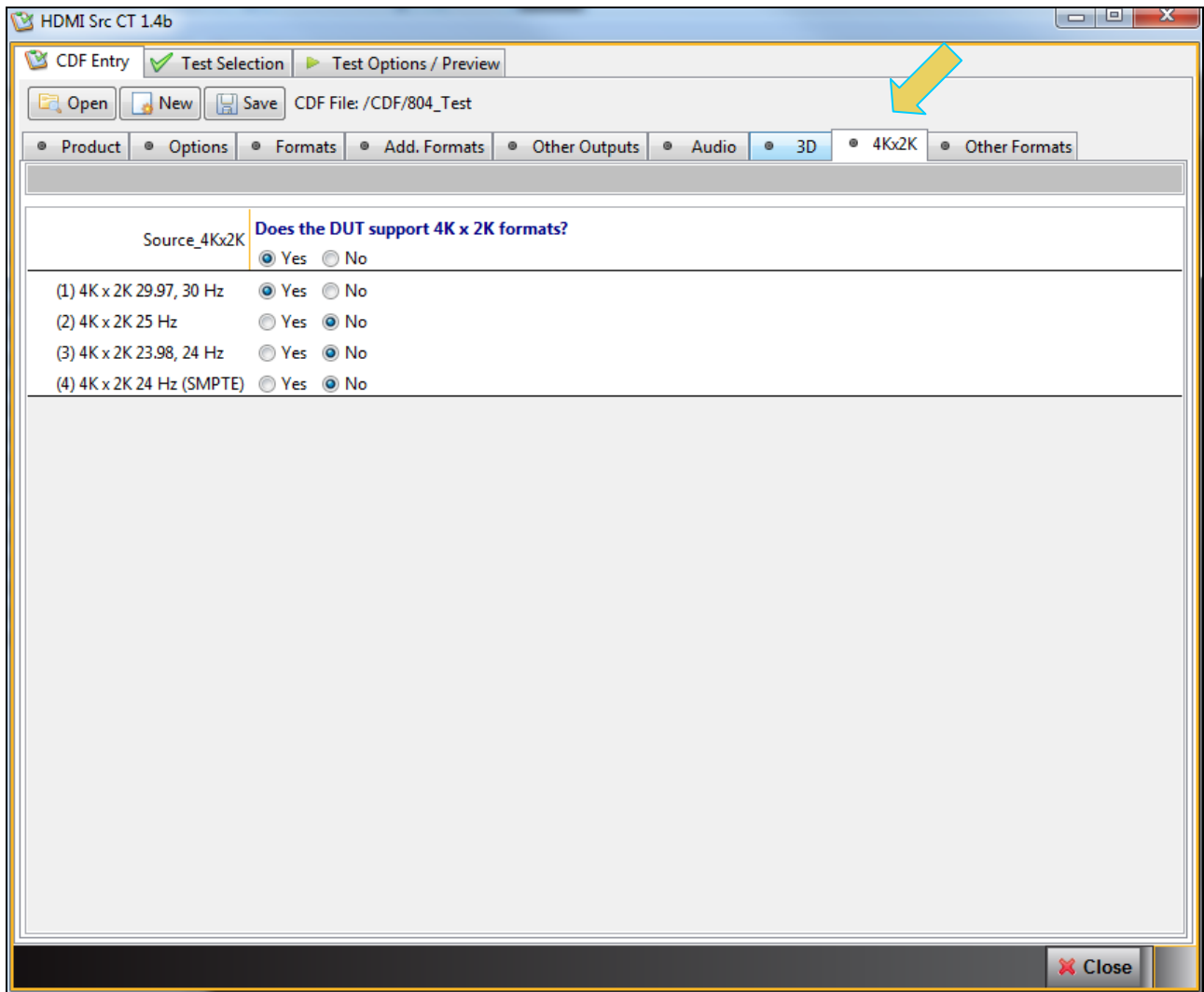
11. Complete the items in the **3D** tab. An error is shown in the screen sample below because 3D formats are indicated but none selected. The second screen shows the error resolved by selecting some mandatory 3D formats.



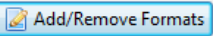


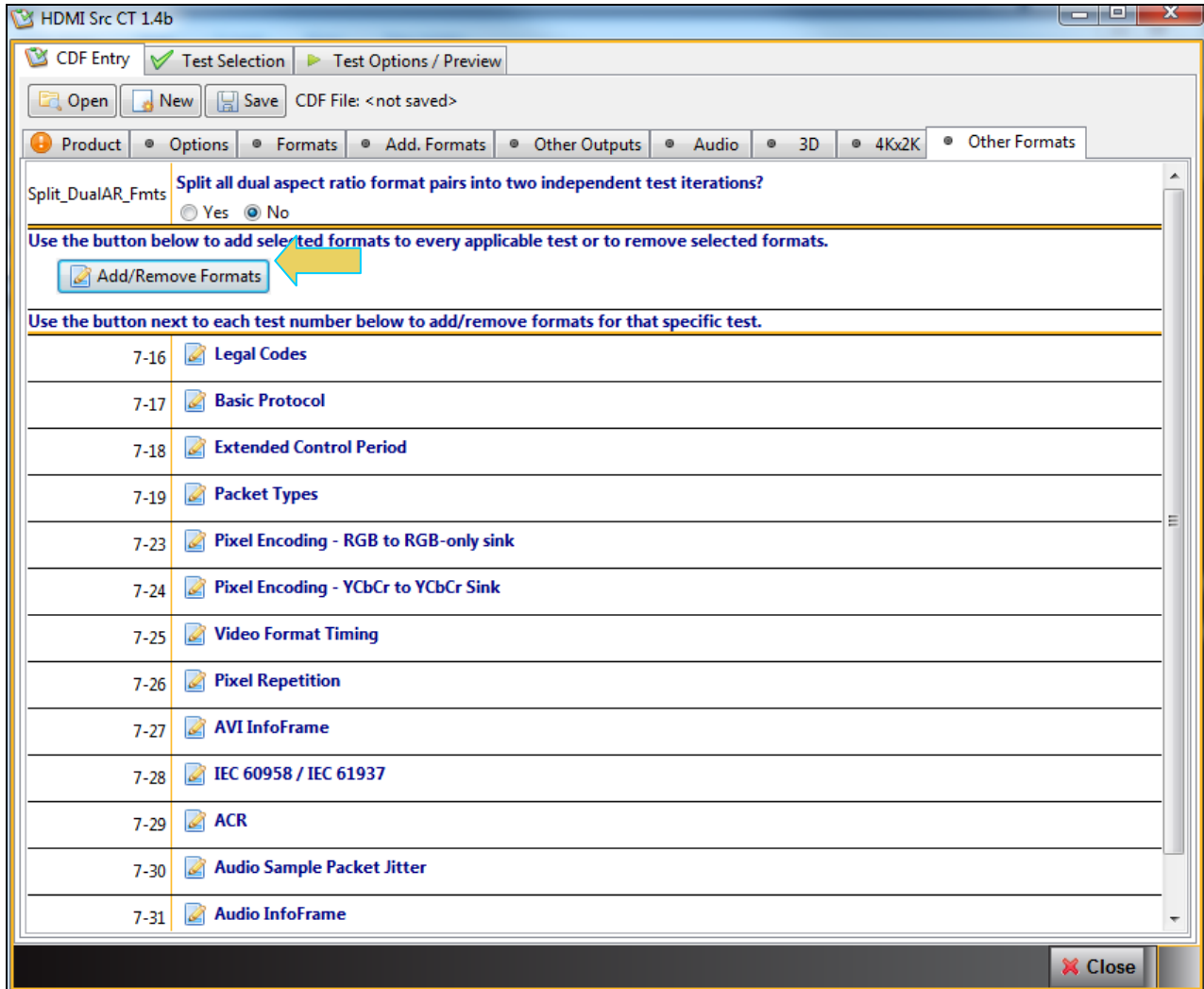


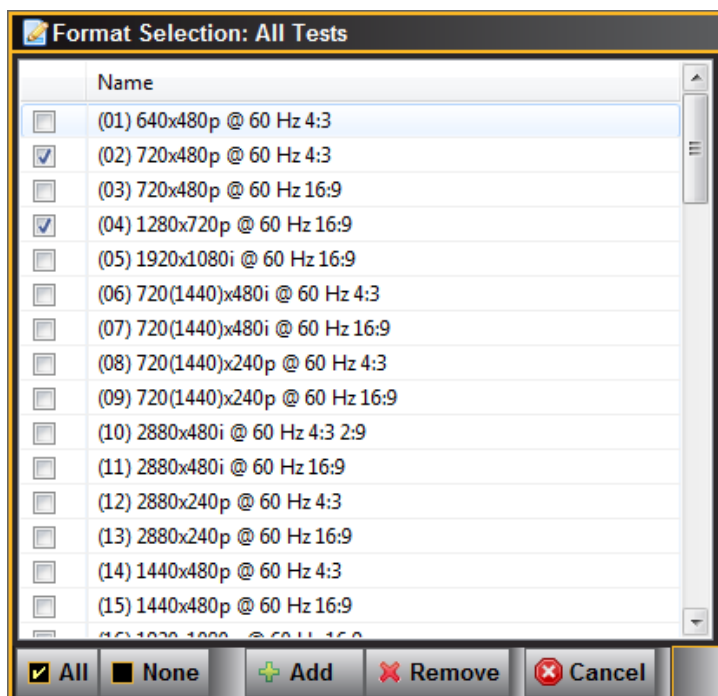
12. Complete the items in the **4Kx2K** tab.



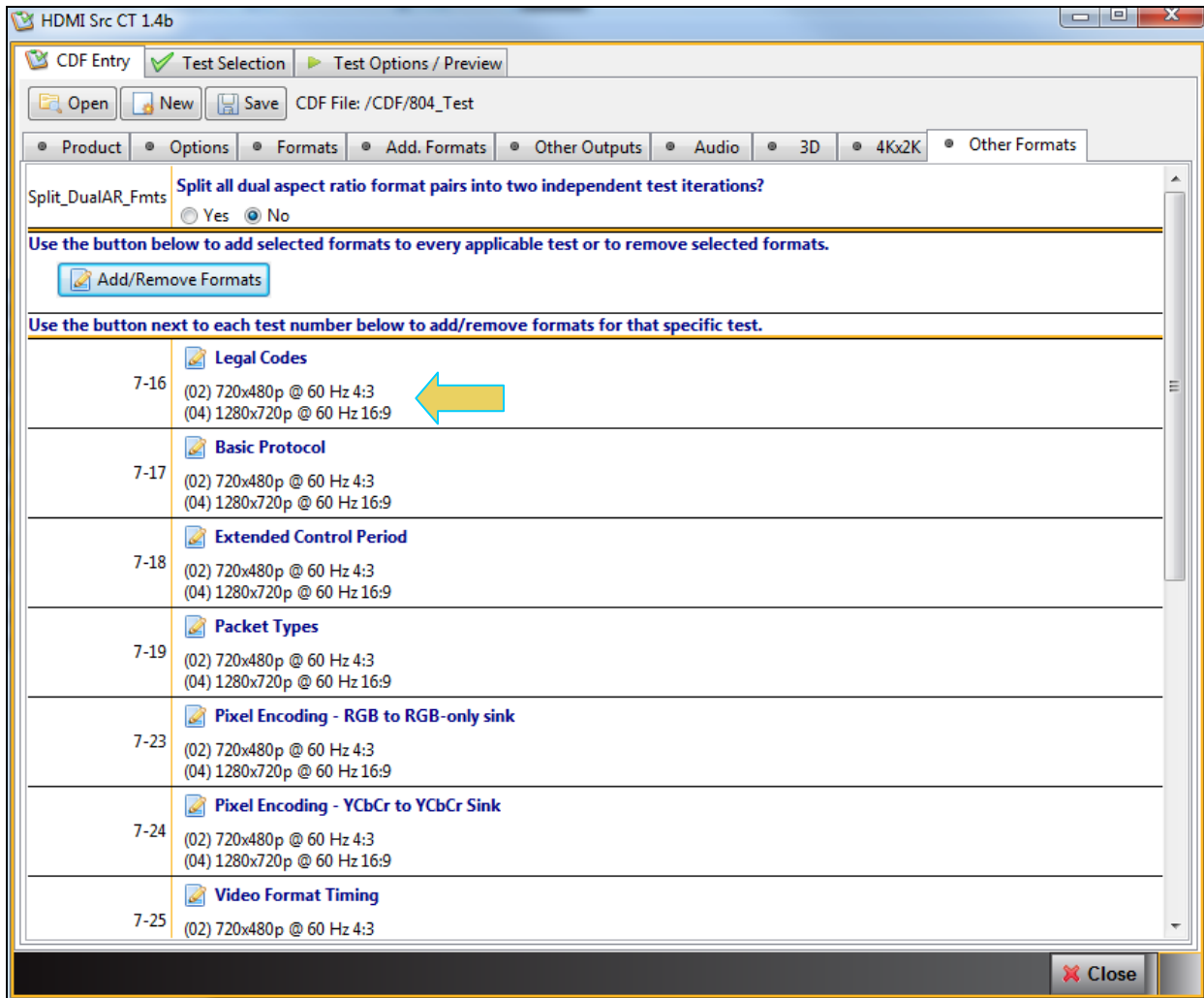
13. You can now select additional formats for testing on an individual test basis. This enables you to run a particular test on a format that is not specified in the CTS.


You can either select additional formats for all tests or you can specify formats to test only for specific tests. To select formats to apply to all tests, simply click on the **Add/Remove Formats**  button and a dialog box will open (second example slide below) and select the additional formats that you wish to test.



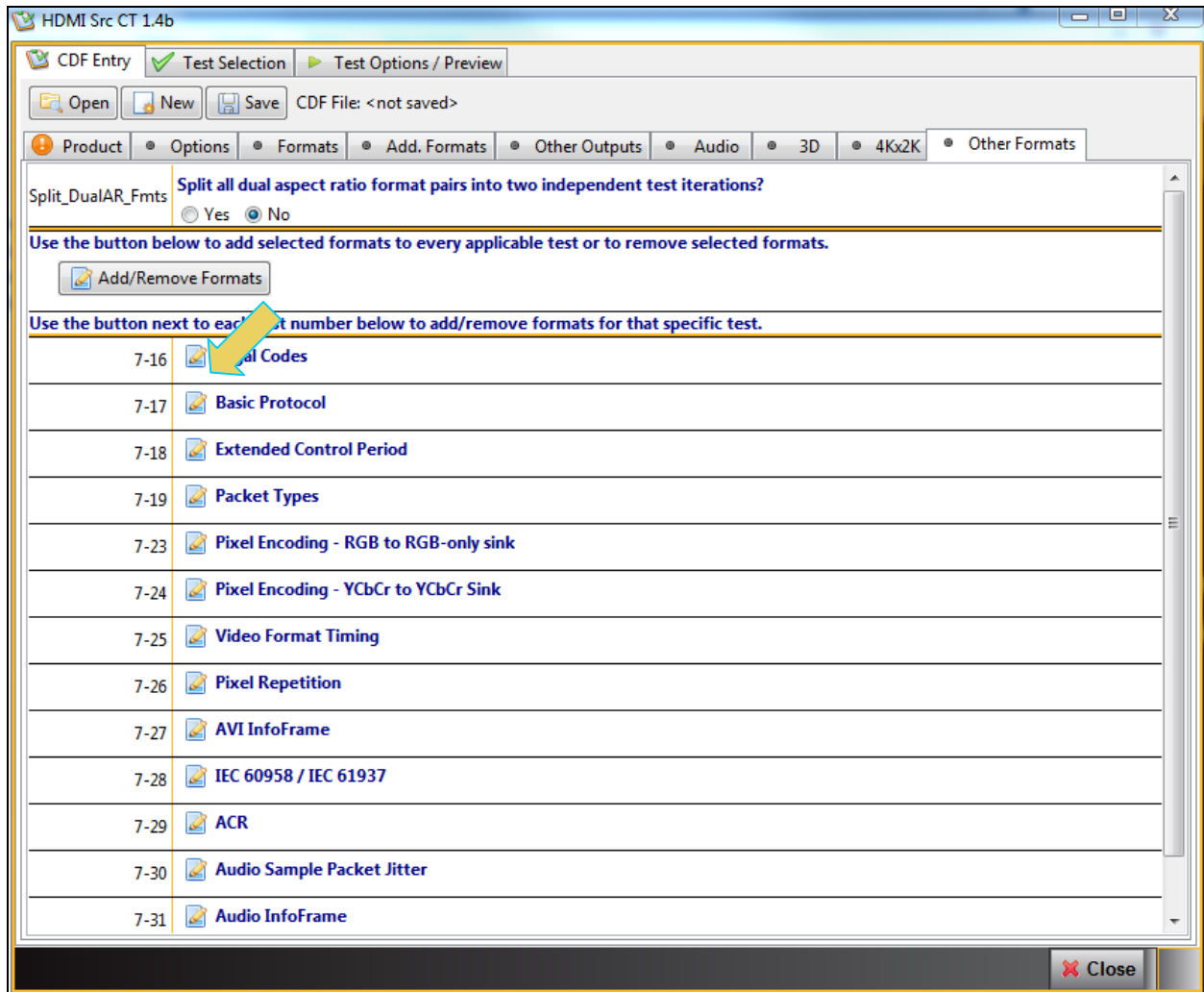


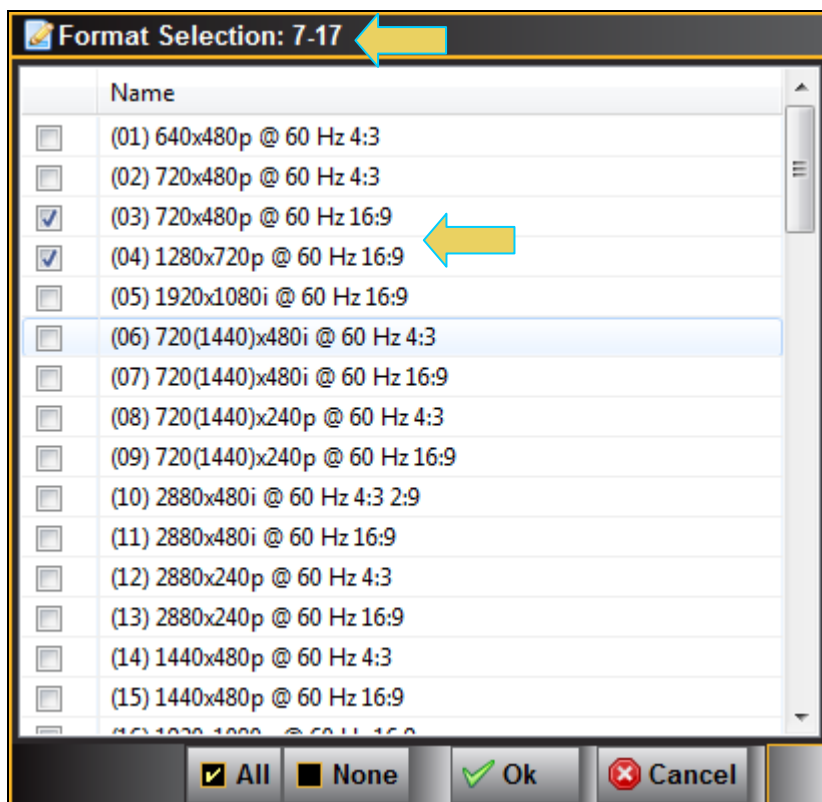
The result is that you will see these formats listed under each test. As shown in the following screen example.



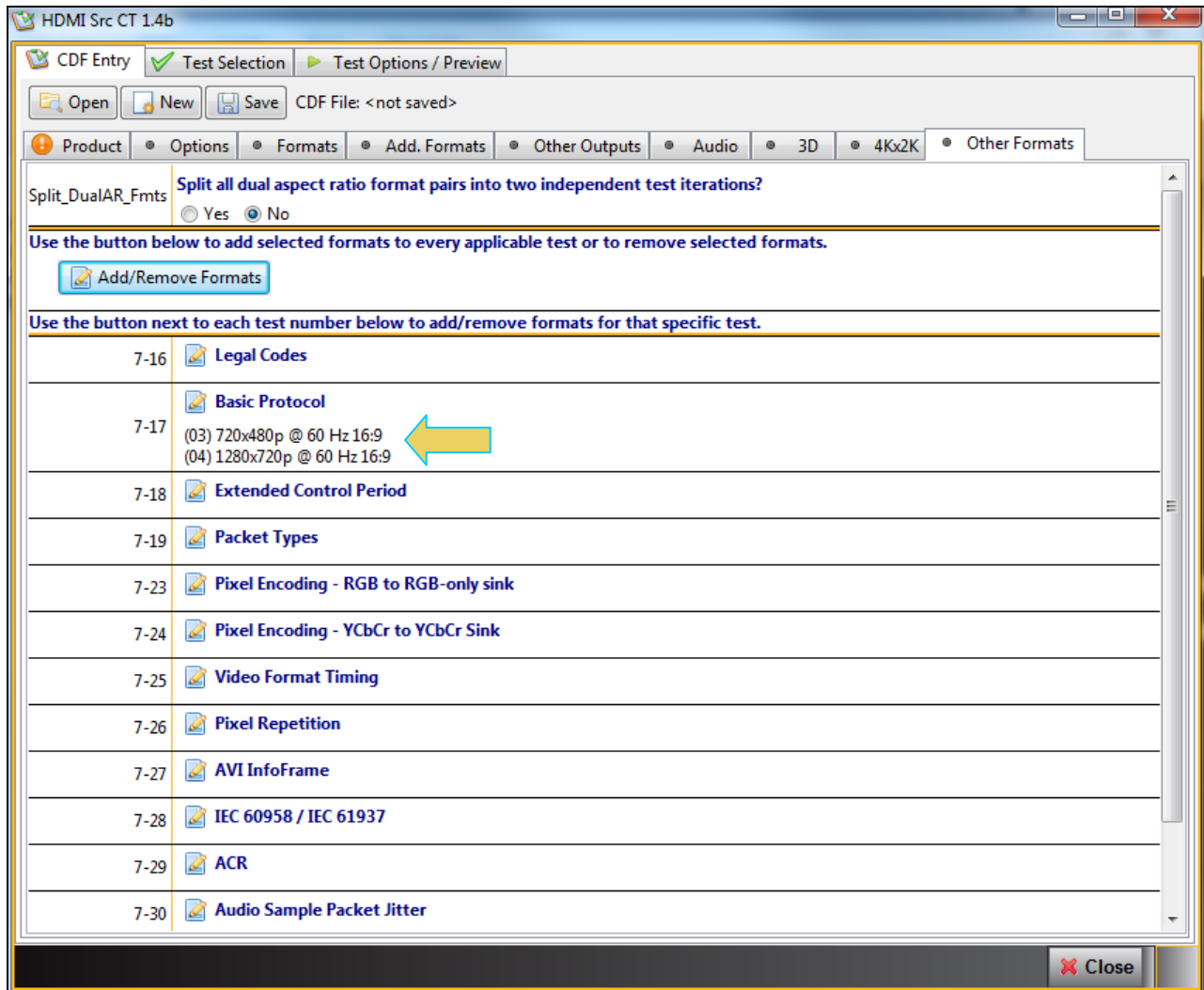
If you wish to select additional formats for testing on an individual basis, click on the  icon adjacent to a particular test. When you click on this icon a dialog box appears enabling you to select “Other Formats” for that particular test. You can select individual formats using the check boxes beside each format or you can select all formats with the **All** check box at the bottom of the dialog box. You can clear all selected formats with the **None** check box at the bottom of the dialog box. Click **OK** or **Cancel** appropriately.

Refer to the screen shots below showing the selection of other formats for the 7-17 test.






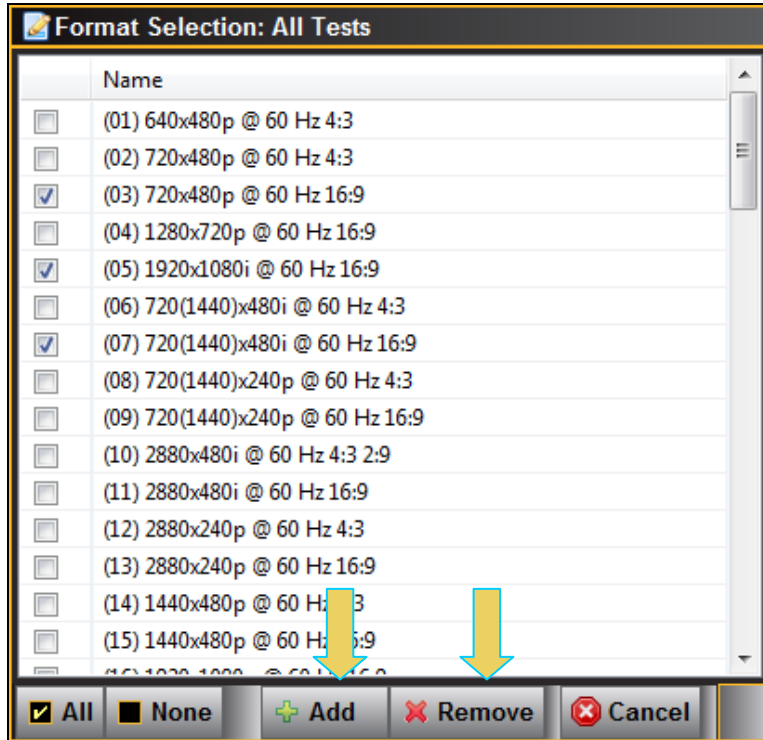
Notice in the screen shot below that the other formats that you have selected for the 7-17 test appear underneath the test.



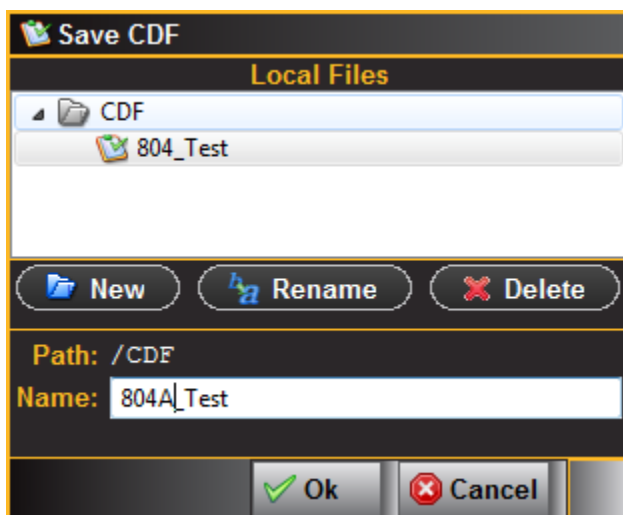


Note that you can Add or Remove formats across all tests, click on the Add/Remove Formats activation button

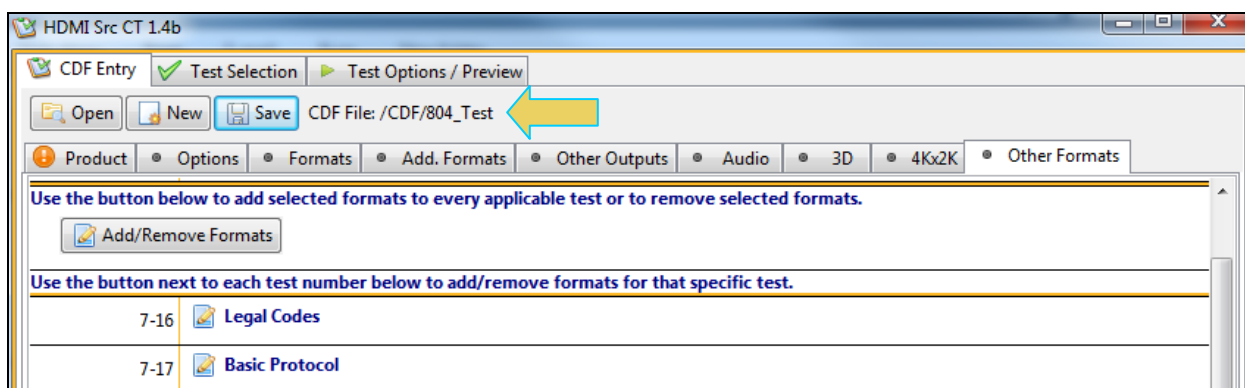
 on the Format Selection dialog box as shown below. You can add tests by selecting them using the check boxes then clicking the Add button. You can delete additional formats by selecting them using the check boxes and then clicking on the Remove button.



14. Save the CDF. A confirmation box with a default name will appear as shown below. Edit the name if necessary and click OK. You can also rename CDF files or remove them from the saved list.



The name you assigned to the CDF will appear beside the **Save** button as shown below.

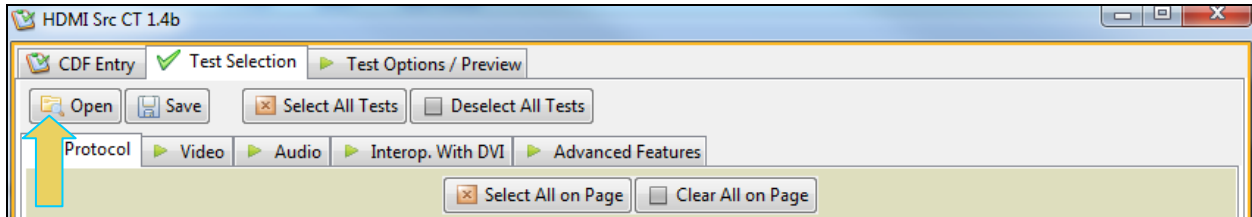


### 3.7 Selecting which tests to run

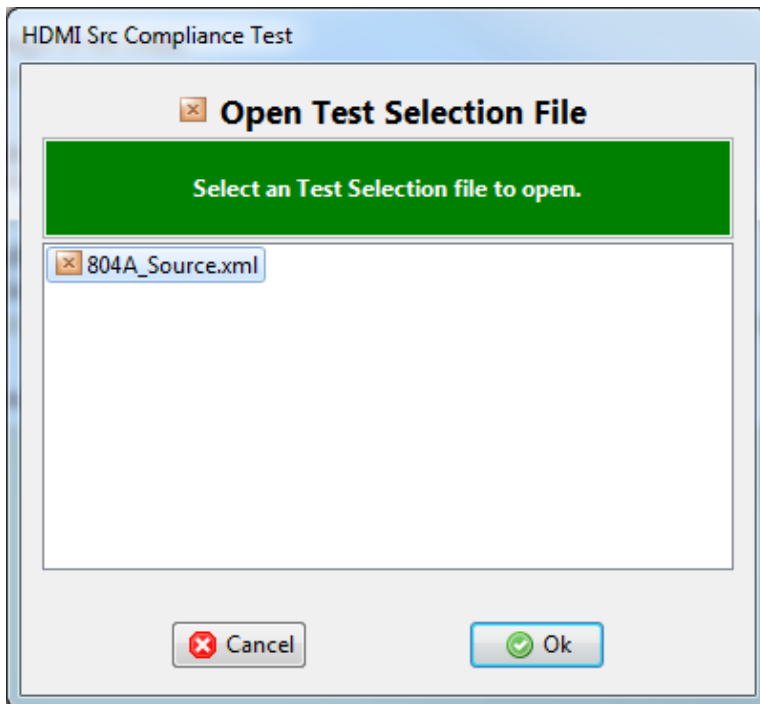
Use the following procedures to select the tests to run. There are multiple tabs which correspond to each section in the CTS.

