



980 MHL CBUS Compliance Test Module

User Guide

Rev: A4



Table of Contents

1	About the 980 MHL CBUS Compliance Test Module	4
1.1	Scope of this User Guide	5
1.2	Changes to this User Guide	6
1.3	What options are available with the 980 MHL CBUS Compliance Test module?	6
1.4	980 User Interface	9
2	Getting Started	11
2.1	What is in the 980 shipping box?	11
2.2	Operational workflow for CBUS Compliance Testing	11
2.3	Connector Description	12
3	MHL CBUS Source Compliance Tests	15
3.1	Workflow for running the MHL CBUS Source Compliance Tests	16
3.2	Making the physical MHL connections	17
3.3	Completing the CDF	17
3.4	Selecting which tests to run	29
3.5	Executing the MHL CBUS Source Compliance Tests	35
3.6	Viewing Details of Source Compliance Test Passes or Failures	48
3.7	Accessing the test results through the navigator panel	50
3.8	Viewing the MHL Source Compliance HTML test report	54
3.9	CBUS Log Plot	59
4	MHL CBUS Sink Compliance Tests	61
4.1	System Test – Section 4.2	61
4.2	CBUS Tests – Section 4.3	61
4.3	CBUS Common Tests – Section 6.3	62
4.4	Workflow for running the MHL CBUS Sink Compliance Tests	62
4.5	Making the physical MHL connections	64
4.6	Completing the CDF	64
4.7	Selecting which tests to run	76
4.8	Executing the MHL CBUS Sink Compliance Tests	82
4.9	Viewing Details of Sink Compliance Test Passes or Failures	89
4.10	Accessing the test results through the navigator panel	90
4.11	Viewing the MHL Sink Compliance HTML test report	92

5	MHL CBUS Dongle Compliance Tests	96
5.1	System Test – Section 5.2	96
5.2	CBUS Tests – Section 5.3	96
5.3	CBUS Common Tests – Section 6.3	97
5.4	Workflow for running the MHL CBUS Dongle Compliance Tests	97
5.5	Making the physical MHL connections	98
5.6	Completing the CDF	98
5.7	Selecting which tests to run	111
5.8	Executing the MHL CBUS Dongle Compliance Tests	116
5.9	Viewing Details of Dongle Compliance Test Passes or Failures	125
5.10	Accessing the test results through the navigator panel	127
5.11	Viewing the MHL Dongle Compliance HTML test report	129
6	CBUS Log Plot	133
6.1	Accessing the CBUS Log Plots	134
6.2	Locating Data in the CBUS Log Plot Panel	136
6.3	Viewing Events in the CBUS Log Plot Panel	138
6.4	Viewing the Timestamps of the Events	139
6.5	General Controls – CBUS Log Plot	141
6.6	Working with Markers	146

1 About the 980 MHL CBUS Compliance Test Module

This chapter provides an overview of features of the 980 MHL CBUS Compliance Test module and the 980 GUI Manager. 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 (example shown below).
- 2) The 980B Advanced Test Platform – 5-slot chassis with a 15 inch touch display

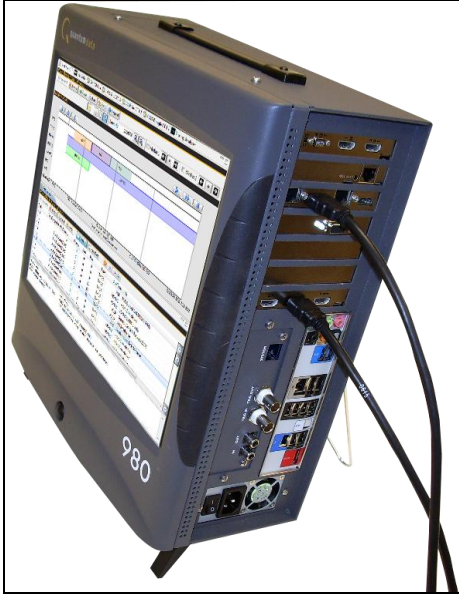
The 980 MHL CBUS Compliance Test module provides CBUS compliance testing for MHL CTS 1.2 and 2.0 source, sink and dongle devices. The 980 GUI Manager is a PC application to manage and use the 980 MHL CBUS Compliance Test module. The test require no additional external equipment. You can disseminate the test results and Log Plots to colleagues, subject matter experts and Quantum Data support for analysis. Your colleagues and subject matter experts are not required to have a 980 test instrument to view the test results and Log Plots; they simply need to download the 980 GUI Manager application from the Quantum Data website.



980 Advanced Test Platform – Front View



980 Advanced Test Platform – Rear View



980 Advanced Test Platform

1.1 Scope of this User Guide

This User Guide provides descriptive and procedural information on the 980 MHL CBUS compliance test module for testing MHL sources, sinks and dongles.

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

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/MHL Source Compliance Test – This User Guide covers source compliance testing for both MHL and HDMI sources. These compliance test applications are provided by the

980 HDMI Protocol Analyzer module or the 980 HDMI Protocol Analyzer Gen 3 system. Used in conjunction with the 980 Advanced Test Platform Quick Start Guide.

- 980 HDMI Protocol Analyzer HDMI/MHL Sink Compliance Test – This User Guide covers sink compliance testing for both MHL and HDMI sinks (and MHL dongles). These compliance test applications are provided by the 980 HDMI Protocol Analyzer module or the 980 HDMI Protocol Analyzer Gen 3 system. Used in conjunction with the 980 Advanced Test Platform Quick Start Guide.
- 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.

1.2 Changes to this User Guide

The following changes were made to this document:

This User Guide has been updated recently to include the following:

- Include MHL CBUS 2.0 compliance tests.
- Include discussion of the 980B Advanced Test Platform
- Include descriptive and procedural information on the CBUS Event Log Plot.

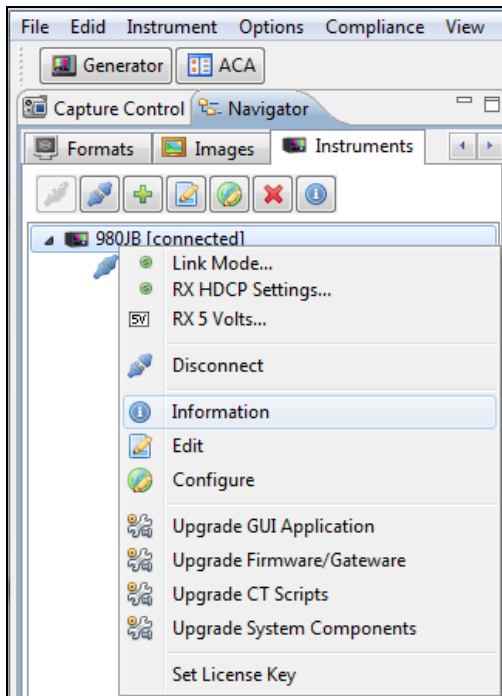
Note: Please be sure to check the Quantum Data website for updates to this User Guide.

1.3 What options are available with the 980 MHL CBUS Compliance Test module?

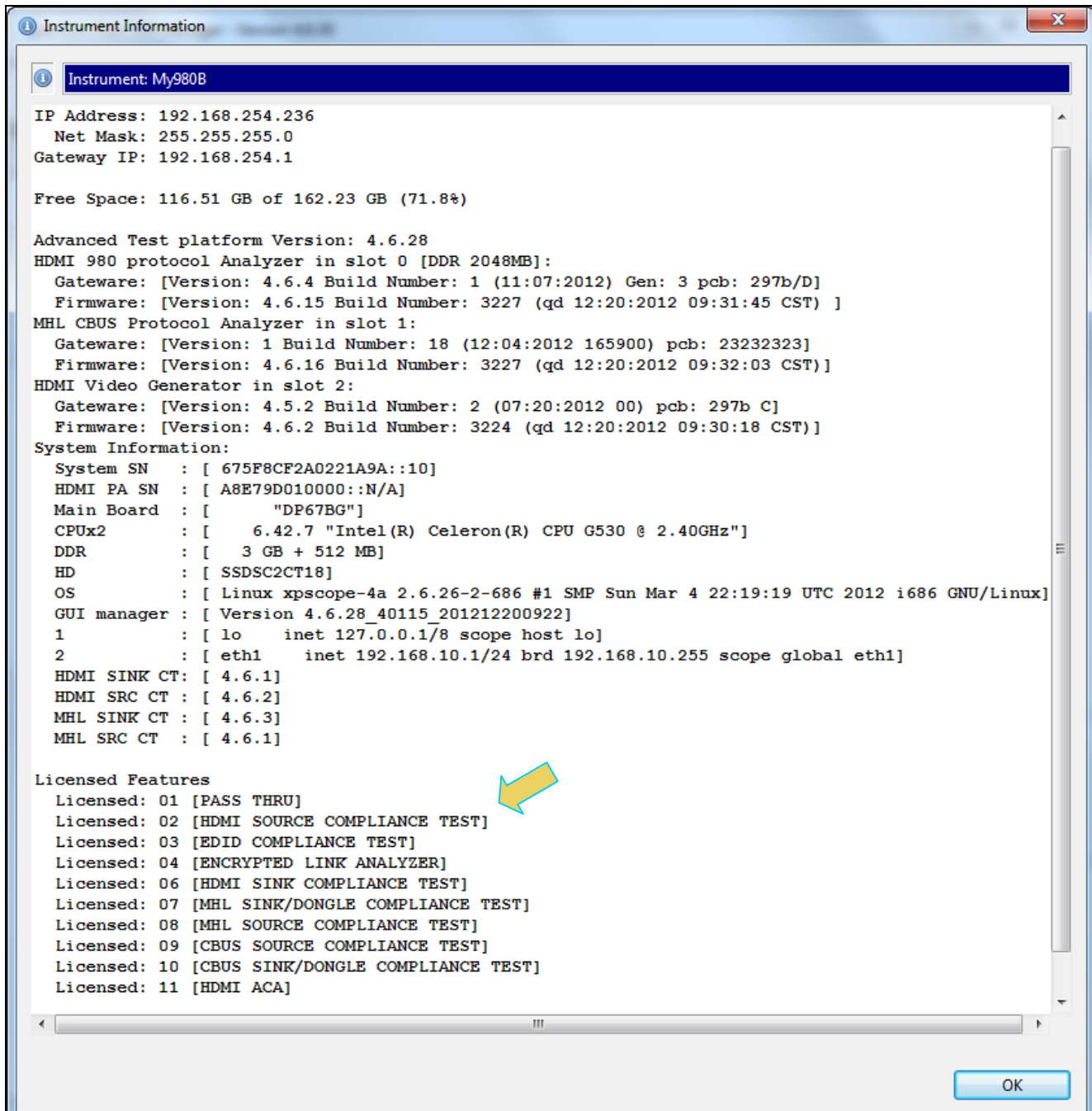
There are two options that you can purchase with the 980 MHL CBUS Compliance Test module. You must have a license to use these options:

- MHL CBUS Source Compliance module which tests in accordance with MHL 1.2 CTS and MHL CTS 2.0.
- MHL CBUS Sink/Dongle Compliance module which tests in accordance with MHL 1.2 CTS and MHL CTS 2.0.

You can determine what options the 980 is provisioned with by accessing the Instrument Information screen on either the built-in or external 980 GUI manager. When using the external 980 GUI Manager you must be connected to the 980 in order to read the Instrument Information. Refer to the following screen.



Select **Information** to view the **Instrument Information** panel.



Instrument Information

Instrument: My980B

IP Address: 192.168.254.236
Net Mask: 255.255.255.0
Gateway IP: 192.168.254.1

Free Space: 116.51 GB of 162.23 GB (71.8%)

Advanced Test platform Version: 4.6.28

HDMI 980 protocol Analyzer in slot 0 [DDR 2048MB]:
Gateway: [Version: 4.6.4 Build Number: 1 (11:07:2012) Gen: 3 pcb: 297b/D]
Firmware: [Version: 4.6.15 Build Number: 3227 (qd 12:20:2012 09:31:45 CST)]

MHL CBUS Protocol Analyzer in slot 1:
Gateway: [Version: 1 Build Number: 18 (12:04:2012 165900) pcb: 23232323]
Firmware: [Version: 4.6.16 Build Number: 3227 (qd 12:20:2012 09:32:03 CST)]

HDMI Video Generator in slot 2:
Gateway: [Version: 4.5.2 Build Number: 2 (07:20:2012 00) pcb: 297b C]
Firmware: [Version: 4.6.2 Build Number: 3224 (qd 12:20:2012 09:30:18 CST)]

System Information:

System SN : [675F8CF2A0221A9A::10]
HDMI PA SN : [A8E79D010000::N/A]
Main Board : ["DP67BG"]
CPUx2 : [6.42.7 "Intel(R) Celeron(R) CPU G530 @ 2.40GHz"]
DDR : [3 GB + 512 MB]
HD : [SSDSC2CT18]
OS : [Linux xpscope-4a 2.6.26-2-686 #1 SMP Sun Mar 4 22:19:19 UTC 2012 i686 GNU/Linux]
GUI manager : [Version 4.6.28_40115_201212200922]
1 : [lo inet 127.0.0.1/8 scope host lo]
2 : [eth1 inet 192.168.10.1/24 brd 192.168.10.255 scope global eth1]
HDMI SINK CT: [4.6.1]
HDMI SRC CT : [4.6.2]
MHL SINK CT : [4.6.3]
MHL SRC CT : [4.6.1]

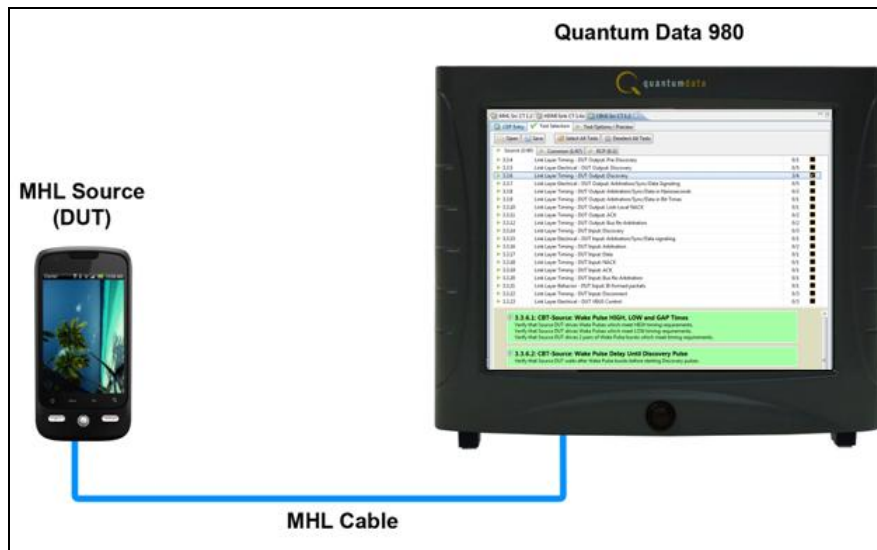
Licensed Features

Licensed: 01 [PASS THRU]
Licensed: 02 [HDMI SOURCE COMPLIANCE TEST]
Licensed: 03 [EDID COMPLIANCE TEST]
Licensed: 04 [ENCRYPTED LINK ANALYZER]
Licensed: 06 [HDMI SINK COMPLIANCE TEST]
Licensed: 07 [MHL SINK/DONGLE COMPLIANCE TEST]
Licensed: 08 [MHL SOURCE COMPLIANCE TEST]
Licensed: 09 [CBUS SOURCE COMPLIANCE TEST]
Licensed: 10 [CBUS SINK/DONGLE COMPLIANCE TEST]
Licensed: 11 [HDMI ACA]

OK

1.4 980 User Interface

The 980 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.



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

1.4.2 Embedded 980 GUI Manager

You can operate the 980 fully through the built-in color touch screen display. There are two key features that are available only with the embedded 980 GUI Manager: 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. These features apply to the 980 HDMI Protocol Analyzer module and not to the MHL CBUS Compliance module.

You can transfer data captures and compliance test results 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.

2 Getting Started

This chapter explains what is involved in getting your 980 CBUS Compliance Test Module up and running in the 980/980B Advanced Test Platform.

2.1 What is in the 980 shipping box?

When the Quantum Data 980 is shipped it will contain a variety of items. The items it will contain will depend on the module configurations and whether it is a 980 ATP or a 980B ATP. The following list shows all the items in the 980 shipping box with the standard configuration of the 980, which includes the 980 HDMI Protocol Analyzer, and also those items specific to the MHL CBUS Compliance Test module.

Standard configuration items with 980/980B:

- Quantum Data 980 test instrument (comes standard with 980; optional for 980B).
- 980 HDMI Protocol Analyzer module (pre-installed).
- Ethernet cable (P/N 30-00151) – used for connecting a host PC to the 980 over the LAN interface.
- Detachable power cable – used for supplying power to the 980.
- HDMI cable (P/N 30-00146) – Category 2 HDMI cable, 6 feet (comes standard with 980; optional for 980B).
- ESD warning sheet (P/N 68-00204) – information useful for protecting the HDMI interface against static discharge.

MHL CBUS Compliance module items:

- MHL CBUS Compliance Test module
Note: The MHL CBUS Compliance test module will be pre-installed in the 980 chassis.
- HDMI cable (P/N 30-00202) – Short (30 centimeter) HDMI cable CBUS compliance test. (Used for MHL CBUS sink compliance test option).
- MHL cable (P/N 30-00197) – Short (30 centimeter) MHL cable for running compliance test. (Used for MHL CBUS source compliance test option).

2.2 Operational workflow for CBUS Compliance Testing

The following are the high level steps you will need to follow MHL CBUS compliance testing.

2.2.1 Procedures covered in 980 Advanced Test Platform Quick Start Guide:

1. Remove the 980 from the shipping box.
2. Assemble the source device under test into your lab area and power it up. When using the optional pass-through feature to monitor between an HDMI or MHL source and an HDMI or MHL sink, assemble the display device as well.
3. Connect the 980 Protocol Analyzer power cable (provided) to a suitable outlet (110-240V 50/60Hz) and apply power to the 980.
4. (Optional – not required if using the built-in display) Select a suitable PC to host the 980 GUI Manager application. A minimum of 512MB of RAM is recommended. (Note that you do not need a PC because you can use the built-in Front Panel display; however the external 980 GUI Manager provides you with a larger viewing area).

5. (Optional – not required if using the built-in display) Determine how you are going to connect to the 980 Protocol Analyzer from the external 980 GUI Manager in order to operate the instrument:
 - Put the 980 on your corporate network and enable DHCP using an available Ethernet patch cable, or...
 - Connect directly with a host PC or laptop using the Ethernet crossover cable provided.
6. (Optional – not required if using the built-in display) Assign an IP address to the 980/980B either directly or by enabling DHCP.
7. (Optional – not required if using the built-in display) Download the latest 980 GUI Manager application from the Quantum Data website:
www.quantumdata.com/downloads/index.asp.
8. (Optional – not required if using the built-in display) Install the 980 Manager application on your host PC.
9. (Optional – not required if using the built-in display) Establish a connection to the 980 from the 980 Manager resident on your host PC.
10. (Optional – not required if using the built-in display) Through the 980 Manager “Add” the 980/980B as an Instrument.

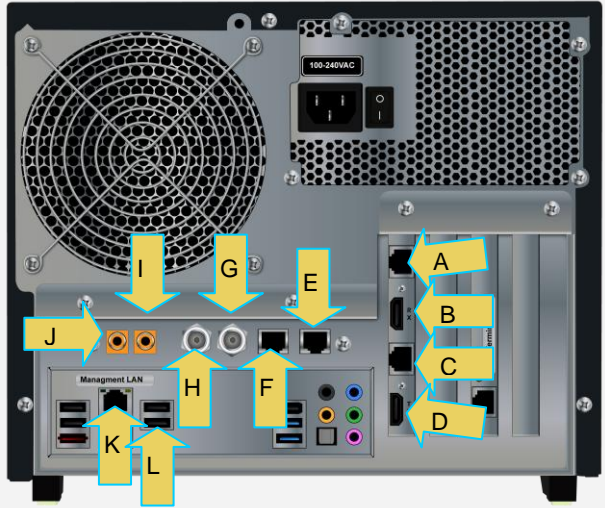
2.2.2 Procedures covered in this User Guide:

1. Connect the MHL device under test to the CBUS Compliance Test module.
2. Launch the 980 GUI Manager application, either the external 980 GUI Manager or the embedded 980 GUI Manager.
3. Launch the CBUS Compliance application in the 980 GUI Manager application.
4. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.
5. Select the tests that you wish to run from the **Test Selection** panel.
6. Initiate the tests through the **Test Options / Review** panel.
7. View the detailed data for test failures if failures occur.
8. View the results in the **Test Results** panel under the **Navigator** panel.

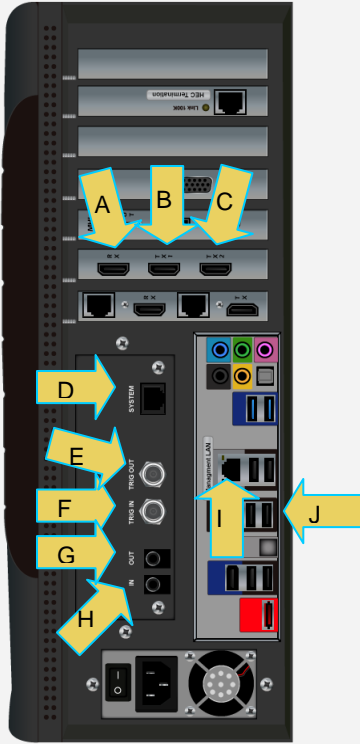
2.3 Connector Description

This User Guide covers three configurations of the 980 rear panels with the MHL CBUS Compliance test module installed. Each illustration shows the CBUS Compliance test module installed in the 980/980B. Use the following table to identify the connector function and descriptions on your 980/980B system configuration.

980 Configurations	Information / Function
CBUS Compliance Module - 980	<p>The following is a description of each connector:</p> <p>980 MHL CBUS module:</p> <ul style="list-style-type: none"> ▪ A – MHL OUT connector for running tests on MHL CBUS compliance tests on dongle devices. ▪ B – MHL IN connector for running tests on MHL CBUS compliance tests on source devices. ▪ C – MHL IN connector and HDMI cable connection to run MHL CBUS compliance tests on sink devices.

980 Configurations	Information / Function
	<p>QD Bus Board (99-000631):</p> <ul style="list-style-type: none"> ▪ D – Ethernet Tx connector use for HEAC function. Not used for CBUS compliance testing. ▪ E – BNC Trig OUT connector. Not used for CBUS compliance testing. ▪ F – BNC Trig IN connector. Not used for CBUS compliance testing. ▪ G – RCA OUT connector for SPDIF function. Not used for CBUS compliance testing. ▪ H – RCA IN connector for SPDIF function. Not used for CBUS compliance testing. <p>Lower Panel:</p> <ul style="list-style-type: none"> ▪ K – Ethernet port for connection to PC host for 980 GUI Manager application, telnet for command line control and FTP for transferring files. ▪ L – Various USB ports for transferring files and restoring system.

Use the following table to identify the connector function and descriptions on your 980/980B system configuration.

980B Configurations	Information / Function
<p>CBUS Compliance Module – 980B</p> 	<p>The following is a description of each connector:</p> <p>980 MHL CBUS module:</p> <ul style="list-style-type: none"> ▪ A – MHL OUT connector for running tests on MHL CBUS compliance tests on dongle devices. ▪ B – MHL IN connector for running tests on MHL CBUS compliance tests on source devices. ▪ C – MHL IN connector and HDMI cable connection to run MHL CBUS compliance tests on sink devices. <p>QD Bus Board (99-000631):</p> <ul style="list-style-type: none"> ▪ D – Ethernet Tx connector use for HEAC function. Not used for CBUS compliance testing. ▪ E – BNC Trig OUT connector. Not used for CBUS compliance testing. ▪ F – BNC Trig IN connector. Not used for CBUS compliance testing. ▪ G – RCA OUT connector for SPDIF function. Not used for CBUS compliance testing. ▪ H – RCA IN connector for SPDIF function. Not used for CBUS compliance testing.

980B Configurations	Information / Function
	<p data-bbox="797 254 964 281">Lower Panel:</p> <ul data-bbox="797 306 1430 485" style="list-style-type: none"><li data-bbox="797 306 1430 411">▪ I – Ethernet port for connection to PC host for 980 GUI Manager application, telnet for command line control and FTP for transferring files.<li data-bbox="797 426 1430 485">▪ J – Various USB ports for transferring files and restoring system.

3 MHL CBUS Source Compliance Tests

This chapter describes how to run the MHL CBUS source compliance tests. Please note you will have to purchase the optional 980 MHL CBUS Compliance Test module in order to run these tests. These procedures assume that you have the 980 Advanced Test Platform powered up and the 980 GUI Manager up and running.

The 980 MHL CBUS Compliance test module supports the following test sections in the MHL 1.2 and MHL 2.0 Compliance Test specifications:

3.1 Electrical Tests

- 3.1.13 Rx Sense Impedance

3.2 System Tests

- 3.2.6 EDID and Device Capability Register Tests
 - 3.2.6.1 EDID Reading Test
 - 3.2.6.2 Device Capability Registers Test
- 3.2.7 RCP Sub-Command Tests
- 3.2.9 3D Tests
 - 3.2.9.1 3D Video Mode Support (MHL CTS 2.0 only)
- 3.2.10 UCP Sub-Command Tests (MHL CTS 2.0 only)

3.3 CBUS Tests

- 3.3.1 CBUS Source DUT Common Test Equipment Setups
- 3.3.2 CBUS Source DUT Common Methodologies
- 3.3.3 Link Layer Electrical – Source: Absolute Maximum Voltages
- 3.3.4 Link Layer Timing – Source DUT Output: Pre-Discovery
- 3.3.5 Link Layer Electrical – Source DUT Output: Discovery
- 3.3.6 Link Layer Timing – Source DUT Output: Discovery
- 3.3.7 Link Layer Electrical – Source DUT Output: Arbitration/Sync/Data Signaling
- 3.3.8 Link Layer Timing – Source DUT Output: Arbitration/Sync/Data in Nanoseconds
- 3.3.9 Link Layer Timing – Source DUT Output: Arbitration/Sync/Data in Bit Times
- 3.3.10 Link Layer Timing – Source DUT Output: Link-Level NACK
- 3.3.11 Link Layer Timing – Source DUT Output: ACK
- 3.3.12 Link Layer Timing – Source DUT Output: Bus Re-Arbitration
- 3.3.13 Link Layer Behavior – Source DUT Output: Ill-formed packets
- 3.3.14 Link Layer Timing – Source DUT Input: Discovery
- 3.3.15 Link Layer Electrical – Source DUT Input: Arbitration/Sync/Data signaling
- 3.3.16 Link Layer Timing – Source DUT Input: Arbitration
- 3.3.17 Link Layer Timing – Source DUT Input: Data
- 3.3.18 Link Layer Timing – Source DUT Input: NACK
- 3.3.19 Link Layer Timing – Source DUT Input: ACK
- 3.3.20 Link Layer Timing – Source DUT Input: Bus Re-Arbitration

- 3.3.21 Link Layer Behavior – Source DUT Input: Ill-formed packets
- 3.3.22 Link Layer Timing – Source DUT Input: Disconnect
- 3.3.23 Link Layer Electrical – Source DUT VBUS Control

6.3 CBUS Common Tests

- 6.3.1 MSC – Source and Sink DUT Input: Device Register Space Contents; Reads
- 6.3.2 MSC – Source and Sink DUT Output: NACK Packet Response to MSC_MSG
- 6.3.3 MSC – Source and Sink DUT Output: Never Initiates Bad Commands
- 6.3.4 MSC – Source and Sink DUT Output: NACK Packet Response to MSC_MSG
- 6.3.5 MSC – Source and Sink DUT Output: Never Initiates Bad Commands
- 6.3.6 MSC – Source and Sink DUT Output: Errors and Exceptions
- 6.3.7 MSC – Source and Sink DUT Output: Disconnect
- 6.3.8 MSC – Source and Sink DUT Input: Device Register Space Contents; Writes
- 6.3.9 MSC – Source and Sink DUT Input: Vendor Specific and Reserved Header Values
- 6.3.10 MSC – Source and Sink DUT Input: Normal Commands
- 6.3.11 MSC – Source and Sink DUT Input: Errors and Exceptions
- 6.3.12 MSC – Source and Sink DUT Input: Argument Timeouts
- 6.3.13 MSC – Source DUT Output: Never Initiates Bad Commands
- 6.3.14 MSC – Source DUT Input: Normal Commands
- 6.3.17 DDC – Source DUT Output; DUT Never Sends Illegal DDC Command
- 6.3.18 DDC – Source DUT Output; Normal Operation
- 6.3.19 DDC – Source DUT Output; Illegal Responses

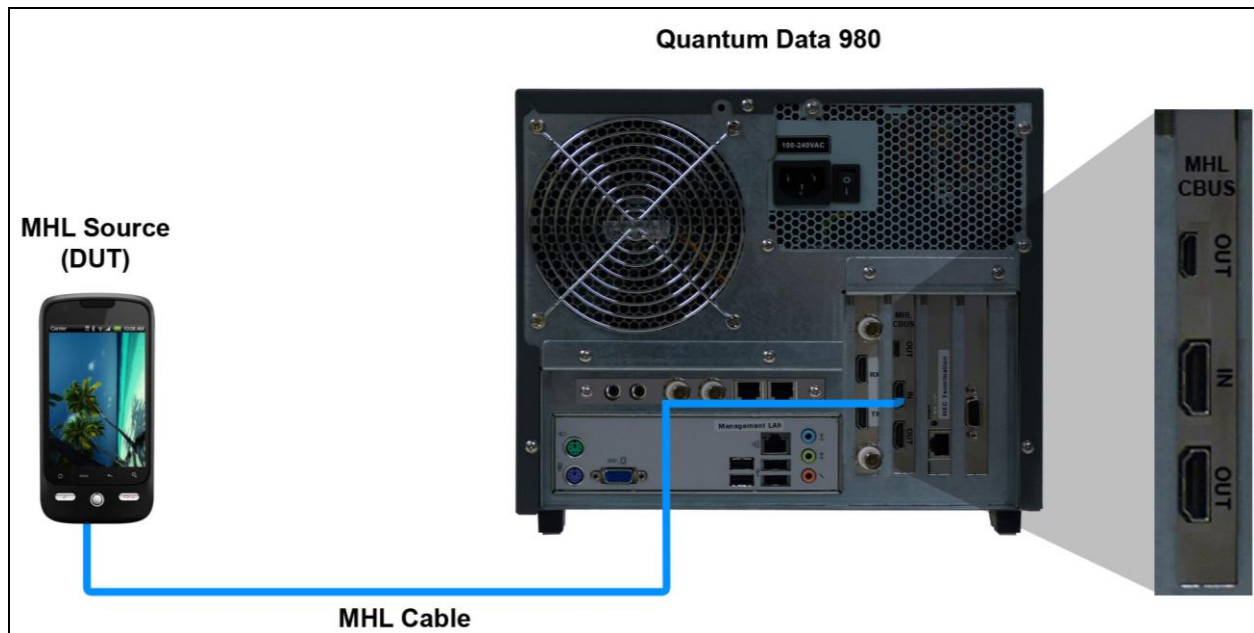
3.1 Workflow for running the MHL CBUS Source Compliance Tests

The list below is the high level workflow for running the MHL CBUS Source Compliance Tests. Note that the installation of the external 980 GUI Manager and the Ethernet session are optional; you can run the compliance tests through the embedded GUI Manager.

1. Power up the 980. Refer to the procedures in 980 Advanced Test Platform Quick Start Guide available from the quantum data website on the downloads page.
2. (Optional; only necessary if using the external 980 GUI Manager) Establish an Ethernet/IP connection between the external 980 GUI Manager and the 980.
3. Connect the MHL source device under test to the CBUS Rx ports on the 980 MHL CBUS Compliance Test module.
4. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.
5. Select the tests that you wish to run from the **Test Selection** panel.
6. Initiate the tests through the **Test Options / Review** panel.
7. View the detailed data for test failures if failures occur.
8. View the results in the **Test Results** panel under the **Navigator** panel.

3.2 Making the physical MHL connections

This subsection describes the physical MHL connections required to run the MHL CBUS source compliance tests.



Connections for MHL CBUS source compliance test – 980

To make the physical MHL connections:

This procedure assumes that you have assembled the 980 with the MHL CBUS Compliance Test module and the MHL source device under test and applied power to all these devices. Refer to the procedures below and the diagram above.

1. Connect your MHL source device under test to the MHL IN connector on the 980 MHL CBUS Compliance Test module. Use the short (30 centimeter) MHL cable provided by Quantum Data.

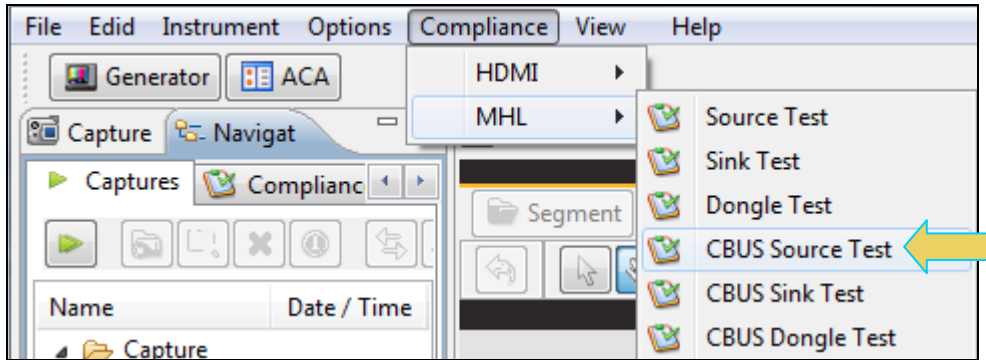
3.3 Completing the CDF

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

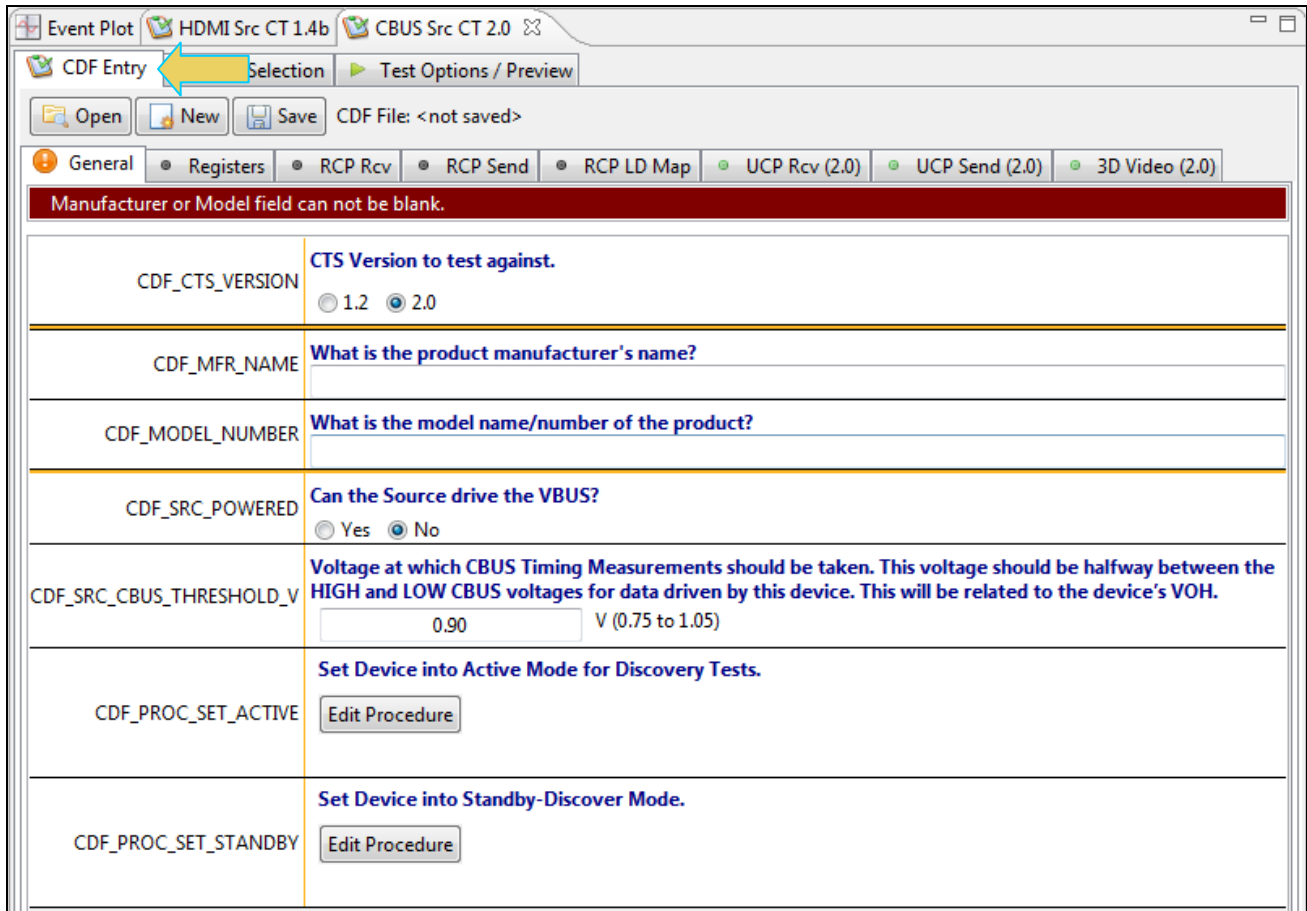
Note: The example workflows and screens use MHL 2.0 except where noted. Workflow and screens are similar for testing MHL 1.2 devices.

To complete the CDF:

1. From the **View** menu, enable viewing of the **MHL CBUS Src CT** panel.

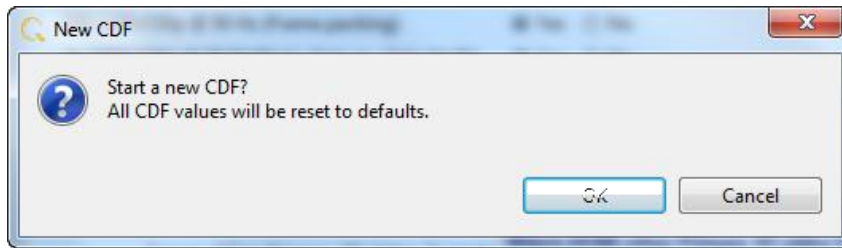


2. Select the **CDF Entry** panel as shown below.



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

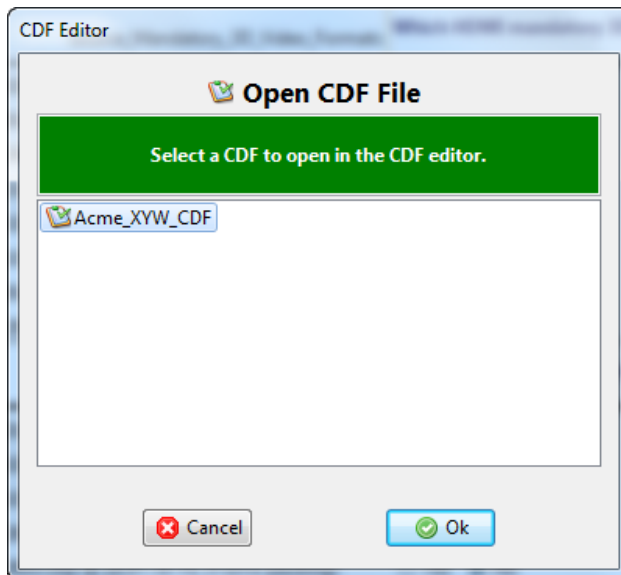
You will be prompted with a confirmation that you want to start a new CDF and reset the values. Click **OK** to proceed.



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

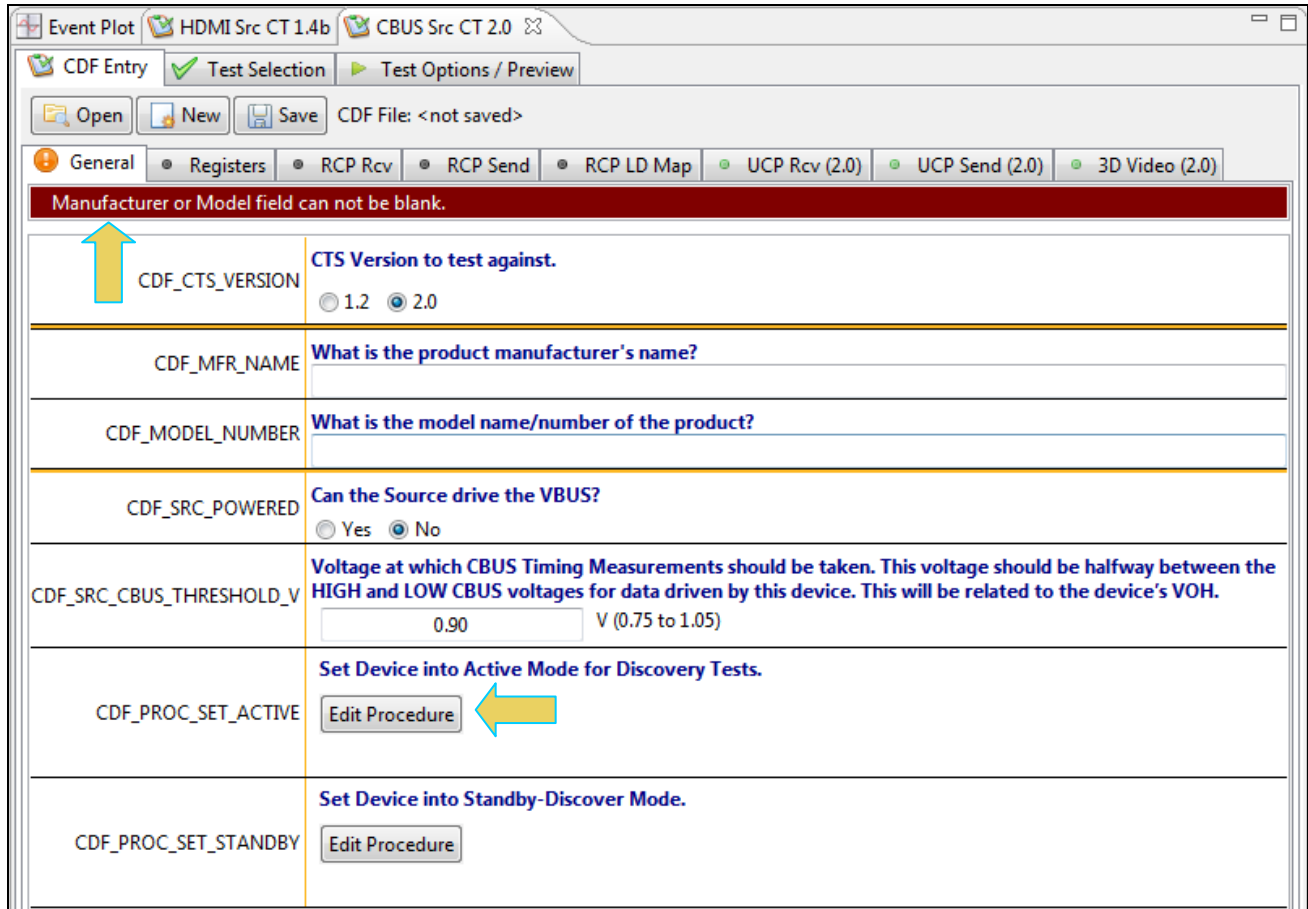
You will be prompted with a dialog box that enables you to open a CDF. Select a CDF and then **OK** to proceed.

Note: You can save these CDFs to your PC for use on other PCs and by other colleagues.



- 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. This is shown in the example below.

You can enter helpful information using the “Edit Procedure” dialog box. The information entered into this dialog box will appear during the test and can be helpful to instruct users on running a particular test.



When you have entered in all the required fields the error indication will go away as shown in the example below.

Event Plot HDMI Src CT 1.4b CBUS Src CT 2.0

CDF Entry Test Selection Test Options / Preview

Open New Save CDF File: <not saved>

General Registers RCP Rcv RCP Send RCP LD Map UCP Rcv (2.0) UCP Send (2.0) 3D Video (2.0)

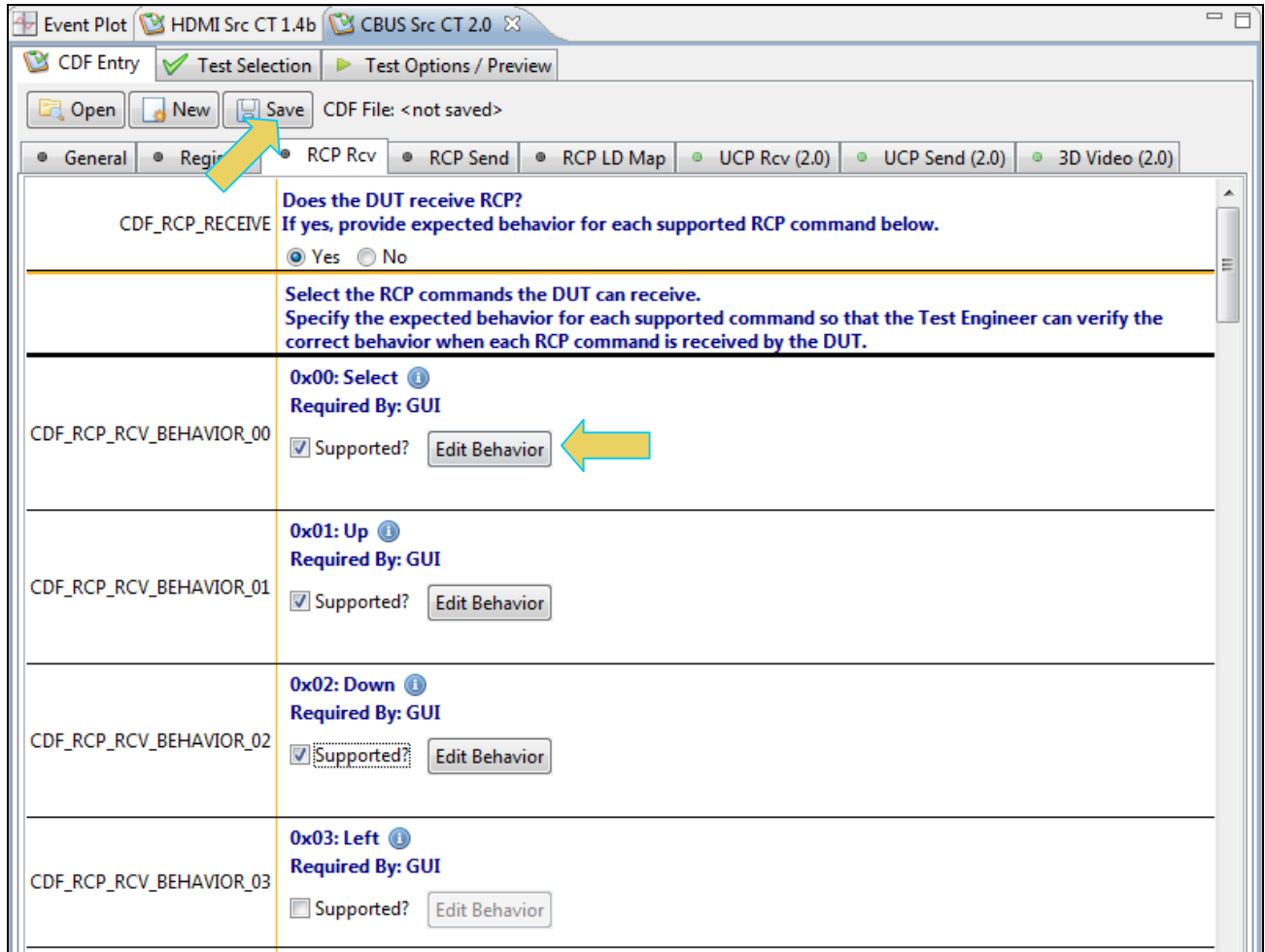
CDF_CTS_VERSION	<p>CTS Version to test against.</p> <p><input type="radio"/> 1.2 <input checked="" type="radio"/> 2.0</p>
CDF_MFR_NAME	<p>What is the product manufacturer's name?</p> <p>Acme</p>
CDF_MODEL_NUMBER	<p>What is the model name/number of the product?</p> <p>XYZ</p>
CDF_SRC_POWERED	<p>Can the Source drive the VBUS?</p> <p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>
CDF_SRC_CBUS_THRESHOLD_V	<p>Voltage at which CBUS Timing Measurements should be taken. This voltage should be halfway between the HIGH and LOW CBUS voltages for data driven by this device. This will be related to the device's VOH.</p> <p>0.90 V (0.75 to 1.05)</p>
CDF_PROC_SET_ACTIVE	<p>Set Device into Active Mode for Discovery Tests.</p> <p>Edit Procedure</p>
CDF_PROC_SET_STANDBY	<p>Set Device into Standby-Discover Mode.</p> <p>Edit Procedure</p>

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

	Declare the expected value of each of the DUT's Capability Registers.	
CDF_CR_MHL_VER_MAJOR	Register: MHL_VERSION Field: MHL_VER_MAJOR 1	
CDF_CR_MHL_VER_MINOR	Register: MHL_VERSION Field: MHL_VER_MINOR 0	
CDF_CR_DEV_TYPE	Register: DEV_CAT Field: DEV_TYPE <input type="radio"/> (1) Sink <input checked="" type="radio"/> (2) Source <input type="radio"/> (3) Dongle	
CDF_CR_ADOPTER_ID_H	Register: ADOPTER_ID_H Field: ADOPTER_ID_H 0 00 - FF	
CDF_CR_ADOPTER_ID_L	Register: ADOPTER_ID_L Field: ADOPTER_ID_L 0 00 - FF	
CDF_CR_DEVICE_ID_H	Register: DEVICE_ID_H Field: DEVICE_ID_H 0 00 - FF	
CDF_CR_DEVICE_ID_L	Register: DEVICE_ID_L Field: DEVICE_ID_L 0 00 - FF	
CDF_CR_BANDWIDTH	Register: BANDWIDTH Field: BANDWIDTH 15 5..15	
CDF_CR_INT_SIZE	Register: INT_STAT_SIZE Field: INT_SIZE 4 4..15	
CDF_CR_STAT_SIZE	Register: INT_STAT_SIZE Field: STAT_SIZE 4 4..15	
CDF_CR_SP_SIZE	Register: SCRATCHPAD_SIZE Field: SP_SIZE 0 0 or 16..64	

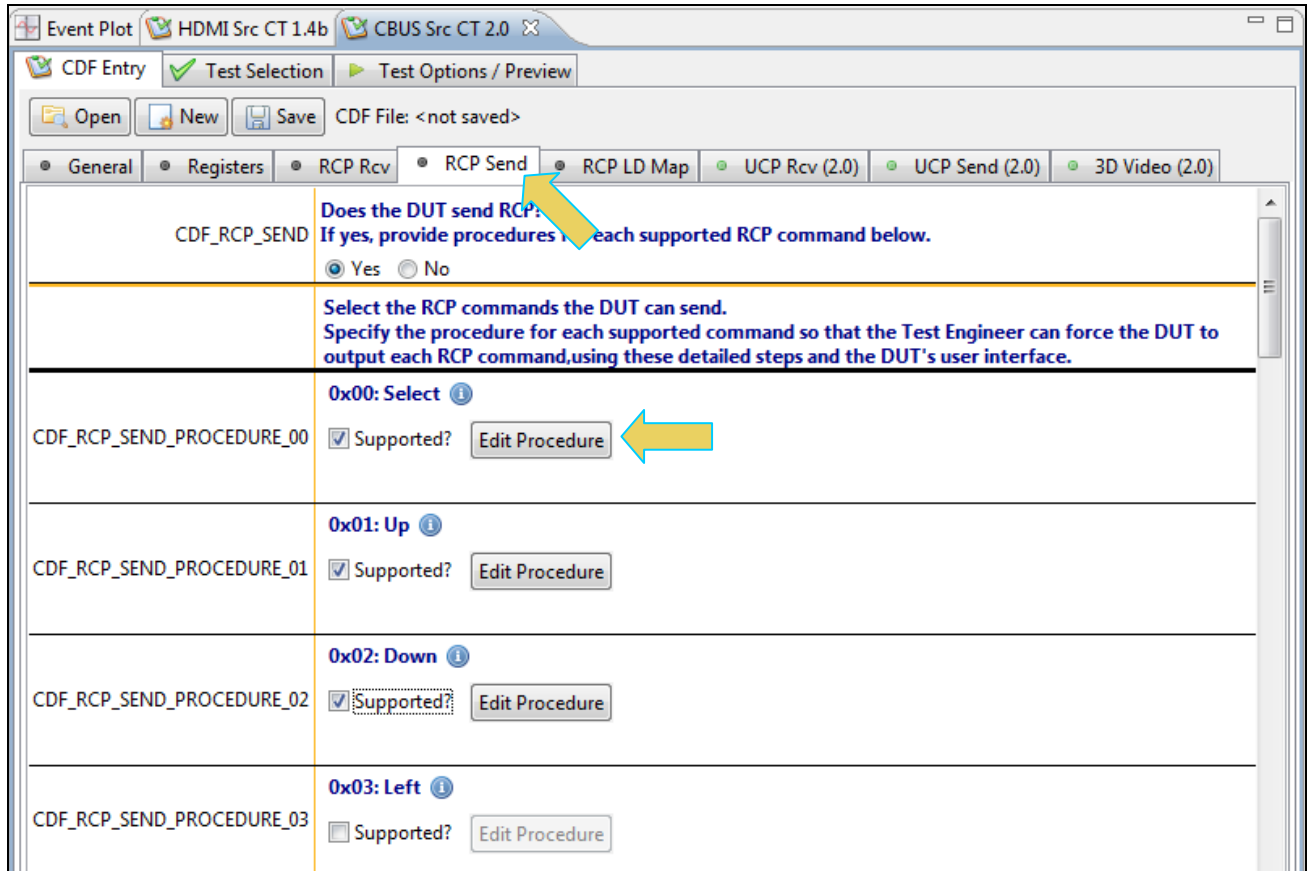
7. Complete the items in the **RCP Rcv** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test. You can enter in the expected behavior for each supported command so that the test engineer can verify that the source DUT behaves properly when receiving the various RCP commands.



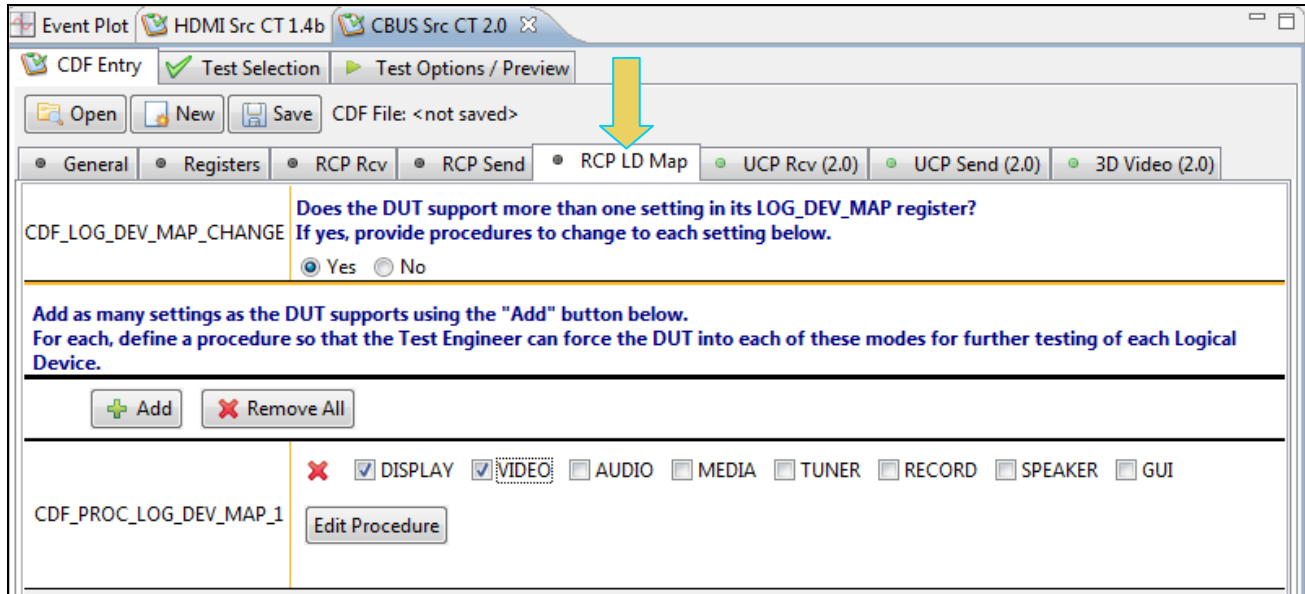
8. Complete the items in the **RCP Send** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test and can be helpful to instruct a test engineer on how to set up a device in order to run a particular test. In the example below you would enter in procedural information which a test engineer could use to cause the source to issue the various RCP commands.



