SL-8800 HDCP 2.2 and HDCP 1.x Protocol Analyzer for HDMI

User Guide

Simplay-UG-02003-A

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1. Overview

This document describes how to use the SL-8800 HDCP Protocol Analyzer (SL-8800) test equipment (TE) from SimplayLabs, LLC™ (SimplayLabs).

The User Guide provides details on the setup and testing of sink, source, and repeater devices for compliance to the High-bandwidth Digital Content Protection (HDCP) System Specification version 2.2 and HDCP version 1.x.

For the latest updates to documentation or software updates, check online at www.vprime.com .

1.1. SL-8800 HDCP Protocol Analyzer Test Equipment

Figure 1.1 shows the front panel of the SL-8800 HDCP Protocol Analyzer TE chassis.
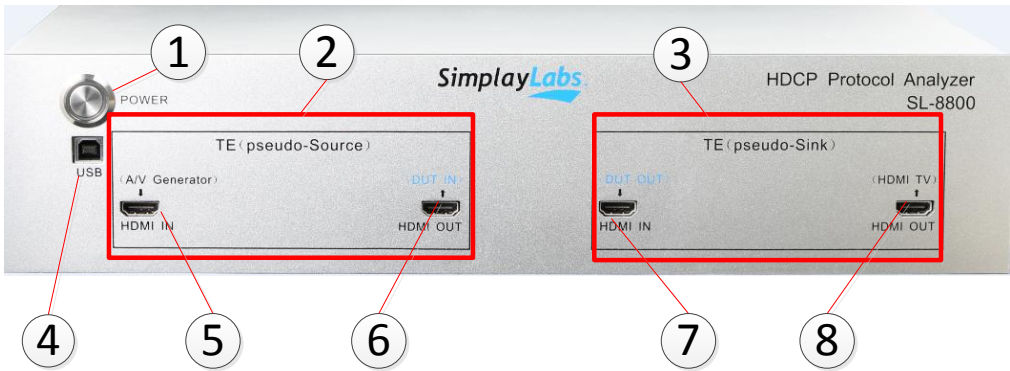
Figure 1.1. SL-8800 HDCP Protocol Analyzer Test Equipment Interface

Item	Label	Description
1	POWER	Power On/Off. **Note**: Restart the HDCP 2.2/HDCP 1.x Protocol Analyzer software if the SL-8800 TE power is cycled Off then On.
2	TE (pseudo-Source)	Source side of the TE chassis.
3	TE (pseudo-Sink)	Sink side of the TE chassis.
4	USB	Cable interface to connect the SL-8800 TE to the host PC through an USB cable. Connect to USB 2.0 port rather than connect to USB 3.0 port. (Time gap between two USB SETUP packages is longer if USB 3.0 host port is using iusb3hub.sys with USB 2.0 device, which causes TE's sending HDCP message timeout.)
5	HDMI IN	Reserved, not used.
6	HDMI OUT	HDMI test signal output, connect to the input port (DUT IN) of a receiver or repeater device.
7	HDMI IN	HDMI test signal input, connect to the output port (DUT OUT) of a transmitter or repeater device.
8	HDMI OUT	HDMI display signal, connect to a display device such as an HDTV or LCD monitor.

1.2. HDCP 2.2/HDCP 1.x Protocol Analyzer Software

This section describes the HDCP 2.2/HDCP 1.x Protocol Analyzer delivery and the software installation steps.

1.2.1. System Requirements
- A PC or laptop computer with Microsoft Windows 7, 32 bit or 64 bit OS.

  Note: The HDCP 2.2/HDCP 1.x Protocol Analyzer software does not support operation under Microsoft Windows 8. User must have a CF card reader.

- Microsoft .NET Framework Client Profile must be present. If not already installed, download it from http://www.microsoft.com/en-us/download/details.aspx?id=24872.
- Minimum 4 GB, optimum 8 GB RAM.
- 500 GB hard drive.

1.2.2. Inside the Box

The SL-8800 Protocol Analyzer TE delivery includes these items:
- SL-8800 tester
- 12 V power supply
- One USB cable
- Two HDMI cables
- One USB stick containing the HDCP 2.2/HDCP 1.x Analyzer software executables and documentation
- This User Guide

1.2.3. Software Installation

Follow these steps to install the HDCP 2.2/HDCP 1.x Protocol Analyzer software.

1. Open and explore the supplied USB stick. Click setup.exe to install HDCP2.x/HDCP1.x Protocol Analyzer software. See Figure 1.2.
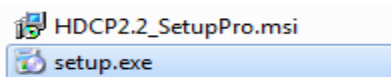
Figure 1.2. Locate and Open Setup.exe File on USB Stick

2. The Welcome to the HDCP Setup Wizard opens, see Figure 1.3. Click Next.
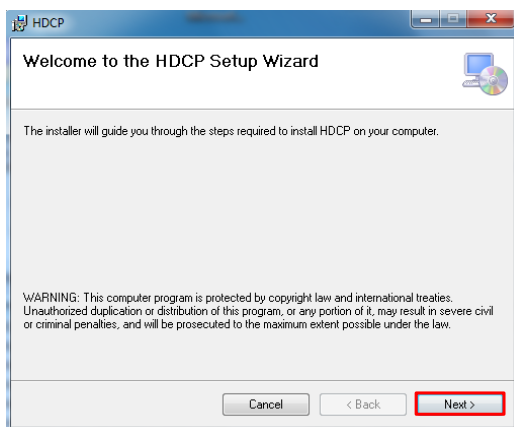
Figure 1.3. Welcome to the HDCP Setup Wizard

3. Plug in the USB cable and power on TE to install USB driver. The default USB driver directory is C:\Program Files (x86)\Simplay Labs\HDCP\Driver. See Figure 1.4.
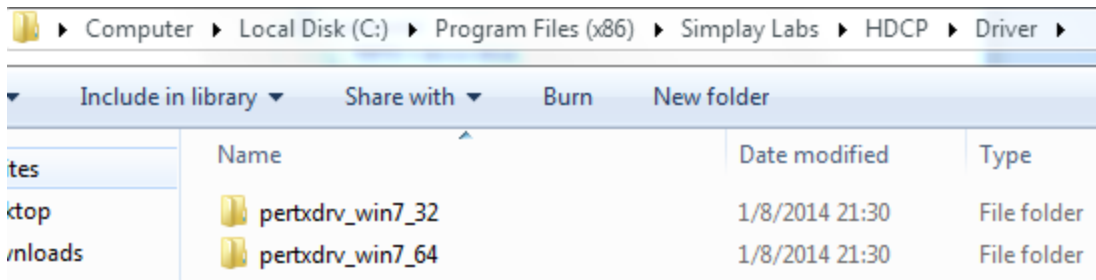
Figure 1.4. Install the USB Driver

4. Windows "Device Manager" shows that the PERT6 X device driver is now installed. See Figure 1.5.
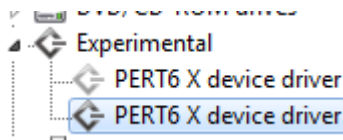
Figure 1.5. New Item in Device Manager

5. To complete the installation, you must update the license file for the SL-8800 software.

   a. Click the Microsoft Windows Start icon on your screen.

   b. Select All Programs.

   c. Select SimplayLabs.

   d. Select HDCP.

   e. Click License Update to select the license file that is appropriate for the installation package. The license file name matches the last three digits of the serial number of your SL-8800 test equipment chassis. See Figure 1.6.

Click Select License File in this window for available licenses.

Double-click the license file name matching the last three digits of your SL-8800 chassis' serial number.
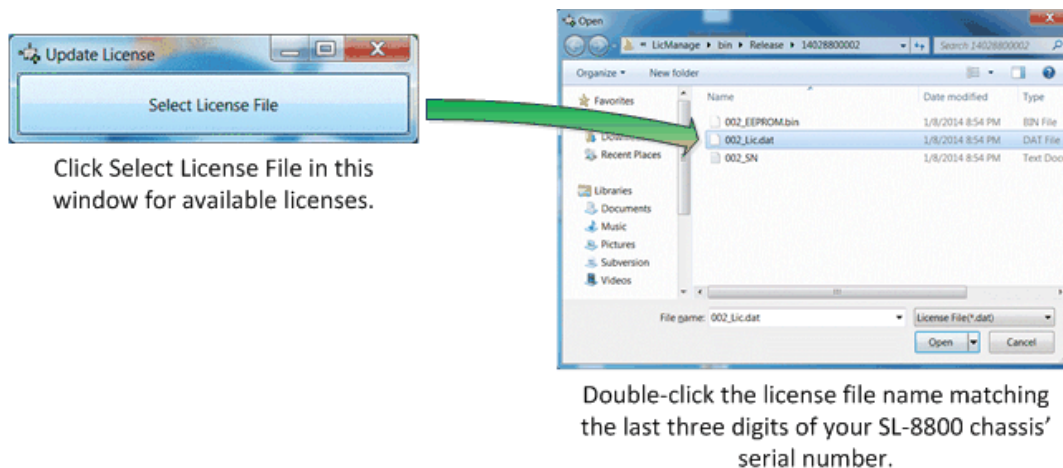
Figure 1.6. Select and Update License File

6. Update FPGA image to CF card if needed.

   To update the FPGA image on the CF card, you need to have CF card reader. Insert the CF card into the CF card reader. You must enter the following command from the DOS-prompt to reformat the CF:

   mkdosfs.exe –v –F 16 X: where X is the drive letter of CF card

   After the completion of reformatting CF, drag and drop **hdcp2x** folder and **xilinx.sys** into CF card drive.

1.2.4. Using the HDCP 2.2 Protocol Analyzer GUI

1. Double-click the "HDCP" shortcut to launch the application. See Figure 1.7.

Figure 1.7. HDCP Shortcut

The Protocol Dialog pops up for user to select version of HDCP protocol to run. See Figure 1.8. Note that Figure 1.8 only pops up if you have license key which is accessed to both HDCP 2.2 and HDCP 1.x.
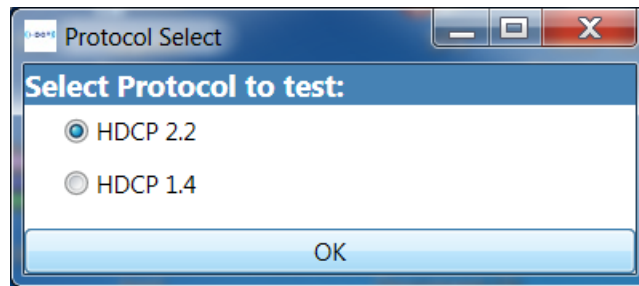
Figure 1.8. HDCP Protocol Select

As soon as the main window of the HDCP 2.2 Protocol Analyzer GUI appears, click the arrow to expand any of the test menus or test IDs. See Figure 1.9. Click the Start Test button only after you have selected one or all the test IDs that you intend to run.
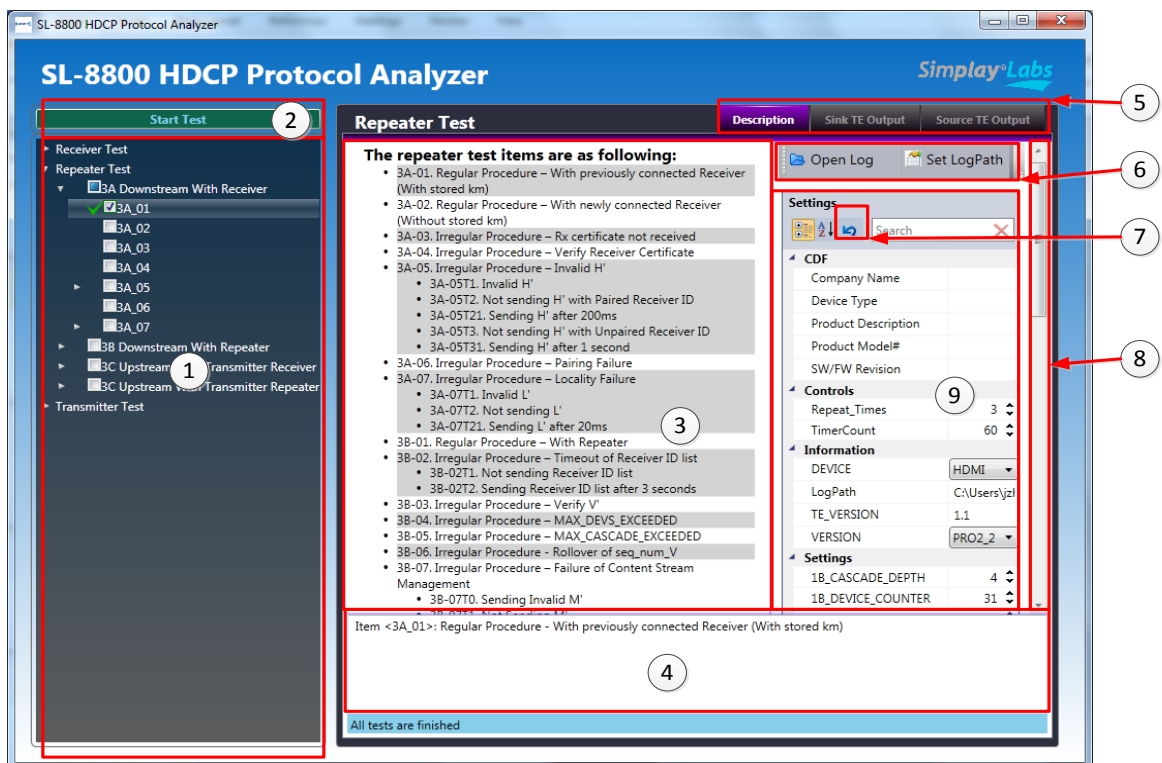
Figure 1.9. Main Window of the HDCP 2.2 Protocol Analyzer GUI

2. The main window of the GUI appears as shown in Figure 1.9. This figure is an example of the main GUI display. Items 1 through 11 of this list give a brief description of its functions:

1) Test Items and test result status.

2) Start Test button.

3) Full descriptions of the test Items.

4) Operation description for the selected item.

5) Tab Page Selection Area

6) Set log path and open log file

7) Reset settings to default values.

8) Scroll bar for settings and descriptions.

9) Settings configuration area.

An example of a log tab, the Sink TE Output tab, appears in Figure 1.10.
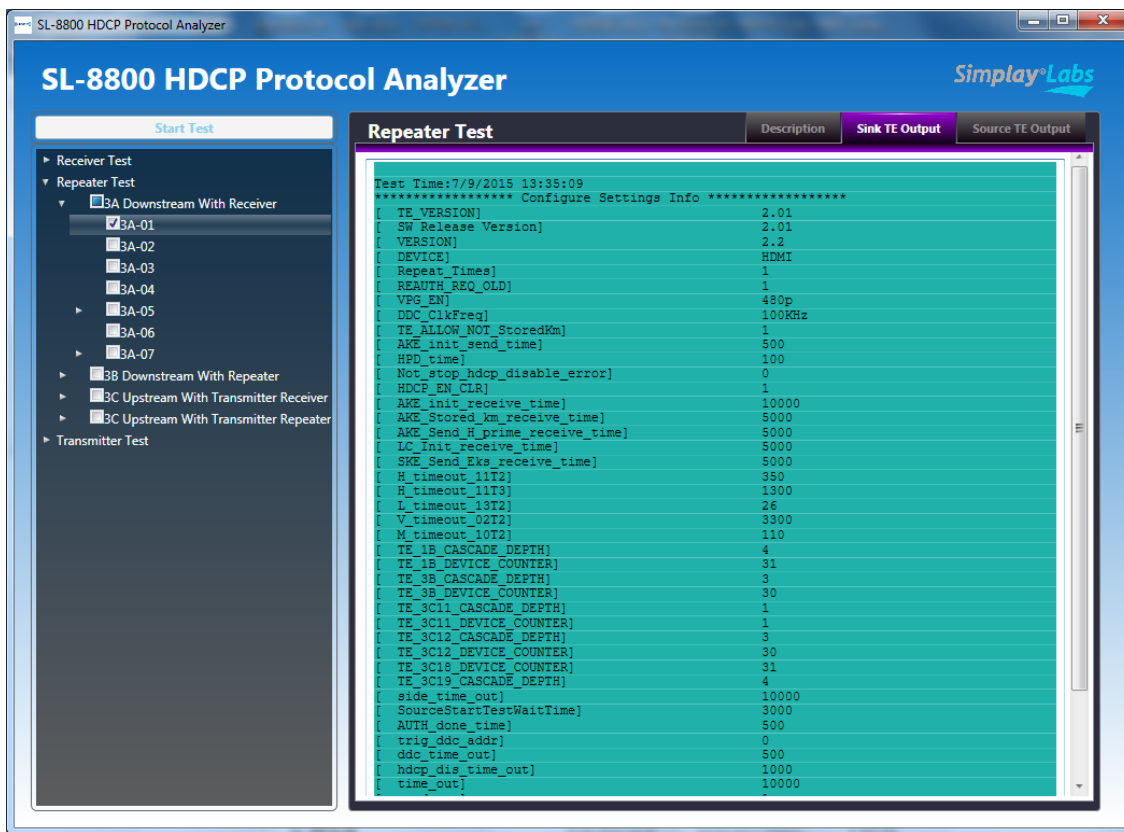
Figure 1.10. Log Tab in the Main Window of the SL-8800 HDCP 2.2 Protocol Analyzer GUI

For each test item, the dialog box with or without the "Select Output Video" option pops up at the end.