#### To select the tests to run:

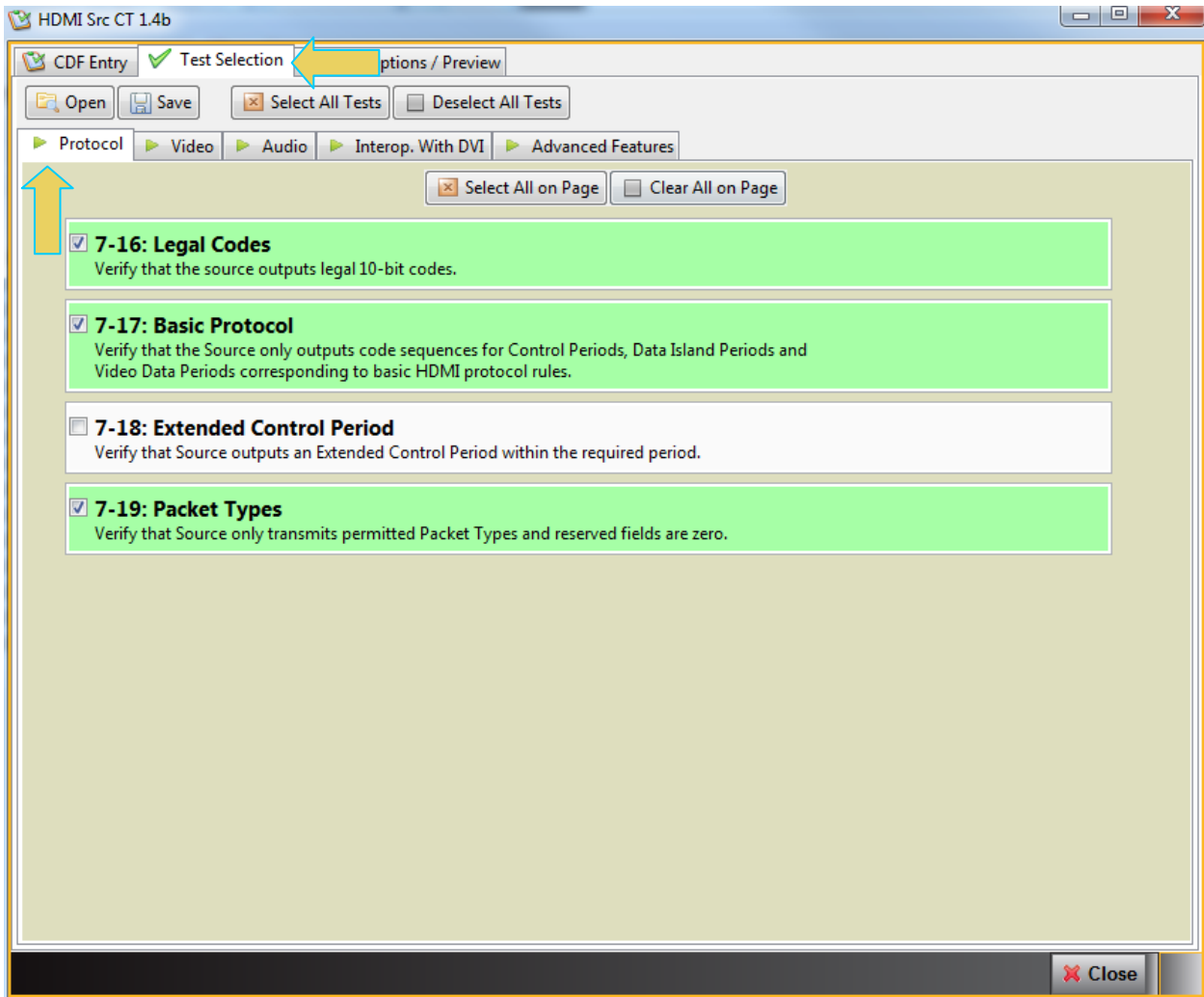
1. Select the **Test Selection** panel as shown below.
2. If you have an existing Test Selection option file saved you can recall that for use in your testing. Simply click on the **Open** activation button.



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

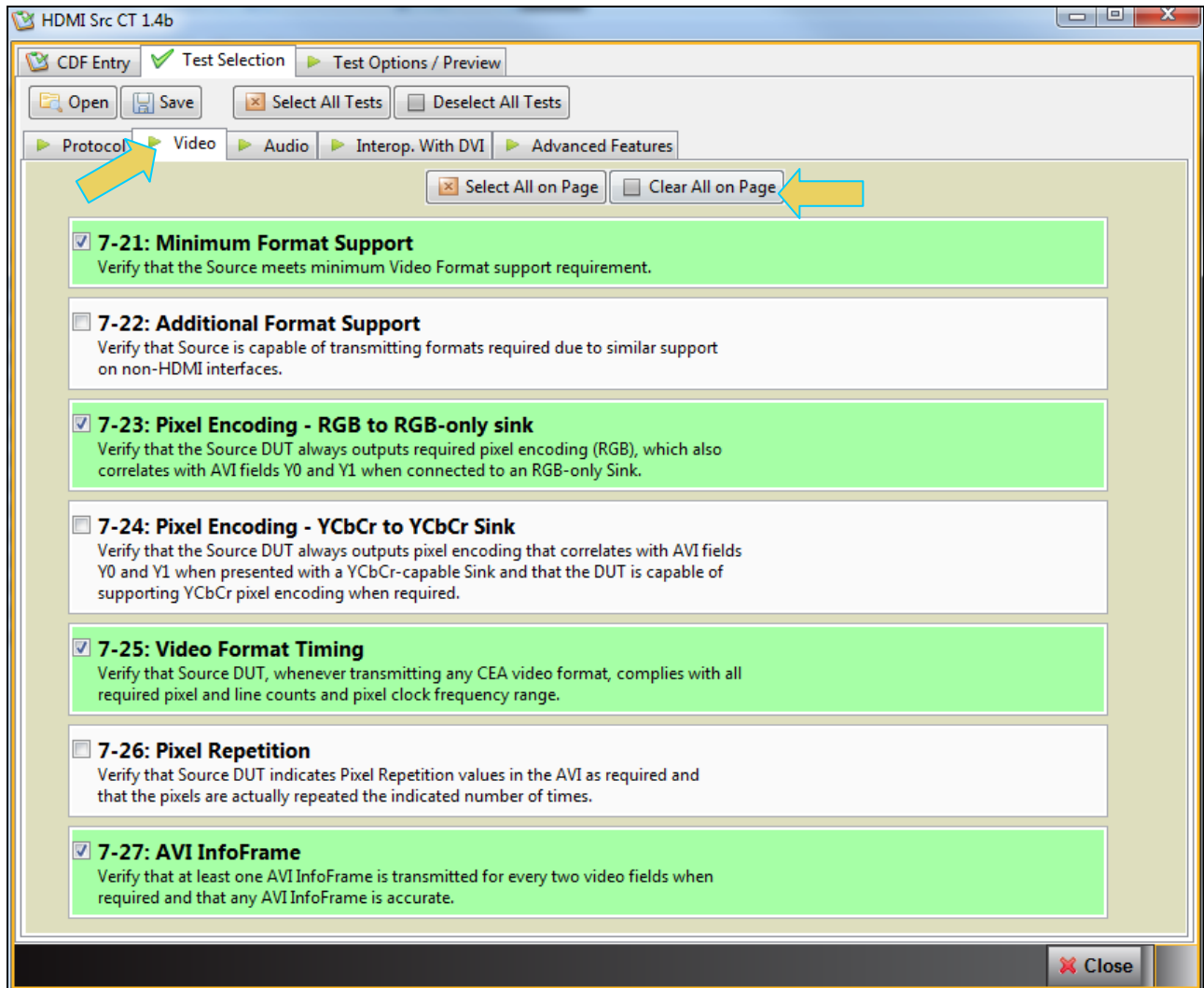


3. Select the tests you wish to run in the **Protocol** tab of the **Test Selection** panel shown below.

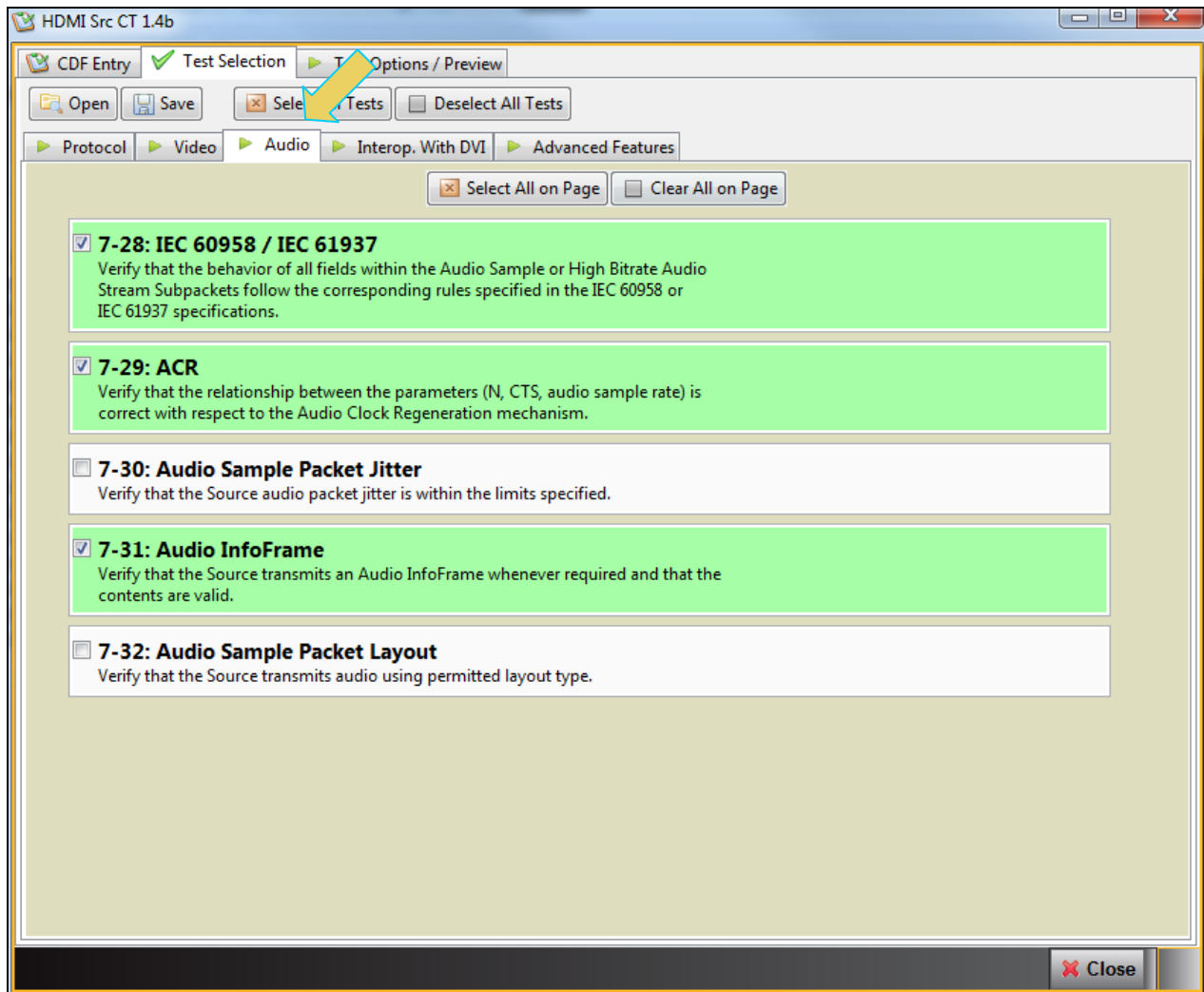


4. Select the tests you wish to run in the **Video** tab of the **Test Selection** panel shown below.

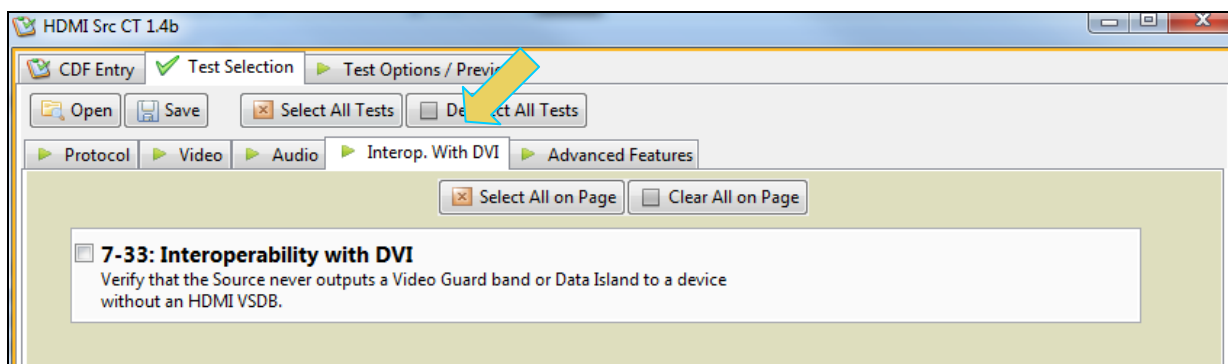
For convenience you can **Select All** or **Deselect All** tests using the activation buttons provided.



5. Select the tests you wish to run in the **Formats** tab of the **Test Selection** panel shown below.

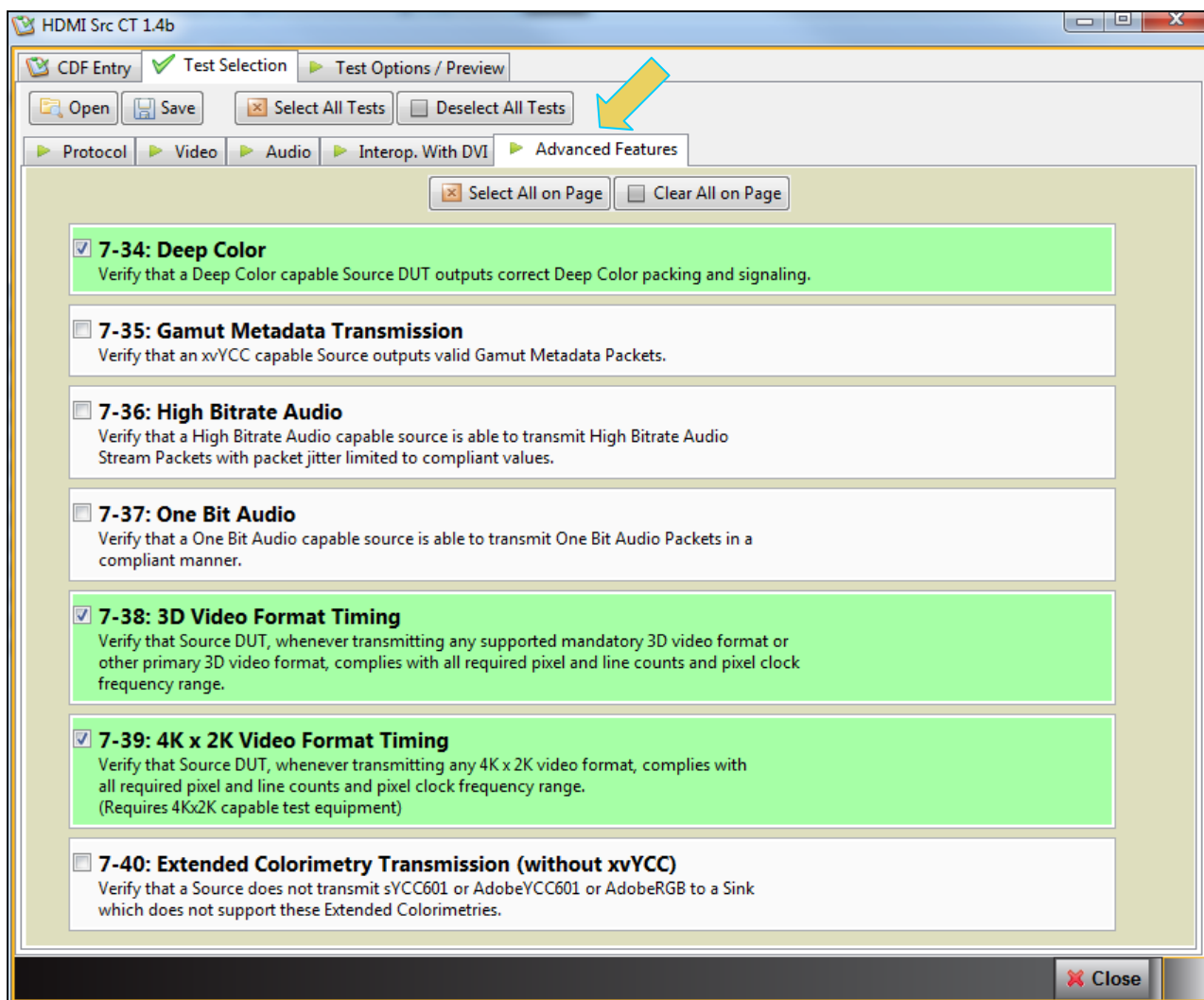


- Select the tests you wish to run in the **Interoperability with DVI** tab of the **Test Selection** panel shown below.

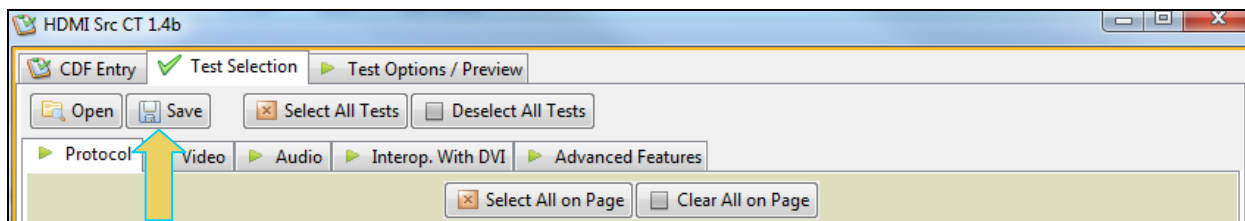


- Select the tests you wish to run in the **Advanced Features** tab of the **Test Selection** panel shown below.

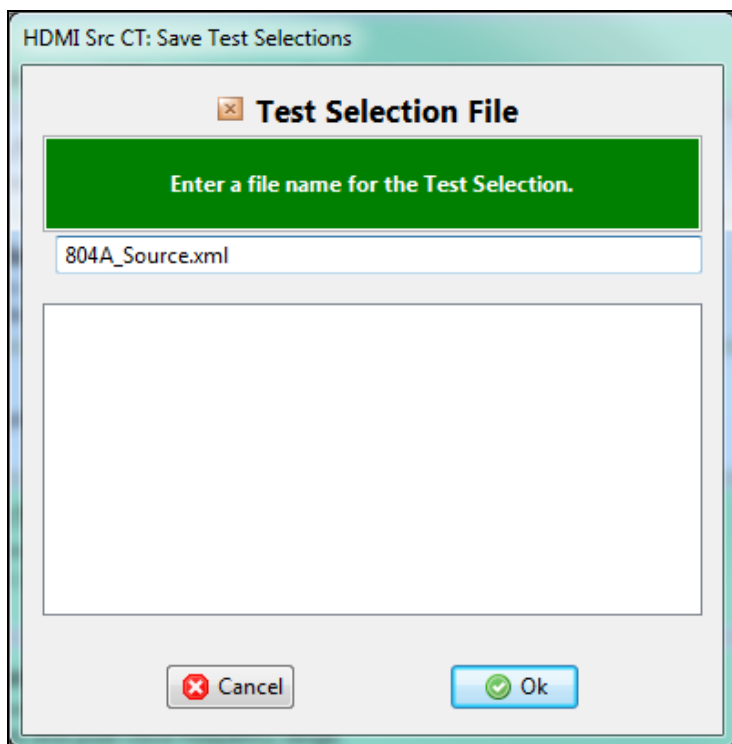
**Note:** Support for the 4K by 2K test (Test ID 7-39) is only available on the 980 297MHz “Gen 3” version of the Protocol Analyzer.



- 8. You can save the Test Selection options using the **Save** activation button. This enables you to quickly recall the test list for re-testing.



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



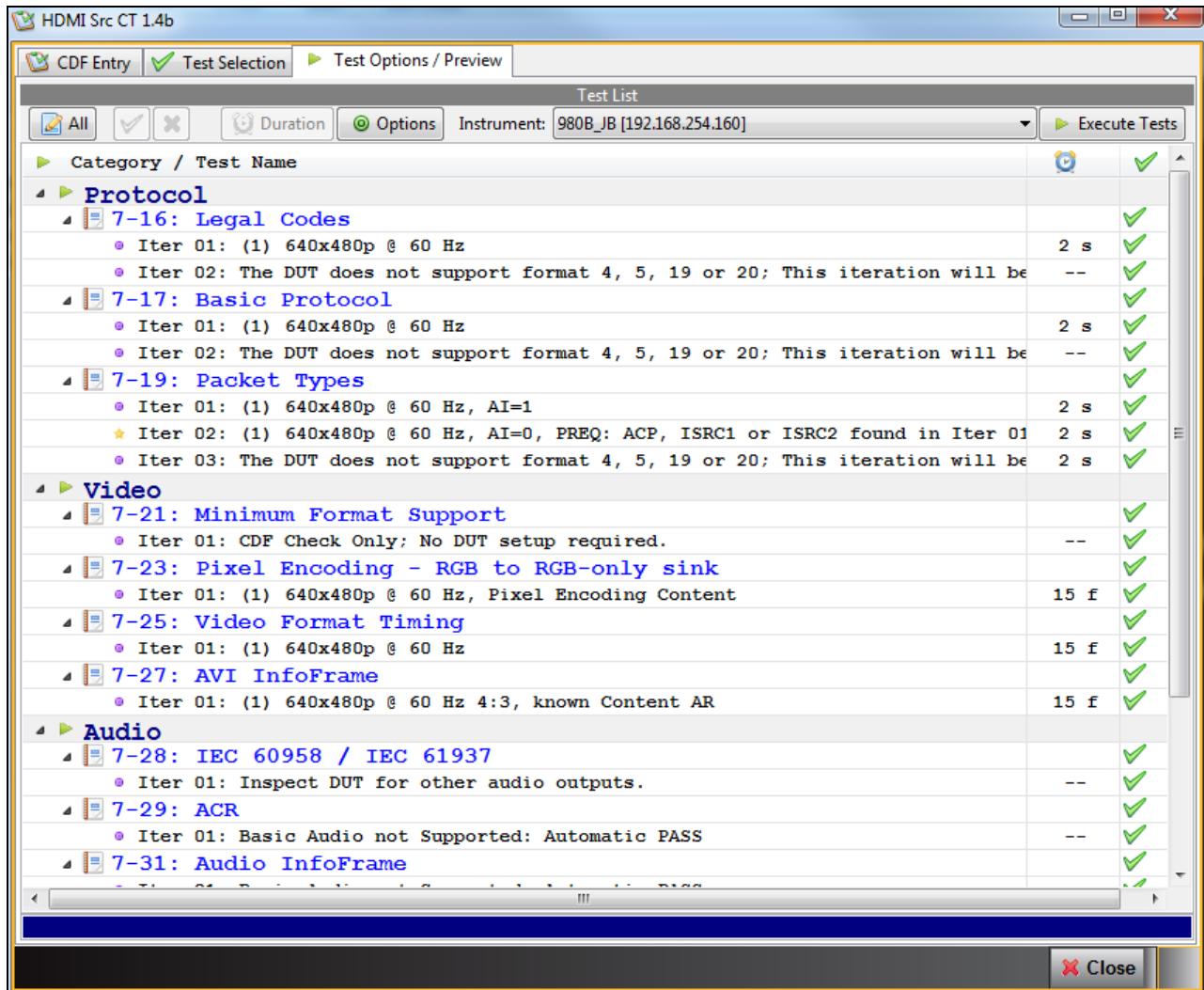


### 3.8 Executing the HDMI Source Compliance Tests

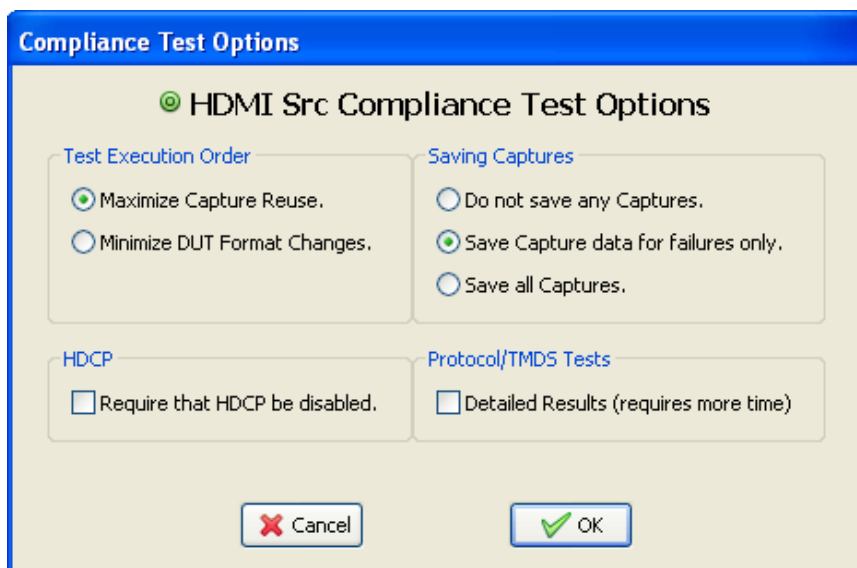
Use the following procedures to initiate the execution of an HDMI Source Compliance test series.

#### To initiate a test series:

1. Select the **Test Options / Preview** panel as shown below. Notice that the “Other” formats appear underneath the required formats for each test.



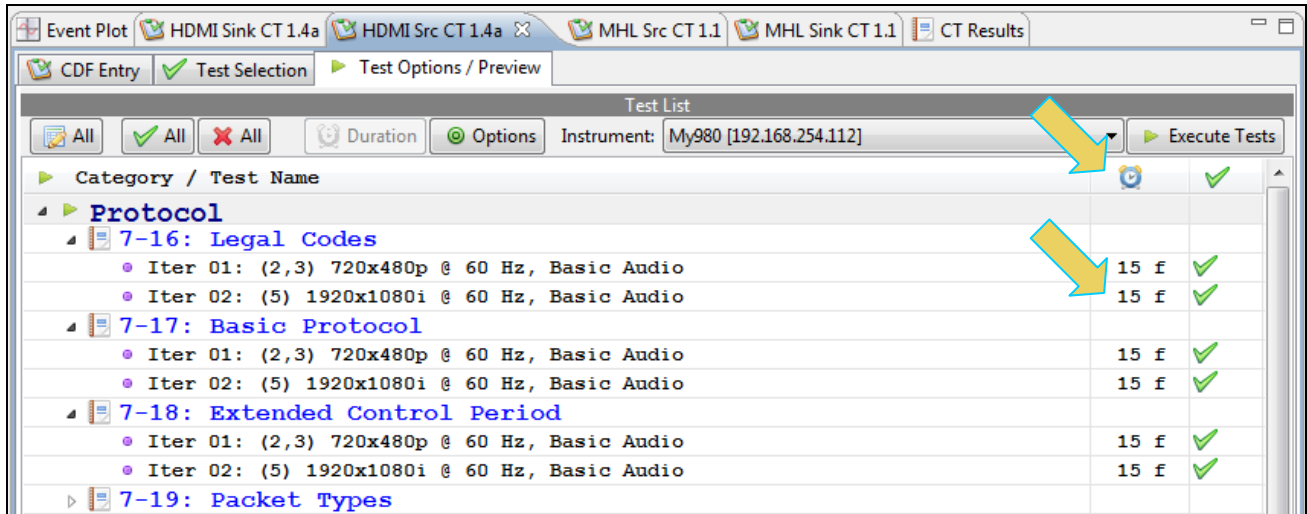
2. Set the **Options** for the tests by clicking on the Options  button. The following dialog box appears:



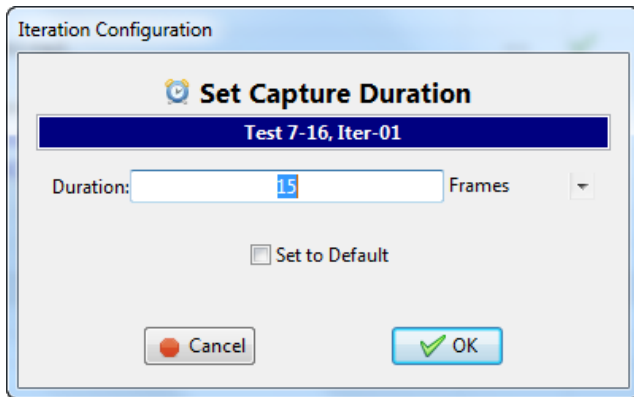
There are a few settings you can define. These relate to what test execution order, saving captured data and enabling or disabling HDCP content protection. The table below describes the options. When completed with the options select the OK activation button to continue.

Option	Description
<b>Test Execution Order</b>	<p>There are two selections:</p> <ul style="list-style-type: none"> <li>- Maximize Capture Reuse – Will run tests in an order that will be quicker because it reuses captures.</li> <li>- Minimize DUT format changes – Will run tests in an order that will minimize user interaction in changing formats.</li> </ul> <p><b>Note:</b> The 980 Rx port will automatically configure its EDID to cause or encourage the source device to send the proper video resolution and audio format for any give test.</p>
<b>Saving Captures</b>	<p>There are three selections:</p> <ul style="list-style-type: none"> <li>- Do not save any captures – no captures are saved regardless of the results, pass or fail.</li> <li>- Save Capture data for failures only – Saves only captures for tests where failures occur.</li> <li>- Saves all Captures – Saves all captures regardless of the results, pass or fail.</li> </ul>
<b>HDCP</b>	<p>Require that HDCP be disabled - A check box that when selected will only run the tests if HDCP content protection on the source is disabled.</p>
<b>Protocol/TMDS Tests</b>	<p>Detailed Results (requires more time) - A check box that when selected will provide the raw protocol data. This will enable you to determine why a test failed. If unchecked you will only receive summary results.</p>

- (Optional) Set the number of frames to capture during the Protocol Tests. Use the alarm clock icon indicated in the screen shot below.

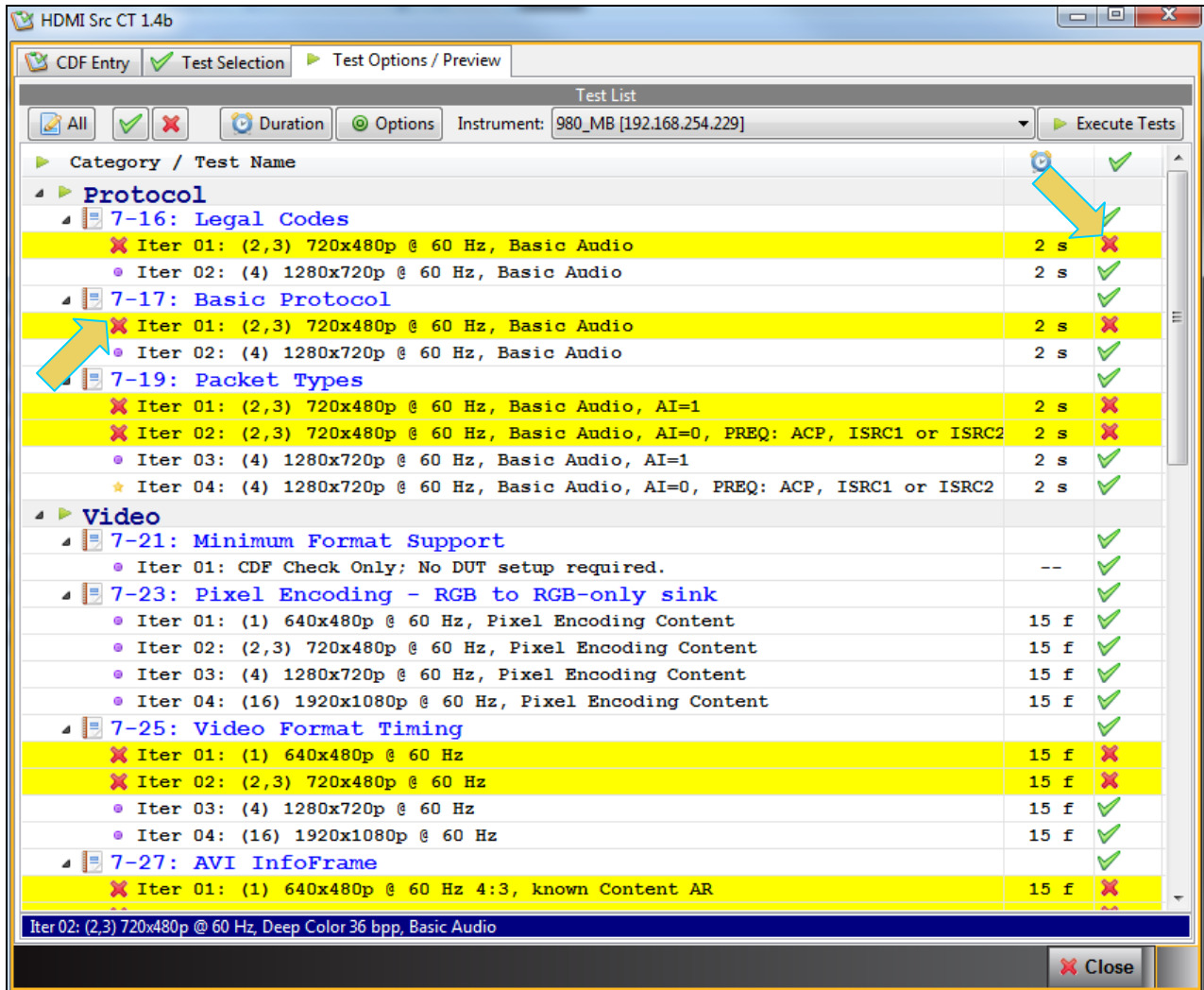


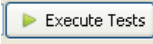
In the example below, the number of frames are set to 15.