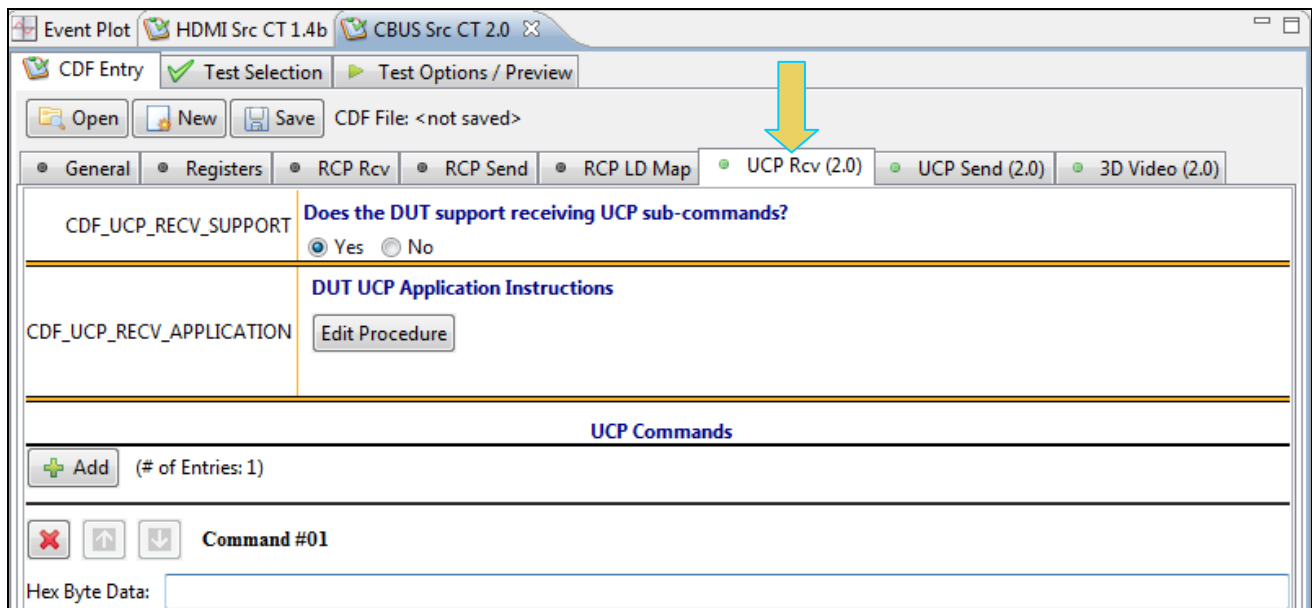
9. Complete the items in the **RCP LD Map** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test to assist the test engineer. In the example below you would enter in procedural information which a test engineer could use to force the source into the proper mode for further testing of each logical device.



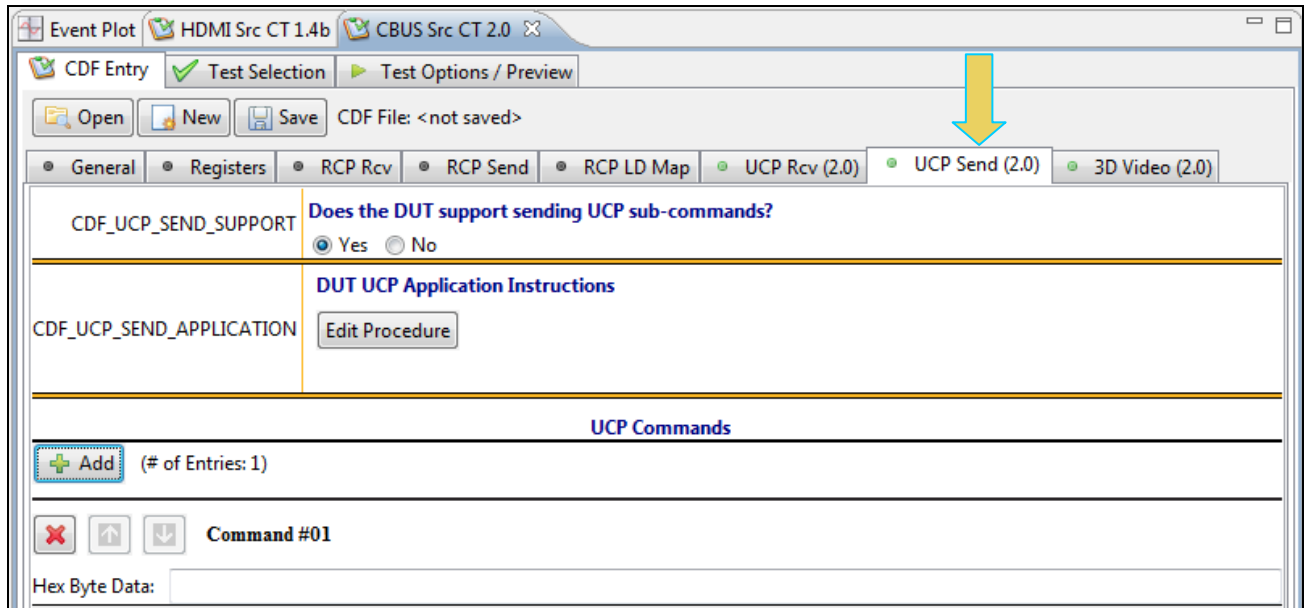
10. Complete the items in the **UCP Rcv** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test to assist a test engineer. You can enter in the expected behavior for each supported command so that the test engineer can verify that the source DUT behaves properly when receiving the various UCP commands.

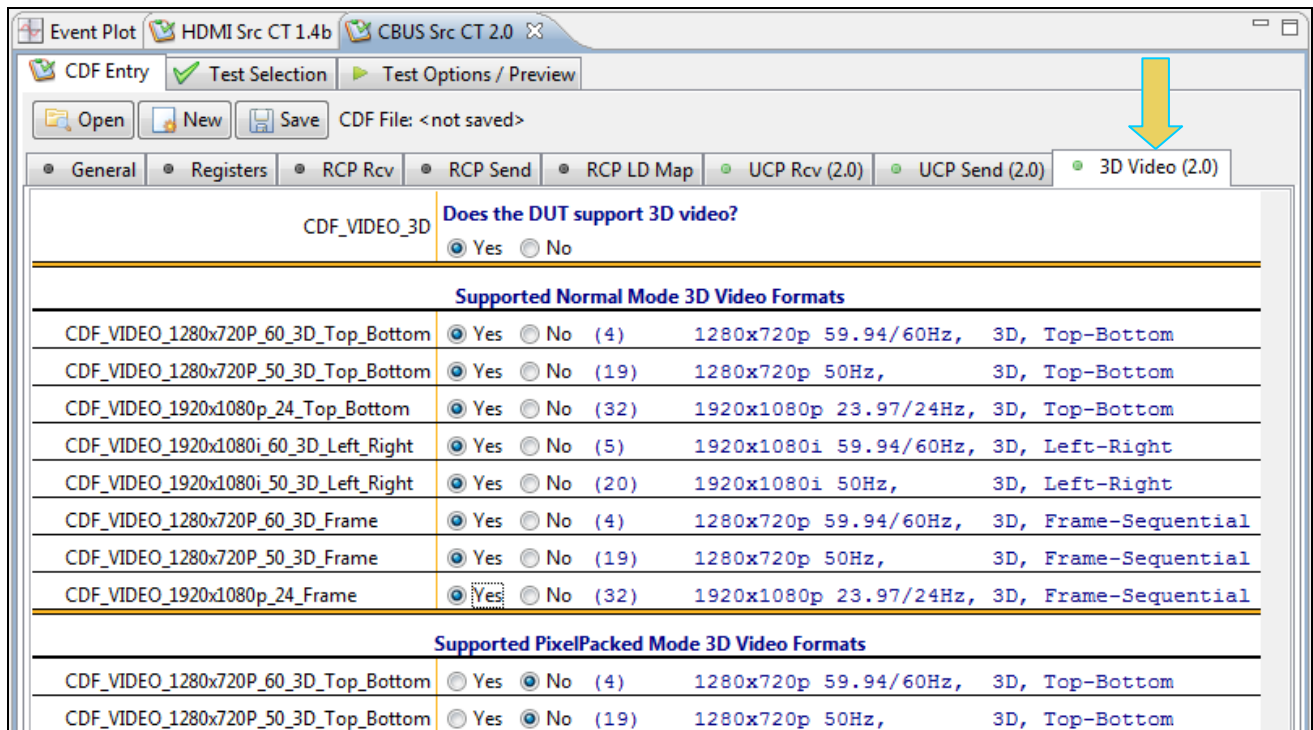


11. Complete the items in the **UCP Send** tab.

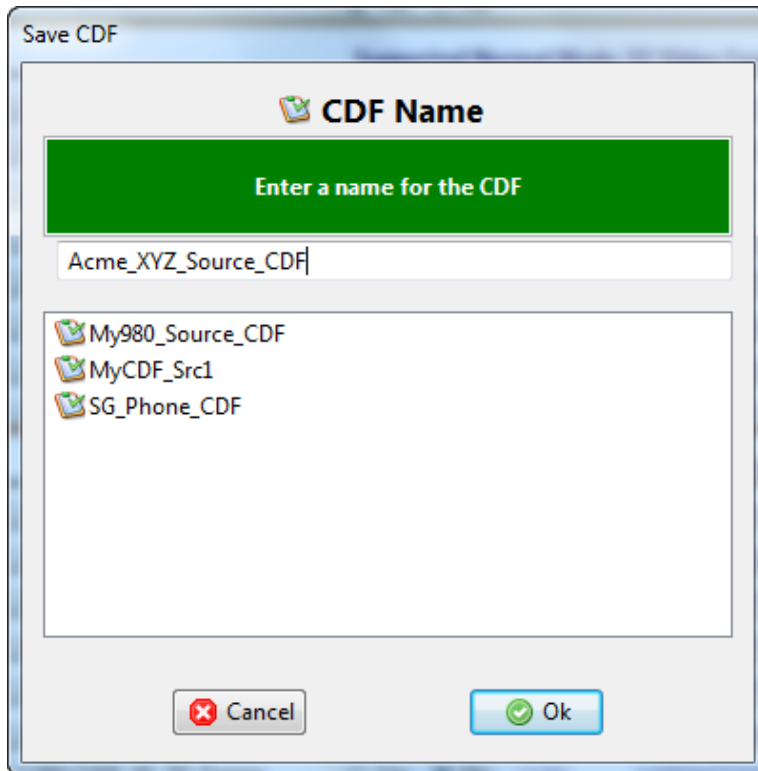
You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test and can be helpful to instruct a test engineer on how to set up a device in order to run a particular test. In the example below you would enter in procedural information which a test engineer could use to cause the source to issue the various UCP commands.



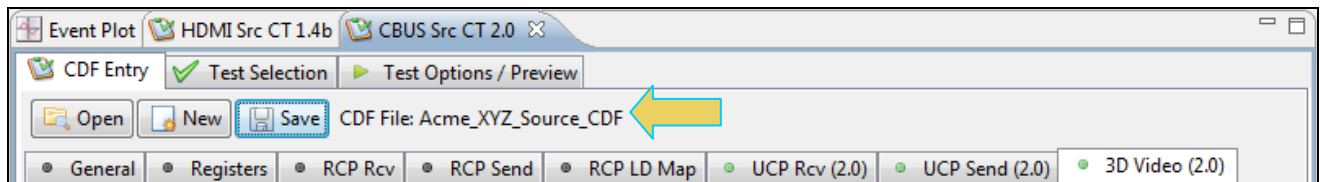
12. Complete the items in the **3D Video** tab.



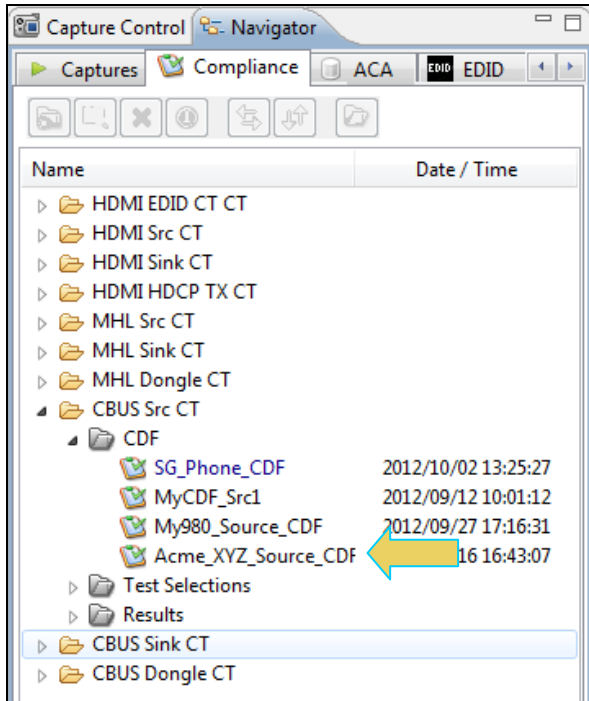
13. Save the CDF. A confirmation box with a default name will appear as shown below. Edit the name if necessary and click OK.



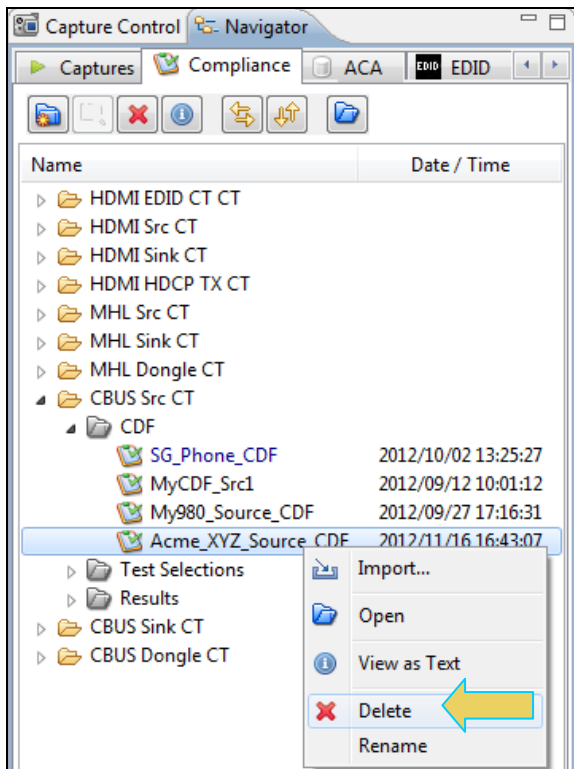
The name of the CDF will appear next to the **Save** button as shown below:



You can then view the CDF or load other CDFs from the Navigator/Compliance view as shown below:



You can open for use these CDF files using the right click **Open** menu item as shown below. You can also delete a CDF or rename it. If you wish to view a text file of the CDF you can do so by selecting **View as Text**. In some cases you might want to share these files with other colleagues. Since these files are stored locally on your PC you can simply email them. Conversely if you wish to import a CDF file from another user for use on your application you can do that using the **Import** function on the right click menu also show below.



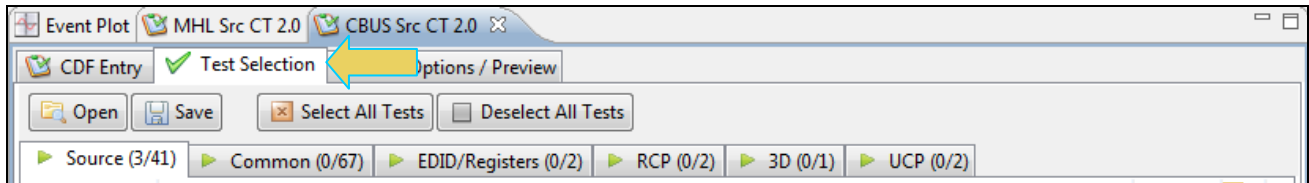
3.4 Selecting which tests to run

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

Note: The example workflows and screens use MHL 2.0 except where noted. Workflow and screens are similar for testing MHL 1.2 devices.

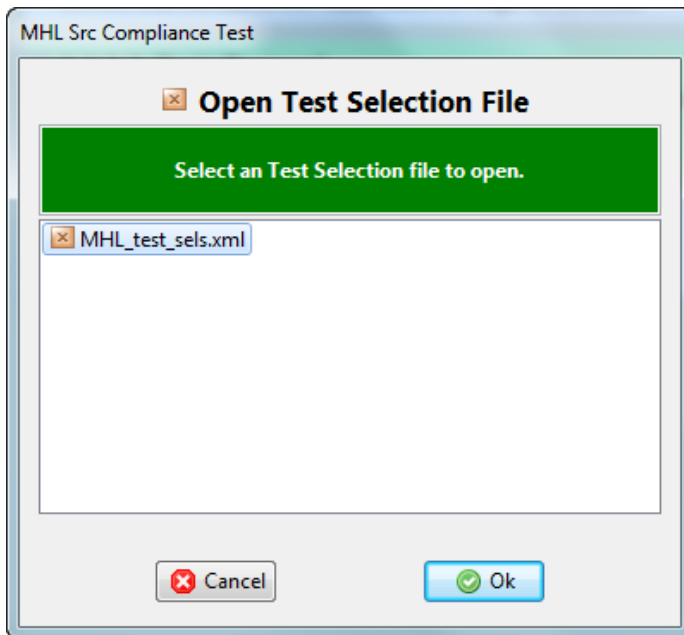
To select the tests to run:

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.

Note: You can save the Test Selection files to your host PC and transfer them to other PCs and for others to use.



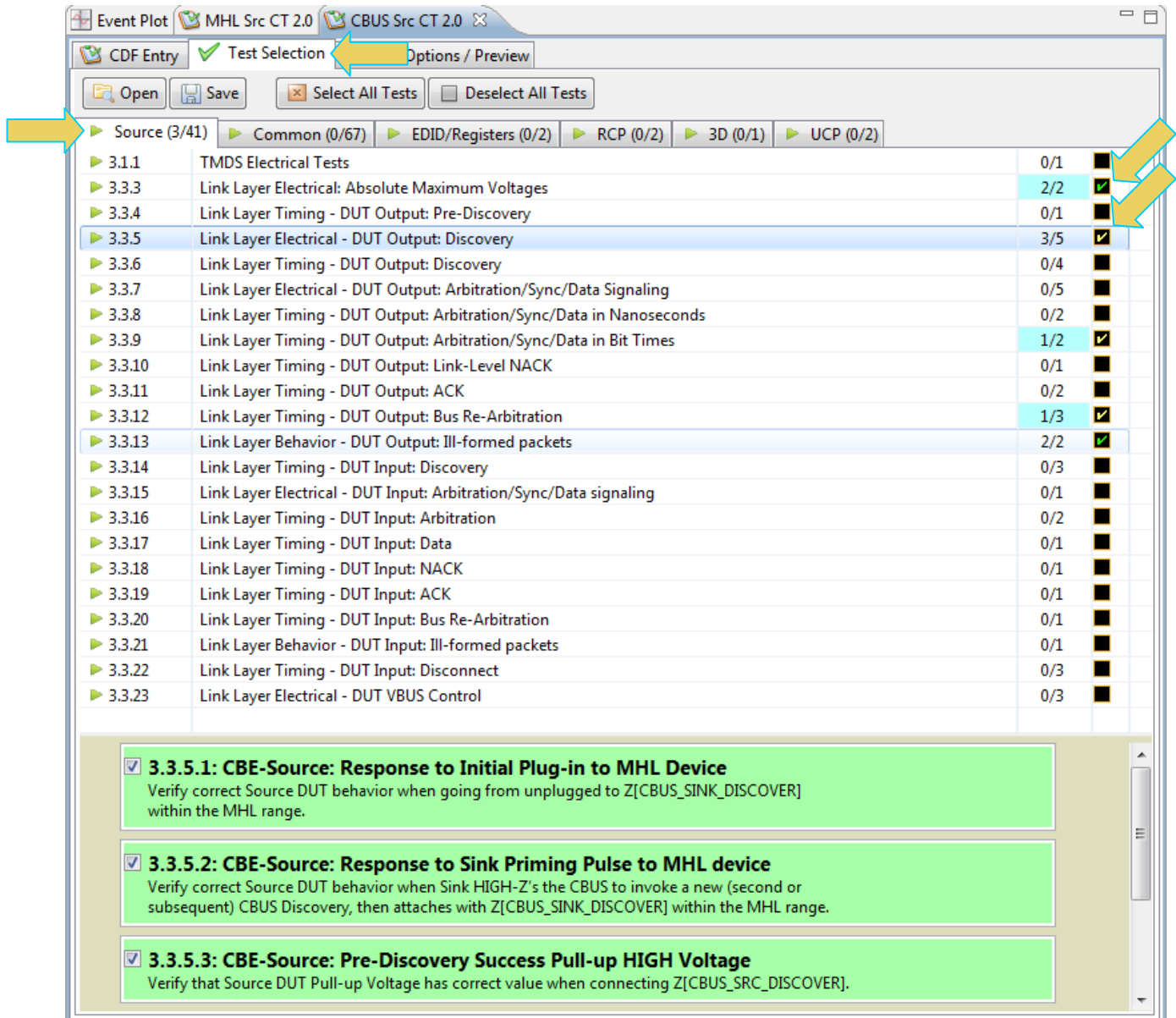
3. Complete the items in the **Source** tab of the **Test Selection** panel shown below.

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

Check box indicators inform how many tests in each section and how many are selected. Each tab (Source, Common or RCP) inform you of how many tests in that section have been selected.

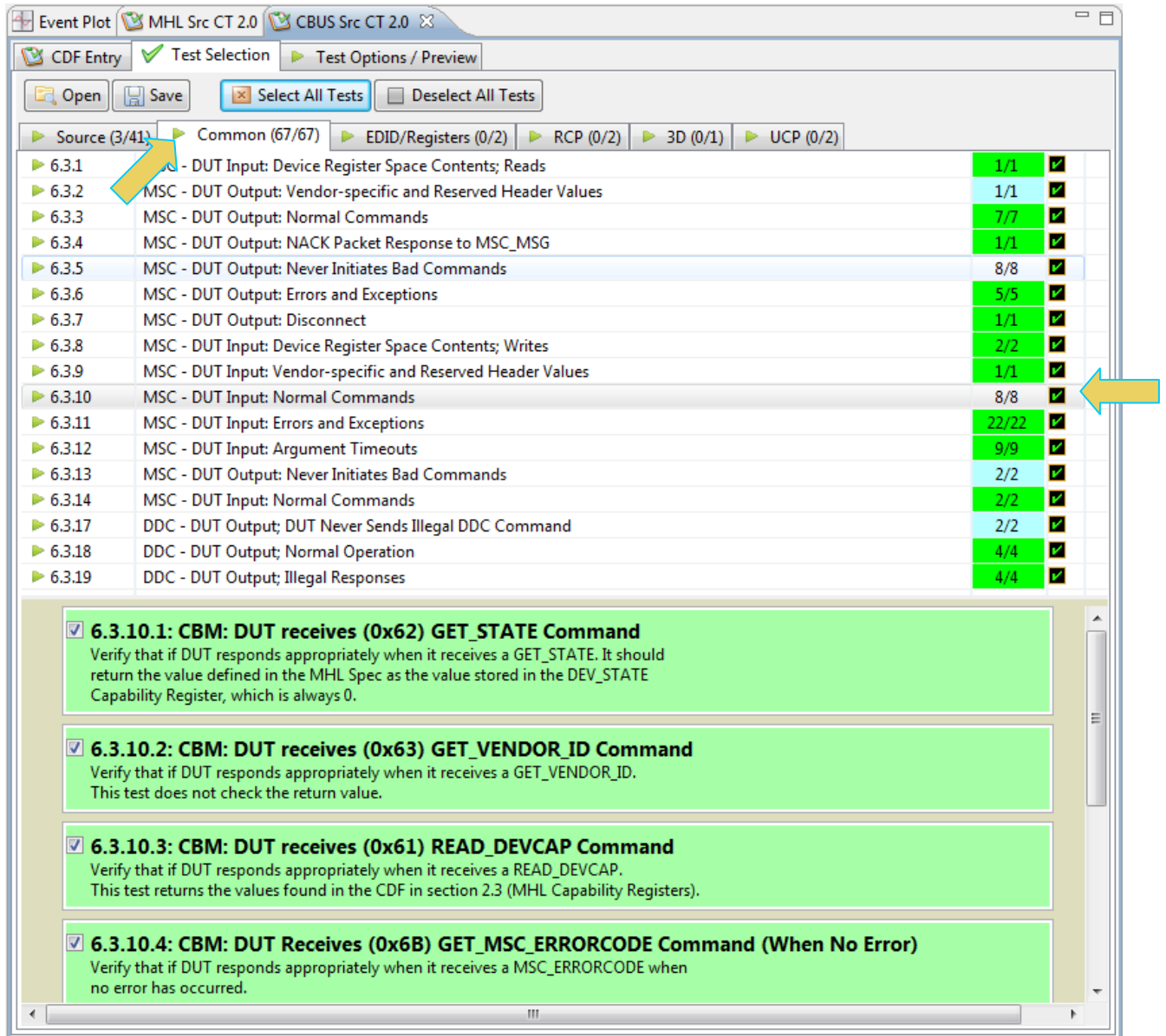
Each test section list includes several tests. In the example shown below the 3.2.6 EDID and Device Capability Register Test section is selected and the specific tests in that section are then available to be selected.

Note: Some tests are run in background and cannot be deselected.

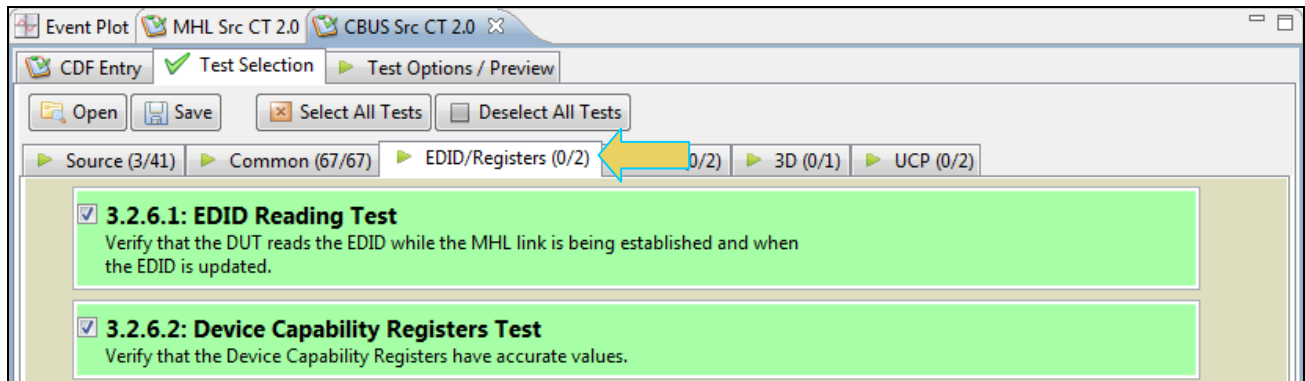


4. Complete the items in the **Common** tab of the **Test Selection** panel shown below.

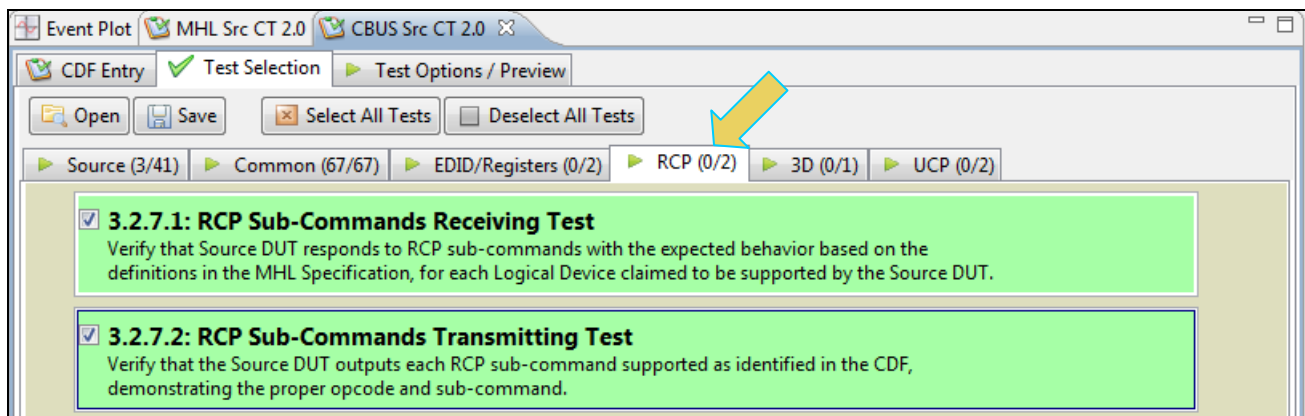
For convenience you can **Select All** or **Deselect All** tests using the activation buttons provided.



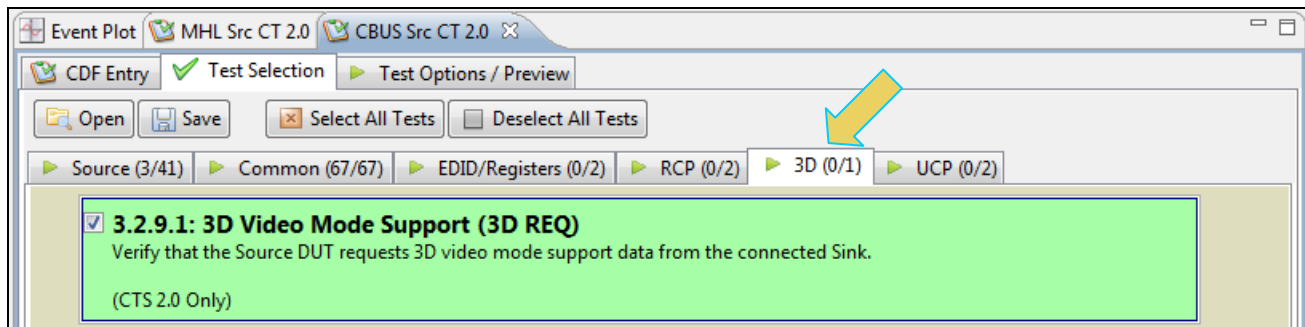
5. Complete the items in the **EDID Registers** tab of the **Test Selection** panel shown below.



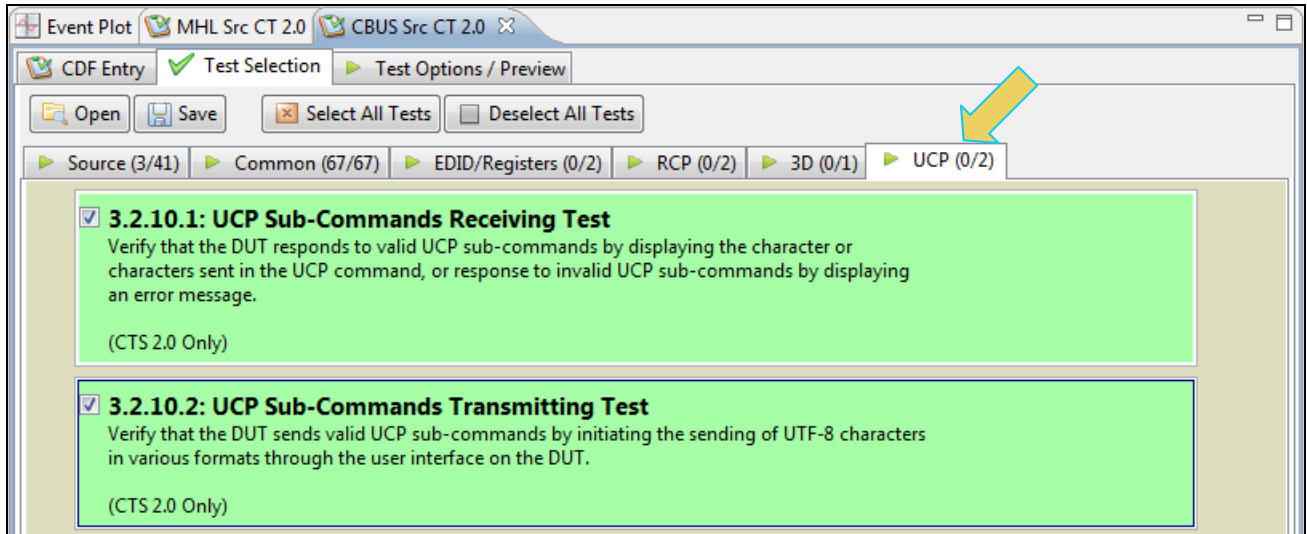
6. Complete the items in the **RCP** tab of the **Test Selection** panel shown below.



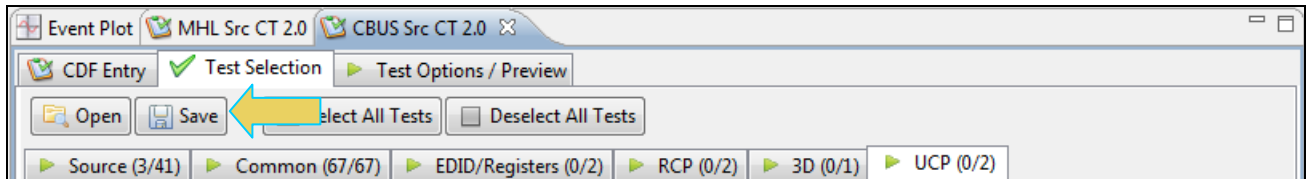
7. Complete the items in the **3D** tab of the **Test Selection** panel shown below.



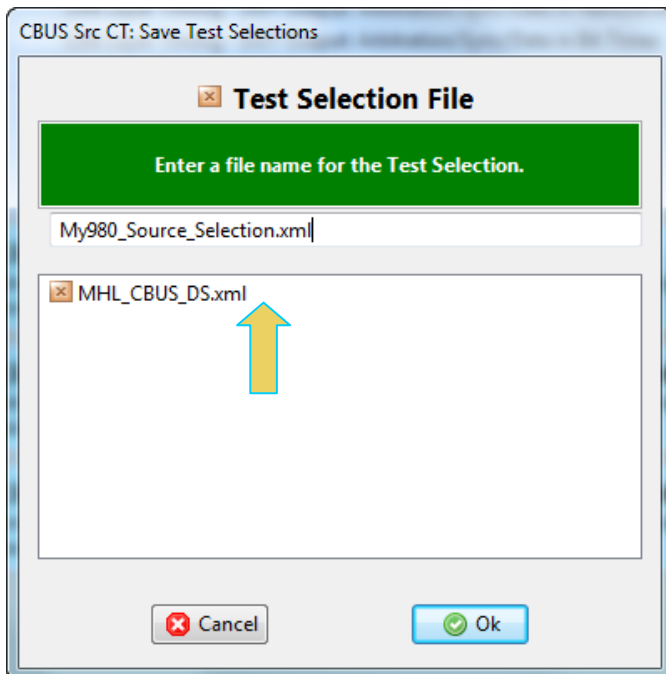
8. Complete the items in the **UCP** tab of the **Test Selection** panel shown below.



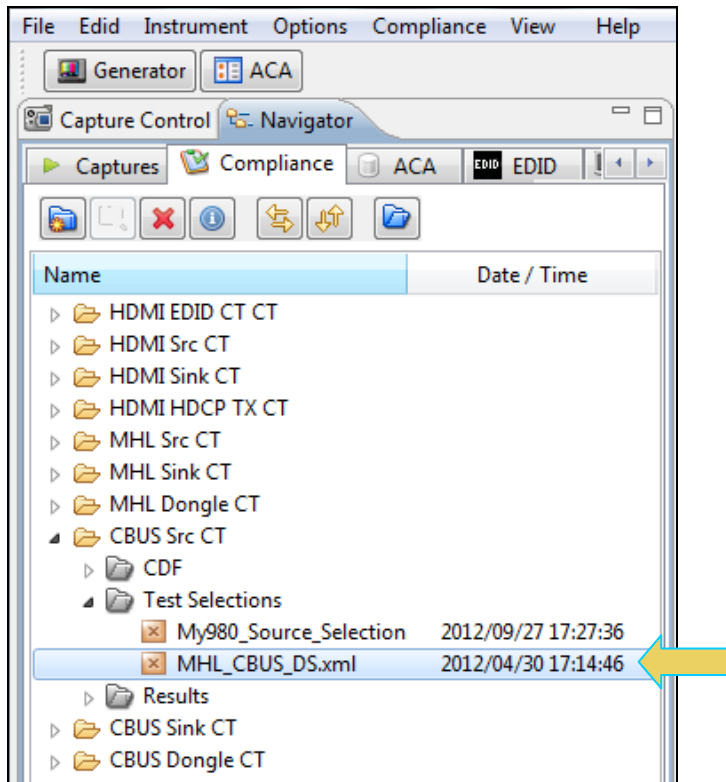
9. You can save the Test Selection options using the **Save** activation button.



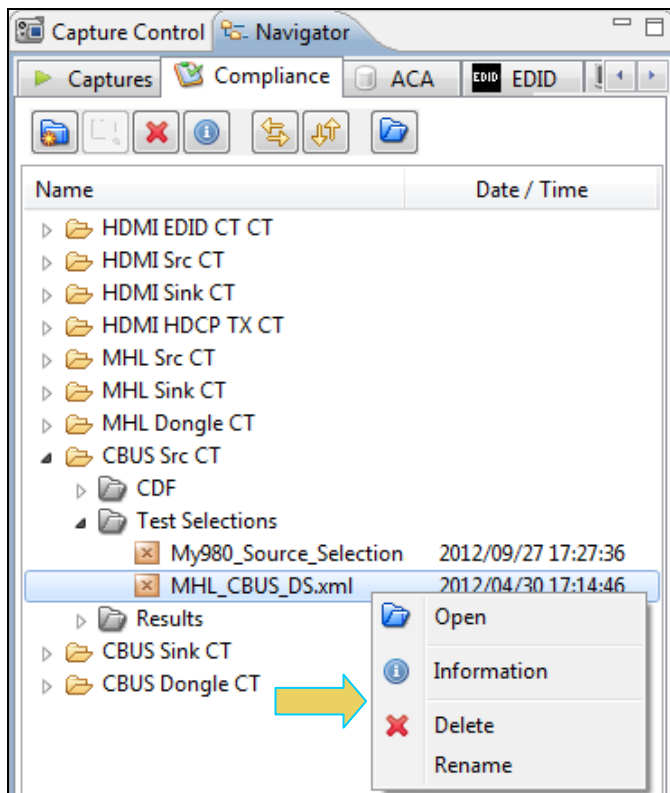
A dialog box will appear as follows. Simply assign a name and click on the **OK** activation button. Click **Cancel** to exit.



You can then view the Test Selection in the Navigator/Test Selections view as shown below. You can delete Test Selections and load Test Selections from this list as well.



You can use the right click menu to open, delete or rename a Test Selection file as shown below.



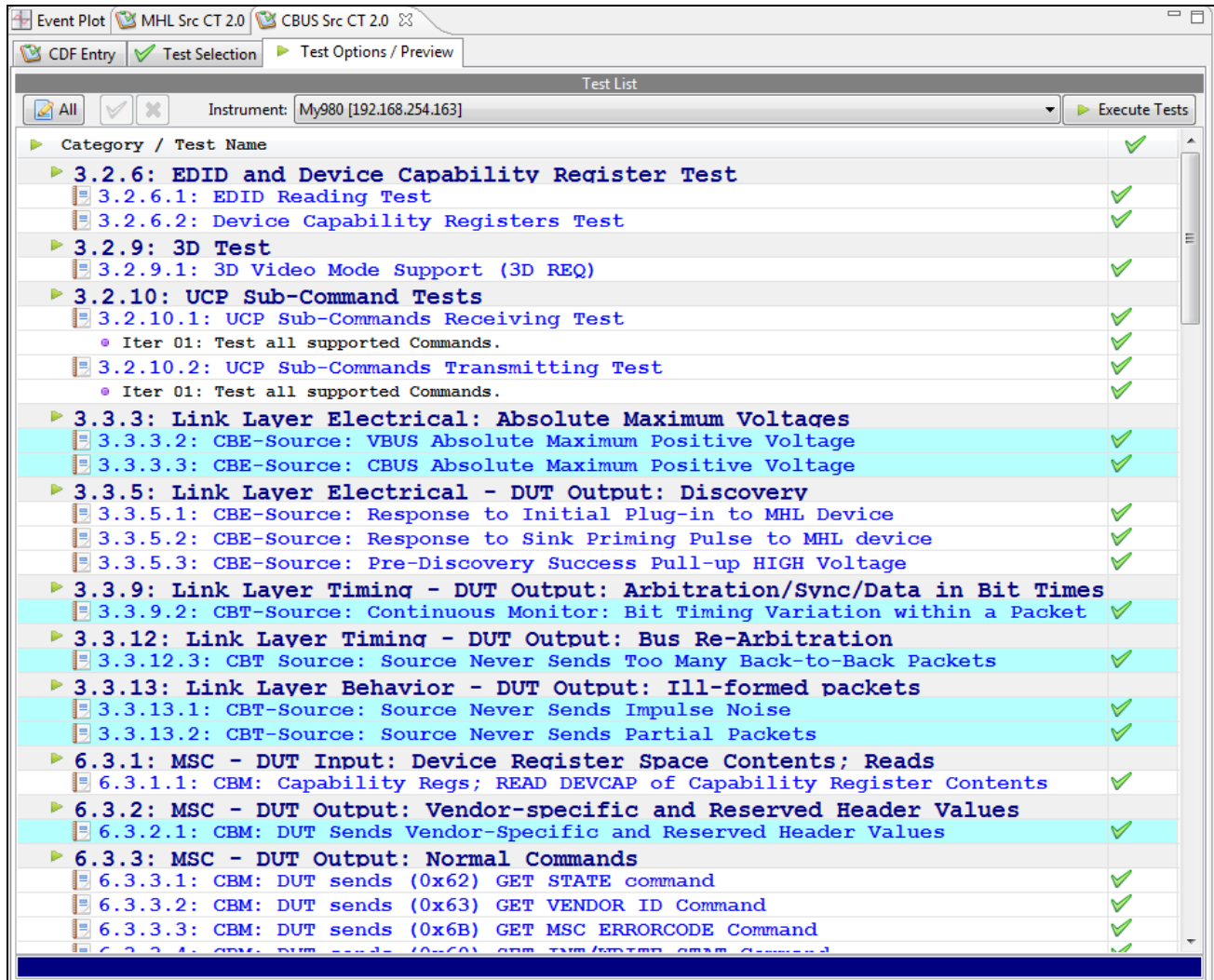
3.5 Executing the MHL CBUS Source Compliance Tests

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

Note: The example workflows and screens use MHL 2.0 except where noted. Workflow and screens are similar for testing MHL 1.2 devices.

To initiate a test series:

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



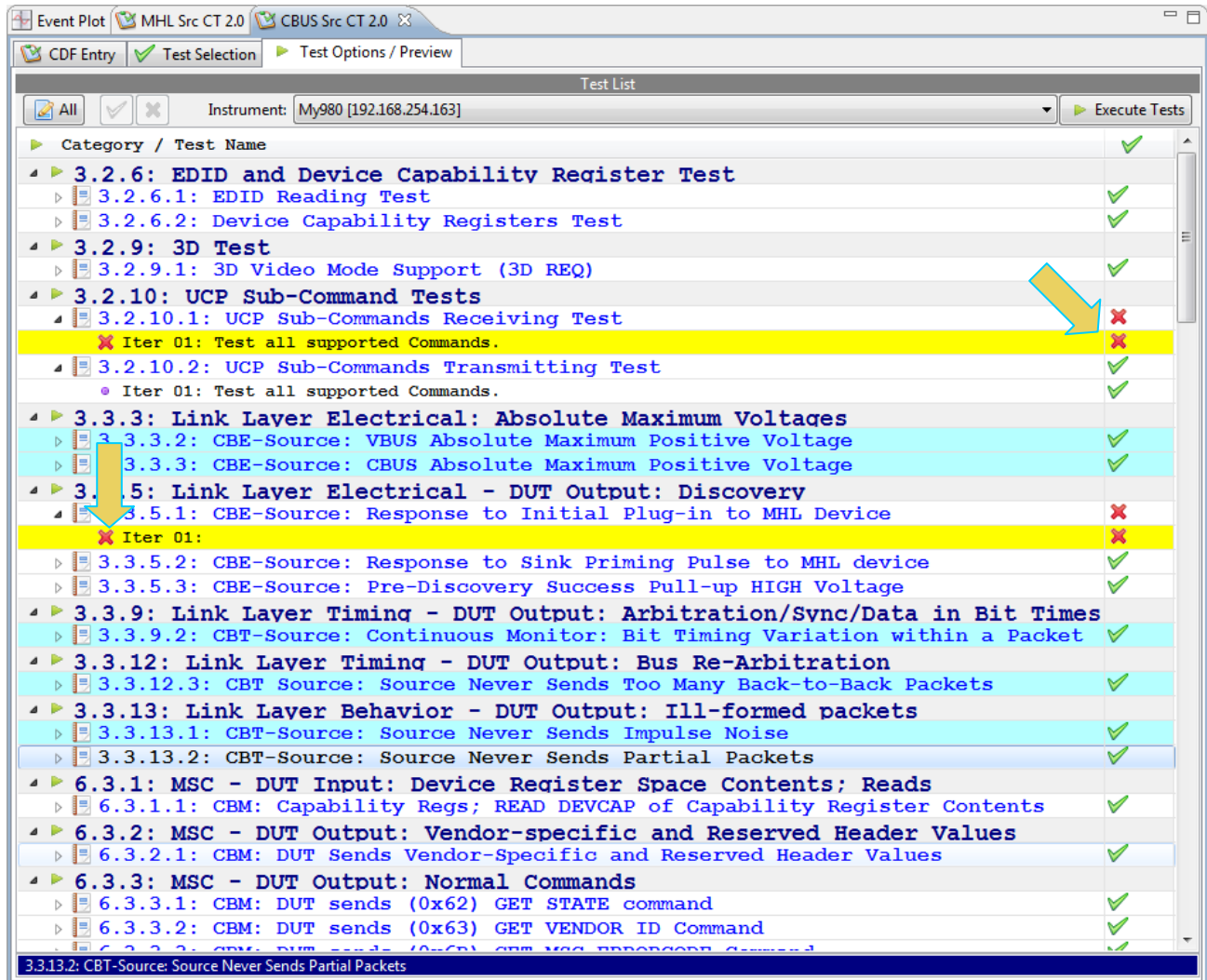
The screenshot shows a 'Test List' window with the following content:

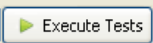
Instrument: My980 [192.168.254.163] Execute Tests

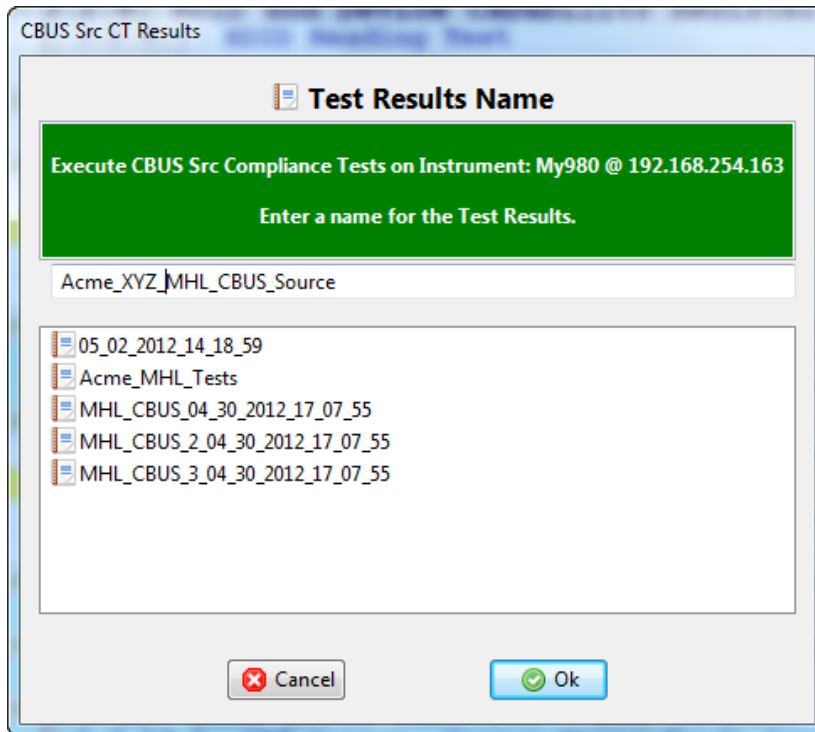
Category / Test Name	Status
▶ 6.3.1: MSC - DUT Input: Device Register Space Contents; Reads	✓
▶ 6.3.1.1: CBM: Capability Regs; READ DEVCAP of Capability Register Contents	✓
▶ 6.3.2: MSC - DUT Output: Vendor-specific and Reserved Header Values	✓
▶ 6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Values	✓
▶ 6.3.3: MSC - DUT Output: Normal Commands	✓
▶ 6.3.3.1: CBM: DUT sends (0x62) GET STATE command	✓
▶ 6.3.3.2: CBM: DUT sends (0x63) GET VENDOR ID Command	✓
▶ 6.3.3.3: CBM: DUT sends (0x6B) GET MSC ERRORCODE Command	✓
▶ 6.3.3.4: CBM: DUT sends (0x60) SET INT/WRITE STAT Command	✓
▶ 6.3.3.5: CBM: DUT sends (0x6C) WRITE BURST Command	✓
▶ 6.3.3.6: CBM: DUT sends (0x68) MSC MSG Command	✓
▶ 6.3.3.7: CBM: DUT sends (0x6A) GET DDC ERRORCODE Command	✓
▶ 6.3.4: MSC - DUT Output: NACK Packet Response to MSC MSG	✓
▶ 6.3.4.1: CBM: DUT Receives NACK to MSC MSG	✓
▶ 6.3.5: MSC - DUT Output: Never Initiates Bad Commands	✓
▶ 6.3.5.1: CBM: DUT Never Sends Reserved Commands	✓
▶ 6.3.5.2: CBM: DUT Never Sends Illegal Commands	✓
▶ 6.3.5.3: CBM: DUT Never Sends Data While No Command is Outstanding	✓
▶ 6.3.5.4: CBM: DUT Never Sends (0x33) ACK packet While No Command is Outstanding	✓
▶ 6.3.5.5: CBM: DUT Never Sends (0x34) NACK Packet While No Command is Outstanding	✓
▶ 6.3.5.6: CBM: DUT Never Sends (0x35) ABORT While No Command is Outstanding	✓
▶ 6.3.5.7: CBM: DUT Never Sends (0x32) EOF While No Command is Outstanding	✓
▶ 6.3.5.8: CBM: DUT never sends WRITE BURST Command without First Arbitrating	✓
▶ 6.3.6: MSC - DUT Output: Errors and Exceptions	✓
▶ 6.3.6.1: CBM: DUT Receives Bad Reply; Control instead of Data	✓
▶ 6.3.6.2: CBM: DUT Receives Bad Reply; Data instead of Control	✓
▶ 6.3.6.3: CBM: DUT Receives Bad Reply; Control, Control instead of Control, Data	✓
▶ 6.3.6.4: CBM: DUT Receives Result Timeout	✓
▶ 6.3.6.5: CBM: Verify No Next Command Until Hold-Off after ABORT Seen	✓
▶ 6.3.7: MSC - DUT Output: Disconnect	✓
▶ 6.3.7.1: CBM: DUT Receives Disconnect during Various Commands	✓
▶ 6.3.8: MSC - DUT Input: Device Register Space Contents; Writes	✓
▶ 6.3.8.1: CBM: Interrupt Regs; CBM: INTM (0x60): Valid Register Demand	✓

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

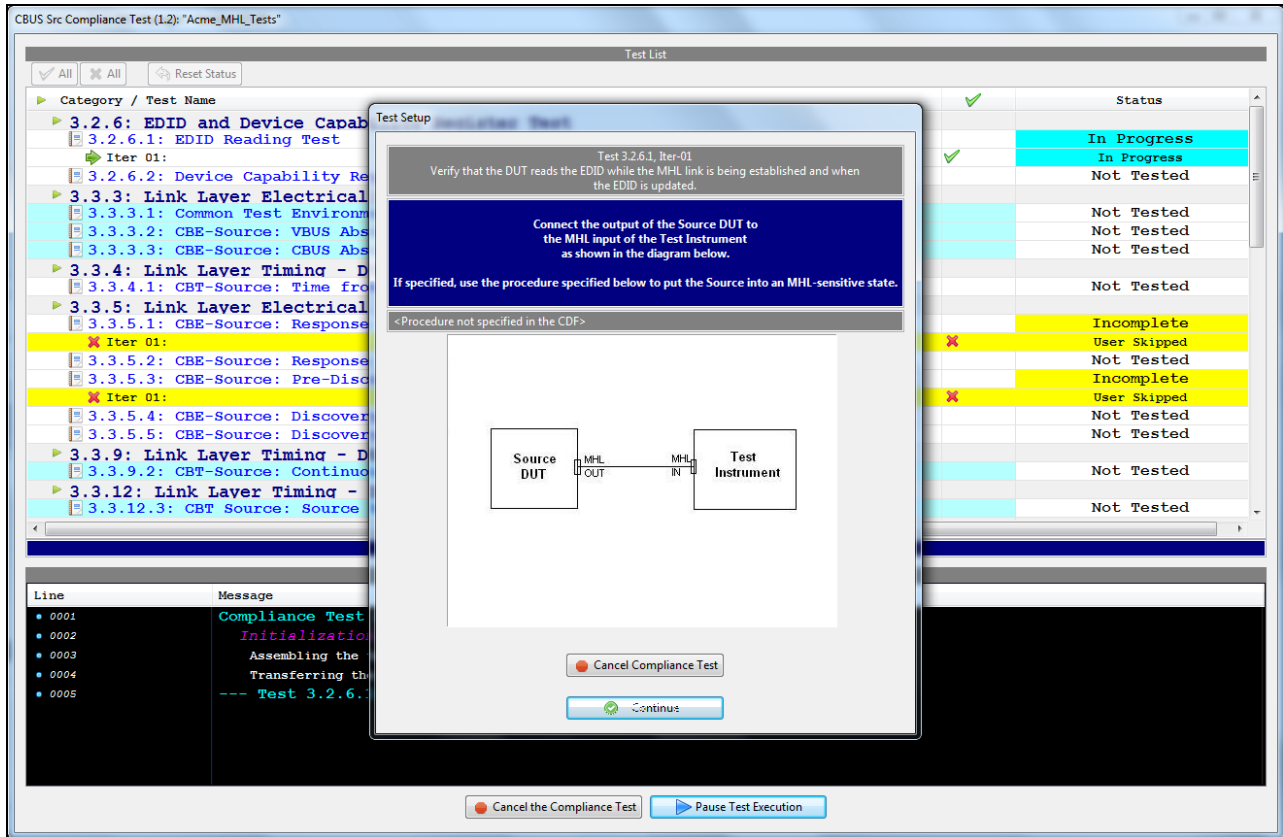
The screen shot below shows some of the tests that have been skipped (highlighted in yellow with a red X).



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



A screen will appear instructing you on how to connect your MHL CBUS source device for testing. A sample screen is shown below:



During the test, the test results are shown. 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 examples below.