Depending on the test case of CTS, if the test case stated process has to be completed successfully, a dialog box pops up to let you select the output video pattern that matches the one on the display device. See Figure 1.11.
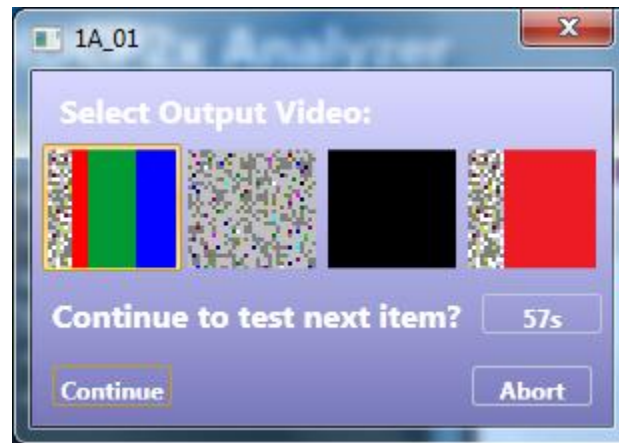
Figure 1.11. Dialog with Select Output Video Option

Depending on the test case on CTS, if the test case stated that the authentication process does not have to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog without the "Select Output Video" option, as shown in Figure 1.12, pops-up to let you decide whether to continue next item by selecting "Continue" or "Abort".
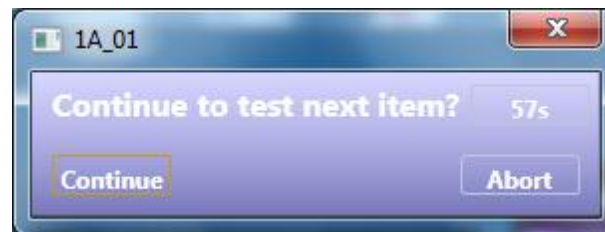
Figure 1.12. Dialog without Select Output Video Option

1.2.5. Using the HDCP 1.x Protocol Analyzer GUI

1. Double-click the "HDCP" shortcut to launch the application. See Figure 1.13.
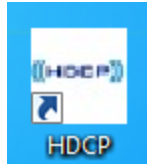
Figure 1.13. HDCP Shortcut

The Protocol Dialog pops up for user to select version of HDCP protocol to run. See Figure 1.14. Note that Figure 1.14 only pops up if you have license key which is accessed to both HDCP 2.2 and HDCP 1.x.
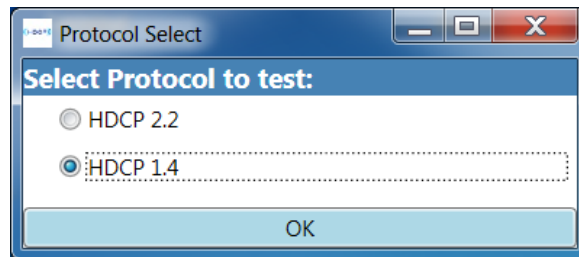
Figure 1.14. HDCP Protocol Select

As soon as the main window of the HDCP 1.x Protocol Analyzer GUI appears, click the arrow to expand any of the test menus or test IDs, as shown in Figure 1.15. Click the Start Test button only after you have selected one or all the test IDs that you intend to run.
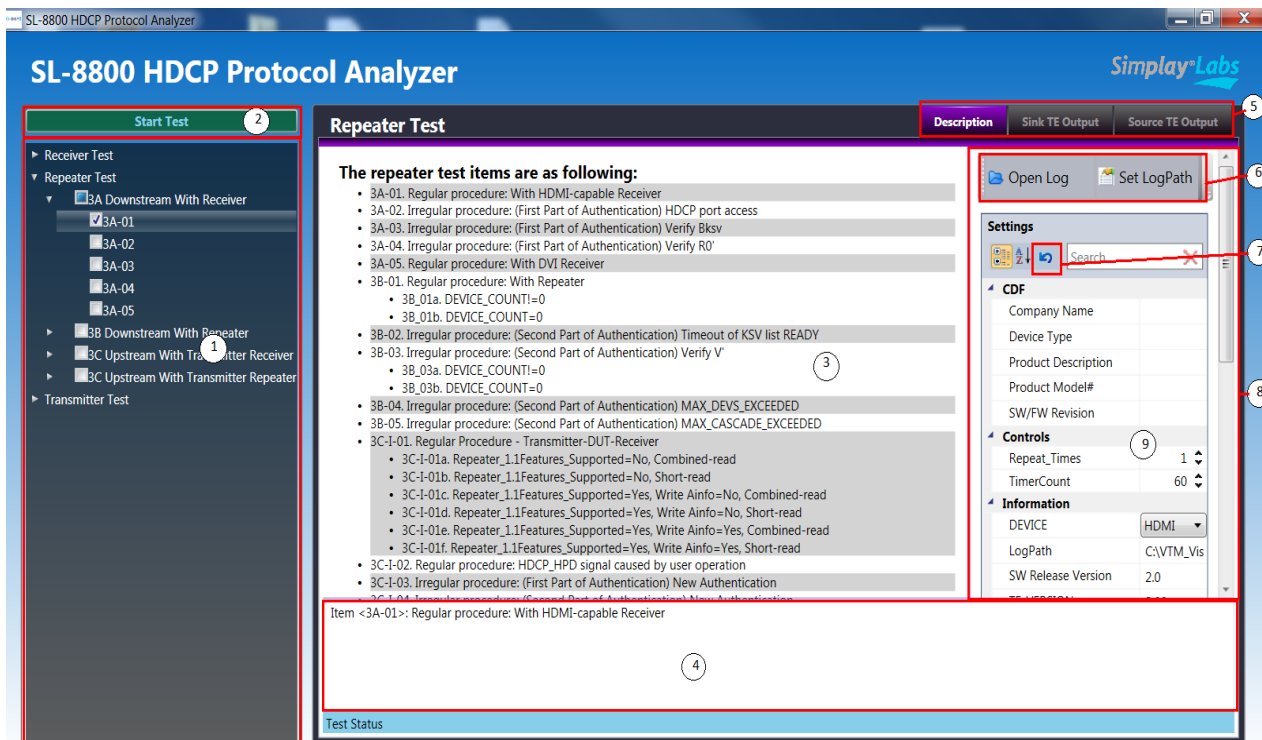
Figure 1.15. Main Window of the HDCP 1.X Protocol Analyzer GUI

2. The main window of the GUI appears as shown in Figure 1.15. This figure is an example of the main GUI display. Items 1 through 11 of this list give a brief description of its functions:

1) Test Items and test result status.

2) Start Test button.

3) Full descriptions of the test Items.

4) Operation description for the selected item.

5) Tab Page Selection Area

6) Set log path and open log file

7) Reset settings to default values.

8) Scroll bar for settings and descriptions.

9) Settings configuration area.

An example of a log tab, the Sink TE Output tab, appears in Figure 1.16.
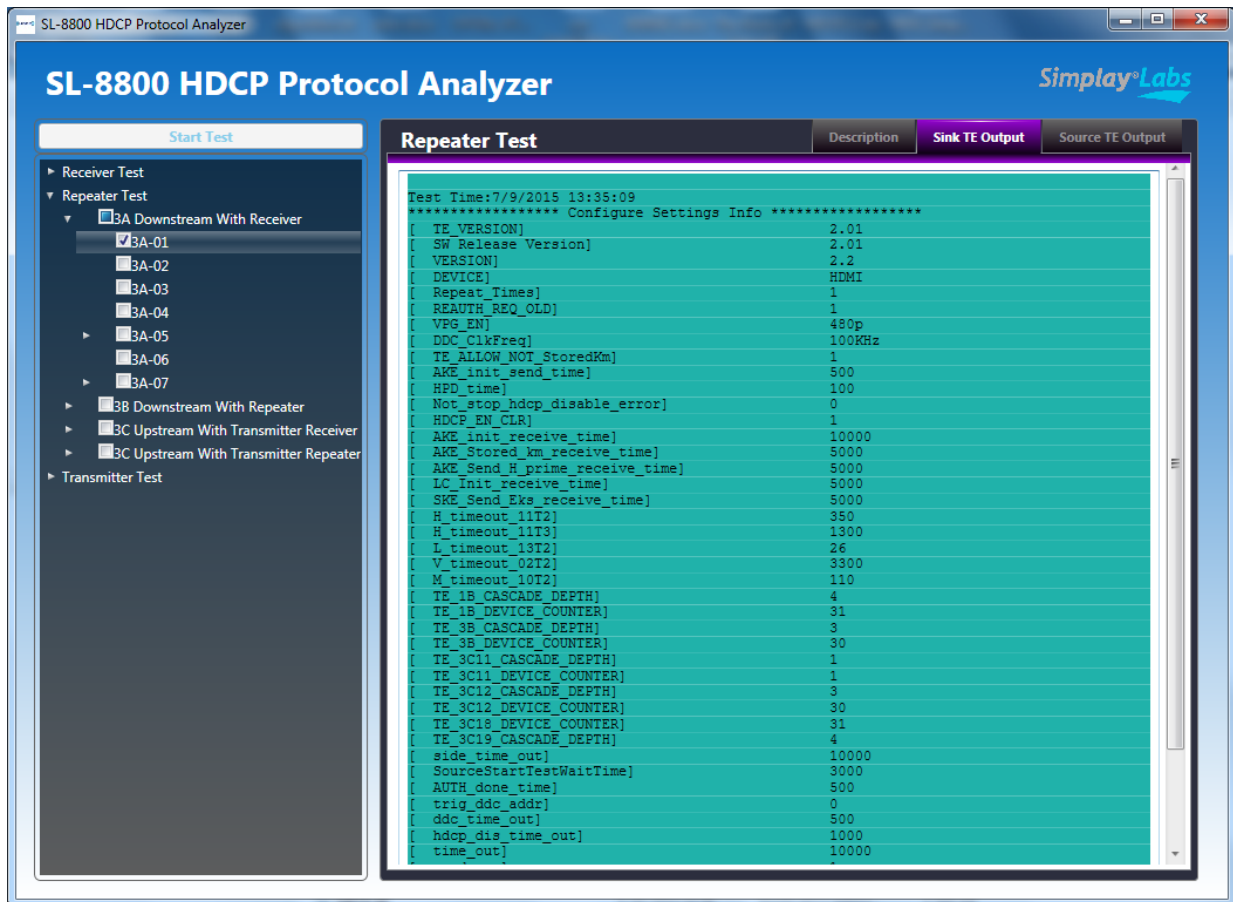
Figure 1.16. Log Tab in the Main Window of the SL-8800 HDCP 1.x Protocol Analyzer GUI

For each test item, the dialog box with or without the "Select Output Video" option pops up at the end.

Depending on the test case stated that the authentication process has to be completed successfully, a dialog box pops up to let you select the output video pattern that matches the one on the display device. See Figure 1.17.
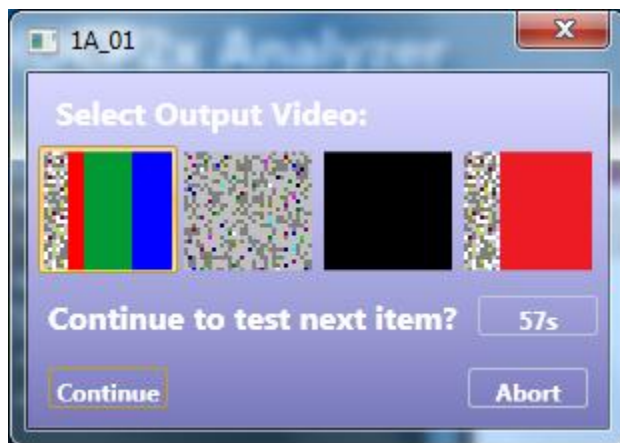
Figure 1.17. Dialog with Select Output Video Option

Depending on the test case of CTS, if the test case stated that the authentication process does not has to complete throughout the test or the test case stated that the authentication process has to complete but failed during authentication, the dialog without the "Select Output Video" option, as shown in Figure 1.18, pops-up to let you decide whether to continue next item by selecting "Continue" or "Abort".
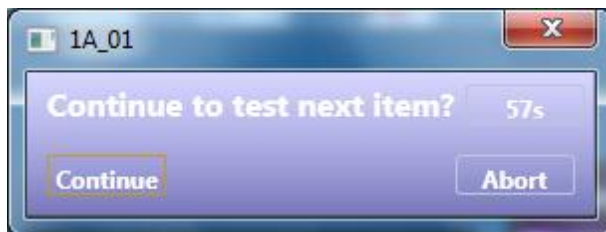
Figure 1.18. Dialog without Select Output Video Option

2. HDCP 2.2 Transmitter Test for Source Device

This section describes the test items, test operation guide, sample of the log file and report file.

2.1. Test Items

For source device testing, these items are tested when the SL-8800 emulates a receiver device.

1A. Downstream procedure with Receiver		
Item ID	**Test Description**	**Check Video**
1A_01	Regular Procedure - With previously connected Receiver (With stored km)	Yes
1A_02	Regular Procedure - With newly connected Receiver (Without stored km) TE does not complete pairing	No
1A_03	Regular Procedure - Receiver disconnect after AKE_Init	Yes
1A_04	Regular Procedure - Receiver disconnect after km	Yes
1A_05	Regular Procedure - Receiver disconnect after locality check	Yes
1A_06	Regular Procedure - Receiver disconnect after ks	Yes
1A_07	Regular Procedure - Receiver sends REAUTH_REQ after ks	Yes
1A_08	Irregular Procedure - Rx certificate not received	No
1A_09	Irregular Procedure - Verify Receiver Certificate	No
1A_11_T1	Irregular Procedure - Invalid H' Invalid H'	No
1A_11_T2	Irregular Procedure – Invalid H' Not sending H' with Paired Receiver ID	No
1A_11T3	Irregular Procedure Invalid H' Not sending H' with Unpaired Receiver ID	No
1A_12	Irregular Procedure - Pairing Failure	No
1A_13T1	Irregular Procedure - Locality Failure Invalid L' Invalid L'	No
1A_13T2	Irregular Procedure - Locality Failure time out Not sending L'	No

These items are tested when the SL-8800 emulates a repeater device.

1B. Downstream procedure with Repeater		
Item ID	**Test Description**	**Check Video**
1B_01	Regular Procedure - With Repeater	Yes
1B_02	Irregular Procedure - Timeout of Receiver ID list Not sending Receiver ID list	No
1B_03	Irregular Procedure - Verify V'	No
1B_04	Irregular Procedure - MAX_DEVS_EXCEEDED	No
1B_05	Irregular Procedure - MAX_CASCADE_EXCEEDED	No
1B_06	Irregular Procedure - Incorrect seq_num_V	No
1B_07	Regular Procedure - Re-authentication on HDCP_HPD	Yes
1B_08	Regular Procedure - Re-authentication on REAUTH_REQ	Yes
1B_09	Irregular Procedure - Rollover of seq_num_V	No
1B_10T0	Irregular Procedure - Failure of Content Stream Management Sending Invalid M'	No
1B_10T1	Irregular Procedure - Failure of Content Stream Management Not sending M'	No

2.2. Test Operation

2.2.1. Connection Setup for Source Device Testing

Figure 2.1. Connection Setup for Source Device Testing

Figure 2.1 shows the connection between the source device, SL-8800 (see Figure 1.1), and display device. Follow these steps to setup the connection and start testing.

1. Power on the SL-8800 and connect it to PC using the USB cable.

2. Turn on the source device.

3. Connect output port of the source device to "HDMI IN" connector of SL-8800 sink side.

4. Make sure that the source generates 480P60/720P60/1080p60 video.

5. Double-click the HDCP icon on PC. The main window of the HDCP 2.2 Analyzer appears. Expand the "Transmitter Test" field (see area 1 of Figure 1.9).

6. Click the 'Set LogPath' to change the log directory to a desired location if needed (see Figure 1.9).

7. Select test items. Click the "Start Test" button. Now the verification process starts.

2.2.2. Verification Test of the Authentication Procedure

1. Wait for approximately 30s for each test item.

2. Depending on the test case on CTS, if the test case stated that the authentication process has to be completed successfully, a dialog box with the "Select Output Video" option (see Figure 1.11) pops up to let you select the output video pattern that matches with the one on the display device. Depending on the test case on CTS, if the test case stated that the authentication process does not has to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog box without the "Select Output Video" option (see Figure 1.12) pops up to let you decide whether to continue next item by selecting "Continue" or "Abort."

3. GUI does not generate a report, rather only txt file for each test item, if "Abort" is selected.

4. Check the results according to GUI or the report.

Notes: 1.   There is no need to unplug the HDMI cable and plug it back again during the test process. The SL-8800 can emulate HPD process.