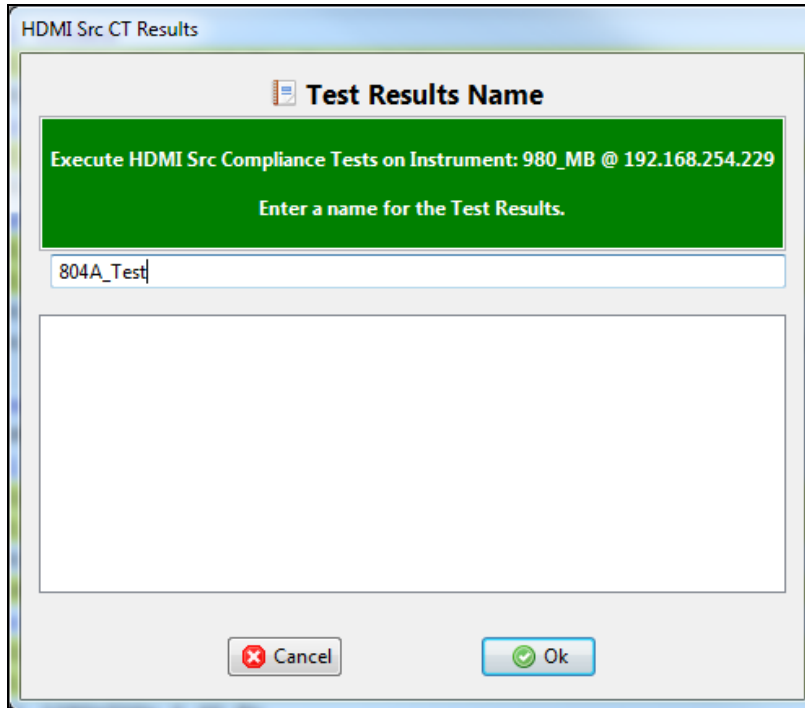


- (Optional) Review the list of tests for each category. If you wish to skip some of the tests. You can skip tests by clicking on the Check mark on the right side of the **Test Options / Preview** panel.

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.



When you click on the **Ok** button the tests will begin and a new window will appear with a Test Log on the bottom providing status information about the tests. A sample screen is shown below.

The screenshot shows the 'HDMI Src Compliance Test (1.4b): "804A\_Test"' window. At the top, there are control buttons for 'Duration', 'Reset Status', and 'Options'. Below is a 'Test List' table with columns for 'Category / Test Name', 'Duration', 'Status', and 'Test Name'. The table is organized into sections: Protocol, Video, and Test Log. A yellow arrow points from the '7-23: Pixel Encoding - RGB to RGB-only sink' test entry in the Test List to the Test Log section.

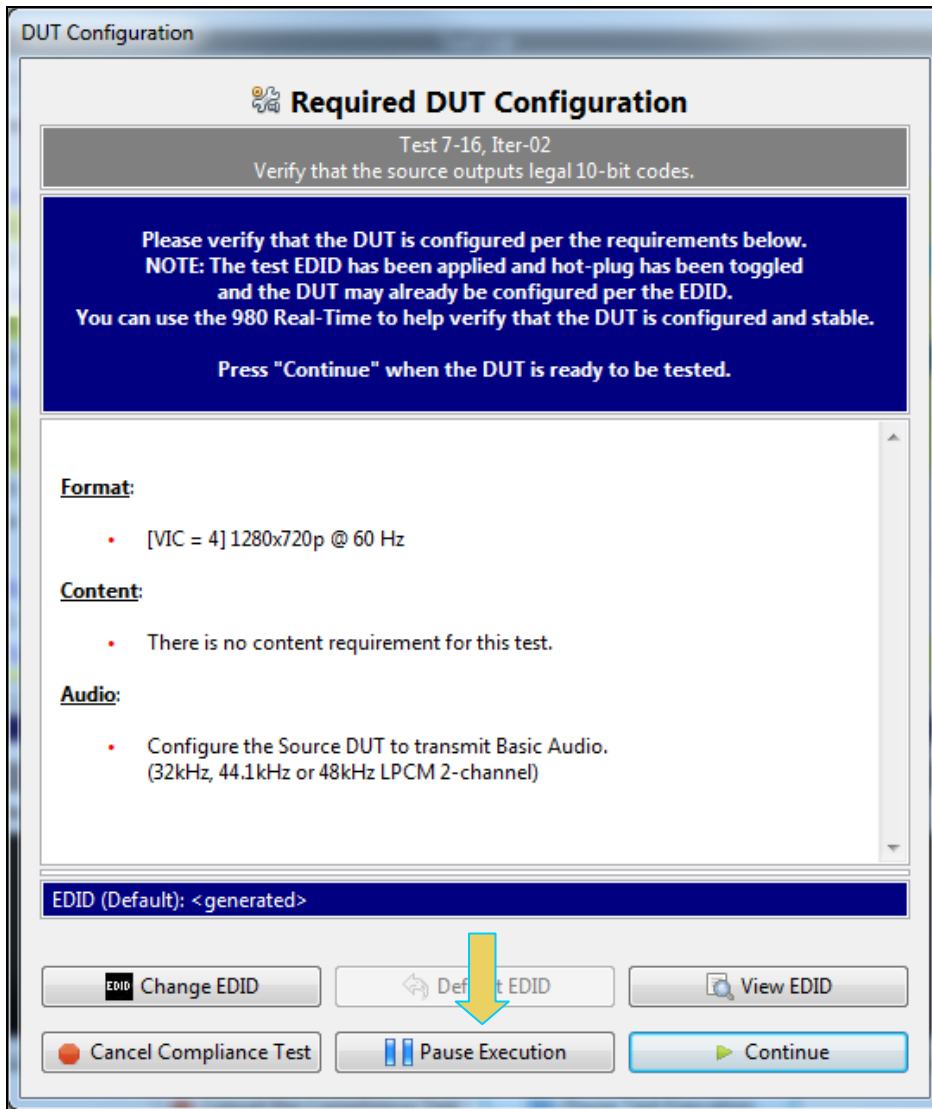
Category / Test Name	Duration	Status	Test Name
▶ Protocol		✓	
▶ 7-16: Legal Codes		✓	
✗ Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio	2 s	✗	User Skipped
• Iter 02: (4) 1280x720p @ 60 Hz, Basic Audio	2 s	✓	Not Tested
▶ 7-17: Basic Protocol		✓	
✗ Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio	2 s	✗	User Skipped
• Iter 02: (4) 1280x720p @ 60 Hz, Basic Audio	2 s	✓	Not Tested
▶ 7-19: Packet Types		✓	
✗ Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio, AI=1	2 s	✗	User Skipped
✗ Iter 02: (2,3) 720x480p @ 60 Hz, Basic Audio, AI=0, PREQ	2 s	✗	User Skipped
• Iter 03: (4) 1280x720p @ 60 Hz, Basic Audio, AI=1	2 s	✓	Not Tested
★ Iter 04: (4) 1280x720p @ 60 Hz, Basic Audio, AI=0, PREQ:	2 s	✓	Not Tested
▶ Video			
▶ 7-21: Minimum Format Support		✓	Not Tested
• Iter 01: CDF Check Only; No DUT setup required.	--	✓	Not Tested
▶ 7-23: Pixel Encoding - RGB to RGB-only sink		✓	Incomplete

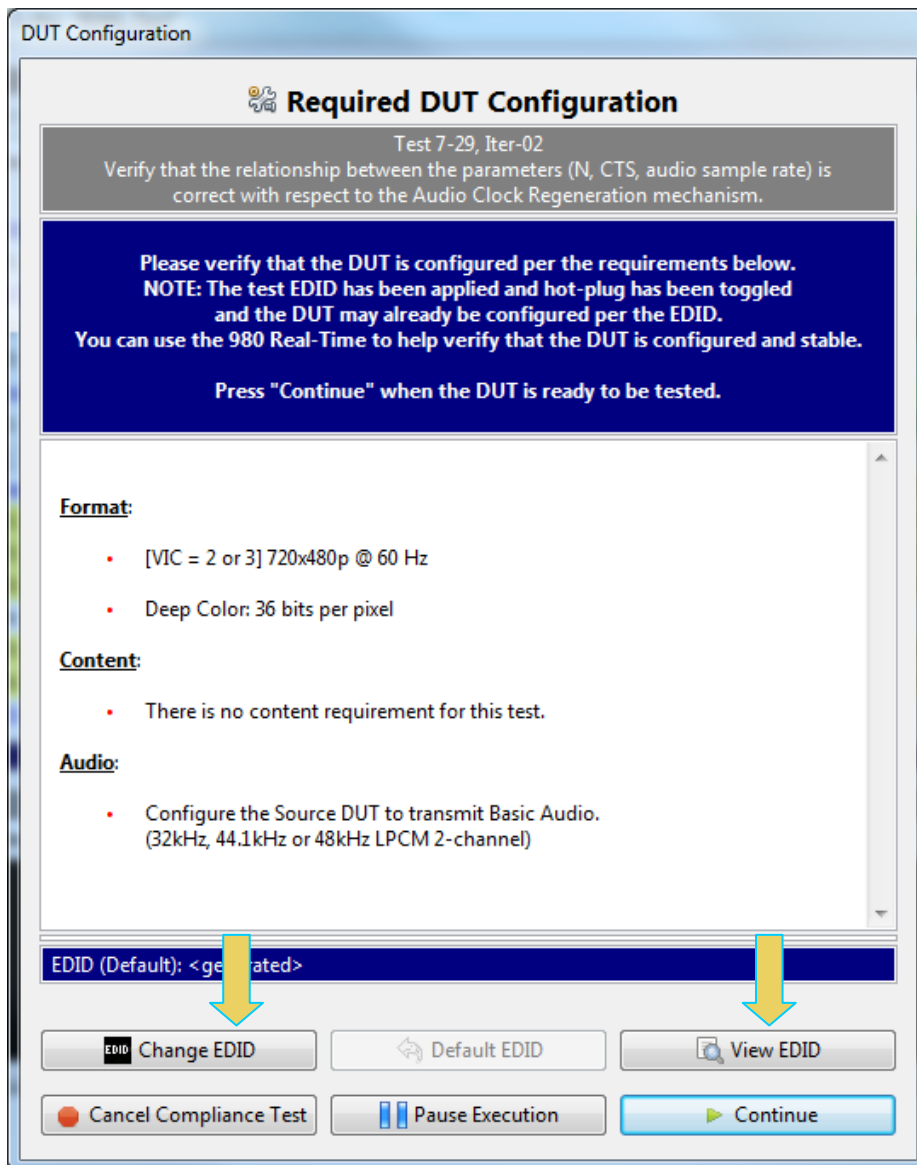
Line	Message
• 0001	Compliance Test Started.
• 0002	Initialization.
• 0003	Assembling the test list.
• 0004	Disabling Pass-through.

At the bottom of the window, there are two buttons: 'Cancel the Compliance Test' and 'Pause Test Execution'.

During the tests a **Required DUT Configuration** dialog box will appear which requires that you to verify that the source device under test is in the correct mode (video and audio format are correct). The following screen shot depicts this. This example shows the dialog box for the 7-29 test but the dialog box is similar for other tests. Press **Continue** when you have the source device in the correct mode. If you need to pause the test to configure the source device under test, you can do so by clicking on the **Pause Execution** activation button. You can cancel the test using the **Cancel Compliance Test** button.



For some tests there are audio requirements. An example is shown below.



The **Required DUT Configuration** dialog box also has a few options for EDID selection. The 980 GUI Manager can auto-generate an appropriate EDID to evoke the proper response from the source device under test. The **View EDID** option enables you to view the EDID that the 980 GUI Manager has auto-generated. An example is shown on the screen shot below. Note that the EDID report is a scrolling window that allows you to view the entire EDID in human readable text.



EDID Decode

C:\Users\inkendall\Desktop\980\_CBUS\_GUI\980mg\hdmict\results\acme-xyz-hdmi-source7\testEdid.xml

Report generated on: February 5, 2013 2:56 PM www.quantumdata.com

### Quantum Data EDID Data Report

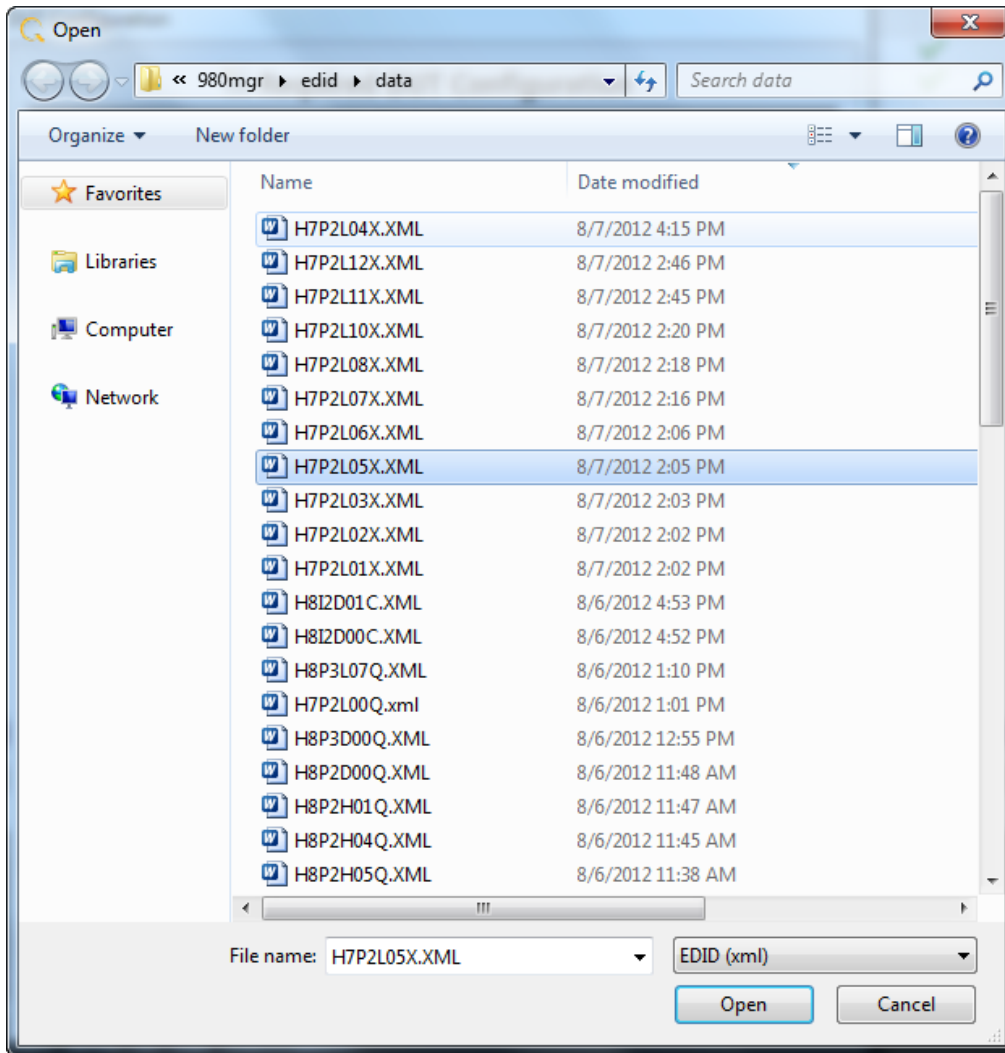
**Block 0**

	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	B2	00	04	00	00	00
10:	20	14	01	03	80	50	2D	78	0A	0D	C9	A0	57	47	98	27
20:	12	48	4C	20	00	00	01	01	01	01	01	01	01	01	01	01
30:	01	01	01	01	01	01	8F	0A	D0	8A	20	E0	2D	10	10	3E
40:	96	00	20	C2	31	00	00	18	8F	0A	D0	8A	20	E0	2D	10
50:	10	3E	96	00	58	C2	21	00	00	18	00	00	00	FC	00	48
60:	44	4D	49	20	43	54	20	54	45	53	54	0A	00	00	00	FD
70:	00	17	F1	08	8C	1E	00	0A	20	20	20	20	20	20	01	BC

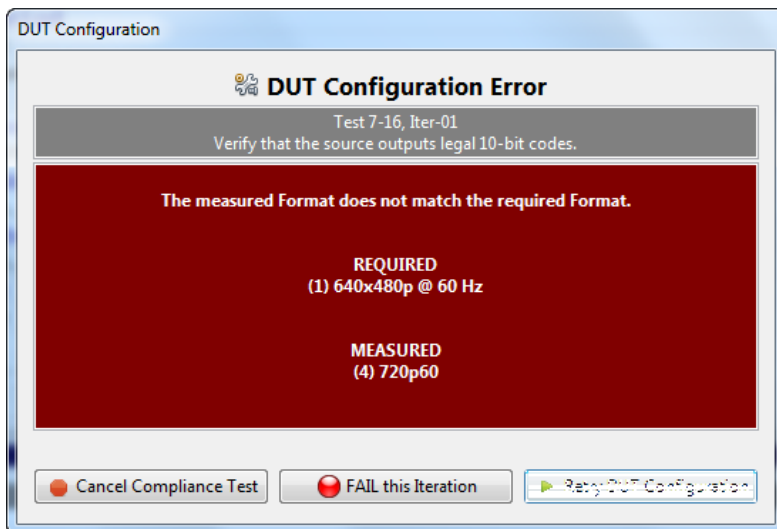
Checksum verified  
 Version 1 header verified  
 EDID Version 1, Revision 3  
 Number of additional blocks: 1  
 Manufacturer: QDI

← Back ▶ Forward 📁 Save As ✖ Close


There may be cases where you wish to change the EDID for a particular test. For example the EDID that is auto-generated may have some parameters or may be formed in a way that your source device is having difficulty parsing. To change the EDID you can use the **Change EDID** option on the **Required DUT Configuration** dialog box. When you click on the Change EDID dialog box a Windows browsing window (shown below) is opened allowing you to browse and select alternative EDIDs.



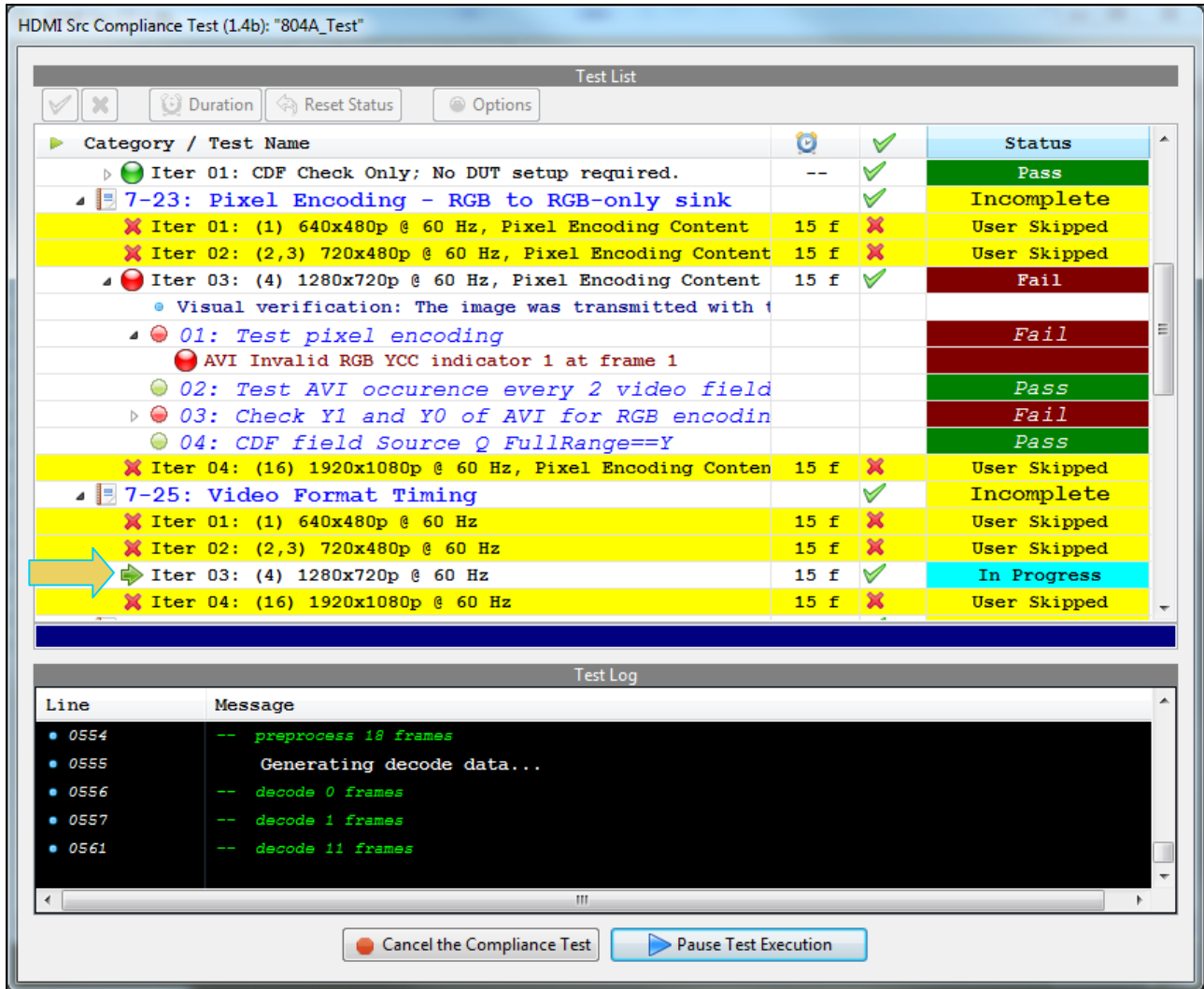
If you do not have the source device under test in the proper mode, an error dialog box will appear. A sample of this error dialog box is shown below. In this case you can reset the device under test and then retest.



During the test, the test results are shown as they occur in the **Test Options / Preview** panel. There is a progress arrow which points to the test that is currently being run. Refer to the screen shot below.

The lower panel **Test Log** shows the testing activity as it occurs. A progress arrow  indicates the current test.

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 Manager application.



**HDMI Src Compliance Test (1.4b): "804A\_Test"**

Test List

Category / Test Name	Duration	Options	Status
Iter 01: CDF Check Only; No DUT setup required.	--	✓	Pass
7-23: Pixel Encoding - RGB to RGB-only sink		✓	Incomplete
✗ Iter 01: (1) 640x480p @ 60 Hz, Pixel Encoding Content	15 f	✗	User Skipped
✗ Iter 02: (2,3) 720x480p @ 60 Hz, Pixel Encoding Content	15 f	✗	User Skipped
Iter 03: (4) 1280x720p @ 60 Hz, Pixel Encoding Content	15 f	✓	Fail
• Visual verification: The image was transmitted with			
01: Test pixel encoding			Fail
• AVI Invalid RGB YCC indicator 1 at frame 1			
02: Test AVI occurrence every 2 video field			Pass
03: Check Y1 and Y0 of AVI for RGB encoding			Fail
04: CDF field Source Q FullRange==Y			Pass
✗ Iter 04: (16) 1920x1080p @ 60 Hz, Pixel Encoding Content	15 f	✗	User Skipped
7-25: Video Format Timing		✓	Incomplete
✗ Iter 01: (1) 640x480p @ 60 Hz	15 f	✗	User Skipped
✗ Iter 02: (2,3) 720x480p @ 60 Hz	15 f	✗	User Skipped
➡ Iter 03: (4) 1280x720p @ 60 Hz	15 f	✓	In Progress
✗ Iter 04: (16) 1920x1080p @ 60 Hz	15 f	✗	User Skipped

Test Log

Line	Message
0554	-- preprocess 18 frames
0555	Generating decode data...
0556	-- decode 0 frames
0557	-- decode 1 frames
0561	-- decode 11 frames

HDMI Src Compliance Test (1.4b): "804A\_Test"

Test List

Category / Test Name	Duration	Result	Status
7-29: ACR		✓	Pass
▶ Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio	3 s	✓	Pass
▶ Iter 02: (2,3) 720x480p @ 60 Hz, Deep Color 36 bpp, Bas	3 s	✓	Pass
7-31: Audio InfoFrame		✓	Pass
▶ Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio	15 f	✓	Pass
Advanced Features			
7-34: Deep Color		✓	Incomplete
✗ Iter 01: 30 bpp is currently not supported (36 bpp only)	--	✗	User Skipped
✗ Iter 02: (2,3) 720x480p @ 60 Hz, Deep Color 36 bpp	15 f	✗	User Skipped
✗ Iter 03: 30 bpp is currently not supported (36 bpp only)	--	✗	User Skipped
▶ Iter 04: (4) 1280x720p @ 60 Hz, Deep Color 36 bpp	15 f	✓	Pass
✗ Iter 05: 30 bpp is currently not supported (36 bpp only)	--	✗	User Skipped
✗ Iter 06: (16) 1920x1080p @ 60 Hz, Deep Color 36 bpp	15 f	✗	User Skipped
7-38: 3D Video Format Timing		✓	Skipped
▶ Iter 01: The DUT does not support 3D formats: Test will	--	✓	Skipped
7-39: 4K x 2K Video Format Timing		✓	Pass
▶ Iter 01: (1) 4K x 2K 29.97, 30 Hz	15 f	✓	Pass

Test Log

Line	Message
1183	Processing analysis results.
1184	Test 7-39 Iter 01 -> Pass
1185	Tests completed
1186	Restarting Test Execution
1187	Tests completed ←

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 shots to see examples of the **CT Results** panel. Note that you may have to view the specifics of each test indicated as Incomplete to see failures. This can be seen in the following two screen examples.

**Compliance Test Results Viewer**

**HDMI Source Compliance Test Results**

Results Name: 804A\_Test      Manufacturer: Acme      [HTML Report](#)  
 Date Tested: July 26, 2013 11:25 AM      Model Name: 1  
 Overall Status: **CTS 1.4b - Incomplete**      Port Tested: 1

Test Results

Test Name / Details	Status
7-16: Legal Codes	Incomplete
7-17: Basic Protocol	Incomplete
7-19: Packet Types	Incomplete
7-21: Minimum Format Support	Pass
7-23: Pixel Encoding - RGB to RGB-only sink	Incomplete
7-25: Video Format Timing	Incomplete
7-27: AVI InfoFrame	Incomplete
7-28: IEC 60958 / IEC 61937	Pass
7-29: ACR	Pass
7-31: Audio InfoFrame	Pass
7-34: Deep Color	Incomplete
7-38: 3D Video Format Timing	Skipped
7-39: 4K x 2K Video Format Timing	Pass

Open Capture

Instrument: 980\_MB [192.168.254.229]      Continue Test Execution

Close

Compliance Test Results Viewer

**HDMI Source Compliance Test Results**

Results Name: 804A\_Test      Manufacturer: Acme      [HTML Report](#)  
 Date Tested: July 26, 2013 11:25 AM      Model Name: 1  
 Overall Status: **CTS 1.4b - Incomplete**      Port Tested: 1

Test Results

Test Name / Details	Duration	Status
▶ Iter 03: (4) 1280x720p @ 60 Hz, Basic Audio, AI=1	2 s	Pass
▶ Iter 04: (4) 1280x720p @ 60 Hz, Basic Audio, AI=0, PREQ: ACP,	2 s	Skipped
▶ 7-21: Minimum Format Support		Pass
▲ 7-23: Pixel Encoding - RGB to RGB-only sink		Incomplete
✘ Iter 01: (1) 640x480p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
✘ Iter 02: (2,3) 720x480p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
▲ Iter 03: (4) 1280x720p @ 60 Hz, Pixel Encoding Content	15 f	Fail
• Visual verification: The image was transmitted with the cor		
● 01: Test pixel encoding		Fail
● AVI Invalid RGB YCC indicator 1 at frame 1		
● 02: Test AVI occurrence every 2 video field		Pass
● 03: Check Y1 and Y0 of AVI for RGB encoding		Fail
● 04: CDF field Source Q FullRange==Y		Pass
✘ Iter 04: (16) 1920x1080p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
▲ 7-25: Video Format Timing		Incomplete
✘ Iter 01: (1) 640x480p @ 60 Hz	15 f	User Skipped
✘ Iter 02: (2,3) 720x480p @ 60 Hz	15 f	User Skipped

Open Capture      AVI Invalid RGB YCC indicator 1 at frame 1

Instrument: 980\_MB [192.168.254.229]      Continue Test Execution

Close

### 3.9 Viewing Details of Source Compliance Test Failures

When you have completed the test series you will have an opportunity to view the detailed data for a particular failure. Use the following procedures to view the details of a failure.

#### To view the details of a failure:

1. Expose the detailed results of a failure and highlight a failure. Refer to the screen example below.

The screenshot shows the 'Compliance Test Results Viewer' window. At the top, it displays 'HDMI Source Compliance Test Results' for 'Results Name: 804A\_Test', 'Manufacturer: Acme', 'Date Tested: July 26, 2013 11:25 AM', 'Model Name: 1', and 'Port Tested: 1'. The overall status is 'CTS 1.4b - Incomplete'. Below this is a table of test results:

Test Name / Details	Duration	Status
Iter 03: (4) 1280x720p @ 60 Hz, Basic Audio, AI=1	2 s	Pass
Iter 04: (4) 1280x720p @ 60 Hz, Basic Audio, AI=0, PREQ: ACP,	2 s	Skipped
7-21: Minimum Format Support		Pass
7-23: Pixel Encoding - RGB to RGB-only sink		Incomplete
Iter 01: (1) 640x480p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
Iter 02: (2,3) 720x480p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
Iter 03: (4) 1280x720p @ 60 Hz, Pixel Encoding Content	15 f	Fail
Visual verification: The image was transmitted with the cor		
01: Test pixel encoding		Fail
AVI Invalid RGB YCC indicator 1 at frame 1		
02: Test AVI occurrence every 2 video field		Pass
03: Check Y1 and Y0 of AVI for RGB encoding		Fail
04: CDF field Source Q FullRange==Y		Pass
Iter 04: (16) 1920x1080p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
7-25: Video Format Timing		Incomplete
Iter 01: (1) 640x480p @ 60 Hz	15 f	User Skipped
Iter 02: (2,3) 720x480p @ 60 Hz	15 f	User Skipped

At the bottom left, there is an 'Open Capture' button. Below it, the instrument is identified as '980\_MB [192.168.254.229]'. A 'Continue Test Execution' button is on the bottom right, and a 'Close' button is at the very bottom right.