CBUS Src Compliance Test (1.2): "Acme_MHL_Tests"

Test List

Category / Test Name	Status	Status
✘ Iter 01:	✘	User Skipped
▶ 3.3.5.2: CBE-Source: Response to Sink Priming Pulse to MHL device	✔	Fail
▶ Iter 01:	✔	Fail
▶ 3.3.5.3: CBE-Source: Pre-Discovery Success Pull-up HIGH Voltage	✔	Incomplete
✘ Iter 01:	✘	User Skipped
▶ 3.3.5.4: CBE-Source: Discovery Pulse Drive HIGH Voltage	✔	Pass
▶ Iter 01:	✔	Pass
▶ 3.3.5.5: CBE-Source: Discovery Pulse float LOW Voltage	✔	Pass
▶ Iter 01:	✔	Pass
▶ 3.3.9: Link Layer Timing - DUT Output: Arbitration/Sync/Data in Bit Times	✔	Pass
▶ 3.3.9.2: CBT-Source: Continuous Monitor: Bit Timing Variation within a Packet	✔	Pass
▶ 3.3.12: Link Layer Timing - DUT Output: Bus Re-Arbitration	✔	Pass
▶ 3.3.12.3: CBT Source: Source Never Sends Too Many Back-to-Back Packets	✔	Pass
▶ 3.3.13: Link Layer Behavior - DUT Output: Ill-formed packets	✔	Pass
▶ 3.3.13.1: CBT-Source: Source Never Sends Impulse Noise	✔	Pass
▶ 3.3.13.2: CBT-Source: Source Never Sends Partial Packets	✔	Pass
▶ 3.3.14: Link Layer Timing - DUT Input: Discovery	✔	Fail
▶ 3.3.14.1: CBT-Source: Discovery; Sink Responds Correctly; Time to Source Pull-up Change	✔	Fail
▶ Iter 01:	✔	Fail
▶ 3.3.14.2: CBT-Source: Discovery; Sink Responds Late	✔	Incomplete
✘ Iter 01:	✘	User Skipped
▶ 3.3.14.3: CBT-Source: Discovery; Sink Never Drives MHL+/IGH	✔	In Progress
▶ Iter 01:	✔	In Progress

Test Log

Line	Message
0041	Test 3.3.5.5 Iter 01 -> Pass
0042	--- Test 3.3.14.1-01
0043	Executing the test.
0044	Retrieving test results.
0045	Processing test results.
0046	Saving the test logs.
0047	Test 3.3.14.1 Iter 01 -> Fail
0048	--- Test 3.3.14.3-01
0049	Executing the test.

Cancel the Compliance Test | Pause Test Execution

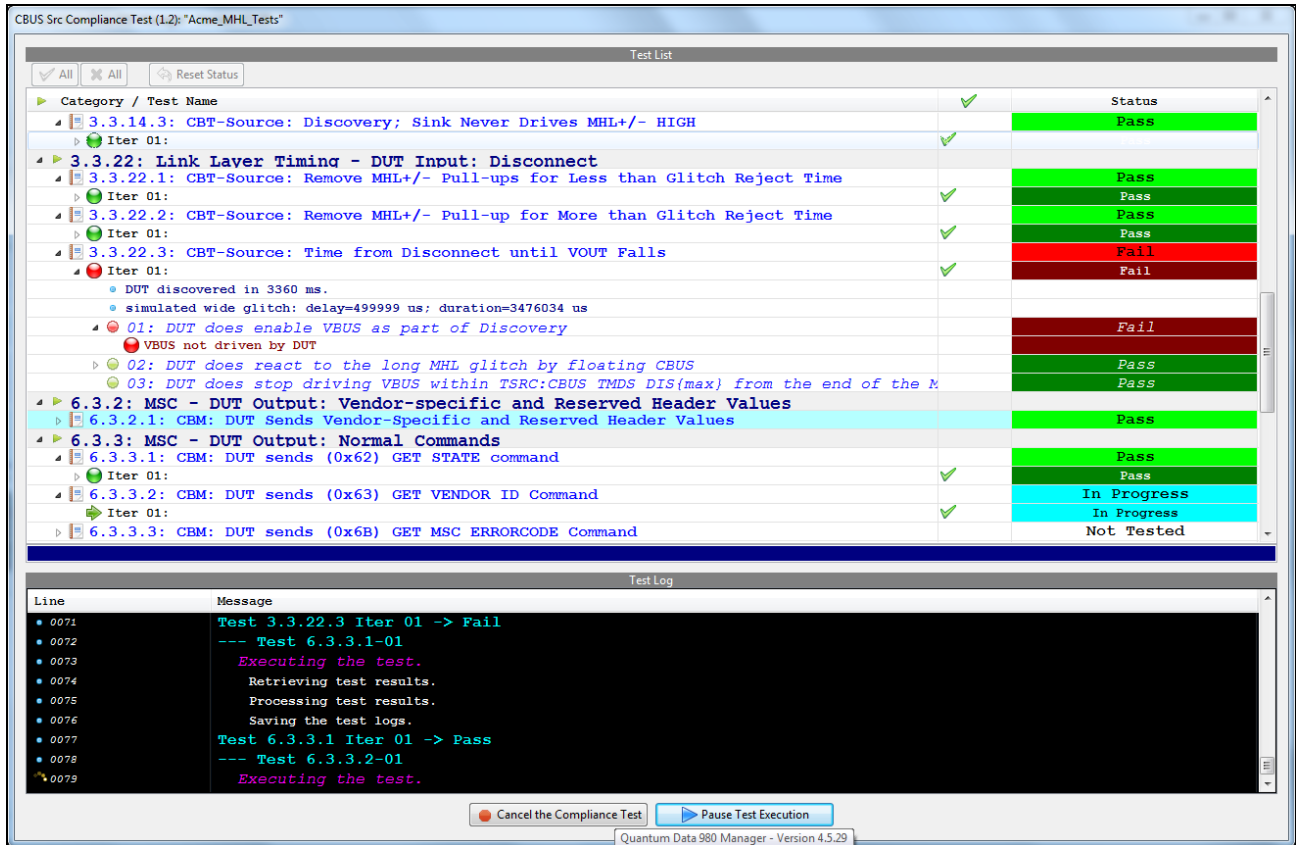
CBUS Src Compliance Test (1,2): "Acme_MHL_Tests"

Test List

Category / Test Name	Status
Iter 01:	Pass
3.3.22.2: CBT-Source: Remove MHL+/- Pull-up for More than Glitch Reject Time	Pass
Iter 01:	Pass
3.3.22.3: CBT-Source: Time from Disconnect until VOUT Falls	Fail
Iter 01:	Fail
6.3.2: MSC - DUT Output: Vendor-specific and Reserved Header Values	Pass
6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Values	Pass
6.3.3: MSC - DUT Output: Normal Commands	In Progress
6.3.3.1: CBM: DUT sends (0x62) GET STATE command	In Progress
Iter 01:	Not Tested
6.3.3.2: CBM: DUT sends (0x63) GET VENDOR ID Command	Not Tested
6.3.3.3: CBM: DUT sends (0x6B) GET MSC ERRORCODE Command	Not Tested
6.3.3.4: CBM: DUT sends (0x60) SET INT/WRITE STAT Command	Not Tested
6.3.3.5: CBM: DUT sends (0x6C) WRITE BURST Command	Not Tested
6.3.3.6: CBM: DUT sends (0x68) MSC MSG Command	Not Tested
6.3.3.7: CBM: DUT sends (0x6A) GET DDC ERRORCODE Command	Not Tested
6.3.5: MSC - DUT Output: Never Initiates Bad Commands	Pass
6.3.5.1: CBM: DUT Never Sends Reserved Commands	Pass
6.3.5.2: CBM: DUT Never Sends Illegal Commands	Pass
6.3.5.3: CBM: DUT Never Sends Data While No Command is Outstanding	Pass
6.3.5.4: CBM: DUT Never Sends (0x33) ACK packet While No Command is Outstanding	Pass
6.3.5.5: CBM: DUT Never Sends (0x34) NACK Packet While No Command is Outstanding	Pass
6.3.5.6: CBM: DUT Never Sends (0x35) ABORT While No Command is Outstanding	Pass

Test Log

Line	Message
0065	Test 3.3.22.2 Iter 01 -> Pass
0066	--- Test 3.3.22.3-01
0067	Executing the test.
0068	Retrieving test results.
0069	Processing test results.
0070	Saving the test logs.
0071	Test 3.3.22.3 Iter 01 -> Fail
0072	--- Test 6.3.3.1-01
0073	Executing the 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. Refer to the following screen example.

CBUS Src Compliance Test (1.2): "Acme_MHL_Tests"

Test List

Category / Test Name	Status
6.3.3.4: CBM: DUT sends (0x60) SET INT/WRITE STAT Command	Pass
Iter 01:	Pass
6.3.3.5: CBM: DUT sends (0x6C) WRITE BURST Command	Pass
Iter 01:	Pass
6.3.3.6: CBM: DUT sends (0x68) MSC MSG Command	Pass
Iter 01:	Pass
6.3.3.7: CBM: DUT sends (0x6A) GET DDC ERRORCODE Command	In Progress
Iter 01:	In Progress
6.3.5: MSC - DUT Output: Never Initiates Bad Commands	
6.3.5.1: CBM: DUT Never Sends Reserved Commands	Pass
6.3.5.2: CBM: DUT Never Sends Illegal Commands	Pass
6.3.5.3: CBM: DUT Never Sends Data While No Command is Outstanding	Pass
6.3.5.4: CBM: DUT Never Sends (0x33) ACK packet While No Command is Outstanding	Pass
6.3.5.5: CBM: DUT Never Sends (0x34) NACK Packet While No Command is Outstanding	Pass
6.3.5.6: CBM: DUT Never Sends (0x35) ABORT While No Command is Outstanding	Pass
6.3.5.7: CBM: DUT Never Sends (0x32) EOF While No Command is Outstanding	Pass
6.3.8: MSC - DUT Input: Device Register Space Contents; Writes	
6.3.8.1: CBM: Interrupt Regs; SET INT (0x60); Valid Registers Respond	Not Tested
6.3.8.2: CBM: Status Regs; WRITE STAT (0x60); Valid Registers Respond	Not Tested
6.3.13: MSC - DUT Output: Never Initiates Bad Commands	
6.3.13.1: CBM-Source: Source DUT Never Sends (0x64) SET HPD Command	Pass
6.3.13.2: CBM-Source: Source DUT Never Sends (0x65) CLR HPD Command	Pass
6.3.17: DDC - DUT Output; DUT Never Sends Illegal DDC Command	

Test Log

Line	Message
0101	Test 6.3.3.5 Iter 01 -> Pass
0102	--- Test 6.3.3.6-01
0103	Executing the test.
0104	Retrieving test results.
0105	Processing test results.
0106	Saving the test logs.
0107	Test 6.3.3.6 Iter 01 -> Pass
0108	--- Test 6.3.3.7-01
0109	Executing the test.

You can view the details of failures when they occur by exposing the navigation arrows on the left. Examples are shown on the following two screens.

The screenshot displays the 'CBUS Src Compliance Test (L2): "Acme_MHL_Tests"' window. It features a 'Test List' table and a 'Test Log' window below it.

Category / Test Name	Status
6.3.5.5: CBM: DUT Never Sends (0x34) NACK Packet While No Command is Outstanding	Pass
6.3.5.6: CBM: DUT Never Sends (0x35) ABORT While No Command is Outstanding	Pass
6.3.5.7: CBM: DUT Never Sends (0x32) EOF While No Command is Outstanding	Pass
6.3.8: MSC - DUT Input: Device Register Space Contents; Writes	In Progress
6.3.8.1: CBM: Interrupt Regs; SET INT (0x60); Valid Registers Respond	In Progress
6.3.8.2: CBM: Status Regs; WRITE STAT (0x60); Valid Registers Respond	Not Tested
6.3.13: MSC - DUT Output: Never Initiates Bad Commands	
6.3.13.1: CBM-Source: Source DUT Never Sends (0x64) SET HPD Command	Pass
6.3.13.2: CBM-Source: Source DUT Never Sends (0x65) CLR HPD Command	Pass
6.3.17: DDC - DUT Output; DUT Never Sends Illegal DDC Command	Fail
6.3.17.2: CBM-Source: DUT Never Sends Illegal DDC Command	Fail
Iter 01: Continuous Background Test	Fail
3.2.6.1: At 32767818.43 us, DUT sent illegal DDC cmd: 0x131	
3.2.6.1: DUT sent 1 illegal DDC commands	
3.2.6.2: At 11349757.88 us, DUT sent illegal DDC cmd: 0x131	
3.2.6.2: DUT sent 1 illegal DDC commands	
6.3.3.1: At 03882783.44 us, DUT sent illegal DDC cmd: 0x131	
6.3.3.1: At 17536593.43 us, DUT sent illegal DDC cmd: 0x131	
6.3.3.1: DUT sent 2 illegal DDC commands	
6.3.3.2: At 11336282.14 us, DUT sent illegal DDC cmd: 0x131	
6.3.3.2: At 25020419.49 us, DUT sent illegal DDC cmd: 0x131	
6.3.3.2: DUT sent 2 illegal DDC commands	

Line	Message
0110	Retrieving test results.
0111	Processing test results.
0112	Saving the test logs.
0113	Test 6.3.7 Iter 01 -> Pass
0114	--- Test 6.3.8.1-01
0115	Executing the test.
0116	Retrieving test results.
0117	Processing test results.
0118	Saving the test logs.

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

CBUS Src Compliance Test (1.2): "Acme_MHL_Tests"

Test List

All
 All

Category / Test Name	Status
6.3.2: MSC - DUT Output: Vendor-specific and Reserved Header Values	Pass
6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Values	Pass
6.3.3: MSC - DUT Output: Normal Commands	Pass
6.3.3.1: CBM: DUT sends (0x62) GET STATE command	Pass
Iter 01:	Pass
6.3.3.2: CBM: DUT sends (0x63) GET VENDOR ID Command	Pass
Iter 01:	Pass
6.3.3.3: CBM: DUT sends (0x6B) GET MSC ERRORCODE Command	Pass
Iter 01:	Pass
<ul style="list-style-type: none"> Pass 1, watching for 0x56b: tester response fastest DUT discovered in 3610 ms. DUT did not send command being watched for within 10 seconds, PASS Pass 2, watching for 0x56b: tester response slowest DUT discovered in 3370 ms. 	Pass
<ul style="list-style-type: none"> 01: No unexpected MSC commands or unexpected Data during the time it is waiting for 02: DUT does not send NACK packet or ABORT packet in response to the data returned 	Pass
6.3.3.4: CBM: DUT sends (0x60) SET INT/WRITE STAT Command	Pass
Iter 01:	Pass
6.3.3.5: CBM: DUT sends (0x6C) WRITE BURST Command	Pass
Iter 01:	Pass
6.3.3.6: CBM: DUT sends (0x68) MSC MSG Command	Pass
Iter 01:	Pass
6.3.3.7: CBM: DUT sends (0x6A) GET DDC ERRORCODE Command	Pass

Test Log

Line	Message
0118	Saving the test logs.
0119	Test 6.3.8.1 Iter 01 -> Fail
0120	--- Test 6.3.8.2-01
0121	Executing the test.
0122	Retrieving test results.
0123	Processing test results.
0124	Saving the test logs.
0125	Test 6.3.8.2 Iter 01 -> Fail
0126	Tests completed

The log will indicate when the tests have completed.

The screenshot displays a software window titled "CBUS Src Compliance Test (1.2): 'Acme_MHL_Tests'". It is divided into two main sections: "Test List" and "Test Log".

Test List: This section contains a table with columns for "Category / Test Name", a status indicator (checkmarks or red dots), and "Status". The tests are grouped by category (e.g., 6.3.3.7, 6.3.5, 6.3.8, 6.3.13, 6.3.17). The status column shows "Pass" in green and "Fail" in red.

Category / Test Name	Status
Iter 01:	Pass
6.3.3.7: CBM: DUT sends (0x6A) GET DDC ERRORCODE Command	Pass
Iter 01:	Pass
6.3.5: MSC - DUT Output: Never Initiates Bad Commands	
6.3.5.1: CBM: DUT Never Sends Reserved Commands	Pass
6.3.5.2: CBM: DUT Never Sends Illegal Commands	Pass
6.3.5.3: CBM: DUT Never Sends Data While No Command is Outstanding	Pass
6.3.5.4: CBM: DUT Never Sends (0x33) ACK packet While No Command is Outstanding	Pass
6.3.5.5: CBM: DUT Never Sends (0x34) NACK Packet While No Command is Outstanding	Pass
6.3.5.6: CBM: DUT Never Sends (0x35) ABORT While No Command is Outstanding	Fail
6.3.5.7: CBM: DUT Never Sends (0x32) EOF While No Command is Outstanding	Pass
6.3.8: MSC - DUT Input: Device Register Space Contents; Writes	
6.3.8.1: CBM: Interrupt Regs; SET INT (0x60); Valid Registers Respond	Fail
Iter 01:	Fail
6.3.8.2: CBM: Status Regs; WRITE STAT (0x60); Valid Registers Respond	Fail
Iter 01:	Fail
6.3.13: MSC - DUT Output: Never Initiates Bad Commands	
6.3.13.1: CBM-Source: Source DUT Never Sends (0x64) SET HPD Command	Pass
6.3.13.2: CBM-Source: Source DUT Never Sends (0x65) CLR HPD Command	Pass
6.3.17: DDC - DUT Output; DUT Never Sends Illegal DDC Command	
6.3.17.2: CBM-Source: DUT Never Sends Illegal DDC Command	Fail
Iter 01: Continuous Background Test	Fail
6.3.17.3: CBM-Source: DUT Never Sends Illegal DDC Command Sequence	Pass

Test Log: This section shows a list of messages with line numbers. A yellow arrow points to line 0124, which says "Tests completed".

```

Line      Message
-----
0118     Saving the test logs.
0119     Test 6.3.8.1 Iter 01 -> Fail
0120     --- Test 6.3.8.2-01
0121     Executing the test.
0122     Retrieving test results.
0123     Processing test results.
0124     Saving the test logs.
0125     Test 6.3.8.2 Iter 01 -> Fail
0126     Tests completed
    
```

At the bottom of the window, there are two buttons: "Close Window" and "Continue Testing".

When the tests are completed the test window that shows the current activity will close. A new tab and panel will appear called the **CT Results** tab. You can view the test results in this panel. Refer to the following screen shot for an example of the **CT Results** panel.

CBUS Src Compliance Test Results

Results Name: Acme_MHL_Tests ManufManufacturer: [HTML Report](#)
 Date Tested: October 2, 2012 2:05 PM Model NModel Name:
 Overall Status: **CTS 1.2 - Incomplete** Port TesPort Tested:

Test Name / Details	Status
3.2.6.1: EDID Reading Test	Fail
3.2.6.2: Device Capability Registers Test	Pass
3.3.3.1: Common Test Environment	Pass
3.3.3.2: CBE-Source: VBUS Absolute Maximum Positive Voltage	Pass
3.3.3.3: CBE-Source: CBUS Absolute Maximum Positive Voltage	Pass
3.3.4.1: CBT-Source: Time from Source VBUS Application to Disc	Fail
3.3.5.1: CBE-Source: Response to Initial Plug-in to MHL Device	Incomplete
3.3.5.2: CBE-Source: Response to Sink Priming Pulse to MHL dev	Fail
3.3.5.3: CBE-Source: Pre-Discovery Success Pull-up HIGH Voltag	Incomplete
3.3.5.4: CBE-Source: Discovery Pulse Drive HIGH Voltage	Pass
3.3.5.5: CBE-Source: Discovery Pulse float LOW Voltage	Pass
3.3.9.2: CBT-Source: Continuous Monitor: Bit Timing Variation	Pass
3.3.12.3: CBT Source: Source Never Sends Too Many Back-to-Back	Pass
3.3.13.1: CBT-Source: Source Never Sends Impulse Noise	Pass
3.3.13.2: CBT-Source: Source Never Sends Partial Packets	Pass
3.3.14.1: CBT-Source: Discovery; Sink Responds Correctly; Time	Fail
3.3.14.2: CBT-Source: Discovery; Sink Responds Late	Incomplete
3.3.14.3: CBT-Source: Discovery; Sink Never Drives MHL+/- HIGH	Pass
3.3.22.1: CBT-Source: Remove MHL+/- Pull-ups for Less than Gli	Pass
3.3.22.2: CBT-Source: Remove MHL+/- Pull-up for More than Glit	Pass
3.3.22.3: CBT-Source: Time from Disconnect until VOUT Falls	Fail
6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Va	Pass
6.3.3.1: CBM: DUT sends (0x62) GET STATE command	Pass
6.3.3.2: CBM: DUT sends (0x63) GET VENDOR ID Command	Pass
6.3.3.3: CBM: DUT sends (0x6B) GET MSC ERRORCODE Command	Pass
6.3.3.4: CBM: DUT sends (0x60) SET INT/WRITE STAT Command	Pass
6.3.3.5: CBM: DUT sends (0x6C) WRITE BURST Command	Pass
6.3.3.6: CBM: DUT sends (0x68) MSC MSG Command	Pass
6.3.3.7: CBM: DUT sends (0x6A) GET DDC ERRORCODE Command	Pass

Instrument: My980 [192.168.254.135] [Continue Test Execution](#)

3.6 Viewing Details of Source Compliance Test Passes or 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 test.

To view the details of each test:

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

CBUS Src Compliance Test Results

Results Name: Acme_MHL_Tests Manufacturer: Acme HTML Report

Date Tested: October 2, 2012 2:05 PM Model Name: XYZ

Overall Status: **CTS 1.2 - Incomplete** Port Tested: 1

Test Name / Details	Status	
3.3.3.2: CBE-Source: VBUS Absolute Maximum Positive Voltage	Pass	
3.3.3.3: CBE-Source: CBUS Absolute Maximum Positive Voltage	Pass	
3.3.4.1: CBT-Source: Time from Source VBUS Application to Disc	Fail	
3.3.5.1: CBE-Source: Response to Initial Plug-in to MHL Device	Incomplete	
3.3.5.2: CBE-Source: Response to Sink Priming Pulse to MHL dev	Fail	
3.3.5.3: CBE-Source: Pre-Discovery Success Pull-up HIGH Voltag	Incomplete	
3.3.5.4: CBE-Source: Discovery Pulse Drive HIGH Voltage	Pass	
3.3.5.5: CBE-Source: Discovery Pulse float LOW Voltage	Pass	
3.3.9.2: CBT-Source: Continuous Monitor: Bit Timing Variation	Pass	
3.3.12.3: CBT Source: Source Never Sends Too Many Back-to-Back	Pass	
3.3.13.1: CBT-Source: Source Never Sends Impulse Noise	Pass	
3.3.13.2: CBT-Source: Source Never Sends Partial Packets	Pass	
3.3.14.1: CBT-Source: Discovery; Sink Responds Correctly; Time	Fail	
Iter 01:	Fail	--
DUT discovered in 3370 ms.		
DUT in discovery mode: measured 1654/1659/1657.42 mv (min/max/avg)		
DUT in on mode: measured 1513/1517/1515.91 mv (min/max/avg)		
voltage change: -8.54 %		
unexpected voltage change. Expected about 5 percent increase.		
01: Source does complete Discovery	Pass	
02: DUT does switch its pull-up from ZCBUS SRC DISCOVER to	Pass	
3.3.14.2: CBT-Source: Discovery; Sink Responds Late	Incomplete	
3.3.14.3: CBT-Source: Discovery; Sink Never Drives MHL+/- HIGH	Pass	
3.3.22.1: CBT-Source: Remove MHL+/- Pull-ups for Less than Gli	Pass	
3.3.22.2: CBT-Source: Remove MHL+/- Pull-up for More than Glit	Pass	
3.3.22.3: CBT-Source: Time from Disconnect until VOUT Falls	Fail	
6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Va	Pass	
6.3.3.1: CBM: DUT sends (0x62) GET STATE command	Pass	
6.3.3.2: CBM: DUT sends (0x63) GET VENDOR ID Command	Pass	

3.2.6.1: EDID Reading Test

Instrument: My980 [192.168.254.135] Continue Test Execution

Event Plot Edid Editor EDID CT 1.4a CBUS Sink CT 1.2 CBUS Src CT 1.2 CBUS Dongle CT 1.2 CT Results

CBUS Src Compliance Test Results

Results Name: Acme_MHL_Tests Manufacturer: Acme HTML Report
 Date Tested: October 2, 2012 2:05 PM Model Name: XYZ
 Overall Status: **CTS 1.2 - Incomplete** Port Tested: 1

Test Results

Test Name / Details	Status
3.3.3.2: CBE-Source: VBUS Absolute Maximum Positive Voltage	Pass
3.3.3.3: CBE-Source: CBUS Absolute Maximum Positive Voltage	Pass
3.3.4.1: CBT-Source: Time from Source VBUS Application to Disc	Fail
3.3.5.1: CBE-Source: Response to Initial Plug-in to MHL Device	Incomplete
3.3.5.2: CBE-Source: Response to Sink Priming Pulse to MHL dev	Fail
3.3.5.3: CBE-Source: Pre-Discovery Success Pull-up HIGH Voltag	Incomplete
3.3.5.4: CBE-Source: Discovery Pulse Drive HIGH Voltage	Pass
Iter 01:	Pass
• Running pass 1, VBUS not driven by tester	
• Discovery pulse high measurement: 1606 mv	
• Discovery pulse high measurement: 1608 mv	
• Discovery pulse high measurement: 1609 mv	
• Running pass 2, VBUS driven by tester	
• Discovery pulse high measurement: 1627 mv	
• Discovery pulse high measurement: 1628 mv	
01: HIGH voltage is greater than VIH CBUS{min}	Pass
3.3.9.2: CBE-Source: Discovery Pulse float LOW Voltage	Pass
3.3.12.3: CBT-Source: Continuous Monitor: Bit Timing Variation	Pass
3.3.13.1: CBT-Source: Source Never Sends Too Many Back-to-Back	Pass
3.3.13.2: CBT-Source: Source Never Sends Impulse Noise	Pass
3.3.13.2: CBT-Source: Source Never Sends Partial Packets	Pass
3.3.14.1: CBT-Source: Discovery; Sink Responds Correctly; Time	Fail
3.3.14.2: CBT-Source: Discovery; Sink Responds Late	Incomplete
3.3.14.3: CBT-Source: Discovery; Sink Never Drives MHL+/- HIGH	Pass
3.3.22.1: CBT-Source: Remove MHL+/- Pull-ups for Less than Gli	Pass
3.3.22.2: CBT-Source: Remove MHL+/- Pull-up for More than Glit	Pass
3.3.22.3: CBT-Source: Time from Disconnect until VOUT Falls	Fail
6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Va	Pass
6.3.3.1: CBM: DUT sends (0x62) GET STATE command	Pass

6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Values

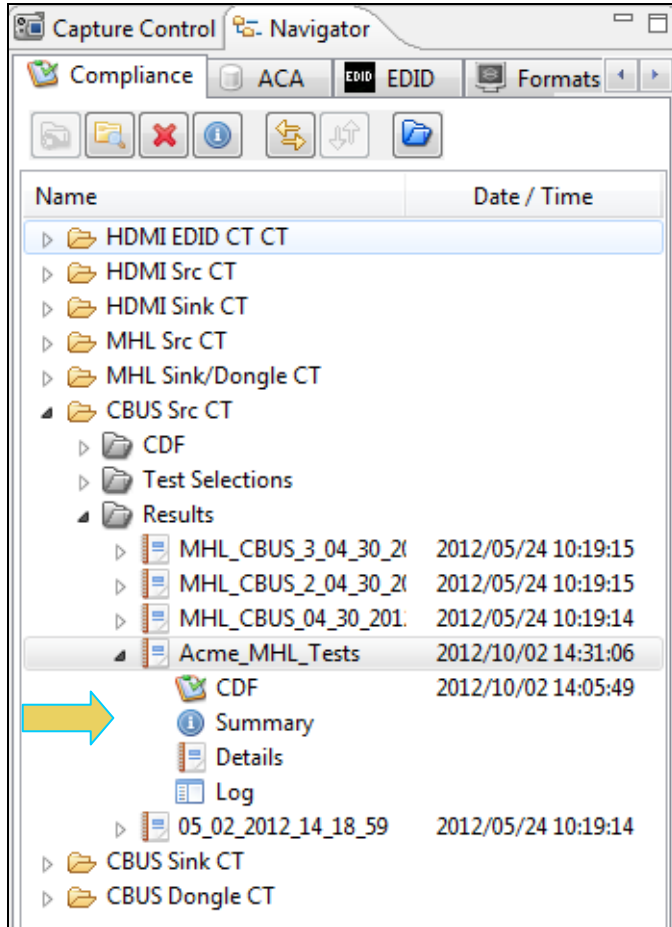
Instrument: My980 [192.168.254.135] Continue Test Execution

3.7 Accessing the test results through the navigator panel

You can view the results of the tests at any time after you run them through the 980 GUI Manager's **Navigator** panel. Use the following procedures to view the details of a test.

To access the test results:

1. Access the **Navigator** tab and select **Compliance**. Refer to the screen example below.



- Double click on the Results file you wish to view. The results will appear in a CT Results window on the right. Refer to the screen example below.

The screenshot displays a software interface for compliance testing. The main window is titled "CBUS Src Compliance Test Results". It shows the following information:

- Results Name:** 05_02_2012_14_18_59
- Date Tested:** May 2, 2012 2:19 PM
- Manufacturer:** MHLCBUS
- Model Name:** XYZ
- Overall Status:** CTS 1.2 - Fail
- Port Tested:** 1

The main results area contains a table of test items:

Test Name / Details	Status
3.2.6.1: EDID Reading Test	Fail
3.2.6.2: Device Capability Registers Test	Fail
3.3.4.1: CBT-Source: Time from Source VBUS Application to Discovery	Fail
3.3.5.1: CBE-Source: Response to Initial Plug-in to MHL Device	Pass
3.3.5.3: CBE-Source: Pre-Discovery Success Pull-up HIGH Voltage	Fail
3.3.9.1: CBT-Source: Arb, Sync, Data HIGH and LOW Times	Pass
3.3.14.1: CBT-Source: Discovery; Sink Responds Correctly; Time to s	Fail
3.3.14.2: CBT-Source: Discovery; Sink Responds Late	Pass
6.3.3.1: CBM: DUT sends (0x62) GET STATE command	Fail
6.3.3.2: CBM: DUT sends (0x63) GET VENDOR ID Command	Fail
6.3.3.3: CBM: DUT sends (0x6B) GET MSC ERRORCODE Command	Fail
6.3.8.1: CBM: Interrupt Regs; SET INT (0x60); Valid Registers Respo	Fail
6.3.8.2: CBM: Status Regs; WRITE STAT (0x60); Valid Registers Respo	Fail
6.3.11.3: CBM: DUT Receives Data While No Command Outstanding	Fail
6.3.11.5: CBM: DUT Receives (0x34) a NACK Packet While No Command C	Fail
6.3.12.1: CBM: DUT Receives (0x61) READ DEVCAP - Offset Timeout	Pass
6.3.12.3: CBM: DUT Receives (0x60) SET INT - Data Timeout	Pass
6.3.12.5: CBM: DUT Receives (0x6C) WRITE BURST - Offset Timeout	Fail
6.3.18.1: CBM-Source: DUT Issues DDC Short Read and Current Read	Fail
6.3.18.2: CBM-Source: DUT Issues Regular DDC Read	Fail
6.3.18.3: CBM-Source: DUT Issues DDC Segment Read	Fail

At the bottom of the interface, there is a "User Action Button" for "6.3.18.2: CBM-Source: DUT Issues Regular DDC Read" and an "Instrument" dropdown menu showing "Dan_980_CBUS [192.168.254.155]".

3. Double click on the Log file you wish to view. The results will appear in a new window. Refer to the screen example below.

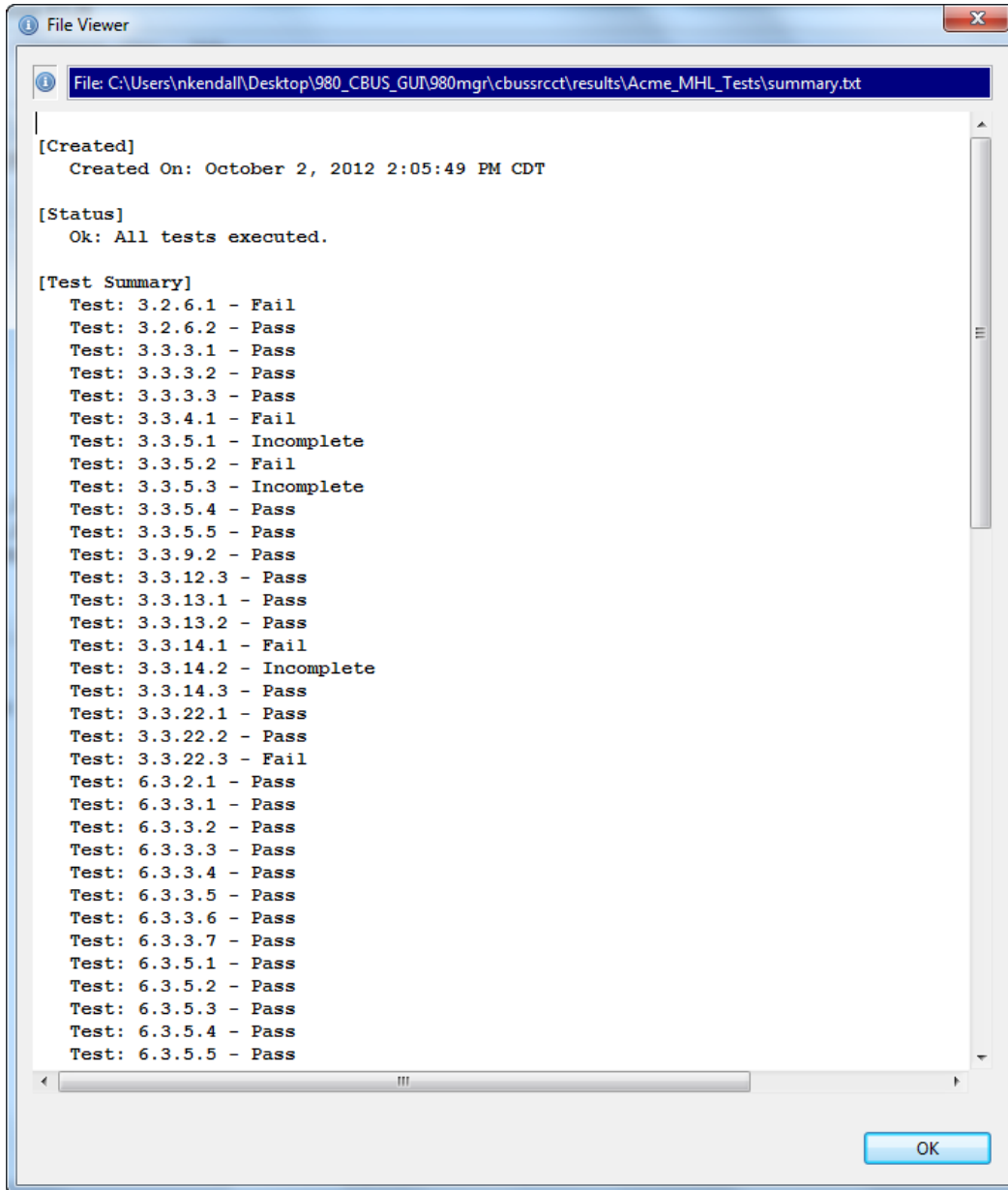
The screenshot shows a 'Log Viewer' window titled 'Log' with 'From: Acme_MHL_Tests'. The log content is as follows:

```

Line      Message
-----
14:05:50:260  Compliance Test Started.
14:05:50:363  Initialization.
14:05:50:397  Assembling the test list.
14:05:51:295  Transferring the CDF to the Test Instrument.
14:05:51:295      FTP Connect
14:05:51:557      FTP Put
      From "C:\Users\inkendall\Desktop\980_CBUS_GUI\980mgr\cbusroot\results\Acme_MHL_Tests\cdf.txt"
      To "cdf.txt"
14:05:51:919  --- Test 3.2.6.1-01
14:06:51:640  Configuration Change: UNKNOWN -> SRC_ACTIVE
14:06:51:692  Executing the test.
14:06:51:693      exec rm -f /home/qd/cbus_results.log
14:06:51:710      exec rm -f /home/qd/cbus_results.log
14:06:51:900      #cbus-scope>
14:06:51:901      IN10:cbus_test 3.2.6.1 -o "/home/qd/" -c "/home/qd/cdf.txt"
14:06:51:910      IN10:cbus_test 3.2.6.1 -o "/home/qd/" -c "/home/qd/cdf.txt"
14:07:35:805      #cbus-scope>
14:07:36:031  Retrieving test results.
14:07:36:031      FTP Connect
14:07:36:289      FTP Get
      From "cbus_results.log"
      To "C:\Users\inkendall\Desktop\980_CBUS_GUI\980mgr\cbusroot\results\Acme_MHL_Tests\lastResult.log"
14:07:36:533  Processing test results.
14:07:36:565  Saving the test logs.
14:07:36:568      exec test -e "/home/qd/cbus_log.log" && echo exists
14:07:36:580      exec test -e "/home/qd/cbus_log.log" && echo exists
14:07:36:770      exists
14:07:36:771      #cbus-scope>
14:07:36:771      FTP Connect
14:07:37:028      FTP Get
      From "cbus_log.log"
      To "C:\Users\inkendall\Desktop\980_CBUS_GUI\980mgr\cbusroot\results\Acme_MHL_Tests\3.2.6.1-01\cbus_log.log"
  
```

At the bottom of the window, there is a 'Close' button.

4. Double click on the Summary file. The Summary file will appear in a new window. Refer to the screen example below.



3.8 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.

To view the html test report:

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

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

The screenshot shows the 'CBUS Src Compliance Test Results' application window. The top bar displays the title and a yellow arrow points to the 'HTML Report' button. Below the title bar, test details are shown: Results Name: Acme_MHL_Tests, Date Tested: October 2, 2012 2:05 PM, Overall Status: CTS 1.2 - Incomplete, Manufacturer: Acme, Model Name: XYZ, and Port Tested: 1. The main area is a table of test results with columns for Test Name / Details and Status. A dialog box titled 'Generate Report' is open, showing 'HTML Report' for 'Acme_MHL_Tests' and options to 'Show Test Summary Only' (unchecked) and 'Include CDF Information' (checked). The table below shows various test items with their status (Pass, Fail, Incomplete).

Test Name / Details	Status
3.2.6.1: EDID Reading Test	Fail
3.2.6.2: Device Capability Registers Test	Pass
3.3.3.1: Common Test Environment	Pass
3.3.3.2: CBT-Source: Positive Voltage	Pass
3.3.3.3: CBT-Source: Positive Voltage	Pass
3.3.3.4: CBT-Source: Application to Disc	Fail
3.3.3.5: CBT-Source: Plug-in to MHL Device	Incomplete
3.3.3.6: CBT-Source: Plug Pulse to MHL dev	Fail
3.3.3.7: CBT-Source: Pull-up HIGH Voltag	Incomplete
3.3.3.8: CBT-Source: HIGH Voltage	Pass
3.3.3.9: CBT-Source: LOW Voltage	Pass
3.3.3.10: CBT-Source: Timing Variation	Pass
3.3.3.11: CBT-Source: Many Back-to-Back	Pass
3.3.3.12: CBT-Source: Pulse Noise	Pass
3.3.3.13: CBT-Source: Serial Packets	Pass
3.3.3.14: CBT-Source: Data Correctly; Time	Fail
3.3.3.15: CBT-Source: Data Late	Incomplete
3.3.14.3: CBT-Source: Discovery; Sink Never Drives MHL+/- HIGH	Pass
3.3.22.1: CBT-Source: REMOVE MHL+/- Pull-ups for Less than Gli	Pass
3.3.22.2: CBT-Source: Remove MHL+/- Pull-up for More than Glit	Pass
3.3.22.3: CBT-Source: Time from Disconnect until VOUT Falls	Fail
6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Va	Pass
6.3.3.1: CBM: DUT sends (0x62) GET STATE command	Pass
6.3.3.2: CBM: DUT sends (0x63) GET VENDOR ID Command	Pass
6.3.3.3: CBM: DUT sends (0x6B) GET MSC ERRORCODE Command	Pass
6.3.3.4: CBM: DUT sends (0x60) SET INT/WRITE STAT Command	Pass
6.3.3.5: CBM: DUT sends (0x6C) WRITE BURST Command	Pass
6.3.3.6: CBM: DUT sends (0x68) MSC MSG Command	Pass
6.3.3.7: CBM: DUT sends (0x6A) GET DDC ERRORCODE Command	Pass

Specify if you want to see a summary report and if you want to see the CDF. If you leave Show Test Summary Only unchecked the application will produce a full detailed report. The following screens provide samples of the report.

Note: This example shows an MHL 1.2 test result; MHL 2.0 test results are similar in content and structure.

HTML Viewer
 C:\Users\nkendall\Desktop\980_CBUS_GUT\980mgr\cbussrct\results\Acme_MHL_Tests\Report_Summary_Cdf.htm

Report generated on: October 2, 2012 2:41 PM www.quantumdata.com

Quantum Data

CBUS Src Compliance Test Report

CTS 1.2

Results Name:	Acme_MHL_Tests	Manufacturer:	Acme
Date Tested:	October 2, 2012 2:05 PM	Model Name:	XYZ
Overall Status:	Incomplete	Port Tested:	-

Capabilities Declaration Form (CDF)

General	
CDF_MFR_NAME	Acme
CDF_MODEL_NUMBER	XYZ
CDF_SRC_POWERED	YES
CDF_SRC_CBUS_THRESHOLD_V	0.90
CDF_PROC_SET_ACTIVE	Not Specified
CDF_PROC_SET_STANDBY	Not Specified
CDF_RCP_RECEIVE	YES
CDF_RCP_SEND	NO
CDF_LOG_DEV_MAP_CHANGE	NO
Capability Registers	
CDF_CR_MHL_VER_MAJOR	1
CDF_CR_MHL_VER_MINOR	0
CDF_CR_DEV_TYPE	2
CDF_CR_POW	0
CDF_CR_ADOPTER_ID_H	0
CDF_CR_ADOPTER_ID_L	0

← Back → Forward Save As Close

The CDF is shown below:

HTML Viewer
C:\Users\kendall\Desktop\980_CBUS_GUI\980mg\cbussrct\results\Acme_MHL_Tests\Report_Summary_Cdf.htm

Capability Registers	
CDF_CR_MHL_VER_MAJOR	1
CDF_CR_MHL_VER_MINOR	0
CDF_CR_DEV_TYPE	2
CDF_CR_POW	0
CDF_CR_ADOPTER_ID_H	0
CDF_CR_ADOPTER_ID_L	0
CDF_CR_SUPP_RGB444	1
CDF_CR_SUPP_YCBCR444	1
CDF_CR_SUPP_YCBCR422	0
CDF_CR_SUPP_PPIXEL	0
CDF_CR_SUPP_ISLANDS	0
CDF_CR_SUPP_VGA	0
CDF_CR_AUD_2CH	1
CDF_CR_AUD_SCH	0
CDF_CR_VT_GRAPHICS	0
CDF_CR_VT_PHOTO	0
CDF_CR_VT_CINEMA	0
CDF_CR_VT_GAME	0
CDF_CR_SUPP_VT	0
CDF_CR_LD_DISPLAY	0
CDF_CR_LD_VIDEO	1
CDF_CR_LD_AUDIO	1
CDF_CR_LD_MEDIA	1
CDF_CR_LD_TUNER	0
CDF_CR_LD_RECORD	0
CDF_CR_LD_SPEAKER	0
CDF_CR_LD_GUI	1
CDF_CR_BANDWIDTH	15

Back Forward Save As Close

The detailed results for a failure are shown below:

HTML Viewer	
C:\Users\mkendall\Desktop\980_CBUS_GUI\980mgr\cbussrcc\results\Acme_MHL_Tests\Report_Summary_Cdf.htm	
Test 3.2.6.1 EDID Reading Test	Fail
Test 3.2.6.2 Device Capability Registers Test	Pass
Test 3.3.3.1 Common Test Environment	Pass
Test 3.3.3.2 CBE-Source: VBUS Absolute Maximum Positive Voltage	Pass
Test 3.3.3.3 CBE-Source: CBUS Absolute Maximum Positive Voltage	Pass
Test 3.3.4.1 CBT-Source: Time from Source VBUS Application to Discovery Pulses	Fail
Test 3.3.5.1 CBE-Source: Response to Initial Plug-in to MHL Device	Incomplete
Test 3.3.5.2 CBE-Source: Response to Sink Priming Pulse to MHL device	Fail
Test 3.3.5.3 CBE-Source: Pre-Discovery Success Pull-up HIGH Voltage	Incomplete
Test 3.3.5.4 CBE-Source: Discovery Pulse Drive HIGH Voltage	Pass
Test 3.3.5.5 CBE-Source: Discovery Pulse float LOW Voltage	Pass
Test 3.3.9.2 CBT-Source: Continuous Monitor: Bit Timing Variation within a Packet	Pass
Test 3.3.12.3 CBT-Source: Source Never Sends Too Many Back-to-Back Packets	Pass
Test 3.3.13.1 CBT-Source: Source Never Sends Impulse Noise	Pass
Test 3.3.13.2 CBT-Source: Source Never Sends Partial Packets	Pass
Test 3.3.14.1 CBT-Source: Discovery; Sink Responds Correctly; Time to Source Pull-up Change	Fail
Test 3.3.14.2 CBT-Source: Discovery; Sink Responds Late	Incomplete
Test 3.3.14.3	Pass

HTML Viewer
 C:\Users\nkendall\Desktop\980_CBUS_GUI\980mgr\cbussrct\results\05_02_2012_14_18_59\Report_Cdf.htm

Test 3.2.6.2 Device Capability Registers Test		Fail
<ul style="list-style-type: none"> • Iter 01: <ul style="list-style-type: none"> ■ DUT discovered in 2492 ms. ■ ----- ■ Continuous test results to follow ■ 3.3.3: Tester began driving VBUS at 00050362.40; VBUS expected to be stable by 00065362.40. ■ 3.3.3: CBUS and VBUS within Absolute Maximum voltages during entire test ■ 3.3.12.3: max incoming back to back packets: 0 (good) ■ 3.3.13.1: no narrow pulses detected ■ 3.3.13.2: no bad packets from DUT detected 		Fail
<ul style="list-style-type: none"> • 01: MHL_VERSION register matches CDF_CR_MHL_VER_MAJOR and CDF_CR_MHL_VER_MINOR <ul style="list-style-type: none"> ■ DUT has wrong major version; wanted 1 but got 0 ■ DUT minor version matches 	Fail	
<ul style="list-style-type: none"> • 02: DEV_TYPE in the DEV_CAT(offset:0x02) register is 0b0010:Source <ul style="list-style-type: none"> ■ DUT DEV_TYPE doesn't match CDF; wanted 2 but got 0 	Fail	
<ul style="list-style-type: none"> • 03: POW in the DEV_CAT(offset:0x02) register matches the CDF_CR_POW field in CDF <ul style="list-style-type: none"> ■ DUT POW is correct 	Pass	
<ul style="list-style-type: none"> • 04: ADOPTER_ID_H(offset:0x03) and ADOPTER_ID_L(offset:0x04) register matches the corresponding CDF_CR_ADOPTER_ID_H and CDF_CR_ADOPTER_ID_L fields in the CDF <ul style="list-style-type: none"> ■ DUT ADOPTER_ID_H is correct ■ DUT ADOPTER_ID_L is correct 	Pass	
<ul style="list-style-type: none"> • 05: SUPP_RGB444, SUPP_YBCR444, SUPP_YBCR422, SUPP_PPIXEL, SUPP_ISLANDS and SUPP_VGA bits in the VID_LINK_MODE(offset:0x05) register match the corresponding CDF_CR_SUPP_RGB444, CDF_CR_SUPP_YBCR444, CDF_CR_SUPP_YBCR422, CDF_CR_SUPP_PPIXEL, CDF_CR_SUPP_ISLANDS and CDF_CR_SUPP_VGA field in the CDF <ul style="list-style-type: none"> ■ DUT SUPP_RGB444 is correct ■ DUT SUPP_YBCR444 is correct ■ DUT SUPP_YBCR422 is correct ■ DUT SUPP_PPIXEL is correct ■ DUT SUPP_ISLANDS is correct 	Pass	

Save As Close

The final page of the report shows the test equipment configuration as shown below.

Test Equipment Information	
Instrument	
<pre>Name: Dan_980_CBUS IP Address: 192.168.254.155 Net Mask: 255.255.255.0 Gateway IP: 192.168.254.1 Version: QD980 Advanced Test platform Version: 4.3.0 MHL CBUS Protocol Analyzer in slot 1: Gateway: [Version: 0 Build Number: 1 (05:02:2012 100000) pcb: 23232323] Firmware: [Version: 1.0.0 beta Build Number: 242 (dsmth 05:02:2012 13:21:41 CDT)] System Information: SN : [N/A::N/A] Main Board : ["DG41RQ"] CPUx1 : [6.22.1 "Intel(R) Celeron(R) CPU 440 @ 2.00GHz"] DDR : [2 GB] HD : [WD1600BEVT-1] OS : [Linux xpscope-97 2.6.26-2-686 #1 SMP Wed Aug 19 06:06:52 UTC 2009 i686 GNU/Linux] GUI manager : [Version 3.1.0.26501.201107071448] 1 : [lo inet 127.0.0.1/8 scope host lo] 2 : [eth0 inet 192.168.254.155/24 brd 192.168.254.255 scope global eth0] HDMI SRC CTS: [2.4.4] MHL SRC CTS : [NOT Installed] HDMI SNK CTS: [NOT Installed]</pre>	
Host	
<pre>UI Name: Quantum Data 980 Manager - Version 3.1.14 UI Home: platform:/base/plugins/com.quantumdata.1980.app Java Vendor: Null Java Runtime: 1.6.0_15-b03 Java Home: C:\Users\nkendall\Desktop\MHL_CBUS_Release_4_26\980mgr\jre OS: win32 OS Arch: x86 Locale: en_US</pre>	
<small>Generated on: May 2, 2012 2:33 PM www.quantumdata.com</small>	

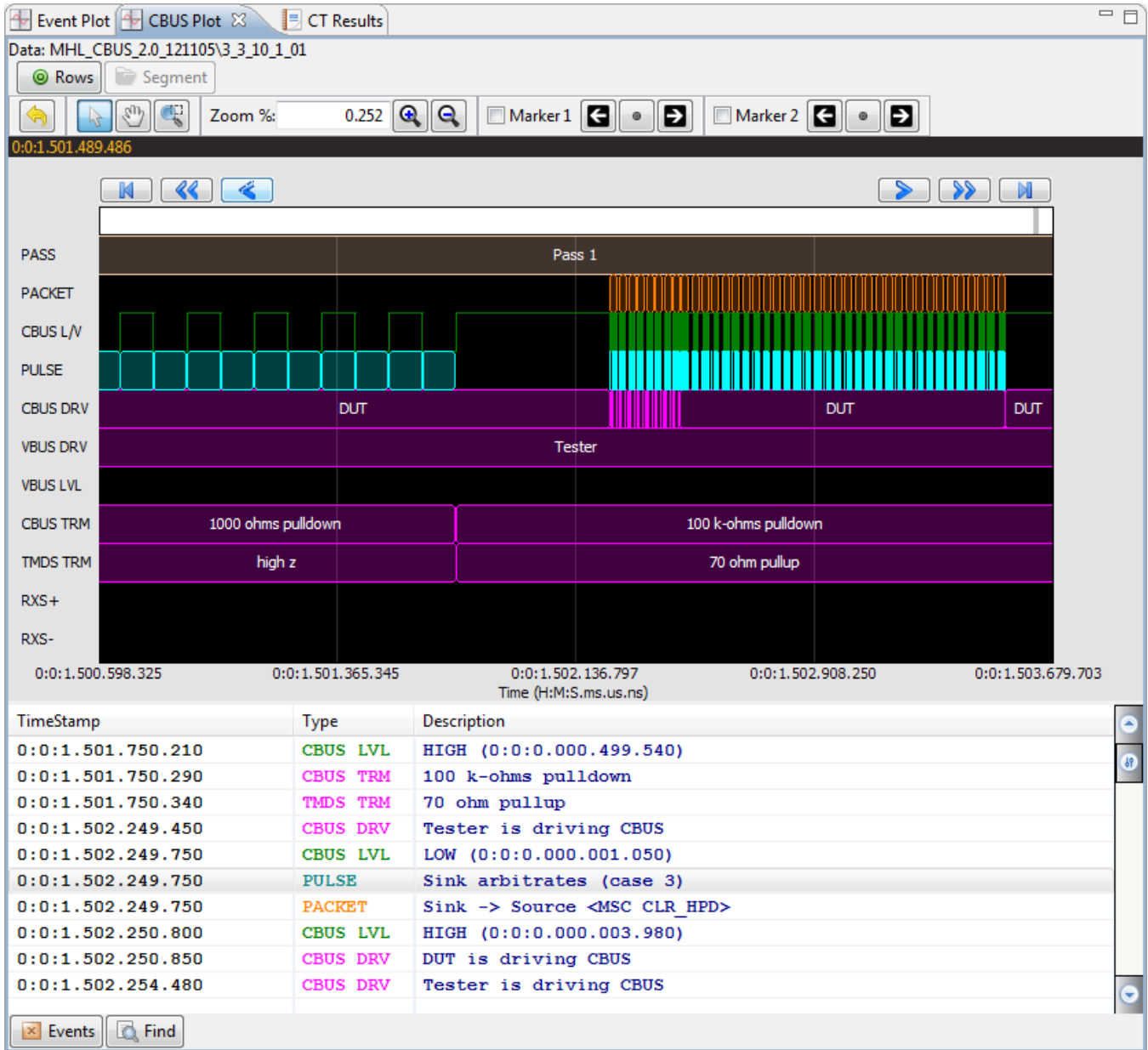
3.9 CBUS Log Plot

The **CBUS Log Plot** panel (shown below) is panel used for viewing the bit and byte timing events of the CBUS controls and commands that occurred during a specific test. A **CBUS Log Plot** is provided for each source CBUS compliance test. The panel has both a graphical depiction of CBUS timing events and a sequential table list out of each event. The vertical axis shows the various CBUS event types. The **CBUS Log Plot** panel provides a set of CBUS event types labeled on the left that indicate the type of event. The horizontal axis is time.

The **CBUS Log Plot** is useful diagnosing CBUS compliance test failures.

The example below shows a series of events captured during a source test.

For more detailed information about the **CBUS Log Plot**, please refer to [CBUS Log Plot](#).



4 MHL CBUS Sink Compliance Tests

This chapter describes how to run the MHL CBUS sink compliance tests. Please note you will have to purchase the optional 980 MHL CBUS Compliance Test module in order to run these tests.