2.   For 1A side, SL-8800 sink side emulates for the receiver functions.

3.   For 1B side, SL-8800 sink side emulates for the repeater functions.

2.3. Report File

The sample report file appears in Figure 2.2.
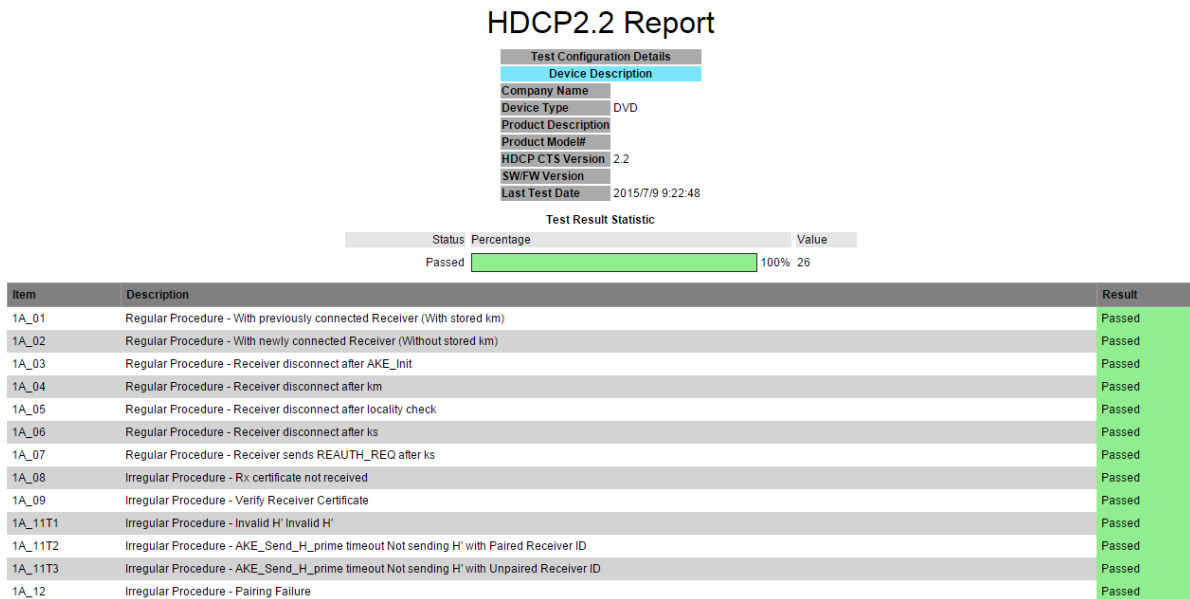
Figure 2.2. Sample Report File of Testing Source Device

3. HDCP 2.2 Receiver Test for Sink Device of HDCP 2.2

This section describes the test items, test operation guide, sample log file, and sample report file.

3.1. Test Items

For sink device testing, these items are tested when the SL-8800 emulates a transmitter.

2C. Upstream procedure with Transmitter		
Item ID	**Test Description**	**Check Video**
2C_01_T1	Regular Procedure (AKE_No_Stored_km)	Yes
2C_01_T2	Regular Procedure (AKE_Stored_km)	Yes
2C_02	Irregular Procedure - New Authentication after AKE_Init	Yes
2C_03	Irregular Procedure - New Authentication during Locality Check	Yes
2C_04	Irregular Procedure - New Authentication After SKE_Send_Eks	Yes
2C_05	Irregular Procedure - New Authentication during Link Synchronization	Yes

3.2. Test Operation

3.2.1. Connection Setup for Sink Device Testing
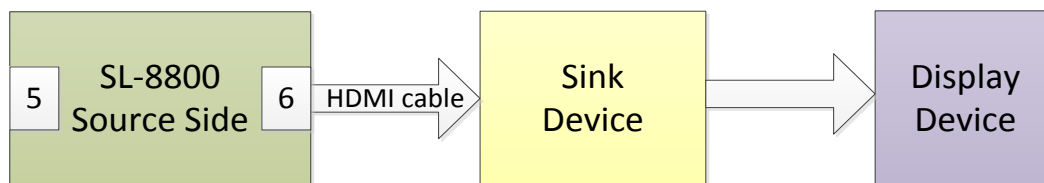
Figure 3.1. Connection Setup for the Sink Device

Figure 3.1 shows the connection between the SL-8800 (see Figure 1.1), sink device, and display device. Follow these steps to setup the connection and start testing.

1. Power on the SL-8800 and connect it to the PC using the USB cable.

2. Turn on the sink device.

3. Connect "HDMI OUT" connector of the SL-8800 source side to the input port of the sink device.

4. Make sure that the sink device can output video to display.

5. Double-click the HDCP icon on the PC screen. The main window of the HDCP 2.2 Analyzer GUI appears. Expand the "Receiver Test" field (see area 1 of Figure 1.9).

6. Click "Set LogPath" to change the log directory to a desired location if needed. See area 6 of Figure 1.9.

7. Select test items to test and click the "Start Test" button. Now the verification process starts.

3.2.2. Verification Test of the Authentication Procedure

1. Wait for about 30s for each test item.

2. Depending on the test case on CTS, if the test case stated that the authentication process has to be completed successfully, the dialog box with the "Select Output Video" option (see Figure 1.11) pops up to let you select the output video pattern that matches the one on the display device. Depending on the test on CTS, if the test case stated that the authentication process does not has to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog box without the "Select Output Video" option (see Figure 1.12) pops up to let you decide whether to continue next item by selecting "Continue" or "Abort."

3. The GUI does not generate a report, rather only txt file for each test item, if "Abort" is selected.

4. Check the results according to GUI or the report.

   Note: SL-8800 source side generates a color bar pattern to test the sink device.

3.2.3. Report File

The sample report file is displayed as follows. See Figure 3.2.
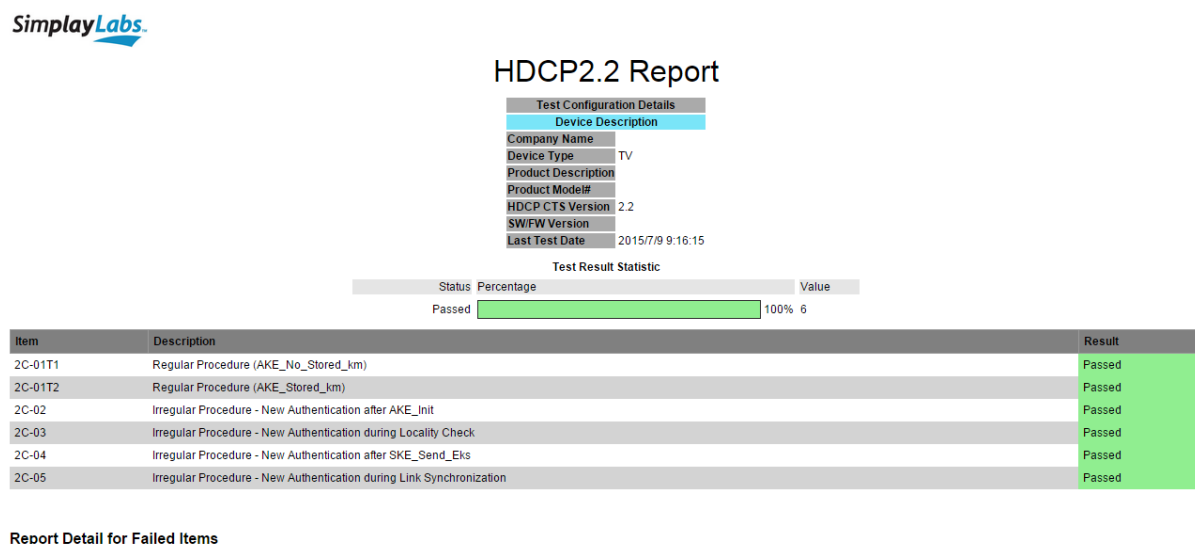
Figure 3.2. Sample Report File of Testing Sink Device

4. HDCP 2.2 Downstream Procedure Test for Repeater Device

This section describes the test items, test operation guide, sample log file, and sample report file.

4.1. Test Items

For repeater device testing, these items are tested when SL-8800 sink side emulates a receiver.

3A. Downstream procedure with Receiver		
Item ID	**Test Description**	**Check Video**
3A_01	Regular Procedure - With previously connected Receiver (With stored km)	Yes
3A-02	Regular Procedure - With newly connected Receiver (Without stored km) TE does not complete pairing	No
3A_03	Irregular Procedure - Rx certificate not received	No
3A_04	Irregular Procedure - Verify Receiver Certificate	No
3A_05T1	Irregular Procedure - Invalid H' Invalid H'	No
3A_05T2	Irregular Procedure - AKE_Send_H_prime timeout Not sending H' with Paired Receiver ID	No
3A_05T3	Irregular Procedure - AKE_Send_H_prime timeout Not sending H' with Unpaired Receiver ID	No
3A_06	Irregular Procedure - Pairing Failure	No
3A_07T1	Irregular Procedure - Locality Failure Invalid L' Invalid L'	No
3A_07T2	Irregular Procedure - Locality Failure time out Not sending L'	No

These items are tested when SL-8800 sink side emulates a repeater.

3B. Downstream procedure with Repeater		
Item ID	**Test Description**	**Check Video**
3B_01	Regular Procedure - With Repeater	Yes
3B_02	Irregular Procedure - Timeout of Receiver ID list Not sending Receiver ID list	No
3B_03	Irregular Procedure - Verify V'	No
3B_04	Irregular Procedure - MAX_DEVS_EXCEEDED	No
3B_05	Irregular Procedure - MAX_CASCADE_EXCEEDED	No
3B_06	Irregular Procedure - Rollover of seq_num_V	No
3B_07T0	Irregular Procedure - Failure of Content Stream Management Sending Invalid M'	No
3B_07T1	Irregular Procedure - Failure of Content Stream Management Not sending M'	No

4.2. Test Operation

4.2.1. Connection Setup for Repeater Device Downstream Testing

Figure 4.1. Connection Setup for Repeater Device

Figure 4.1 shows the connection between the SL-8800 (see Figure 1.1), repeater, and display devices. Follow these steps to setup the connection and start testing.

1. Turn on TE (SL-8800) and connect it to PC by USB. Then turn on the repeater device.

2. Connect the device input to the SL-8800 source side by HDMI cable. Make sure to connect from "HDMI OUT" connector of the SL-8800 source side to the input port of the repeater device.

3. Connect device output to SL-8800 sink side by HDMI cable. Make sure to connect from the output port of the receiver device to "HDMI IN" connector of the SL-8800 sink side.

4. Connect the SL-8800 sink side output connector to the display device. Make sure to connect from "HDMI OUT" connector of the SL-8800 sink side to the display device.

5. Double-click the HDCP icon on PC. The main window of the HDCP 2.2 Analyzer appears. Expand the "Repeater Test" field (see area 1 of Figure 1.9).

6. Click "Set LogPath" to change the log directory to a desired location (see area 6 of Figure 1.9).

7. Select test items to test and click the 'Start Test' button. Now the verification process starts.

4.2.2. Verification Test of the Authentication Procedure

1. Wait for about 30s for each test item.

2. Depending on the test case on CTS, if the test case stated that the authentication process has to complete successfully, the dialog box with the "Select Output Video" option (see Figure 1.11) pops up to let you select the output video pattern that matches the one on the display device. Depending on the test case on CTS, if the test case stated that the authentication process does not has to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog box without the "Select Output Video" option (see Figure 1.12 pops up to let you decide whether to continue next item by selecting "Continue" or "Abort."

3. The GUI does not generate a report, rather only txt file for each test item if "Abort" is selected.

4. Check the results according to GUI or the report.

> **Notes:**
>
> 1. For 3A, the SL-8800 source side emulates a normal source; the SL-8800 sink side emulates sink functions.
>
> 2. For 3B, the SL-8800 source side emulates a normal source; the sink side emulates repeater functions.

4.3. Report Description

The sample report file is displayed as shown in Figure 4.2.
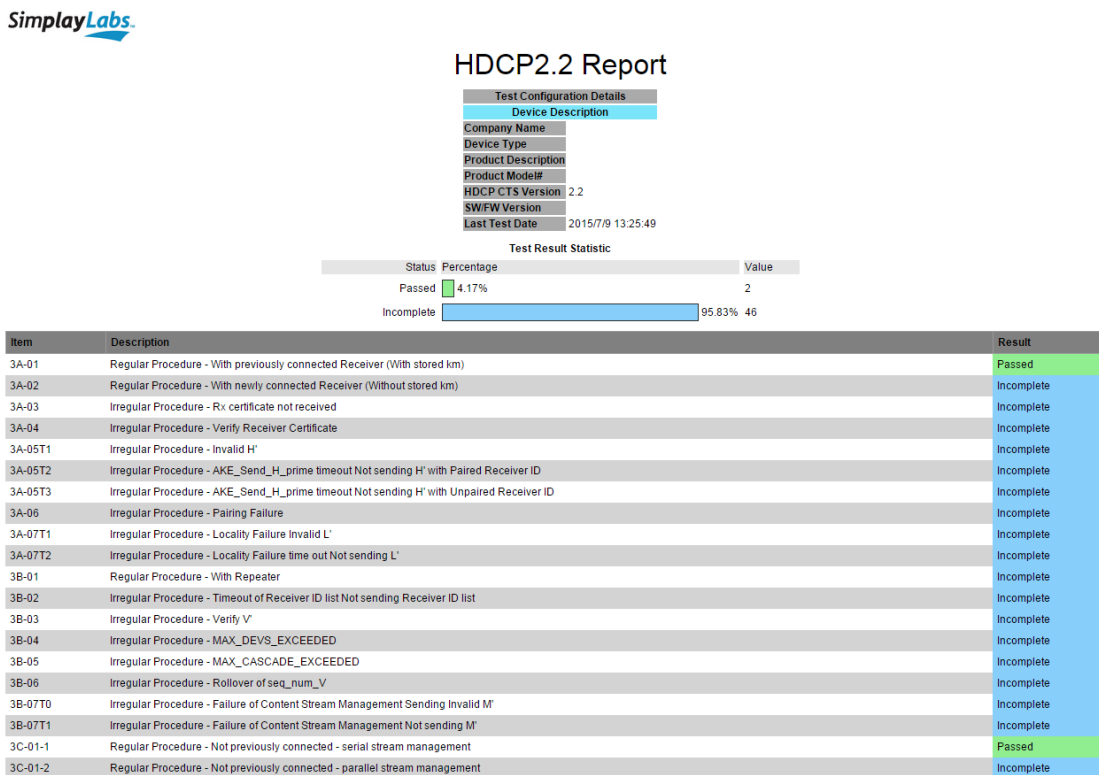
Figure 4.2. Sample Report File of Downstream Procedure Testing Repeater Device

5. HDCP 2.2 Upstream Procedure Test for Repeater Device

This section describes the test items, test operation guide, sample log file, and sample report file.

5.1. Test Items

For repeater device testing, these items are tested when the SL-8800 source side emulates a transmitter.

3C. Repeater (DUT) Connected to Transmitter (TE pseudo-Source) and Receiver (TE pseudo-Sink)		
Item ID	Test Description	Check Video
3C_01_1	Regular Procedure - Transmitter - DUT –Receiver Not previously connected Content Stream Management done in serial with propagation of topology information	Yes
3C_01_2	Regular Procedure - Transmitter - DUT –Receiver Not previously connected Content Stream Management done in parallel with propagation of topology information	Yes
3C_01_3	Regular Procedure - Transmitter - DUT –Receiver Previously connected Content Stream Management done in serial with propagation of topology information	Yes
3C_01_4	Regular Procedure - Transmitter - DUT –Receiver Previously connected Content Stream Management done in parallel with propagation of topology information	Yes
3C_04	Irregular Procedure - New Authentication after AKE_Init	No
3C_05	Irregular Procedure - New Authentication during Locality Check	No
3C_06	Irregular Procedure - New Authentication after SKE_Send_Eks	No
3C_07	Irregular Procedure - New Authentication during Link Synchronization	No
3C_08	Irregular Procedure - Rx Certificate invalid	No
3C_09_1	Irregular Procedure - Invalid H' Invalid H'	No
3C_09_2	Irregular Procedure - AKE_Send_H_prime timeout Not sending H' with Paired Receiver ID	No
3C_10_1	Irregular Procedure - Locality Failure Invalid L' Invalid L'	No
3C_10_2	Irregular Procedure - Locality Failure time out Not sending L'	No

These items are tested when the SL-8800 source side emulates a transmitter and the sink side emulates a repeater.