When you highlight a failure in the Details window of the **CT Results** panel, you can navigate to the details in the **Data Decode** panel by clicking on the **Open Capture** activation button on the bottom left of the panel (indicated in the screen example above). The resulting capture windows are shown in the screen shot below.

The application will take you to the entry in the **Data Decode** panel where the error occurred.

The screenshot shows the Capture Viewer application interface. The top panel displays a timing diagram with various signal traces: TMS, VSYNC, HSYNC, ENCR-E, AVMLTE, DDC, and CEC. A yellow arrow points to the AVI frame in the diagram. The bottom panel shows the Data Decode table with the following data:

Packet	Time (H:M:S.ms.us.ns.ps)	Frame	Line	Pixel	Type	SubType	Info
3	0:30:6.528.982.500.000		0	0	TMDS	HSYNC	HSYNC 40 clocks
4	0:30:6.528.982.500.000		0	0	TMDS	VSYNC	VSYNC 8250 clocks
5	0:30:6.528.982.650.000		0	11	TMDS	GCP	General Control Packet (GCP)
6	0:30:6.528.983.080.970		0	43	TMDS	AVI IF	AVI InfoFrame
7	0:30:6.528.983.511.940		0	75	TMDS	AUD IF	Audio InfoFrame
8	0:30:6.528.983.942.909		0	107	TMDS	VEN	Vendor-Specific InfoFrame
9	0:30:6.528.994.890.000		0	920	TMDS	AUDSAM	Audio Sample Packet(L-PCM and IEC 61937 compressed formats)

Below the table, the following information is displayed:

```
check sum:          verified
scan info:          no data
Bar Info:           no Data
active info:        no data
RGB/YCC indicator: YCbCr 4:2:2
```

Yellow arrows in the original image point to the AVI InfoFrame entry in the table and the 'no data' status for Bar Info and active info.

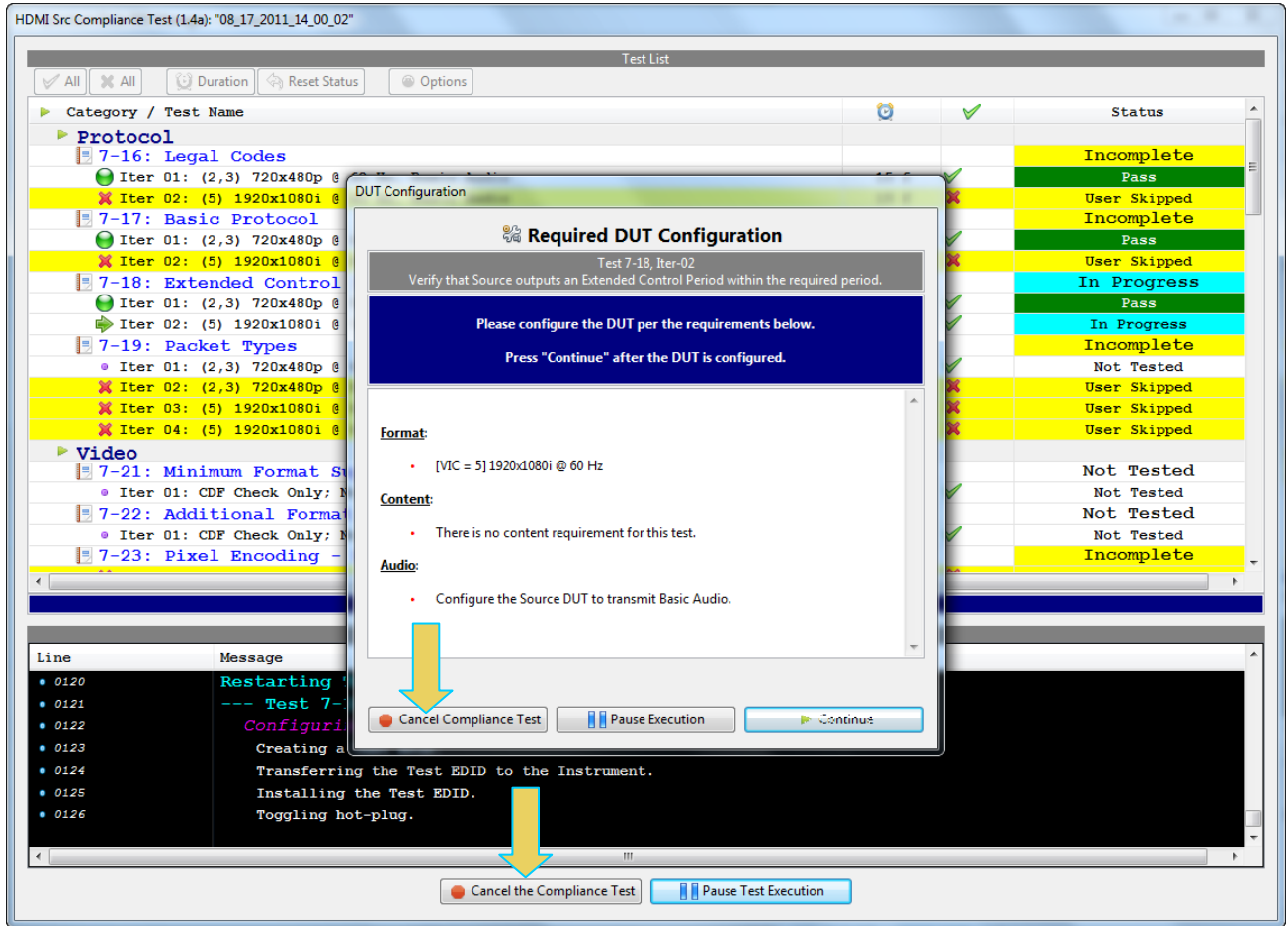


### 3.10 Canceling and Resuming the HDMI Source Compliance after cancel

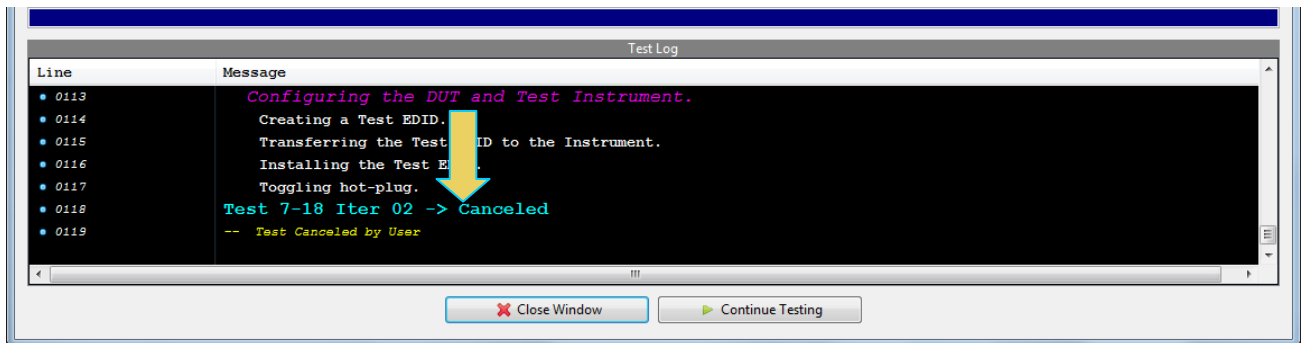
You can complete or resume a test series that was canceled earlier. The test results are saved in a directory that is accessible through the 980 GUI Manager. Use the following procedures to cancel and then resume a test.

**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.

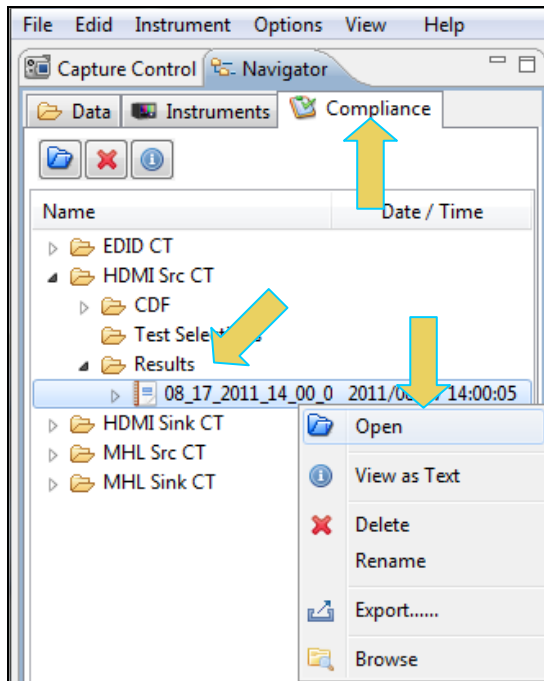


An indication that the test was canceled will be shown in the Test Log lower panel.

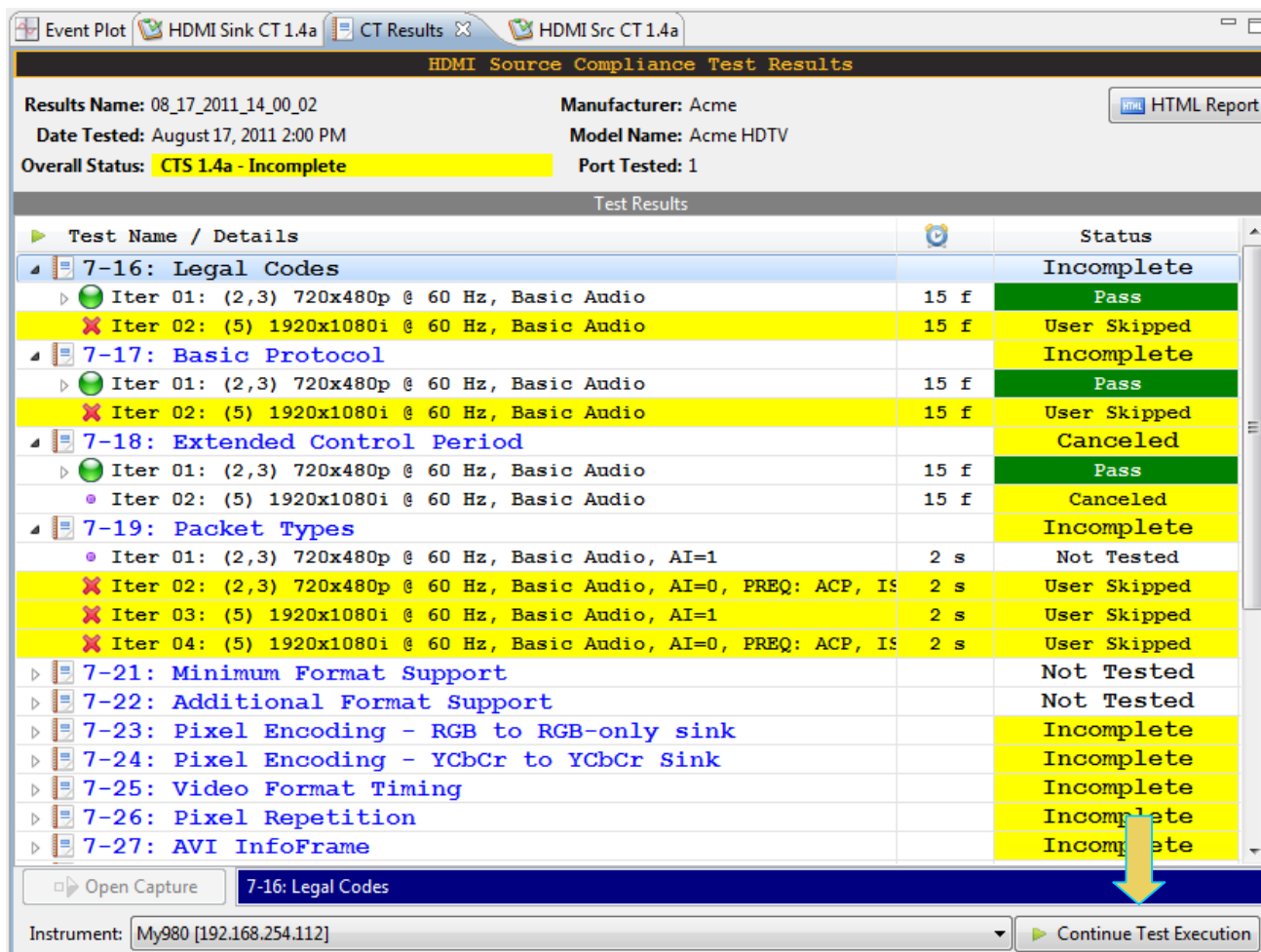


**To resume a canceled test:**

1. Navigate to the Navigator/Compliance panel and open the HDMI Source 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.

### 3.11 Viewing the HDMI Source 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.

**HDMI Source Compliance Test Results**

Results Name: 804A\_Test      Manufacturer: Acme  
 Date Tested: July 26, 2013 11:25 AM      Model Name: 1  
 Overall Status: **CTS 1.4b - Incomplete**      Port Tested: 1

Test Results

Test Name / Details	Time	Status
Iter 03: (4) 1280x720p @ 60 Hz, Basic Audio, AI=1	2 s	Pass
Iter 04: (4) 1280x720p @ 60 Hz, Basic Audio, AI=0, PREQ: ACP,	2 s	Skipped
7-21: Minimum Format Support		Pass
7-23: Pixel Encoding - RGB to RGB-only sink		Incomplete
✘ Iter 01: (1) 640x480p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
✘ Iter 02: (2,3) 720x480p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
Iter 03: (4) 1280x720p @ 60 Hz, Pixel Encoding Content	15 f	Fail
Visual verification: The image was transmitted with the cor		
01: Test pixel encoding		Fail
AVI Invalid RGB YCC indicator 1 at frame 1		
02: Test AVI occurrence every 2 video field		Pass
03: Check Y1 and Y0 of AVI for RGB encoding		Fail
04: CDF field Source Q FullRange==Y		Pass
✘ Iter 04: (16) 1920x1080p @ 60 Hz, Pixel Encoding Content	15 f	User Skipped
7-25: Video Format Timing		Incomplete
✘ Iter 01: (1) 640x480p @ 60 Hz	15 f	User Skipped
✘ Iter 02: (2,3) 720x480p @ 60 Hz	15 f	User Skipped

Instrument: 980\_MB [192.168.254.229]      Continue Test Execution

**Generate Report**

**HTML Report**

804A\_Test

Select the desired report options.

Show Test Summary Only.

Include CDF Information.

Cancel      OK

The following screens show examples of various parts of the HTML report.

The html report is shown in the following screens.

HTML Viewer  
 C:\Users\nkendall\980\_Capture\_Files\_4\_8\hdmict\results\804A\_Test\Report\_Cdf.htm

Report generated on: July 26, 2013 11:43 AM www.quantumdata.com

## Quantum Data HDMI Source Compliance Test Report CTS 1.4b

Results Name:	804A_Test	Manufacturer:	Acme
Date Tested:	July 26, 2013 11:25 AM	Model Name:	1
Overall Status:	Incomplete	Port Tested:	1

Report Index / Summary					
<a href="#">Test 7-16</a>	Incomplete	<a href="#">Test 7-17</a>	Incomplete	<a href="#">Test 7-19</a>	Incomplete
<a href="#">Test 7-21</a>	Pass	<a href="#">Test 7-23</a>	Incomplete	<a href="#">Test 7-25</a>	Incomplete
<a href="#">Test 7-27</a>	Incomplete	<a href="#">Test 7-28</a>	Pass	<a href="#">Test 7-29</a>	Pass
<a href="#">Test 7-31</a>	Pass	<a href="#">Test 7-34</a>	Incomplete	<a href="#">Test 7-38</a>	Skipped
<a href="#">Test 7-39</a>	Pass	<a href="#">CDF</a>		<a href="#">Equipment Info</a>	

Capabilities Declaration Form (CDF)	
Product Information	
Manufacturer	Acme
Model Name	1
HDMI_output_count	1
Port Tested	1

← Back → Forward Save As Close

HTML Viewer  
 C:\Users\nkendall\980\_Capture\_Files\_4\_8\hdmict\results\804A\_Test\Report\_Cdf.htm

Test 7-17 Basic Protocol	Incomplete																										
<ul style="list-style-type: none"> <li>• Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio</li> </ul>	User Skipped																										
<ul style="list-style-type: none"> <li>• Iter 02: (4) 1280x720p @ 60 Hz, Basic Audio                             <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr><td>• 01: Verify that ENC_EN code is not detected in window of opportunity</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 02: Verify 12pix of Control period before transition to next character</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 03: Verify Control period prior to the DI preamble should not have DI preamble control code</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 04: Inconsistent/Illegal DI or Video preamble, 8 pix match the CTLx val for any other *pix</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 05: Verify Data Island Leading Guard Band:Exp Vals Ch0:0x28e,0x271,0x163,0x2c3, Ch1-Ch2:0x133</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 06: Verify Data Island Trailing Guard Band:Exp Vals Ch0:0x28e,0x271,0x163,0x2c3, Ch1-Ch2:0x133</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 07: verify DI TERC4 encoding</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 08: Verify first Chr following the Leading GB should NOT have TERC4 ch0, bit 3==1</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 09: Any other Chr prior to trailing GB should have TERC4 ch0, bit 3==1</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 10: Verify DI Len. is not 0 and is integral of 32 pix and no. of pkts are &lt;=18</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 11: BCH Parity check</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 12: Video Guard Band:Exp Vals 0x2cc, 0x133, 0x2cc</td><td style="background-color: green;">Pass</td></tr> <tr><td>• 13: Legal Video Data codes</td><td style="background-color: green;">Pass</td></tr> </table> </li> </ul>	• 01: Verify that ENC_EN code is not detected in window of opportunity	Pass	• 02: Verify 12pix of Control period before transition to next character	Pass	• 03: Verify Control period prior to the DI preamble should not have DI preamble control code	Pass	• 04: Inconsistent/Illegal DI or Video preamble, 8 pix match the CTLx val for any other *pix	Pass	• 05: Verify Data Island Leading Guard Band:Exp Vals Ch0:0x28e,0x271,0x163,0x2c3, Ch1-Ch2:0x133	Pass	• 06: Verify Data Island Trailing Guard Band:Exp Vals Ch0:0x28e,0x271,0x163,0x2c3, Ch1-Ch2:0x133	Pass	• 07: verify DI TERC4 encoding	Pass	• 08: Verify first Chr following the Leading GB should NOT have TERC4 ch0, bit 3==1	Pass	• 09: Any other Chr prior to trailing GB should have TERC4 ch0, bit 3==1	Pass	• 10: Verify DI Len. is not 0 and is integral of 32 pix and no. of pkts are <=18	Pass	• 11: BCH Parity check	Pass	• 12: Video Guard Band:Exp Vals 0x2cc, 0x133, 0x2cc	Pass	• 13: Legal Video Data codes	Pass	Pass
• 01: Verify that ENC_EN code is not detected in window of opportunity	Pass																										
• 02: Verify 12pix of Control period before transition to next character	Pass																										
• 03: Verify Control period prior to the DI preamble should not have DI preamble control code	Pass																										
• 04: Inconsistent/Illegal DI or Video preamble, 8 pix match the CTLx val for any other *pix	Pass																										
• 05: Verify Data Island Leading Guard Band:Exp Vals Ch0:0x28e,0x271,0x163,0x2c3, Ch1-Ch2:0x133	Pass																										
• 06: Verify Data Island Trailing Guard Band:Exp Vals Ch0:0x28e,0x271,0x163,0x2c3, Ch1-Ch2:0x133	Pass																										
• 07: verify DI TERC4 encoding	Pass																										
• 08: Verify first Chr following the Leading GB should NOT have TERC4 ch0, bit 3==1	Pass																										
• 09: Any other Chr prior to trailing GB should have TERC4 ch0, bit 3==1	Pass																										
• 10: Verify DI Len. is not 0 and is integral of 32 pix and no. of pkts are <=18	Pass																										
• 11: BCH Parity check	Pass																										
• 12: Video Guard Band:Exp Vals 0x2cc, 0x133, 0x2cc	Pass																										
• 13: Legal Video Data codes	Pass																										

Test 7-19 Packet Types	Incomplete
<ul style="list-style-type: none"> <li>• Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio, AI=1</li> </ul>	User Skipped

← Back → Forward Save As Close

HTML Viewer	
C:\Users\nkendall\980_Capture_Files_4_8\hdmict\results\804A_Test\Report_Cdf.htm	
<b>Test 7-21</b> Minimum Format Support	Pass
<ul style="list-style-type: none"> <li>• Iter 01: CDF Check Only; No DUT setup required.</li> <li>▪ Supported: 640x480p @ 59.94/60Hz 4:3 (Format 1)</li> <li>▪ Supported: 720x480p @ 59.94/60Hz 4:3 (Format 2) or 16:19 (Format 3)</li> <li>▪ NOT Supported: 720x576p @ 50Hz 4:3 (Format 17) or 16:9 (Format 18)</li> </ul>	Pass
<b>Test 7-23</b> Pixel Encoding - RGB to RGB-only sink	Incomplete
<ul style="list-style-type: none"> <li>• Iter 01: (1) 640x480p @ 60 Hz, Pixel Encoding Content</li> </ul>	User Skipped
<ul style="list-style-type: none"> <li>• Iter 02: (2,3) 720x480p @ 60 Hz, Pixel Encoding Content</li> </ul>	User Skipped
<ul style="list-style-type: none"> <li>• Iter 03: (4) 1280x720p @ 60 Hz, Pixel Encoding Content</li> </ul>	Fail
<ul style="list-style-type: none"> <li>▪ Captured Data -- Test_7_23_03</li> <li>▪ Visual verification: The image was transmitted with the correct pixel encoding.</li> </ul>	
<ul style="list-style-type: none"> <li>• 01: Test pixel encoding</li> </ul>	Fail
<ul style="list-style-type: none"> <li>▪ AVI Invalid RGB YCC indicator 1 at frame 1</li> </ul>	
<ul style="list-style-type: none"> <li>• 02: Test AVI occurrence every 2 video field</li> </ul>	Pass
<ul style="list-style-type: none"> <li>• 03: Check Y1 and Y0 of AVI for RGB encoding</li> </ul>	Fail
<ul style="list-style-type: none"> <li>▪ AVI RGB only Y1 and Y0 not 0   14716 130 0 5 43 1806545649.06 1237547 AVI InfoFrame [Frame 000, Line 0005, Pixel 43]</li> <li>▪ AVI RGB only Y1 and Y0 not 0   29530 130 1 5 43 1806562315.47 2475047 AVI InfoFrame [Frame 001, Line 0005, Pixel 43]</li> <li>▪ AVI RGB only Y1 and Y0 not 0   44332 130 2 5 43 1806578981.88 3712547 AVI InfoFrame [Frame 002, Line 0005, Pixel 43]</li> </ul>	
<p style="text-align: right;"> <span>← Back</span> <span>→ Forward</span> <span>Save As</span> <span>Close</span> </p>	

The report also provides information on the 980 used to run the test. This is shown below.

HTML Viewer	
C:\Users\nkendall\980_Capture_Files_4_8\hdmict\results\804A_Test\Report_Cdf.htm	
<b>Test Equipment Information</b>	
<b>Instrument</b>	
<pre> Name: 980_MB IP Address: 192.168.254.229 Net Mask: 255.255.255.0 Gateway IP: 192.168.254.1 Free Space: 68.58 GB of 162.23 GB (42.3%) Version: Advanced Test platform Version: 4.8.9 HDMI 980 protocol Analyzer in slot 0 [DDR 2048MB]:   Gateway: [Version: 4.7.7 Build Number: 1 (04:22:2013) Gen: 3 pcb: 297b/D]   Firmware: [Version: 4.8.9 Build Number: 8096 (mblair 07:18:2013 10:39:42 CDT) ] HDMI Video Generator in slot 1:   Gateway: [Version: 4.7.6 Build Number: 2 (05:21:2013 00) pcb: 297b C]   Firmware: [Version: 4.8.9 Build Number: 8093 (mblair 07:18:2013 10:37:55 CDT)] System Information: System SN      : [ 6779F4AF800C2657::100000] HDMI PA SN    : [ A7B99D010000::N/A] Main Board    : [ "SandyBridge Platform"] CPUx2         : [ 6.42.7 "Intel(R) Celeron(R) CPU G530 @ 2.40GHz"] DDR           : [ 2 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 4.8.99.99182_201307250940] 1             : [ lo inet 127.0.0.1/8 scope host lo] 2             : [ eth0 inet 192.168.254.229/24 brd 192.168.254.255 scope global eth0] PCIE3         : [ 2,5x4] HDMI SRC CT   : [ 4.7.4] HDCP SRC CT   : [ 4.6.0] MHL SINK CT   : [ 4.7.18] MHL SRC CT    : [ 4.7.20] HDMI SINK CTS : [ 3.1.8]           </pre>	
<b>Host</b>	
<pre> UI Name: Quantum Data 980 Manager - Version 4.8.99 UI Home: platform:/base/plugins/com.quantumdata.1980.app2 Java Vendor: Null Java Runtime: 1.6.0_15-b03 Java Home: C:\Users\nkendall\Desktop\980_Release_MHL_NewGUI_4.8.99.99182_Win\980mgr\jre           </pre>	
<p style="text-align: right;"> <span>← Back</span> <span>→ Forward</span> <span>Save As</span> <span>Close</span> </p>	

## 4 MHL Source Compliance Tests

---

This chapter describes how to use the **optional** MHL source compliance test feature. Please note you will have to purchase the MHL Compliance Test option in order to run these tests. The 980 supports the following test sections in the MHL 1.2, 1.3, 2.0 & 2.1 Compliance Test specification:

### 3.2.2 TMDS Coding

- 3.2.2.1 Legal Codes Normal Mode
- 3.2.2.2 Basic Protocol Normal Mode
- 3.2.2.3 Packet Types Normal Mode
- 3.2.2.4 Legal Codes Packed Pixel Mode (MHL CTS 1.3, 2.0, 2.1 only)
- 3.2.2.5 Basic Protocol Packed Pixel Mode (MHL CTS 1.3, 2.0, 2.1 only)
- 3.2.2.6 Packet Types Packed Pixel Mode (MHL CTS 1.3, 2.0, 2.1 only)

### 3.2.3 Video Modes

- 3.2.3.1 Video Formats Normal Mode
- 3.2.3.2 Pixel Encoding Normal Mode
- 3.2.3.3 AVI Infoframes Normal Mode
- 3.2.3.4 Video Quantization Ranges
- 3.2.3.5 Video Formats Packed Pixel Mode (MHL CTS 1.3, 2.0, 2.1 only)
- 3.2.3.6 Pixel Encoding Packed Pixel Mode (MHL CTS 1.3, 2.0, 2.1 only)
- 3.2.3.7 AVI Infoframes Packed Pixel Mode (MHL CTS 1.3, 2.0, 2.1 only)

### 3.2.4 Audio Test

- 3.2.4.1 IEC 60958 / IEC 61937
- 3.2.4.2 Audio Clock Regeneration
- 3.2.4.3 Audio Infoframe

### 3.2.6 EDID and Device Status Register Test

- 3.2.6.3 Device Status Registers Test Normal Mode (MHL CTS 1.3, 2.0, 2.1 only)
- 3.2.6.4 Device Status Registers Test Packed Pixel Mode (MHL CTS 1.3, 2.0, 2.1 only)

### 3.2.8 RAP Sub-Command Tests

- 3.2.8.1 RAP and RAPK Sub-Commands Test (MHL CTS 2.0, 2.1 only)

### 3.2.9 3D Video Tests

- 3.2.9.2 3D Video Format Timings (MHL CTS 1.3, 2.0, 2.1 only)
- 3.2.9.3 3D Video Mode Indicator (MHL CTS 1.3, 2.0, 2.1 only)

## 4.1 Workflow for running the MHL Source Compliance Tests

The following is the high level workflow for running the MHL Source Compliance Tests. This workflow assumes that you have powered up the 980 and established an Ethernet session with the 980 as described in 980 Advanced Test Platform Quick Start Guide available on the Quantum Data website:

<http://www.quantumdata.com/products/980.asp>.

1. Connect the source device under test to the 980 HDMI Protocol Analyzer.

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.



## 4.2 Making the physical MHL connections

This subsection describes the physical MHL connections required to run the MHL source compliance tests. It assumes that you have established an Ethernet/IP session between the 980 and the 980 GUI Manager.

You will use on the Quantum Data Test Point Adapters between the MHL device under test and the 980 HDMI Protocol Analyzer. For MHL 1.2 testing you will use the TPA-MHL-8R. For MHL 1.3, 2.0 & 2.1 testing you will use TPA-MHL2-8R. The general setup is depicted below.

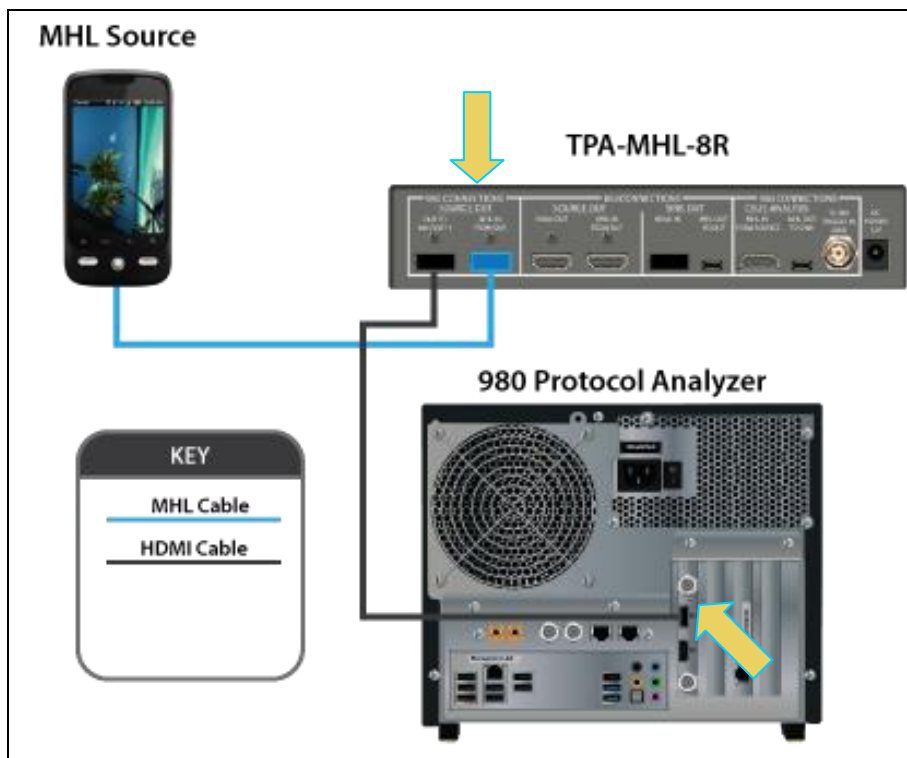
### 4.2.1 Making physical connections for MHL 1.2 test configurations

These procedures are used when connecting source compliance tests on MHL 1.2 devices

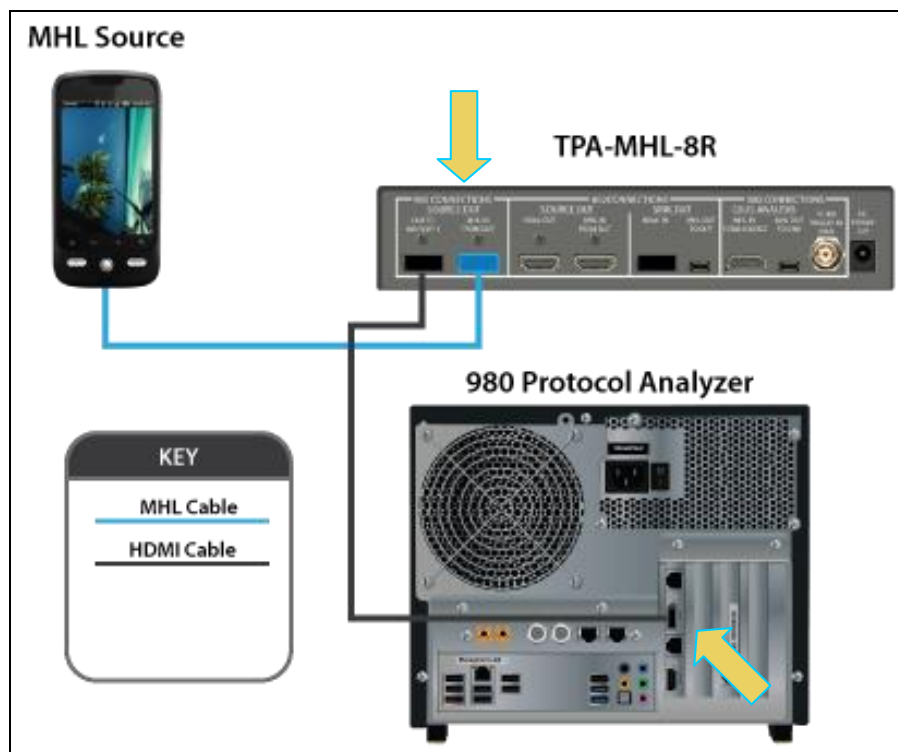
#### To make the physical HDMI and MHL connections for 1.2 testing with the TPA-MHL-8R:

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

1. Connect your MHL source device under test to the TPA-MHL-8R Test Point Adapter. Use the **MHL IN FROM DUT** connector on the section on the TPA labeled **980 CONNECTIONS – SOURCE DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.
2. Using an HDMI cable, connect the TPA-MHL-8R Test Point Adapter to the 980 HDMI Protocol Analyzer. Connect the HDMI cable to the topmost HDMI connector on the 980 labeled Rx. Use the **OUT TO 980 PORT 1** connector on the section on the TPA labeled **980 CONNECTIONS – SOURCE DUT**. Use an HDMI-compliant cable.