The 980 MHL CBUS Compliance test module supports the test sections listed below in the MHL 1.2 and MHL 2.0 Compliance Test specifications. **Please note that some non-CBUS compliance tests are also covered by the 980 MHL CBUS Compliance Test module.**

4.1 System Test – Section 4.2

- 4.2.5 EDID and Device Capability Register Tests
 - 4.2.5.1 EDID Reading Test
 - 4.2.5.2 Device Capability Registers Test
- 4.2.6 RCP Sub-Command Tests
- 4.2.8 3D Tests
 - 4.2.8.1 3D Video Most Support (MHL CTS 2.0 only)
- 4.2.9 UCP Sub-Command Tests (MHL CTS 2.0 only)

4.2 CBUS Tests – Section 4.3

- 4.3.1 CBUS Sink DUT Common Test Equipment Setups
- 4.3.2 CBUS Sink DUT Common Required Methodologies
- 4.3.3 Link Layer Electrical - Sink: Absolute Maximum Voltages
- 4.3.4 Link Layer Electrical – Sink DUT Output: Standby Discovery Impedance
- 4.3.5 Link Layer Timing – Sink DUT Output: Pre-Discovery
- 4.3.6 Link Layer Electrical – Sink DUT Output: Arbitration/Sync/Data Signaling
- 4.3.7 Link Layer Timing – Sink DUT Output: Arbitration/Sync/Data in Nanoseconds
- 4.3.8 Link Layer Timing – Sink DUT Output: Arbitration/Sync/Data in Bit Times
- 4.3.9 Link Layer Timing – Sink DUT Output: Link Level NACK
- 4.3.10 Link Layer Timing – Sink DUT Output: Link Level ACK
- 4.3.11 Link Layer Timing – Sink DUT Output: Bus Re-Arbitration
- 4.3.12 Link Layer Timing – Sink DUT Output: Ill-formed packets
- 4.3.13 Link Layer Electrical – Sink DUT Input: Discovery
- 4.3.14 Link Layer Timing – Sink DUT Input: Discovery OK
- 4.3.15 Link Layer Timing – Sink DUT Input: Discovery Reject
- 4.3.16 Link Layer Electrical – Sink DUT Input: Arbitration/Sync/Data Signaling
- 4.3.17 Link Layer Timing – Sink DUT Input: Arbitration
- 4.3.18 Link Layer Timing – Sink DUT Input: Data
- 4.3.19 Link Layer Timing – Sink DUT Input: NACK
- 4.3.20 Link Layer Timing – Sink DUT Input: ACK

- 4.3.21 Link Layer Timing – Sink DUT Input: Bus Re-Arbitration
- 4.3.22 Link Layer Timing – Sink DUT Input: Ill-formed Packets
- 4.3.23 Link Layer Timing – Sink DUT Input: Disconnect
- 4.3.24 Link Layer Electrical – Sink DUT VBUS Output
- 4.3.25 Link Layer Timing – Sink DUT VBUS Turn On Transition

4.3 CBUS Common Tests – Section 6.3

- 6.3.1 MSC – Source and Sink DUT Input: Device Register Space Contents; Reads
- 6.3.2 MSC – Source and Sink DUT Output: NACK Packet Response to MSC_MSG
- 6.3.3 MSC – Source and Sink DUT Output: Never Initiates Bad Commands
- 6.3.5 MSC – Source and Sink DUT Output: Errors and Exceptions
- 6.3.6 MSC – Source and Sink DUT Input: Device Register Space Contents; Writes
- 6.3.7 MSC – Source and Sink DUT Input: Vendor Specific and Reserved Header Values
- 6.3.8 MSC – Source and Sink DUT Input: Device Register Space Contents; Writes
- 6.3.9 MSC – Source and Sink DUT Input: Vendor-specific and Reserved Header Values
- 6.3.10 MSC – Source and Sink DUT Input: Normal Commands
- 6.3.11 MSC – Source and Sink DUT Input: Errors and Exceptions
- 6.3.12 MSC – Source and Sink DUT Input: Argument Timeouts
- 6.3.15 MSC – Sink DUT Output: Normal Commands
- 6.3.16 MSC – Sink DUT Input: Errors and Exceptions
- 6.3.20 DDC – Sink DUT Input; Continuous Monitors and Normal Operation
- 6.3.21 DDC – Sink DUT Input; Normal Operation
- 6.3.22 DDC – Sink DUT Input; Illegal Responses

4.4 Workflow for running the MHL CBUS Sink Compliance Tests

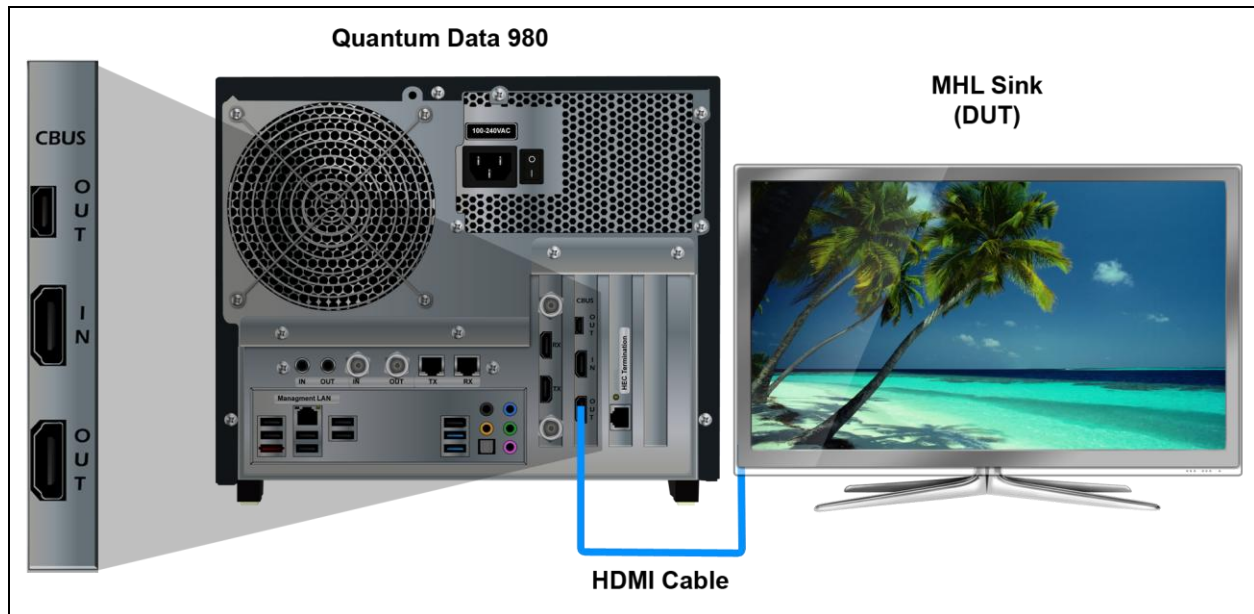
The list below is the high level workflow for running the MHL CBUS Sink Compliance Tests. Note that the installation of the external 980 GUI Manager and the Ethernet session are optional; you can run the compliance tests through the embedded GUI Manager.

1. Power up the 980. Refer to the procedures in [Getting Started](#).
Note: The power switch in the front is used when you are turning off the 980 for a short period of time. For extended periods of off time, it is best to power the 980 down by first using the power button on the front and then the rocker switch on the back.
2. (Optional; only necessary if using the external 980 GUI Manager) Establish an Ethernet/IP connection between the external 980 GUI Manager and the 980.
3. Connect the MHL sink device under test to the CBUS Out port on the 980 MHL CBUS Compliance module using an HDMI cable.
4. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.
5. Select the tests that you wish to run from the **Test Selection** panel.

6. Initiate the tests through the **Test Options / Review** panel.
7. View the detailed data for test failures if failures occur.
8. View the results in the **Test Results** panel under the **Navigator** panel.

4.5 Making the physical MHL connections

This subsection describes the physical MHL connections required to run the MHL CBUS sink compliance tests.



Connections for MHL CBUS sink compliance test – 980

To make the physical MHL connections:

This procedure assumes that you have assembled the 980 with the MHL CBUS Compliance Test module and the MHL source device under test and applied power to all these devices. Refer to the procedures below and the diagram above.

1. Connect your MHL sink device under test to the lower OUT connector (HDMI) on the 980 MHL CBUS Compliance Test module as shown in the figure above.

Important Note: Quantum Data provides a short 30cm HDMI cable for running the MHL CBUS sink compliance tests. Although we recommend that you use this cable for all MHL CBUS sink compliance tests, the cable is optional except for the following tests where the supplied 30cm cable is mandatory:

- 4.3.6.2
- 4.3.7.2
- 4.3.15.1
- 4.3.15.2
- 4.3.24.1

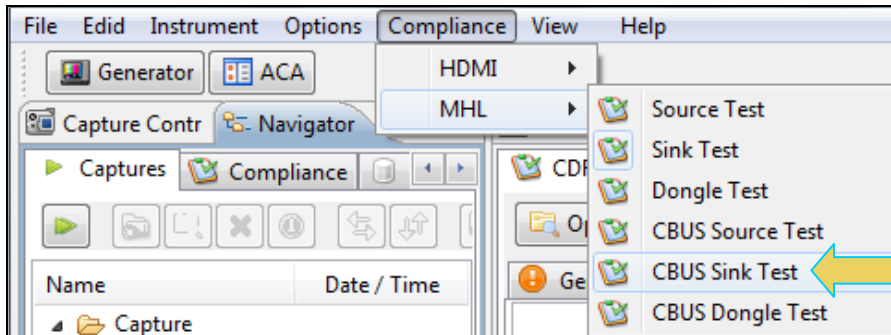
4.6 Completing the CDF

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

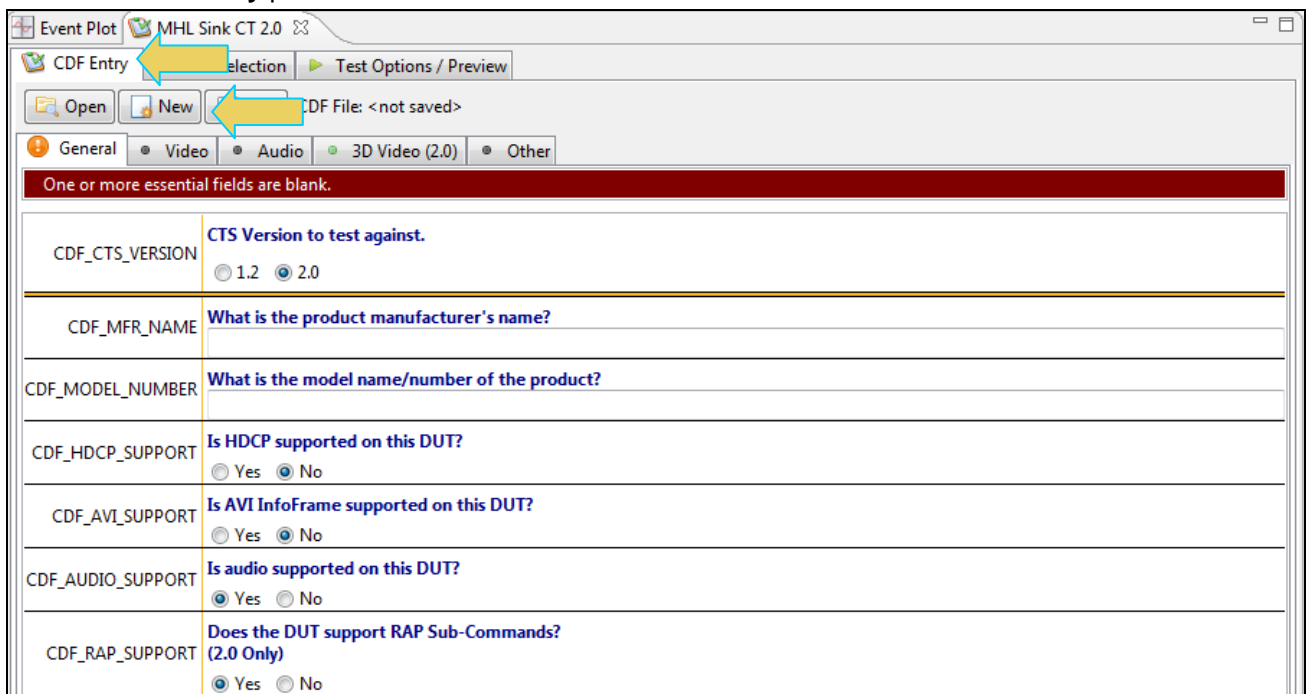
Note: The example workflows and screens use MHL 2.0 except where noted. Workflow and screens are similar for testing MHL 1.2 devices.

To complete the CDF:

1. From the **View** menu, enable viewing of the **MHL CBUS Sink CT** panel.

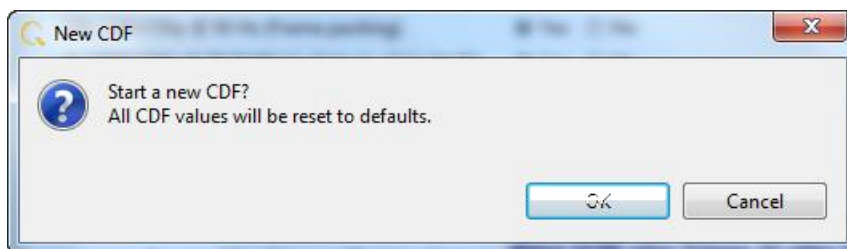


2. Select the **CDF Entry** panel as shown below.



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

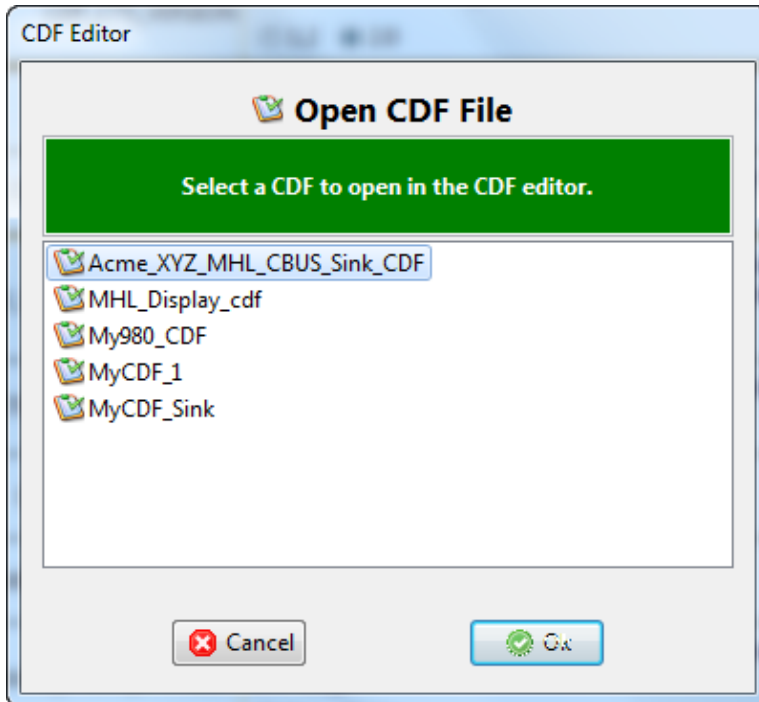
You will be prompted with a confirmation that you want to start a new CDF and reset the values. Click **OK** to proceed.



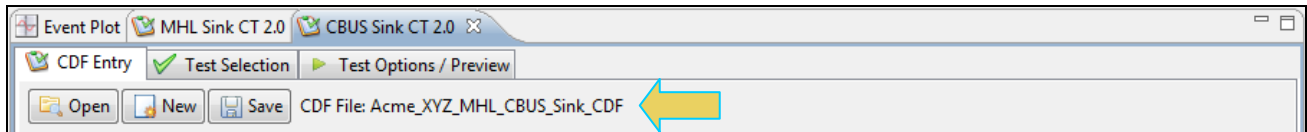
4. To open an existing CDF, click on the **Open** activation button.

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

Note: You can save these CDFs to your PC for use on other PCs and by other colleagues.



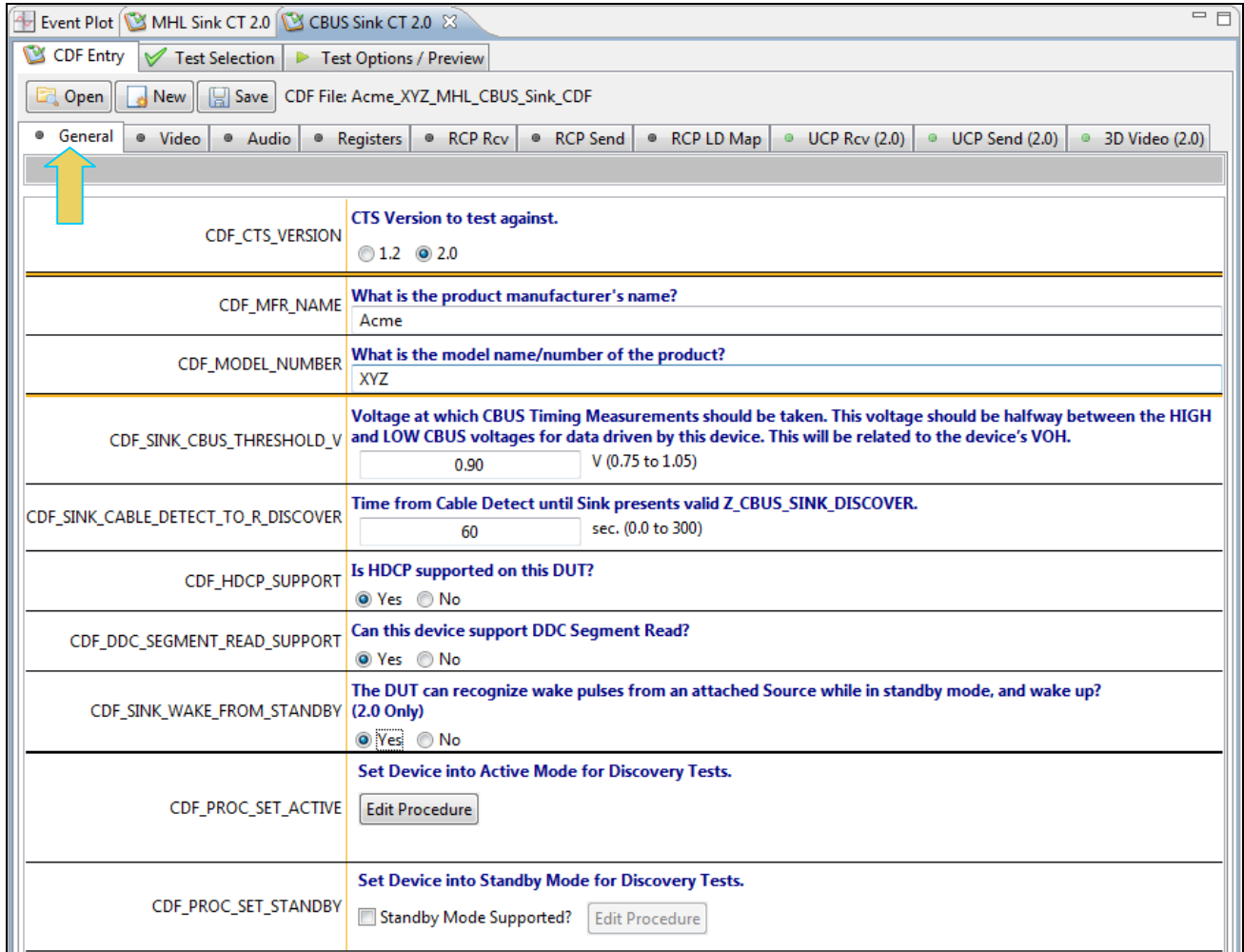
After you open an existing CDF or save it the name will appear beside the **Save** activation button as shown below:



5. 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.

Note: A read status message will appear indicating if you have not completed all the essential fields. This is shown in the example below.

When you have entered in all the required fields the error indication will go away as shown in the example below.



You can enter information using the “Edit Procedure” dialog box to help test engineers understand how to put the device in the proper mode. The information entered into this dialog box will appear during the test.

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

The screenshot shows a software window titled 'Event Plot' with tabs for 'MHL Sink CT 2.0' and 'CBUS Sink CT 2.0'. The 'Video' tab is selected, showing a 'CDF File: Acme_XYZ_MHL_CBUS_Sink_CDF'. The interface includes a menu bar with 'General', 'Video', 'Audio', 'Registers', 'RCP Rcv', 'RCP Send', 'RCP LD Map', 'UCP Rcv (2.0)', 'UCP Send (2.0)', and '3D Video (2.0)'. Below the menu bar, there are four sections for video encoding support, each with a 'CDF_VIDEO_' prefix and a question: 'Does the DUT support [encoding]?' with 'Yes' and 'No' radio buttons.

Property	Yes	No	Notes	Resolution	Refresh Rate
CDF_VIDEO_RGB	<input checked="" type="radio"/>	<input type="radio"/>			
CDF_VIDEO_YCBCR_444	<input checked="" type="radio"/>	<input type="radio"/>			
CDF_VIDEO_YCBCR_422	<input type="radio"/>	<input checked="" type="radio"/>			
CDF_VIDEO_PACKEDPIXEL	<input type="radio"/>	<input checked="" type="radio"/>			
Supported Normal Mode Video Formats					
CDF_VIDEO_VGA	<input type="radio"/>	<input checked="" type="radio"/>	(1)	640x480p (VGA)	59.94/60Hz
CDF_VIDEO_480p_60	<input checked="" type="radio"/>	<input type="radio"/>	(2, 3)	720x480p	59.94/60Hz
CDF_VIDEO_720p_60	<input checked="" type="radio"/>	<input type="radio"/>	(4)	1280x720p	59.94/60Hz
CDF_VIDEO_1080i_60	<input type="radio"/>	<input checked="" type="radio"/>	(5)	1920x1080i	59.94/60Hz
CDF_VIDEO_480i_60_2X	<input type="radio"/>	<input checked="" type="radio"/>	(6, 7)	1440x480i	59.94/60Hz
CDF_VIDEO_480i_60_4X	<input type="radio"/>	<input checked="" type="radio"/>	(10, 11)	2880x480i	59.94/60Hz
CDF_VIDEO_480p_60_2X	<input type="radio"/>	<input checked="" type="radio"/>	(14, 15)	1440x480p	59.94/60Hz
CDF_VIDEO_576p_50	<input checked="" type="radio"/>	<input type="radio"/>	(17, 18)	720x576p	50Hz
CDF_VIDEO_720p_50	<input type="radio"/>	<input checked="" type="radio"/>	(19)	1280x720p	50Hz
CDF_VIDEO_1080i_50	<input checked="" type="radio"/>	<input type="radio"/>	(20)	1920x1080i	50Hz
CDF_VIDEO_576i_50_2X	<input type="radio"/>	<input checked="" type="radio"/>	(21, 22)	1440x576i	50Hz
CDF_VIDEO_576i_50_4X	<input type="radio"/>	<input checked="" type="radio"/>	(25, 26)	2880x576i	50Hz
CDF_VIDEO_576p_50_2X	<input type="radio"/>	<input checked="" type="radio"/>	(29, 30)	1440x576p	50Hz
CDF_VIDEO_1080p_24	<input type="radio"/>	<input checked="" type="radio"/>	(32)	1920x1080p	23.97/24Hz
CDF_VIDEO_1080p_25	<input type="radio"/>	<input checked="" type="radio"/>	(33)	1920x1080p	25Hz
CDF_VIDEO_1080p_30	<input type="radio"/>	<input checked="" type="radio"/>	(34)	1920x1080p	29.97/30Hz
CDF_VIDEO_1080p_60	<input type="radio"/>	<input checked="" type="radio"/>	(16)	1920x1080p	59.94/60Hz
CDF_VIDEO_1080p_50	<input type="radio"/>	<input checked="" type="radio"/>	(31)	1920x1080p	50Hz

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

The screenshot shows a software window with the following elements:

- Windows: Event Plot, MHL Sink CT 2.0, CBUS Sink CT 2.0
- Buttons: CDF Entry, Test Selection, Test Options / Preview, Open, New, Save
- File: CDF File: Acme_XYZ_MHL_CBUS_Sink_CDF
- Navigation: General, Video, **Audio**, Registers, RCP Rcv, RCP Send, RCP LD Map, UCP Rcv (2.0), UCP Send (2.0), 3D Video (2.0)
- Linear PCM Audio Support**
 - CDF_AUDIO_2CH_32kHz: Yes No **PCM 2Ch 32kHz Audio?**
 - CDF_AUDIO_2CH_44.1kHz: Yes No **PCM 2Ch 44.1kHz Audio?**
 - CDF_AUDIO_2CH_48kHz: Yes No **PCM 2Ch 48kHz Audio?**
 - CDF_AUDIO_2CH_88.2kHz: Yes No **PCM 2Ch 88.2kHz Audio?**
 - CDF_AUDIO_2CH_96kHz: Yes No **PCM 2Ch 96kHz Audio?**
 - CDF_AUDIO_2CH_176.4kHz: Yes No **PCM 2Ch 176.4kHz Audio?**
 - CDF_AUDIO_2CH_192kHz: Yes No **PCM 2Ch 192kHz Audio?**
- CDF_AUDIO_PCM_Channels: **Max supported Channel Count.** 0 2 3 4 5 6 7 8
- CDF_AUDIO_Max_Fs_Multi_Ch: **Maximum Freq for multi-channel audio (kHz)** 32kHz 44.1kHz 48kHz 88.2kHz 96kHz 176.4kHz 192kHz
- Non-PCM Audio Support**
 - CDF_AUDIO_AC3: Yes No **2: AC-3 (Dolby Digital)**
 - CDF_AUDIO_MPEG1: Yes No **3: MPEG1 (Layers 1_2)**
 - CDF_AUDIO_MP3: Yes No **4: MP3: MPEG1 Layer 3**
 - CDF_AUDIO_MPEG2: Yes No **5: MPEG2 (multichannel)**
 - CDF_AUDIO_AAC: Yes No **6: AAC**

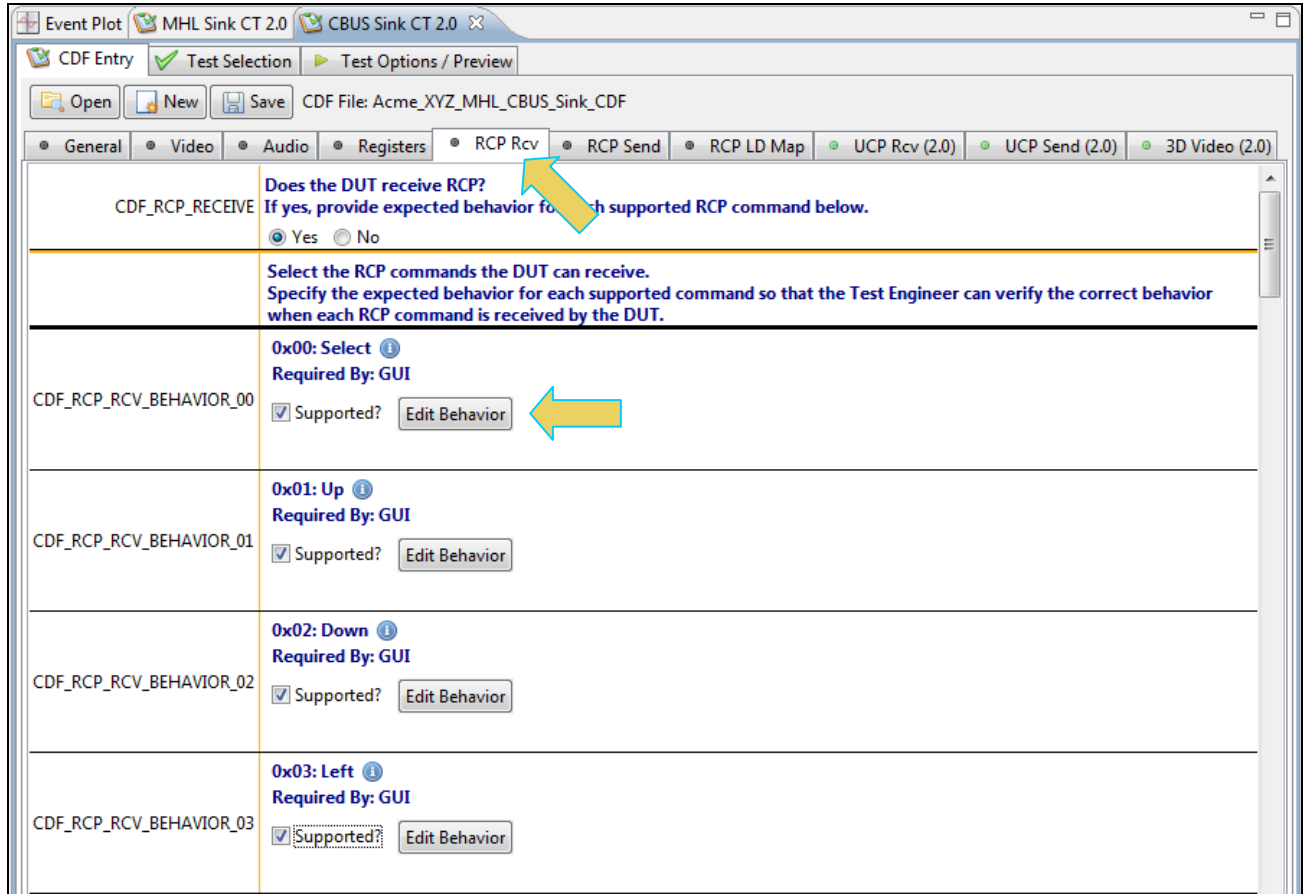
8. Complete the items in the **Registers** tab.

Declare the expected value of each of the DUT's Capability Registers.

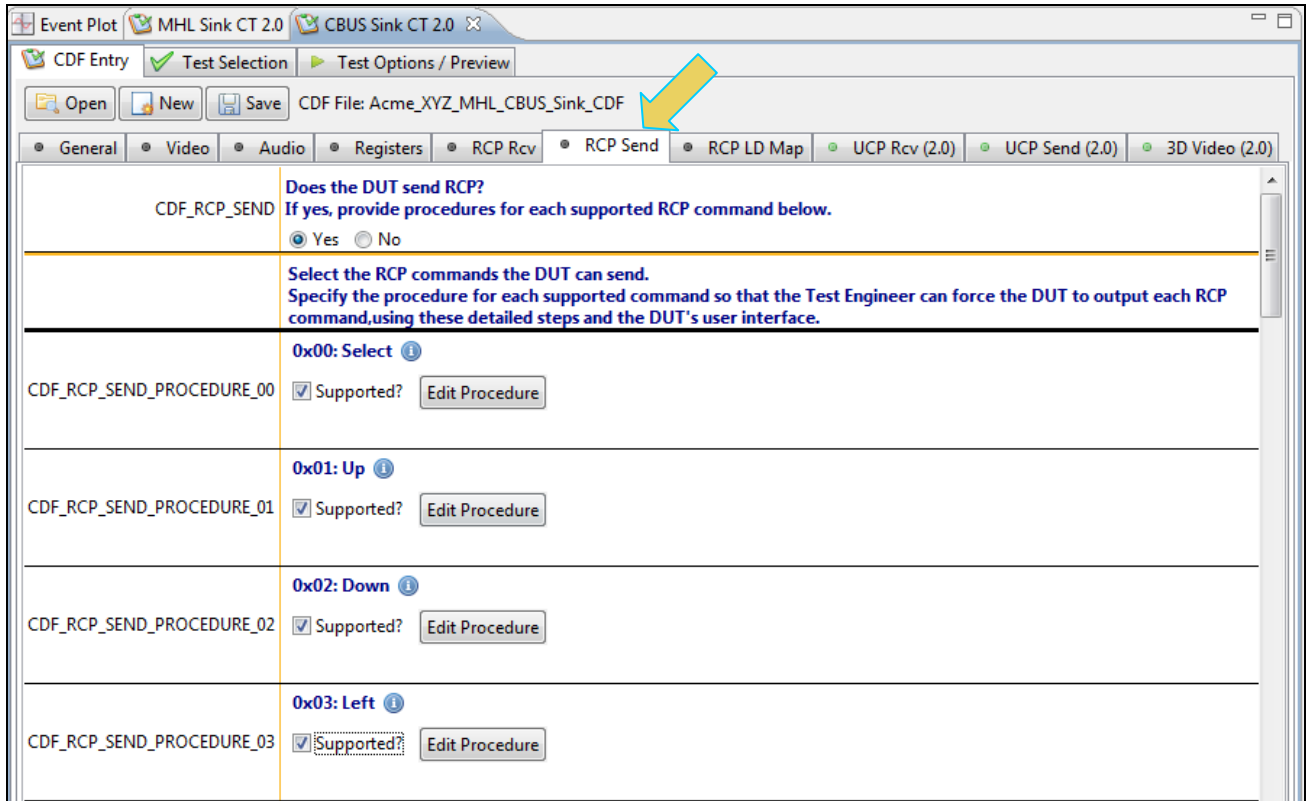
CDF_CR_MHL_VER_MAJOR	Register: MHL_VERSION	Field: MHL_VER_MAJOR	<input type="text" value="1"/>
CDF_CR_MHL_VER_MINOR	Register: MHL_VERSION	Field: MHL_VER_MINOR	<input type="text" value="0"/>
CDF_CR_DEV_TYPE	Register: DEV_CAT	Field: DEV_TYPE	<input checked="" type="radio"/> (1) Sink <input type="radio"/> (2) Source <input type="radio"/> (3) Dongle
CDF_CR_ADOPTER_ID_H	Register: ADOPTER_ID_H	Field: ADOPTER_ID_H	<input type="text" value="0"/> 00 - FF
CDF_CR_ADOPTER_ID_L	Register: ADOPTER_ID_L	Field: ADOPTER_ID_L	<input type="text" value="0"/> 00 - FF
CDF_CR_DEVICE_ID_H	Register: DEVICE_ID_H	Field: DEVICE_ID_H	<input type="text" value="0"/> 00 - FF
CDF_CR_DEVICE_ID_L	Register: DEVICE_ID_L	Field: DEVICE_ID_L	<input type="text" value="0"/> 00 - FF
CDF_CR_BANDWIDTH	Register: BANDWIDTH	Field: BANDWIDTH	<input type="text" value="15"/> 5..15
CDF_CR_INT_SIZE	Register: INT_STAT_SIZE	Field: INT_SIZE	<input type="text" value="4"/> 4..15
CDF_CR_STAT_SIZE	Register: INT_STAT_SIZE	Field: STAT_SIZE	<input type="text" value="4"/> 4..15

9. Complete the items in the **RCP Rcv** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will help a test engineer determine if the device behaves properly when the various RCP commands are received.

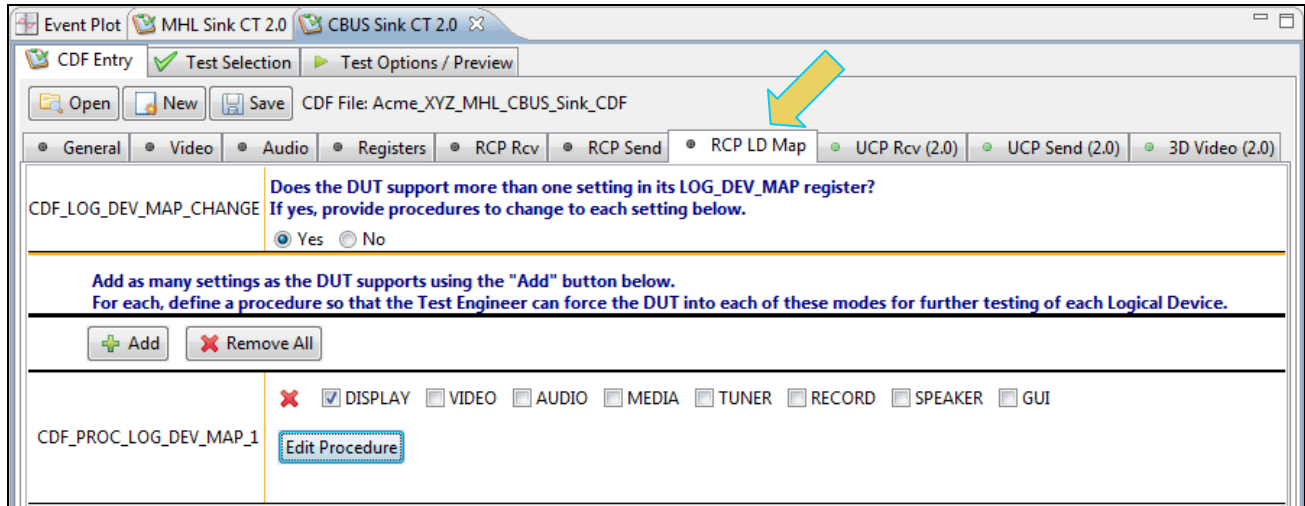
10. Complete the items in the **RCP Send** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test and can be helpful to instruct a test engineer on how to set up a device in order to run a particular test. In the example below you would enter in procedural information which a test engineer could use to cause the sink to issue the various RCP commands.



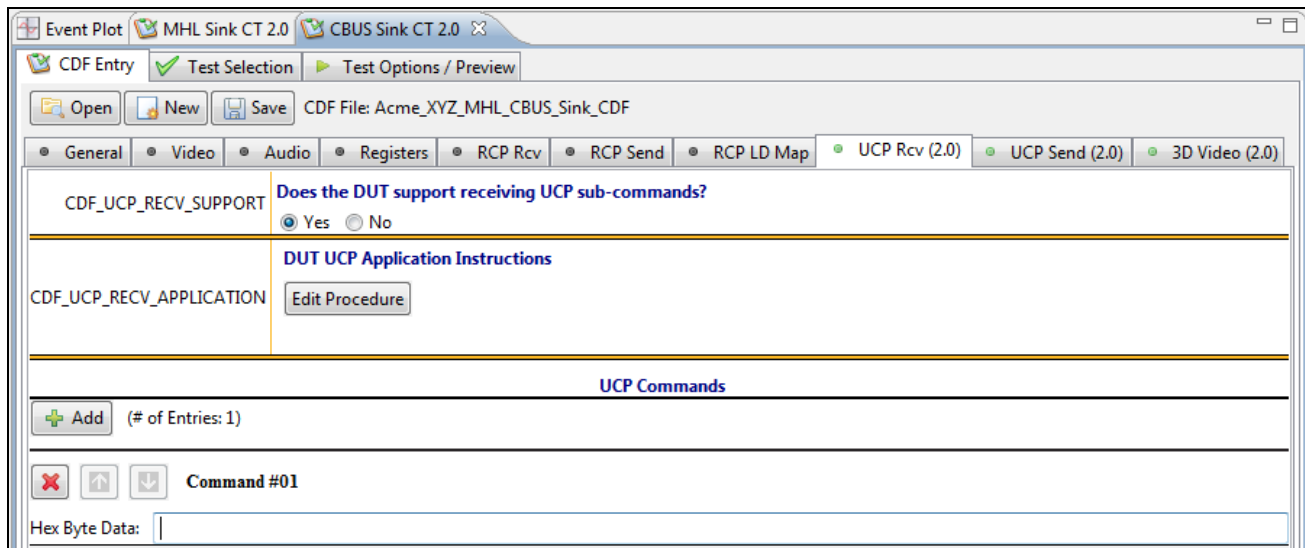
11. Complete the items in the **RCP LD Map** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test to assist the test engineer. In the example below you would enter in procedural information which a test engineer could use to force the sink into the proper mode for further testing of each logical device.



12. Complete the items in the **UCP Rcv** tab.

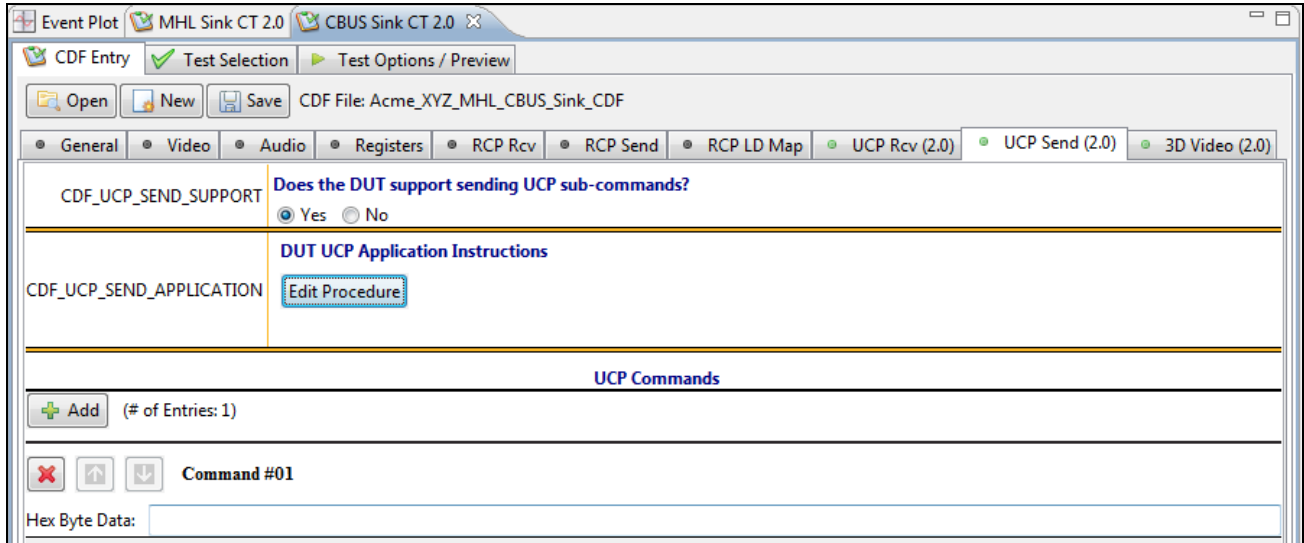
You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test to assist a test engineer. You can enter in the expected behavior for each supported command so that the test engineer can verify that the sink DUT behaves properly when receiving the various UCP commands.



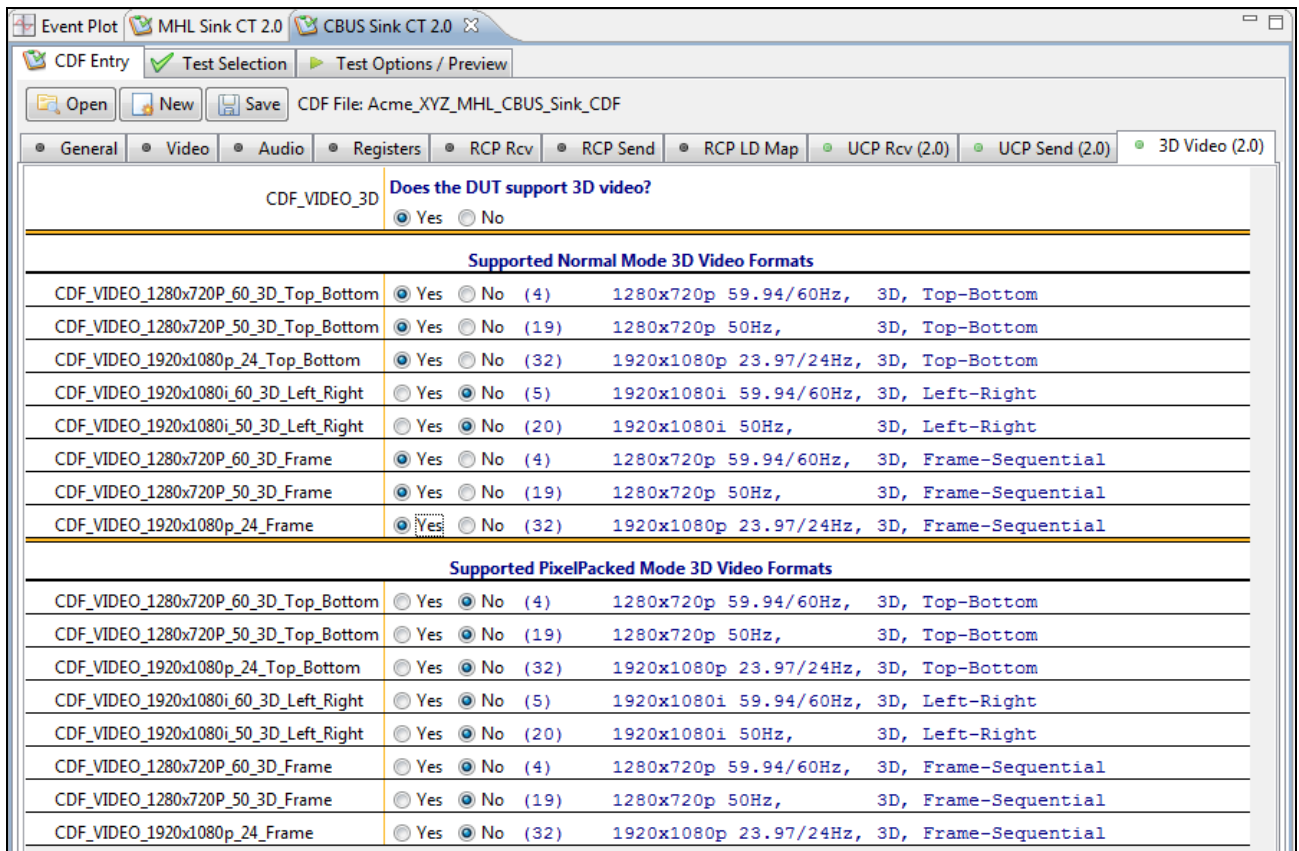
13. Complete the items in the **UCP Send** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test and can be helpful to instruct a test engineer on how to set up a device in

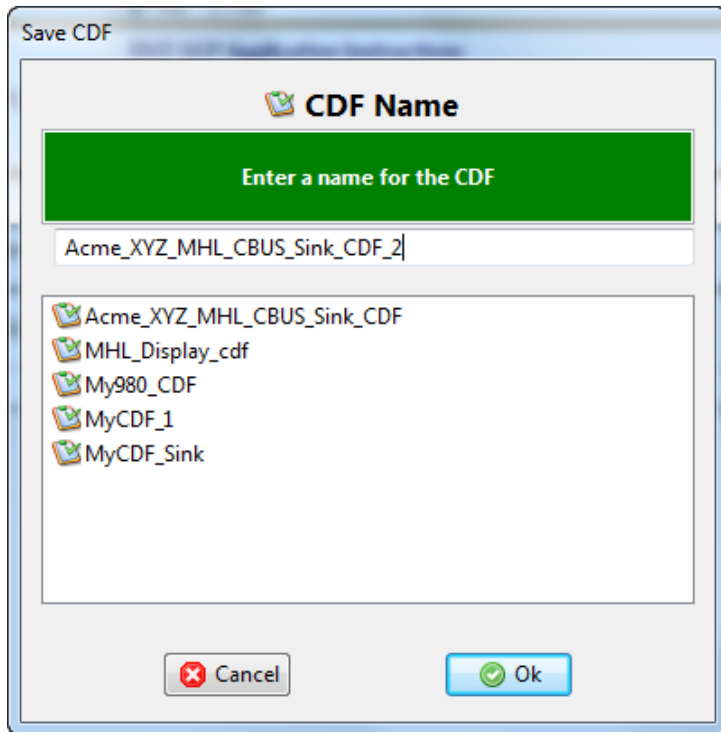
order to run a particular test. In the example below you would enter in procedural information which a test engineer could use to cause the sink to issue the various UCP commands.



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



15. Save the CDF. If you have not already saved the CDF, you can do so with the **Save** activation button. Alternatively you can save the CDF under a different name.



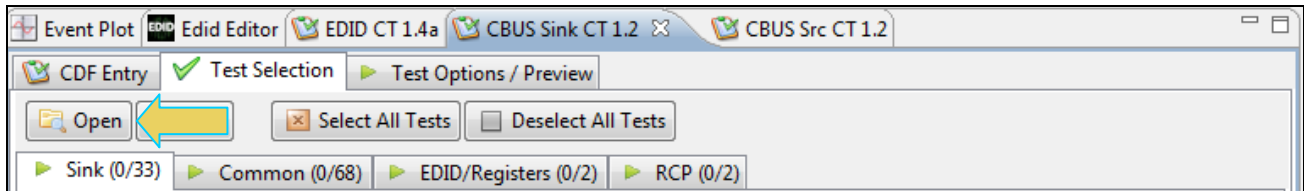
4.7 Selecting which tests to run

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

Note: The example workflows and screens use MHL 2.0 except where noted. Workflow and screens are similar for testing MHL 1.2 devices.

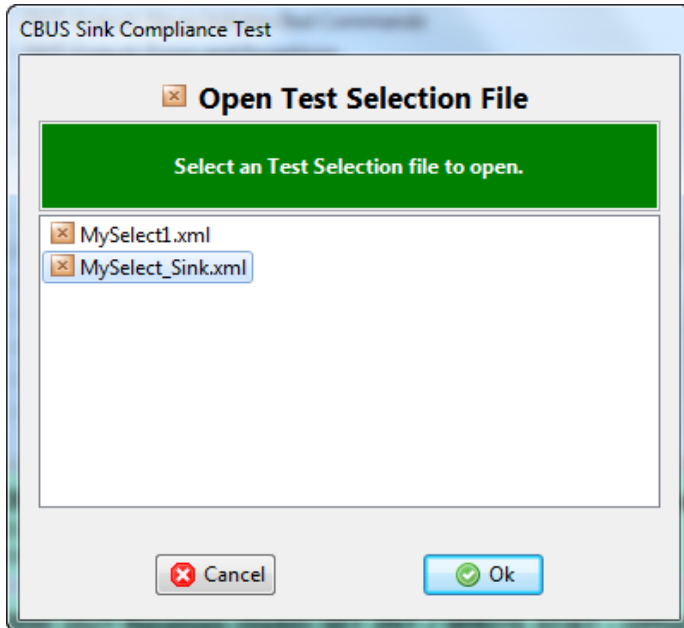
To select the tests to run:

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.

Note: You can save the Test Selection files to your host PC and transfer them to other PCs and for others to use.



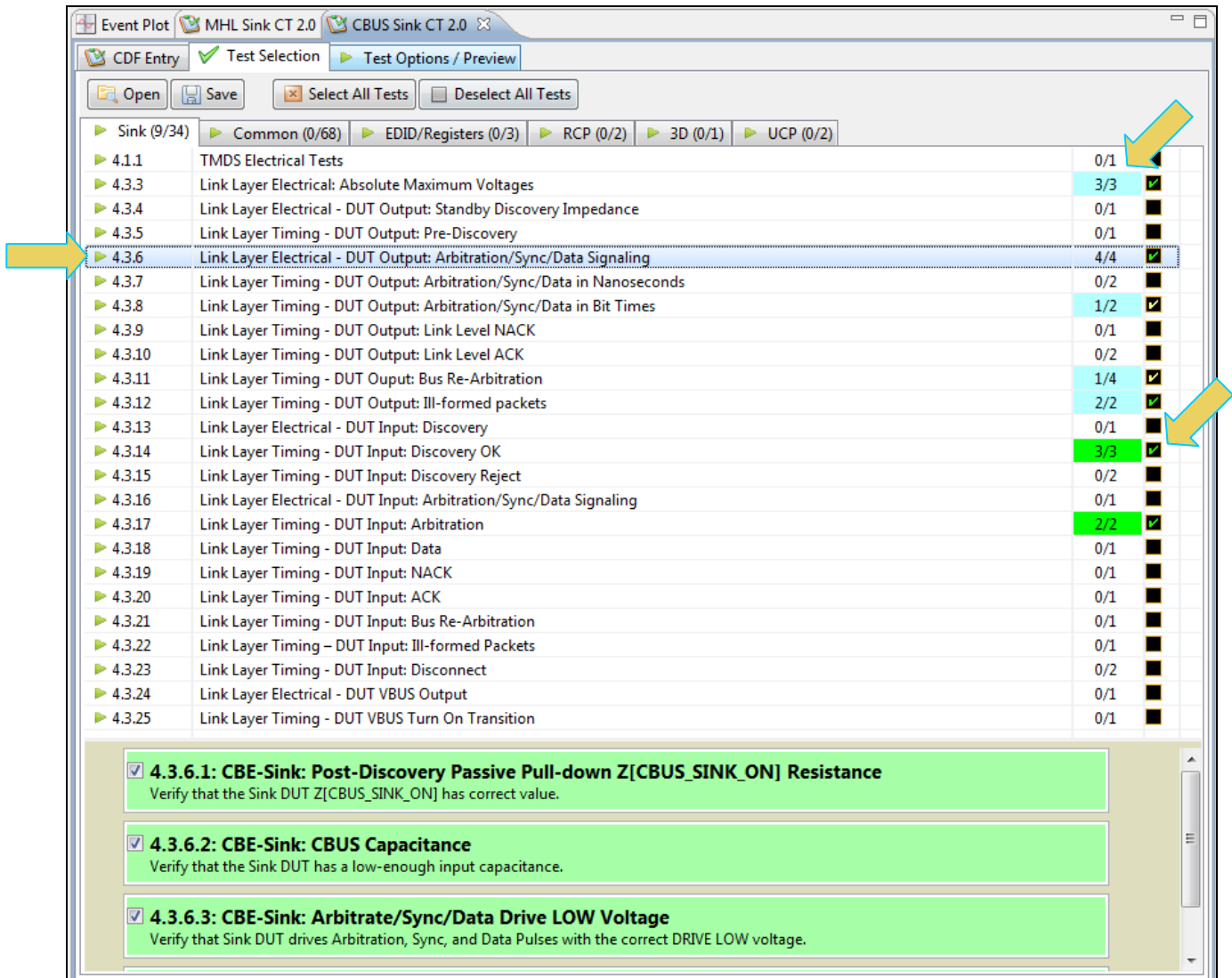
3. Complete the items in the **Sink** tab of the **Test Selection** panel shown below.

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

Check box indicators inform how many tests in each section and how many are selected. Each tab (Sink, Common or RCP) inform you of how many tests in that section have been selected.

Each test section list includes several tests. In the example shown below, the 4.3.6 Link Layer Timing – DUT Output: Bus Arbitration/Sync/Data Signaling Test section is selected and the specific tests in that section are then available to be selected.

Note: Some tests are run in background and cannot be deselected such as the 4.3.3 but there are other background tests within other 4.3.x sections are that are also background. The background tests are highlighted in a light blue as shown in the example below.



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

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

The screenshot shows the 'Test Selection' panel with the following data:

Test ID	Test Name	Progress	Status
4.1.1	TMDS Electrical Tests	0/1	Not Selected
4.3.3	Link Layer Electrical: Absolute Maximum Voltages	3/3	Selected
4.3.4	Link Layer Electrical - DUT Output: Standby Discovery Impedance	0/1	Not Selected
4.3.5	Link Layer Timing - DUT Output: Pre-Discovery	0/1	Not Selected
4.3.6	Link Layer Electrical - DUT Output: Arbitration/Sync/Data Signaling	4/4	Selected
4.3.7	Link Layer Timing - DUT Output: Arbitration/Sync/Data in Nanoseconds	0/2	Not Selected
4.3.8	Link Layer Timing - DUT Output: Arbitration/Sync/Data in Bit Times	1/2	Selected
4.3.9	Link Layer Timing - DUT Output: Link Level NACK	0/1	Not Selected
4.3.10	Link Layer Timing - DUT Output: Link Level ACK	0/2	Not Selected
4.3.11	Link Layer Timing - DUT Output: Bus Re-Arbitration	1/4	Selected
4.3.12	Link Layer Timing - DUT Output: Ill-formed packets	2/2	Selected
4.3.13	Link Layer Electrical - DUT Input: Discovery	0/1	Not Selected
4.3.14	Link Layer Timing - DUT Input: Discovery OK	3/3	Selected
4.3.15	Link Layer Timing - DUT Input: Discovery Reject	0/2	Not Selected
4.3.16	Link Layer Electrical - DUT Input: Arbitration/Sync/Data Signaling	0/1	Not Selected
4.3.17	Link Layer Timing - DUT Input: Arbitration	2/2	Selected
4.3.18	Link Layer Timing - DUT Input: Data	0/1	Not Selected
4.3.19	Link Layer Timing - DUT Input: NACK	0/1	Not Selected
4.3.20	Link Layer Timing - DUT Input: ACK	0/1	Not Selected
4.3.21	Link Layer Timing - DUT Input: Bus Re-Arbitration	0/1	Not Selected
4.3.22	Link Layer Timing - DUT Input: Ill-formed Packets	0/1	Not Selected
4.3.23	Link Layer Timing - DUT Input: Disconnect	0/2	Not Selected
4.3.24	Link Layer Electrical - DUT VBUS Output	0/1	Not Selected
4.3.25	Link Layer Timing - DUT VBUS Turn On Transition	0/1	Not Selected

<input checked="" type="checkbox"/>	4.3.6.1: CBE-Sink: Post-Discovery Passive Pull-down Z[CBUS_SINK_ON] Resistance Verify that the Sink DUT Z[CBUS_SINK_ON] has correct value.
<input checked="" type="checkbox"/>	4.3.6.2: CBE-Sink: CBUS Capacitance Verify that the Sink DUT has a low-enough input capacitance.
<input checked="" type="checkbox"/>	4.3.6.3: CBE-Sink: Arbitrate/Sync/Data Drive LOW Voltage Verify that Sink DUT drives Arbitration, Sync, and Data Pulses with the correct DRIVE LOW voltage.

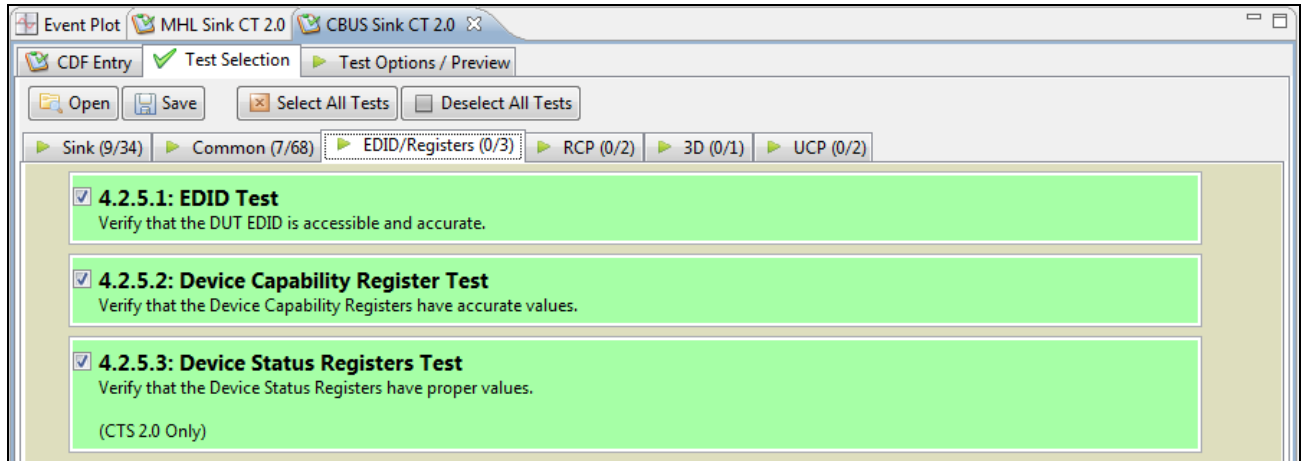
5. Complete the items in the **Common** tab of the **Test Selection** panel shown below.