Item ID	Test Description	Check Video
3C. Repeater (DUT) Connected to Transmitter (TE pseudo-Source) and Repeater (TE pseudo-Repeater)		
3C_11	Regular Procedure - Transmitter - DUT -Repeater (With stored km)	Yes
3C_12	Regular Procedure - Receiver disconnected after AKE_Init	No
3C_13	Regular Procedure - Receiver disconnected after Km	No
3C_14	Regular Procedure - Receiver disconnected after locality check	No
3C_15	Regular Procedure - Receiver disconnected after ks	No
3C_16	Irregular Procedure - Timeout of Receiver ID list	No
3C_17	Irregular Procedure - Verify V'	No
3C_18	Irregular Procedure - DEVICE_COUNT	No
3C_19	Irregular Procedure - DEPTH	No
3C_20	Irregular Procedure - MAX_DEVS_EXCEEDED	No
3C_21	Irregular Procedure - MAX_CASCADE_EXCEEDED	No
3C_22	Regular Procedure - Repeater with zero downstream device	No
3C_23	Regular Procedure - Propagation of HDCP_2_0_REPEATER_DOWNSTREAM flag	Yes
3C_24	Regular Procedure - Propagation of HDCP1_DEVICE_DOWNSTREAM flag	Yes
3C_25_T0	Regular Procedure - Content Stream Management - Valid M'	Yes
3C_25_T1	Regular Procedure - Content Stream Management - Invalid M'	No
3C_25_T2	Regular Procedure - Content Stream Management - Not sending M'	No

5.2. Test Operation

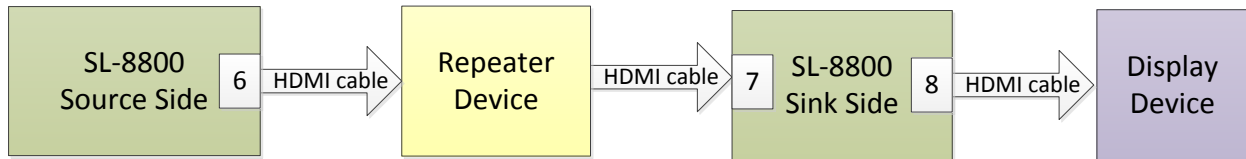### 5.2.1. Connection Setup for Test Repeater Device Upstream Testing
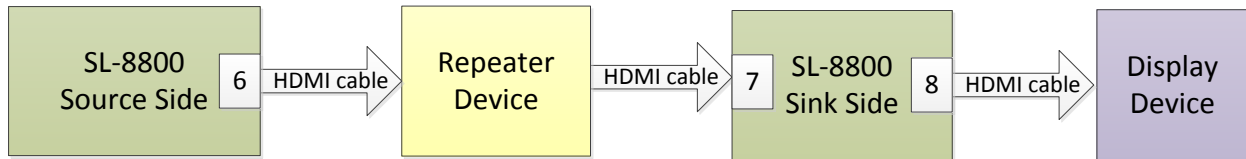
Figure 5.1. Connection Setup for the Repeater Device

Figure 5.1 shows the connection setup using SL-8800 Interface (see Figure 1.1). Follow these steps to setup the connection among the device source, SL-8800, and display device.

1. Turn on the SL-8800 and connect it to the PC through the USB cable.

2. Turn on the repeater device.

3. Use an HDMI cable to connect the "HDMI OUT" port of the SL-8800 source side to the input port of the repeater device.

4. Connect the repeater device output to the SL-8800 sink side through the HDMI cable. Make sure to connect from the output port of the repeater device to the "HDMI IN" connector of the SL 8800 sink side.

5. Connect the output connector of the SL-8800 sink side to the display device. Make sure to connect from the "HDMI OUT" connector of the SL-8800 sink side to the display device.

6. Double-click the HDCP icon on PC. The main window of the HDCP 2.2 Analyzer appears. Expand the "Repeater Test" field (see area 1 of Figure 1.9).

7. Click the "Set LogPath" to change the log directory to a desired location if needed.
    See area 6 of Figure 1.9.

8. Select test items to test and click the "Start Test" button. Now the verification process starts.

5.2.2. Verification Test of the Authentication Procedure

1. Wait for about 30s for each test item.

2. Depending on the test case on CTS, if the test case stated that the authentication process has to be completed successfully, a dialog box with the "Select Output Video" option (see Figure 1.11) will pop up to let you select the output video pattern that matches the one on the display device. Depending on the test case on CTS, if the test case stated that the authentication process does not has to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog box without the "Select Output Video" option (see Figure 1.12) pops up to let you decide whether to continue next item by selecting "Continue" or "Abort."

3. GUI will not generate report (only txt file for each test item) if "Abort" is selected.

4. Check the results according to the GUI or the report.

   Notes: 1. For 3C-01~3C-10, SL-8800 source side emulates the source functions, and the SL-8800 sink side emulates the sink functions.

                     2. For 3C-11~3C-25, SL-8800 source side emulates the source functions, and the SL-8800 sink side emulates the repeater functions.

5.3. Report File

The sample report file is displayed as shown in Figure 5.2.
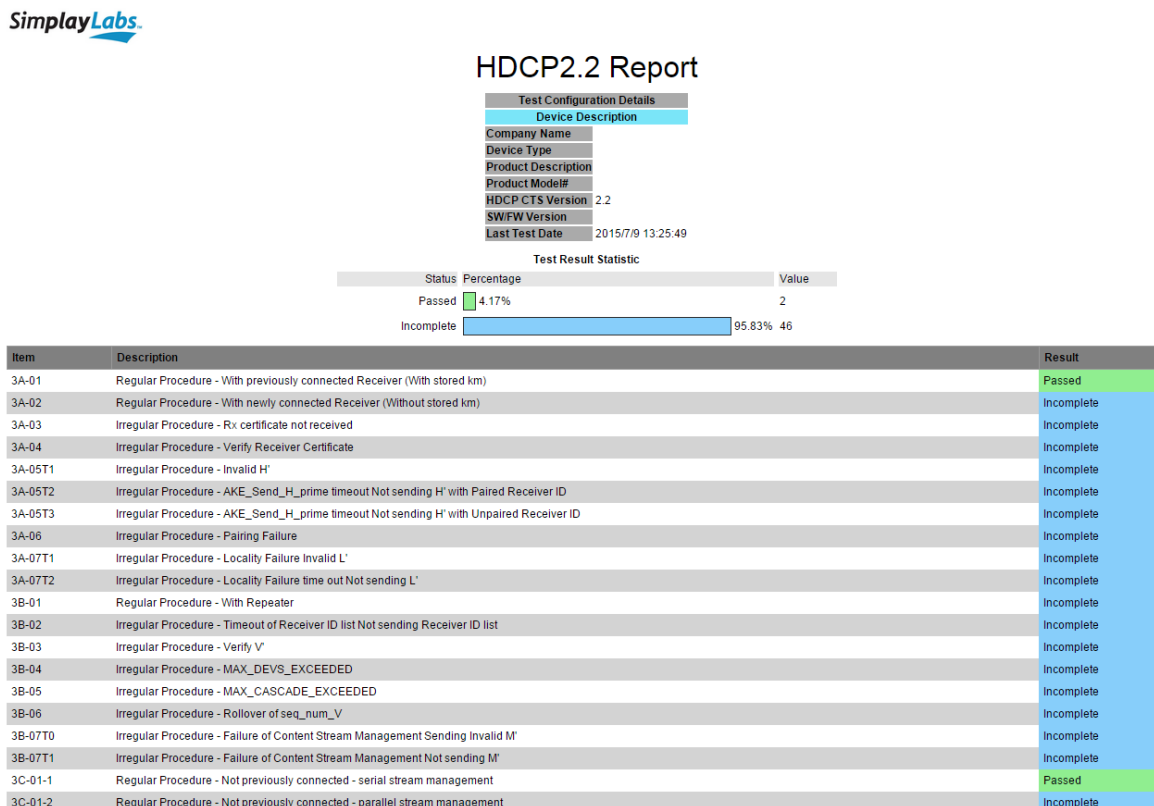
Figure 5.2. Sample Report File of Upstream Procedure Testing Repeater Device

6. Log Information

The time written for each DDC instruction in the LOG contains the time from the SL-8800 and the time difference, in milliseconds, from the previous instructions.

HPD activity log:

```
-- --- HDMI Disconnected(HPD Low): (<Current Time>(<Differential time>))
-- +++ HDMI Connected(HPD High): (<Current Time>(<Differential time>))
```

RxStatus register value log (Only record once when value changed):

```
-- DDC Polling DUT RxStatus <Sink RxStatus Value>  (<Current Time>(<Differential time>))
-- TE RxStatus <Sink RxStatus Value> (<Current Time>(<Differential time>))
```

Receiver(rx) and transfer(tx) message log:

```
rx: <Message_Name>: (<Current Time>(<Differential time>))
tx: <Message_Name>: (<Current Time>(<Differential time>))
```

HDCP enabled or disabled activity log:

```
-- OOO HDCP Encryption Disabled: (<Current Time>(<Differential time>))
-- XXX HDCP Encryption Enabled: (<Current Time>(<Differential time>))
```

6.1. Sample Sink Log File

ERROR and WARNING are outputted as follows:

- ERROR: [error content] : The tested device operation does not meet expectations and it is prohibited.

- WARNING: [warning content] : The tested device operation does not meet expectations but it is not treated as a failure. If the verification test is completed with the tested device, the software outputs "PASS"/"FAIL" at the end of the Log file.