Connections for MHL 1.2 source compliance testing – 980 Rev C Protocol Analyzer module)



Connections for MHL 1.2 source compliance testing – 980 Rev D Protocol Analyzer module

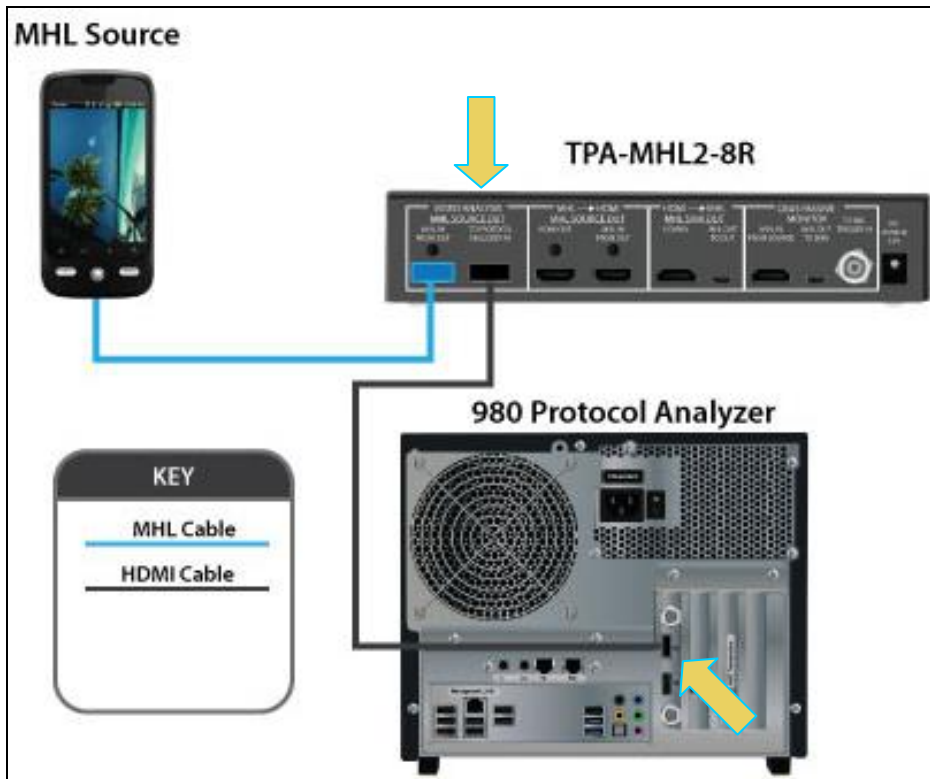
#### 4.2.2 Making physical connections for MHL 1.3, 2.0, 2.1 test configurations

These procedures are used when connecting source compliance tests on MHL 1.3, 2.0, 2.1 devices

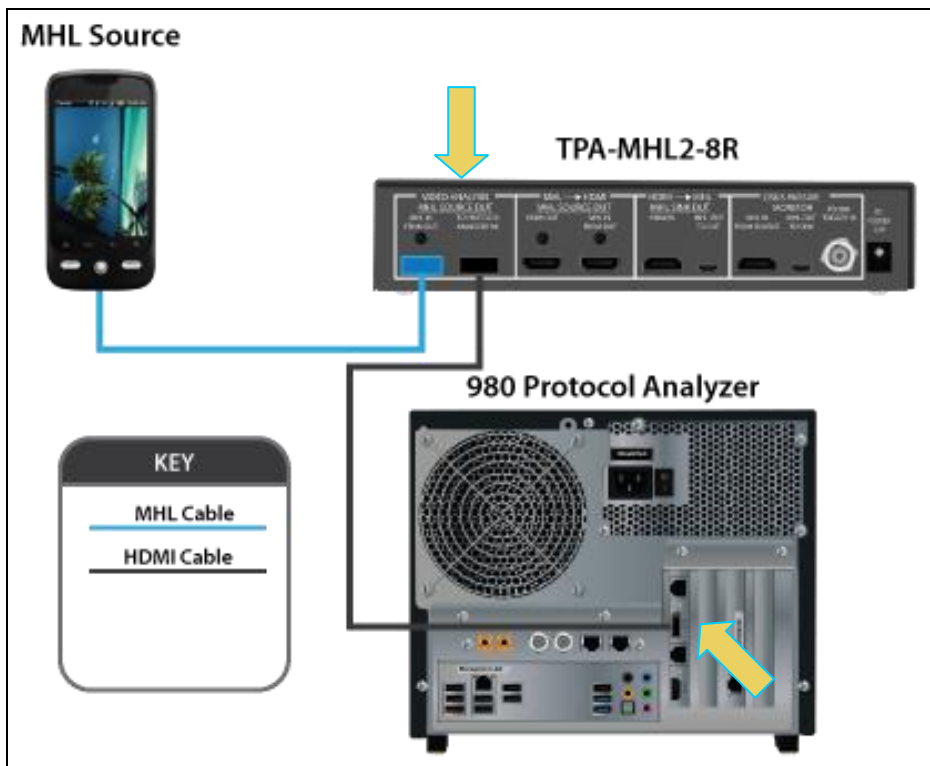
##### To make the physical HDMI and MHL connections for 1.3, 2.0, 2.1 testing with the TPA-MHL2-8R:

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

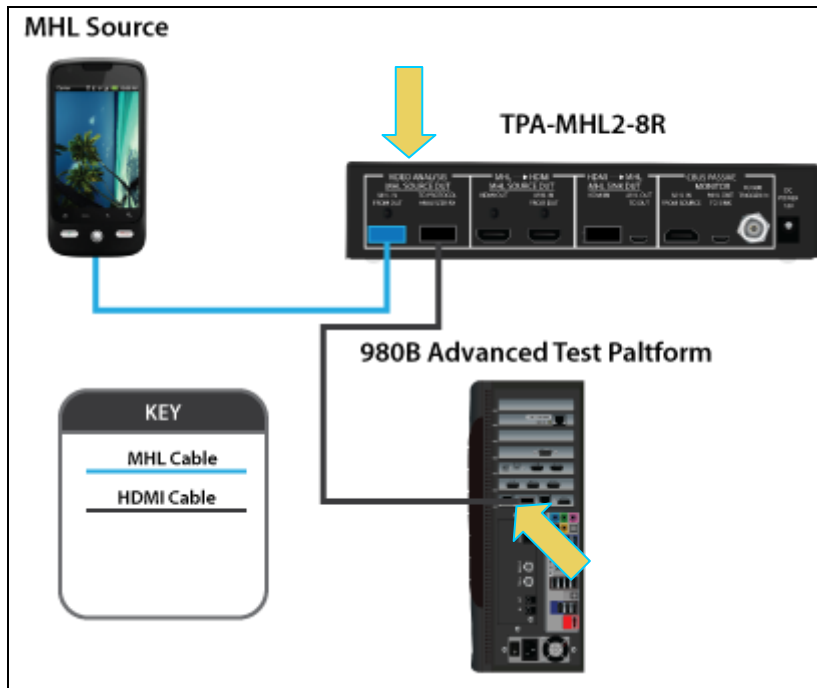
1. Connect your MHL source device under test to the TPA-MHL2-8R Test Point Adapter. Use the **MHL IN FROM DUT** connector on the section on the TPA labeled **VIDEO ANALYSIS – MHL SOURCE DUT**. Use an MHL compliant cable connecting the HDMI end to the TPA and the micro USB end to the MHL source.
2. Using an HDMI cable, connect the TPA-MHL2-8R Test Point Adapter to the 980 HDMI Protocol Analyzer module. Connect the HDMI cable to the topmost HDMI connector on the 980 labeled Rx. Use the **TO PROTOCOL ANALYZER RX** connector on the section on the TPA labeled **VIDEO ANALYSIS – MHL SOURCE DUT**. Use an HDMI-compliant cable.



Connections for MHL 1.3, 2.0, 2.1 source compliance testing – 980 Rev C Protocol Analyzer module



Connections for MHL 1.3, 2.0, 2.1 source compliance testing – 980 Rev D Protocol Analyzer module



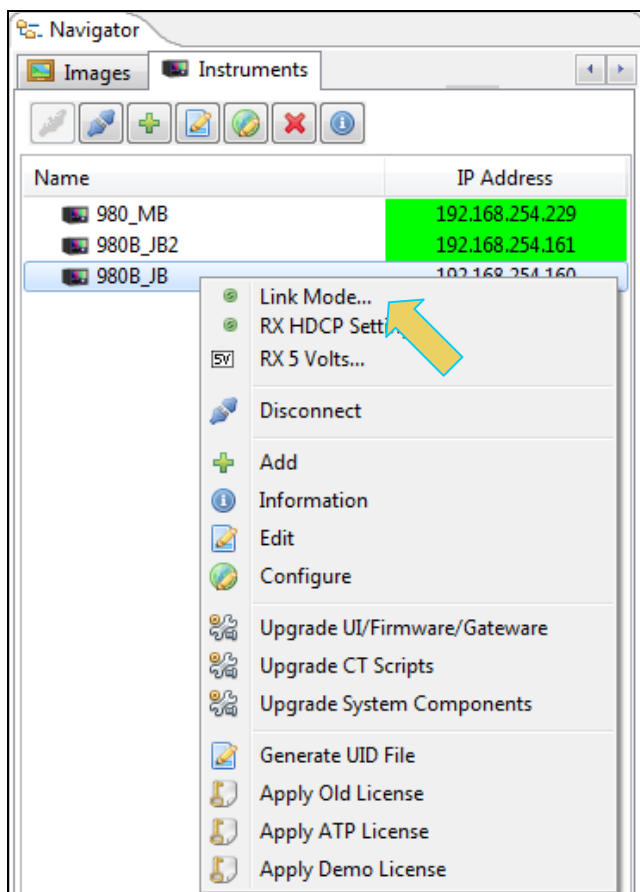
Connections for MHL 1.3, 2.0, 2.1 source compliance testing – 980B

### 4.3 Setting the 980 Mode to MHL

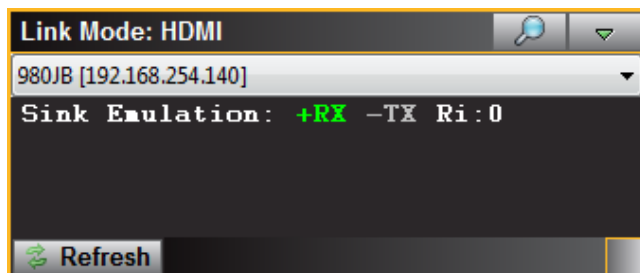
Use the following procedures to set the 980 HDMI Protocol Analyzer module to the MHL mode.

**To set the 980 mode to MHL:**

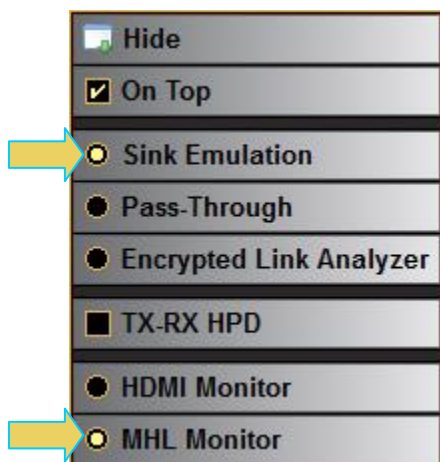
1. From the **Instrument** menu, select the **Link Mode**.



The following menu appears:



2. Select the pull-down menu as shown below.



3. Select the MHL Monitor checkbox and the Sink Emulation checkbox as shown above. The various modes are described below.

- **Sink emulation** – In the sink emulation monitoring configuration the 980 HDMI Protocol Analyzer HDMI Rx port is connected directly to the source device under test. The 980 HDMI Protocol Analyzer is emulating an HDMI/MHL sink device. The sink emulation mode is the typical mode of operation. You can monitor the HDMI/MHL transactions between the source device under test and the 980 HDMI Protocol Analyzer Rx port. All of the data types described in this manual can be monitored in the sink emulation mode unless noted otherwise. ***This is the mode used for the HDMI or MHL source compliance tests.***
- **Pass-Through Monitor** – In the Pass-Through monitoring configuration the 980 HDMI Protocol Analyzer HDMI Rx port is connected to the source device under test and the 980 HDMI Protocol Analyzer HDMI Tx port is connected to a sink device. The pass-through mode enables you to monitor the HDMI traffic passively between an HDMI/MHL source and an HDMI/MHL sink device. ***This mode is not used for the HDMI or MHL source compliance tests.***
- **Encrypted Link Analyzer** - (Optional) In the Encrypted Link Analyzer configuration the 980 HDMI Protocol Analyzer HDMI Rx port is connected to the source device under test and the 980 HDMI Protocol Analyzer HDMI Tx port is connected to a sink device. The Encrypted Link Analyzer configuration enables you to monitor and analyze HDCP encrypted protocol data transmitted between an HDMI source device and sink device. ***This mode is not used for the HDMI or MHL source compliance tests.***
- **TX-RX HPD** - Enabling this option will replicate the hot plug signal from the TX side (an attached sink device) on the RX side (like a hot plug repeater). ***This is the mode used for the HDMI or MHL source compliance tests.***

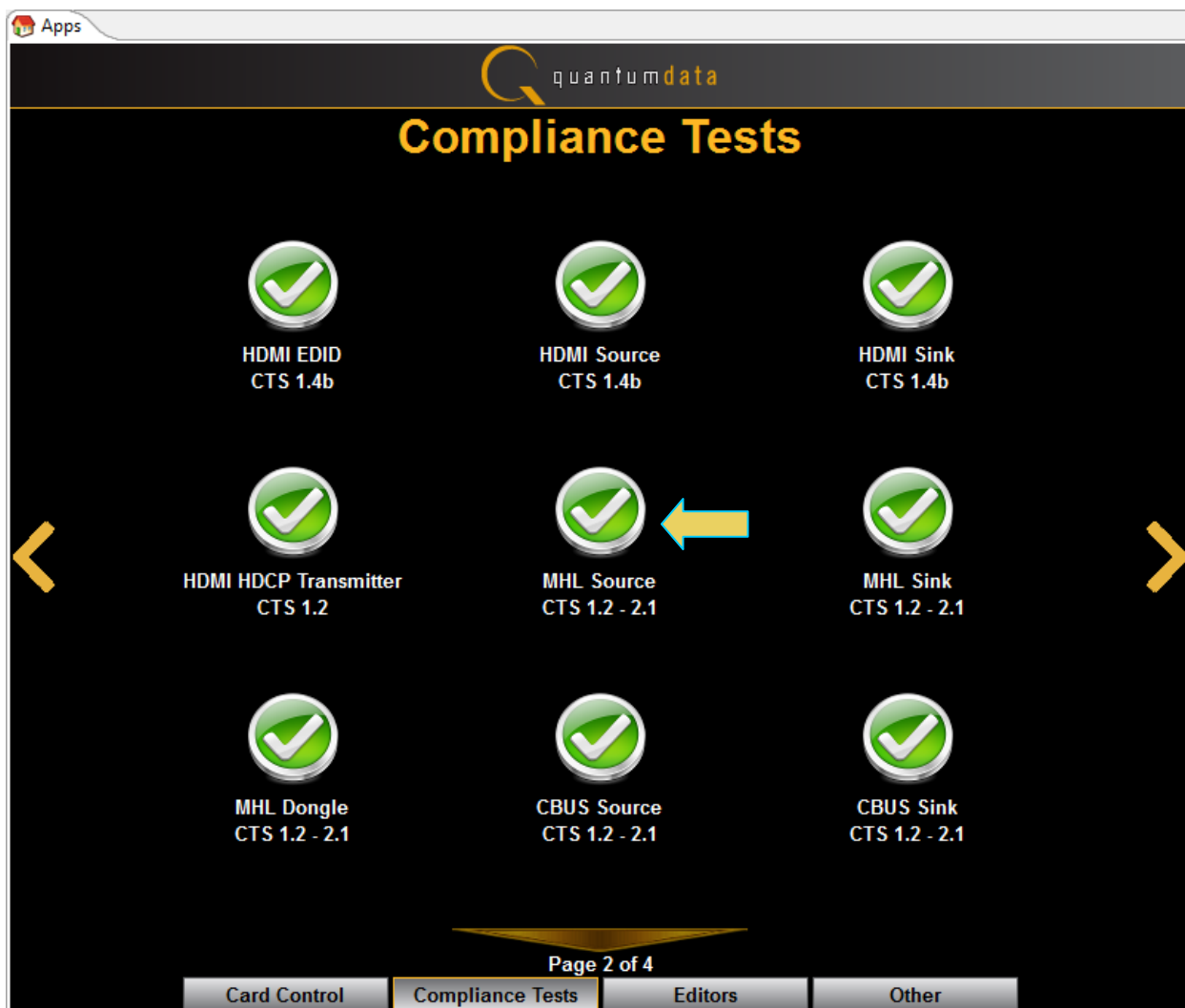
## 4.4 Completing the CDF

Use the following procedures to complete the CDF for the MHL source compliance tests.

**Note:** All the examples used in the following procedures use the MHL 2.1 test flow. The operation for running MHL 1.2, 1.3 and 2.0 tests is quite similar.

### To complete the CDF:

1. From the **Compliance** menu, enable viewing of the **MHLSrc CT** panel.



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

MHL Src CT 2.1

CDF Entry | Section | Test Options / Preview

Open | New | Save | CDF File: <not saved>

General | Video | Audio | 3D Video

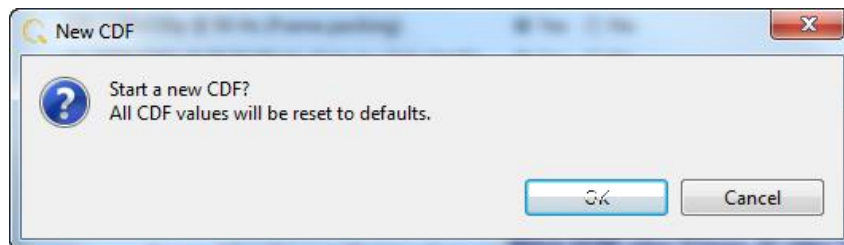
One or more essential fields are blank.

CDF_CTS_VERSION	CTS Version to test against. <input type="radio"/> 1.2 <input type="radio"/> 1.3 <input type="radio"/> 2.0 <input checked="" type="radio"/> 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? <input type="radio"/> Yes <input checked="" type="radio"/> No
CDF_AVI_SUPPORT	Is AVI InfoFrame supported on this DUT? <input type="radio"/> Yes <input checked="" type="radio"/> No
CDF_AUDIO_SUPPORT	Is audio supported on this DUT? <input checked="" type="radio"/> Yes <input type="radio"/> No
CDF_RAP_SUPPORT	Does the DUT support RAP Sub-Commands? (CTS >= 2.0 Only) <input checked="" type="radio"/> Yes <input type="radio"/> No

Close

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

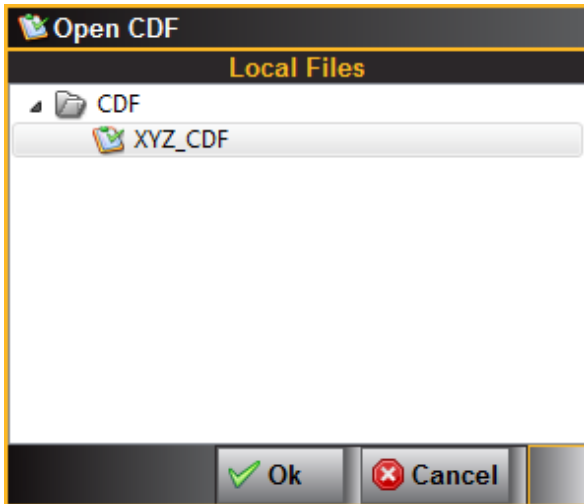
You will be prompted with a confirmation that you want to start a new CDF and reset the values. Click **OK** to proceed.



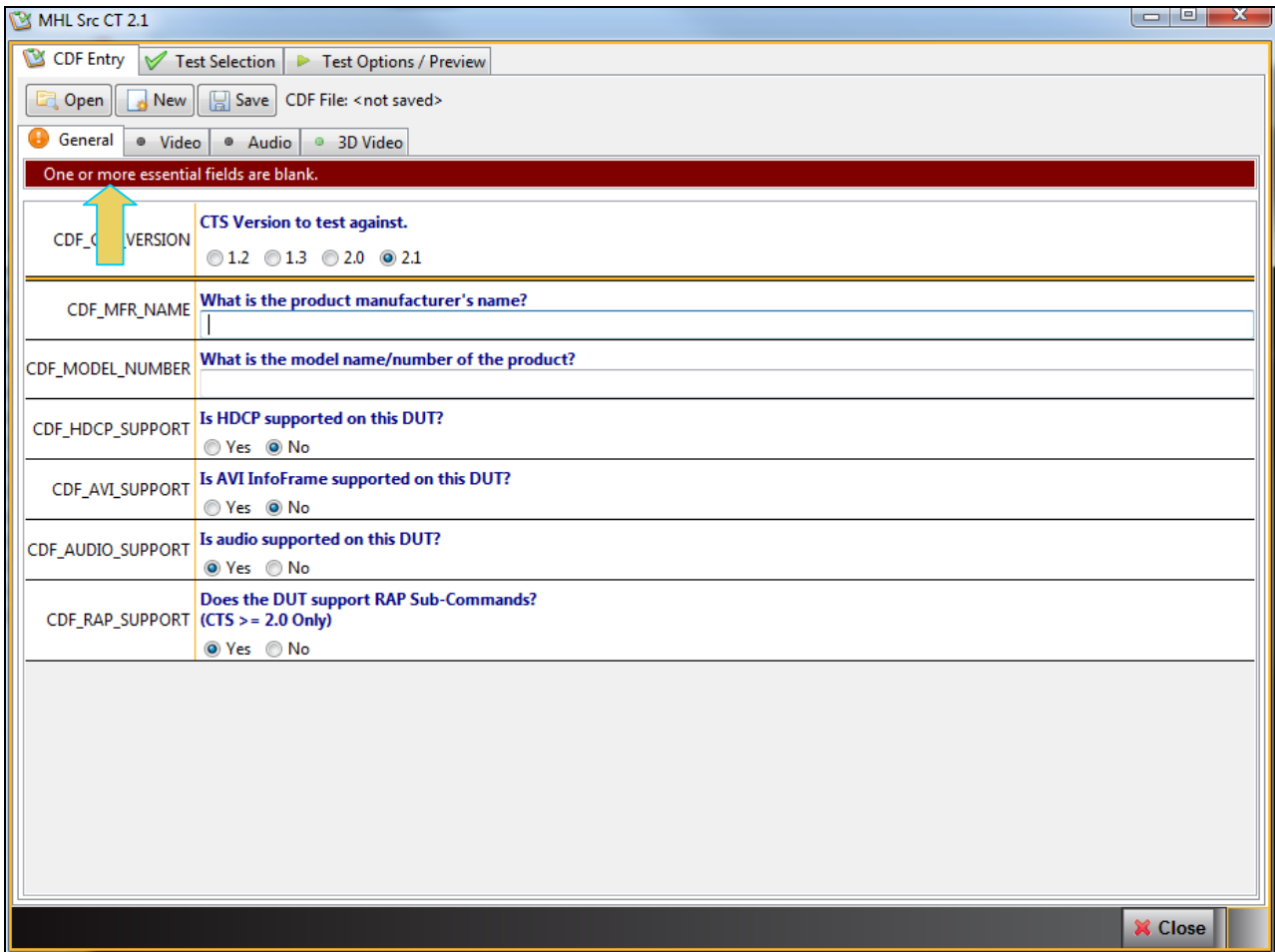
- To open an existing CDF, click on the **Open** activation button.

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

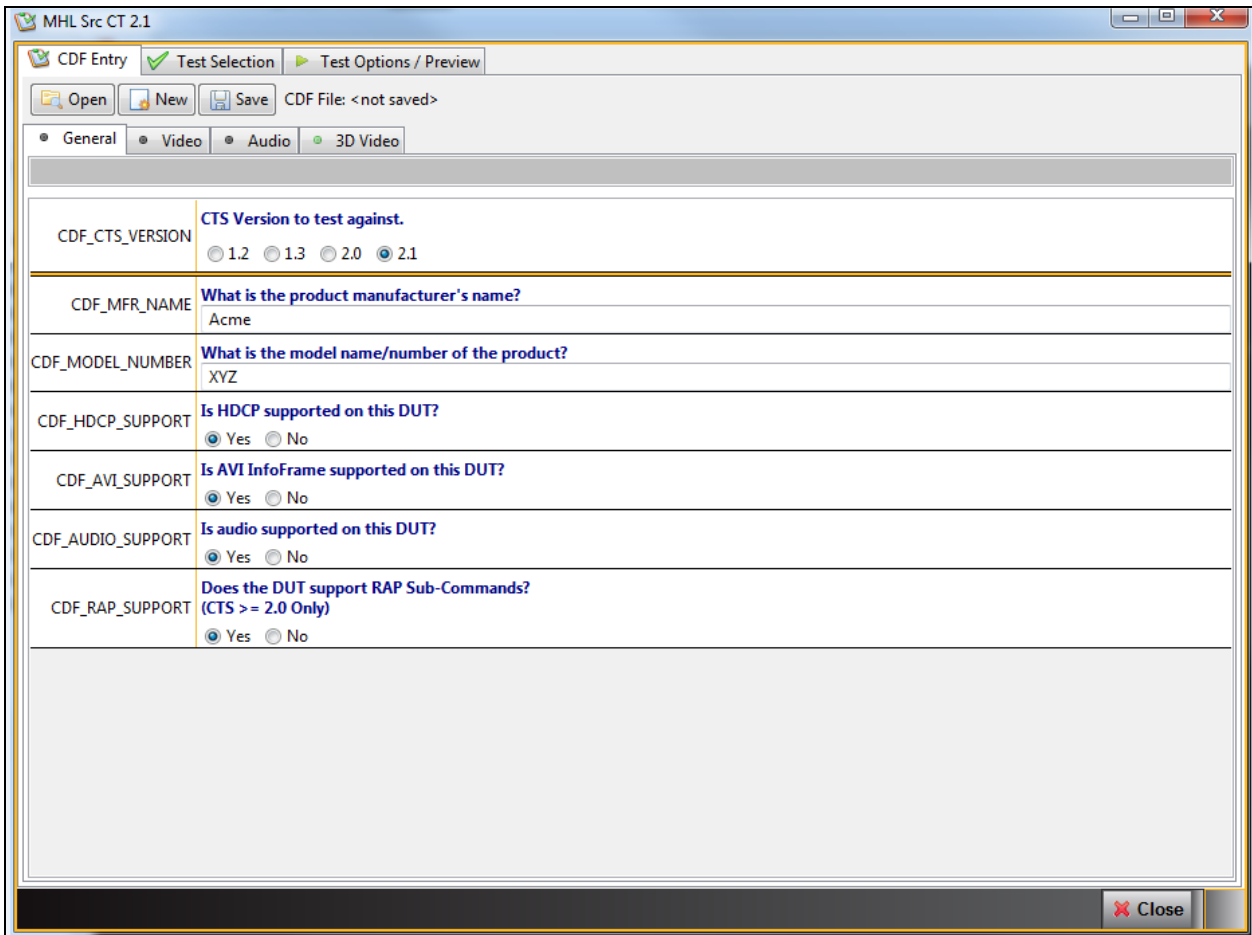




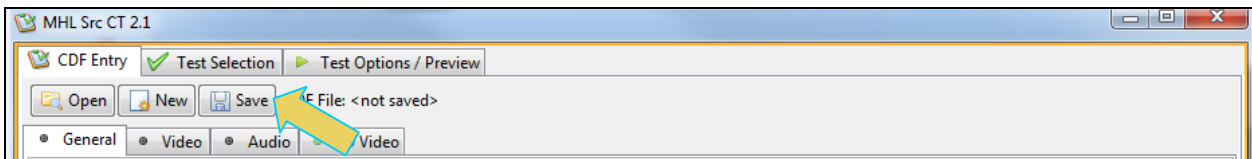
- Complete the items in the **General** tab of the CDF Entry panel shown below. Note that you will have to complete the essential fields in order to proceed. A read status message will appear indicating if you have not completed all the essential fields.