The screenshot shows a software interface with the following components:

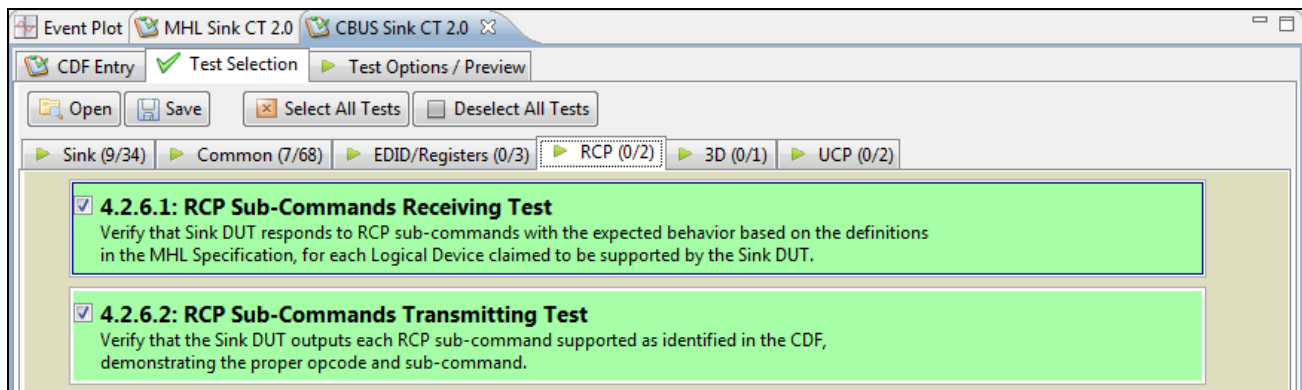
- Windows:** Event Plot, MHL Sink CT 2.0, CBUS Sink CT 2.0.
- Buttons:** CDF Entry, Test Selection, Test Options / Preview, Open, Save, Select All Tests, Deselect All Tests.
- Test Selection Panel:**
 - Tree view: Sink (9/34) > Common (7/68) > Registers (0/3) > RCP (0/2) > 3D (0/1) > UCP (0/2)
 - Table of tests:
- Test Details Panel (Expanded for 6.3.3):**
 - 6.3.3.1: CBM: DUT sends (0x62) GET_STATE command**
Observe that the DUT sends valid MHL Sideband Channel Commands. Respond with legal results, and observe the DUT responses. Observe that the DUT sends valid GET_STATE commands, and waits for a response before sending another MSC command.
 - 6.3.3.2: CBM: DUT sends (0x63) GET_VENDOR_ID Command**
Observe that the DUT sends valid MHL Sideband Channel Commands. Respond with legal results, and observe the DUT responses. Observe that the DUT sends valid GET_VENDOR_ID commands, and waits for a response before sending another MSC command.
 - 6.3.3.3: CBM: DUT sends (0x6B) GET_MSC_ERRORCODE Command**
Observe that the DUT sends valid MHL Sideband Channel Commands. Respond with legal results, and observe the DUT responses. Observe that the DUT sends valid GET_MSC_ERRORCODE commands, and waits for a response before sending another MSC command.
 - 6.3.3.4: CBM: DUT sends (0x60) SET_INT/WRITE_STAT Command**
Observe that the DUT sends valid MHL Sideband Channel Commands. Respond with legal results, and observe the DUT responses. Observe that the DUT sends valid SET_INT or WRITE_STAT commands, and waits for a response before sending another MSC command.

Test ID	Description	Progress	Status
6.3.1	MSC - DUT Input: Device Register Space Contents; Reads	0/1	Not Started
6.3.2	MSC - DUT Output: Vendor-specific and Reserved Header Values	1/1	Completed
6.3.3	MSC - DUT Output: Normal Commands	7/7	Completed
6.3.5	MSC - DUT Output: Never Initiates Bad Commands	8/8	Completed
6.3.6	MSC - DUT Output: Errors and Exceptions	0/5	Not Started
6.3.7	MSC - DUT Output: Disconnect	0/1	Not Started
6.3.8	MSC - DUT Input: Device Register Space Contents; Writes	0/2	Not Started
6.3.9	MSC - DUT Input: Vendor-specific and Reserved Header Values	0/1	Not Started
6.3.10	MSC - DUT Input: Normal Commands	0/8	Not Started
6.3.11	MSC - DUT Input: Errors and Exceptions	0/22	Not Started
6.3.12	MSC - DUT Input: Argument Timeouts	0/9	Not Started
6.3.15	MSC - DUT Output: Normal Commands	0/2	Not Started
6.3.16	MSC - DUT Input: Errors and Exceptions	0/2	Not Started
6.3.20	DDC - DUT Input; Continuous Monitors and Normal Operation	2/2	Completed
6.3.21	DDC - DUT Input; Normal Operation	0/5	Not Started
6.3.22	DDC - DUT Input; Illegal Responses	0/3	Not Started

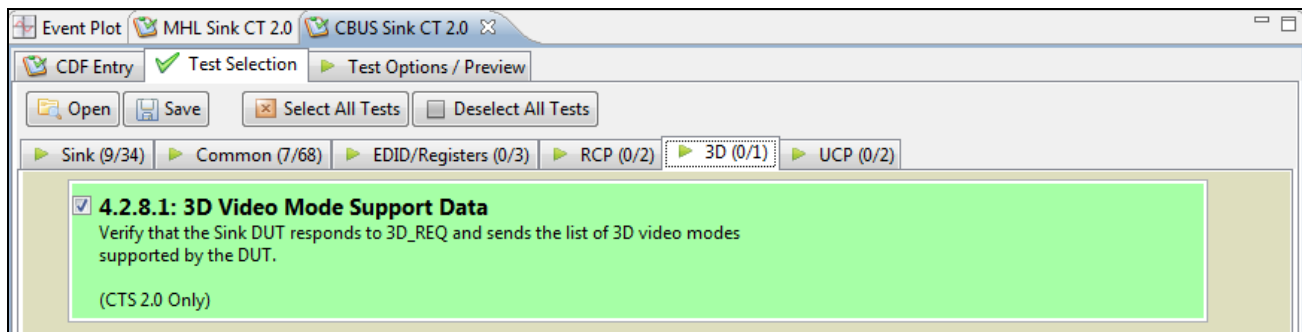
6. Complete the items in the **EDID** tab of the **Test Selection** panel shown below.



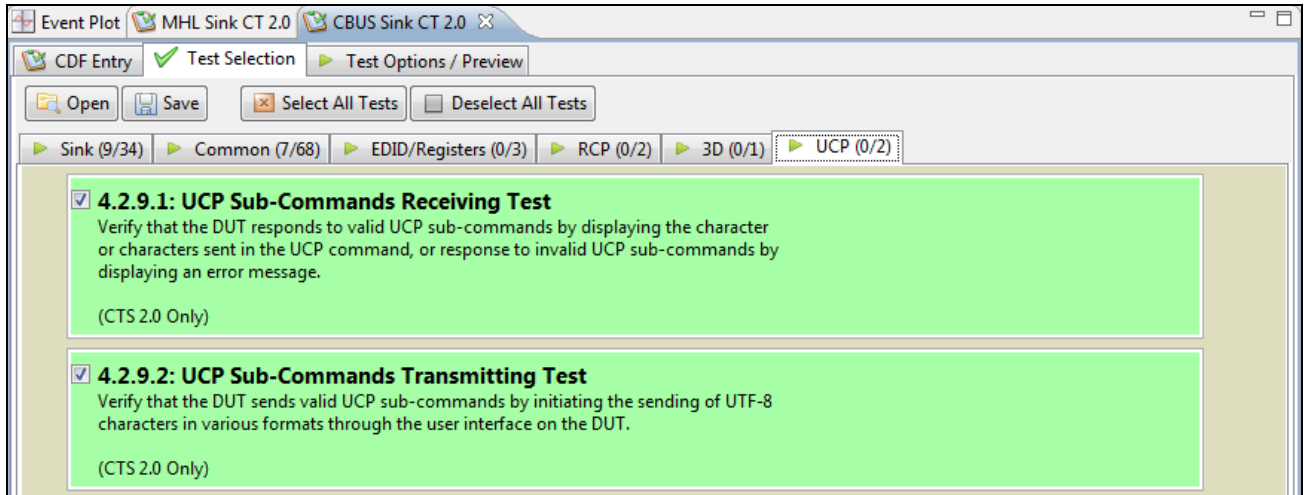
7. Complete the items in the **RCP** tab of the **Test Selection** panel shown below.



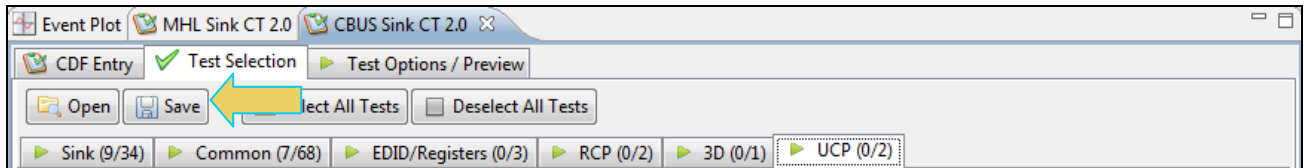
8. Complete the items in the **3D** tab of the **Test Selection** panel shown below.



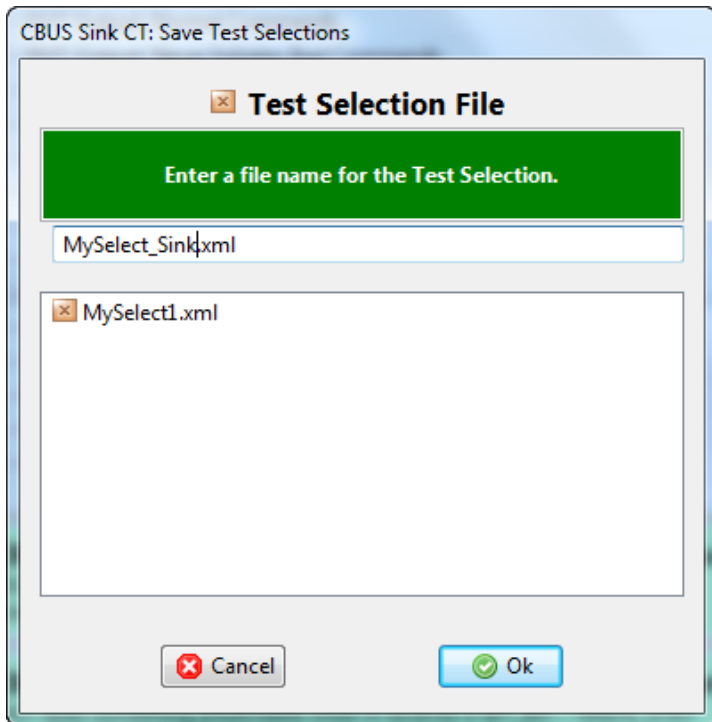
9. Complete the items in the **UCP** tab of the **Test Selection** panel shown below.



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



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



4.8 Executing the MHL CBUS Sink Compliance Tests

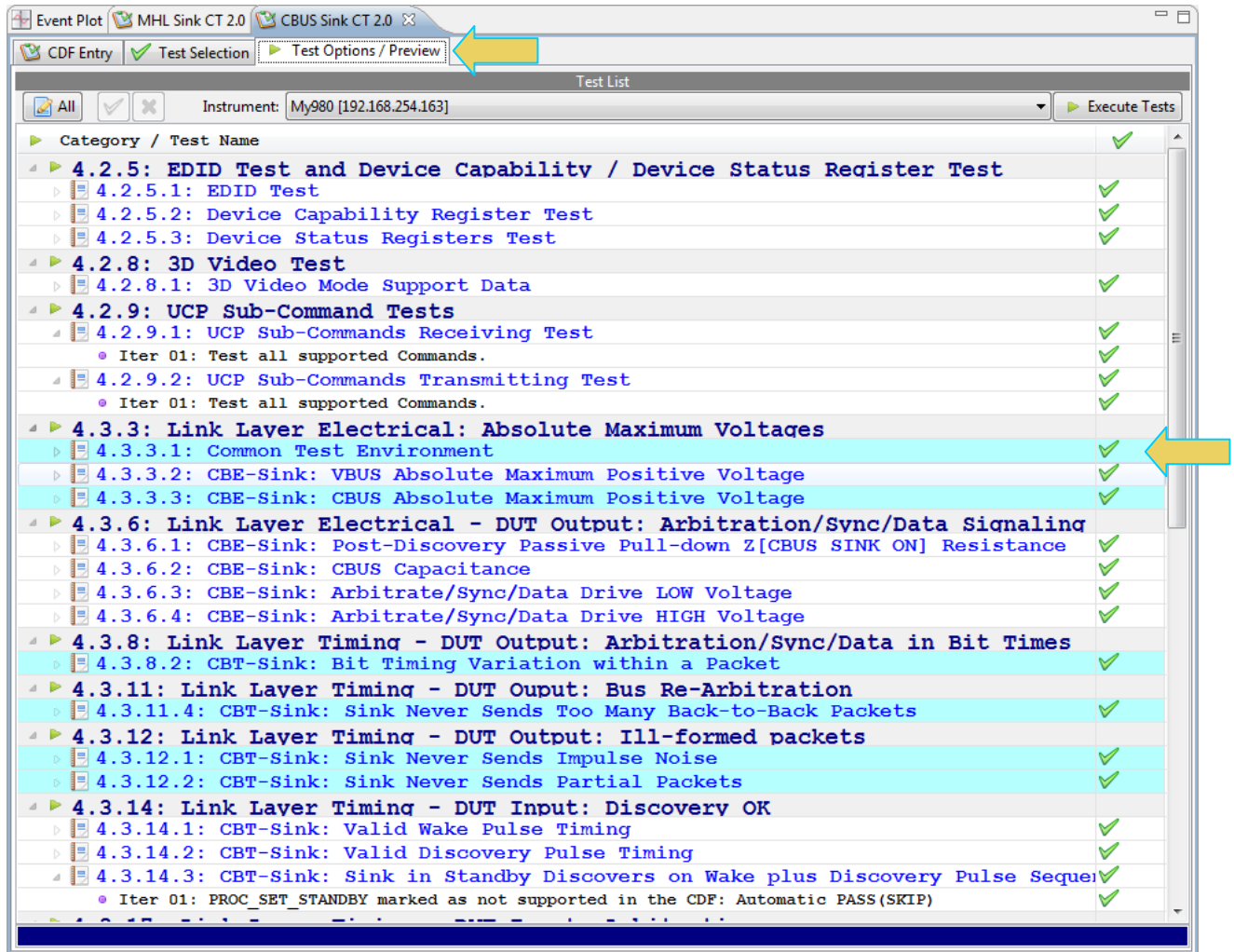
Use the following procedures to initiate the execution of an MHL CBUS Sink Compliance test series.

Note: The example workflows and screens use MHL 2.0 except where noted. Workflow and screens are similar for testing MHL 1.2 devices.

To initiate a test series:

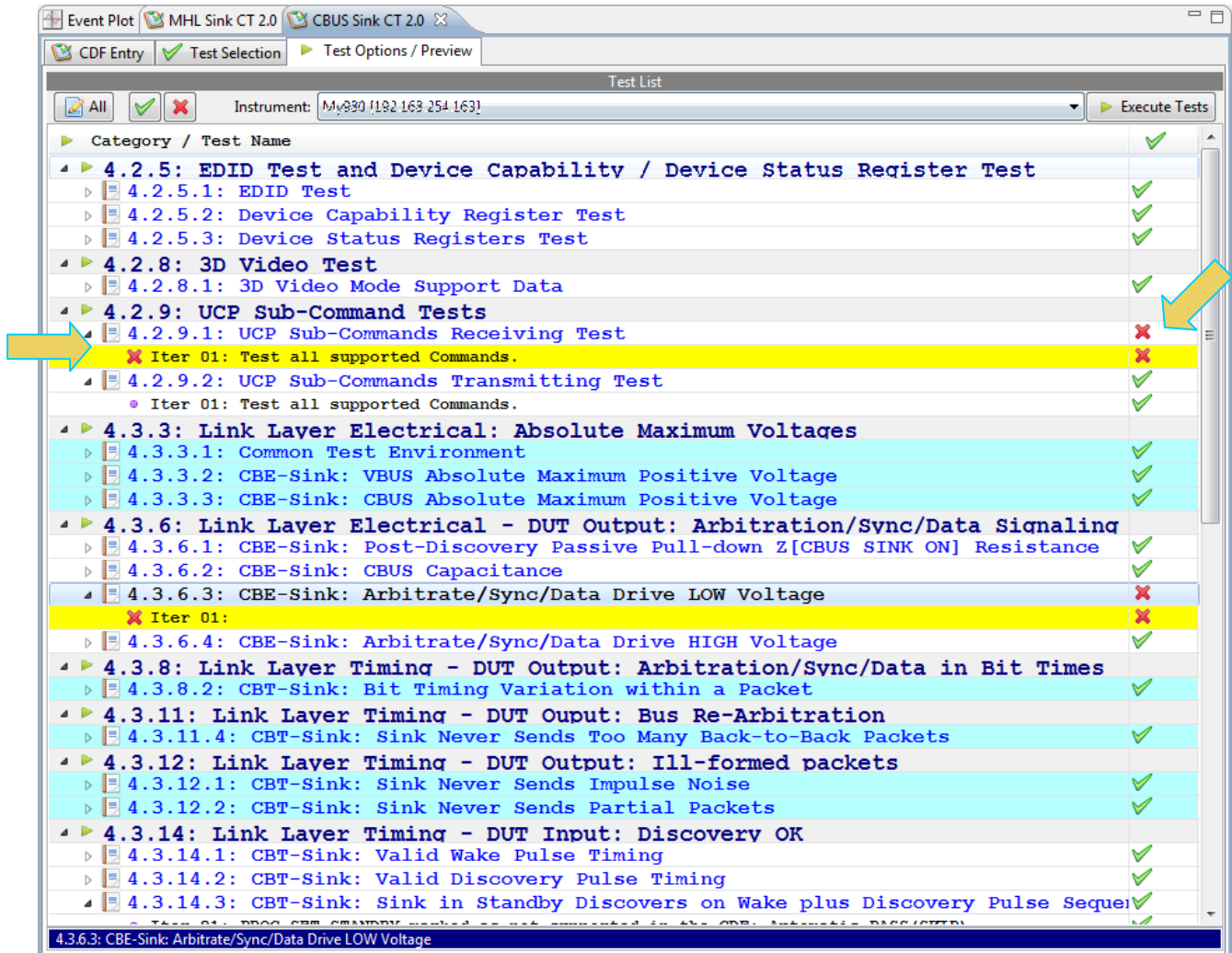
1. Select the **Test Options / Preview** panel as shown below.

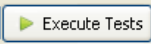
Note: The background tests are highlighted in light blue. These are tests that are run in the background during the remaining test suite. Refer to the two screen shots below.

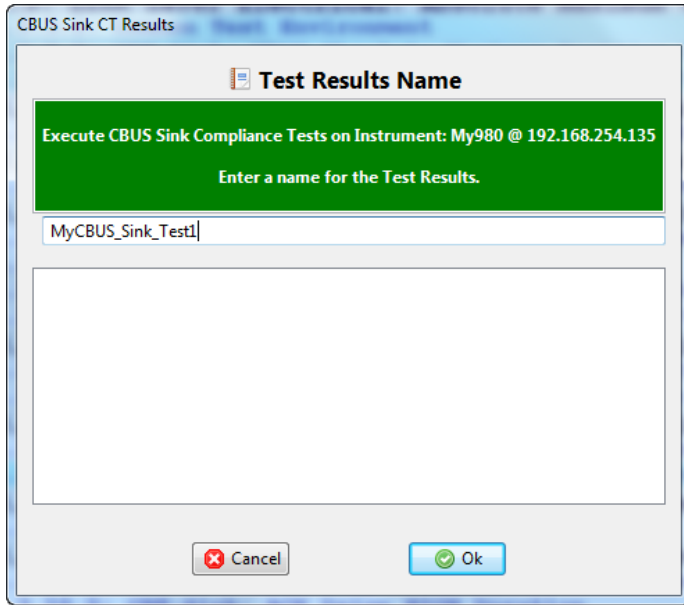


- (Optional) Review the list of tests for each category. If you wish to skip some of the tests. You can skip tests by clicking on the Check mark on the right side of the **Test Options / Preview** panel.

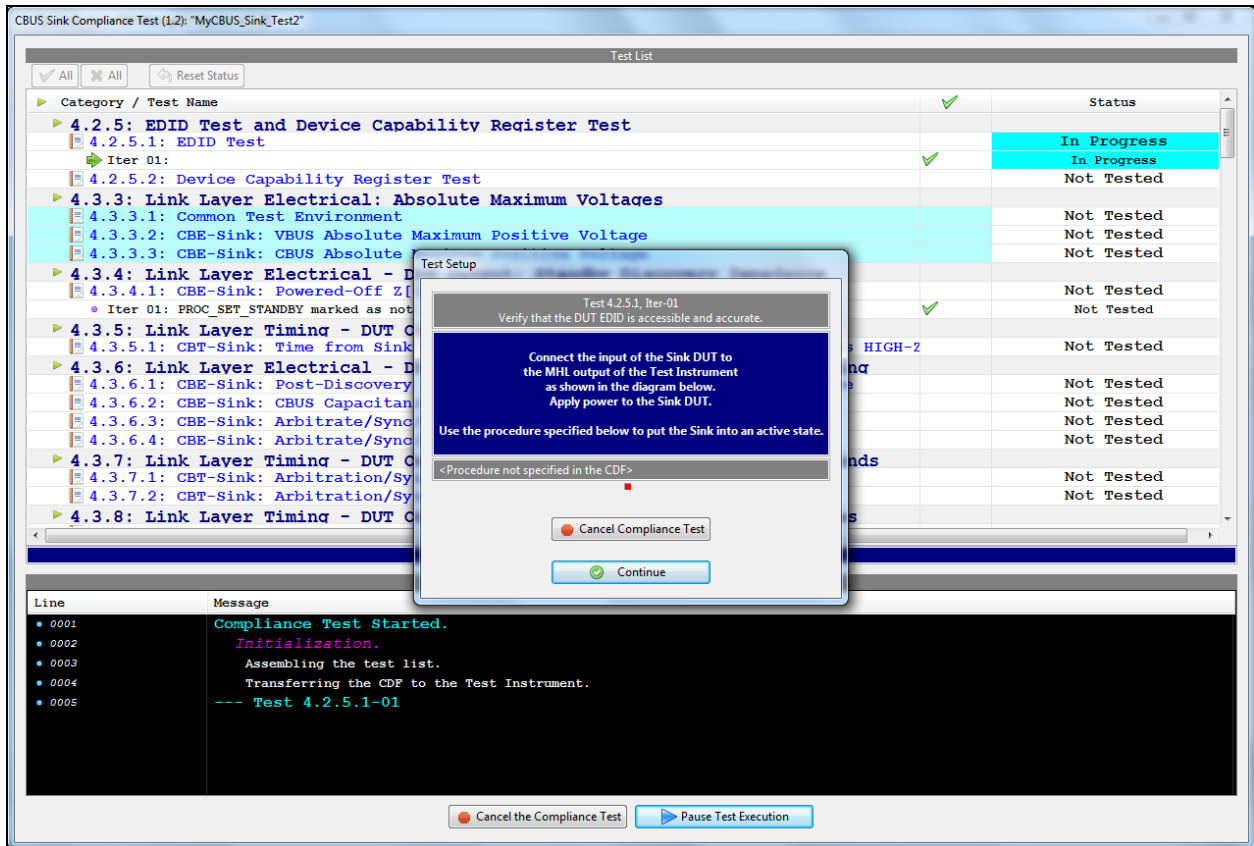
The screen shot below shows some of the tests that have been skipped (highlighted in yellow with a red X).



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



A screen will appear instructing you on how to connect your MHL CBUS sink device for testing. A sample screen is shown below:



During the test, the test results are shown under the Status column. 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 examples below.

The screenshot displays the 'CBUS Sink Compliance Test (1.2): "MyCBUS_Sink_Test3"' interface. It is divided into two main sections: 'Test List' and 'Test Log'.

Test List: A table with columns for 'Category / Test Name', a progress indicator (checkmark or 'X'), and 'Status'. The status column uses color coding: red for 'Fail', green for 'Pass', yellow for 'Incomplete', cyan for 'In Progress', and grey for 'Not Tested' or 'User Skipped'. A yellow arrow points to the 'Status' column header, and another yellow arrow points to the 'In Progress' status of test 4.3.6.2.

Category / Test Name	Progress	Status
4.2.5: EDID Test and Device Capability Register Test	✓	Fail
4.2.5.2: Device Capability Register Test	✓	Fail
Iter 01:	✓	Fail
4.3.3: Link Layer Electrical: Absolute Maximum Voltages		Pass
4.3.3.1: Common Test Environment		Pass
4.3.3.2: CBE-Sink: VBUS Absolute Maximum Positive Voltage		Pass
4.3.3.3: CBE-Sink: CBUS Absolute Maximum Positive Voltage		Pass
4.3.5: Link Layer Timing - DUT Output: Pre-Discovery		Incomplete
4.3.5.1: CBT-Sink: Time from Sink-side MHL Cable Detect until Sink CBUS Leaves HI	✗	User Skipped
Iter 01:	✗	User Skipped
4.3.6: Link Layer Electrical - DUT Output: Arbitration/Sync/Data Signaling		Incomplete
4.3.6.1: CBE-Sink: Post-Discovery Passive Pull-down Z[CBUS SINK ON] Resistance	✗	User Skipped
Iter 01:	✗	User Skipped
4.3.6.2: CBE-Sink: CBUS Capacitance	▶	In Progress
Iter 01:	▶	In Progress
4.3.6.3: CBE-Sink: Arbitrate/Sync/Data Drive LOW Voltage	✓	Not Tested
4.3.6.4: CBE-Sink: Arbitrate/Sync/Data Drive HIGH Voltage	✗	Incomplete
Iter 01:	✗	User Skipped
4.3.8: Link Layer Timing - DUT Output: Arbitration/Sync/Data in Bit Times		Not Tested
4.3.8.1: CBT-Sink: Arb, Sync, Data HIGH and LOW Timing		Not Tested
4.3.8.2: CBT-Sink: Bit Timing Variation within a Pack		Pass
4.3.9: Link Layer Timing - DUT Output: Link Level CK		Not Tested
4.3.9.1: CBT-Sink: Response to Link Level NACK		Not Tested

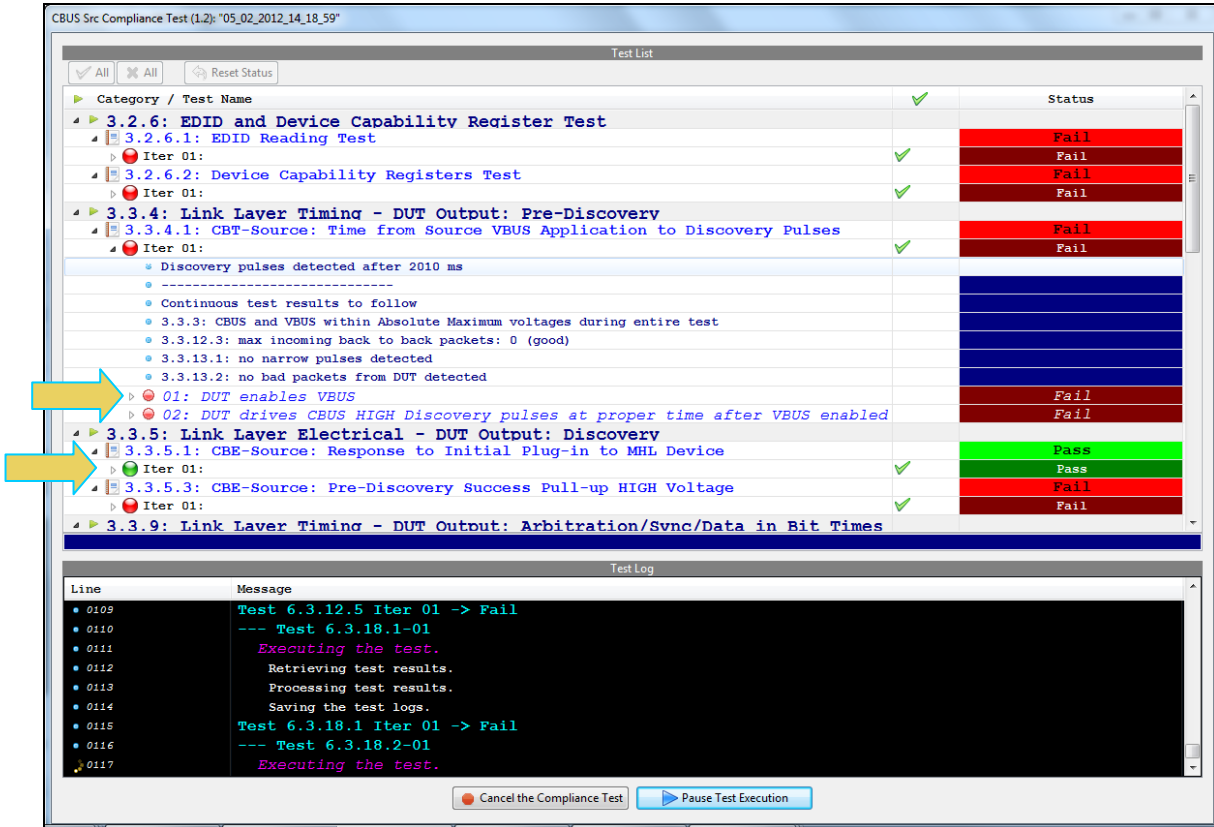
Test Log: A list of messages with line numbers. The log shows the test configuration and execution progress.

```

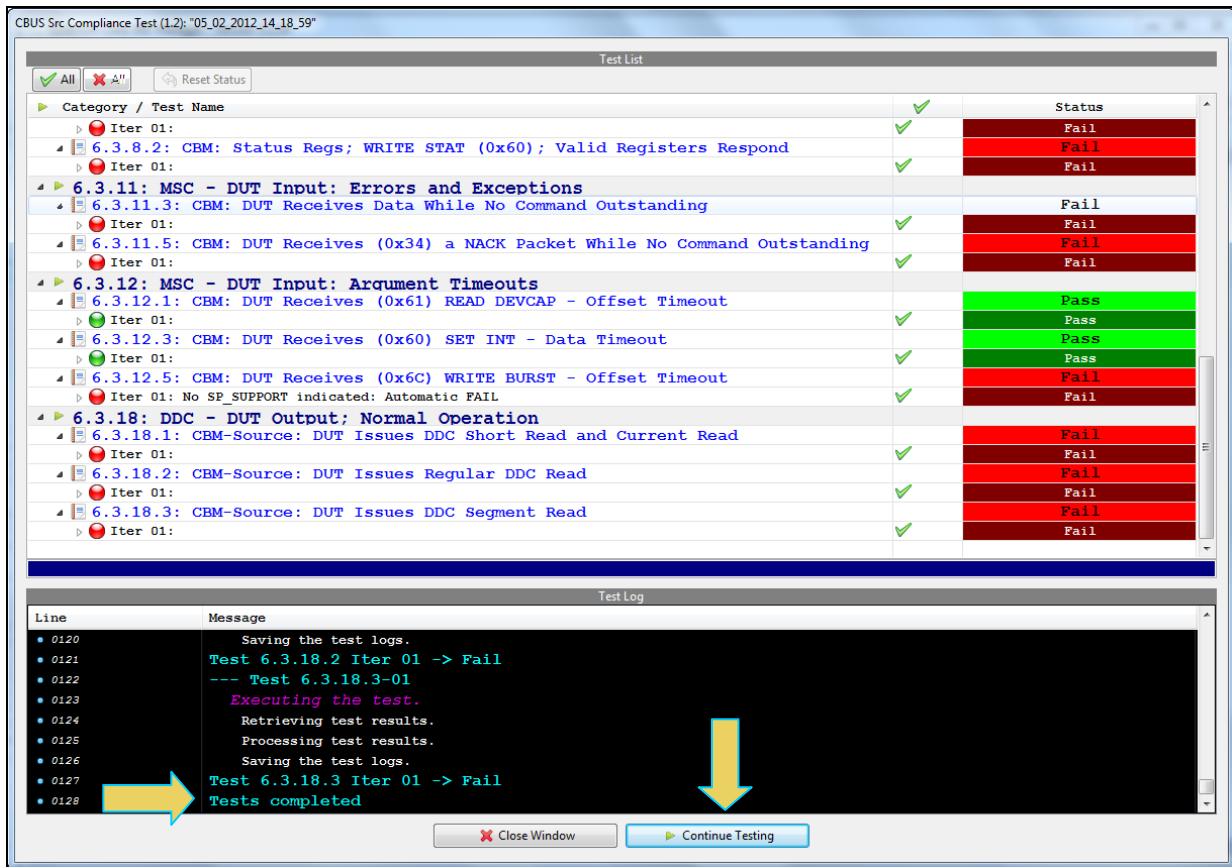
Line      Message
-----
0006      Configuration Change: UNKNOWN -> SINK_ACTIVE
0007      Executing the test.
0008      Retrieving test results.
0009      Processing test results.
0010      Saving the test logs.
0011      Test 4.2.5.2 Iter 01 -> Fail
0012      --- Test 4.3.6.2-01
0013      Executing the test.
    
```

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

You can view the details of failures or passes when they occur by exposing the navigation arrows on the left. Examples are shown on the following screen.



The log will indicate when the tests have completed. 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 following screen example.



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 **CBUS Sink CT 1.2** 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.

CBUS Sink Compliance Test Results

Results Name: MyCBUS_Sink_Test2 Manufacturer: Acme HTML Report
 Date Tested: September 14, 2012 12:01 PM Model Name: XYZ
 Overall Status: **CTS 1.2 - Canceled** Port Tested: 1

Test Name / Details	Status
4.2.5.1: EDID Test	Fail
4.2.5.2: Device Capability Register Test	Fail
4.3.3.1: Common Test Environment	Pass
4.3.3.2: CBE-Sink: VBUS Absolute Maximum Positive Voltage	Pass
4.3.3.3: CBE-Sink: CBUS Absolute Maximum Positive Voltage	Pass
4.3.4.1: CBE-Sink: Powered-Off Z[CBUS SINK DISCOVER]	Skipped
4.3.5.1: CBT-Sink: Time from Sink-side MHL Cable Detect	Skipped
4.3.6.1: CBE-Sink: Post-Discovery Passive Pull-down Z[CBUS SINK DISCOVER]	Fail
4.3.6.2: CBE-Sink: CBUS Capacitance	Fail
4.3.6.3: CBE-Sink: Arbitrate/Sync/Data Drive LOW Voltage	Fail
4.3.6.4: CBE-Sink: Arbitrate/Sync/Data Drive HIGH Voltage	Fail
4.3.7.1: CBT-Sink: Arbitration/Sync/Data Active Drive HIGH Voltage	Fail
4.3.7.2: CBT-Sink: Arbitration/Sync/Data Edge Rate	Fail
4.3.8.1: CBT-Sink: Arb, Sync, Data HIGH and LOW Timing	Fail
4.3.8.2: CBT-Sink: Bit Timing Variation within a Packet	Pass
4.3.9.1: CBT-Sink: Response to Link Level NACK	Fail
4.3.10.1: CBT-Sink: ACK Output Timing in Nanoseconds	Fail
4.3.10.2: CBT-Sink: ACK Drive HIGH Duration	Fail
4.3.11.1: CBT-Sink: Sink uses Case 2 Regular Arbitration	Fail
4.3.11.2: CBT-Sink: Sink Case 3 Long Re-arbitration when	Fail
4.3.11.3: CBT-Sink: Sink Uses Case 1 Back-to-Back Timing	Fail
4.3.11.4: CBT-Sink: Sink Never Sends Too Many Back-to-Back	Pass
4.3.12.1: CBT-Sink: Sink Never Sends Impulse Noise	Pass
4.3.12.2: CBT-Sink: Sink Never Sends Partial Packets	Pass
4.3.13.1: CBE-Sink: Discovery Sensitivity to Input Voltage	Fail
4.3.14.1: CBT-Sink: Valid Wake Pulse Timing	Fail
4.3.14.2: CBT-Sink: Valid Discovery Pulse Timing	Fail
4.3.14.3: CBT-Sink: Sink in Standby Discovers on Wake pulse	Skipped
4.3.15.1: CBT-Sink: First Discovery Pulse should be Ignored	Fail

Instrument: My980 [192.168.254.135] Continue Test Execution

4.9 Viewing Details of Sink Compliance Test Passes or 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 test.

To view the details of each test:

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

Results Name: MyCBUS_Sink_Test2 **Manufacturer:** Acme
Date Tested: September 14, 2012 12:01 PM **Model Name:** XYZ
Overall Status: CTS 1.2 - Canceled **Port Tested:** 1

Test Results

Test Name / Details	Status
4.3.6.4: CBE-Sink: Arbitrate/Sync/Data Drive HIGH Voltage	Fail
4.3.7.1: CBT-Sink: Arbitration/Sync/Data Active Drive HIGH Duration	Fail
4.3.7.2: CBT-Sink: Arbitration/Sync/Data Edge Rate	Fail
4.3.8.1: CBT-Sink: Arb, Sync, Data HIGH and LOW Timing	Fail
4.3.8.2: CBT-Sink: Bit Timing Variation within a Packet	Pass
4.3.9.1: CBT-Sink: Response to Link Level NACK	Fail
4.3.10.1: CBT-Sink: ACK Output Timing in Nanoseconds	Fail
4.3.10.2: CBT-Sink: ACK Drive HIGH Duration	Fail
4.3.11.1: CBT-Sink: Sink uses Case 2 Regular Arbitration after NACK	Fail
4.3.11.2: CBT-Sink: Sink Case 3 Long Re-arbitration when it Gives up the Bus	Fail
Iter 01:	--
DUT failed to discover. Timed out after 13000 ms.	
timed out	
01: DUT does eventually send a data packet.	Fail
DUT did not send a data packet in response to GET_STATE	
02: DUT does NOT do re-arbitration (after an ACK) sooner than TWAIT (express	Pass
4.3.11.3: CBT-Sink: Sink Uses Case 1 Back-to-Back Timing (No Re-arbitration)	Fail
4.3.11.4: CBT-Sink: Sink Never Sends Too Many Back-to-Back Packets	Pass
4.3.12.1: CBT-Sink: Sink Never Sends Impulse Noise	Pass
4.3.12.2: CBT-Sink: Sink Never Sends Partial Packets	Pass
4.3.13.1: CBE-Sink: Discovery Sensitivity to Input Voltages	Fail
4.3.14.1: CBT-Sink: Valid Wake Pulse Timing	Fail
4.3.14.2: CBT-Sink: Valid Discovery Pulse Timing	Fail
4.3.14.3: CBT-Sink: Sink in Standby Discovers on Wake plus Discovery Pulse Sequ	Skipped
4.3.15.1: CBT-Sink: First Discovery Pulse should be Ignored	Fail
4.3.15.2: CBT-Sink: Last Discovery Pulse should be Ignored	Fail
4.3.16.1: CBE-Sink: Sensitivity to VIH/VIL	Fail
4.3.17.1: CBT-Sink: End of Discovery to Early Source-side Arbitration	Fail
4.3.17.2: CBT-Sink: Sink Loses Arbitration Collision Correctly	Fail

4.2.5.1: EDID Test

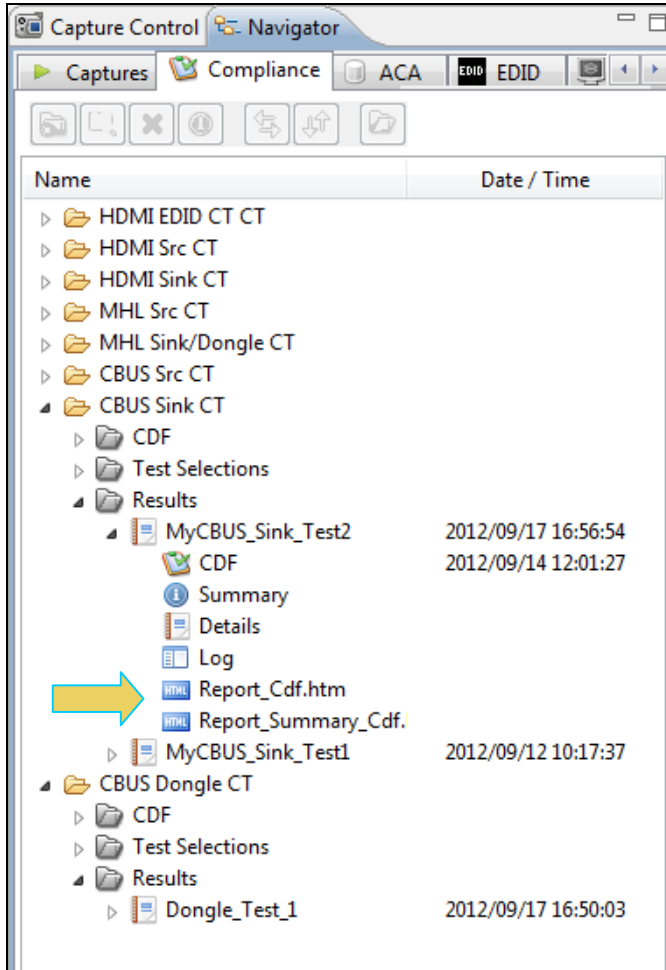
Instrument: My980 [192.168.254.135] Continue Test Execution

4.10 Accessing the test results through the navigator panel

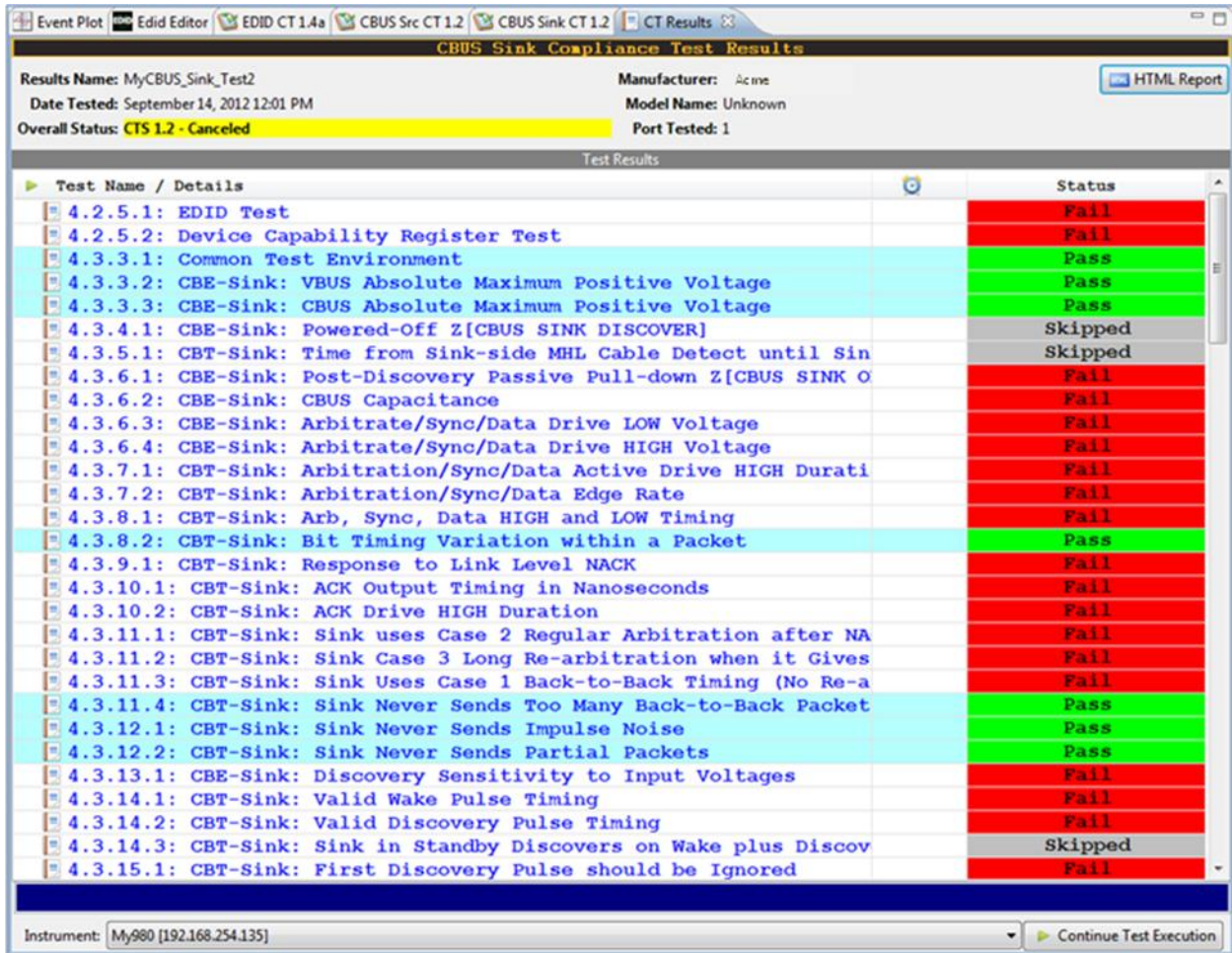
You can view the results of the tests at any time after you run them through the 980 GUI Manager's **Navigator** panel. Use the following procedures to view the details of a test.

To access the test results:

1. Access the **Navigator** tab and select **Compliance**. Refer to the screen example below.



- Double click on the Results file you wish to view. The results will appear in a CT Results window on the right. Refer to the screen example below.



4.11 Viewing the MHL Sink Compliance HTML test report

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

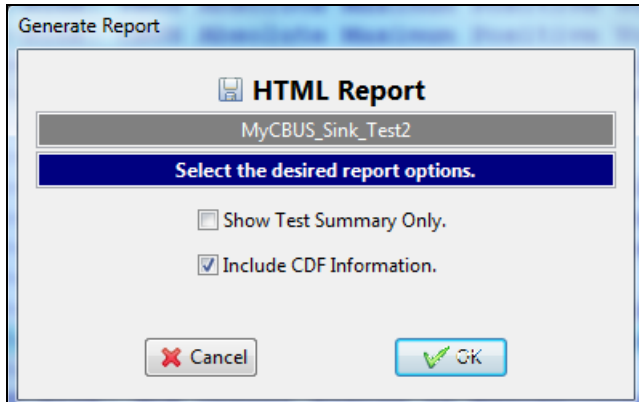
To view the html test report:

1. Select the **CT Results** panel as shown below.

Test Name / Details	Status
4.2.5.1: EDID Test	Fail
4.2.5.2: Device Capability Register Test	Fail
4.3.3.1: Common Test Environment	Pass
4.3.3.2: CBE-Sink: VBUS Absolute Maximum Positive Voltage	Pass
4.3.3.3: CBE-Sink: CBUS Absolute Maximum Positive Voltage	Pass
4.3.4.1: CBE-Sink: Powered-Off Z[CBUS SINK DISCOVER]	Skipped
4.3.5.1: CBT-Sink: Time from Sink-side MHL Cable Detect until Sin	Skipped
4.3.6.1: CBE-Sink: Post-Discovery Passive Pull-down Z[CBUS SINK O	Fail
4.3.6.2: CBE-Sink: CBUS Capacitance	Fail
4.3.6.3: CBE-Sink: Arbitrate/Sync/Data Drive LOW Voltage	Fail
4.3.6.4: CBE-Sink: Arbitrate/Sync/Data Drive HIGH Voltage	Fail
4.3.7.1: CBT-Sink: Arbitration/Sync/Data Active Drive HIGH Durati	Fail
4.3.7.2: CBT-Sink: Arbitration/Sync/Data Edge Rate	Fail
4.3.8.1: CBT-Sink: Arb, Sync, Data HIGH and LOW Timing	Fail
4.3.8.2: CBT-Sink: Bit Timing Variation within a Packet	Pass
4.3.9.1: CBT-Sink: Response to Link Level NACK	Fail
4.3.10.1: CBT-Sink: ACK Output Timing in Nanoseconds	Fail
4.3.10.2: CBT-Sink: ACK Drive HIGH Duration	Fail
4.3.11.1: CBT-Sink: Sink uses Case 2 Regular Arbitration after NA	Fail
4.3.11.2: CBT-Sink: Sink Case 3 Long Re-arbitration when it Gives	Fail
4.3.11.3: CBT-Sink: Sink Uses Case 1 Back-to-Back Timing (No Re-a	Fail
4.3.11.4: CBT-Sink: Sink Never Sends Too Many Back-to-Back Packet	Pass
4.3.12.1: CBT-Sink: Sink Never Sends Impulse Noise	Pass
4.3.12.2: CBT-Sink: Sink Never Sends Partial Packets	Pass
4.3.13.1: CBE-Sink: Discovery Sensitivity to Input Voltages	Fail
4.3.14.1: CBT-Sink: Valid Wake Pulse Timing	Fail
4.3.14.2: CBT-Sink: Valid Discovery Pulse Timing	Fail
4.3.14.3: CBT-Sink: Sink in Standby Discovers on Wake plus Discov	Skipped
4.3.15.1: CBT-Sink: First Discovery Pulse should be Ignored	Fail

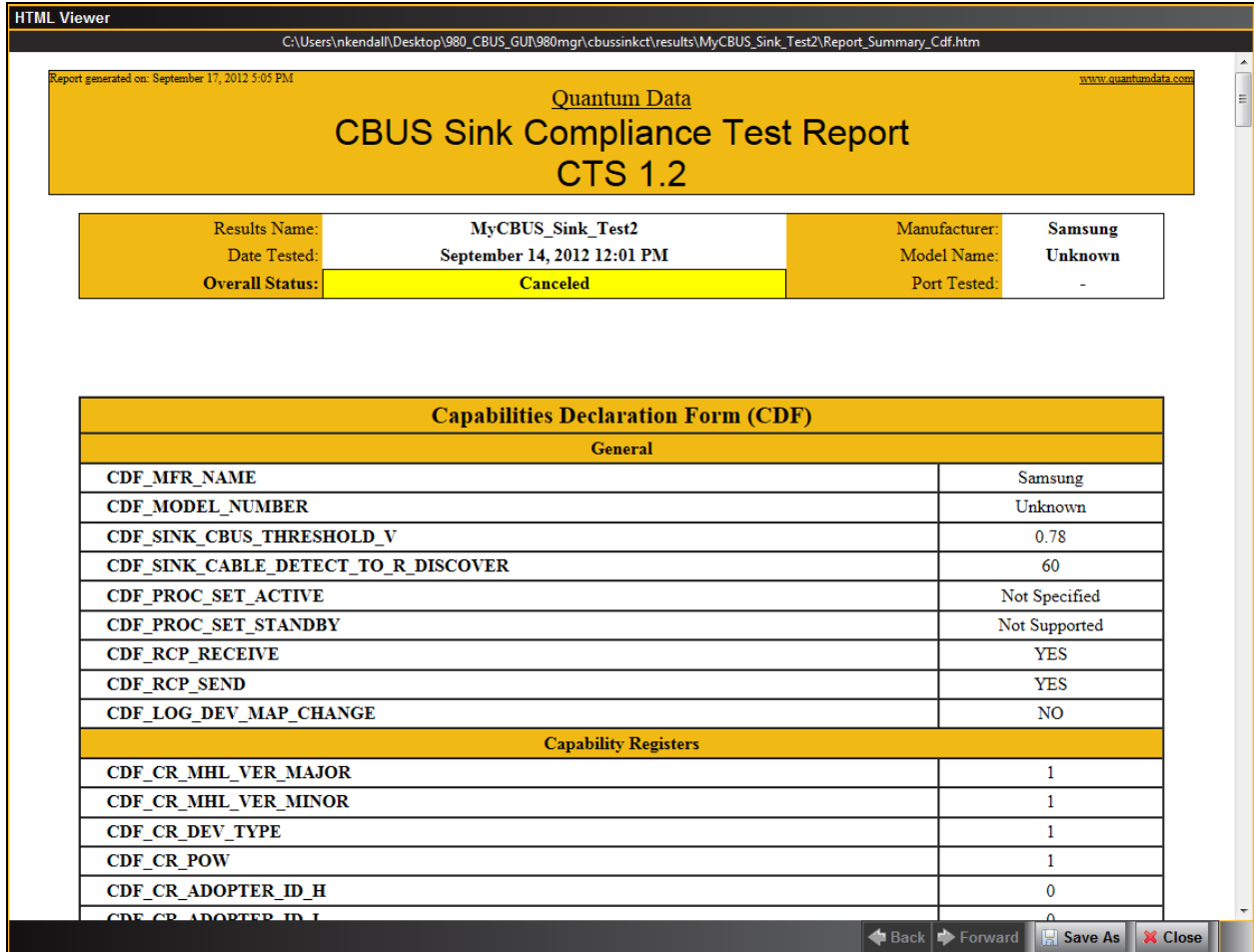
2. Click on the **HTML Report** activation button.

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.



Specify if you want to see a summary report and if you want to see the CDF. If you leave Show Test Summary Only unchecked the application will produce a full detailed report. The following screens provide samples of the report.

Note: This example shows an MHL 1.2 test result; MHL 2.0 test results are similar in content and structure.



The CDF is shown below:

HTML Viewer
C:\Users\nkendall\Desktop\980_CBUS_GUP\980mgf\cbussinkct\results\MyCBUS_Sink_Test2\Report_Summary_Cdf.htm

Test 4.2.5.1 EDID Test	Fail
Test 4.2.5.2 Device Capability Register Test	Fail
Test 4.3.3.1 Common Test Environment	Pass
Test 4.3.3.2 CBE-Sink: VBUS Absolute Maximum Positive Voltage	Pass
Test 4.3.3.3 CBE-Sink: CBUS Absolute Maximum Positive Voltage	Pass
Test 4.3.4.1 CBE-Sink: Powered-Off Z[CBUS_SINK_DISCOVER]	Skipped
Test 4.3.5.1 CBT-Sink: Time from Sink-side MHL Cable Detect until Sink CBUS Leaves HIGH-Z	Skipped
Test 4.3.6.1 CBE-Sink: Post-Discovery Passive Pull-down Z[CBUS_SINK_ON] Resistance	Fail
Test 4.3.6.2 CBE-Sink: CBUS Capacitance	Fail
Test 4.3.6.3 CBE-Sink: Arbitrate/Sync/Data Drive LOW Voltage	Fail
Test 4.3.6.4 CBE-Sink: Arbitrate/Sync/Data Drive HIGH Voltage	Fail
Test 4.3.7.1 CBT-Sink: Arbitration/Sync/Data Active Drive HIGH Duration	Fail
Test 4.3.7.2 CBT-Sink: Arbitration/Sync/Data Edge Rate	Fail
Test 4.3.8.1 CBT-Sink: Arb, Sync, Data HIGH and LOW Timing	Fail
Test 4.3.8.2 CBT-Sink: Bit Timing Variation within a Packet	Pass
Test 4.3.9.1 CBT-Sink: Response to Link Level NACK	Fail
Test 4.3.10.1 CBT-Sink: ACK Output Timing in Nanoseconds	Fail

Back Forward Save As Close

The final page of the report shows the test equipment configuration as shown below.

The screenshot shows an HTML Viewer window displaying a report titled "Test Equipment Information". The report is divided into two main sections: "Instrument" and "Host".