This is the sample sink log file of 3A_01.

```
Test Time:2015/7/9 13:25:29
****************** Configure Settings Info ******************
[  TE_VERSION]                              2.01
[  SW Release Version]                      2.01
[  VERSION]                                 2.2
[  DEVICE]                                  HDMI
[  Repeat_Times]                            1
[  REAUTH_REQ_OLD]                          1
[  VPG_EN]                                  480p
[  DDC_ClkFreq]                             100KHz
[  TE_ALLOW_NOT_StoredKm]                   1
[  AKE_init_send_time]                      500
[  HPD_time]                                100
[  Not_stop_hdcp_disable_error]            0
[  HDCP_EN_CLR]                             1
[  AKE_init_receive_time]                   10000
[  AKE_Stored_km_receive_time]             5000
[  AKE_Send_H_prime_receive_time]           5000
[  LC_Init_receive_time]                    5000
[  SKE_Send_Eks_receive_time]              5000
[  H_timeout_11T2]                          350
[  H_timeout_11T3]                          1300
[  L_timeout_13T2]                          26
[  V_timeout_02T2]                          3300
[  M_timeout_10T2]                          110
[  TE_1B_CASCADE_DEPTH]                     4
[  TE_1B_DEVICE_COUNTER]                    31
[  TE_3B_CASCADE_DEPTH]                     3
[  TE_3B_DEVICE_COUNTER]                    30
[  TE_3C11_CASCADE_DEPTH]                   1
```

```
[   TE_3C11_DEVICE_COUNTER]                          1
[   TE_3C12_CASCADE_DEPTH]                           3
[   TE_3C12_DEVICE_COUNTER]                          30
[   TE_3C18_DEVICE_COUNTER]                          31
[   TE_3C19_CASCADE_DEPTH]                           4
[   side_time_out]                                  10000
[   SourceStartTestWaitTime]                        3000
[   AUTH_done_time]                                 500
[   trig_ddc_addr]                                  0
[   ddc_time_out]                                   500
[   hdcp_dis_time_out]                              1000
[   time_out]                                       10000
[   rand_gen]                                       1
[   verbose]                                        1
[   interim_verbose]                                0
*********************************************************
                
=============Test Item(3A-01) Iteration(1) Sink Side Begin=============
    re_init
    sink rx_msg_buf_init
    msg_trig_init(sink)
    side_rx_info_set
    run_sink
    sink_init
    reset_side_rx_cr
    configure_run
    init_run_core
    source::hdcp_disable
    sink::hdcp_disable
    sink::hdcp_reset_REAUTH_REQ
    load_otp(0)
    sink::wait_ms(1000)
    sink::hdmi_disconnected
    sink rx_msg_buf_init
    trig_ddc::3000
    sink::hdmi_connected(not_set_rx_ready:0)
    Wait HPD_time - start
    sink::wait_ms(100)
    Wait HPD_time - done
    set_side_rx_ready
    run_sink_core
    iteration = 0
1   sink<-rx::AKE_Init
    sink::hdcp_disable
    HDCP is disabled
    HDCP is disabled
2   sink->tx::AKE_Send_Cert
    iteration = 1
3   sink<-rx::AKE_No_Stored_km
    HDCP is disabled
4   sink->tx::AKE_Send_H_prime
5   sink->tx::AKE_Send_Pairing_Info
    iteration = 2
6   sink<-rx::LC_Init
    HDCP is disabled
7   sink->tx::LC_Send_L_prime
    iteration = 3
8   sink<-rx::SKE_Send_Eks
    sink->tx::HDCP_EN
    trig_ddc::3000
    sink::wait_ms(500)
    sink_done
    trig_ddc::3000
    check_sink_end(0)
```

```
Begin Test:

    sink_3A_01
    sink_init
    reset_side_rx_cr
    configure_run
    init_run_core
    source::hdcp_disable
    sink::hdcp_disable
    sink::hdcp_reset_REAUTH_REQ
    load_otp(0)
    sink::wait_ms(1000)
    sink::hdmi_disconnected
    sink rx_msg_buf_init
    trig_ddc::3000
    sink::hdmi_connected(not_set_rx_ready:0)
    Wait HPD_time - start
    sink::wait_ms(84)
    Wait HPD_time - done
    set_side_rx_ready
    sink_1A_01
    sink_STEP_1A_01_1
    sink::hdmi_connected(not_set_rx_ready:0)
    sink_STEP_1A_01_2
9   sink<-rx::AKE_Init
    sink::hdcp_disable
    HDCP is disabled
    HDCP is disabled
    sink_STEP_1A_01_3
10  sink->tx::AKE_Send_Cert
11  sink<-rx::AKE_Stored_km
12  sink->tx::AKE_Send_H_prime
    sink_STEP_1A_01_4
13  sink<-rx::LC_Init
14  sink->tx::LC_Send_L_prime
    sink_STEP_1A_01_5
15  sink<-rx::SKE_Send_Eks
    sink_STEP_1A_01_6
    sink->tx::HDCP_EN
    trig_ddc::3000
    sink::wait_ms(500)
    set_side_rx_done
    msg_trig_dump(sink)
-- =================================================
-- sink: Start Trigger buf dump(1670)
-- =================================================
-- --- TE has de-asserted HPD: (1244.0625ms(+1244.0625ms))
-- +++ TE has asserted HPD: (1347.9375ms(+103.875ms))
-- Read HDCP2Version Register: 04(1529.875ms(+181.9375ms))

1   rx: AKE_Init: (2712.75ms(+1182.875ms))
  Rtx:
    65 65 37 9C 04 2A 95 6A
  TxCaps:
    02 00 00 (11)

-- TE RxStatus 0x0216  (2726.1875ms(+13.4375ms))

2   tx: AKE_Send_Cert: (2728.125ms(+15.375ms))
  Receiver ID:
    3E 2D C2 48 7B
  Receiver Public Key:
    9D A5 DA BD EE C2 CF 2E 14 C8 9D 61 2F DE D1 28
    65 AE 29 BE 92 AE 06 DE 82 F8 4B 33 C4 D6 C5 C0
    E0 C0 27 11 84 42 EB 33 1A C9 62 5D 1B 00 DC 7A
```

```
       64 FF 6D B1 6B 07 FE D9 E4 A8 7C CA 1C EE BD A7
       8A 17 E9 80 B9 BC 98 7F 80 DA 1C 6A EE 47 42 C3
       F1 AB 6D 2F F8 7E B3 4B 59 DA 45 09 81 6A A9 C8
       0F 52 E5 E3 61 DC D7 8D 41 F7 D5 AE D5 04 95 29
       8C 99 D9 A3 CE 85 FF C7 19 B7 4B AD DE F8 2C 8B
       01 00 01
     Reserved:
       00 00
     DCP LLC Signature:
       90 A4 1D 3E 71 60 2A F3 05 6B 73 48 9F 63 70 C6
       B6 99 C0 0C 63 84 72 C1 57 32 C3 09 73 E0 0B 45
       0C 22 BA AB A2 9E F1 FE 30 98 00 6A E3 C7 27 93
       DB C4 5A F0 10 CD 07 54 4E B0 C4 1A 2A C2 20 4F
       C8 04 E9 58 C2 21 60 78 85 1E CC D0 FB 73 29 EA
       10 B6 32 9C D8 34 5A 6A 04 91 2B AD A9 29 59 55
       E3 0A FB 75 67 96 2C 20 96 12 80 74 A0 31 FF F5
       0E 93 F0 31 CD 92 1F 57 30 D1 EA 5E 69 E7 4D DF
       EB CA 47 89 1B 1D 69 57 9E 97 E5 4D A7 D4 C5 3A
       5F AD 62 F9 F0 54 CA 5F 10 0D 45 2C BC 7E D8 29
       F3 70 6D 75 03 C8 2C 9F F8 8A 75 98 21 A8 06 CC
       97 6E D4 42 41 53 C7 7E 46 AC 17 6D 45 55 93 AD
       7A AB D8 D8 30 C5 1A 46 FB 50 33 0C 7A A1 11 97
       C5 69 4D 2E 8A 7A 9B 60 31 26 AA 44 B7 E5 4C 36
       0B F1 43 90 EC 7B 33 F1 96 C0 D5 A3 36 F0 76 45
       5B 52 4D 29 4A 7F 4F 04 F7 19 6E 1C 78 60 6F F9
       90 30 AD C3 36 4C B6 30 F4 C3 15 17 75 BF 6A 51
       56 D2 E0 8B 89 A5 68 AB E6 C9 F6 CA 00 21 23 83
       06 0F E5 46 15 24 47 05 CD 93 F7 BA C9 AD 74 C1
       68 E3 DA 2C 74 5E DF 05 00 90 51 AB 8C 82 E1 BB
       5D 58 29 5E A7 2E 6B 66 BB 1B 9E 1E 6D AA 1E AA
       24 BF 59 E8 D6 F6 47 F6 A1 E1 32 4E CD 33 CD 9B
       26 13 C5 31 C5 33 3A 7C A8 C7 F5 A1 E6 88 C7 4F
       7F D3 4A 5A 79 F4 B5 54 76 66 6F 73 66 18 EA BA
     Rrx:
       E0 15 67 46 82 90 CC B3
     RxCaps:
       02 00 00 (533)

Version: 2
Downstream is a Repeater: No


-- TE RxStatus 0x0000  (2790.5ms(+62.375ms))

3   rx: AKE_No_Stored_km: (2879.875ms(+151.75ms))
   Ekpub_Km:
       44 C1 88 73 84 48 82 01 5A FF ED A1 F1 5D 90 5E
       D2 B1 B8 7C 0F CE 18 00 C5 11 D9 EF 0C 8E 9E 14
       85 B7 CF 41 07 04 D6 41 6F 6F 3A 11 78 20 25 15
       93 B4 0B 32 AF FE C8 3F A8 9B 28 2B 4D 0B BD 9B
       77 12 E0 1B FD C0 F9 5D 8E 8B 04 3E F9 A5 6B 89
       CC A0 B5 94 C4 47 B1 63 F5 7F 5E FD 05 26 18 38
       85 18 3A B5 A0 4B B4 B1 98 CF 21 B5 CC AC 37 10
       5C 74 AD 50 97 89 57 31 4C 8B E0 0B 1D AD C3 86 (128)

-- TE RxStatus 0x0021  (3312ms(+432.125ms))

4   tx: AKE_Send_H_prime: (3313.9375ms(+434.0625ms))
   H':
       00 0A E9 D9 7C EF 8E F8 1B E1 5F 87 2A D1 E3 72
       C2 8A E5 8C B9 57 9E CB CB 7C 54 4C C3 38 C4 1A (32)

-- TE RxStatus 0x0000  (3317.6875ms(+3.75ms))
-- TE RxStatus 0x0011  (3339.3125ms(+25.375ms))
```

```
5   tx: AKE_Send_Pairing_Info: (3340.25ms(+26.3125ms))
  Ekh_Km:
    C2 5C 99 58 5F 7C 15 37 11 F4 4E 7A F5 6C C0 F1 (16)

-- TE RxStatus 0x0000  (3342.1875ms(+1.9375ms))

6   rx: LC_Init: (3346ms(+5.75ms))
  Rn:
    F3 B8 C6 C5 20 7E 0D 18 (8)

-- TE RxStatus 0x0021  (3351.0625ms(+5.0625ms))

7   tx: LC_Send_L_prime: (3352.5ms(+6.5ms))
  L':
    F3 39 6E C2 74 A0 7E FC 43 A6 72 2A FA 0F 92 CB
    30 DE D7 B6 BC 45 F9 DA 9C B1 8C 5D D6 D5 99 2D (32)

-- TE RxStatus 0x0000  (3356.3125ms(+3.8125ms))

8   rx: SKE_Send_Eks: (3358.375ms(+5.875ms))
  Edkey_Ks:
    6E A3 D6 CA 6A E5 18 AD E2 AD EE CF 5B E8 E9 30
  Riv:
    88 78 F6 1A 3C 52 3F 29 (24)

-- XXX HDCP Encryption Enabled: (3589.3125ms(+230.9375ms))
-- --- TE has de-asserted HPD: (4942.6875ms(+1353.375ms))
-- OOO HDCP Encryption Disabled: (4942.6875ms(+0ms))
-- +++ TE has asserted HPD: (5029.4375ms(+86.75ms))
-- Read HDCP2Version Register: 04(5211.625ms(+182.1875ms))

9   rx: AKE_Init: (6394.5625ms(+1182.9375ms))
  Rtx:
    0D 56 A4 A4 85 60 89 1D
  TxCaps:
    02 00 00 (11)

-- TE RxStatus 0x0216  (6408.375ms(+13.8125ms))

10  tx: AKE_Send_Cert: (6409.9375ms(+15.375ms))
  Receiver ID:
    3E 2D C2 48 7B
  Receiver Public Key:
    9D A5 DA BD EE C2 CF 2E 14 C8 9D 61 2F DE D1 28
    65 AE 29 BE 92 AE 06 DE 82 F8 4B 33 C4 D6 C5 C0
    E0 C0 27 11 84 42 EB 33 1A C9 62 5D 1B 00 DC 7A
    64 FF 6D B1 6B 07 FE D9 E4 A8 7C CA 1C EE BD A7
    8A 17 E9 80 B9 BC 98 7F 80 DA 1C 6A EE 47 42 C3
    F1 AB 6D 2F F8 7E B3 4B 59 DA 45 09 81 6A A9 C8
    0F 52 E5 E3 61 DC D7 8D 41 F7 D5 AE D5 04 95 29
    8C 99 D9 A3 CE 85 FF C7 19 B7 4B AD DE F8 2C 8B
    01 00 01
  Reserved:
    00 00
  DCP LLC Signature:
    90 A4 1D 3E 71 60 2A F3 05 6B 73 48 9F 63 70 C6
    B6 99 C0 0C 63 84 72 C1 57 32 C3 09 73 E0 0B 45
    0C 22 BA AB A2 9E F1 FE 30 98 00 6A E3 C7 27 93
    DB C4 5A F0 10 CD 07 54 4E B0 C4 1A 2A C2 20 4F
    C8 04 E9 58 C2 21 60 78 85 1E CC D0 FB 73 29 EA
    10 B6 32 9C D8 34 5A 6A 04 91 2B AD A9 29 59 55
    E3 0A FB 75 67 96 2C 20 96 12 80 74 A0 31 FF F5
    0E 93 F0 31 CD 92 1F 57 30 D1 EA 5E 69 E7 4D DF
    EB CA 47 89 1B 1D 69 57 9E 97 E5 4D A7 D4 C5 3A
    5F AD 62 F9 F0 54 CA 5F 10 0D 45 2C BC 7E D8 29
```

```
        F3 70 6D 75 03 C8 2C 9F F8 8A 75 98 21 A8 06 CC
        97 6E D4 42 41 53 C7 7E 46 AC 17 6D 45 55 93 AD
        7A AB D8 D8 30 C5 1A 46 FB 50 33 0C 7A A1 11 97
        C5 69 4D 2E 8A 7A 9B 60 31 26 AA 44 B7 E5 4C 36
        0B F1 43 90 EC 7B 33 F1 96 C0 D5 A3 36 F0 76 45
        5B 52 4D 29 4A 7F 4F 04 F7 19 6E 1C 78 60 6F F9
        90 30 AD C3 36 4C B6 30 F4 C3 15 17 75 BF 6A 51
        56 D2 E0 8B 89 A5 68 AB E6 C9 F6 CA 00 21 23 83
        06 0F E5 46 15 24 47 05 CD 93 F7 BA C9 AD 74 C1
        68 E3 DA 2C 74 5E DF 05 00 90 51 AB 8C 82 E1 BB
        5D 58 29 5E A7 2E 6B 66 BB 1B 9E 1E 6D AA 1E AA
        24 BF 59 E8 D6 F6 47 F6 A1 E1 32 4E CD 33 CD 9B
        26 13 C5 31 C5 33 3A 7C A8 C7 F5 A1 E6 88 C7 4F
        7F D3 4A 5A 79 F4 B5 54 76 66 6F 73 66 18 EA BA
    Rrx:
        66 65 4E BE 3B BF D4 8D
    RxCaps:
        02 00 00 (533)


Version: 2
Downstream is a Repeater: No


-- TE RxStatus 0x0000  (6472.3125ms(+62.375ms))

11  rx: AKE_Stored_km: (6527.8125ms(+117.875ms))
    Ekh_Km:
        C2 5C 99 58 5F 7C 15 37 11 F4 4E 7A F5 6C C0 F1
    m:
        65 65 37 9C 04 2A 95 6A E0 15 67 46 82 90 CC B3 (32)

-- TE RxStatus 0x0021  (6579.4375ms(+51.625ms))

12  tx: AKE_Send_H_prime: (6581.375ms(+53.5625ms))
    H':
        1C D2 8A DF 58 ED 3D 86 34 47 5C 2C D2 93 B4 E6
        35 39 43 71 BE 37 B7 C7 7A 88 AA 7E 01 12 B7 4E (32)

-- TE RxStatus 0x0000  (6585.1875ms(+3.8125ms))

13  rx: LC_Init: (6588.9375ms(+7.5625ms))
    Rn:
        64 0E 17 B3 F5 BF 07 FA (8)

-- TE RxStatus 0x0021  (6594ms(+5.0625ms))

14  tx: LC_Send_L_prime: (6595.4375ms(+6.5ms))
    L':
        55 97 1A 7D 12 BE F0 1D 15 27 66 64 99 69 43 44
        FC C9 2D F1 09 D1 AA D2 84 52 8A 4A 2A AC E0 33 (32)

-- TE RxStatus 0x0000  (6599.25ms(+3.8125ms))

15  rx: SKE_Send_Eks: (6601.3125ms(+5.875ms))
    Edkey_Ks:
        21 F3 09 18 37 D5 21 49 18 16 AE 80 1C 56 90 90
    Riv:
        1A E5 FD 11 A7 88 1E 5A (24)

-- XXX HDCP Encryption Enabled: (6834.375ms(+233.0625ms))
-- ================================================
-- sink: End Trigger buf dump
-- ================================================

===============Test Item(3A-01) Iteration(1) Passed===============
```