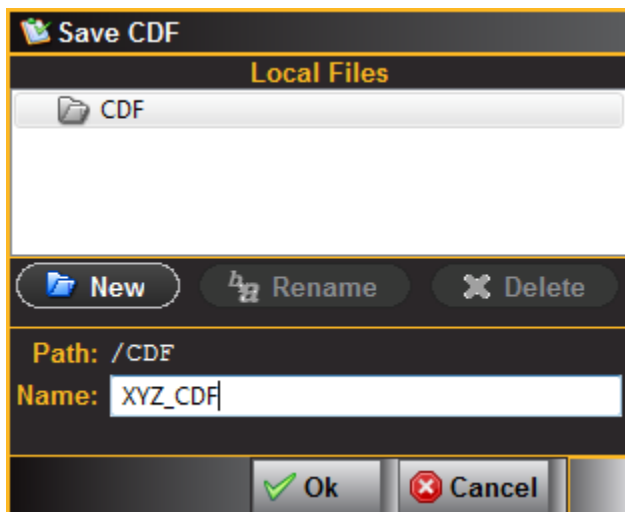
After you fill in all the mandatory information the message will clear as shown below:



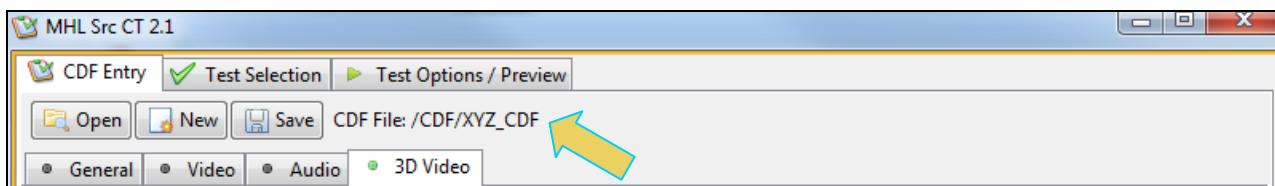
- Save the CDF. You can save the CDF at any time from the **Save** button near the top of the panel as shown below:



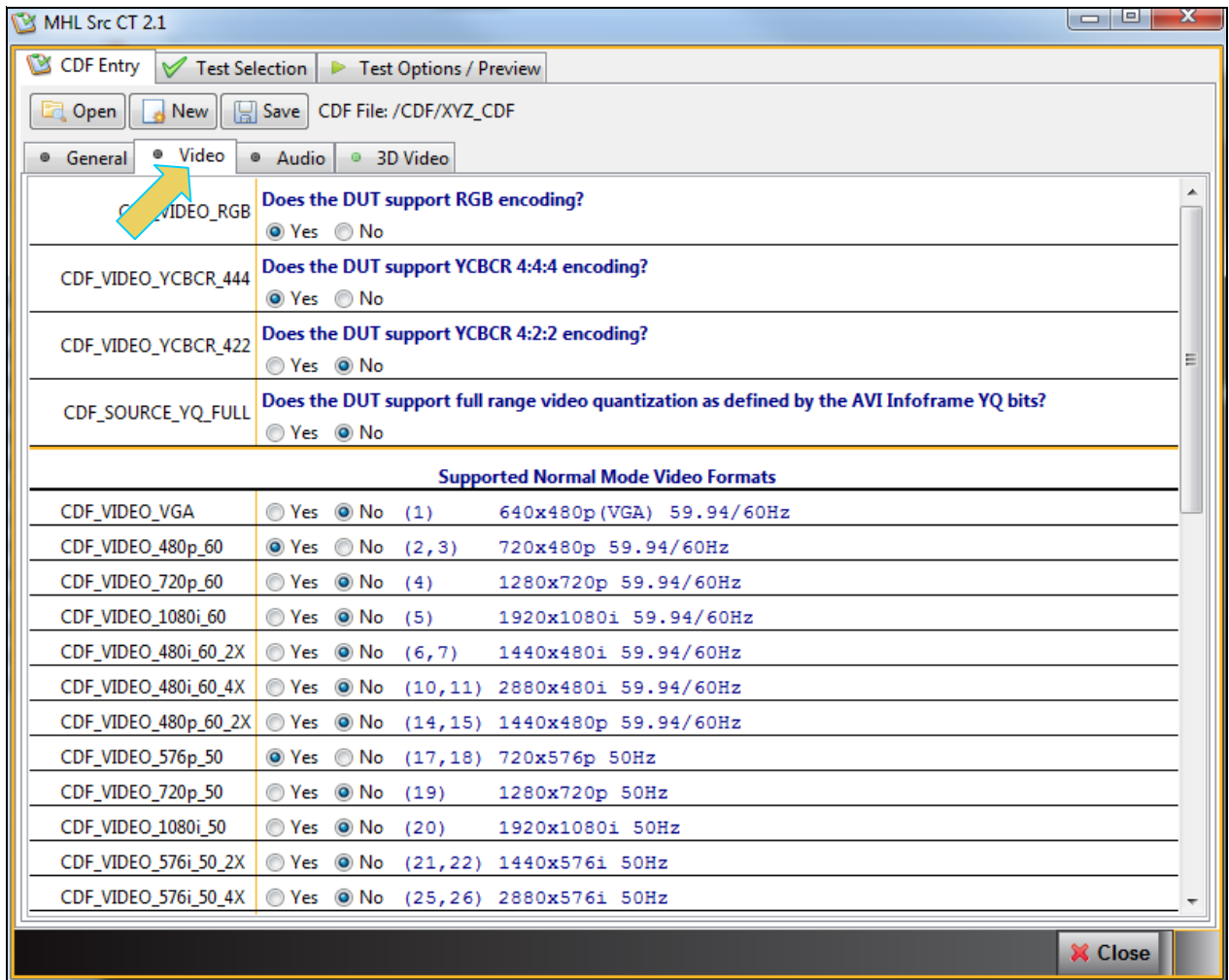
A confirmation box with a default name will appear as shown below. Edit the name if necessary and click **OK**.



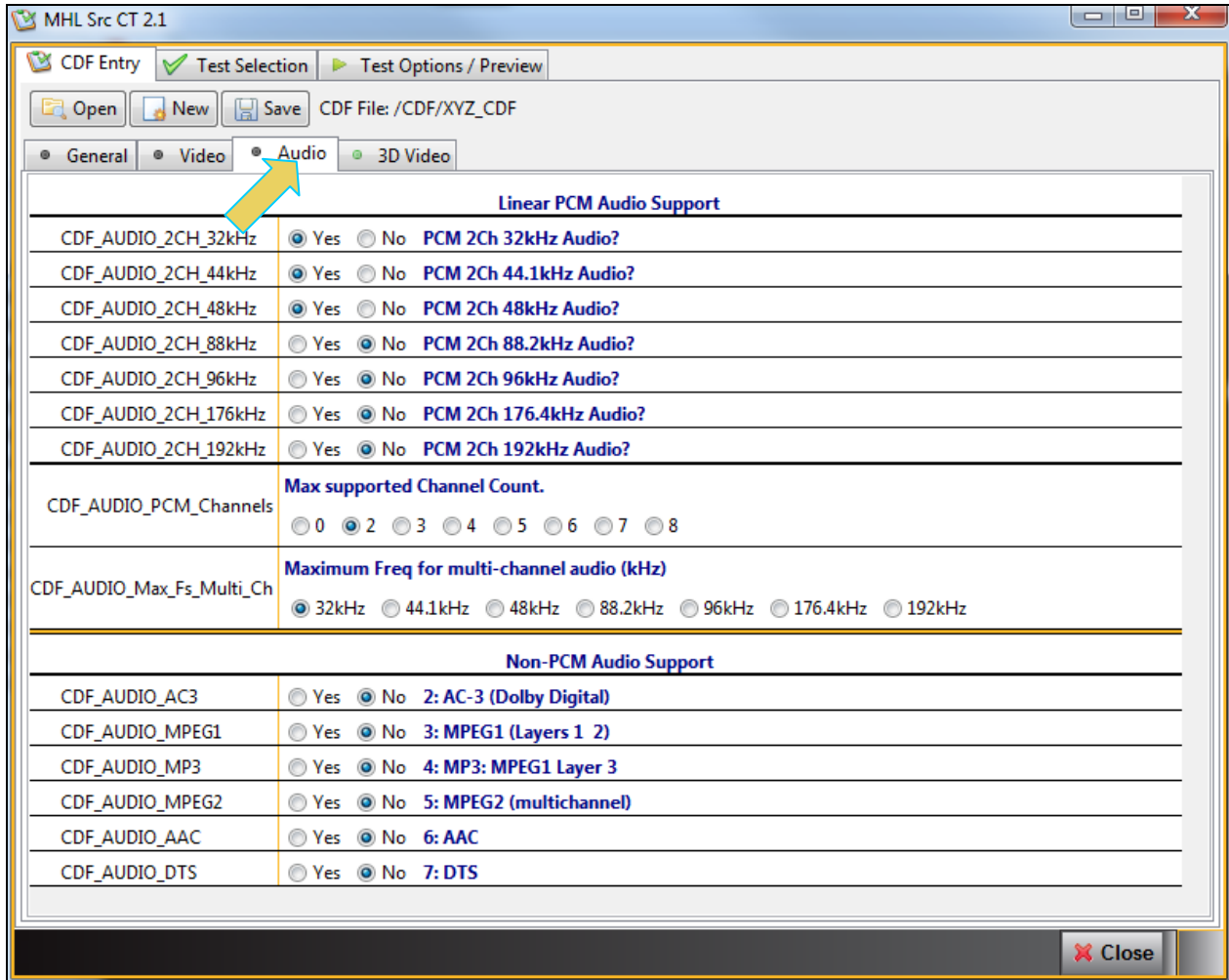
Once you save the CDF it will appear near the top of the panel adjacent to the **Save** button as shown below:



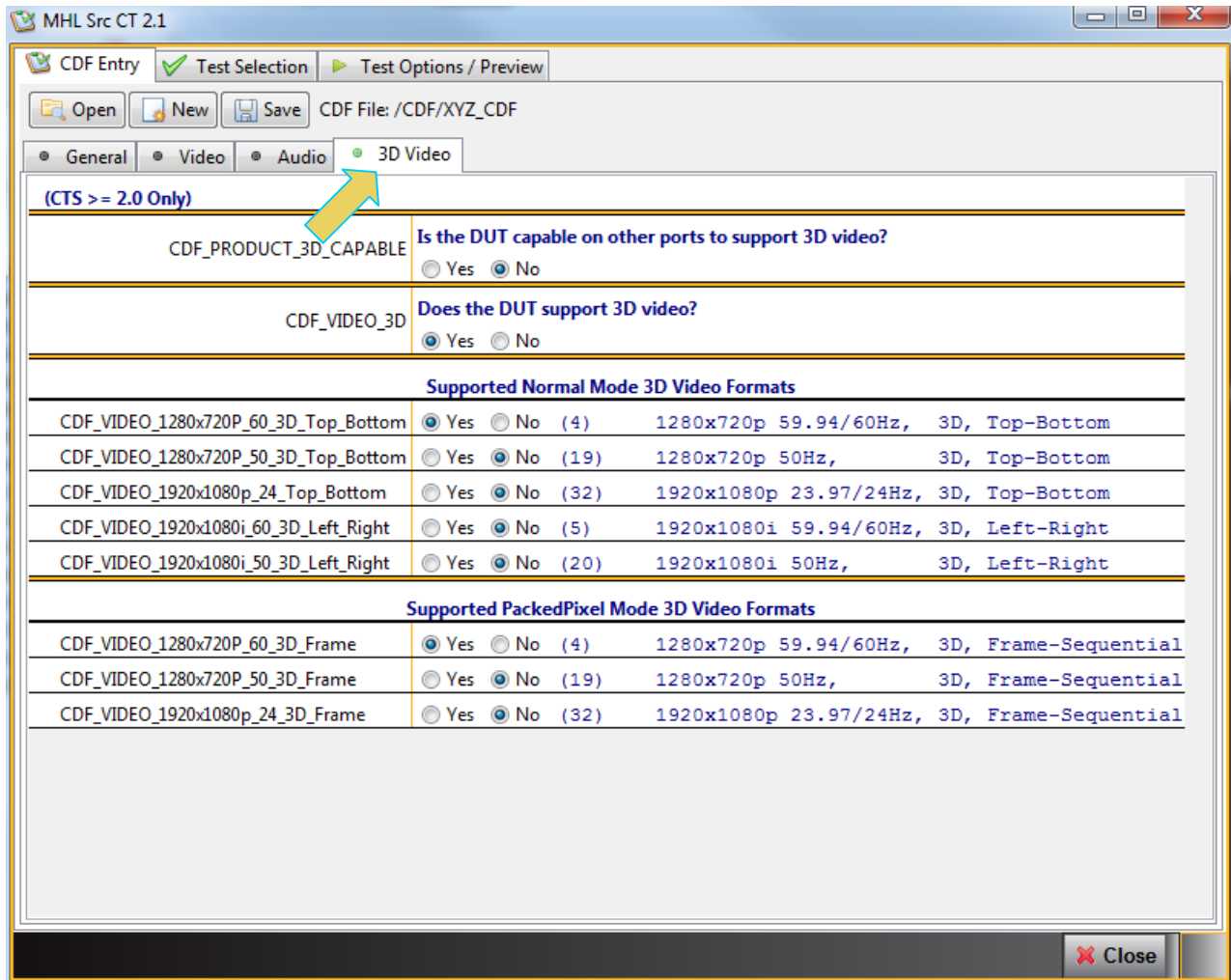
7. Complete the items in the **Video** tab.



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



9. Complete the items in the **3D** tab if it applies.



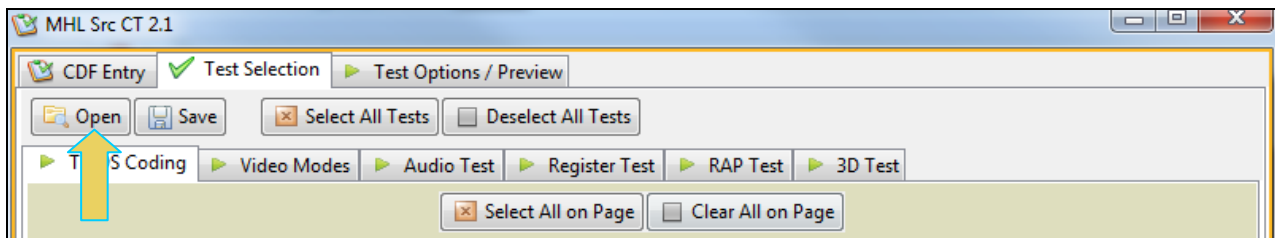
## 4.5 Selecting which tests to run

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

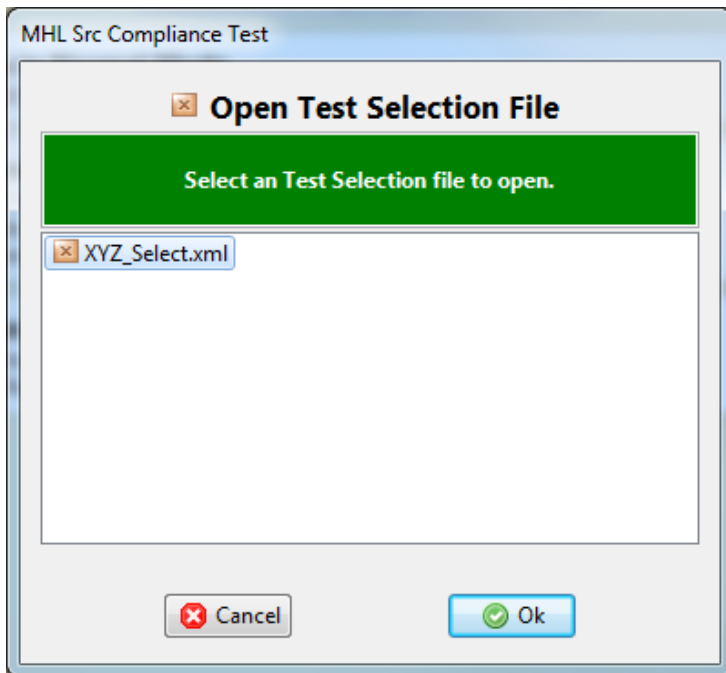
**Note:** All the examples used in the following procedures use the MHL 2.1 test flow. You can also run MHL 1.2, 1.3 or 2.0 tests and the operation is the same.

### 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.

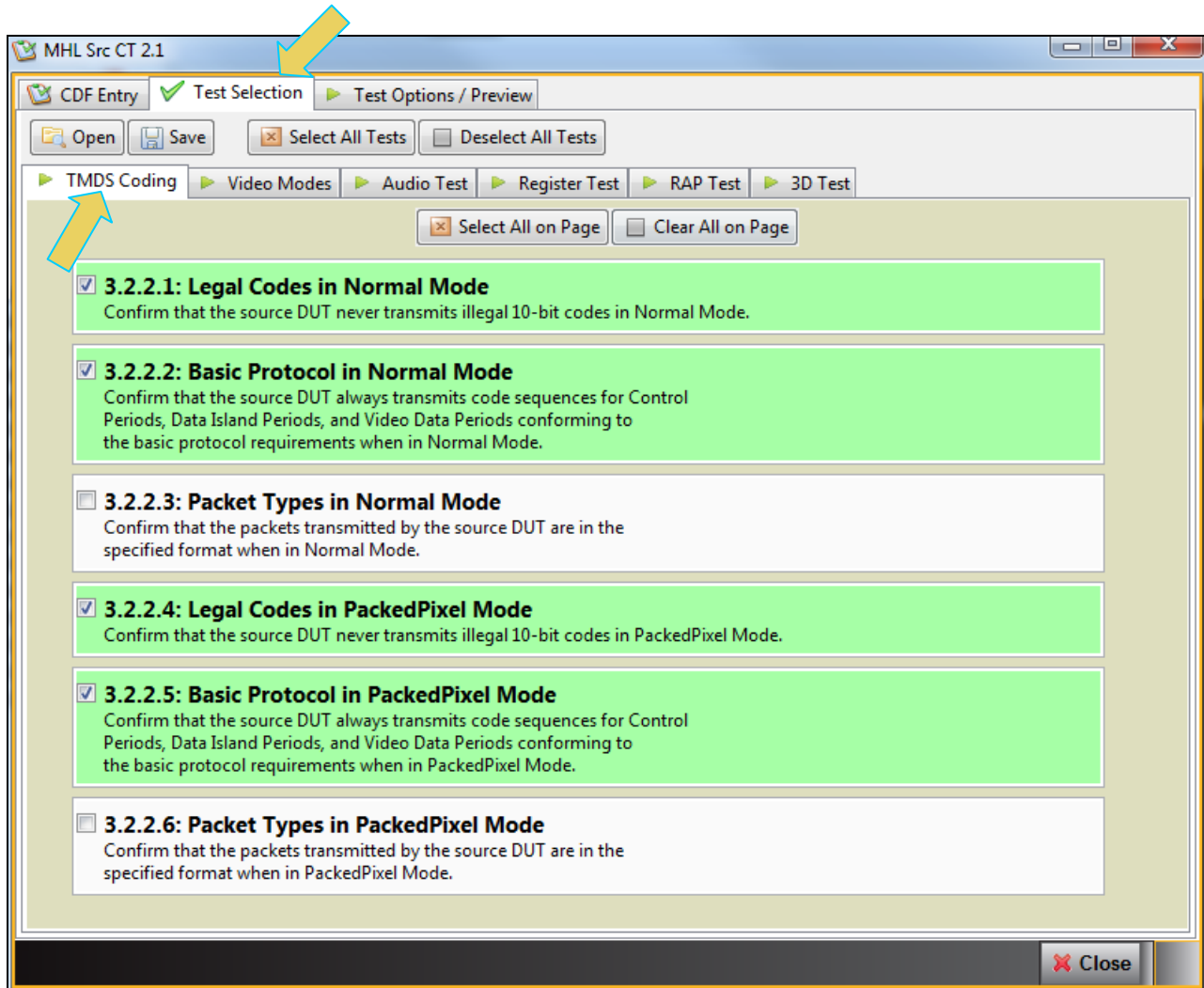


A dialog box will appear as follows. Simply select the file and click on the **OK** activation button.



3. Select the tests in the **TMDS Coding** tab of the **Test Selection** panel shown below.

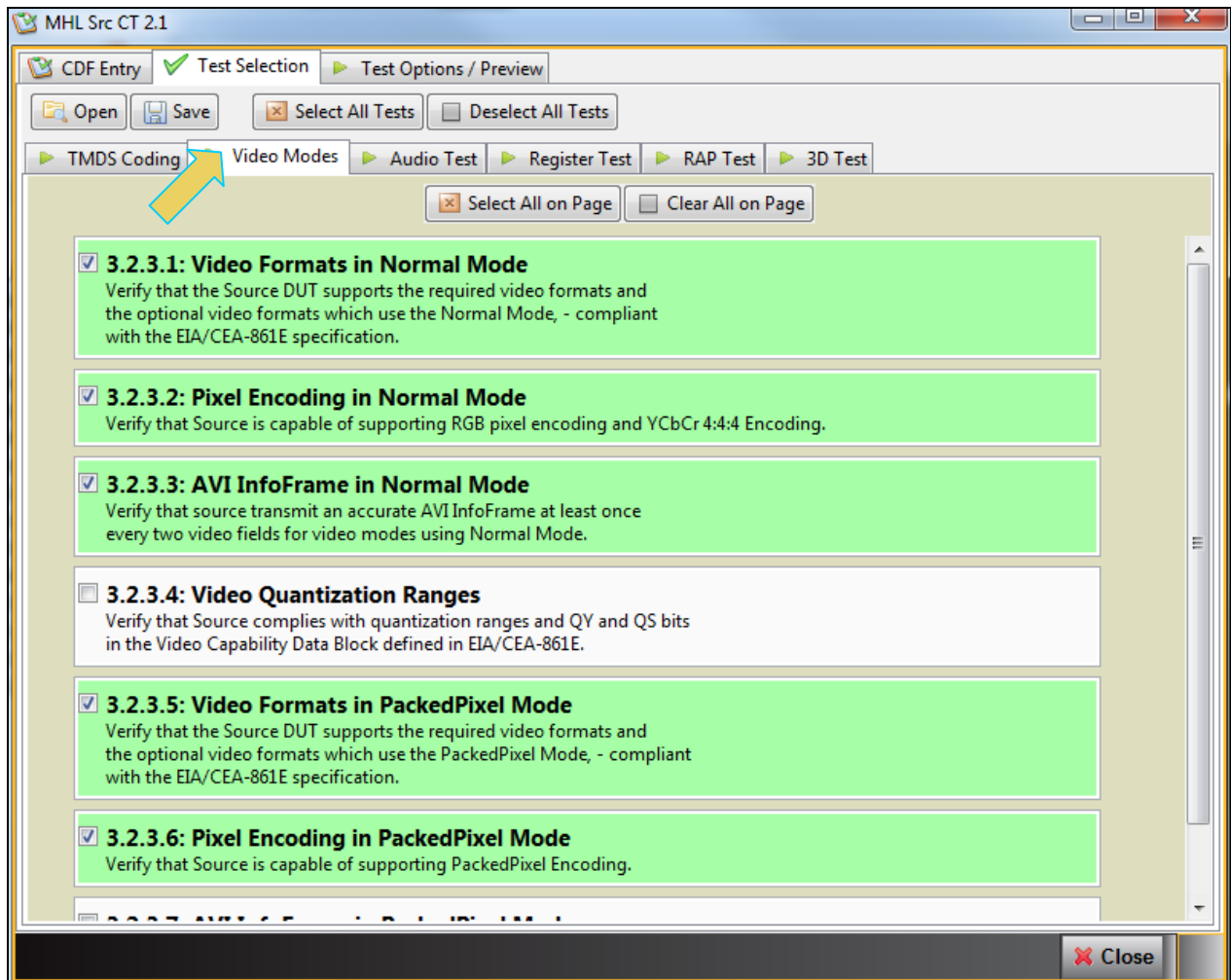
**Note:** You can select (or deselect/clear) all tests on a page  **Select All on Page**  **Clear All on Page** or all tests in the series  **Select All Tests**  **Deselect All Tests** using the activation buttons provided.



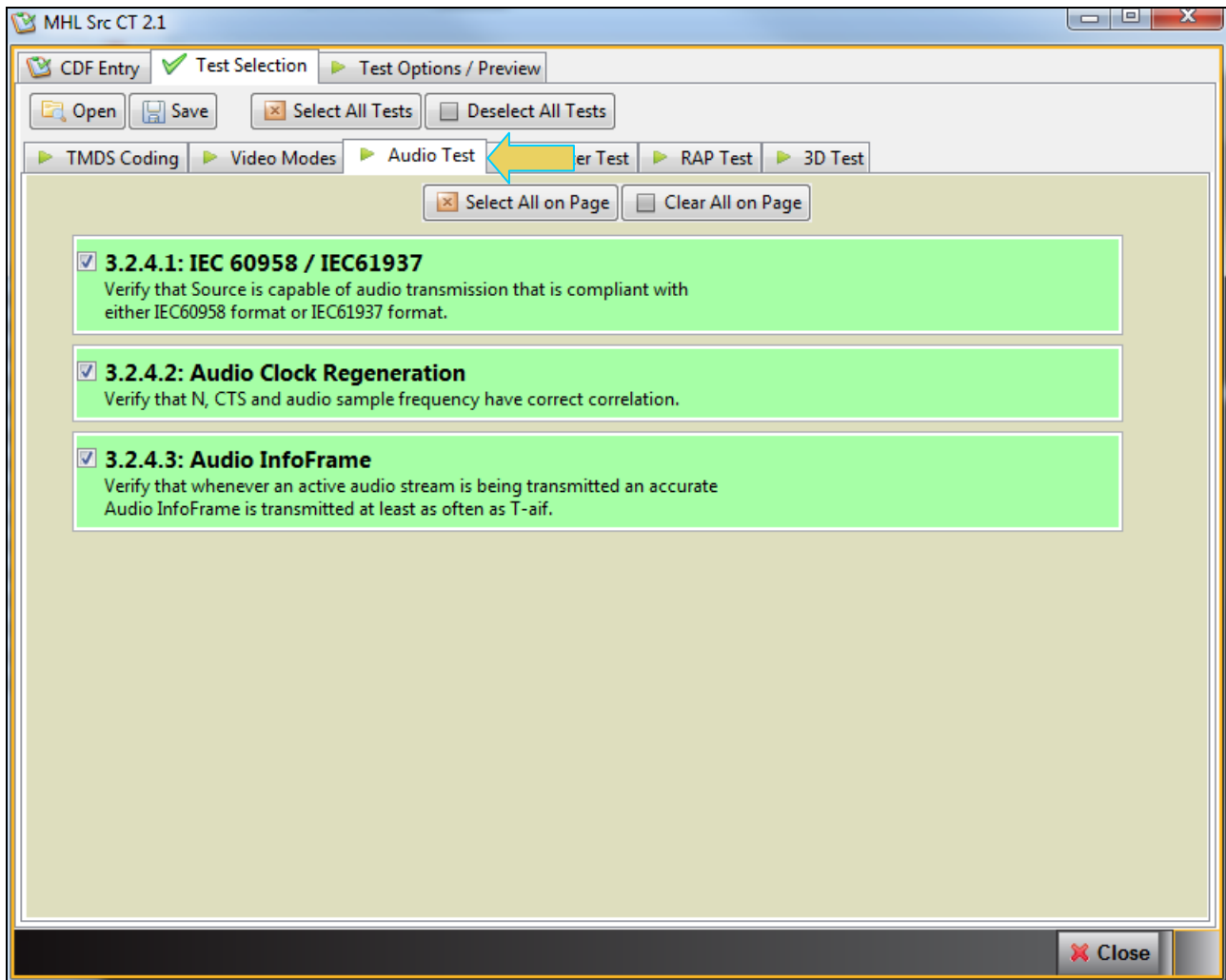


4. Select the tests in the **Video Modes** tab of the **Test Selection** panel shown below.

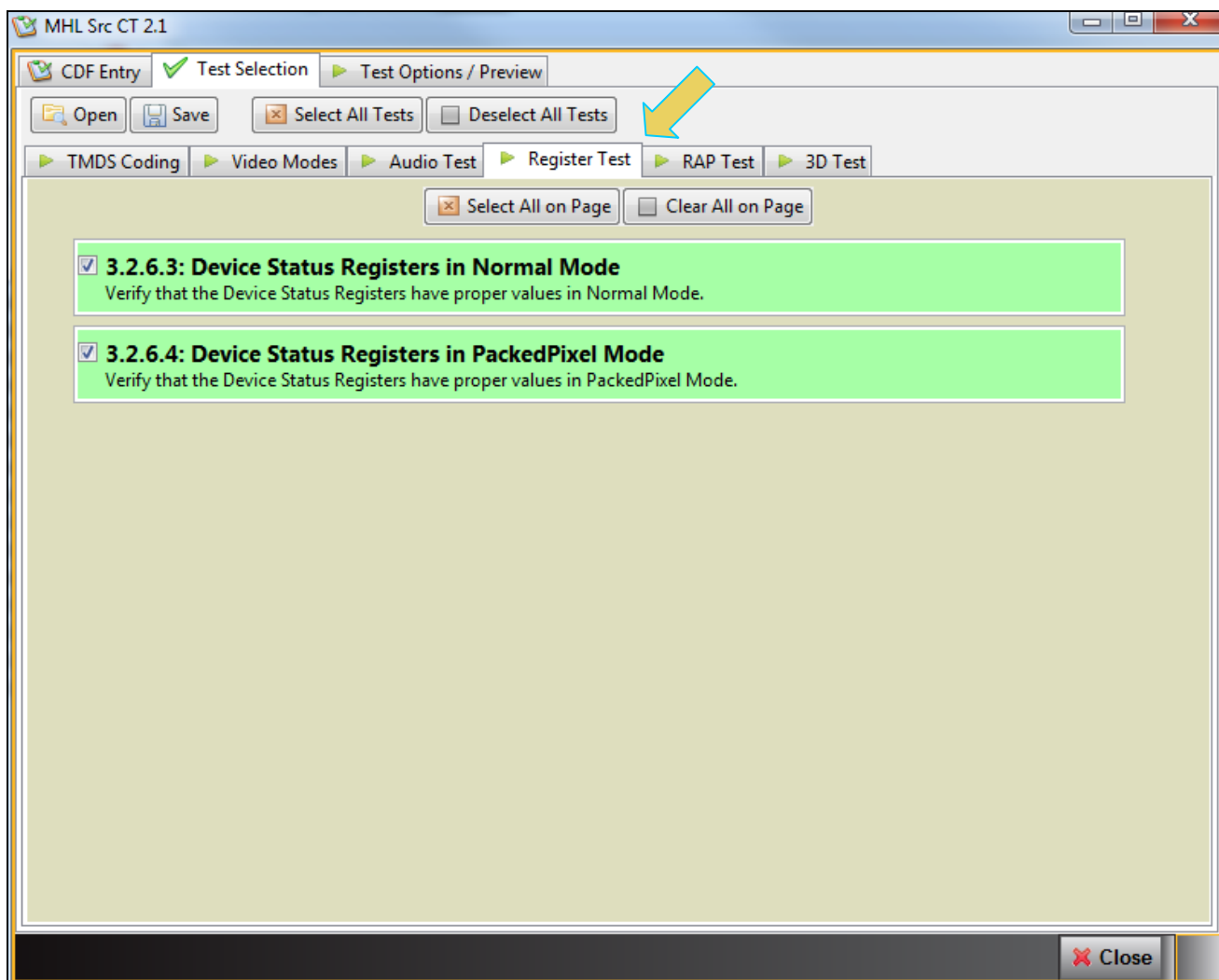
For convenience you can **Select All** or **Deselect All** tests using the activation buttons provided.



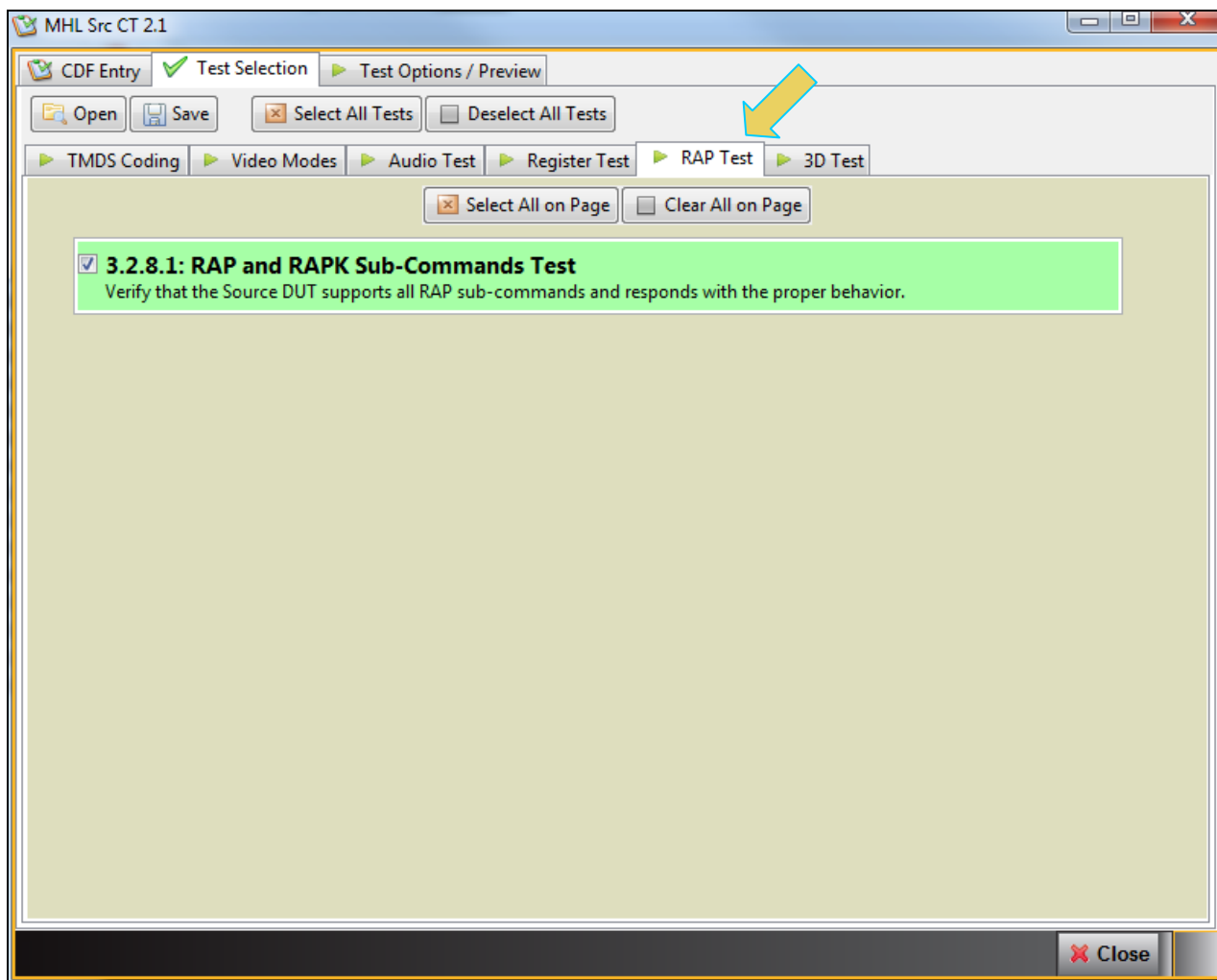
5. Select the tests in the **Audio** tab of the **Test Selection** panel shown below.