Instrument Information:

```

Name: My980
IP Address: 192.168.254.135
Net Mask: 255.255.255.0
Gateway IP: 192.168.254.1
Free Space: 121.08 GB of 144.22 GB (84.0%)
Version:
  Advanced Test platform Release: 4.5.27
  MHL CBUS Protocol Analyzer in slot 1:
    Gateway: [Version: 0 Build Number: 4 (09:11:2012 121000) pcb: 23232323]
    Firmware: [Version: 1.0.1 Build Number: 1978 (mblair 09:13:2012 09:21:52 CDT)]
  System Information:
    System SN : [ 47A7D6F8C0A385A0::N/A]
    SN : [ 318383010000::11120010c]
    Main Board : [ "DP67DE"]
    CPUx4 : [ 6.42.7 "Intel(R) Core(TM) i3-2100 CPU @ 3.10GHz"]
    DDR : [ 3 GB + 768 MB]
    HD : [ WD1600BEVT-1]
    OS : [ Linux xpscope-81 2.6.26-2-686 #1 SMP Wed Sep 21 04:35:47 UTC 2011 i686 GNU/Linux]
    GUI manager : [ Version 4.5.27_39005_201209061011]
    1 : [ lo inet 127.0.0.1/8 scope host lo]
    2 : [ eth0 inet 192.168.254.135/24 brd 192.168.254.255 scope global eth0]
    HDMI SINK CTS: [ 3.1.7]
    HDMI SRC CTS: [ 3.1.8]
    MHL SINK CTS: [ 1.2.0]
    MHL SRC CTS: [ 1.2.1]
  
```

Host Information:

```

UI Name: Quantum Data 980 Manager - Version 4.5.29
UI Home: platform:/base/plugins/com.quantumdata.1980.app
Java Vendor: Null
Java Runtime: 1.6.0_15-b03
Java Home: C:\Users\nkendall\Desktop\980_Release_5_29\980mgr\jre
OS: win32
OS Arch: x86
Locale: en_US
Free Space: 13.40 GB of 453.66 GB (3.0%)
  
```

At the bottom of the viewer, it says "Generated on: September 17, 2012 5:05 PM" and "www.quantumdata.com". Navigation buttons for Back, Forward, Save As, and Close are visible at the bottom right.

4.12 CBUS Log Plot

The **CBUS Log Plot** panel (shown below) is panel used for viewing the bit and byte timing events of the CBUS controls and commands that occurred during a specific test. A **CBUS Log Plot** is provided for each source CBUS compliance test. The panel has both a graphical depiction of CBUS timing events and a sequential table list out of each event. The vertical axis shows the various CBUS event types. The **CBUS Log Plot** panel provides a set of CBUS event types labeled on the left that indicate the type of event. The horizontal axis is time.

The **CBUS Log Plot** is useful diagnosing CBUS compliance test failures.

The example below shows a series of events captured during a source test.

For more detailed information about the **CBUS Log Plot**, please refer to [CBUS Log Plot](#).

5 MHL CBUS Dongle Compliance Tests

This chapter describes how to run the MHL CBUS dongle compliance tests. Please note you will have to purchase the optional 980 MHL CBUS Compliance Test module in order to run these tests.

The 980 MHL CBUS Compliance test module supports the test sections listed below in the MHL 1.2 and 2.0 Compliance Test specification. **Please note that some non-CBUS compliance tests are also covered by the 980 MHL CBUS Compliance Test module.**

5.1 System Test – Section 5.2

- 5.2.5.1 EDID Test
- 5.2.5.2 Device Capability Register Test
- 5.2.6 RCP Sub-command Tests
- 5.2.8.1 3D Video Mode Support Data (MHL 2.0)
- 5.2.9 UCP Sub-Commands Tests (MHL 2.0)

5.2 CBUS Tests – Section 5.3

- 5.3.1 CBUS Dongle DUT Common Test Equipment Setups
- 5.3.2 CBUS Dongle DUT Common Required Methodologies
- 5.3.3 Link Layer Electrical – Dongle Absolute Maximum Voltages
- 5.3.4 Link Layer Electrical – Dongle DUT Output: Standby Discovery Impedance
- 5.3.5 Link Layer Timing – Dongle DUT Output: Pre-Discovery
- 5.3.6 Link Layer Electrical – Dongle DUT Output: Arbitration/Sync/Data Signaling
- 5.3.7 Link Layer Timing – Dongle DUT Output: Arbitration/Sync/Data in Nanoseconds
- 5.3.8 Link Layer Timing – Dongle DUT Output: Arbitration/Sync/Data in Bit Times
- 5.3.9 Link Layer Timing – Dongle DUT Output: Link Level NACK
- 5.3.10 Link Layer Timing – Dongle DUT Output: Link Level ACK
- 5.3.11 Link Layer Timing – Dongle DUT Output: Bus Re-Arbitration
- 5.3.12 Link Layer Timing – Dongle DUT Output: Ill-formed packets
- 5.3.13 Link Layer Electrical – Dongle DUT Input: Discovery
- 5.3.14 Link Layer Timing – Dongle DUT Input: Discovery OK
- 5.3.15 Link Layer Timing – Dongle DUT Input: Discovery Reject
- 5.3.16 Link Layer Electrical – Sink DUT Input: Arbitration/Sync/Data Signaling
- 5.3.17 Link Layer Timing – Sink DUT Input: Arbitration
- 5.3.18 Link Layer Timing – Sink DUT Input: Data
- 5.3.19 Link Layer Timing – Sink DUT Input: NACK
- 5.3.20 Link Layer Timing – Dongle DUT Input: ACK
- 5.3.21 Link Layer Timing – Dongle DUT Input: Bus Re-Arbitration
- 5.3.22 Link Layer Timing – Sink DUT Input: Ill-formed Packets

- 5.3.23 Link Layer Timing – Sink DUT Input: Disconnect
- 5.3.24 Link Layer Electrical – Sink DUT VBUS Output
- 5.3.25 Link Layer Timing – Sink DUT VBUS Turn On Transition

5.3 CBUS Common Tests – Section 6.3

- 6.3.1 MSC – Source and Sink DUT Input: Device Register Space Contents; Reads
- 6.3.2 MSC – Source and Sink DUT Output: NACK Packet Response to MSC_MSG
- 6.3.3 MSC – Source and Sink DUT Output: Never Initiates Bad Commands
- 6.3.5 MSC – Source and Sink DUT Output: Errors and Exceptions
- 6.3.6 MSC – Source and Sink DUT Input: Device Register Space Contents; Writes
- 6.3.7 MSC – Source and Sink DUT Input: Vendor Specific and Reserved Header Values
- 6.3.8 MSC – Source and Sink DUT Input: Device Register Space Contents; Writes
- 6.3.9 MSC – Source and Sink DUT Input: Vendor-specific and Reserved Header Values
- 6.3.10 MSC – Source and Sink DUT Input: Normal Commands
- 6.3.11 MSC – Source and Sink DUT Input: Errors and Exceptions
- 6.3.12 MSC – Source and Sink DUT Input: Argument Timeouts
- 6.3.15 MSC – Sink DUT Output: Normal Commands
- 6.3.16 MSC – Sink DUT Input: Errors and Exceptions
- 6.3.20 DDC – Sink DUT Input; Continuous Monitors and Normal Operation
- 6.3.21 DDC – Sink DUT Input; Normal Operation
- 6.3.22 DDC – Sink DUT Input; Illegal Responses

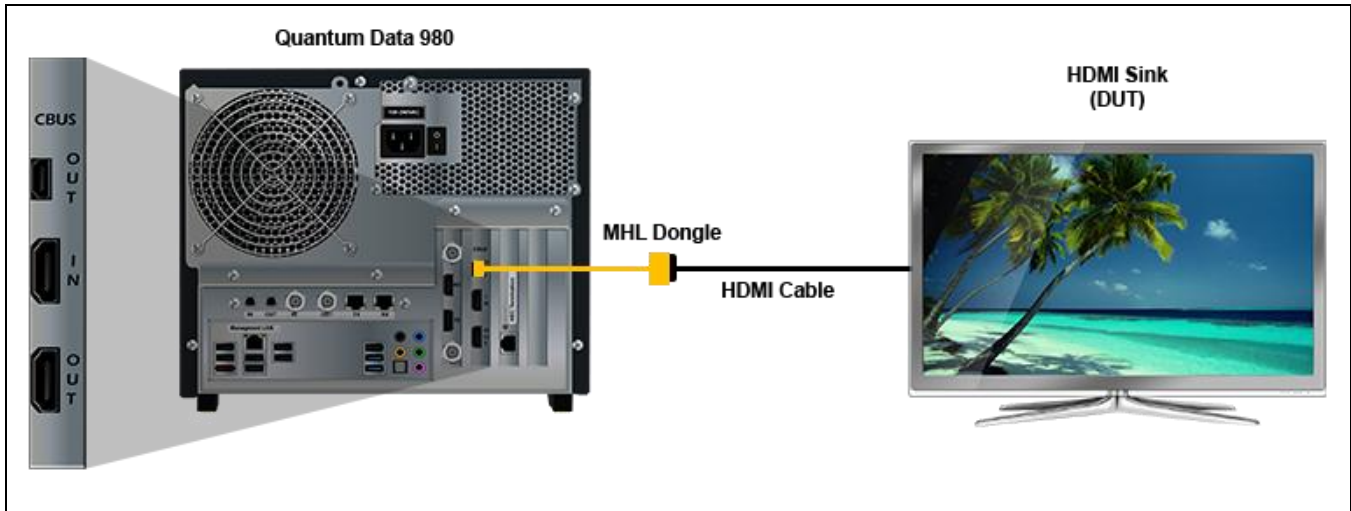
5.4 Workflow for running the MHL CBUS Dongle Compliance Tests

The list below is the high level workflow for running the MHL CBUS Dongle Compliance Tests. Note that the installation of the external 980 GUI Manager and the Ethernet session are optional; you can run the compliance tests through the embedded GUI Manager.

1. Power up the 980. Refer to the procedures in [Getting Started](#).
Note: The power switch in the front is used when you are turning off the 980 for a short period of time. For extended periods of off time, it is best to power the 980 down by first using the power button on the front and then the rocker switch on the back.
2. (Optional; only necessary if using the external 980 GUI Manager) Establish an Ethernet/IP connection between the external 980 GUI Manager and the 980.
3. Connect the MHL dongle device under test to the CBUS MHL Out (MHL micro USB) port on the 980 MHL CBUS Compliance Test module.
4. Complete a (or load an existing) Capabilities Declaration Form (CDF) for the device under test using the **CDF Entry** panel.
5. Select the tests that you wish to run from the **Test Selection** panel.
6. Initiate the tests through the **Test Options / Review** panel.
7. View the detailed data for test failures if failures occur.
8. View the results in the **Test Results** panel under the **Navigator** panel.

5.5 Making the physical MHL connections

This subsection describes the physical MHL connections required to run the MHL CBUS dongle compliance tests.



To make the physical MHL connections:

This procedure assumes that you have assembled the 980 with the MHL CBUS Compliance Test module and the MHL dongle device under test and applied power to all these devices. Refer to the procedures below and the diagram above.

1. Connect your MHL dongle device under test to the top most OUT connector (MHL micro USB) on the 980 MHL CBUS Compliance Test module as shown in the figure above. Use the cable connected to the dongle.
2. Connect your HDMI sink device to the MHL dongle using a standard HDMI cable.

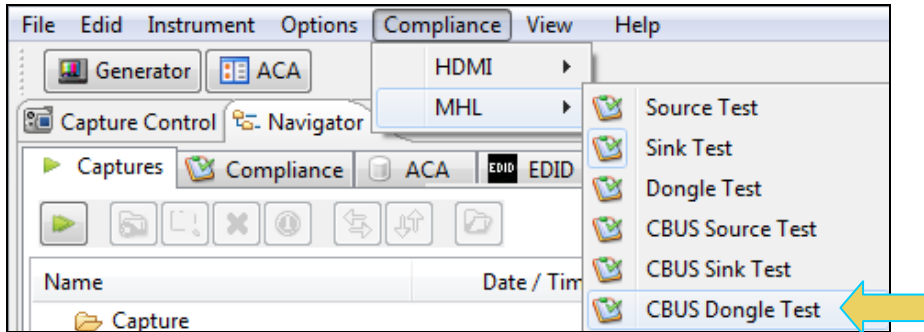
5.6 Completing the CDF

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

Note: The workflow screen examples in this section show MHL 2.0 except where noted. MHL 1.2 workflow and screens are similar.

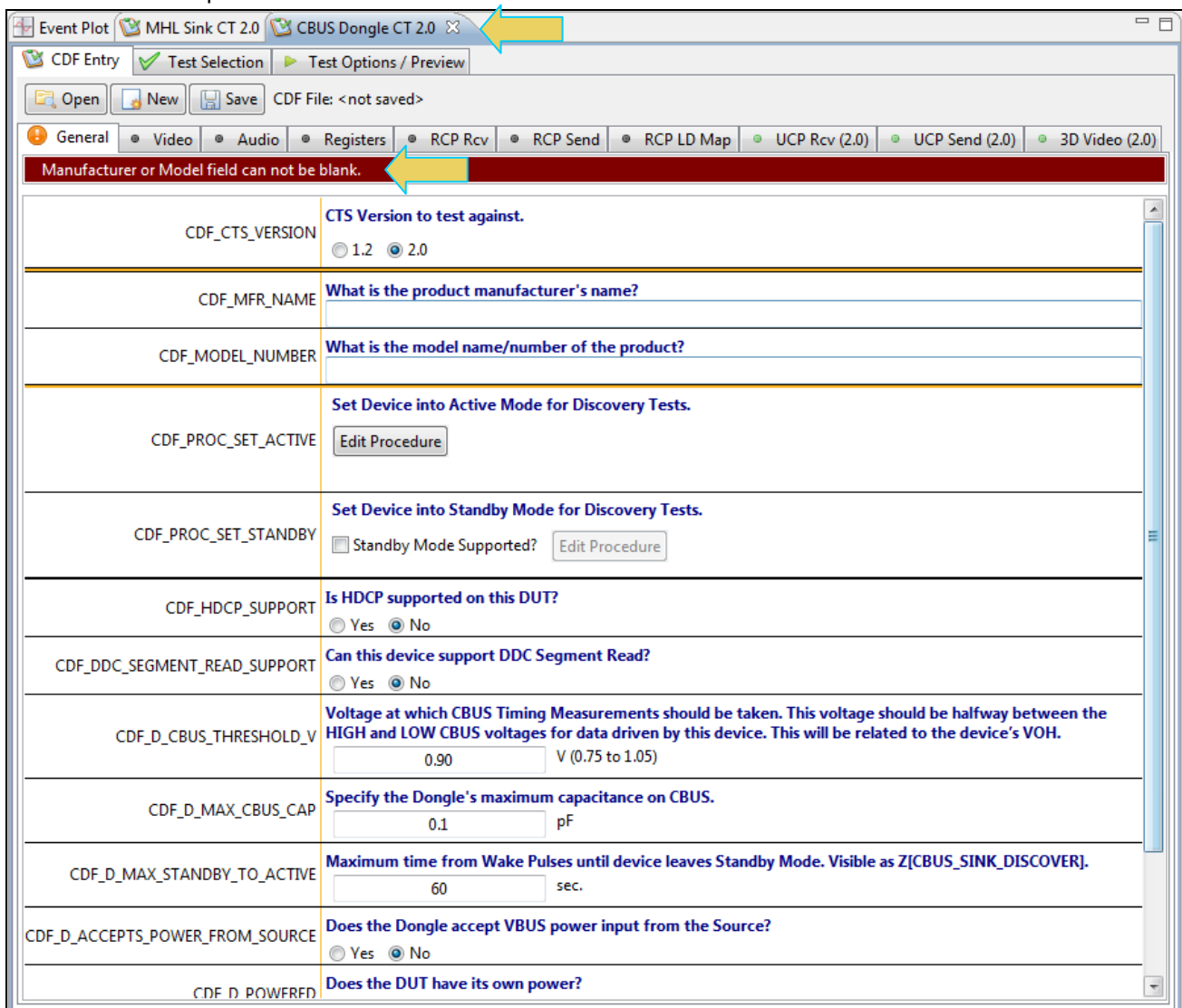
To complete the CDF:

1. From the **View** menu, enable viewing of the **MHL CBUS Dongle CT** panel.



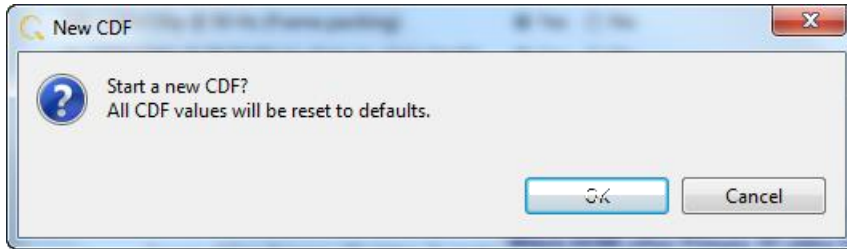
2. Select the **CDF Entry** panel as shown below.

Note: A read status message will appear indicating if you have not completed all the essential fields. This is shown in the example below.



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

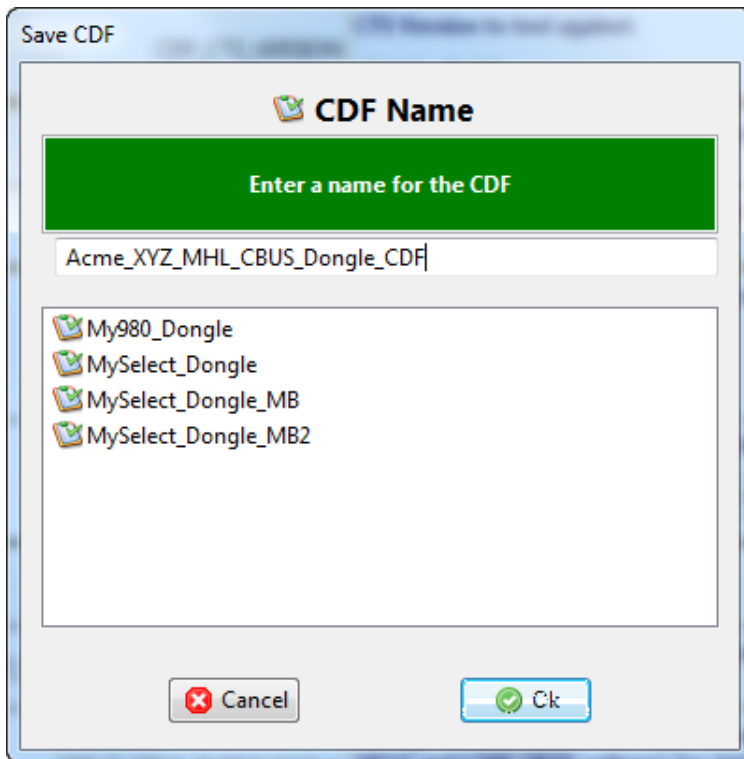
You will be prompted with a confirmation that you want to start a new CDF and reset the values. Click **OK** to proceed.



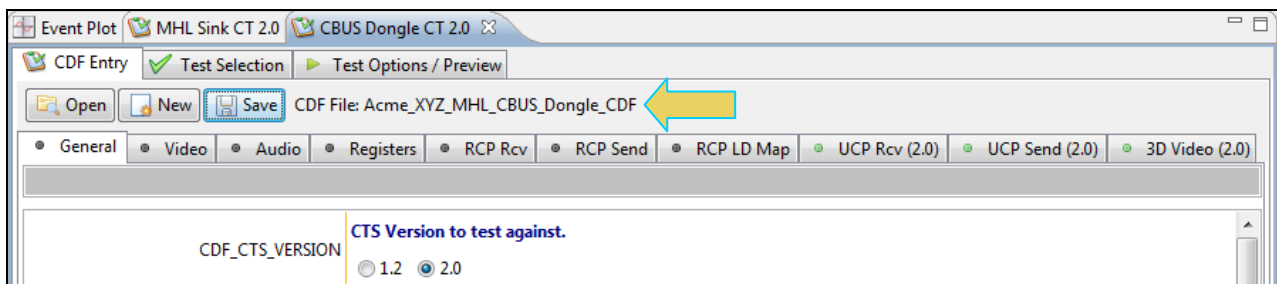
4. To open an existing CDF, click on the **Open** activation button.

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

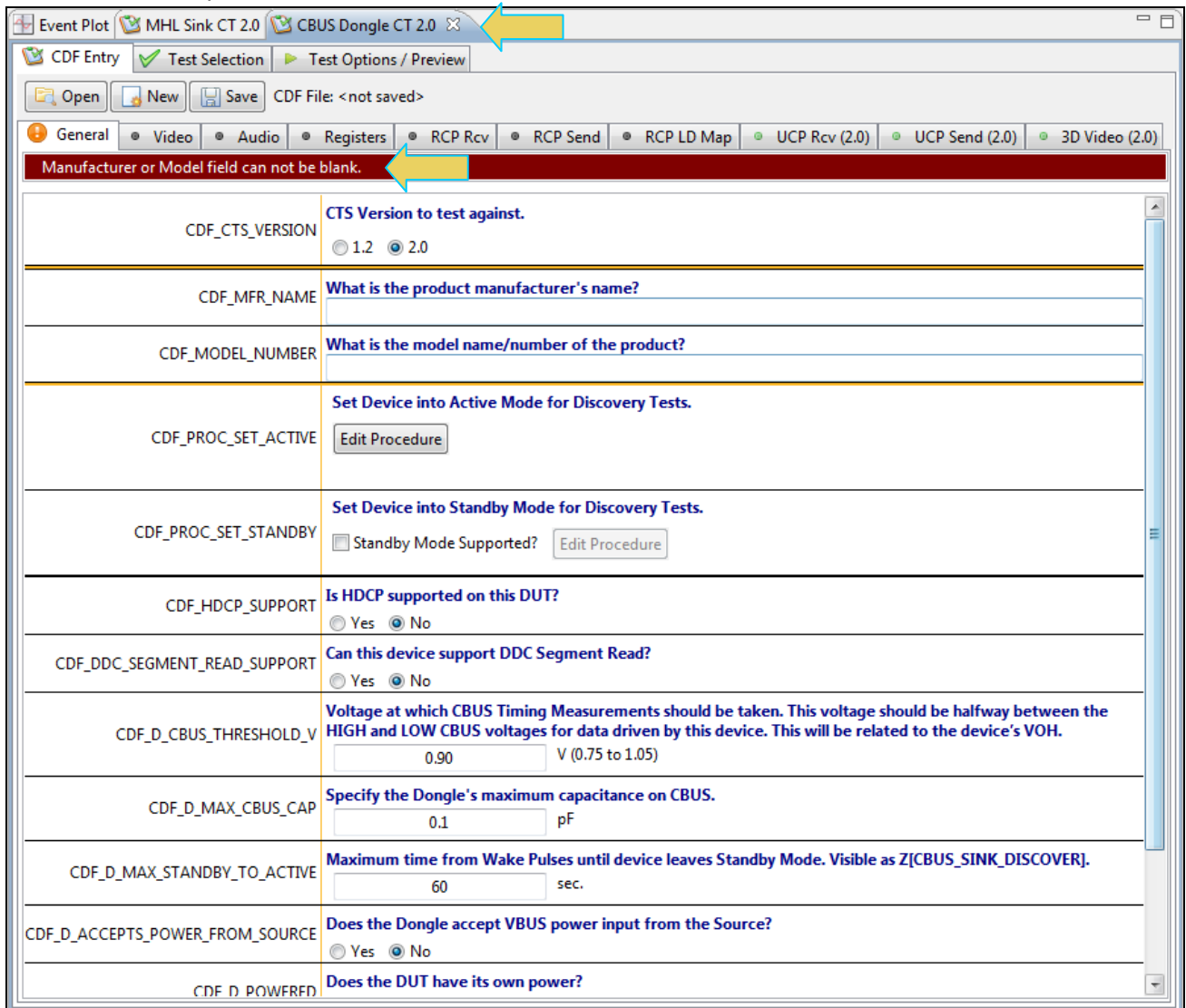
Note: You can save these CDFs to your PC for use on other PCs and by other colleagues.



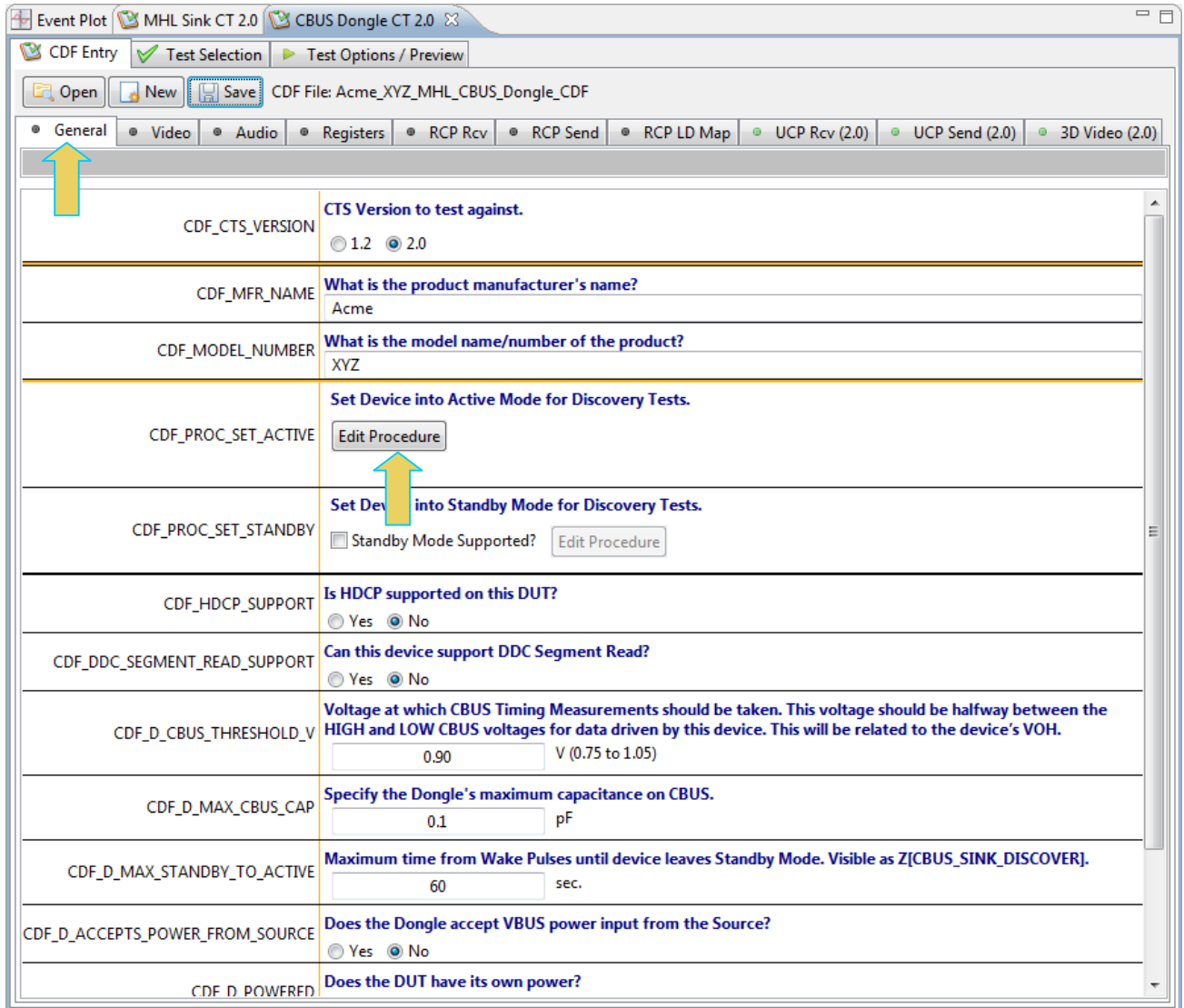
After you open an existing CDF or save it the name will appear beside the **Save** activation button as shown below:



5. 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.
6. **Note:** A read status message will appear indicating if you have not completed all the essential fields. This is shown in the example below.



When you have entered in all the required fields the error indication will go away as shown in the example below.



You can enter helpful information using the “Edit Procedure” dialog box to instruct a test engineer how to put the device in the proper mode. The information entered into this dialog box will appear during the test.

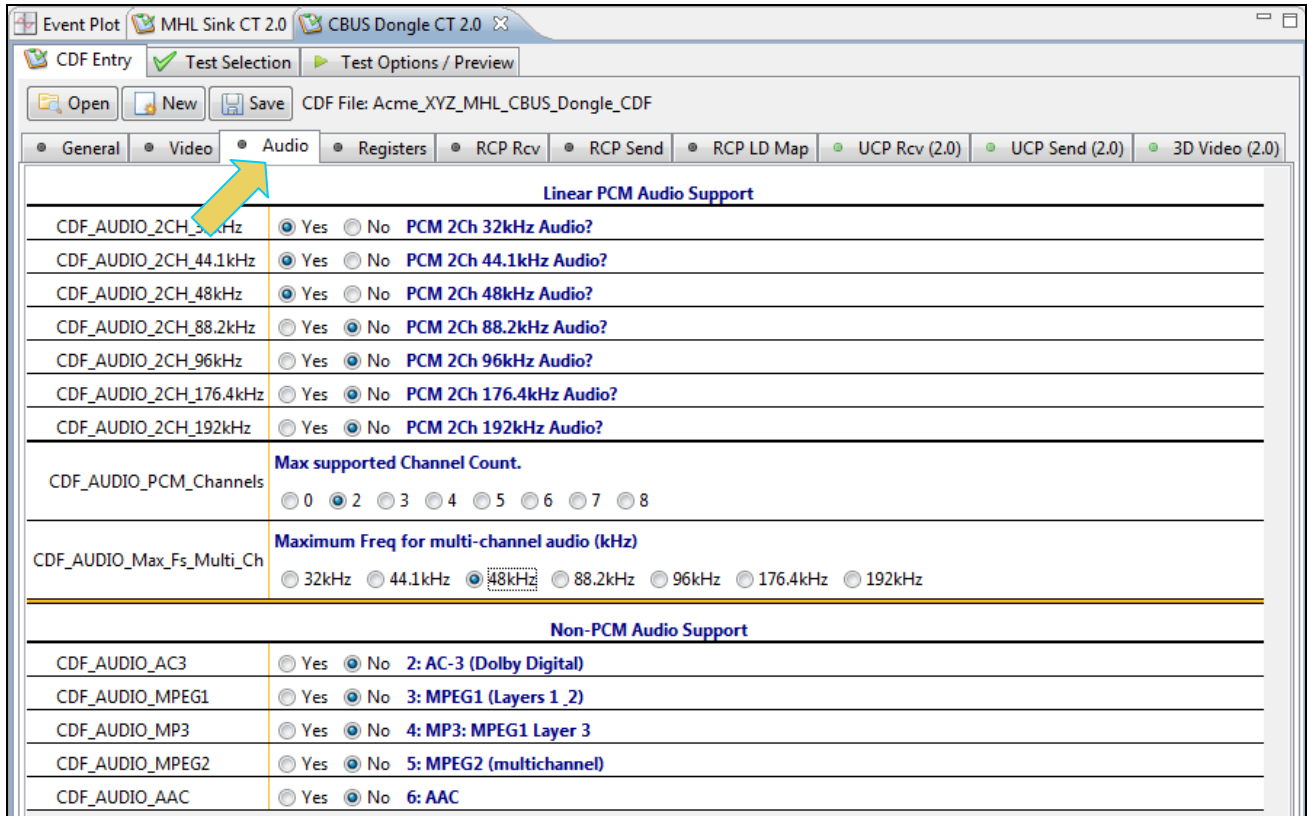
7. Complete the items in the **Video** tab.

The screenshot shows a software window titled 'Event Plot' with tabs for 'MHL Sink CT 2.0' and 'CBUS Dongle CT 2.0'. The main area is a 'CDF Entry' window with a 'Test Selection' button and a 'Test Options / Preview' button. The 'CDF File' is 'Acme_XYZ_MHL_CBUS_Dongle_CDF'. The 'Video' tab is selected, showing a list of video format support questions and a table of supported normal mode video formats.

Property	Question	Yes	No
CDF_VIDEO_RGB	Does the DUT support RGB encoding?	<input checked="" type="radio"/>	<input type="radio"/>
CDF_VIDEO_YCBCR_444	Does the DUT support YCBCR 4:4:4 encoding?	<input checked="" type="radio"/>	<input type="radio"/>
CDF_VIDEO_YCBCR_422	Does the DUT support YCBCR 4:2:2 encoding?	<input type="radio"/>	<input checked="" type="radio"/>
CDF_VIDEO_PACKEDPIXEL	Does the DUT support PackedPixel encoding?	<input type="radio"/>	<input checked="" type="radio"/>

Supported Normal Mode Video Formats			
CDF_VIDEO_VGA	<input type="radio"/> Yes <input checked="" type="radio"/> No	(1)	640x480p (VGA) 59.94/60Hz
CDF_VIDEO_480p_60	<input checked="" type="radio"/> Yes <input type="radio"/> No	(2, 3)	720x480p 59.94/60Hz
CDF_VIDEO_720p_60	<input checked="" type="radio"/> Yes <input type="radio"/> No	(4)	1280x720p 59.94/60Hz
CDF_VIDEO_1080i_60	<input type="radio"/> Yes <input checked="" type="radio"/> No	(5)	1920x1080i 59.94/60Hz
CDF_VIDEO_480i_60_2X	<input type="radio"/> Yes <input checked="" type="radio"/> No	(6, 7)	1440x480i 59.94/60Hz
CDF_VIDEO_480i_60_4X	<input type="radio"/> Yes <input checked="" type="radio"/> No	(10, 11)	2880x480i 59.94/60Hz
CDF_VIDEO_480p_60_2X	<input type="radio"/> Yes <input checked="" type="radio"/> No	(14, 15)	1440x480p 59.94/60Hz
CDF_VIDEO_576p_50	<input checked="" type="radio"/> Yes <input type="radio"/> No	(17, 18)	720x576p 50Hz
CDF_VIDEO_720p_50	<input type="radio"/> Yes <input checked="" type="radio"/> No	(19)	1280x720p 50Hz
CDF_VIDEO_1080i_50	<input type="radio"/> Yes <input checked="" type="radio"/> No	(20)	1920x1080i 50Hz
CDF_VIDEO_576i_50_2X	<input type="radio"/> Yes <input checked="" type="radio"/> No	(21, 22)	1440x576i 50Hz
CDF_VIDEO_576i_50_4X	<input type="radio"/> Yes <input checked="" type="radio"/> No	(25, 26)	2880x576i 50Hz
CDF_VIDEO_576p_50_2X	<input type="radio"/> Yes <input checked="" type="radio"/> No	(29, 30)	1440x576p 50Hz
CDF_VIDEO_1080p_24	<input type="radio"/> Yes <input checked="" type="radio"/> No	(32)	1920x1080p 23.97/24Hz
CDF_VIDEO_1080p_25	<input type="radio"/> Yes <input checked="" type="radio"/> No	(33)	1920x1080p 25Hz
CDF_VIDEO_1080p_30	<input type="radio"/> Yes <input checked="" type="radio"/> No	(34)	1920x1080p 29.97/30Hz
CDF_VIDEO_1080p_60	<input type="radio"/> Yes <input checked="" type="radio"/> No	(16)	1920x1080p 59.94/60Hz
CDF_VIDEO_1080p_50	<input type="radio"/> Yes <input checked="" type="radio"/> No	(31)	1920x1080p 50Hz

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



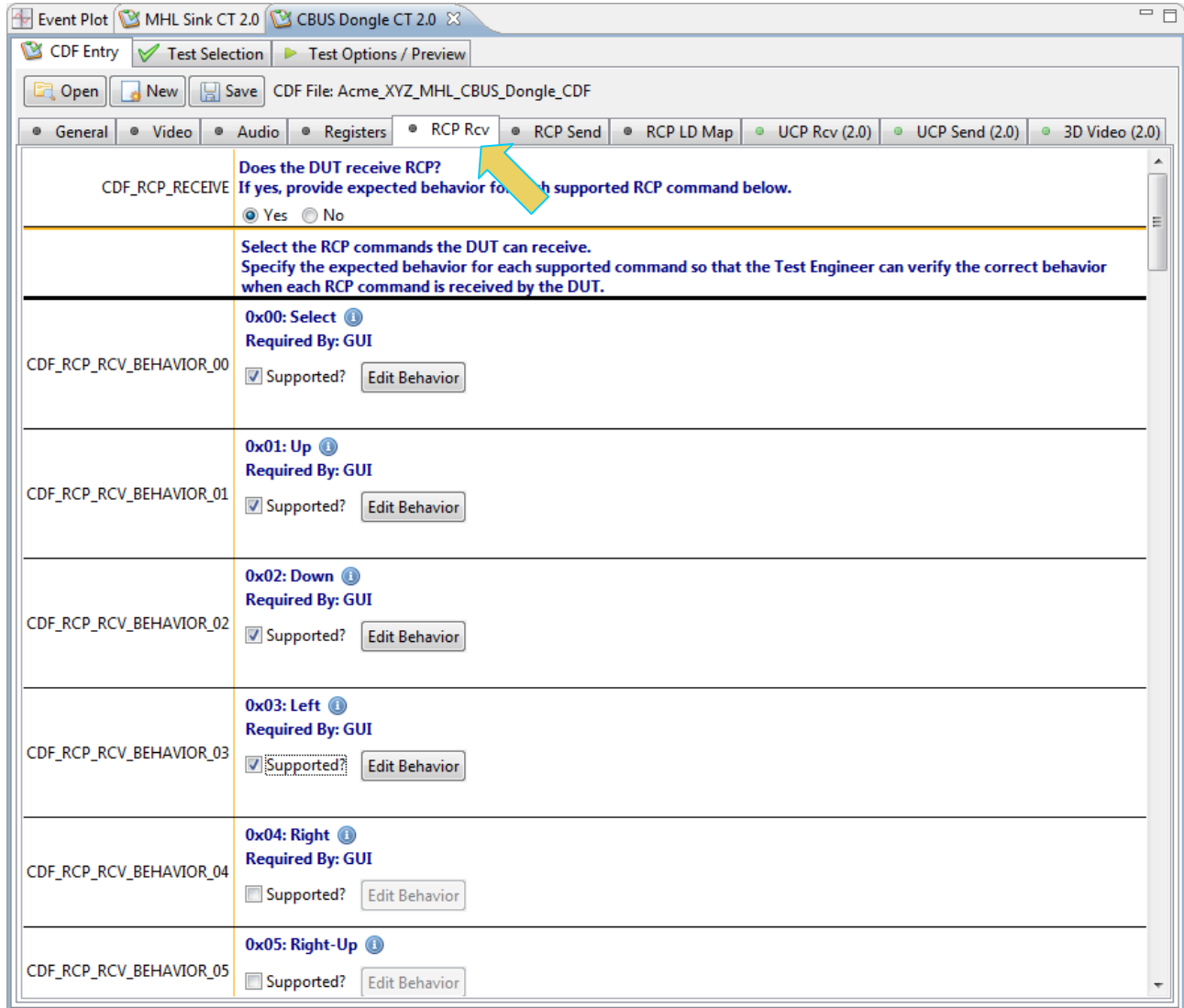
9. Complete the items in the **Registers** tab.

Declare the expected value of each of the DUT's Capability Registers.

CDF_CR_MHL_VER_MAJOR	Register: MHL_VERSION Field: MHL_VER_MAJOR 1
CDF_CR_MHL_VER_MINOR	Register: MHL_VERSION Field: MHL_VER_MINOR 0
CDF_CR_DEV_TYPE	Register: DEV_CAT Field: DEV_TYPE <input type="radio"/> (1) Sink <input type="radio"/> (2) Source <input checked="" type="radio"/> (3) Dongle
CDF_CR_ADOPTER_ID_H	Register: ADOPTER_ID_H Field: ADOPTER_ID_H 0 00 - FF
CDF_CR_ADOPTER_ID_L	Register: ADOPTER_ID_L Field: ADOPTER_ID_L 0 00 - FF
CDF_CR_DEVICE_ID_H	Register: DEVICE_ID_H Field: DEVICE_ID_H 0 00 - FF
CDF_CR_DEVICE_ID_L	Register: DEVICE_ID_L Field: DEVICE_ID_L 0 00 - FF
CDF_CR_BANDWIDTH	Register: BANDWIDTH Field: BANDWIDTH 15 5..15
CDF_CR_INT_SIZE	Register: INT_STAT_SIZE Field: INT_SIZE 4 4..15
CDF_CR_STAT_SIZE	Register: INT_STAT_SIZE Field: STAT_SIZE 4 4..15
CDF_CR_SP_SIZE	Register: SCRATCHPAD_SIZE Field: SP_SIZE 0 0 or 16..64
CDF_CR_POW	Register: DEV_CAT Field: POW <input type="radio"/> 1 <input checked="" type="radio"/> 0

10. Complete the items in the **RCP Rcv** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will help a test engineer determine if the device behaves properly when the various RCP commands are received.

11. Complete the items in the **RCP Send** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test and can be helpful to instruct a test engineer on how to set up a device in order to run a particular test. In the example below you would enter in procedural information which a test engineer could use to cause the dongle to issue the various RCP commands.

The screenshot shows the 'RCP Send' configuration window. At the top, there are tabs for 'CDF Entry', 'Test Selection', and 'Test Options / Preview'. Below the tabs are 'Open', 'New', and 'Save' buttons, followed by the text 'CDF File: Acme_XYZ_MHL_CBUS_Dongle_CDF'. A yellow arrow points to this text. Below this is a menu bar with options: 'General', 'Video', 'Audio', 'Registers', 'RCP Rcv', 'RCP Send', 'RCP LD Map', 'UCP Rcv (2.0)', 'UCP Send (2.0)', and '3D Video (2.0)'. The 'RCP Send' option is selected. The main area contains the following text and controls:

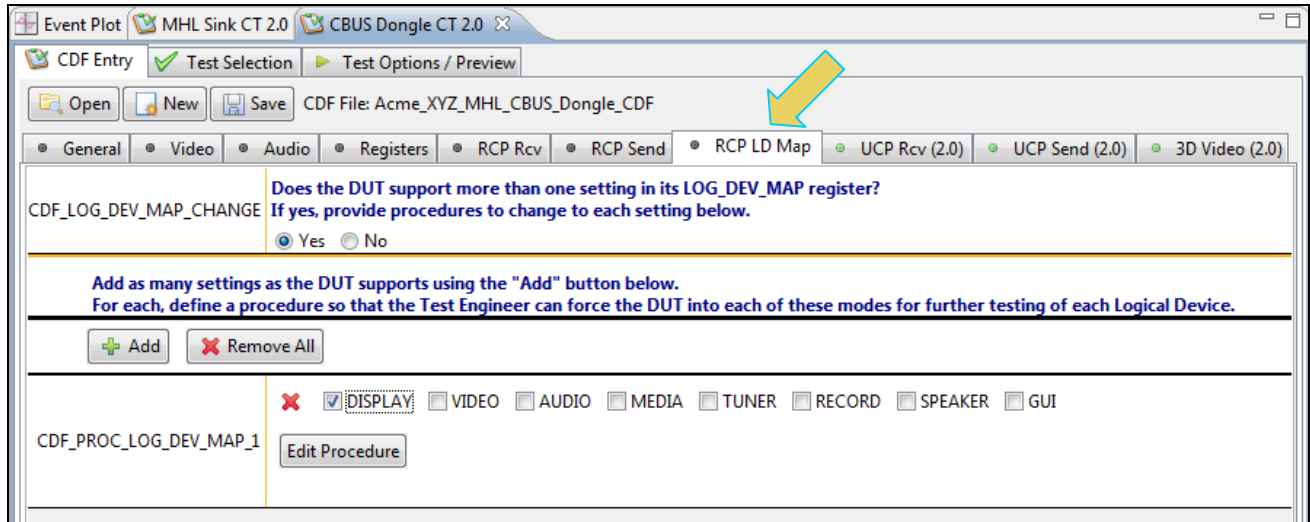
CDF_RCP_SEND Does the DUT send RCP?
If yes, provide procedures for each supported RCP command below.
 Yes No

Select the RCP commands the DUT can send.
Specify the procedure for each supported command so that the Test Engineer can force the DUT to output each RCP command, using these detailed steps and the DUT's user interface.

CDF_RCP_SEND_PROCEDURE_00	0x00: Select ⓘ <input checked="" type="checkbox"/> Supported? <input type="button" value="Edit Procedure"/>
CDF_RCP_SEND_PROCEDURE_01	0x01: Up ⓘ <input checked="" type="checkbox"/> Supported? <input type="button" value="Edit Procedure"/>
CDF_RCP_SEND_PROCEDURE_02	0x02: Down ⓘ <input checked="" type="checkbox"/> Supported? <input type="button" value="Edit Procedure"/>
CDF_RCP_SEND_PROCEDURE_03	0x03: Left ⓘ <input checked="" type="checkbox"/> Supported? <input type="button" value="Edit Procedure"/>
CDF_RCP_SEND_PROCEDURE_04	0x04: Right ⓘ <input checked="" type="checkbox"/> Supported? <input type="button" value="Edit Procedure"/>
CDF_RCP_SEND_PROCEDURE_05	0x05: Right-Up ⓘ <input type="checkbox"/> Supported? <input type="button" value="Edit Procedure"/>
CDF_RCP_SEND_PROCEDURE_06	0x06: Right-Down ⓘ <input type="checkbox"/> Supported? <input type="button" value="Edit Procedure"/>

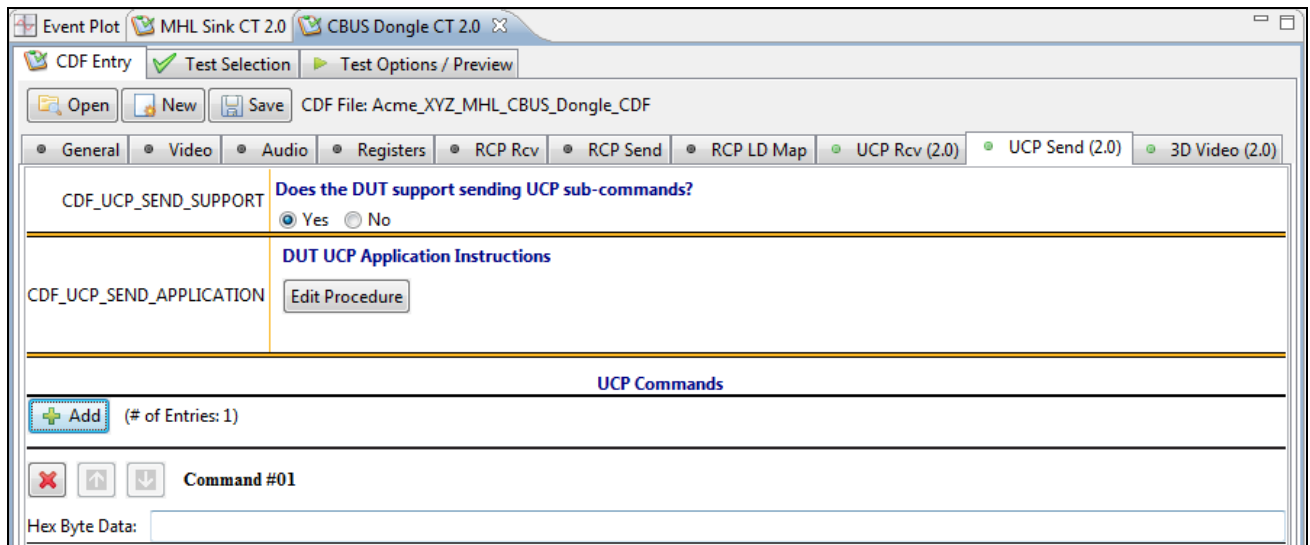
12. Complete the items in the **RCP LD Map** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test to assist the test engineer. In the example below you would enter in procedural information which a test engineer could use to force the dongle into the proper mode for further testing of each logical device.



13. Complete the items in the **UCP Rcv** tab.

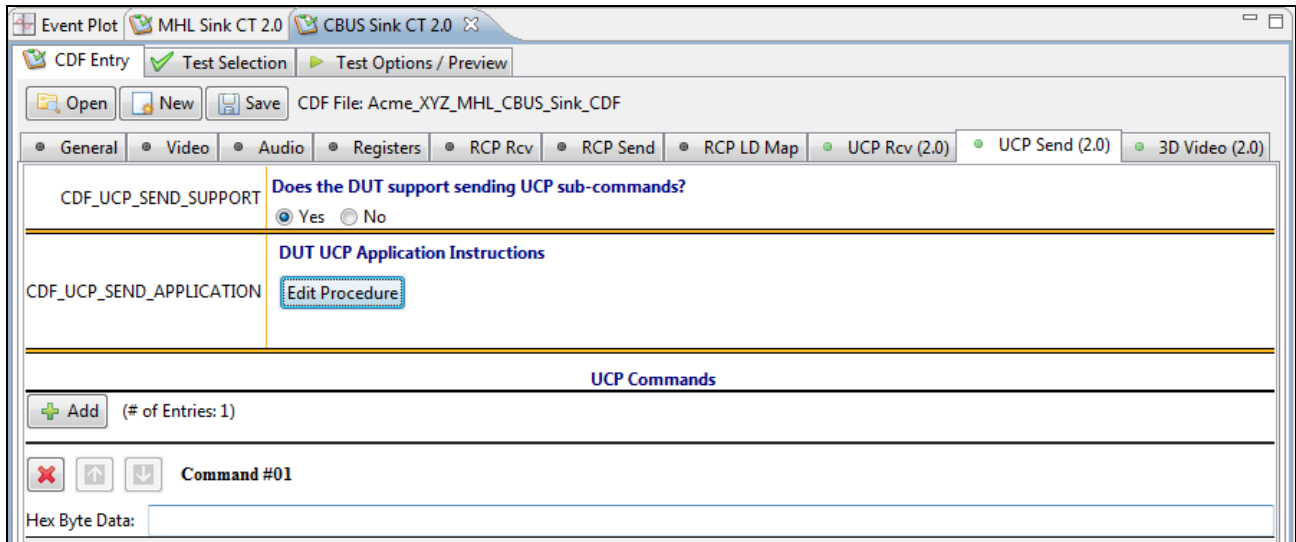
You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test to assist a test engineer. You can enter in the expected behavior for each supported command so that the test engineer can verify that the dongle DUT behaves properly when receiving the various UCP commands.



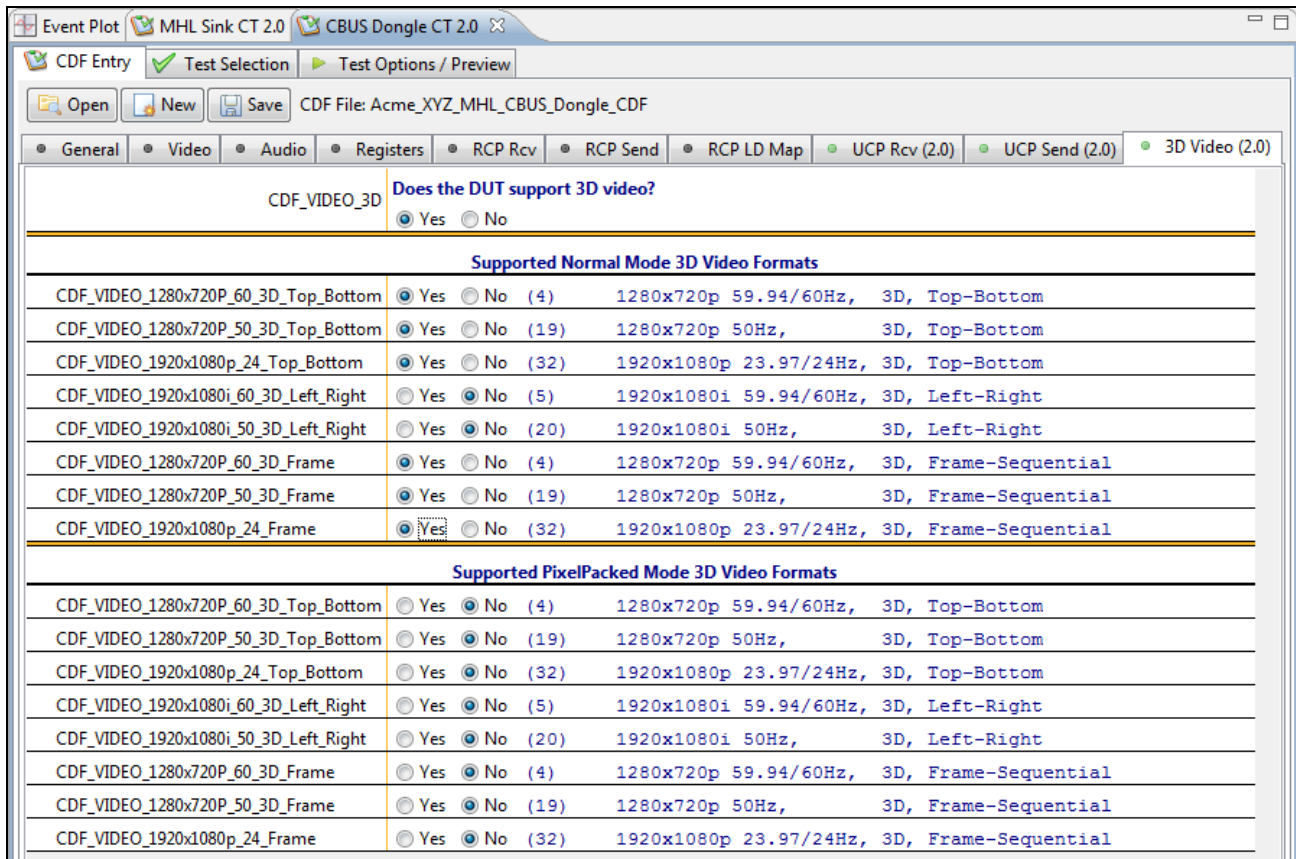
14. Complete the items in the **UCP Send** tab.

You can enter helpful information using the “**Edit Procedure**” dialog box. The information entered into this dialog box will appear during the test and can be helpful to instruct a test engineer on how to set up a device in

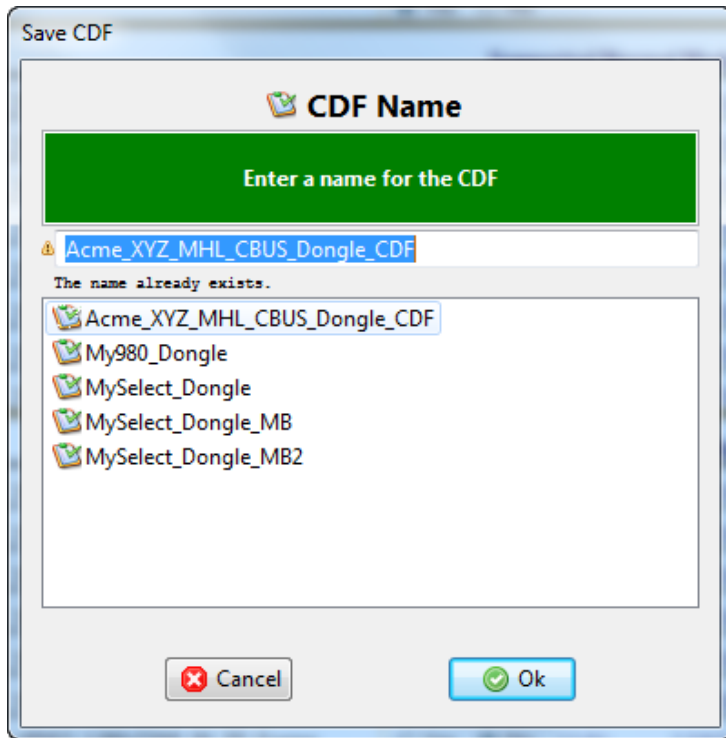
order to run a particular test. In the example below you would enter in procedural information which a test engineer could use to cause the dongle to issue the various UCP commands.



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



16. Save the CDF. If you have not already saved the CDF, you can do so with the **Save** activation button. Alternatively you can save the CDF under a different name.



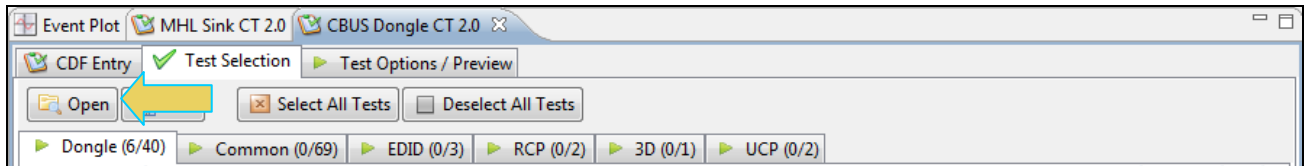
5.7 Selecting which tests to run

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

Note: The workflow screen examples in this section show MHL 2.0 except where noted. MHL 1.2 workflow and screens are similar.