6.2. Sample Source Log File

This is the sample source log file of 3A_01.

```
Test Time:2015/7/9 13:25:29

================Test Item(3A-01) Iteration(1) Source Side Begin================
    vpg_set(480p)
    re_init
    source rx_msg_buf_init
    msg_trig_init(source)
    configure_run
    init_run_core
    source::hdcp_disable
    sink::hdcp_disable
    sink::hdcp_reset_REAUTH_REQ
    load_otp(0)
    ftn_wait_sink_ready_disconnected
    ftn_wait_sink_ready
    reset_side_rx_ready
    source::wait_hdmi_disconnected
    source::hdcp_disable
    source<-rx::Connect
    source::wait_hdmi_connected
    vpg_set(480p)
    source::hdcp_disable
1   source->tx::AKE_Init
    source::hdcp_disable
Turn off DDC polling
    Checking DDC Busy
Turn on DDC polling
    source::wait_ms(500)
2   source<-rx::AKE_Send_Cert
    ftn_source_check_RxID_action
3   source->tx::AKE_Stored_km
4   source->tx::AKE_No_Stored_km
5   source<-rx::AKE_Send_H_prime
6   source<-rx::AKE_Send_Pairing_Info
7   source->tx::LC_Init
8   source<-rx::LC_Send_L_prime
9   source->tx::SKE_Send_Eks
    ftn_source_check_repeater_action
    Repeater(RxID) 1:
10  source<-rx::RepeaterAuth_Send_ReceiverID_List(3000ms)
    Repeater(RxID) 2:
11  source->tx::RepeaterAuth_Send_Ack
    ftn_source_repeater_stream_manage
    Repeater(StreamMM) 1:
12  source->tx::RepeaterAuth_Stream_Manage
    Repeater(StreamMM) 2:
13  source<-rx::RepeaterAuth_Stream_Ready time(100ms) r8051(1)
    source<-rx::HDCP_EN
    source::wait_ms(100)
    source::wait_ms(500)
    ftn_wait_sink_done_reauth
    ftn_wait_sink_done
HDMI disconnected!!
    source<-rx::Connect
    source::wait_hdmi_connected
    vpg_set(480p)
    source::hdcp_disable
14  source->tx::AKE_Init
    source::hdcp_disable
Turn off DDC polling
    Checking DDC Busy
Turn on DDC polling
```

```
     source::wait_ms(500)
15   source<-rx::AKE_Send_Cert
     ftn_source_check_RxID_action
16   source->tx::AKE_Stored_km
17   source<-rx::AKE_Send_H_prime
18   source->tx::LC_Init
19   source<-rx::LC_Send_L_prime
20   source->tx::SKE_Send_Eks
     ftn_source_check_repeater_action
     Repeater(RxID) 1:
21   source<-rx::RepeaterAuth_Send_ReceiverID_List(3000ms)
     Repeater(RxID) 2:
22   source->tx::RepeaterAuth_Send_Ack
     ftn_source_repeater_stream_manage
     Repeater(StreamMM) 1:
23   source->tx::RepeaterAuth_Stream_Manage
     Repeater(StreamMM) 2:
24   source<-rx::RepeaterAuth_Stream_Ready time(100ms) r8051(1)
     source<-rx::HDCP_EN
     source::wait_ms(100)
     source::wait_ms(500)
     ftn_wait_sink_done_reauth
     ftn_wait_sink_done
     reset_side_cr
     msg_trig_dump(source)
-- ================================================
-- source: Start Trigger buf dump(1932)
-- source: DDC Poll interval:1ms
-- ================================================
-- --- DUT has de-asserted HPD: (1271.1875ms(+1271.1875ms))
-- +++ DUT has asserted HPD: (1538.1875ms(+267ms))
-- --- DUT has de-asserted HPD: (2161.1875ms(+623ms))
-- +++ DUT has asserted HPD: (2163.5625ms(+2.375ms))
-- DDC Polling DUT RxStatus 0xbc00   (2196.375ms(+32.8125ms))

1   tx: AKE_Init: (2698.875ms(+535.3125ms))
  Rtx:
    8F 00 72 2D B3 8F AC 24
  TxCaps:
    02 00 00 (11)

-- DDC Polling DUT RxStatus 0x0216   (2701.5ms(+2.625ms))

2   rx: AKE_Send_Cert: (2701.875ms(+3ms))
  Receiver ID:
    9D 63 49 6A 5C
  Receiver Public Key:
    B8 43 F7 2B 77 5B 98 7B CE 48 BC 2A BC 0A 24 C9
    56 89 49 AA 53 F3 A4 42 54 20 36 6A E4 15 EB FF
    AD AC 2D 2D DF D7 7D 28 03 24 67 1A D2 C4 CD 84
    3A 0F CE 81 97 EE 71 56 5B CB D8 6A D1 EB 0C 29
    D7 9F 30 F6 5F EE 64 FB 59 D6 88 F5 5D 0B 75 7E
    E1 EF E0 3F 8A 92 CD 1F E5 C1 3E C2 AF 65 85 52
    8B BB 0C 28 1D E0 4E 75 51 AE 27 AC 87 52 3D AB
    F0 B2 D0 C8 E3 29 24 C8 E4 EA 11 5B 9D C9 A3 3B
    01 00 01
  Reserved:
    00 00
  DCP LLC Signature:
    3B FB A9 A2 F8 70 97 C4 5A 33 19 C3 0A CF D9 5B
    F9 42 AD 1F 74 DB 48 0C 9A DF A2 F8 76 1D 71 F0
    08 31 72 4D E7 9B B4 84 51 0A 92 A8 91 F1 0A B3
    AC 0E 49 36 BE D1 4A 2A 33 CC 07 3F 94 A2 AF 4A
    88 F2 17 D2 40 B6 17 88 25 A1 1F 62 31 58 2F 07
    31 F0 20 02 50 6D 2A C9 B2 A3 CC 93 81 14 3D AE
```

```
       4C 48 D5 44 D8 74 CD 51 78 CA 01 43 B2 D4 DB C1
       17 C3 10 94 0D DD FD 19 97 E6 00 CE CE 23 CC 85
       B5 4B FD 87 8C 35 BC D5 77 3E 74 9B 61 4E 0E B8
       5A 31 1A BA 3F FE 63 E9 FE 1F FA F5 2C E5 2D F1
       D4 1A F2 2C 06 03 3B 3E B1 03 9D AF 95 AC 46 5A
       83 83 D5 B4 20 B5 25 3A 39 E3 9B 2B 0C C4 95 D1
       CD 5F D6 FC 66 A2 A4 11 F6 39 0A A2 EC 51 0C 0F
       DC 28 7F 0A 5B 3C BF 1D 00 24 B5 F0 8B F9 1B CB
       31 8E F4 A7 9A CC 41 AA 07 30 31 66 2F 70 9F 5B
       E2 57 DD C4 CF F6 D7 45 50 64 0E 15 F7 02 D2 90
       6C F7 CD 3B 29 9C AA 97 96 82 BD 53 5F 0F 2D 9D
       41 17 3F A2 C0 EF F4 2B 38 8E A2 3D 71 3D 37 39
       4C 51 72 53 71 BF A5 F1 4B A7 0F B0 55 9E 4B C3
       E7 ED 8A E1 7A FF 52 7C 82 46 84 24 4D D4 E0 A4
       C9 0C D6 88 2F F8 9F 42 D5 BB E1 32 A9 AE 86 9D
       DB D3 45 AB 57 E8 4F D5 A9 32 A0 5C 9A 18 AC 28
       D4 1B 22 D8 13 EB F1 3D 06 31 4B 79 18 86 97 F0
       BC 6B 96 2E E6 30 30 93 C6 98 AE FC ED 13 33 5F
    Rrx:
       E2 A2 70 35 B0 30 94 BE
    RxCaps:
       02 00 01 (533)


Version: 2
Downstream is a Repeater: Yes


-- DDC Polling DUT RxStatus 0x0000   (2751.25ms(+49.375ms))

4    tx: AKE_No_Stored_km: (3051.8125ms(+349.9375ms))
  Ekpub_Km:
       83 19 B5 A1 AA 0F 4F EB B0 17 31 F8 93 18 B8 58
       FC BE F1 B2 4C 15 2D 8B B5 09 6A DB 9C CC 95 0A
       08 61 3A DA 73 CE 1D 23 9F 53 27 BC 60 DA 9E 69
       52 98 13 97 83 37 C0 4C DE 2E 99 2C 0E 28 1E 45
       A0 2B B6 A7 9B 3C D5 7B D6 51 9A B7 06 E8 9E C0
       AF 55 13 3F AA 61 20 27 E7 8E EF 59 35 74 6B 20
       3A FE 1B 63 CF 1E 83 C1 F9 30 FA 65 85 1D 01 DD
       27 08 6B A0 0D F1 A0 41 5A E9 00 72 DB 00 56 E7 (128)

-- DDC Polling DUT RxStatus 0x0021   (3445.4375ms(+393.625ms))

5    rx: AKE_Send_H_prime: (3445.8125ms(+394ms))
  H':
       F7 78 4B 74 11 D0 8B CC 39 C2 8F 68 E8 1E 1F 56
       DD 80 47 6D 6A 2A 8A 8E FB 9D E1 26 B7 29 93 49 (32)

-- DDC Polling DUT RxStatus 0x0011   (3450.1875ms(+4.375ms))

6    rx: AKE_Send_Pairing_Info: (3450.5625ms(+4.75ms))
  Ekh_Km:
       1F 83 0F 22 43 4C F1 0D 1F 2D A7 2A 3D F2 6C B1 (16)

-- DDC Polling DUT RxStatus 0x0000   (3453.5ms(+2.9375ms))

7    tx: LC_Init: (3471.9375ms(+21.375ms))
  Rn:
       72 D4 8C 84 7F A6 06 77 (8)

-- DDC Polling DUT RxStatus 0x0021   (3477.25ms(+5.3125ms))

8    rx: LC_Send_L_prime: (3477.625ms(+5.6875ms))
  L':
       35 EA 3C E8 78 20 7B CC A2 68 2C 6E 33 68 4D 3B
       C6 F3 25 5C 3F D7 D3 28 3E 9C 32 E6 C0 A1 46 C8 (32)
```

```
-- DDC Polling DUT RxStatus 0x0000   (3482ms(+4.375ms))

9   tx: SKE_Send_Eks: (3495.125ms(+17.5ms))
  Edkey_Ks:
    54 FD 53 02 A4 F1 B2 14 C5 22 19 2B E1 F7 55 7A
  Riv:
    B7 7A 43 D7 0A C0 F5 1C (24)

-- DDC Polling DUT RxStatus 0x0400   (3499.5625ms(+4.4375ms))
-- DDC Polling DUT RxStatus 0x041b   (3502.5625ms(+7.4375ms))

10  rx: RepeaterAuth_Send_ReceiverID_List: (3503ms(+7.875ms))
  RxInfo:
    02 10
  seq_num_V:
    00 00 00
  V':
    BE 01 47 F7 72 89 9E C6 7C 47 E6 F5 6F B1 82 91
  Receiver ID List:
    RcvID0: 3E 2D C2 48 7B (26)

Depth: 1
Device Count: 1
Max Device Exceeded: 0
Max Cascade Exceeded: 0
HDCP2.0 Repeater Downstream: 0
HDCP1.x Repeater Downstream: 0

-- DDC Polling DUT RxStatus 0x0000   (3506.8125ms(+3.8125ms))

11  tx: RepeaterAuth_Send_Ack: (3527.125ms(+24.125ms))
  V:
    77 0E DB AA 14 22 9D D2 52 B9 EB B4 AA B1 E6 48 (16)


12  tx: RepeaterAuth_Stream_Manage: (3533.3125ms(+6.1875ms))
  seq_num_M:
    00 00 00
  k:
    00 01
  StreamID(1 byte)Type(1 byte):
    00 00 (7)

-- DDC Polling DUT RxStatus 0x0021   (3538.1875ms(+4.875ms))

13  rx: RepeaterAuth_Stream_Ready: (3538.5625ms(+5.25ms))
  M':
    5A BA E3 4E 74 48 4F B5 3D 40 49 6E 81 25 F8 4A
    48 AF B2 86 71 D8 A5 39 FA 78 13 1D 22 00 8C AF (32)

-- DDC Polling DUT RxStatus 0x0000   (3543ms(+4.4375ms))
-- XXX HDCP Encryption Enabled: (3679.875ms(+141.3125ms))
-- --- DUT has de-asserted HPD: (4991.25ms(+1311.375ms))
-- +++ DUT has asserted HPD: (5219.8125ms(+228.5625ms))
-- --- DUT has de-asserted HPD: (5840ms(+620.1875ms))
-- +++ DUT has asserted HPD: (5842.375ms(+2.375ms))
-- OOO HDCP Encryption Disabled: (5873.875ms(+31.5ms))

14  tx: AKE_Init: (6380.125ms(+506.25ms))
  Rtx:
    5D 1B 5E 71 33 A0 BC 46
  TxCaps:
    02 00 00 (11)
```

```
-- DDC Polling DUT RxStatus 0x0216   (6383.3125ms(+3.1875ms))

15  rx: AKE_Send_Cert: (6383.6875ms(+3.5625ms))
  Receiver ID:
    9D 63 49 6A 5C
  Receiver Public Key:
    B8 43 F7 2B 77 5B 98 7B CE 48 BC 2A BC 0A 24 C9
    56 89 49 AA 53 F3 A4 42 54 20 36 6A E4 15 EB FF
    AD AC 2D 2D DF D7 7D 28 03 24 67 1A D2 C4 CD 84
    3A 0F CE 81 97 EE 71 56 5B CB D8 6A D1 EB 0C 29
    D7 9F 30 F6 5F EE 64 FB 59 D6 88 F5 5D 0B 75 7E
    E1 EF E0 3F 8A 92 CD 1F E5 C1 3E C2 AF 65 85 52
    8B BB 0C 28 1D E0 4E 75 51 AE 27 AC 87 52 3D AB
    F0 B2 D0 C8 E3 29 24 C8 E4 EA 11 5B 9D C9 A3 3B
    01 00 01
  Reserved:
    00 00
  DCP LLC Signature:
    3B FB A9 A2 F8 70 97 C4 5A 33 19 C3 0A CF D9 5B
    F9 42 AD 1F 74 DB 48 0C 9A DF A2 F8 76 1D 71 F0
    08 31 72 4D E7 9B B4 84 51 0A 92 A8 91 F1 0A B3
    AC 0E 49 36 BE D1 4A 2A 33 CC 07 3F 94 A2 AF 4A
    88 F2 17 D2 40 B6 17 88 25 A1 1F 62 31 58 2F 07
    31 F0 20 02 50 6D 2A C9 B2 A3 CC 93 81 14 3D AE
    4C 48 D5 44 D8 74 CD 51 78 CA 01 43 B2 D4 DB C1
    17 C3 10 94 0D DD FD 19 97 E6 00 CE CE 23 CC 85
    B5 4B FD 87 8C 35 BC D5 77 3E 74 9B 61 4E 0E B8
    5A 31 1A BA 3F FE 63 E9 FE 1F FA F5 2C E5 2D F1
    D4 1A F2 2C 06 03 3B 3E B1 03 9D AF 95 AC 46 5A
    83 83 D5 B4 20 B5 25 3A 39 E3 9B 2B 0C C4 95 D1
    CD 5F D6 FC 66 A2 A4 11 F6 39 0A A2 EC 51 0C 0F
    DC 28 7F 0A 5B 3C BF 1D 00 24 B5 F0 8B F9 1B CB
    31 8E F4 A7 9A CC 41 AA 07 30 31 66 2F 70 9F 5B
    E2 57 DD C4 CF F6 D7 45 50 64 0E 15 F7 02 D2 90
    6C F7 CD 3B 29 9C AA 97 96 82 BD 53 5F 0F 2D 9D
    41 17 3F A2 C0 EF F4 2B 38 8E A2 3D 71 3D 37 39
    4C 51 72 53 71 BF A5 F1 4B A7 0F B0 55 9E 4B C3
    E7 ED 8A E1 7A FF 52 7C 82 46 84 24 4D D4 E0 A4
    C9 0C D6 88 2F F8 9F 42 D5 BB E1 32 A9 AE 86 9D
    DB D3 45 AB 57 E8 4F D5 A9 32 A0 5C 9A 18 AC 28
    D4 1B 22 D8 13 EB F1 3D 06 31 4B 79 18 86 97 F0
    BC 6B 96 2E E6 30 30 93 C6 98 AE FC ED 13 33 5F
  Rrx:
    80 7C ED FF E7 1A C8 AF
  RxCaps:
    02 00 01 (533)

Version: 2
Downstream is a Repeater: Yes


-- DDC Polling DUT RxStatus 0x0000   (6433.0625ms(+49.375ms))

16  tx: AKE_Stored_km: (6584.0625ms(+200.375ms))
  Ekh_Km:
    1F 83 0F 22 43 4C F1 0D 1F 2D A7 2A 3D F2 6C B1
  m:
    8F 00 72 2D B3 8F AC 24 E2 A2 70 35 B0 30 94 BE (32)


-- DDC Polling DUT RxStatus 0x0021   (6595.0625ms(+11ms))

17  rx: AKE_Send_H_prime: (6595.5ms(+11.4375ms))
  H':
    9D 76 4C C0 66 6D 65 67 69 5D C6 C0 36 EB 82 36
    C7 93 76 72 D0 58 0F 33 B7 3F 98 FE 02 C4 17 12 (32)
```

```
-- DDC Polling DUT RxStatus 0x0000  (6599.875ms(+4.375ms))

18  tx: LC_Init: (6616.5ms(+21ms))
  Rn:
    25 9E 98 01 1B 97 3B 49 (8)

-- DDC Polling DUT RxStatus 0x0021  (6622.0625ms(+5.5625ms))

19  rx: LC_Send_L_prime: (6622.4375ms(+5.9375ms))
  L':
    2D BB 14 58 8E 3F FB 8F F1 03 2C 42 26 0F 4A CC
    43 DE 50 DD 92 9A 44 3A A1 DF 97 86 A6 45 5A 77 (32)

-- DDC Polling DUT RxStatus 0x0000  (6626.8125ms(+4.375ms))

20  tx: SKE_Send_Eks: (6640.4375ms(+18ms))
  Edkey_Ks:
    AE B9 CE 25 46 E1 03 2C A2 72 12 C9 02 37 C4 8A
  Riv:
    DE D2 93 35 52 B5 32 01 (24)

-- DDC Polling DUT RxStatus 0x0400  (6644.375ms(+3.9375ms))
-- DDC Polling DUT RxStatus 0x041b  (6647.4375ms(+7ms))

21  rx: RepeaterAuth_Send_ReceiverID_List: (6647.8125ms(+7.375ms))
  RxInfo:
    02 10
  seq_num_V:
    00 00 00
  V':
    03 DD A5 DA 0C C0 18 FF CC AB AF 4E B4 8D 33 36
  Receiver ID List:
    RcvID0: 3E 2D C2 48 7B (26)

Depth: 1
Device Count: 1
Max Device Exceeded: 0
Max Cascade Exceeded: 0
HDCP2.0 Repeater Downstream: 0
HDCP1.x Repeater Downstream: 0

-- DDC Polling DUT RxStatus 0x0000  (6651.625ms(+3.8125ms))

22  tx: RepeaterAuth_Send_Ack: (6669.8125ms(+22ms))
  V:
    EE D6 92 A1 E4 68 96 64 59 C6 DA 7E 05 FD 3A 0D (16)


23  tx: RepeaterAuth_Stream_Manage: (6675.0625ms(+5.25ms))
  seq_num_M:
    00 00 00
  k:
    00 01
  StreamID(1 byte)Type(1 byte):
    00 00 (7)

-- DDC Polling DUT RxStatus 0x0021  (6680ms(+4.9375ms))

24  rx: RepeaterAuth_Stream_Ready: (6680.375ms(+5.3125ms))
  M':
    1B 6C DC 1A E9 6A 20 BB 91 07 90 44 76 F4 04 D4
    A6 CE 90 50 07 02 7C 5B DB 8E 33 13 22 E3 B9 2B (32)

-- DDC Polling DUT RxStatus 0x0000  (6684.8125ms(+4.4375ms))
```

```
-- XXX HDCP Encryption Enabled: (6824.8125ms(+144.4375ms))
-- =================================================
-- source: End Trigger buf dump
-- =================================================

Test Item(3A-01) Iteration(1) Test End
Turn off DDC polling


================Test Item(3A-01) Iteration(1) Passed===============
```

7. HDCP 1.x Transmitter Test for Source Device

This section describes the test items, test operation guide, sample of the log file and report file.

7.1. Test Items

For source device testing, these items are tested when the SL-8800 emulates a receiver device.

Item ID	Test Description	Check Video
1A. Downstream procedure with Receiver		
1A_01	Regular Procedure - With HDMI-capable Receiver	Yes
1A_02	Regular Procedure – HDCP_HPD after writing Aksv	No
1A_03	Regular Procedure – HDCP_HPD after starting third part of authentication	Yes
1A_04	Irregular Procedure – (First part of authentication) HDCP port access	No
1A_05	Irregular Procedure - (First part of authentication) Verify Bksv	No
1A_06	Irregular Procedure - (First part of authentication) Verify R0'	No
1A_07	Irregular Procedure - (Third part of authentication) Verify Ri'	No
1A_07a	Irregular Procedure - (Third part of authentication) Verify return of Ri'	No
1A_08	Irregular Procedure - SRM	No
1A_09	Regular Procedure – With DVI Receiver	Yes

These items are tested when the SL-8800 emulates a repeater device.

Item ID	Test Description	Check Video
1B. Downstream procedure with Repeater		
1B_01	Regular Procedure - With Repeater	Yes
1B_02	Regular Procedure – HDCP_HPD after reading R0'	No
1B_03	Irregular Procedure – (Second part of authentication) Timeout of KSV list READY	No
1B_04	Irregular Procedure - (Second part of authentication) Verify V'	No
1B_05	Irregular Procedure - (Second part of authentication) MAX_DEVS_EXCEEDED	No
1B_06	Irregular Procedure - (Second part of authentication) MAX_CASCADE_EXCEEDED	No

7.2. Test Operation

7.2.1. Connection Setup for Source Device Testing
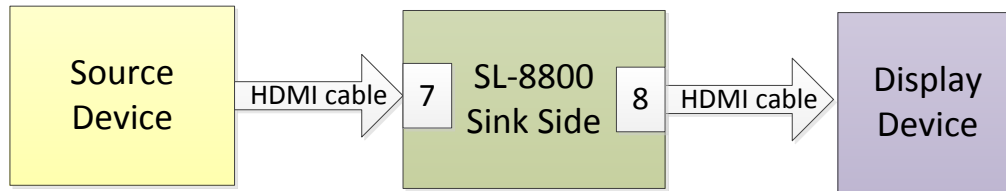
Figure 7.1. Connection Setup for Source Device Testing

Figure 7.1 shows the connection between the source device, SL-8800 (see Figure 1.1), and display device. Follow these steps to setup the connection and start testing.

1. Power on the SL-8800 and connect it to PC using the USB cable.

2. Turn on the source device.

3. Connect output port of the source device to "HDMI IN" connector of SL-8800 sink side.

4. Make sure that the source generates 480P60/720P60/1080p60 video.

5. Double-click the HDCP icon on PC. The main window of the HDCP 1.x Analyzer appears. Expand the "Transmitter Test" field (see area 1 of Figure 1.9).

6. Click the "Set LogPath" to change the log directory to a desired location if needed (see Figure 1.9).

7. Select test items. Click the "Start Test" button. Now the verification process starts.

7.2.2. Verification Test of the Authentication Procedure

1. Wait for approximately 30s for each test item.

2. Depending on the test case on CTS, if the test case stated that the authentication process has to be completed successfully, a dialog box with the "Select Output Video" option (see Figure 1.11) pops up to let you select the output video pattern that matches with the one on the display device. Depending on the test case on CTS, if the test case stated that the authentication process does not has to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog box without the "Select Output Video" option (see Figure 1.12) pops up to let you decide whether to continue next item by selecting "Continue" or "Abort."