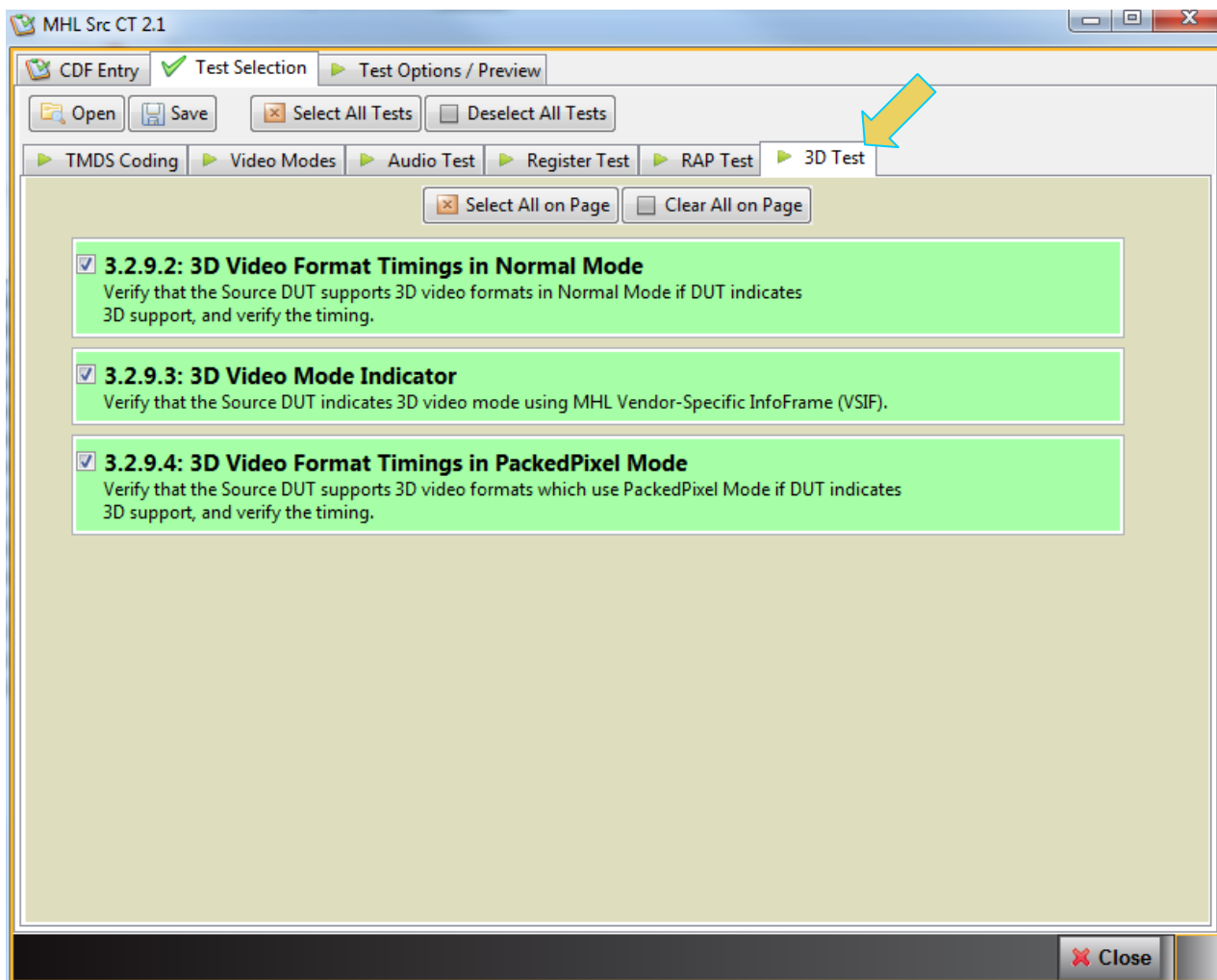
6. Select the tests in the **Register** tab of the **Test Selection** panel shown below.



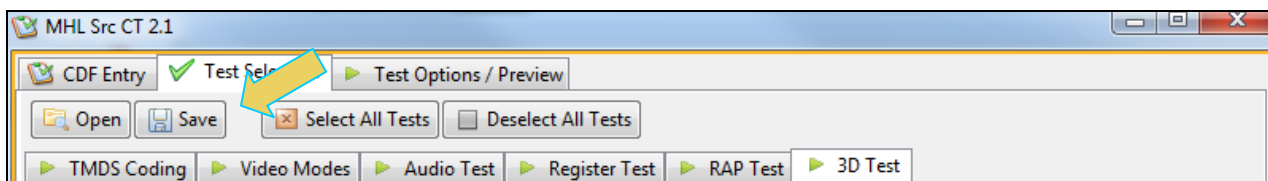
7. Select the tests in the **RAP** tab of the **Test Selection** panel shown below.



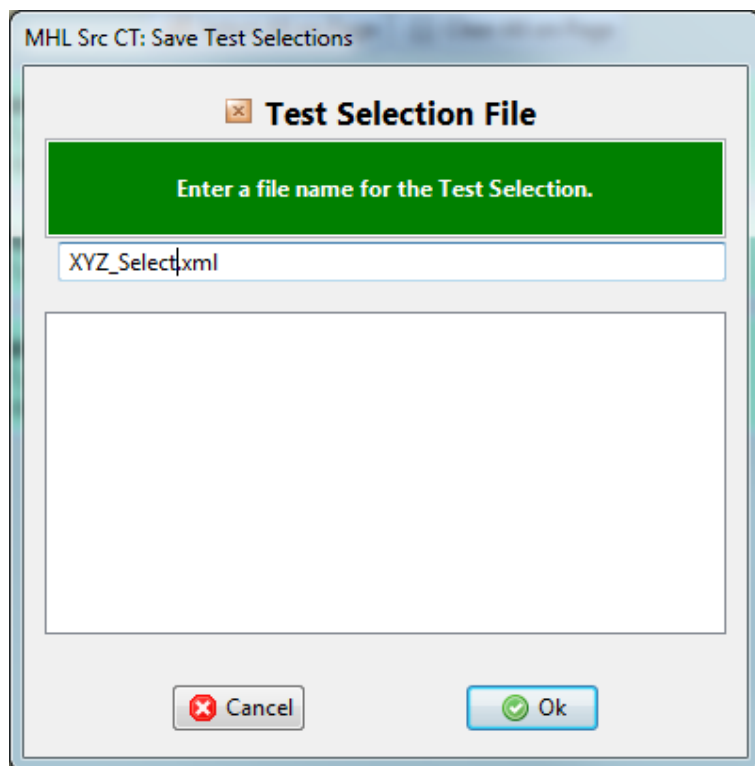
8. Select the tests in the **3D** tab of the **Test Selection** panel shown below.



9. 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.



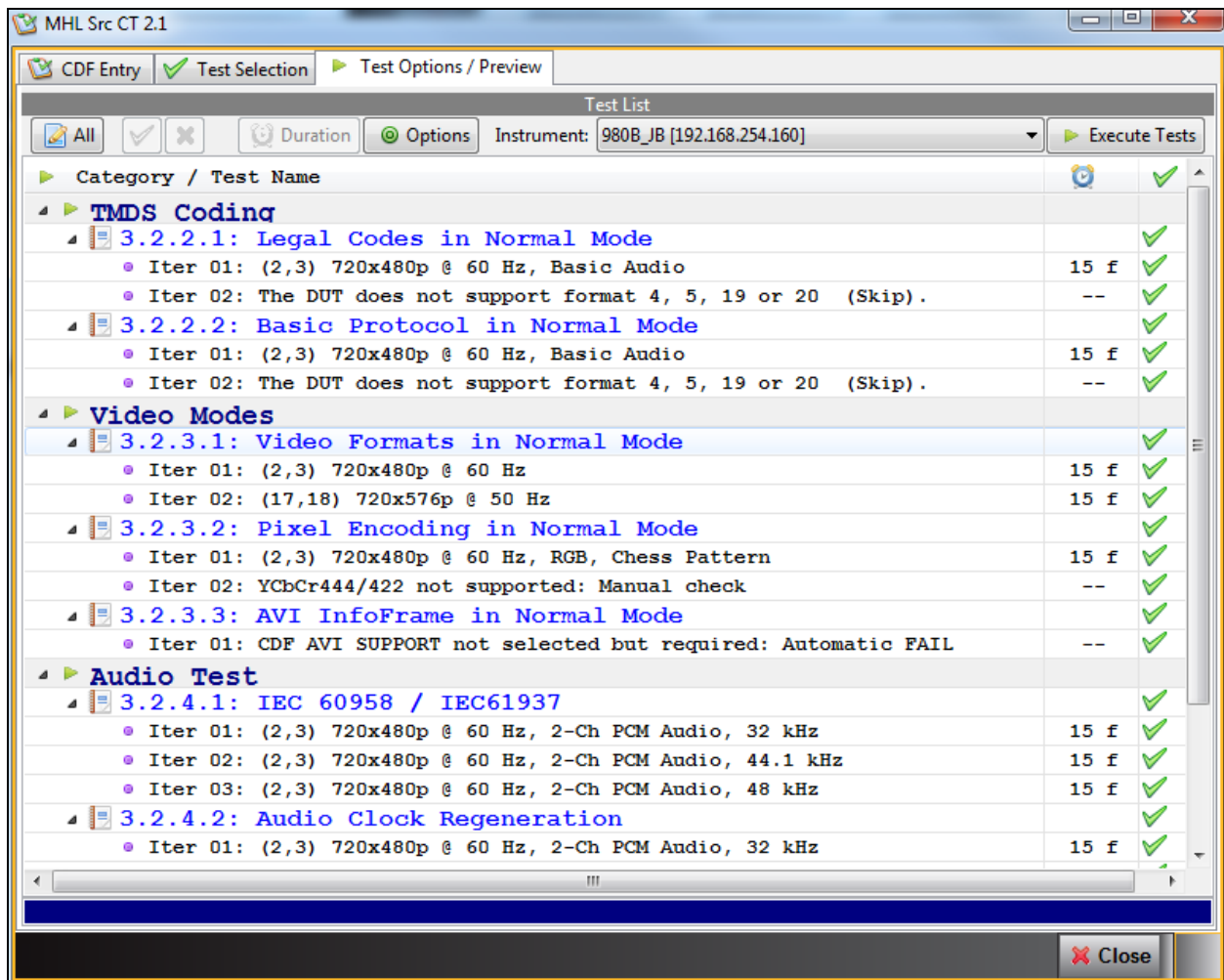
## 4.6 Executing the MHL Source Compliance Tests

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

**Note:** All the examples used in the following procedures use the MHL 2.1 test flow. You can also run MHL 1.2, 1.3 and 2.0 tests and the operation is the same.

**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 appears:

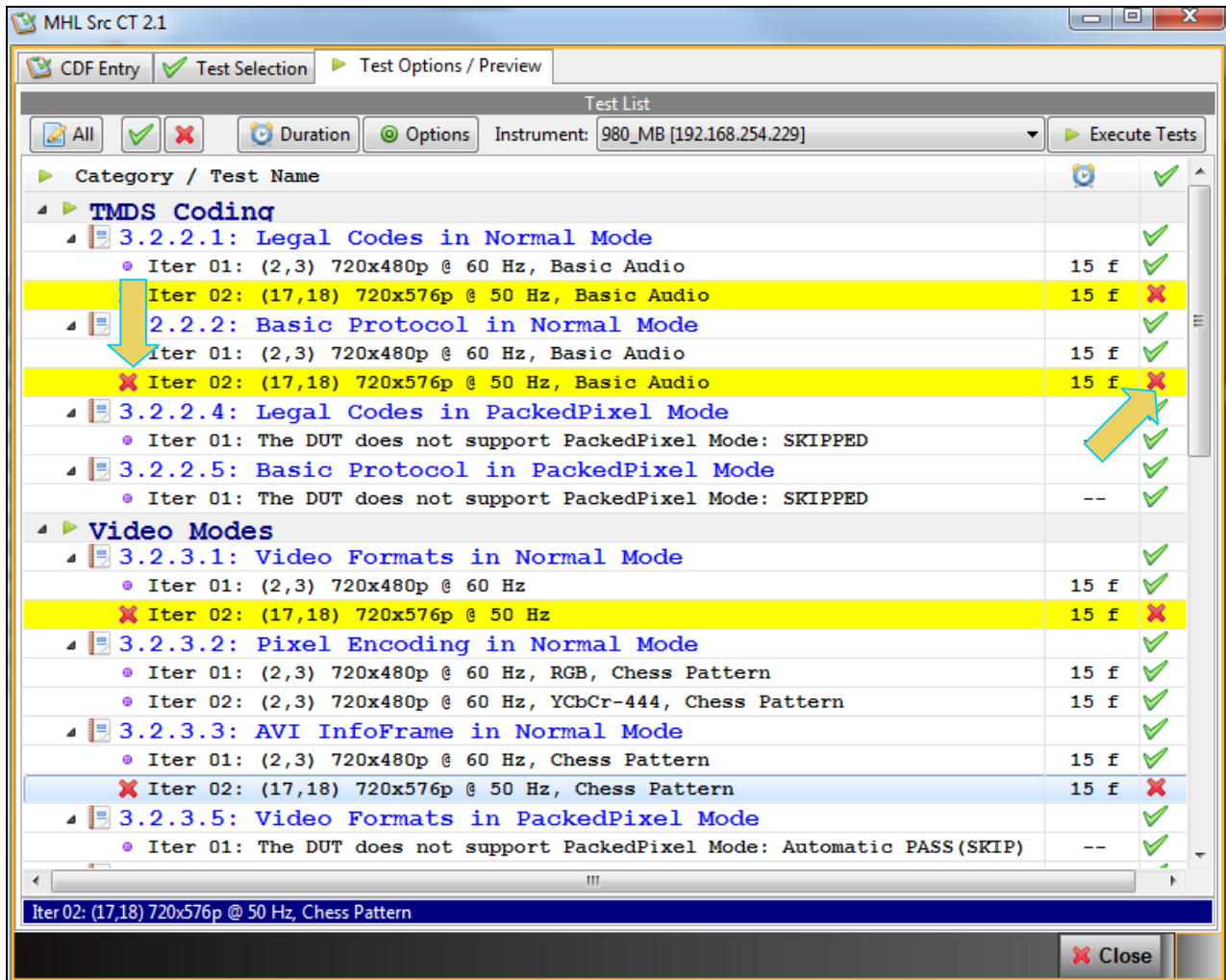
There are three settings you can define. These relate to what test execution order, saving captured data and enabling or disabling HDCP content protection. The table below describes the options. When completed with the options select the OK activation button to continue.

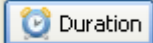
Option	Description
<b>Test Execution Order</b>	<p>There are two selections:</p> <ul style="list-style-type: none"> <li>- Maximize Capture Reuse – Will run tests in an order that will be quicker because it reuses captures.</li> <li>- Minimize DUT format changes – Will run tests in an order that will minimize user interaction in changing formats.</li> </ul> <p><b>Note:</b> The 980 Rx port will automatically configure its EDID to cause or encourage the source device to send the proper video resolution and audio format for any give test.</p>
<b>Saving Captures</b>	<p>There are three selections:</p> <ul style="list-style-type: none"> <li>- Do not save any captures – no captures are saved regardless of the results, pass or fail.</li> <li>- Save Capture data for failures only – Saves only captures for tests where failures occur.</li> <li>- Saves all Captures – Saves all captures regardless of the results, pass or fail.</li> </ul>
<b>HDCP</b>	<p>Require that HDCP be disabled - A check box that when selected will only run the tests if HDCP content protection on the source is disabled.</p>
<b>Protocol/TMDS Tests</b>	<p>Detailed Results (requires more time) - A check box that when selected will provide detailed results. If unchecked you will just receive summary results.</p>

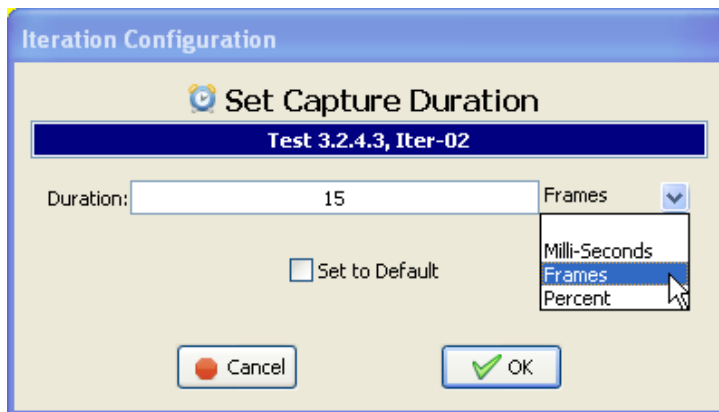



3. (Optional) Review the list of tests for each category. If you wish to skip some of the tests. You can skip tests by clicking on the Check mark on the right side of the **Test Options / Preview** panel.

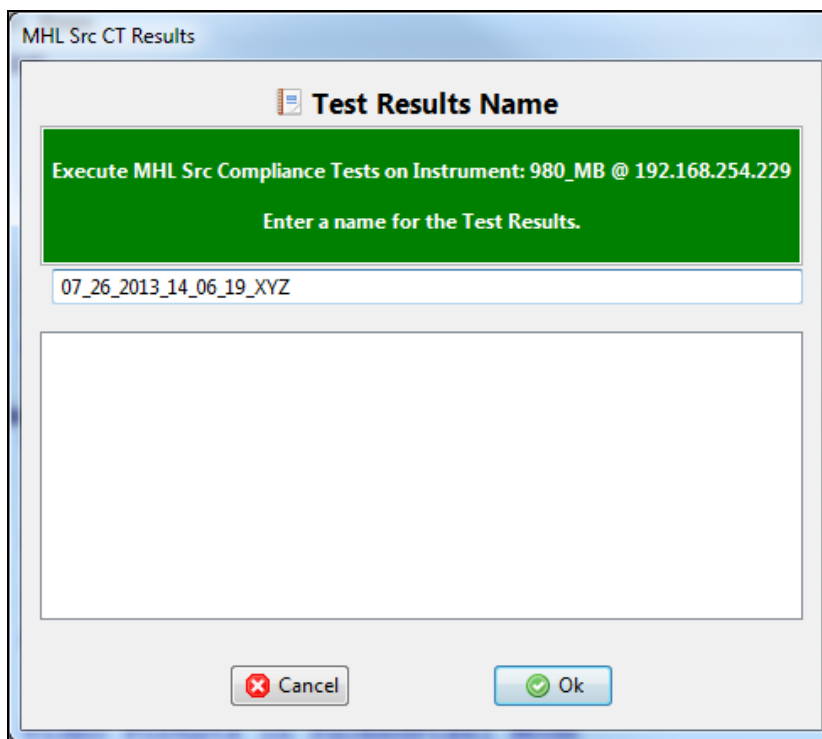
The screen shot below shows some of the tests that have been skipped (highlighted in yellow with a red X).



4. (Optional) Set the duration  for each test by selecting the test and then specifying how many iterations of the test are conducted. Typically you would specify the duration in the number of frames but the pull-down menu also enables you to specify this in milliseconds or percent.

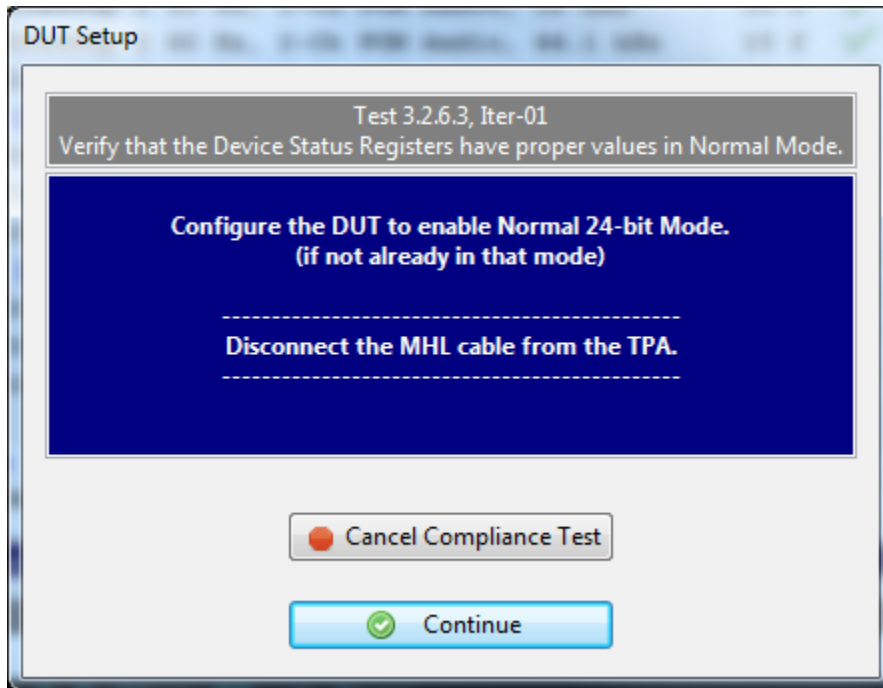


5. Click on the Execute Tests  activation button to initiate the test suite. You will be prompted for a name for the tests. This dialog box is shown below.




When you click OK on the **Test Results Name** dialog box the tests will begin.

During the tests a **DUT Setup** dialog box will appear which provides you with instructions for physically connecting the devices. An example is shown in the screen below.



During the tests a **Required DUT Configuration** dialog box will appear that instructs you to verify that the source device under test is in the correct mode (video and audio format are correct). The following screen shot depicts this. Press **Continue** when you have the source device in the correct mode. If you need to pause the test to configure the source device under test, you can do so by clicking on the **Pause Execution** activation button. You can cancel the test using the **Cancel Compliance** Test button.

DUT Configuration

Hz, Basic Audio  **Required DUT Configuration** 1.5 f

Test 3.2.2.2, Iter-02

Confirm that the source DUT always transmits code sequences for Control Periods, Data Island Periods, and Video Data Periods conforming to the basic protocol requirements.

**Please verify that the DUT is configured per the requirements below.**  
**NOTE: The test EDID has been applied and hot-plug has been toggled and the DUT may already be configured per the EDID.**  
**You can use the 980 Real-Time to help verify that the DUT is configured and stable.**

**Press "Continue" when the DUT is ready to be tested.**

**Format:**

- [VIC = 4] 1280x720p @ 60 Hz

**Content:**

- There is no content requirement for this test.

**Audio:**

- Configure the Source DUT to transmit Basic Audio.

EDID (Default): <generated>

Change EDID Default EDID View EDID

Cancel Compliance Test Pause Execution Continue

You can view the EDID (**View EDID**) and/or change the EDID (**Change EDID**) to evoke a particular format from the MHL source device under test. When you click on **View EDID** an HTML report appears as shown below. This enables you to verify that an EDID's preferred timing is appropriate for a particular test. When you click on **Change EDID** a navigation window appears enabling you to select any EDID files that you have stored on your PC. A few screen examples of the EDID report are shown below.

EDID Decode
C:\Users\nkendall\Desktop\980\_R\_3\_1\_11\_MHL\_CTS\_1\_2\980mgr\workspace\mhlsrcct\results\03\_06\_2012\_16\_28\_35\testEdid.xml

Report generated on: March 6, 2012 4:29 PM
www.quantumdata.com

## Quantum Data EDID Data Report

**Block 0**

	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	B2	00	04	00	00	00
10:	20	14	01	03	80	50	2D	78	0A	0D	C9	A0	57	47	98	27
20:	12	48	4C	20	00	00	01	01	01	01	01	01	01	01	01	01
30:	01	01	01	01	01	01	01	1D	00	72	51	D0	1E	20	6E	28
40:	55	00	20	C2	31	00	00	1E	00	00	00	10	00	00	00	00
50:	00	00	00	00	00	00	00	00	00	00	00	00	00	FC	00	48
60:	44	4D	49	20	43	54	20	54	45	53	54	0A	00	00	00	FD
70:	00	17	F1	08	8C	11	00	0A	20	20	20	20	20	20	01	54

Checksum verified  
 Version 1 header verified  
 EDID Version 1, Revision 3  
 Number of additional blocks: 1  
     Manufacturer: QDI  
     Product Code: 178  
     Serial #: 4  
 Date of Manufacture: Week 32 of 2010

**Display Features**

- VESA DFP 1.x non compatible
- Horizontal Screen Size 80 cm
- Vertical Screen Size 45 cm
- Display Transfer Characteristics (Gamma) 2.20
- Active off: No Suspend: No Standby: No
- RGB color display
- sRGB is not used as default

Save As Close

EDID Decode

C:\Users\nkendall\980\_Capture\_Files\_4\_8\mhlsrcct\results\07\_26\_2013\_14\_06\_19\_XVZ\testEdid.xml

Checksum verified  
 Version 1 header verified  
 EDID Version 1, Revision 3  
 Number of additional blocks: 1  
     Manufacturer: QDI  
     Product Code: 178  
     Serial #: 4  
 Date of Manufacture: Week 32 of 2010

**Display Features**

- \*VESA DFP 1.x non compatible
- \*Horizontal Screen Size 80 cm
- \*Vertical Screen Size 45 cm
- \*Display Transfer Characteristics (Gamma) 2.20
- \*Active off: No Suspend: No Standby: No
- \*RGB color display
- \*sRGB is not used as default
- \*Preferred Timing is native
- \*Display is non-continuous frequency (multi-mode)

**Chromaticity**

Red: (0.625, 0.340)  
 Green: (0.280, 0.595)  
 Blue: (0.155, 0.070)  
 White: (0.283, 0.298)

**Established Timings I**

640 x 480 @ 60Hz

**Established Timings II**

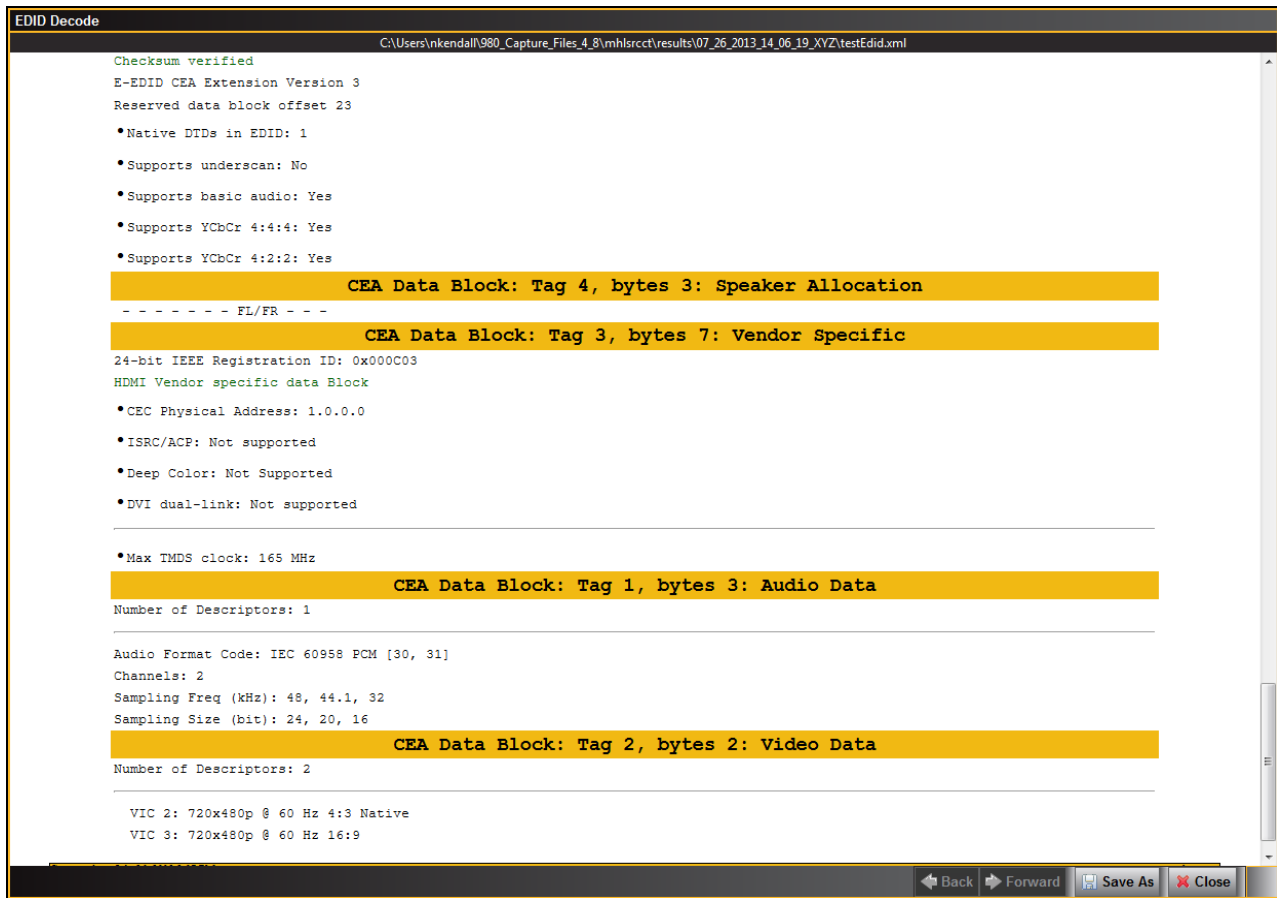
No Timings Defined.

Manufacturer's Timings: None

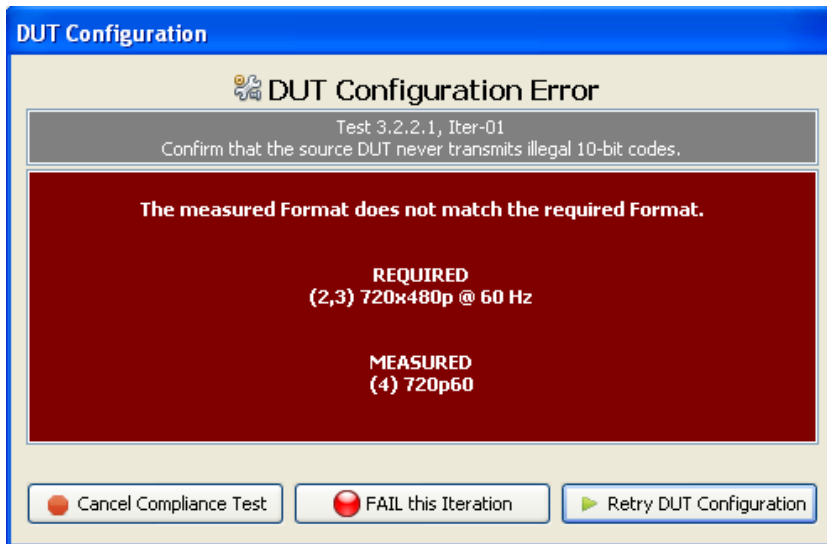
**Standard Timings**


Timing #1: Not Defined  
 Timing #2: Not Defined  
 Timing #3: Not Defined

Back Forward Save As Close



If you do not have the source device under test in the proper mode, an error dialog box will appear. Samples of these error dialog boxes are shown below.