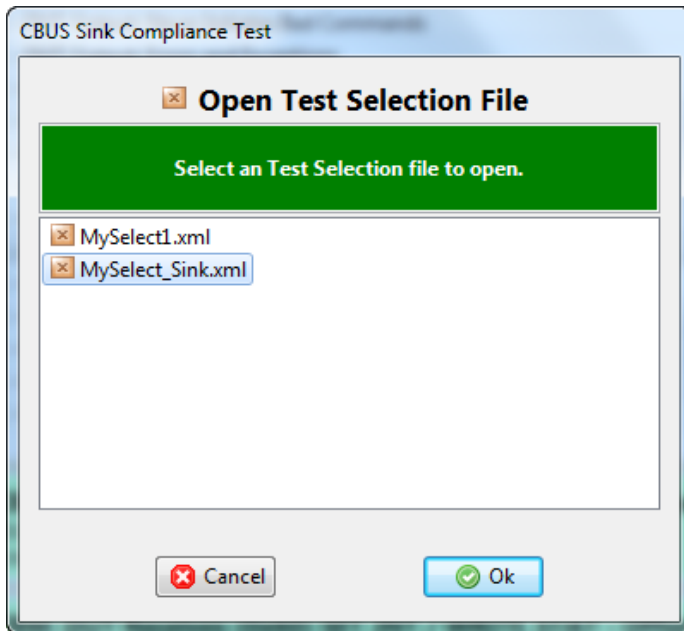
To select the tests to run:

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.

Note: You can save the Test Selection files to your host PC and transfer them to other PCs and for others to use.



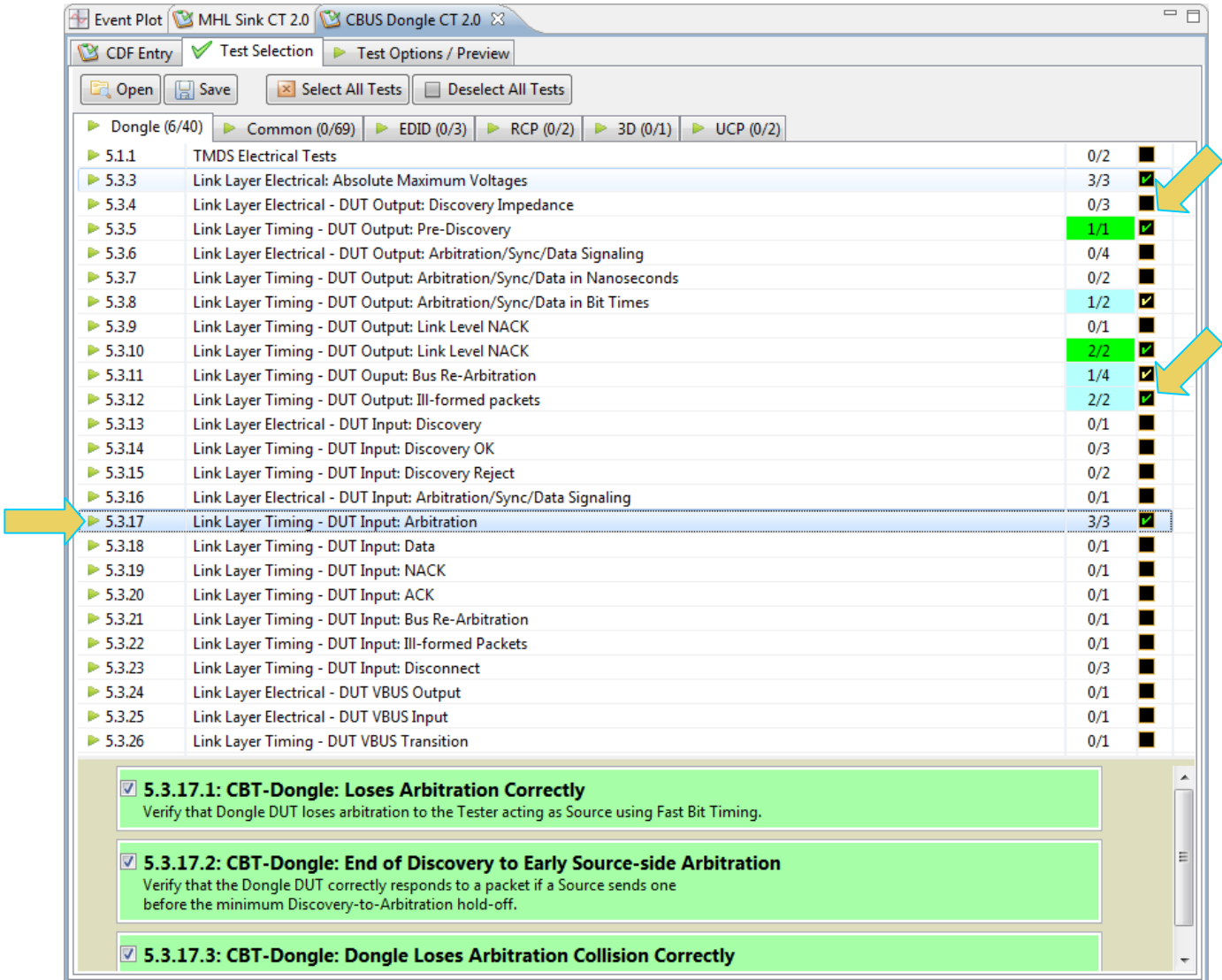
3. Complete the items in the **Sink** tab of the **Test Selection** panel shown below.

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

Check box indicators inform how many tests in each section and how many are selected. Each tab (Sink, Common or RCP) inform you of how many tests in that section have been selected.

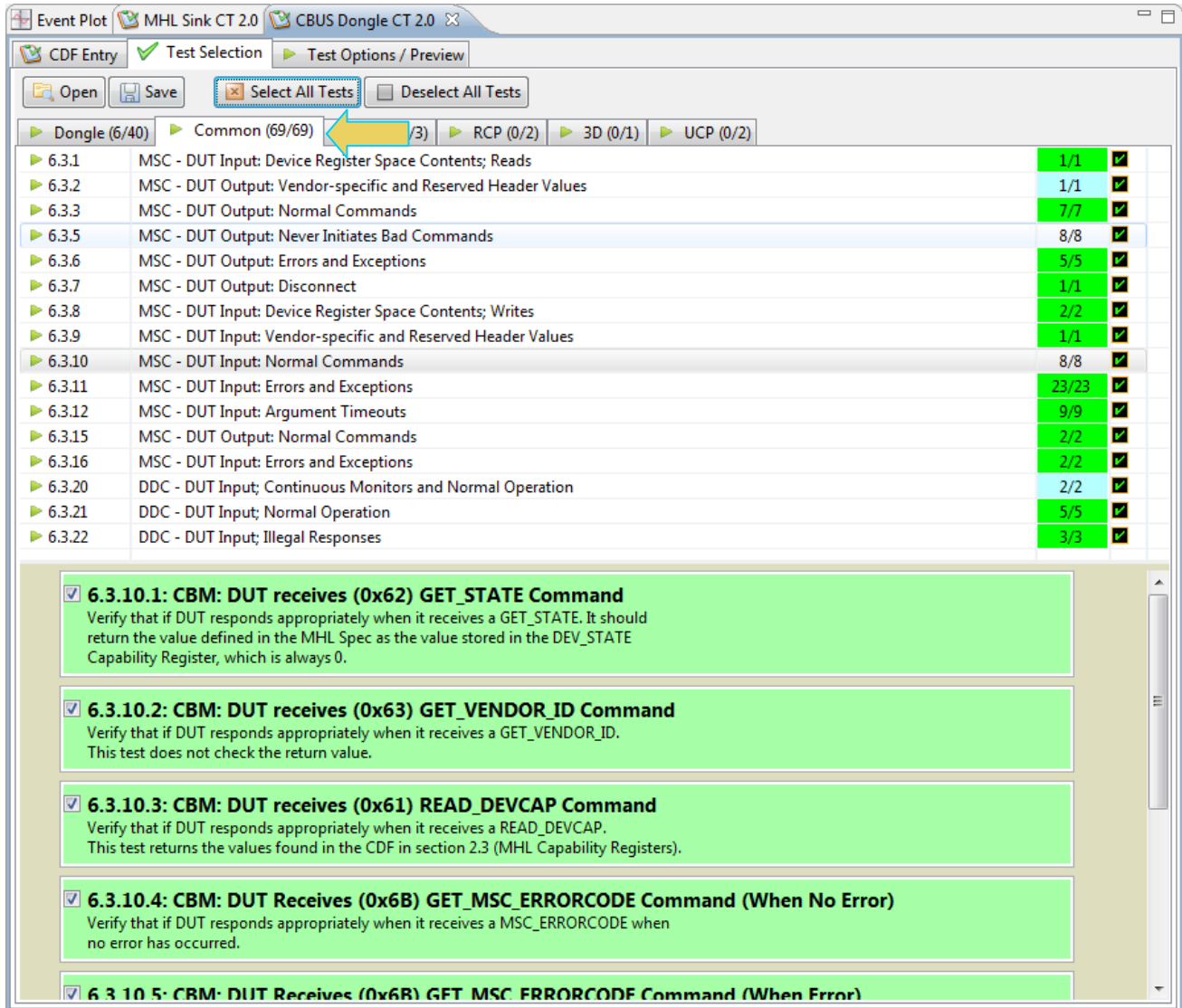
Each test section list includes several tests. In the example shown below, the 5.3.17 Link Layer Timing – DUT Input: Arbitration Test section is selected and the specific tests in that section are then available to be selected.

Note: Some tests are run in background and cannot be deselected such as the 5.3.12. The background tests are highlighted in a light blue as shown in the example below.

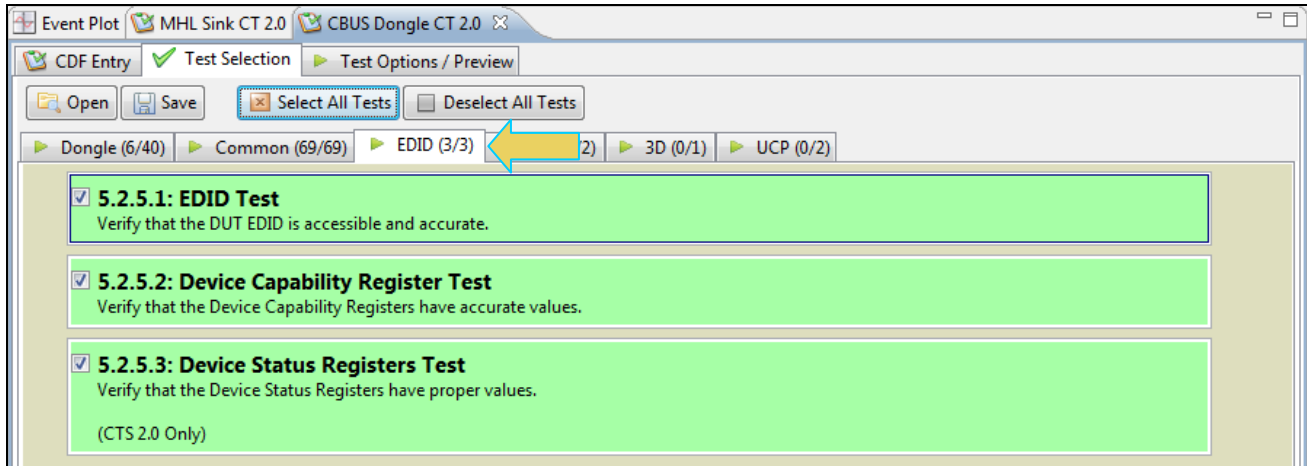


4. Complete the items in the **Common** tab of the **Test Selection** panel shown below.

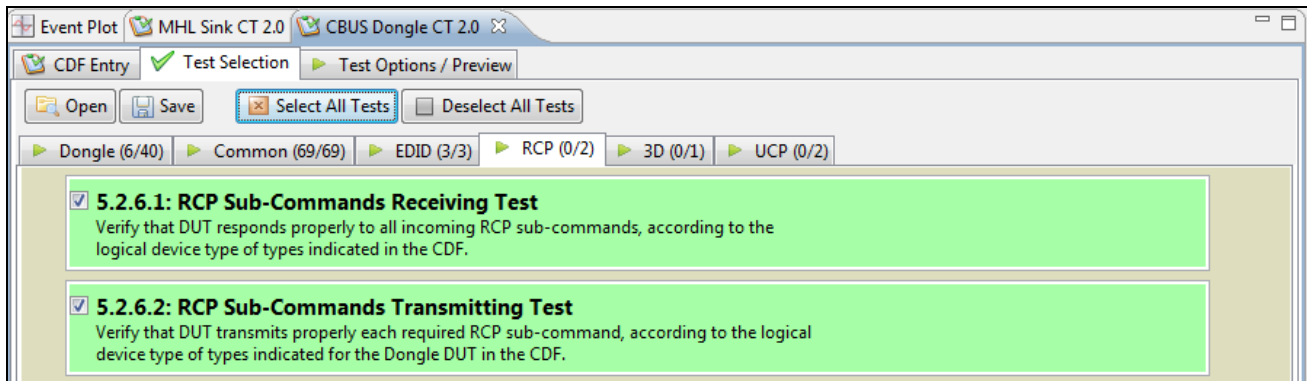
For convenience you can **Select All** or **Deselect All** tests using the activation buttons provided.



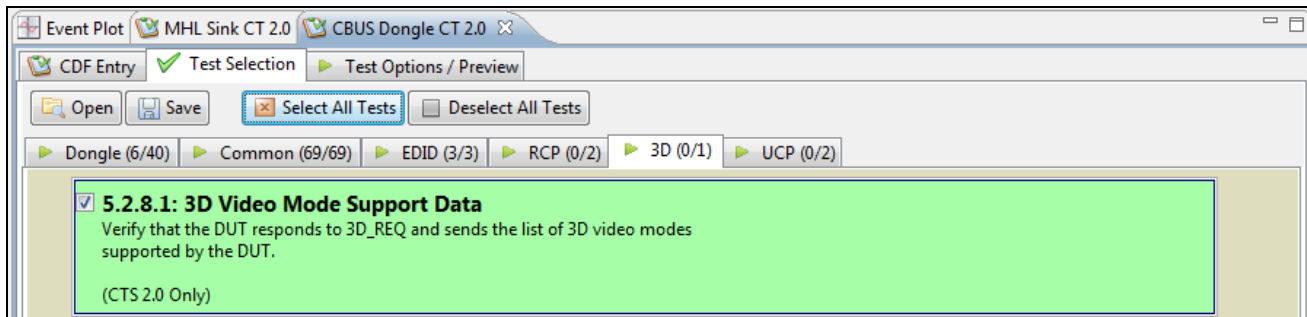
5. Complete the items in the **EDID** tab of the **Test Selection** panel shown below.



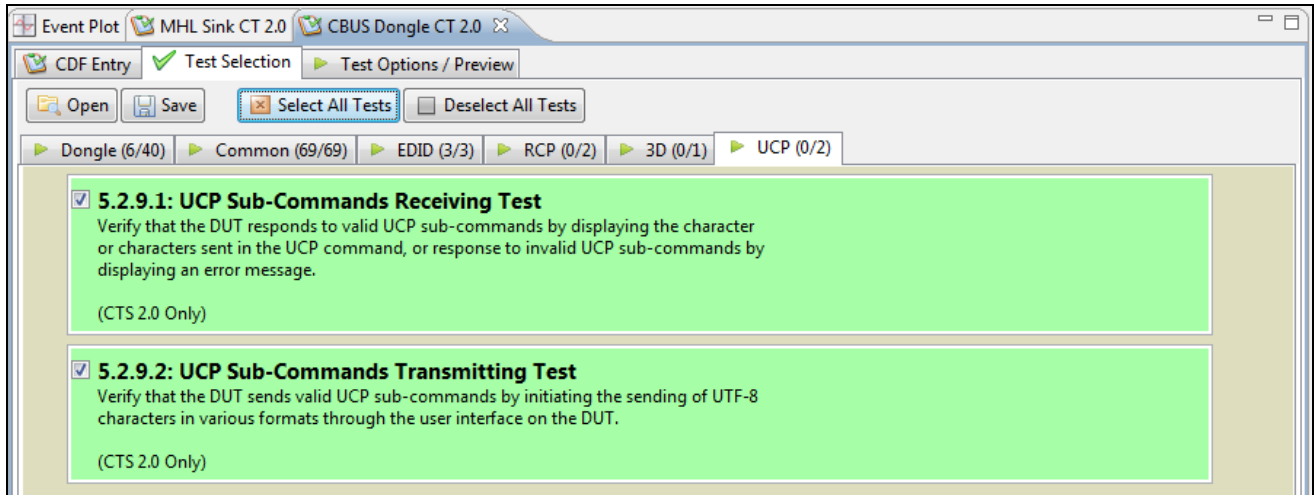
6. Complete the items in the **RCP** tab of the **Test Selection** panel shown below.



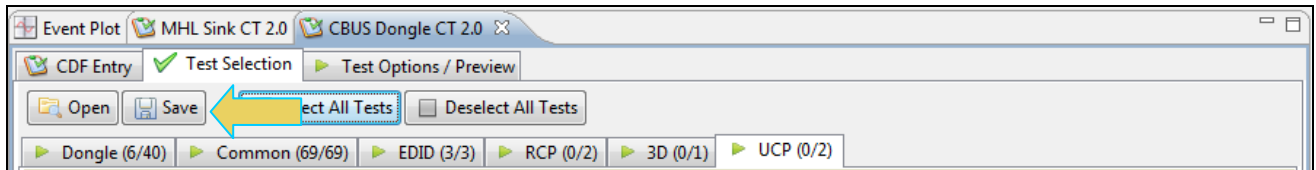
7. Complete the items in the **3D** tab of the **Test Selection** panel shown below.



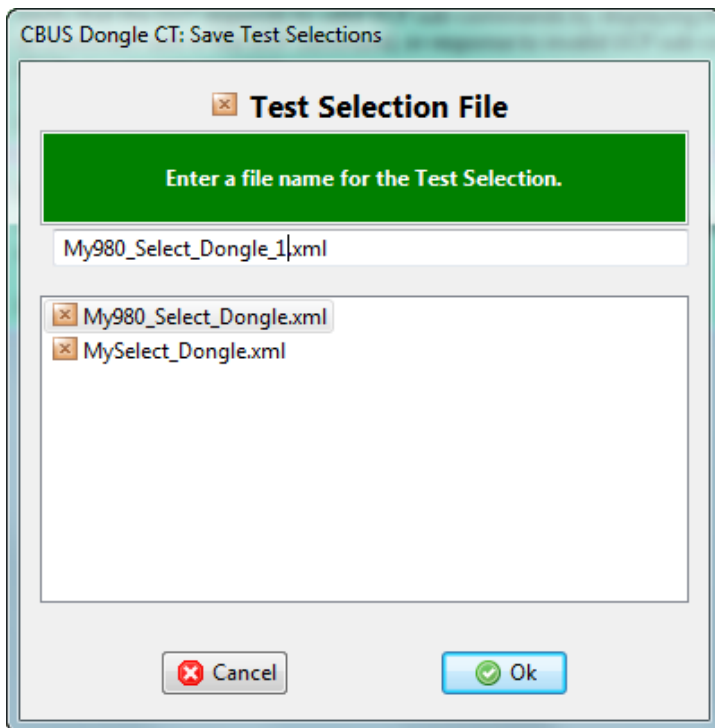
8. Complete the items in the **UCP** tab of the **Test Selection** panel shown below.



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



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



5.8 Executing the MHL CBUS Dongle Compliance Tests

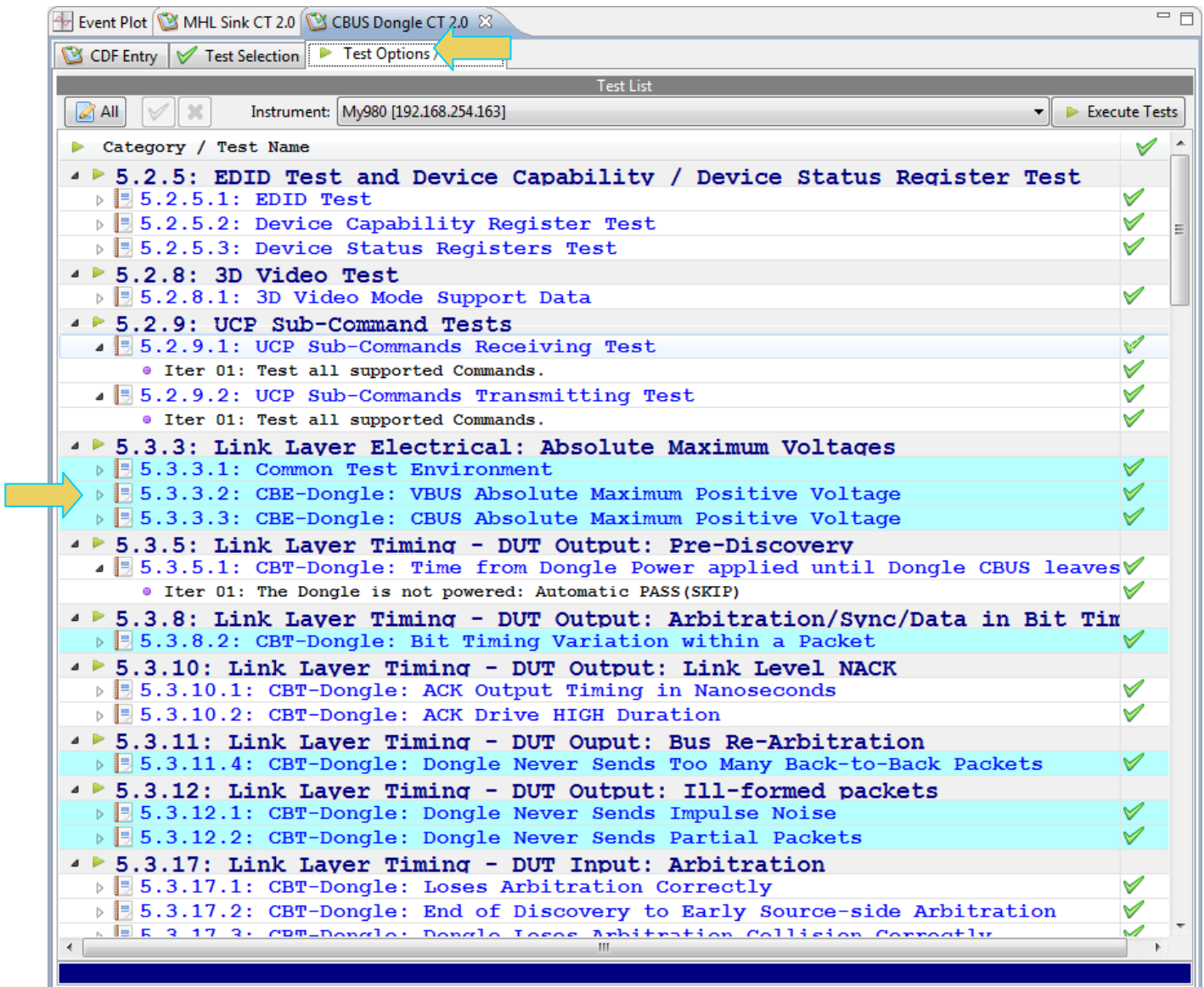
Use the following procedures to initiate the execution of an MHL CBUS Dongle Compliance test series.

Note: The workflow screen examples in this section show MHL 2.0 except where noted. MHL 1.2 workflow and screens are similar.

To initiate a test series:

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

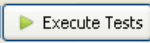
Note: The background tests are highlighted in light blue. These are tests that are run in the background during the remaining test suite. Refer to the two screen shots below.

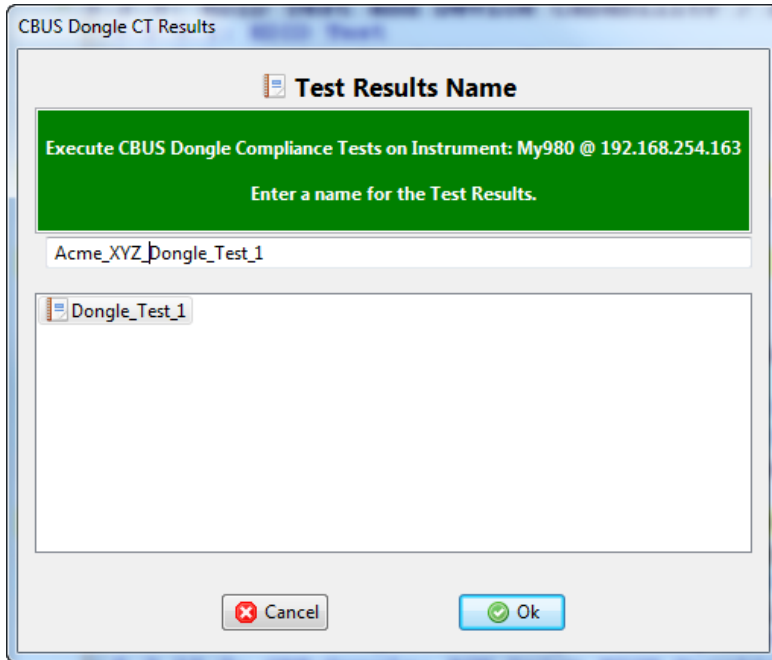


- (Optional) Review the list of tests for each category. If you wish to skip some of the tests. You can skip tests by clicking on the Check mark on the right side of the **Test Options / Preview** panel.

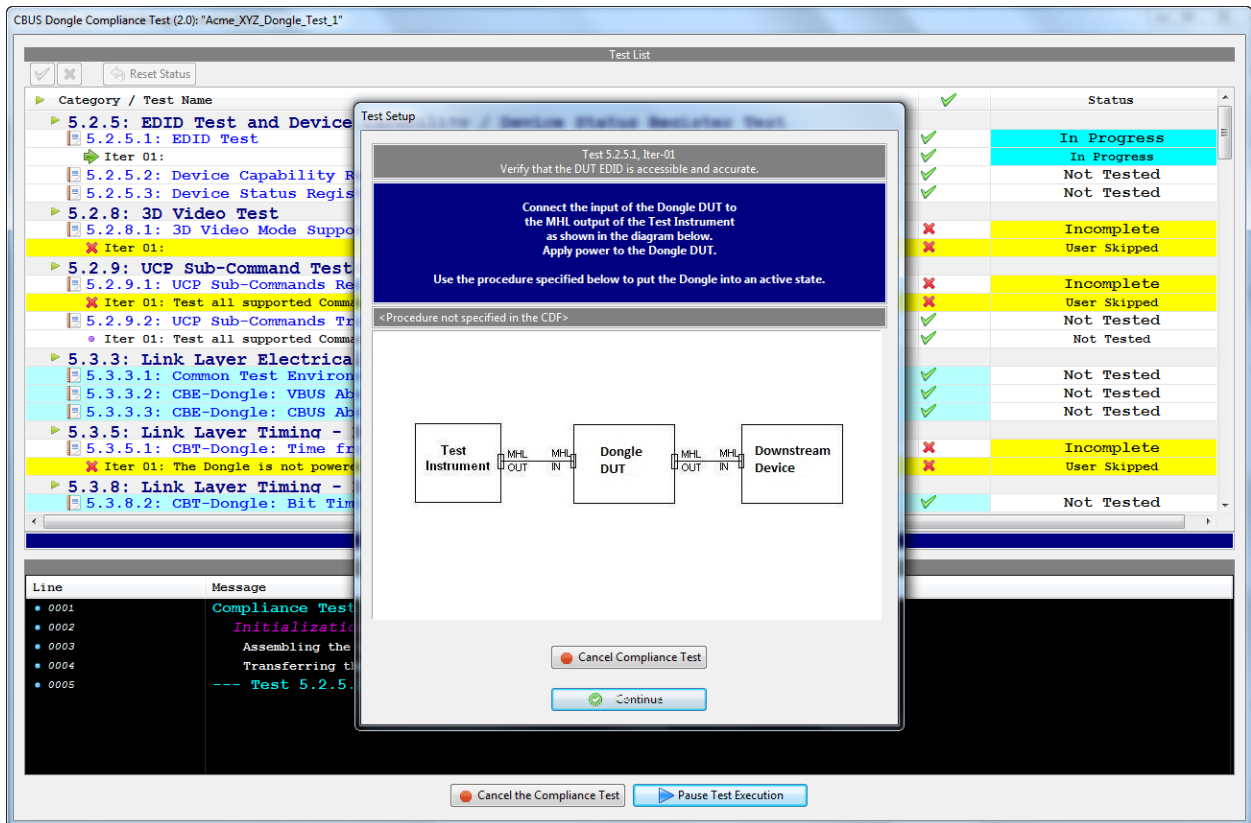
The screen shot below shows some of the tests that have been skipped (highlighted in yellow with a red X).



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



A screen will appear instructing you on how to connect your MHL CBUS dongle device for testing. A sample screen is shown below:



During the test, the test results are shown. 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 examples below.

The screenshot displays the 'CBUS Dongle Compliance Test (L2): "Dongle_Test_1"' window. It is divided into two main sections: 'Test List' and 'Test Log'.

Test List: This section shows a hierarchical list of tests. The 'Status' column indicates the result of each test. A yellow arrow points to the test '5.3.6.2: CBE-Dongle: CBUS Capacitance', which is currently 'In Progress'. Other tests shown include '5.2.5.2: Device Capability Register Test' (Fail), '5.3.3: Link Layer Electrical: Absolute Maximum Voltages' (Pass), '5.3.4: Link Layer Electrical - DUT Output: Discovery Impedance' (Pass), and '5.3.5: Link Layer Timing - DUT Output: Pre-Discovery' (Fail).

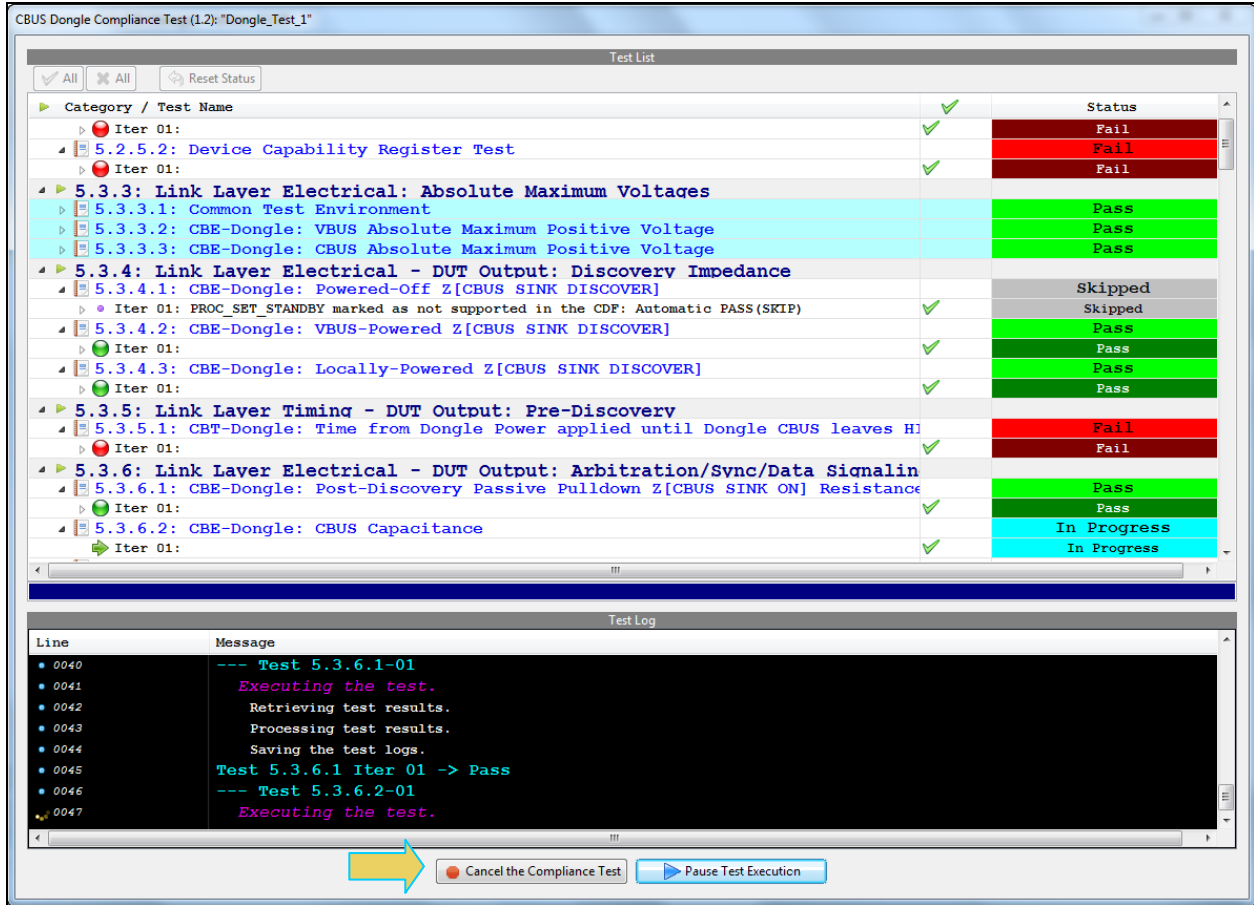
Test Log: This section shows the execution details for the currently running test, '5.3.6.1-01'. The log messages are as follows:

```

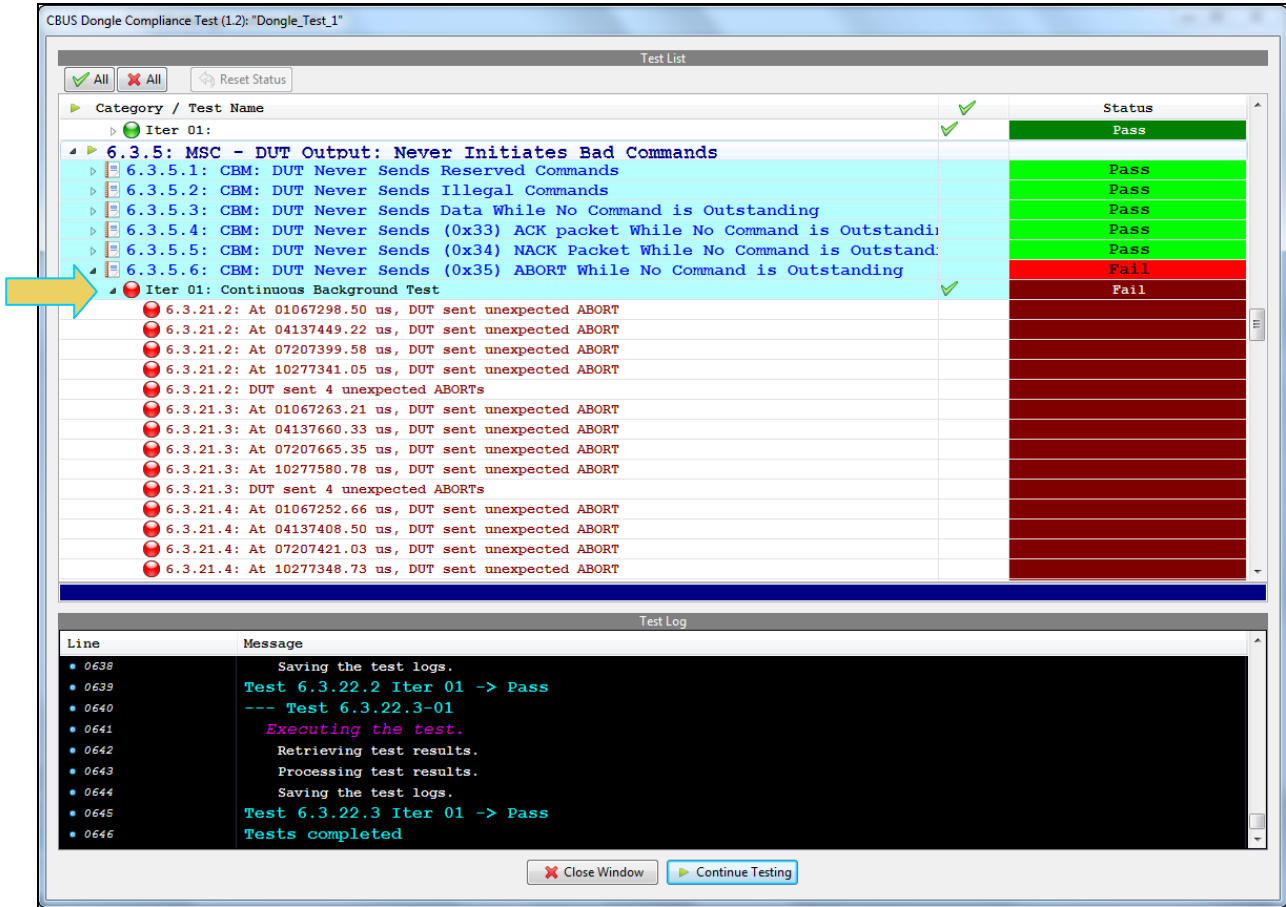
0040 --- Test 5.3.6.1-01
0041 Executing the test.
0042 Retrieving test results.
0043 Processing test results.
0044 Saving the test logs.
0045 Test 5.3.6.1 Iter 01 -> Pass
0046 --- Test 5.3.6.2-01
0047 Executing the test.
    
```

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

You can cancel the compliance test or pause it 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 following screen example.



You can view the details of failures and passes when they occur by exposing the navigation arrows on the left. Examples are shown on the following two screens.



CBUS Dongle Compliance Test (1.2): "Dongle_Test_1"

Test List

All All

Category / Test Name	✓	Status
6.3.10.7: CBM: DUT Receives (0x68) MSC MSG Command - RCP Support == 1 and RAP	✓	Pass
Iter 01:	✓	Pass
6.3.10.8: CBM: DUT Receives (0x6A) GET DDC ERRORCODE Command	✓	Pass
Iter 01:	✓	Pass
6.3.11: MSC - DUT Input: Errors and Exceptions		
6.3.11.1: CBM: DUT Receives Reserved Commands	✓	Pass
Iter 01:	✓	Pass
6.3.11.2: CBM: DUT Receives Illegal Commands	✓	Pass
Iter 01:	✓	Pass
6.3.11.3: CBM: DUT Receives Data While No Command Outstanding	✓	Pass
Iter 01:	✓	Pass
6.3.11.4: CBM: DUT Receives (0x33) ACK Packet While No Command Outstanding	✓	Pass
Iter 01:	✓	Pass
6.3.11.5: CBM: DUT Receives (0x34) a NACK Packet While No Command Outstanding	✓	Pass
Iter 01:	✓	Pass
6.3.11.6: CBM: DUT Receives (0x32) EOF While No Command Outstanding	✓	Pass
Iter 01:	✓	Pass
6.3.11.7: CBM: DUT Receives (0x35) ABORT While No Command Outstanding	✓	Fail
Iter 01:	✓	Fail
6.3.11.8: CBM: DUT Receives (0x61) READ DEVCAP - Offset Control	✓	Pass
Iter 01:	✓	Pass
6.3.11.9: CBM: DUT Receives (0x61) READ DEVCAP - Offset Invalid	✓	In Progress
Iter 01:	✓	In Progress

Test Log

Line	Message
0424	Test 6.3.11.7 Iter 01 -> Fail
0425	--- Test 6.3.11.8-01
0426	Executing the test.
0427	Retrieving test results.
0428	Processing test results.
0429	Saving the test logs.
0430	Test 6.3.11.8 Iter 01 -> Pass
0431	--- Test 6.3.11.9-01
0432	Executing the test.

The log will indicate when the tests have completed.

The screenshot displays the 'CBUS Dongle Compliance Test (1.2): "Dongle_Test_1"' application. The main window is titled 'Test List' and contains a table of test results. Below this is a 'Test Log' window showing the execution details.

Category / Test Name	Status
5.3.26: Link Layer Timing - DUT VBUS Transition	Skipped
5.3.26.1: CBT-Dongle: Dongle DUT VBUS Transition	Skipped
Iter 01: The Dongle does not accept power from the Source: Automatic PASS(SKIP)	Skipped
6.3.1: MSC - DUT Input: Device Register Space Contents; Reads	Fail
6.3.1.1: CBM: Capability Regs; READ DEVCAP of Capability Register Contents	Fail
Iter 01:	Fail
DUT discovered in 470 ms.	
01: procedure did not TIMEOUT	Pass
02: replied with an ACK packet followed by a Data packet within 2 * TPKT	Pass
03: read data documented in the CDF	Pass
04: DUT is a Source or Sink and RCP SUPPORT and RAP SUPPORT are both 1	Fail
05: DUT is a Source or Sink and SP SUPPORT is 1	Fail
DUT is a Source or Sink and SP SUPPORT is not 1	Fail
06: SP SUPPORT is 1 and SCRATCHPAD SIZE is between 16 and 64	Pass
07: value in bits [7:4] is greater than or equal to 0x3	Pass
08: value in bits [3:0] is greater than or equal to 0x3	Pass
6.3.2: MSC - DUT Output: Vendor-specific and Reserved Header Values	Pass
6.3.2.1: CBM: DUT Sends Vendor-Specific and Reserved Header Values	Pass
6.3.3: MSC - DUT Output: Normal Commands	Pass
6.3.3.1: CBM: DUT sends (0x62) GET STATE command	Pass
Iter 01:	Pass
6.3.3.2: CBM: DUT sends (0x63) GET VENDOR ID Command	Pass
Iter 01:	Pass

Line	Message
0638	Saving the test logs.
0639	Test 6.3.22.2 Iter 01 -> Pass
0640	--- Test 6.3.22.3-01
0641	Executing the test.
0642	Retrieving test results.
0643	Processing test results.
0644	Saving the test logs.
0645	Test 6.3.22.3 Iter 01 -> Pass
0646	Tests completed

The log window includes a yellow arrow pointing to the 'Tests completed' message at line 0646. At the bottom of the application window, there are two buttons: 'Close Window' and 'Continue Testing'.

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 **CBUS Dongle CT 1.2** 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.

Results Name: Dongle_Test_1
Date Tested: September 13, 2012 4:24 PM
Overall Status: CTS 1.2 - Fail

Manufacturer: QD
Model Name: XYZ
Port Tested: 1

Test Name / Details	Status
5.2.5.1: EDID Test	Fail
5.2.5.2: Device Capability Register Test	Fail
5.3.3.1: Common Test Environment	Pass
5.3.3.2: CBE-Dongle: VBUS Absolute Maximum Positive Voltage	Pass
5.3.3.3: CBE-Dongle: CBUS Absolute Maximum Positive Voltage	Pass
5.3.4.1: CBE-Dongle: Powered-Off Z[CBUS SINK DISCOVER]	Skipped
5.3.4.2: CBE-Dongle: VBUS-Powered Z[CBUS SINK DISCOVER]	Pass
5.3.4.3: CBE-Dongle: Locally-Powered Z[CBUS SINK DISCOVER]	Pass
5.3.5.1: CBT-Dongle: Time from Dongle Power applied until Dongle CBUS leaves HIGH-	Fail
5.3.6.1: CBE-Dongle: Post-Discovery Passive Pulldown Z[CBUS SINK ON] Resistance	Pass
5.3.6.2: CBE-Dongle: CBUS Capacitance	Fail
5.3.6.3: CBE-Dongle: Arbitrate/Sync/Data Drive LOW Voltage	Pass
5.3.6.4: CBE-Dongle: Arbitrate/Sync/Data Drive HIGH Voltage	Pass
5.3.7.1: CBT-Dongle: Arbitration/Sync/Data Active Drive HIGH Duration	Pass
5.3.7.2: CBT-Dongle: Arbitration/Sync/Data Edge Rate	Pass
5.3.8.1: CBT-Dongle: Arb, Sync, Data HIGH and LOW Timing	Pass
5.3.8.2: CBT-Dongle: Bit Timing Variation within a Packet	Fail
5.3.9.1: CBT-Dongle: Response to Link Level NACK	Pass
5.3.10.1: CBT-Dongle: ACK Output Timing in Nanoseconds	Pass
5.3.10.2: CBT-Dongle: ACK Drive HIGH Duration	Pass
5.3.11.1: CBT-Dongle: Dongle uses Case 2 Regular Arbitration after NACK	Pass
5.3.11.2: CBT-Dongle: Dongle uses Case 3 Long Re-arbitration when it Gives up the	Pass
5.3.11.3: CBT-Dongle: Dongle uses Case 1 Back-to-Back Timing (No Re-arbitration)	Pass
5.3.11.4: CBT-Dongle: Dongle Never Sends Too Many Back-to-Back Packets	Pass
5.3.12.1: CBT-Dongle: Dongle Never Sends Impulse Noise	Pass
5.3.12.2: CBT-Dongle: Dongle Never Sends Partial Packets	Pass
5.3.13.1: CBE-Dongle: Discovery Sensitivity to Input Voltages	Fail
5.3.14.1: CBT-Dongle: Valid Wake Pulse Timing	Pass
5.3.14.2: CBT-Dongle: Valid Discovery Pulse Timing	Pass

Instrument: My980 [192.168.254.135] Continue Test Execution

5.9 Viewing Details of Dongle Compliance Test Passes or 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 test.

To view the details of each test:

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

The screenshot shows the following test results table:

Test Name / Details	Status
5.2.5.1: EDID Test	Fail
5.2.5.2: Device Capability Register Test	Fail
5.3.3.1: Common Test Environment	Pass
5.3.3.2: CBE-Dongle: VBUS Absolute Maximum Positive Voltage	Pass
5.3.3.3: CBE-Dongle: CBUS Absolute Maximum Positive Voltage	Pass
5.3.4.1: CBE-Dongle: Powered-Off Z[CBUS SINK DISCOVER]	Skipped
5.3.4.2: CBE-Dongle: VBUS-Powered Z[CBUS SINK DISCOVER]	Pass
5.3.4.3: CBE-Dongle: Locally-Powered Z[CBUS SINK DISCOVER]	Pass
5.3.5.1: CBT-Dongle: Time from Dongle Power applied until Dongle CBUS	Fail
Iter 01:	Fail
This test is not ready for general usage yet.	
01: DUT CBUS enters HIGH-Z state within the Dongle Power-up time	Pass
02: DUT remains in high-z state for at least TSINK CBUS FLOAT	Pass
03: DUT asserts a valid ZCBUS DONGLE DISCOVER after the float per	Pass
04: Dongle DUT posts a DCAP CHG interrupt within TDONGLE DCAP CHG	Pass
05: Dongle DUT does not time out	Fail
Tester_Wait_Capability_Registers_Valid timed out.	
06: READ DEVCAP succeeds	Pass
07: POW bit is 1	Pass
08: VBUS stays high, driven by Powered Dongle	Pass
09: unfinished	Pass
5.3.6.1: CBE-Dongle: Post-Discovery Passive Pulldown Z[CBUS SINK ON]	Pass
5.3.6.2: CBE-Dongle: CBUS Capacitance	Fail
5.3.6.3: CBE-Dongle: Arbitrate/Sync/Data Drive LOW Voltage	Pass
5.3.6.4: CBE-Dongle: Arbitrate/Sync/Data Drive HIGH Voltage	Pass
5.3.7.1: CBT-Dongle: Arbitration/Sync/Data Active Drive HIGH Duration	Pass
5.3.7.2: CBT-Dongle: Arbitration/Sync/Data Edge Rate	Pass
5.3.8.1: CBT-Dongle: Arb, Sync, Data HIGH and LOW Timing	Pass
5.3.8.2: CBT-Dongle: Bit Timing Variation within a Packet	Fail

The interface also includes a header with 'Results Name: Dongle_Test_1', 'Date Tested: September 13, 2012 4:24 PM', 'Manufacturer: QD', 'Model Name: XYZ', and 'Overall Status: CTS 1.2 - Fail'. A 'Continue Test Execution' button is visible at the bottom right.

Similarly, you can view the details of a test which passed as shown below:

Event Plot | Edid Editor | EDID CT 1.4a | CBUS Sink CT 1.2 | CBUS Src CT 1.2 | CBUS Dongle CT 1.2 | CT Results

CBUS Dongle Compliance Test Results

Results Name: Dongle_Test_1 **Manufacturer:** QD HTML Report
Date Tested: September 13, 2012 4:24 PM **Model Name:** XYZ
Overall Status: CTS 1.2 - Fail **Port Tested:** 1

Test Name / Details		Status
▶ 5.2.5.1: EDID Test		Fail
▶ 5.2.5.2: Device Capability Register Test		Fail
▶ 5.3.3.1: Common Test Environment		Pass
▶ 5.3.3.2: CBE-Dongle: VBUS Absolute Maximum Positive Voltage		Pass
▶ 5.3.3.3: CBE-Dongle: CBUS Absolute Maximum Positive Voltage		Pass
▶ 5.3.4.1: CBE-Dongle: Powered-Off Z[CBUS SINK DISCOVER]		Skipped
▶ 5.3.4.2: CBE-Dongle: VBUS-Powered Z[CBUS SINK DISCOVER]		Pass
▶ 5.3.4.3: CBE-Dongle: Locally-Powered Z[CBUS SINK DISCOVER]		Pass
▶ 5.3.5.1: CBT-Dongle: Time from Dongle Power applied until Dongle CBUS		Fail
▶ 5.3.6.1: CBE-Dongle: Post-Discovery Passive Pulldown Z[CBUS SINK ON]		Pass
▶ 5.3.6.2: CBE-Dongle: CBUS Capacitance		Fail
▶ 5.3.6.3: CBE-Dongle: Arbitrate/Sync/Data Drive LOW Voltage		Pass
▶ 5.3.6.4: CBE-Dongle: Arbitrate/Sync/Data Drive HIGH Voltage		Pass
▲ Iter 01:	--	Pass
• DUT discovered in 440 ms.		
• Incoming ack bit time: 1006 ns		
• 01: DUT arbitrates for the bus to send a data packet to the Teste		Pass
▲ 02: DUT drives CBUS below Vol cbus(max) during Arbitration, Sync,		Pass
• analyzing arb pulse		
• Low pulse: time below midpoint: 00000001.00 us; time below Vol: 00000001.00 us		
• analyzing sync pulse		
• Low pulse: time below midpoint: 00000001.48 us; time below Vol: 00000001.48 us		
• analyzing header, control, data, and parity pulses		
• Low pulse: time below midpoint: 00000000.48 us; time below Vol: 00000000.48 us		
• Low pulse: time below midpoint: 00000001.01 us; time below Vol: 00000001.01 us		
• Low pulse: time below midpoint: 00000001.02 us; time below Vol: 00000001.02 us		
▶ 5.3.7.1: CBT-Dongle: Arbitration/Sync/Data Active Drive HIGH Duration		Pass
▶ 5.3.7.2: CBT-Dongle: Arbitration/Sync/Data Edge Rate		Pass
▶ 5.3.8.1: CBT-Dongle: Arb, Sync, Data HIGH and LOW Timing		Pass

5.2.5.1: EDID Test

Instrument: My980 [192.168.254.135] ▶ Continue Test Execution

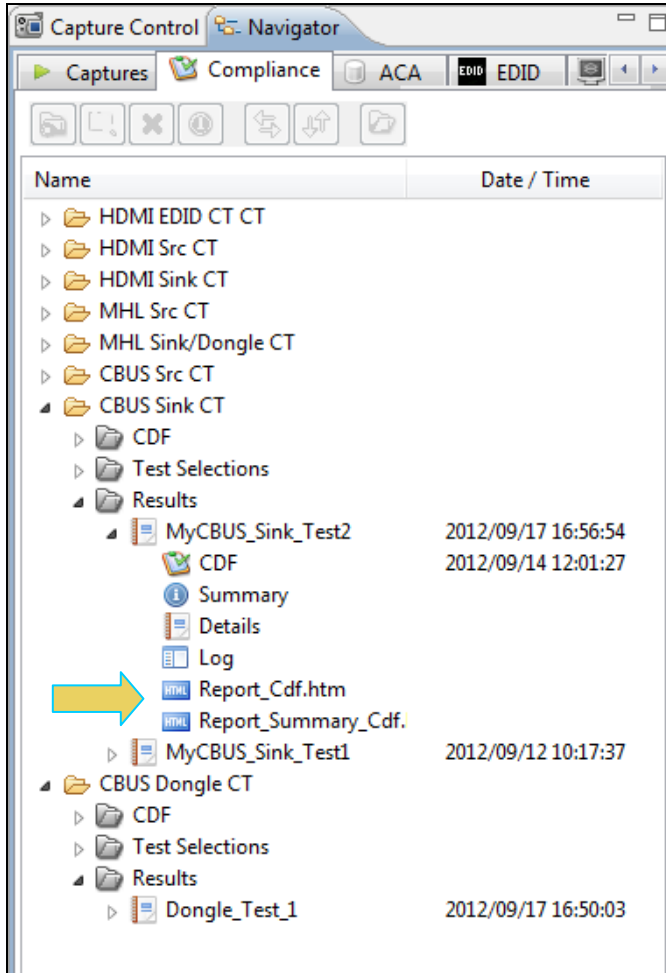


5.10 Accessing the test results through the navigator panel

You can view the results of the tests at any time after you run them through the 980 GUI Manager's **Navigator** panel. Use the following procedures to view the details of a test.

To access the test results:

1. Access the **Navigator** tab and select **Compliance**. Refer to the screen example below.



- Double click on the Results file you wish to view. The results will appear in a CT Results window on the right. Refer to the screen example below.

The screenshot shows a software window titled "CBUS Dongle Compliance Test Results". At the top, it displays test metadata: Results Name: Dongle_Test_1, Date Tested: September 13, 2012 4:24 PM, Overall Status: CTS 1.2 - Fail, Manufacturer: QD, Model Name: XYZ, and Port Tested: 1. There is an "HTML Report" button on the right.

The main area is a table of test results:

Test Name / Details	Status
5.2.5.1: EDID Test	Fail
5.2.5.2: Device Capability Register Test	Fail
5.3.3.1: Common Test Environment	Pass
5.3.3.2: CBE-Dongle: VBUS Absolute Maximum Positive Voltage	Pass
5.3.3.3: CBE-Dongle: CBUS Absolute Maximum Positive Voltage	Pass
5.3.4.1: CBE-Dongle: Powered-Off Z[CBUS SINK DISCOVER]	Skipped
5.3.4.2: CBE-Dongle: VBUS-Powered Z[CBUS SINK DISCOVER]	Pass
5.3.4.3: CBE-Dongle: Locally-Powered Z[CBUS SINK DISCOVER]	Pass
5.3.5.1: CBT-Dongle: Time from Dongle Power applied until Dongle CBUS leaves HIGH-	Fail
5.3.6.1: CBE-Dongle: Post-Discovery Passive Pulldown Z[CBUS SINK ON] Resistance	Pass
5.3.6.2: CBE-Dongle: CBUS Capacitance	Fail
5.3.6.3: CBE-Dongle: Arbitrate/Sync/Data Drive LOW Voltage	Pass
5.3.6.4: CBE-Dongle: Arbitrate/Sync/Data Drive HIGH Voltage	Pass
5.3.7.1: CBT-Dongle: Arbitration/Sync/Data Active Drive HIGH Duration	Pass
5.3.7.2: CBT-Dongle: Arbitration/Sync/Data Edge Rate	Pass
5.3.8.1: CBT-Dongle: Arb, Sync, Data HIGH and LOW Timing	Pass
5.3.8.2: CBT-Dongle: Bit Timing Variation within a Packet	Fail
5.3.9.1: CBT-Dongle: Response to Link Level NACK	Pass
5.3.10.1: CBT-Dongle: ACK Output Timing in Nanoseconds	Pass
5.3.10.2: CBT-Dongle: ACK Drive HIGH Duration	Pass
5.3.11.1: CBT-Dongle: Dongle uses Case 2 Regular Arbitration after NACK	Pass
5.3.11.2: CBT-Dongle: Dongle uses Case 3 Long Re-arbitration when it Gives up the	Pass
5.3.11.3: CBT-Dongle: Dongle uses Case 1 Back-to-Back Timing (No Re-arbitration)	Pass
5.3.11.4: CBT-Dongle: Dongle Never Sends Too Many Back-to-Back Packets	Pass
5.3.12.1: CBT-Dongle: Dongle Never Sends Impulse Noise	Pass
5.3.12.2: CBT-Dongle: Dongle Never Sends Partial Packets	Pass
5.3.13.1: CBE-Dongle: Discovery Sensitivity to Input Voltages	Fail
5.3.14.1: CBT-Dongle: Valid Wake Pulse Timing	Pass
5.3.14.2: CBT-Dongle: Valid Discovery Pulse Timing	Pass

At the bottom, the instrument is identified as "My980 [192.168.254.135]" and there is a "Continue Test Execution" button.