3. GUI does not generate a report, rather only txt file for each test item, if "Abort" is selected.

4. Check the results according to GUI or the report.

Notes: • There is no need to unplug the HDMI cable and plug it back again during the test process. The SL-8800 can emulate HPD process.
• For 1A side, SL-8800 sink side emulates for the receiver functions.
• For 1B side, SL-8800 sink side emulates for the repeater functions.

7.3. Report File

The sample report file appears in Figure 7.2.

HDCP1.x Report

Test Configuration Details	
Device Description	
Company Name	
Device Type	DVD
Product Description	
Product Model#	
HDCP CTS Version	1.2
SW/FW Version	
Last Test Date	2015/7/9 9:47:36

Test Result Statistic

Status	Percentage	Value
Passed	66.67%	16
Skipped	25%	6
Failed	4.17%	1
Incomplete	4.17%	1

Item	Description	Result
1A-01	Regular procedure: With HDMI-capable Receiver	Passed
1A-02a	Regular procedure: HDCP_HPD after writing Aksv - Source_CP&EDID_HPD = No, Physical HPD line	Passed
1A-02b	Regular procedure: HDCP_HPD after writing Aksv - Source_CP&EDID_HPD = Yes, Physical HPD line	Skipped
1A-02c	Regular procedure: HDCP_HPD after writing Aksv - Source_CP&EDID_HPD = Yes, CP&EDID HPD signal	Skipped
1A-03a	Regular procedure: HDCP_HPD after starting third part of authentication - Source_CP&EDID_HPD = No, Physical HPD line	Passed
1A-03b	Regular procedure: HDCP_HPD after starting third part of authentication - Source_CP&EDID_HPD = Yes, Physical HPD line	Skipped
1A-03c	Regular procedure: HDCP_HPD after starting third part of authentication - Source_CP&EDID_HPD = Yes, CP&EDID HPD signal	Skipped
1A-04	Irregular procedure: (First Part of Authentication) HDCP port access	Passed
1A-05	Irregular procedure: (First Part of Authentication) Verify Bksv	Passed
1A-06	Irregular procedure: (First Part of Authentication) Verify R0'	Passed
1A-07	Irregular procedure: (Third Part of Authentication) Verify return of incorrect Ri'	Passed
1A-07a	Irregular procedure: (Third Part of Authentication) Verify not return of Ri'	Failed
1A-08	Irregular procedure: SRM	Incomplete
1A-09	Regular procedure: With DVI Receiver	Passed
1B-01a	Regular procedure: With Repeater - DEVICE_COUNTI=0	Passed

Figure 7.2. Sample Report File of Testing Source Device

8. HDCP 1.x Receiver Test for Sink Device

This section describes the test items, test operation guide, sample log file, and sample report file.

8.1. Test Items

For sink device testing, these items are tested when the SL-8800 emulates a transmitter.

2C. Upstream procedure with Transmitter		
Item ID	Test Description	Check Video
2C_01	Regular Procedure - With HDMI-capable Transmitter	Yes
2C_02	Irregular Procedure - (First part of authentication) New Authentication	Yes
2C_03	Irregular Procedure – (Third part of authentication) New authentication	Yes
2C_04	Regular Procedure – With DVI Transmitter	Yes

8.2. Test Operation

8.2.1. Connection Setup for Sink Device Testing
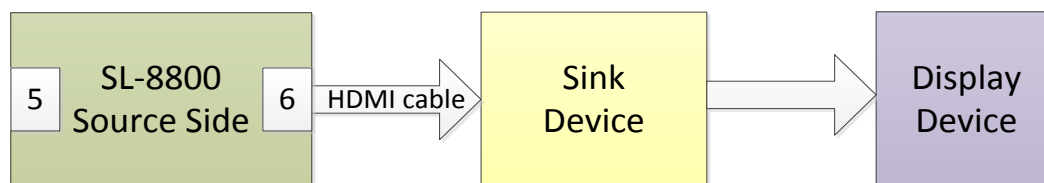
Figure 8.1. Connection Setup for the Sink Device

Figure 8.1 shows the connection between the SL-8800 (see Figure 1.1), sink device, and display device. Follow these steps to setup the connection and start testing.

1. Power on the SL-8800 and connect it to the PC using the USB cable.
2. Turn on the sink device.
3. Connect "HDMI OUT" connector of the SL-8800 source side to the input port of the sink device.
4. Make sure that the sink device can output video to display.
5. Double-click the HDCP icon on the PC screen. The main window of the HDCP 1.x Analyzer GUI appears. Expand the "Receiver Test" field (see area 1 of Figure 1.9).
6. Click "Set LogPath" to change the log directory to a desired location if needed. See area 6 of Figure 1.9.
7. Select test items to test and click the "Start Test" button. Now the verification process starts.

8.2.2. Verification Test of the Authentication Procedure

1. Wait for about 30s for each test item.

2. Depending on the test case on CTS, if the test case stated that the authentication process has to be completed successfully, the dialog box with the "Select Output Video" option (see Figure 1.11) pops up to let you select the output video pattern that matches the one on the display device. Depending on the test case on CTS, if the test case stated that the authentication process does not has to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog box without the "Select Output Video" option (see Figure 1.12) pops up to let you decide whether to continue next item by selecting "Continue" or "Abort."

3. The GUI does not generate a report, rather only txt file for each test item, if "Abort" is selected.

4. Check the results according to GUI or the report.

   Note: SL-8800 source side generates a color bar pattern to test the sink device.

8.3. Report File

The sample report file is displayed as follows. See Figure 8.2.

Figure 8.2. Sample Report File of Testing Sink Device

9. HDCP 1.x Downstream Procedure Test for Repeater Device

This section describes the test items, test operation guide, sample log file, and sample report file.

9.1. Test Items

For repeater device testing, these items are tested when SL-8800 sink side emulates a receiver.

3A. Downstream procedure with Receiver		
Item ID	**Test Description**	**Check Video**
3A_01	Regular Procedure – With HDMI-capable Receiver	Yes
3A-02	Irregular Procedure – (First part of authentication) HDCP port access	No
3A_03	Irregular Procedure – (First part of authentication) Verify Bksv	No
3A_04	Irregular Procedure – (First part of authentication) Verify R0'	No
3A_05	Regular Procedure – With DVI Receiver	Yes

These items are tested when SL-8800 sink side emulates a repeater.

3B. Downstream procedure with Repeater		
Item ID	**Test Description**	**Check Video**
3B_01	Regular Procedure - With Repeater	Yes
3B_02	Irregular Procedure – (Second part of authentication) Timeout of KSV list READY	No
3B_03	Irregular Procedure – (Second part of authentication) Verify V'	No
3B_04	Irregular Procedure – (Second part of authentication) MAX_DEVS_EXCEEDED	No
3B_05	Irregular Procedure – (Second part of authentication) MAX_CASCADE_EXCEEDED	No

9.2. Test Operation

### 9.2.1. Connection Setup for Repeater Device Downstream Testing

Figure 9.1. Connection Setup for Repeater Device

Figure 9.1 shows the connection between the SL-8800 (see Figure 1.1), repeater, and display devices. Follow these steps to setup the connection and start testing.

1. Turn on TE (SL-8800) and connect it to PC by USB. Then turn on the repeater device.

2. Connect the device input to the SL-8800 source side by HDMI cable. Make sure to connect from "HDMI OUT" connector of the SL-8800 source side to the input port of the repeater device.

3. Connect device output to SL-8800 sink side by HDMI cable. Make sure to connect from the output port of the receiver device to "HDMI IN" connector of the SL-8800 sink side.

4. Connect the SL-8800 sink side output connector to the display device. Make sure to connect from "HDMI OUT" connector of the SL-8800 sink side to the display device.

5. Double-click the HDCP icon on PC. The main window of the HDCP 1.X Analyzer appears. Expand the "Repeater Test" field (see area 1 of Figure 1.9).

6. Click "Set LogPath" to change the log directory to a desired location (see area 6 of Figure 1.9).

7. Select test items to test and click the 'Start Test' button. Now the verification process starts.

9.2.2. Verification Test of the Authentication Procedure

1. Wait for about 30s for each test item.

2. Depending on the test case on CTS, if the test case stated that , the dialog box with the "Select Output Video" option (see Figure 1.11) pops up to let you select the output video pattern that matches the one on the display device. Depending on the test case on CTS, if the test case stated that the authentication process does not has to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog box without the "Select Output Video" option (see Figure 1.12) pops up to let you decide whether to continue next item by selecting "Continue" or "Abort."

3. The GUI does not generate a report, rather only txt file for each test item if "Abort" is selected.

4. Check the results according to GUI or the report.

Notes:
- For 3A, the SL-8800 source side emulates a normal source; the SL-8800 sink side emulates sink functions.
- For 3B, the SL-8800 source side emulates a normal source; the sink side emulates repeater functions.
- For 3A-xx and 3B-xx, instead of using SL-8800 as a source side emulates a normal source, user can use the certified HDCP1.x source DVD as normal source.

9.3. Report Description

The sample report file is displayed as shown in Figure 9.2.
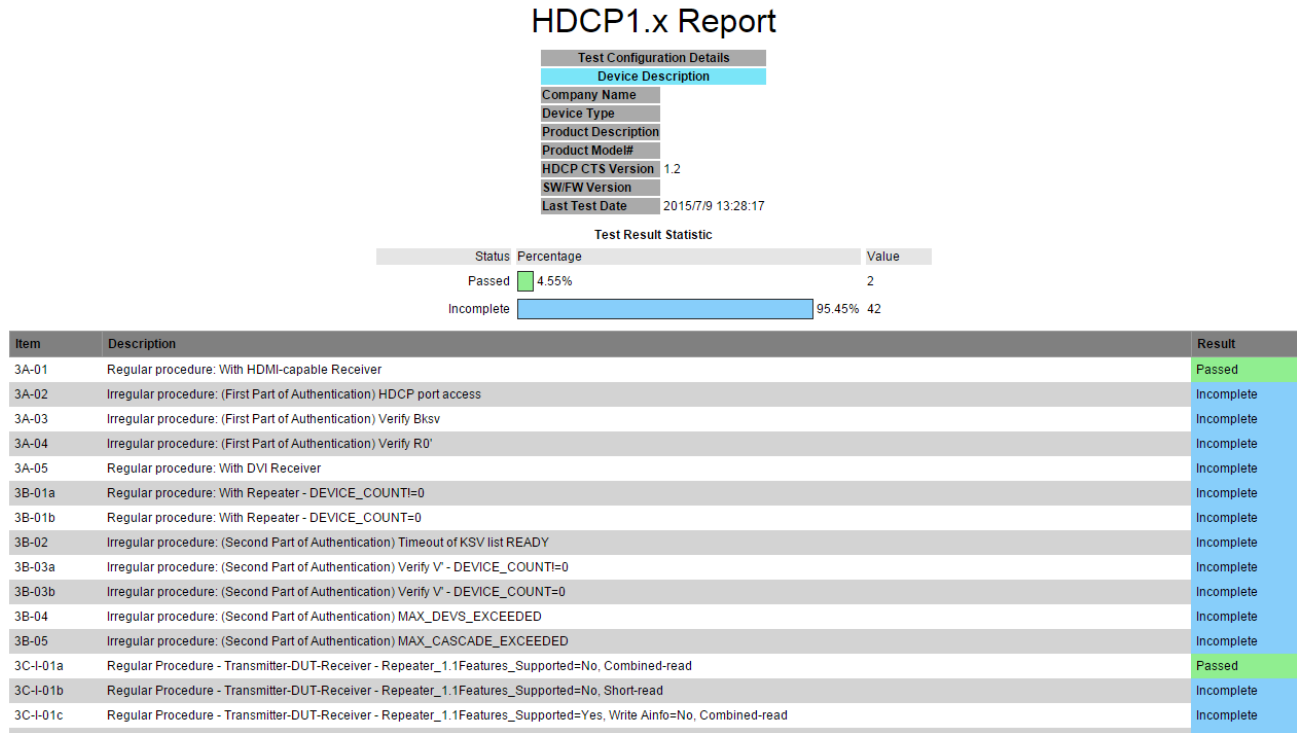
Figure 9.2. Sample Report File of Downstream Procedure Testing Repeater Device

10. HDCP 1.x Upstream Procedure Test for Repeater Device

This section describes the test items, test operation guide, sample log file, and sample report file.

10.1. Test Items

For repeater device testing, these items are tested when the SL-8800 source side emulates a transmitter.

3C. Repeater (DUT) Connected to Transmitter (TE pseudo-Source) and Receiver (TE pseudo-Sink)		
Item ID	**Test Description**	**Check Video**
3C_I_01	Regular Procedure - Transmitter - DUT –Receiver	Yes
3C_I_02	Regular Procedure – HDCP_HPD signal caused by user operation	No
3C_I_03	Irregular Procedure – (First part of authentication) New Authentication	Yes
3C_I_04	Irregular Procedure – (Second part of authentication) New Authentication	Yes
3C_I_05	Irregular Procedure – (Third part of authentication) New Authentication	Yes
3C_I_06	Irregular Procedure – (Second part of authentication) Verify Bksv	No
3C_I_07	Irregular Procedure – (Second part of authentication) Verify R0'	No

These items are tested when the SL-8800 source side emulates a transmitter and the sink side emulates a repeater.

3C. Repeater (DUT) Connected to Transmitter (TE pseudo-Source) and Repeater (TE pseudo-Repeater)		
Item ID	**Test Description**	**Check Video**
3C_II_01	Regular Procedure - Transmitter - DUT –Repeater+Receiver	Yes
3C_II_02	Regular Procedure – HDCP_HPD after writing Aksv	No
3C_II_03	Regular Procedure – HDCP_HPD after writing R0'	No
3C_II_04	Regular Procedure – HDCP_HPD after starting third part of authentication	No
3C_II_05	Irregular Procedure – (Second part of authentication) Verify V'	No
3C_II_06	Irregular Procedure – (Second part of authentication) DEVICE_COUNT	No
3C_II_07	Irregular Procedure – (Second part of authentication) DEPTH	No
3C_II_08	Irregular Procedure – (Second part of authentication) MAX_DEVS_EXCEEDED	No
3C_II_09	Irregular Procedure – (Second part of authentication) MAX_CASCADE_EXCEEDED	No

10.2. Test Operation
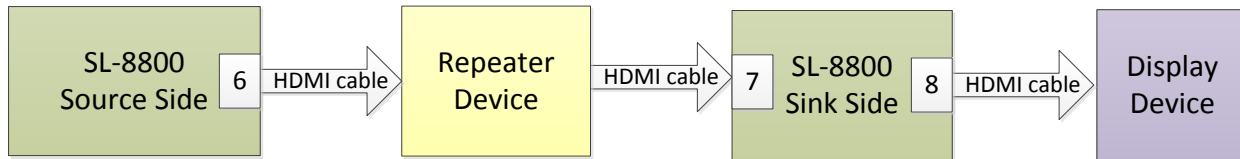
10.2.1. Connection Setup for Test Repeater Device Upstream Testing

Figure 10.1. Connection Setup for the Repeater Device

Figure 10.1 shows the connection setup using SL-8800 Interface (see Figure 1.1). Follow these steps to setup the connection among the device source, SL-8800, and display device.

1. Turn on the SL-8800 and connect it to the PC through the USB cable.

2. Turn on the repeater device.

3. Use an HDMI cable to connect the "HDMI OUT" port of the SL-8800 source side to the input port of the repeater device.

4. Connect the repeater device output to the SL-8800 sink side through the HDMI cable. Make sure to connect from the output port of the repeater device to the "HDMI IN" connector of the SL 8800 sink side.

5. Connect the output connector of the SL-8800 sink side to the display device. Make sure to connect from the "HDMI OUT" connector of the SL-8800 sink side to the display device.

6. Double-click the HDCP icon on PC. The main window of the HDCP 1.x Analyzer appears. Expand the "Repeater Test" field (see area 1 of Figure 1.9).

7. Click the "Set LogPath" to change the log directory to a desired location if needed. See area 6 of Figure 1.9.

8. Select test items to test and click the "Start Test" button. Now the verification process starts.

10.2.2. Verification Test of the Authentication Procedure

1. Wait for about 30s for each test item.

2. Depending on the test case on CTS, if the test case stated that the authentication process has to be completed successfully, a dialog box with the "Select Output Video" option (see Figure 1.11) will pop up to let you select the output video pattern that matches the one on the display device. Depending on the test case on CTS, if the test case stated that the authentication process does not has to complete throughout the test, or the test case stated that the authentication process has to complete but failed during authentication, the dialog box without the "Select Output Video" option (see Figure 1.12) pops up to let you decide whether to continue next item by selecting "Continue" or "Abort."