During the test, the test results are shown as they occur in the **Test Options / Preview** panel. There is a progress arrow  which points to the test that is currently being run. The lower panel **Test Log** shows the testing activity as it occurs. Refer to the screen shot below.

MHL Src Compliance Test (2.1): "07\_26\_2013\_14\_06\_19\_XYZ"

Test List

Category / Test Name	Duration	Status	Checkmark
3.2.3.6: Pixel Encoding in PackedPixel Mode		Skipped	✓
Iter 01: The DUT does not support PackedPixel Mode: Automati	--	Skipped	✓
Audio Test		Incomplete	✓
3.2.4.1: IEC 60958 / IEC61937		Incomplete	✓
Iter 01: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 32 kHz	15 f	Pass	✓
01: Verify the repetition period of B bit.		Pass	✓
02: Verify the nominal Frame Rate.		Pass	✓
Iter 02: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 44.1 kHz	15 f	User Skipped	✗
Iter 03: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 48 kHz	15 f	In Progress	✓
3.2.4.2: Audio Clock Regeneration		Incomplete	✓
Iter 01: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 32 kHz	15 f	Pass	✓
01: Verify N parameter value.		Pass	✓
02: Verify CTS parameter value.		Pass	✓
03: Verify user supplied sampling freq matches		Pass	✓
Iter 02: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 44.1 kHz	15 f	User Skipped	✗
Iter 03: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 48 kHz	15 f	Pending	✓
3.2.4.3: Audio InfoFrame		Incomplete	✓
Iter 01: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 32 kHz	15 f	Fail	✗
Iter 02: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 44.1 kHz	15 f	User Skipped	✗
Iter 01: (2,3) 720x480p @ 60 Hz, 2-Ch PCM Audio, 32 kHz			

Test Log

Line	Message
0409	--- Test 3.2.4.1-03
0410	Configuring the DUT and Test Instrument.
0411	Creating a Test EDID.
0412	Transferring the Test EDID to the Instrument.
0413	Installing the Test EDID.
0414	Toggling hot-plug.
0415	Verifying the captured format timing.

Buttons: Cancel the Compliance Test, Pause Test Execution

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 Manager application. Refer to the screen example above.



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 **MHL Src CT** tab called the **CT Results** tab. You can view the test results in this panel. Refer to the following screen shots to see examples of the **CT Results** panel.

**Note:** The example below shows an MHL 2.1 test. The test operates in a similar fashion other MHL CTS versions of the test.

The screenshot shows the 'Compliance Test Results Viewer' window. The title bar reads 'MHL Source Compliance Test Results'. The main area contains the following information:

- Results Name: 07\_26\_2013\_14\_06\_19\_XYZ
- Manufacturer: Acme
- Date Tested: July 26, 2013 2:06 PM
- Model Name: XYZ
- Overall Status: **CTS 2.1 - Incomplete**
- Port Tested: 1

A table titled 'Test Results' is displayed below. It has two columns: 'Test Name / Details' and 'Status'. The status column uses color coding: green for 'Pass', red for 'Fail', and yellow for 'Incomplete'. Skipped tests are shown in grey.

Test Name / Details	Status
3.2.2.1: Legal Codes in Normal Mode	Pass
3.2.2.2: Basic Protocol in Normal Mode	Pass
3.2.2.4: Legal Codes in PackedPixel Mode	Skipped
3.2.2.5: Basic Protocol in PackedPixel Mode	Skipped
3.2.3.1: Video Formats in Normal Mode	Pass
3.2.3.2: Pixel Encoding in Normal Mode	Pass
3.2.3.3: AVI InfoFrame in Normal Mode	Fail
3.2.3.5: Video Formats in PackedPixel Mode	Skipped
3.2.3.6: Pixel Encoding in PackedPixel Mode	Skipped
3.2.4.1: IEC 60958 / IEC61937	Incomplete
3.2.4.2: Audio Clock Regeneration	Incomplete
3.2.4.3: Audio InfoFrame	Incomplete
3.2.6.3: Device Status Registers in Normal Mode	Fail
3.2.6.4: Device Status Registers in PackedPixel Mode	Skipped
3.2.8.1: RAP and RAPK Sub-Commands Test	Fail
3.2.9.2: 3D Video Format Timings in Normal Mode	Skipped
3.2.9.3: 3D Video Mode Indicator	Skipped
3.2.9.4: 3D Video Format Timings in PackedPixel Mode	Skipped

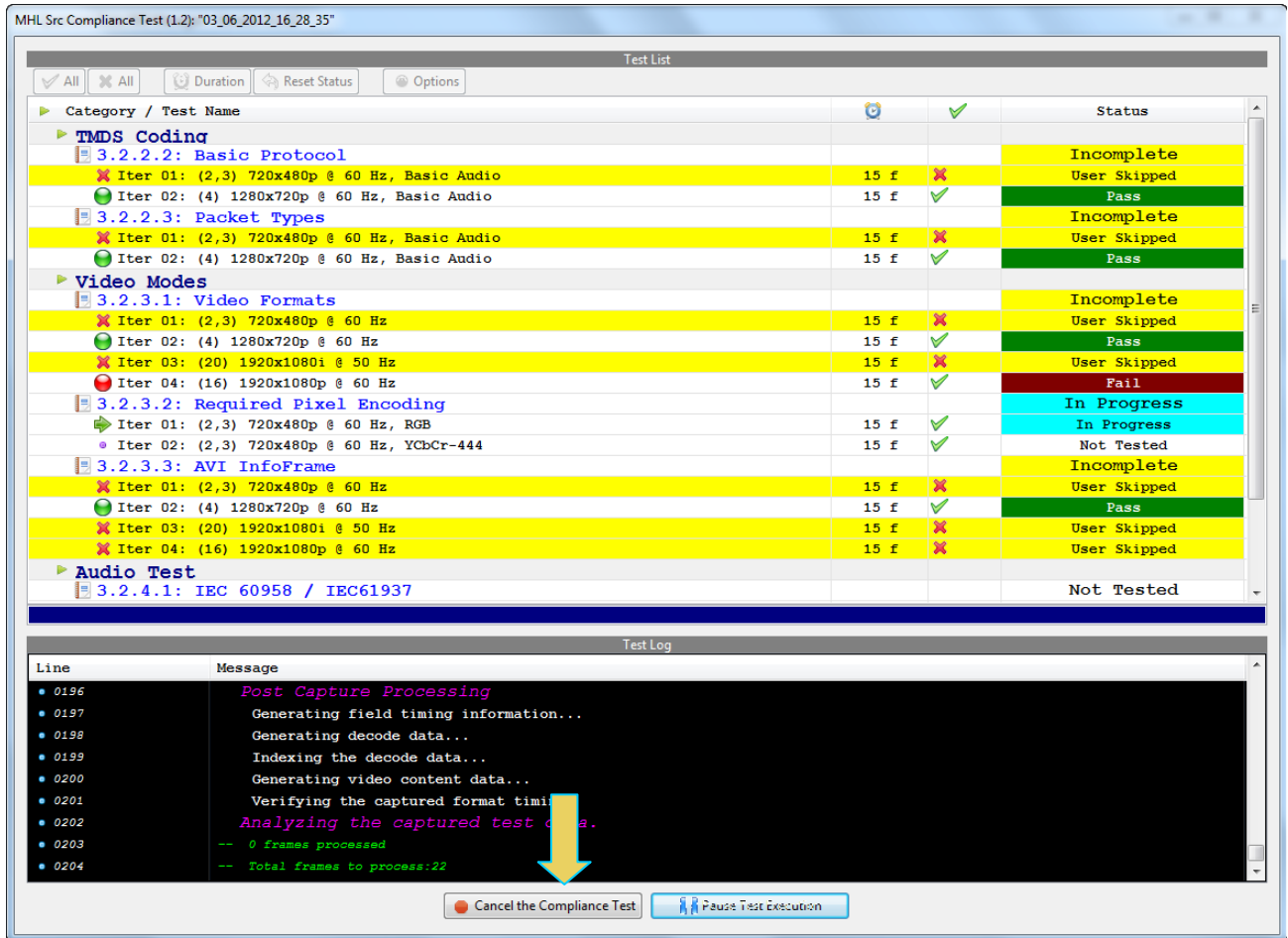
At the bottom of the window, there is an 'Open Capture' button, an 'Instrument' field showing '980\_MB [192.168.254.229]', a 'Continue Test Execution' button, and a 'Close' button.

### 4.7 Canceling and Resuming the MHL Source Compliance after cancel

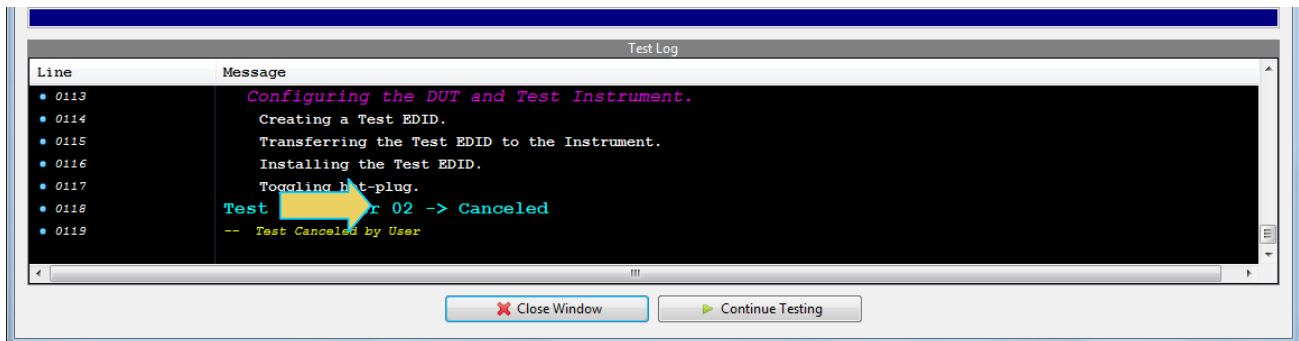
You can complete or resume a test series that was canceled earlier. The test results are saved in a directory that is accessible through the 980 GUI Manager interface. Use the following procedures to cancel and resume a canceled test.

**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.

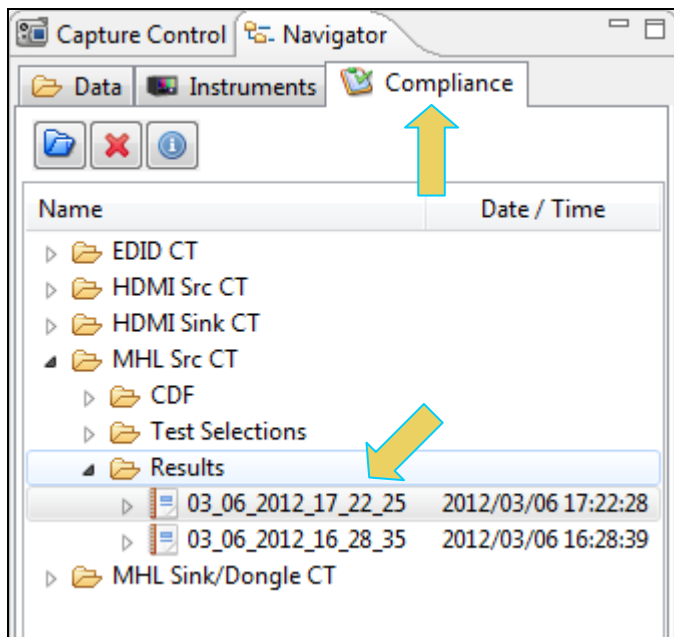


An indication that the test was canceled will be shown in the Test Log lower panel.

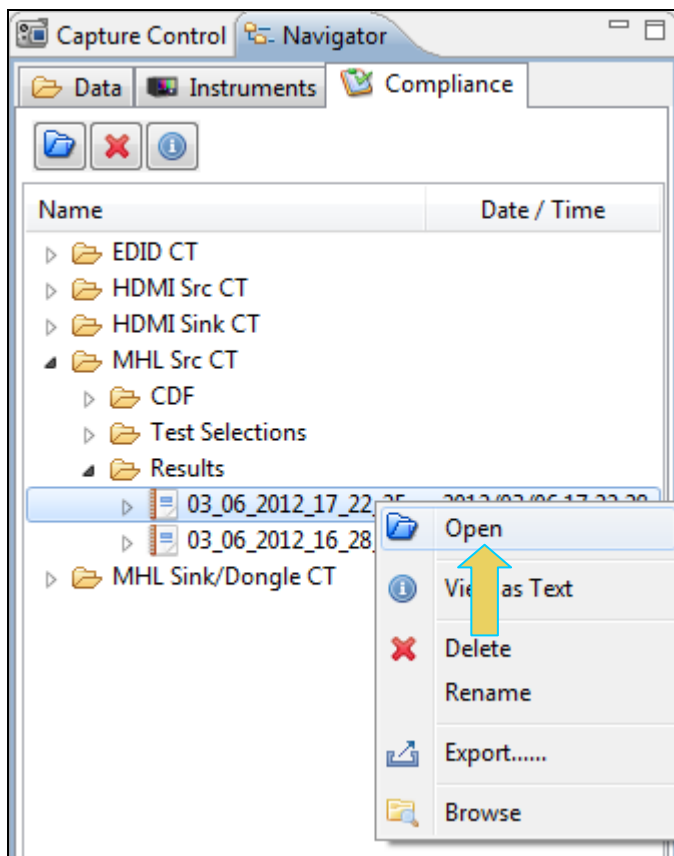


**To resume a canceled test:**

1. Navigate to the Navigator/Compliance panel and open the MHL Source 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.

**MHL Source Compliance Test Results**

Results Name: 03\_06\_2012\_17\_22\_25      Manufacturer: Acme      [HTML Report](#)  
 Date Tested: March 6, 2012 5:22 PM      Model Name: XYZ  
 Overall Status: **CTS 1.2 - Incomplete**      Port Tested: 1

Test Results		Status
Test Name / Details		
▶ 3.2.2.2: Basic Protocol		Incomplete
▶ 3.2.2.3: Packet Types		Incomplete
▶ 3.2.3.1: Video Formats		Incomplete
▶ 3.2.3.2: Required Pixel Encoding		Error
▶ 3.2.3.3: AVI InfoFrame		Incomplete
▶ 3.2.4.1: IEC 60958 / IEC61937		Not Tested
▶ 3.2.4.2: Audio Clock Regeneration		Not Tested
▶ 3.2.4.3: Audio InfoFrame		Not Tested

Open Capture    3.2.2.2: Basic Protocol    **Continue Test Execution**

Instrument: MyMHL980 [192.168.254.103]

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

## 4.8 Viewing Details of Source Compliance Test Failures

When you have completed the test series you will have an opportunity to view the detailed data for a particular failure. Use the following procedures to view the details of a failure.

**Note:** The example below shows an MHL 1.2 test. The test operates in a similar fashion for other MHL CTS versions.

### To view the details of a failure:

1. Expose the detailed results of a failure and highlight a failure. Refer to the screen example below.

Test Name / Details	Status
3.2.2.1: Legal Codes in Normal Mode	Pass
3.2.2.2: Basic Protocol in Normal Mode	Pass
3.2.2.4: Legal Codes in PackedPixel Mode	Skipped
3.2.2.5: Basic Protocol in PackedPixel Mode	Skipped
3.2.3.1: Video Formats in Normal Mode	Pass
3.2.3.2: Pixel Encoding in Normal Mode	Pass
3.2.3.3: AVI InfoFrame in Normal Mode	Fail
Iter 01: (2,3) 720x480p @ 60 Hz, Chess Pattern	Fail
01: Test AVI occurrence every 2 video field.	Pass
02: Test AVI version is 2.	Pass
03: Test AVI aspect ratio.	Pass
04: Test RGB or YCC coding is proper.	Pass
05: Test Overscan/Underscan bits.	Pass
06: Test Pixel repetition factor.	Pass
07: Test VIC is correct.	Fail
Incorrect Video Identification Code: 0, expected: 2 or 3 -- [Frame 000, Line 0009, Pixel 43]	
Incorrect Video Identification Code: 0, expected: 2 or 3 -- [Frame 001, Line 0009, Pixel 43]	
Incorrect Video Identification Code: 0, expected: 2 or 3 -- [Frame 002, Line 0009, Pixel 43]	
Incorrect Video Identification Code: 0, expected: 2 or 3 -- [Frame 003, Line 0009, Pixel 43]	
Incorrect Video Identification Code: 0, expected: 2 or 3 -- [Frame 004, Line 0009, Pixel 43]	
Incorrect Video Identification Code: 0, expected: 2 or 3 -- [Frame 005, Line 0009, Pixel 43]	

2. Navigate to view the results.

When you highlight a failure in the Details window of the **CT Results** panel, you can navigate to the details in the **Data Decode** and **Event Plot** panels by clicking on the **Show in Capture** activation button on the bottom left of the panel. This is shown in the screen shot above. The **Data Decode** and **Event Plot** panels showing the captured data associated with the failure are shown in the screen example below.

**Event Plot** Timing Analysis

C:\Users\kendall\980\_Capture\_Files\_4\_8\hlsrccp\results\07\_26\_2013\_14\_06\_19\_XYZ\Test\_9\_2\_3\_01

Segment Events Rows Find Sync Legend

Zoom %: 0.003

0:25:10.868.660.552.398

TMDS: GCP, AVI, AUD IF, VEN, SPD

VSYNC: VSYNC

HSYNC: HSYNC

0:25:10.671.133.701.835      0:25:10.671.136.238.678      0:25:10.671.138.775.520      0:25:10.671.141.312.363      0:25:10.671.143.849.205

Time (H:M:S.ms.us.ns.ps)

---

**Data Decode**

C:\Users\kendall\980\_Capture\_Files\_4\_8\hlsrccp\results\07\_26\_2013\_14\_06\_19\_XYZ\Test\_9\_2\_3\_01

Segment Events Find Sync Details Raw Data All

Packet	Time (H:M:S.ms.us.ns.ps)	Frame	Line	Pixel	Type	SubType	Info
1856	0:25:10.671.131.400.000	0	8	756	TMDS	AUDSAM	Audio Sample Packet(L-PCM and IEC 61937 compressed formats)
1857	0:25:10.671.135.170.000	0	9	0	TMDS	HSYNC	HSYNC 62 clocks
1858	0:25:10.671.135.170.000	0	9	0	TMDS	VSYNC	VSYNC 5148 clocks
1859	0:25:10.671.135.580.000	0	9	11	TMDS	GCP	General Control Packet (GCP)
1860	0:25:10.671.136.765.191	0	9	43	TMDS	AVI IF	AVI InfoFrame
1861	0:25:10.671.137.950.383	0	9	75	TMDS	AUD IF	Audio InfoFrame
1862	0:25:10.671.139.135.574	0	9	107	TMDS	VEN	Vendor-Specific InfoFrame
1863	0:25:10.671.140.320.766	0	9	139	TMDS	SPD IF	Source Product Descriptor InfoFrame

check sum: verified

scan info: all active pixels & lines are displayed

Bar Info: no Data

active info: format valid

RGB/YCC indicator: RGB

active format: same as picture 8

## 4.9 Viewing the MHL Source 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.

**Note:** The example below shows an MHL 2.1 test. The test operates in a similar fashion for all MHL CTS versions.

### To view the html test report:

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

Compliance Test Results Viewer

MHL Source Compliance Test Results

Results Name: 07\_26\_2013\_14\_06\_19\_XYZ      Manufacturer: Acme  
Date Tested: July 26, 2013 2:06 PM      Model Name: XYZ  
Overall Status: **CTS 2.1 - Incomplete**      Port Tested: 1

HTML Report

Test Results

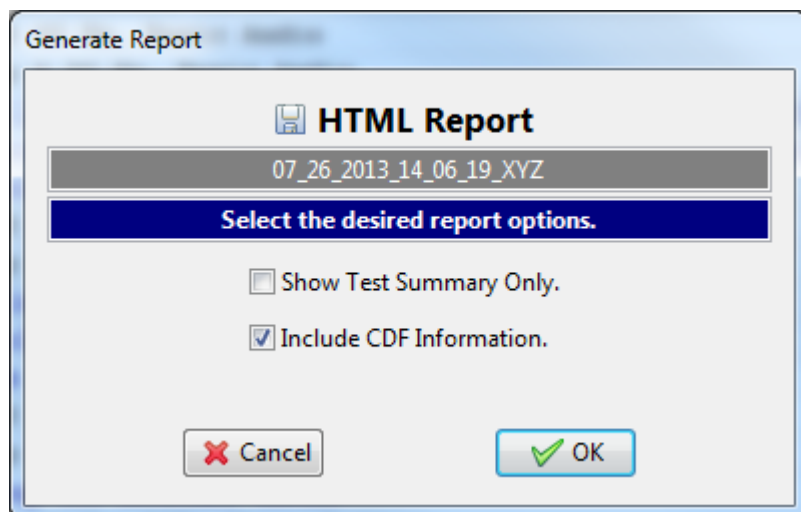
Test Name / Details		Status
3.2.2.1: Legal Codes in Normal Mode		Pass
Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio	15 f	Pass
Iter 02: (17,18) 720x576p @ 50 Hz, Basic Audio	15 f	Pass
01: Verify that all TMDS chrs belong to either Control, DI		Pass
02: All 3 TMDS channels are encoded with the same encoding.		Pass
3.2.2.2: Basic Protocol in Normal Mode		Pass
Iter 01: (2,3) 720x480p @ 60 Hz, Basic Audio	15 f	Pass
Iter 02: (17,18) 720x576p @ 50 Hz, Basic Audio	15 f	Pass
3.2.2.4: Legal Codes in PackedPixel Mode		Skipped
3.2.2.5: Basic Protocol in PackedPixel Mode		Skipped
3.2.3.1: Video Formats in Normal Mode		Pass
Iter 01: (2,3) 720x480p @ 60 Hz	15 f	Pass
Iter 02: (17,18) 720x576p @ 50 Hz	15 f	Pass
3.2.3.2: Pixel Encoding in Normal Mode		Pass
Iter 01: (2,3) 720x480p @ 60 Hz, RGB, Chess Pattern	15 f	Pass
01: Test RGB pixel encoding.		Pass
Iter 02: YCbCr444/422 not supported: Manual check	--	Pass
3.2.3.3: AVI InfoFrame in Normal Mode		Fail
3.2.3.5: Video Formats in PackedPixel Mode		Skipped

Open Capture    3.2.2.1: Legal Codes in Normal Mode

Instrument: 980\_MB [192.168.254.229]    Continue Test Execution

Close

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 report includes a summary, the CDF information, a detailed result for each test and the configuration of the 980 when running the test. These are shown on the following screens.

HTML Viewer  
 C:\Users\kendall\980\_Capture\_Files\_4\_8\mhlsrcct\results\07\_26\_2013\_14\_06\_19\_XYZ\Report\_Cdf.htm

Report generated on: July 26, 2013 2:33 PM www.quantumdata.com

Quantum Data

## MHL Source Compliance Test Report

### CTS 2.1

Results Name:	07_26_2013_14_06_19_XYZ	Manufacturer:	Acme
Date Tested:	July 26, 2013 2:06 PM	Model Name:	XYZ
Overall Status:	Incomplete	Port Tested:	-

Report Index / Summary					
<a href="#">Test 3.2.2.1</a>	Pass	<a href="#">Test 3.2.2.2</a>	Pass	<a href="#">Test 3.2.2.4</a>	Skipped
<a href="#">Test 3.2.2.5</a>	Skipped	<a href="#">Test 3.2.3.1</a>	Pass	<a href="#">Test 3.2.3.2</a>	Pass
<a href="#">Test 3.2.3.3</a>	Fail	<a href="#">Test 3.2.3.5</a>	Skipped	<a href="#">Test 3.2.3.6</a>	Skipped
<a href="#">Test 3.2.4.1</a>	Incomplete	<a href="#">Test 3.2.4.2</a>	Incomplete	<a href="#">Test 3.2.4.3</a>	Incomplete
<a href="#">Test 3.2.6.3</a>	Fail	<a href="#">Test 3.2.6.4</a>	Skipped	<a href="#">Test 3.2.8.1</a>	Fail
<a href="#">Test 3.2.9.2</a>	Skipped	<a href="#">Test 3.2.9.3</a>	Skipped	<a href="#">Test 3.2.9.4</a>	Skipped
<a href="#">CDF</a>		<a href="#">Equipment Info</a>			

Capabilities Declaration Form (CDF)	
General	
CDF_CTS_VERSION	2.1
CDF_MFR_NAME	Acme
CDF_MODEL_NUMBER	XYZ
CDF_HDCP_SUPPORT	YES
CDF_AVI_SUPPORT	YES
CDF_MFR_CDR_SUPPORT	YES

← Back Forward → Save As Close

Test 3.2.3.1		Pass
<b>Video Formats in Normal Mode</b>		Pass
<b>• Iter 01: (2,3) 720x480p @ 60 Hz</b>		Pass
• 01: Verify pixel clock rate.	Pass	Pass
• 02: Verify HS Front porch.	Pass	
• 03: Verify HS_LEN.	Pass	
• 04: Verify Hsync back porch.	Pass	
• 05: Verify H_ACTIVE.	Pass	
• 06: Verify H Sync Polarity.	Pass	
• 07: Verify V Sync front porch.	Pass	
• 08: Verify VS_LEN.	Pass	
• 09: Verify V Sync back porch.	Pass	
• 10: Verify V_ACTIVE.	Pass	
• 11: Verify V Sync polarity.	Pass	
• 12: Verify offset between VSync and HSync active edge.	Pass	
<b>• Iter 02: (17,18) 720x576p @ 50 Hz</b>		Pass
• 01: Verify pixel clock rate.	Pass	Pass
• 02: Verify HS Front porch.	Pass	
• 03: Verify HS_LEN.	Pass	
• 04: Verify Hsync back porch.	Pass	
• 05: Verify H_ACTIVE.	Pass	
• 06: Verify H Sync Polarity.	Pass	
• 07: Verify V Sync front porch.	Pass	
• 08: Verify VS_LEN.	Pass	
• 09: Verify V Sync back porch.	Pass	

HTML Viewer  
 C:\Users\kendall\980\_Capture\_Files\_4\_8\mhlsrcct\results\07\_26\_2013\_14\_06\_19\_XVZ\Report\_Cdf.htm

<b>Test 3.2.3.2</b>		<b>Pass</b>
Pixel Encoding in Normal Mode		<b>Pass</b>
• Iter 01: (2,3) 720x480p @ 60 Hz, RGB, Chess Pattern		<b>Pass</b>
• 01: Test RGB pixel encoding.	<b>Pass</b>	<b>Pass</b>
• Iter 02: YCbCr444/422 not supported: Manual check		<b>Pass</b>

<b>Test 3.2.3.3</b>		<b>Fail</b>
AVI InfoFrame in Normal Mode		<b>Fail</b>
• Iter 01: (2,3) 720x480p @ 60 Hz, Chess Pattern		<b>Fail</b>
• 01: Test AVI occurrence every 2 video field.	<b>Pass</b>	<b>Fail</b>
• 02: Test AVI version is 2.	<b>Pass</b>	
• 03: Test AVI aspect ratio.	<b>Pass</b>	
• 04: Test RGB or YCC coding is proper.	<b>Pass</b>	
• 05: Test Overscan/Underscan bits.	<b>Pass</b>	
• 06: Test Pixel repetition factor.	<b>Pass</b>	
• 07: Test VIC is correct.	<b>Fail</b>	
<ul style="list-style-type: none"> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   16922 130 0 9 43 1510671135.58 450497 AVI InfoFrame [Frame 000, Line 0009, Pixel 43]</li> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   34318 130 1 9 74 1510687818.94 900978 AVI InfoFrame [Frame 001, Line 0009, Pixel 74]</li> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   52231 130 2 9 43 1510704502.38 1351397 AVI InfoFrame [Frame 002, Line 0009, Pixel 43]</li> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   69639 130 3 9 43 1510721185.78 1801847 AVI InfoFrame [Frame 003, Line 0009, Pixel 43]</li> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   87035 130 4 9 43 1510737869.18 2252297 AVI InfoFrame [Frame 004, Line 0009, Pixel 43]</li> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   104443 130 5 9 43 1510754552.58 2702747 AVI InfoFrame [Frame 005, Line 0009, Pixel 43]</li> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   121851 130 6 9 74 1510771235.95 3153228 AVI InfoFrame [Frame 006, Line 0009, Pixel 74]</li> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   139232 130 7 9 43 1510787919.39 3603647 AVI InfoFrame [Frame 007, Line 0009, Pixel 43]</li> <li>▪ Incorrect Video Identification Code: 0, expected: 2 or 3   157160 130 8 9 43 1510804602.79 4054097 AVI InfoFrame</li> </ul>		

Back Forward Save As Close

HTML Viewer  
 C:\Users\nkendall\980\_Capture\_Files\_4\_8\mhlsrcct\results\07\_26\_2013\_14\_06\_19\_XVZ\Report\_Cdf.htm

### Test Equipment Information

Instrument	
Name: 980_MB IP Address: 192.168.254.229 Net Mask: 255.255.255.0 Gateway IP: 192.168.254.1 Free Space: 68.04 GB of 162.23 GB (41.9%) Version: Advanced Test platform Version: 4.8.9 HDMI 980 protocol Analyzer in slot 0 [DDR 2048MB]: Gateway: [Version: 4.7.7 Build Number: 1 (04:22:2013) Gen: 3 pcb: 297b/D] Firmware: [Version: 4.8.9 Build Number: 8096 (mblair 07:18:2013 10:39:42 CDT) ] HDMI Video Generator in slot 1: Gateway: [Version: 4.7.6 Build Number: 2 (05:21:2013 00) pcb: 297b C] Firmware: [Version: 4.8.9 Build Number: 8093 (mblair 07:18:2013 10:37:55 CDT)] System Information: System SN : [ 6779F4AF800C2657::100000] HDMI PA SN : [ A7B99D010000::N/A] Main Board : [ "SandyBridge Platform"] CPUx2 : [ 6.42.7 "Intel(R) Celeron(R) CPU G530 @ 2.40GHz"] DDR : [ 2 GB + 512 MB] HD : [ SSDSC2CT18] OS : [ Linux xpscope-4a 2.6.26-2-686 #1 SMP Sun Mar 4 22:19:19 UTC 2012 1686 GNU/Linux] GUI manager: [ Version 4.8.99_99182_201307250940] 1 : [ lo inet 127.0.0.1/8 scope host lo] 2 : [ eth0 inet 192.168.254.229/24 brd 192.168.254.255 scope global eth0] PCIE3 : [ 2.Sx8] HDMI SRC CT : [ 4.7.4] HDCP SRC CT : [ 4.6.0] MHL SINK CT : [ 4.7.18] MHL SRC CT : [ 4.7.20] HDMI SINK CTS: [ 3.1.8]	
Host	
UI Name: Quantum Data 980 Manager - Version 4.8.99 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_MHL_NewGUI_4.8.99_99182_Win\980mgr\jre OS: win32 OS Arch: x86 Locale: en_US Free Space: 10.95 GB of 223.47 GB (4.9%)	

Generated on: July 26, 2013 2:33 PM www.quantumdata.com

END OF USER GUIDE