5.11 Viewing the MHL Dongle 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.

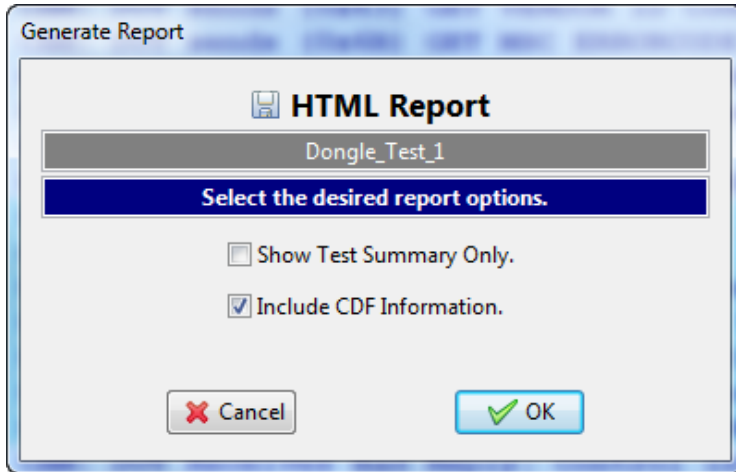
To view the html test report:

1. Select the **CT Results** panel as shown below.

Test Name / Details	Status
5.2.5.1: EDID Test	Fail
5.2.5.2: Device Capability Register Test	Fail
5.3.3.1: Common Test Environment	Pass
5.3.3.2: CBE-Dongle: VBUS Absolute Maximum Positive Voltage	Pass
5.3.3.3: CBE-Dongle: CBUS Absolute Maximum Positive Voltage	Pass
5.3.4.1: CBE-Dongle: Powered-Off Z [CBUS SINK DISCOVER]	Skipped
5.3.4.2: CBE-Dongle: VBUS-Powered Z [CBUS SINK DISCOVER]	Pass
5.3.4.3: CBE-Dongle: Locally-Powered Z [CBUS SINK DISCOVER]	Pass
5.3.5.1: CBT-Dongle: Time from Dongle Power applied until Dongle CBUS leaves HIGH-	Fail
5.3.6.1: CBE-Dongle: Post-Discovery Passive Pulldown Z [CBUS SINK ON] Resistance	Pass
5.3.6.2: CBE-Dongle: CBUS Capacitance	Fail
5.3.6.3: CBE-Dongle: Arbitrate/Sync/Data Drive LOW Voltage	Pass
5.3.6.4: CBE-Dongle: Arbitrate/Sync/Data Drive HIGH Voltage	Pass
5.3.7.1: CBT-Dongle: Arbitration/Sync/Data Active Drive HIGH Duration	Pass
5.3.7.2: CBT-Dongle: Arbitration/Sync/Data Edge Rate	Pass
5.3.8.1: CBT-Dongle: Arb, Sync, Data HIGH and LOW Timing	Pass
5.3.8.2: CBT-Dongle: Bit Timing Variation within a Packet	Fail
5.3.9.1: CBT-Dongle: Response to Link Level NACK	Pass
5.3.10.1: CBT-Dongle: ACK Output Timing in Nanoseconds	Pass
5.3.10.2: CBT-Dongle: ACK Drive HIGH Duration	Pass
5.3.11.1: CBT-Dongle: Dongle uses Case 2 Regular Arbitration after NACK	Pass
5.3.11.2: CBT-Dongle: Dongle uses Case 3 Long Re-arbitration when it Gives up the	Pass
5.3.11.3: CBT-Dongle: Dongle uses Case 1 Back-to-Back Timing (No Re-arbitration)	Pass
5.3.11.4: CBT-Dongle: Dongle Never Sends Too Many Back-to-Back Packets	Pass
5.3.12.1: CBT-Dongle: Dongle Never Sends Impulse Noise	Pass
5.3.12.2: CBT-Dongle: Dongle Never Sends Partial Packets	Pass
5.3.13.1: CBE-Dongle: Discovery Sensitivity to Input Voltages	Fail
5.3.14.1: CBT-Dongle: Valid Wake Pulse Timing	Pass
5.3.14.2: CBT-Dongle: Valid Discovery Pulse Timing	Pass

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.



Specify if you want to see a summary report and if you want to see the CDF. If you leave Show Test Summary Only unchecked the application will produce a full detailed report. The following screens provide samples of the report. Note the first items in the CDF shown below.

Note: This example shows an MHL 1.2 test result; MHL 2.0 test results are similar in content and structure.

HTML Viewer
 C:\Users\nkendall\Desktop\980_CBUS_GUI\980mgr\cbusdonglect\results\Dongle_Test_1\Report_Summary_Cdf.htm

Report generated on: September 17, 2012 4:30 PM www.quantumdata.com

Quantum Data

CBUS Dongle Compliance Test Report

CTS 1.2

Results Name:	Dongle_Test_1	Manufacturer:	QD
Date Tested:	September 13, 2012 4:24 PM	Model Name:	XYZ
Overall Status:	Fail	Port Tested:	-

Capabilities Declaration Form (CDF)	
General	
CDF_MFR_NAME	QD
CDF_MODEL_NUMBER	XYZ
CDF_D_CBUS_THRESHOLD_V	0.90
CDF_D_MAX_CBUS_CAP	0.1
CDF_D_POWERED	YES
CDF_D_MAX_POWER_DOWN	500
CDF_D_MAX_POWER_UP	500
CDF_D_MAX_STANDBY_TO_ACTIVE	60
CDF_PROC_SET_ACTIVE	Not Specified
CDF_PROC_SET_STANDBY	Not Supported
CDF_RCP_RECEIVE	NO
CDF_RCP_SEND	NO
CDF_LOG_DEV_MAP_CHANGE	NO
Capability Registers	
CDF_CR_MHL_VER_MAJOR	1
CDF_CR_MHL_VER_MINOR	0

← Back → Forward Save As Close

The summary results are shown below:

HTML Viewer
 C:\Users\kendall\Desktop\980_CBUS_GUI\980mgr\cbusdonglect\results\Dongle_Test_1\Report_Cdf.htm

Test 5.3.23.2	Fail	Test 5.3.23.3	Fail	Test 5.3.24.1	Pass
Test 5.3.25.1	Skipped	Test 5.3.26.1	Skipped	Test 6.3.1.1	Fail
Test 6.3.2.1	Pass	Test 6.3.3.1	Pass	Test 6.3.3.2	Pass
Test 6.3.3.3	Pass	Test 6.3.3.4	Pass	Test 6.3.3.5	Pass
Test 6.3.3.6	Pass	Test 6.3.3.7	Pass	Test 6.3.5.1	Pass
Test 6.3.5.2	Pass	Test 6.3.5.3	Pass	Test 6.3.5.4	Pass
Test 6.3.5.5	Pass	Test 6.3.5.6	Fail	Test 6.3.5.7	Pass
Test 6.3.6.1	Pass	Test 6.3.6.2	Pass	Test 6.3.6.3	Pass
Test 6.3.6.4	Pass	Test 6.3.6.5	Fail	Test 6.3.7.1	Pass
Test 6.3.8.1	Pass	Test 6.3.8.2	Pass	Test 6.3.9.1	Pass
Test 6.3.10.1	Pass	Test 6.3.10.2	Pass	Test 6.3.10.3	Pass
Test 6.3.10.4	Pass	Test 6.3.10.5	Pass	Test 6.3.10.6	Pass
Test 6.3.10.7	Pass	Test 6.3.10.8	Pass	Test 6.3.11.1	Pass
Test 6.3.11.2	Pass	Test 6.3.11.3	Pass	Test 6.3.11.4	Pass
Test 6.3.11.5	Pass	Test 6.3.11.6	Pass	Test 6.3.11.7	Fail
Test 6.3.11.8	Pass	Test 6.3.11.9	Pass	Test 6.3.11.10	Pass
Test 6.3.11.11	Pass	Test 6.3.11.12	Pass	Test 6.3.11.13	Pass
Test 6.3.11.14	Pass	Test 6.3.11.15	Fail	Test 6.3.11.16	Pass
Test 6.3.11.17	Pass	Test 6.3.11.19	Pass	Test 6.3.11.20	Pass
Test 6.3.11.21	Fail	Test 6.3.11.22	Pass	Test 6.3.11.23	Pass
Test 6.3.11.24	Pass	Test 6.3.12.1	Fail	Test 6.3.12.2	Fail
Test 6.3.12.3	Fail	Test 6.3.12.4	Fail	Test 6.3.12.5	Pass
Test 6.3.12.6	Pass	Test 6.3.12.7	Pass	Test 6.3.12.8	Pass
Test 6.3.12.9	Pass	Test 6.3.15.1	Skipped	Test 6.3.15.2	Skipped
Test 6.3.16.1	Skipped	Test 6.3.16.2	Skipped	Test 6.3.20.2	Pass
Test 6.3.20.3	Pass	Test 6.3.21.1	Pass	Test 6.3.21.2	Pass
Test 6.3.21.3	Pass	Test 6.3.21.4	Pass	Test 6.3.21.5	Fail
Test 6.3.22.1	Pass	Test 6.3.22.2	Pass	Test 6.3.22.3	Pass
CDF		Equipment Info			

← Back ▶ Forward 📁 Save As ✖ Close

The final page of the report shows the test equipment configuration as shown below.

HTML Viewer
C:\Users\nkendall\Desktop\980_CBUS_GUI\980mgr\cbusdonglect\results\Dongle_Test_1\Report_Summary_Cdf.htm

Test Equipment Information

Instrument
<pre>Name: My980 IP Address: 192.168.254.135 Net Mask: 255.255.255.0 Gateway IP: 192.168.254.1 Free Space: 121.08 GB of 144.22 GB (84.0%) Version: Advanced Test platform Release: 4.5.27 MHL CBUS Protocol Analyzer in slot 1: Gateway: [Version: 0 Build Number: 4 (09:11:2012 121000) pcb: 23232323] Firmware: [Version: 1.0.1 Build Number: 1978 (mblair 09:13:2012 09:21:52 CDI)] System Information: System SN : [47A7D6F8C0A385A0::N/A] SN : [318383010000::11120010c] Main Board : ["DPF67DE"] CPUx4 : [6.42.7 "Intel(R) Core(TM) i3-2100 CPU @ 3.10GHz"] DDR : [3 GB + 768 MB] HD : [WD1600BEVT-1] OS : [Linux xpscope-81 2.6.26-2-686 #1 SMP Wed Sep 21 04:35:47 UTC 2011 i686 GNU/Linux] GUI manager : [Version 4.5.27_39005_201209061011] 1 : [lo inet 127.0.0.1/8 scope host lo] 2 : [eth0 inet 192.168.254.135/24 brd 192.168.254.255 scope global eth0] HDMI SINK CTS: [3.1.7] HDMI SRC CTS: [3.1.8] MHL SINK CTS: [1.2.0] MHL SRC CTS: [1.2.1]</pre>
Host
<pre>UI Name: Quantum Data 980 Manager - Version 4.5.29 UI Home: platform:/base/plugins/com.quantumdata.i980.app Java Vendor: Null Java Runtime: 1.6.0_15-b03 Java Home: C:\Users\nkendall\Desktop\980_Release_5_29\980mgr\jre OS: win32 OS Arch: x86 Locale: en_US Free Space: 13.80 GB of 453.66 GB (3.0%)</pre>

Generated on: September 17, 2012 4:30 PM www.quantumdata.com

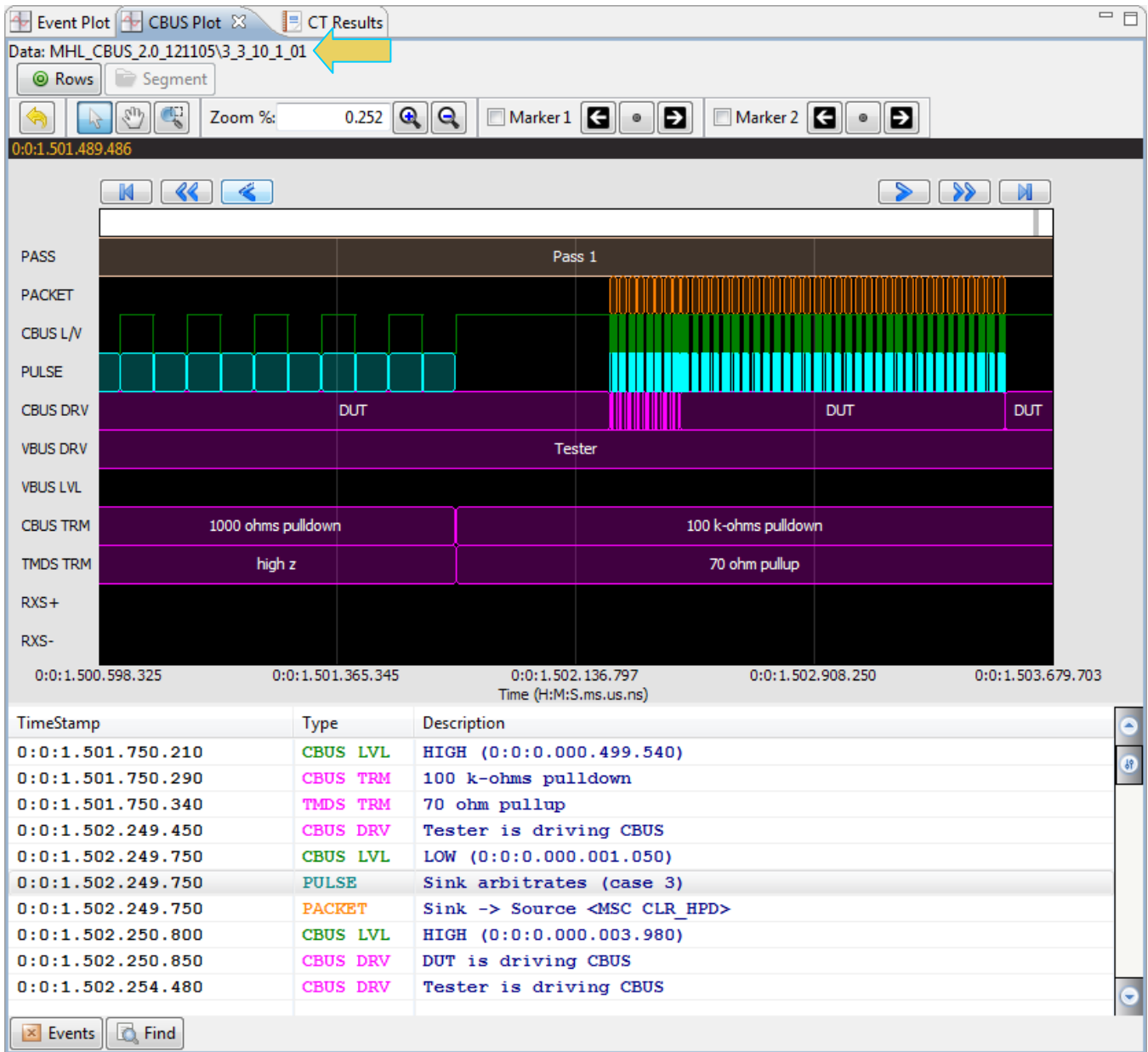
6 CBUS Log Plot

The **CBUS Log Plot** panel (shown below) is panel used for viewing the bit and byte timing events of the CBUS controls and commands that occurred during a specific test. A CBUS Log Plot is provided for each source, sink and dongle CBUS compliance tests. You can disseminate these Log Plots to colleagues as part of the test results. Your colleagues, subject matter experts are not required to have a 980 test instrument to view them; they simply need to download the 980 GUI Manager application from the Quantum Data website.

The panel has both a graphical depiction of CBUS timing events and a sequential table list out of each event. The vertical axis shows the various CBUS event types. The **CBUS Log Plot** panel provides a set of CBUS event types labeled on the left that indicate the type of event. The horizontal axis is time. The scale along the bottom of the **CBUS Log Plot** shows the timestamp for each point in time.

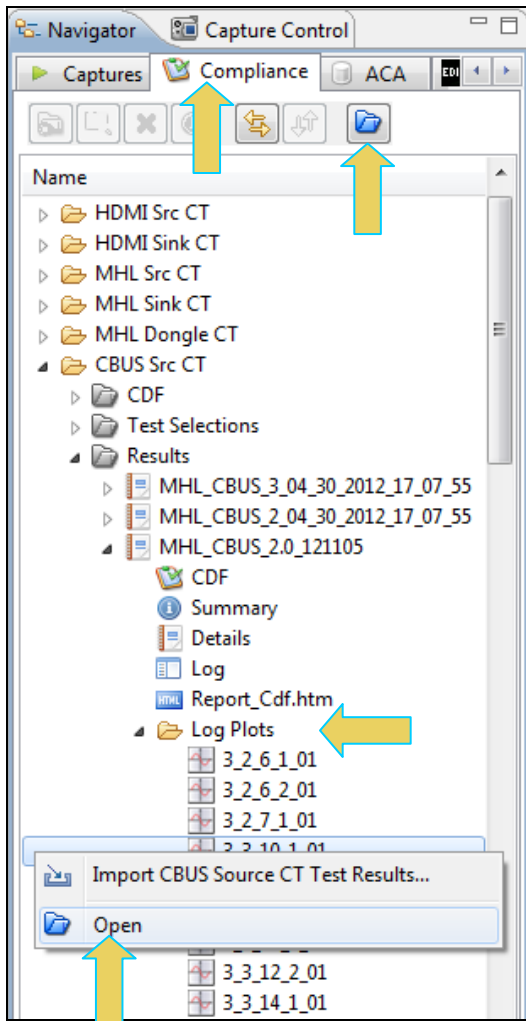
The **CBUS Log Plot** is useful diagnosing CBUS compliance test failures.

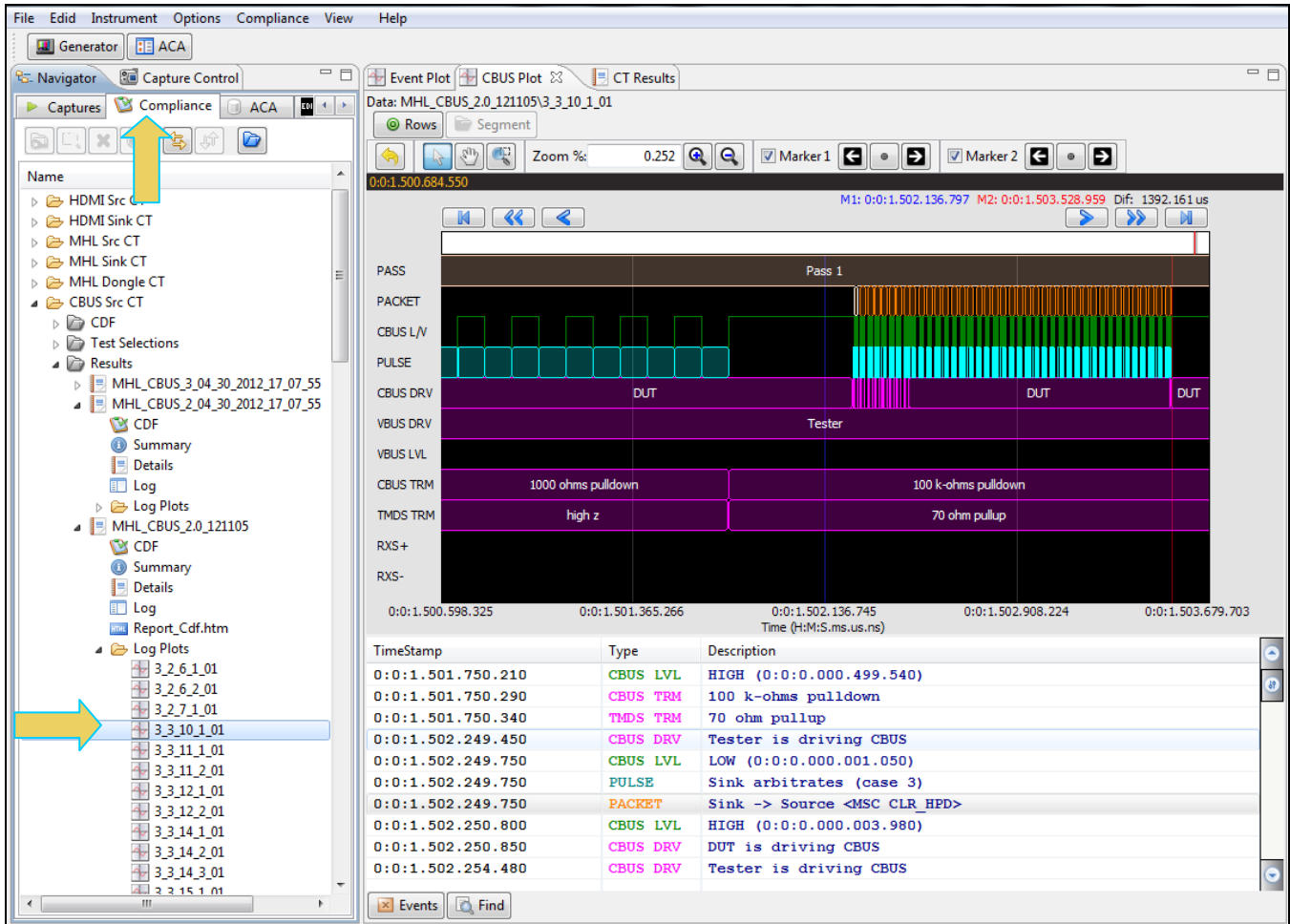
The example below shows a series of events captured during a source test. The test section and number are shown on the top of the panel.



6.1 Accessing the CBUS Log Plots

You can access the **CBUS Log Plot** through the **Navigator/Compliance** panel shown. There is a separate **CBUS Log Plot** for each test in a series of tests. Simply select the log and double click, select open from the right click menu or select the Open icon near the top of the panel to open a **CBUS Log Plot**. Refer to the following two screen shots to view the method of access for the **CBUS Log Plot**.

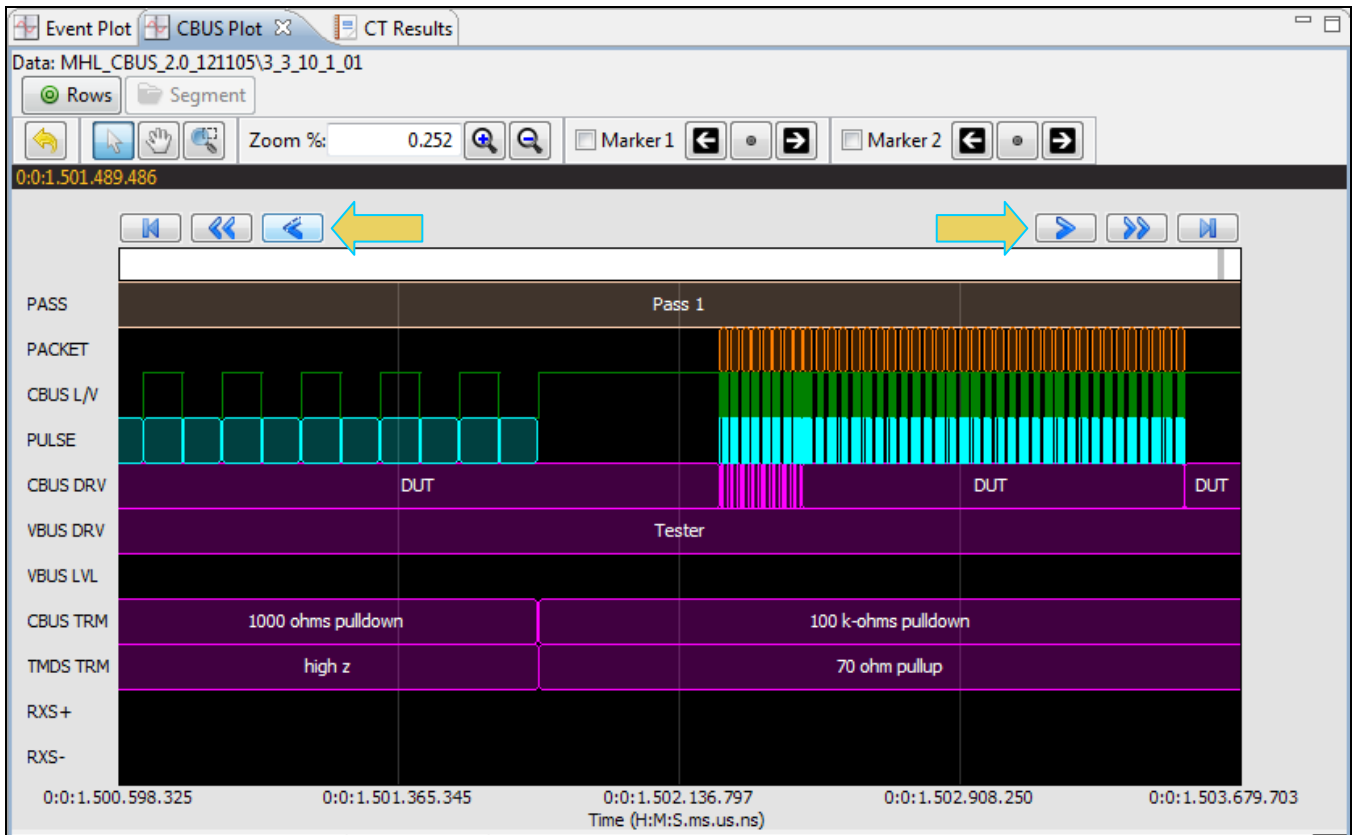




6.2 Locating Data in the CBUS Log Plot Panel

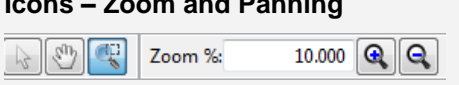




The **CBUS Log Plot** enables you to locate events by searching for specific event types, panning, scrolling and zooming using various techniques. You can filter the events by type to limit the amount of events to sift through. You can synchronize between the upper graphical section of the panel and the lower tabular section.

A scroll bar is provided to enable you to quickly browse through the data. The scroll bar is under the set of function icons just above the data panel where the data is displayed. You can also scroll to the end, scroll by page or scroll incrementally in either direction using the backward and forward activation buttons. See the screen shot below.




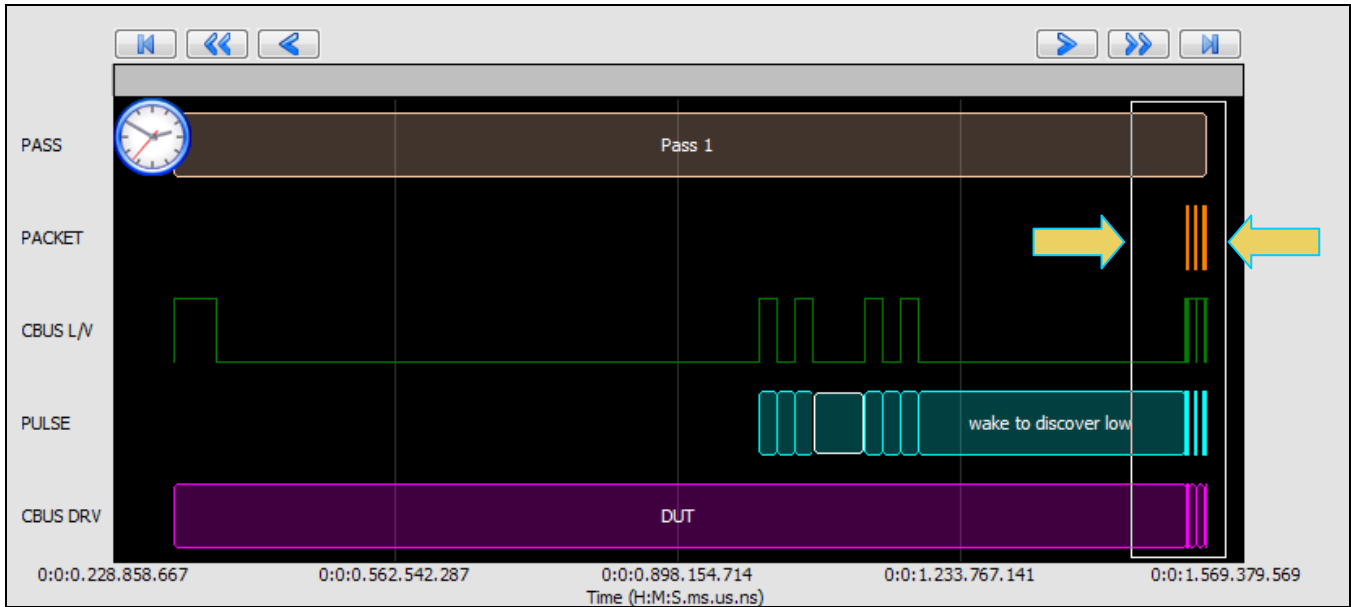
6.3 Viewing Events in the CBUS Log Plot Panel

You can zoom in and zoom out and pan across the events using the slide bars provided. You can also zoom by surrounding a specific section of the captured events. These functions are described in the following table.

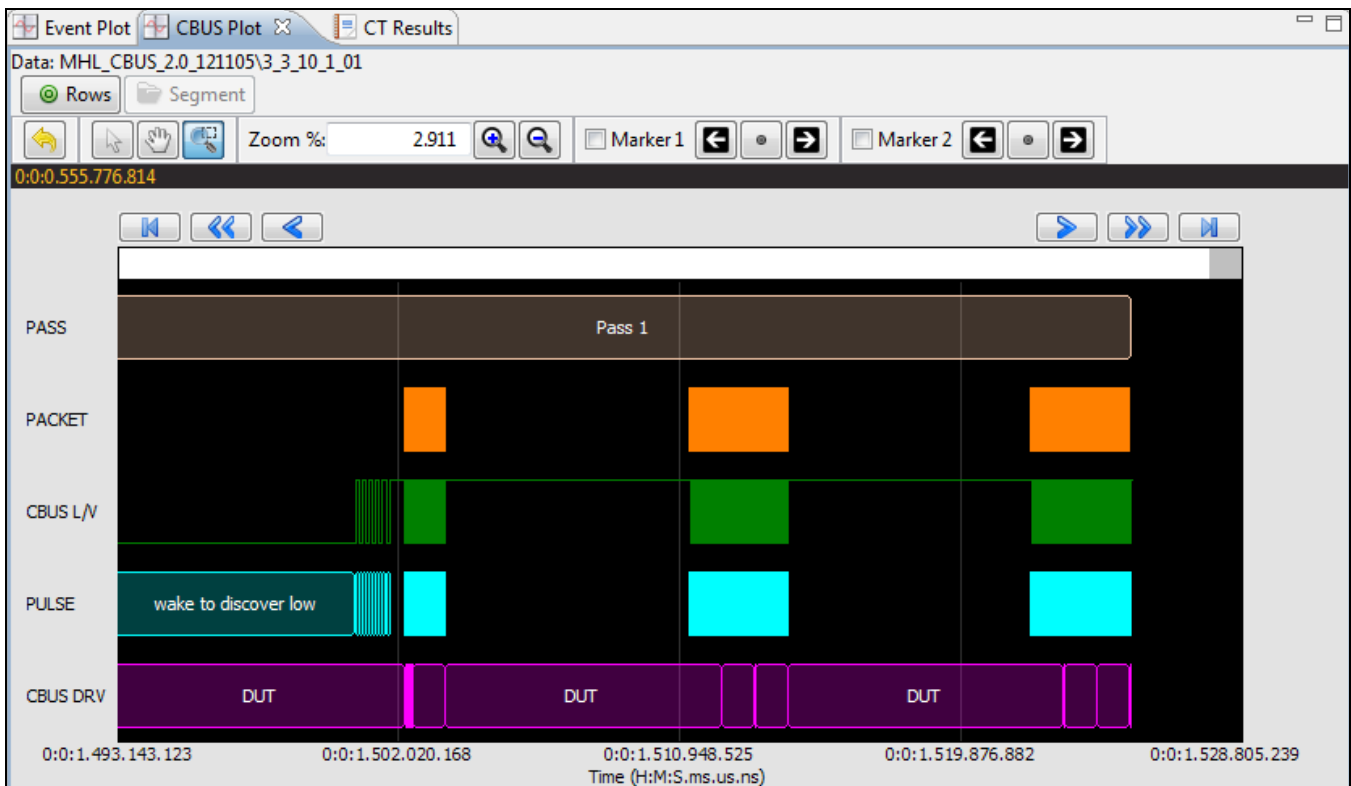
Even Plot Zoom & Panning Icons	Function
<p>Icons – Zoom and Panning</p> 	<ul style="list-style-type: none"> ▪ Surround  activation button – You can select an area of the CBUS Log Plot by clicking and dragging across. When you do this the new view will be limited to the horizontal range that you selected. The midpoint of the selection will become the new center of the data displayed. ▪ Zoom % – The Zoom % function enables you to enter a specific zoom amount in the associated field provided. ▪ Zoom In/Out icons  – The Zoom In/Out function buttons enables you to zoom in and zoom out by clicking on the activation button. The centered point will remain the same. ▪ Panning  – The panning function enables you scan across the data quickly by clicking and dragging. ▪ Pointer  – The pointer icon enables you to click on any point and obtain information such as the data packet type and the timestamp, about that data packet. The information is displayed in a dark panel just above the scroll bar and below the icons.

6.3.1 Surrounding and Zooming with the Range Zoom tool

The **CBUS Log Plot** provides a Range Zoom tool . You can select an area of the plot by clicking and dragging across. When you do this the new view will be limited to the horizontal range that you selected. The midpoint of the selection will become the new center of the events displayed. The two screens below show an example of surrounding a segment of data. The rectangular section identified by the arrows in the screen example below indicates the section that is surrounded. The second view shows the resulting view.



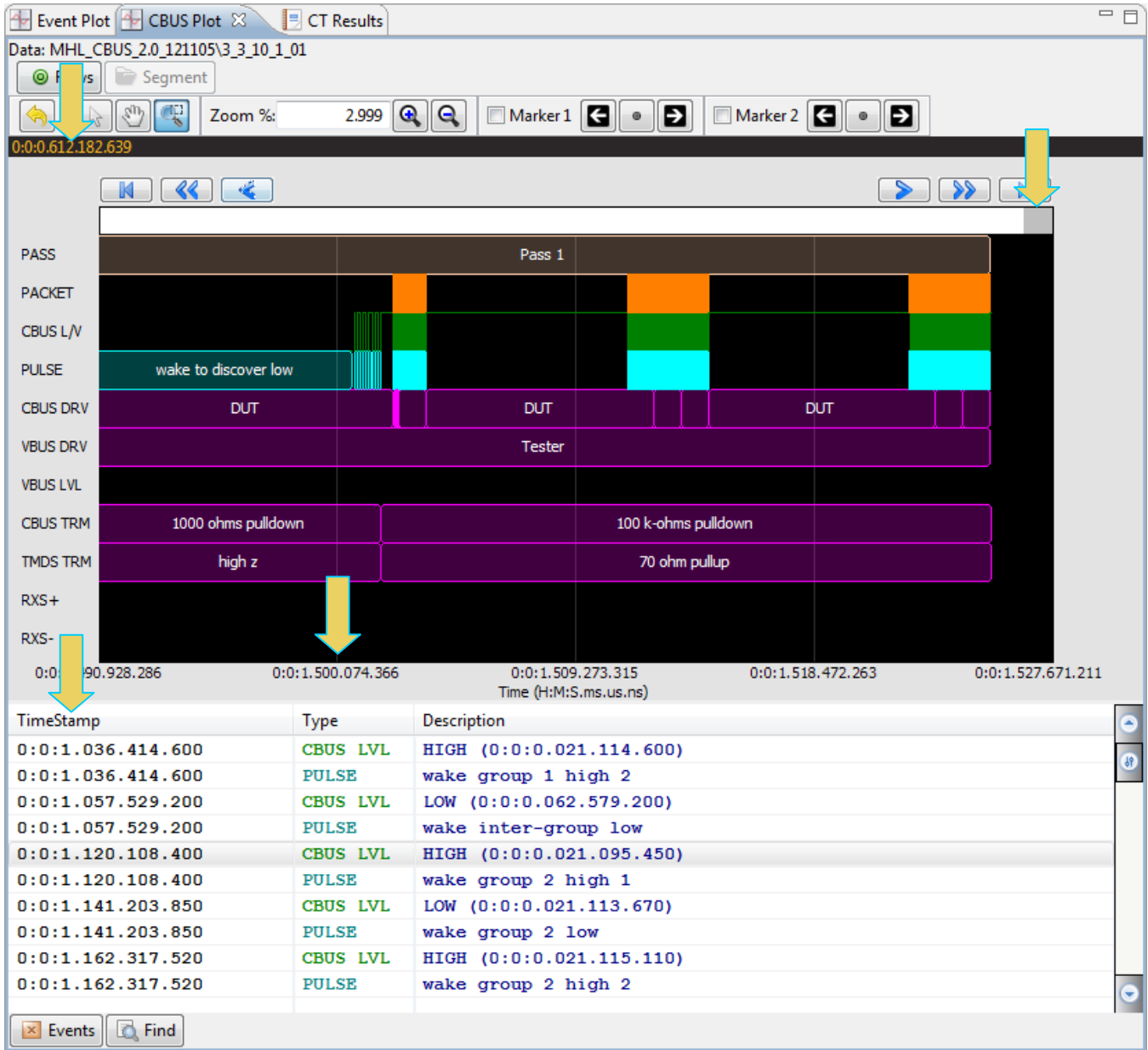
The resulting view is shown below.



6.4 Viewing the Timestamps of the Events

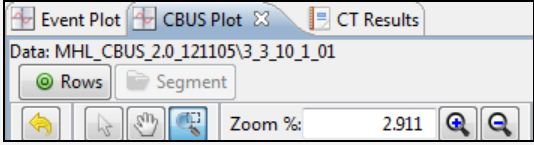
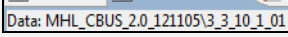
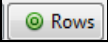
There is a scroll bar on the status panel just above the events that indicates the location of the scroll bar. When you scroll or pan through the data, the timestamps are shown in the status panel below the window where the events are displayed. If you use the pointer tool to select a particular event, the timestamp will be shown in the dark strip above the graphical window and below the control icons. The timestamp in this area always reflects the location of

the cursor. Also when you click on an item in the graphical window the event item will be shown in lower table view. In the example below, a selection has been made on a sync pulse with the pointer tool.



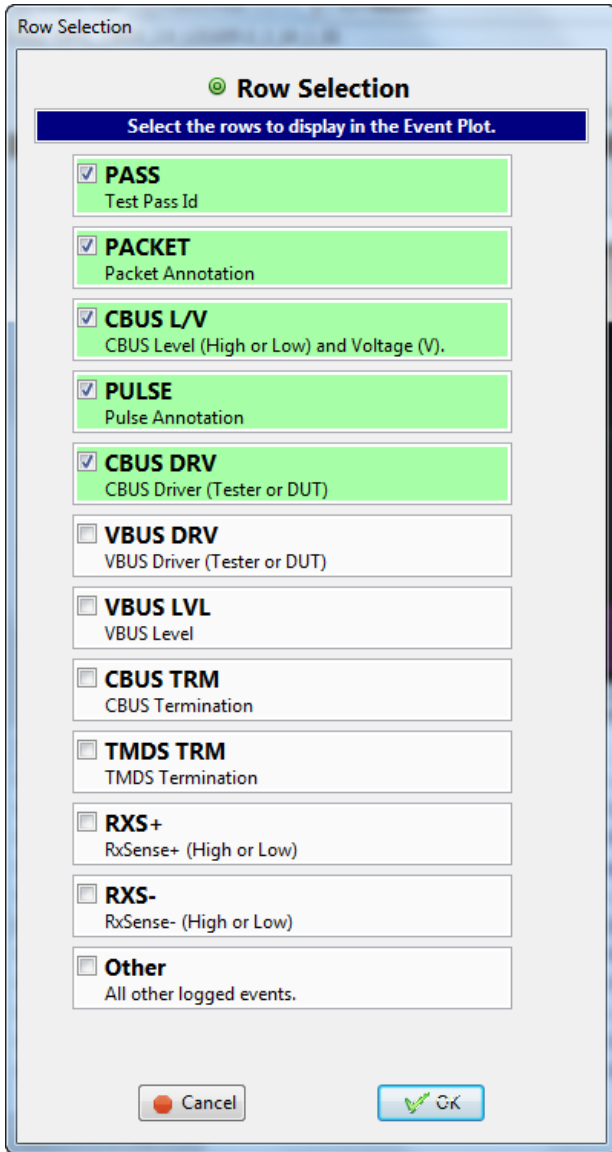
6.5 General Controls – CBUS Log Plot

The various other icons and controls in the **CBUS Log Plot** are described in the tables and screens that follow. There are two tables below, one describing the icons on the top and a second table describing the items on the bottom of the **CBUS Log Plot**.



CBUS Log Plot Icons – Upper Status Section	Function
<p>Icons – General Control</p> 	<ul style="list-style-type: none"> ▪ User path status  – shows the name of the capture file and its location. ▪ Rows  – The Rows activation button enables you to configure the data types that appears in the CBUS Log Plot window. When you click on this icon a dialog box appears enabling you to configure the rows. This dialog box is described further below. ▪ Segment – Large captures are broken into smaller distinct sections called segments to make them more manageable and to improve speed and performance. When you click on the Segment activation button, a dialog box appears enabling you to select and load another segment. In the example to the left, there are no segments to the button is grayed out (as shown in the example).

6.5.1 Configuring Row Information on the CBUS Log Plot

You can customize the CBUS events that appear on the **CBUS Log Plot** Row using the Row configuration dialog. The default configuration is shown below. Simply check the additional items that you wish to show in the **CBUS Log Plot**. Then click OK.



The various other icons and controls in the **CBUS Log Plot** are described in the tables and screens that follow.

CBUS Log Plot Icons – Bottom Status Section	Function																		
<p>Icons – General Control</p> <table border="1"> <tr> <td>0:0:48.701.894.720</td> <td>CBUS LVL</td> <td>HIGH (0:0:0.000.239.610)</td> </tr> <tr> <td>0:0:48.701.894.800</td> <td>CBUS TRM</td> <td>100 k-ohms pulldown</td> </tr> <tr> <td>0:0:48.701.894.850</td> <td>TMD5 TRM</td> <td>70 ohm pullup</td> </tr> <tr> <td>0:0:48.702.134.030</td> <td>CBUS DRV</td> <td>Tester is driving CBUS</td> </tr> <tr> <td>0:0:48.702.134.330</td> <td>CBUS LVL</td> <td>LOW (0:0:0.000.001.050)</td> </tr> <tr> <td>0:0:48.702.134.330</td> <td>PULSE</td> <td>Sink arbitrates (case 3)</td> </tr> </table> <p>Events Find</p>	0:0:48.701.894.720	CBUS LVL	HIGH (0:0:0.000.239.610)	0:0:48.701.894.800	CBUS TRM	100 k-ohms pulldown	0:0:48.701.894.850	TMD5 TRM	70 ohm pullup	0:0:48.702.134.030	CBUS DRV	Tester is driving CBUS	0:0:48.702.134.330	CBUS LVL	LOW (0:0:0.000.001.050)	0:0:48.702.134.330	PULSE	Sink arbitrates (case 3)	<ul style="list-style-type: none"> Events  – The Events activation button enables you to filter the captured data by type. When you click on the Events button a dialog box appears enable you do select or deselect data types individually or a page at a time. This dialog box is described further below. Find  – The Find activation button enables you to locate captured data by type. When you click on the Find button a dialog box appears enable you do specify
0:0:48.701.894.720	CBUS LVL	HIGH (0:0:0.000.239.610)																	
0:0:48.701.894.800	CBUS TRM	100 k-ohms pulldown																	
0:0:48.701.894.850	TMD5 TRM	70 ohm pullup																	
0:0:48.702.134.030	CBUS DRV	Tester is driving CBUS																	
0:0:48.702.134.330	CBUS LVL	LOW (0:0:0.000.001.050)																	
0:0:48.702.134.330	PULSE	Sink arbitrates (case 3)																	

CBUS Log Plot Icons – Bottom Status Section	Function
	a data type to search on. This dialog box is described further below.

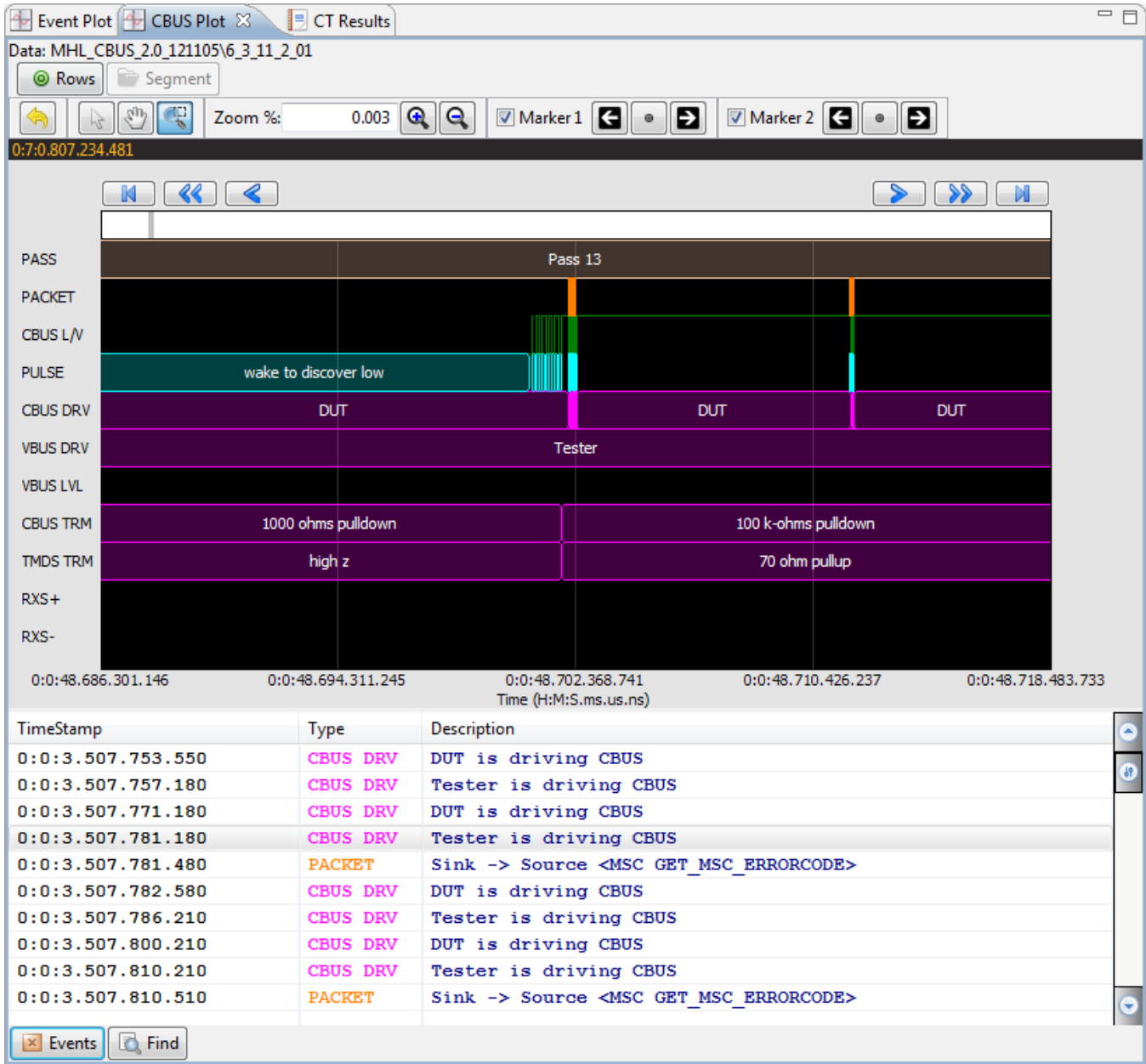
6.5.2 Filtering Events on the CBUS Log Plot

You can filter the CBUS events that appear on the **CBUS Log Plot** using the **Event** button and associated dialog box. Simply click on the **Event** button and check the event types on the dialog box that you wish to view on the **CBUS Log Plot**. Then click OK. The screen examples below depict an Event filter scenario.

The screenshot shows the 'Event Plot' window with the following data: MHL_CBUS_2.0_121105\6_3_11_2_01. The plot displays various signals including PASS, PACKET, CBUS L/V, PULSE, CBUS DRV, VBUS DRV, VBUS LVL, CBUS TRM, TMDS TRM, RXS+, and RXS-. A 'CBUS Event Selection' dialog box is open, showing a list of event types with their counts and descriptions. The 'PULSE' event type is highlighted in blue.

Type	Count	Description
<input type="checkbox"/> CBUS LVL	130215	CBUS Level (High or Low).
<input checked="" type="checkbox"/> CBUS DRV	18635	CBUS Driver (Tester or DUT)
<input checked="" type="checkbox"/> CBUS V	0	CBUS Voltage (V)
<input checked="" type="checkbox"/> CBUS TRM	723	CBUS Termination
<input checked="" type="checkbox"/> TMDS TRM	482	TMDS Termination
<input checked="" type="checkbox"/> VBUS DRV	482	VBUS Driver (Tester or DUT)
<input checked="" type="checkbox"/> PULSE	85435	Pulse Annotation
<input checked="" type="checkbox"/> PACKET	5621	Packet Annotation
<input checked="" type="checkbox"/> RXS+	0	RxSense+ (High or Low)
<input checked="" type="checkbox"/> RXS-	0	RxSense- (High or Low)
<input checked="" type="checkbox"/> VBUS LVL	0	VBUS Level
<input checked="" type="checkbox"/> PASS	241	Test Pass Id
<input checked="" type="checkbox"/> Other	0	All other logged events.

The resulting view is shown on the screen example below.



6.5.3 Finding Events on the CBUS Log Plot

You can locate specific CBUS events in the **CBUS Log Plot** using the **Find** button and associated dialog box. Simply click on the **Find** button and check the event type and text string on the dialog box for the Event that you looking for on the **CBUS Log Plot**. Then click OK. The screen examples below depict an Event filter scenario.

The screenshot displays a software interface for analyzing MHL CBUS compliance tests. The main window shows a signal plot with various channels: PASS, PACKET, CBUS L/V, PULSE, CBUS DRV, VBUS DRV, VBUS LVL, CBUS TRM, TMDS TRM, RXS+, and RXS-. The plot shows a sequence of events including 'Pass 3', 'wake to discover low', 'DUT', 'Tester', and '1000 ohms pulldown'. A search window titled 'Find CBUS Event...' is open on the right, showing search criteria and a list of found events.

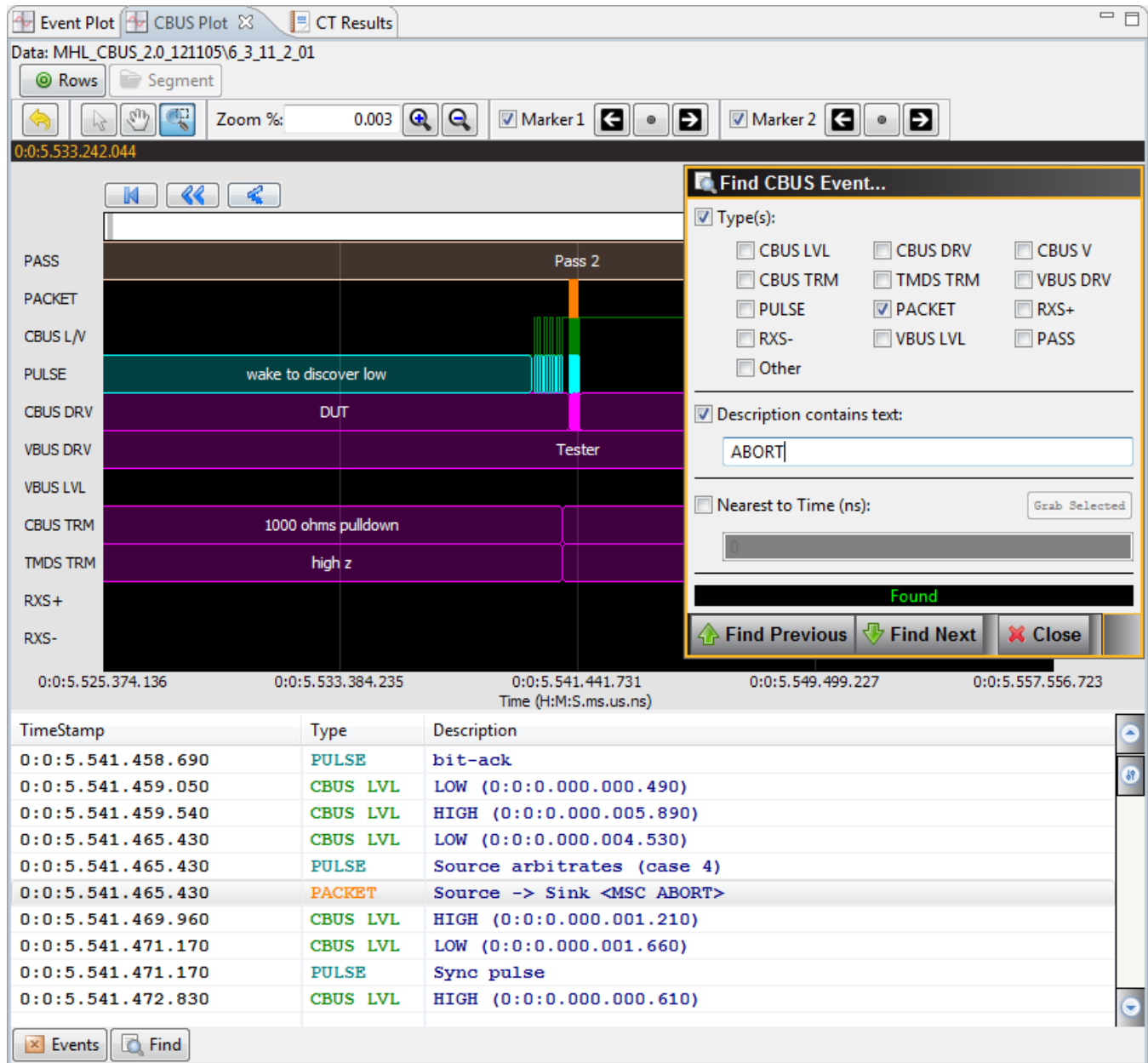
Find CBUS Event... Search Criteria:

- Type(s):
 - CBUS LVL
 - CBUS DRV
 - CBUS V
 - CBUS TRM
 - TMDS TRM
 - VBUS DRV
 - PULSE
 - PACKET
 - RXS+
 - RXS-
 - VBUS LVL
 - PASS
 - Other
- Description contains text:
 - ABORT
- Nearest to Time (ns):
 - Grab Selected

Found Events:



TimeStamp	Type	Description
0:0:0.300.227.310	PASS	Pass 1
0:0:0.300.227.310	CBUS LVL	HIGH (0:0:0.050.006.130)
0:0:0.300.227.310	CBUS DRV	DUT is driving CBUS
0:0:0.300.227.310	CBUS TRM	high z
0:0:0.300.227.310	TMDS TRM	high z
0:0:0.300.227.310	VBUS DRV	DUT is driving VBUS
0:0:0.350.233.060	VBUS DRV	Tester is driving VBUS
0:0:0.350.233.110	CBUS TRM	1000 ohms pulldown
0:0:0.350.233.440	CBUS LVL	LOW (0:0:0.648.013.690)
0:0:0.998.247.130	CBUS LVL	HIGH (0:0:0.021.126.170)

The result is shown on the screen example below.



6.6 Working with Markers

The **CBUS Log Plot** panel enables you to view the events at a high level and identify points of interest for further analysis. You can set two cursors or "markers" in the **Plot** at particular points of interest. The **CBUS Log Plot** will show you the time difference between the two cursors. You can fine tune the position of the cursors with the left

and right arrows associated with each marker . The  center icon allows you to center the particular marker on the **CBUS Log Plot** window. The screens below show the markers being set and the resulting markers placed in the **CBUS Log Plot** panel. Note that you can also set the markers using the right

click menu also shown below and this is the preferred method because the markers will appear exactly where you right click.

You can see the timestamp associated with each marker which are color coded (blue and red) just above the area where the data is shown. The dark text to the right shows the difference in microseconds and pixels between the two markers. Examples are shown in the following two screen shots.