3. GUI will not generate report (only txt file for each test item) if "Abort" is selected.

4. Check the results according to the GUI or the report.

Notes:
- For 3C-01~3C-10, SL-8800 source side emulates the source functions, and the SL-8800 sink side emulates the sink functions.
- For 3C-11~3C-25, SL-8800 source side emulates the source functions, and the SL-8800 sink side emulates the repeater functions.

10.3.Report File

The sample report file is displayed as shown in Figure 10.2.

HDCP1.x Report

Test Configuration Details	
Device Description	
Company Name	
Device Type	
Product Description	
Product Model#	
HDCP CTS Version	1.2
SW/FW Version	
Last Test Date	2015/7/9 13:28:17

Test Result Statistic

Status	Percentage	Value
Passed	4.55%	2
Incomplete	95.45%	42

Item	Description	Result
3A-01	Regular procedure: With HDMI-capable Receiver	Passed
3A-02	Irregular procedure: (First Part of Authentication) HDCP port access	Incomplete
3A-03	Irregular procedure: (First Part of Authentication) Verify Bksv	Incomplete
3A-04	Irregular procedure: (First Part of Authentication) Verify R0'	Incomplete
3A-05	Regular procedure: With DVI Receiver	Incomplete
3B-01a	Regular procedure: With Repeater - DEVICE_COUNT!=0	Incomplete
3B-01b	Regular procedure: With Repeater - DEVICE_COUNT=0	Incomplete
3B-02	Irregular procedure: (Second Part of Authentication) Timeout of KSV list READY	Incomplete
3B-03a	Irregular procedure: (Second Part of Authentication) Verify V' - DEVICE_COUNT!=0	Incomplete
3B-03b	Irregular procedure: (Second Part of Authentication) Verify V' - DEVICE_COUNT=0	Incomplete
3B-04	Irregular procedure: (Second Part of Authentication) MAX_DEVS_EXCEEDED	Incomplete
3B-05	Irregular procedure: (Second Part of Authentication) MAX_CASCADE_EXCEEDED	Incomplete
3C-I-01a	Regular Procedure - Transmitter-DUT-Receiver - Repeater_1.1Features_Supported=No, Combined-read	Passed
3C-I-01b	Regular Procedure - Transmitter-DUT-Receiver - Repeater_1.1Features_Supported=No, Short-read	Incomplete
3C-I-01c	Regular Procedure - Transmitter-DUT-Receiver - Repeater_1.1Features_Supported=Yes, Write Ainfo=No, Combined-read	Incomplete

Figure 10.2. Sample Report File of Upstream Procedure Testing Repeater Device

11. Log Information

The time written for each DDC instruction in the LOG contains the time from the SL-8800 and the time difference, in milliseconds, from the previous instructions.

HPD activity log:

```
-- --- HDMI Disconnected(HPD Low): (<Current Time>(<Differential time>))
-- +++ HDMI Connected(HPD High): (<Current Time>(<Differential time>))
```

Receiver(rx) and transfer(tx) message log:

```
rx: <Message_Name>: (<Current Time>(<Differential time>))
tx: <Message_Name>: (<Current Time>(<Differential time>))
```

HDCP enabled or disabled activity log:

```
-- OOO HDCP Encryption Disabled: (<Current Time>(<Differential time>))
-- XXX HDCP Encryption Enabled: (<Current Time>(<Differential time>))
```

11.1. Sample Sink Log File

ERROR and WARNING are outputted as follows:

- ERROR: [error content] : The tested device operation does not meet expectations and it is prohibited.
- WARNING: [warning content] : The tested device operation does not meet expectations but it is not treated as a failure. If the verification test is completed with the tested device, the software outputs "PASS"/"FAIL" at the end of the Log file.

This is the sample sink log file of 3A_01.

```
Test Time:2015/7/7 9:57:48
****************** Configure Settings Info ******************
[   TE_VERSION]                                  2.01
[   SW Release Version]                          2.01
[   VERSION]                                     1.4
[   DEVICE]                                      HDMI
[   Repeat_Times]                                1
[   rand_gen]                                    1
[   DDC_ClkFreq]                                 100KHz
[* 1.1_Feature_Supported]                        1
[   DUT_Hdcp2x_Supported]                        0
[   DVI_EnPOS_V27_Mode]                          1
[   authe_count]                                 1
[   max_ksv]                                     2
[   monitor_pattern]                             720*480P60
[   cp&edid_hpd]                                 No
************************************************************

================Test Item(3A-01) Iteration(1) Sink Side Begin================
    sink_init
    reset_side_rx_cr
    configure_run
    init_run_core
    load_otp(0)
>> TE has de-asserted HPD
    trig_ddc::3000
    set_side_rx_ready
>> TE has asserted HPD
    set_side_rx_ready
    DUT video has been detected
    TE HDMI mode set
000 [429 ms]   Read Bcaps                        0x80
001 [0   ms]   Read Bcaps                        0x80
002 [0   ms]   Read Bksv                         0x252f78e1d4
003 [121 ms]   Read Bcaps                        0x80
004 [0   ms]   Read Bcaps                        0x80
005 [0   ms]   Read Bksv                         0x252f78e1d4
```

```
006 [0    ms]   Read Bcaps                      0x80
007 [0    ms]   Read Bksv                       0x252f78e1d4
008 [0    ms]   Read Bcaps                      0x80
009 [0    ms]   Read Bksv                       0x252f78e1d4
010 [1    ms]   Write An                        0x7ef10ba2aadc92bf
011 [0    ms]   Read Bcaps                      0x80
012 [0    ms]   Write Aksv                      0x439e677aa0
013 [224 ms]    Read R0'                        0xc5cb
014 [0    ms]   Read Bcaps                      0x80
015 [0    ms]   Read Bcaps                      0x80
016 [0    ms]   Read Bksv                       0x252f78e1d4
017 [0    ms]   Read Bcaps                      0x80
018 [0    ms]   Read Bcaps                      0x80
019 [0    ms]   Read Bksv                       0x252f78e1d4
020 [0    ms]   Read Bcaps                      0x80
021 [0    ms]   Read Bcaps                      0x80
022 [0    ms]   Read Bksv                       0x252f78e1d4
    DUT video encryption enabled
023 [2123ms]    Read Ri'                        0x79e
024 [2135ms]    Read Ri'                        0xc715
025 [2135ms]    Read Ri'                        0x476e
026 [2135ms]    Read Ri'                        0x35c5
027 [2135ms]    Read Ri'                        0xeff6
    set_side_rx_done


================Test Item(3A-01) Iteration(1) Passed===============
```

11.2. Sample Source Log File

This is the sample source log file of 3A_01.

```
Test Time:2015/7/7 9:57:48

================Test Item(3A-01) Iteration(1) Source Side Begin===============
    configure_run
    init_run_core
    load_otp(0)
    ftn_wait_sink_ready
    reset_side_rx_ready
    Mute signal output.
    source::hdcp_disable
    HDCP encryption was disabled
    source<-rx::Connect
    source::wait_hdmi_connected
    pll_set
    Enter HDMI Mode.
    Signal output enable.
    vpg_set(480p)
    >>  TE has started the output of TMDS

First Part of Authentication
000 [1509ms]    Read BCaps                      0xc3
001 [3    ms]   Read Bksv                       0xd267f1ab10
002 [3    ms]   Write An                        0x49ac435a74b4b93b
003 [2    ms]   Write Aksv                      0x1ee1ff1111
    Km : 0x2bded7836e9076
    The first part of authentication has started
004 [101 ms]    R0: 0xdb6d  R0': 0xdb6d  PASS
    HDCP encryption was enabled
005 [3    ms]   Read BCaps                      0xc3
006 [2    ms]   Read BStatus                    0x1000
007 [2    ms]   Read BCaps                      0xc3
```

```
008 [2   ms]   Read BStatus                0x1000
009 [1   ms]   Read BCaps                  0xc3
010 [2   ms]   Read BStatus                0x1000
011 [1   ms]   Read BCaps                  0xc3
012 [2   ms]   Read BStatus                0x1000
013 [2   ms]   Read BCaps                  0xc3
014 [2   ms]   Read BStatus                0x1000
015 [2   ms]   Read BCaps                  0xc3
016 [2   ms]   Read BStatus                0x1000
017 [2   ms]   Read BCaps                  0xc3
018 [2   ms]   Read BStatus                0x1000
019 [2   ms]   Read BCaps                  0xc3
020 [2   ms]   Read BStatus                0x1000
021 [2   ms]   Read BCaps                  0xc3
022 [2   ms]   Read BStatus                0x1000
023 [2   ms]   Read BCaps                  0xc3
024 [2   ms]   Read BStatus                0x1000
025 [2   ms]   Read BCaps                  0xc3
026 [2   ms]   Read BStatus                0x1000
027 [2   ms]   Read BCaps                  0xc3
028 [2   ms]   Read BStatus                0x1000
029 [2   ms]   Read BCaps                  0xc3
030 [2   ms]   Read BStatus                0x1000
031 [2   ms]   Read BCaps                  0xc3
032 [2   ms]   Read BStatus                0x1000
033 [2   ms]   Read BCaps                  0xc3
034 [2   ms]   Read BStatus                0x1000
035 [2   ms]   Read BCaps                  0xc3
036 [2   ms]   Read BStatus                0x1000
037 [2   ms]   Read BCaps                  0xc3
038 [2   ms]   Read BStatus                0x1000
039 [2   ms]   Read BCaps                  0xc3
040 [2   ms]   Read BStatus                0x1000
041 [2   ms]   Read BCaps                  0xc3
042 [2   ms]   Read BStatus                0x1000
043 [2   ms]   Read BCaps                  0xc3
044 [2   ms]   Read BStatus                0x1000
045 [2   ms]   Read BCaps                  0xc3
046 [2   ms]   Read BStatus                0x1000
047 [2   ms]   Read BCaps                  0xc3
048 [2   ms]   Read BStatus                0x1000
049 [2   ms]   Read BCaps                  0xc3
050 [2   ms]   Read BStatus                0x1000
051 [2   ms]   Read BCaps                  0xc3
052 [2   ms]   Read BStatus                0x1000
053 [2   ms]   Read BCaps                  0xc3
054 [2   ms]   Read BStatus                0x1000
055 [2   ms]   Read BCaps                  0xc3
056 [2   ms]   Read BStatus                0x1000
057 [2   ms]   Read BCaps                  0xc3
058 [2   ms]   Read BStatus                0x1000
059 [2   ms]   Read BCaps                  0xc3
060 [2   ms]   Read BStatus                0x1000
061 [2   ms]   Read BCaps                  0xc3
062 [2   ms]   Read BStatus                0x1000
063 [2   ms]   Read BCaps                  0xc3
064 [2   ms]   Read BStatus                0x1000
065 [2   ms]   Read BCaps                  0xc3
066 [2   ms]   Read BStatus                0x1000
067 [2   ms]   Read BCaps                  0xc3
068 [2   ms]   Read BStatus                0x1000
069 [2   ms]   Read BCaps                  0xc3
070 [2   ms]   Read BStatus                0x1000
071 [2   ms]   Read BCaps                  0xc3
072 [2   ms]   Read BStatus                0x1000
```

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```
073 [2    ms]   Read BCaps                      0xc3
074 [2    ms]   Read BStatus                    0x1000
075 [3    ms]   Read BCaps                      0xc3
076 [2    ms]   Read BStatus                    0x1000
077 [2    ms]   Read BCaps                      0xc3
078 [2    ms]   Read BStatus                    0x1000
079 [2    ms]   Read BCaps                      0xc3
080 [2    ms]   Read BStatus                    0x1000
081 [2    ms]   Read BCaps                      0xc3
082 [2    ms]   Read BStatus                    0x1000
083 [2    ms]   Read BCaps                      0xc3
084 [2    ms]   Read BStatus                    0x1000
085 [2    ms]   Read BCaps                      0xc3
086 [2    ms]   Read BStatus                    0x1000
087 [2    ms]   Read BCaps                      0xc3
088 [2    ms]   Read BStatus                    0x1000
089 [2    ms]   Read BCaps                      0xc3
090 [2    ms]   Read BStatus                    0x1000
091 [2    ms]   Read BCaps                      0xc3
092 [2    ms]   Read BStatus                    0x1000
093 [2    ms]   Read BCaps                      0xc3
094 [2    ms]   Read BStatus                    0x1000
095 [2    ms]   Read BCaps                      0xc3
096 [2    ms]   Read BStatus                    0x1000
097 [2    ms]   Read BCaps                      0xc3
098 [2    ms]   Read BStatus                    0x1000
099 [2    ms]   Read BCaps                      0xc3
100 [2    ms]   Read BStatus                    0x1000
101 [2    ms]   Read BCaps                      0xc3
102 [2    ms]   Read BStatus                    0x1000
103 [2    ms]   Read BCaps                      0xc3
104 [2    ms]   Read BStatus                    0x1000
105 [2    ms]   Read BCaps                      0xc3
106 [2    ms]   Read BStatus                    0x1000
107 [2    ms]   Read BCaps                      0xc3
108 [2    ms]   Read BStatus                    0x1000
109 [2    ms]   Read BCaps                      0xc3
110 [2    ms]   Read BStatus                    0x1000
111 [2    ms]   Read BCaps                      0xe3
112 [2    ms]   Read BStatus                    0x1101
113 [88   ms]   Read KSV FIFO                   0xd4 0xe1 0x78 0x2f 0x25
114 [18   ms]   Read V'                         0x9b 0x1a 0xd6 0x37 0x3c 0xd9 0xf0 0x33 0xfc
0xc9 0x01 0x1c 0x33 0xe5 0x88 0x5b 0x69 0x24 0x23 0xe7
115 [67   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
116 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
117 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
118 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
119 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
120 [66   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
121 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
122 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
123 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
124 [66   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
125 [66   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
126 [66   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
127 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
128 [66   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
129 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
130 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
131 [66   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
132 [66   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
133 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
134 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
135 [66   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
136 [65   ms]   Ri: 0xdb6d  Ri': 0xdb6d   PASS
```

```
137 [65  ms]  Ri: 0xdb6d  Ri': 0xdb6d  PASS
138 [65  ms]  Ri: 0xdb6d  Ri': 0xdb6d  PASS
139 [66  ms]  Ri: 0xdb6d  Ri': 0xdb6d  PASS
140 [65  ms]  Ri: 0xdb6d  Ri': 0xdb6d  PASS
141 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
142 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
143 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
144 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
145 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
146 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
147 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
148 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
149 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
150 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
151 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
152 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
153 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
154 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
155 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
156 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
157 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
158 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
159 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
160 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
161 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
162 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
163 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
164 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
165 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
166 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
167 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
168 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
169 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
170 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
171 [66  ms]  Ri: 0xee18  Ri': 0xee18  PASS
172 [65  ms]  Ri: 0xee18  Ri': 0xee18  PASS
173 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
174 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
175 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
176 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
177 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
178 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
179 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
180 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
181 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
182 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
183 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
184 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
185 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
186 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
187 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
188 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
189 [66  ms]  Ri: 0x9196  Ri': 0x9196  PASS
190 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
191 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
192 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
193 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
194 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
195 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
196 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
197 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
198 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
199 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
200 [67  ms]  Ri: 0x9196  Ri': 0x9196  PASS
201 [65  ms]  Ri: 0x9196  Ri': 0x9196  PASS
```

```
202 [65   ms]   Ri: 0x9196   Ri': 0x9196   PASS
203 [66   ms]   Ri: 0x9196   Ri': 0x9196   PASS
204 [65   ms]   Ri: 0x9196   Ri': 0x9196   PASS
205 [66   ms]   Ri: 0x9196   Ri': 0x9196   PASS
206 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
207 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
208 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
209 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
210 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
211 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
212 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
213 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
214 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
215 [62   ms]   Ri: 0x214e   Ri': 0x214e   PASS
216 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
217 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
218 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
219 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
220 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
221 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
222 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
223 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
224 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
225 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
226 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
227 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
228 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
229 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
230 [65   ms]   Ri: 0x214e   Ri': 0x214e   PASS
231 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
232 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
233 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
234 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
235 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
236 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
237 [66   ms]   Ri: 0x214e   Ri': 0x214e   PASS
238 [65   ms]   Ri: 0xf449   Ri': 0xf449   PASS
239 [65   ms]   Ri: 0xf449   Ri': 0xf449   PASS
240 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
241 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
242 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
243 [65   ms]   Ri: 0xf449   Ri': 0xf449   PASS
244 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
245 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
246 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
247 [64   ms]   Ri: 0xf449   Ri': 0xf449   PASS
248 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
249 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
250 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
251 [65   ms]   Ri: 0xf449   Ri': 0xf449   PASS
252 [64   ms]   Ri: 0xf449   Ri': 0xf449   PASS
253 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
254 [65   ms]   Ri: 0xf449   Ri': 0xf449   PASS
255 [65   ms]   Ri: 0xf449   Ri': 0xf449   PASS
256 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
257 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
258 [65   ms]   Ri: 0xf449   Ri': 0xf449   PASS
259 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
260 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
261 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
262 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
263 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
264 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
265 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
266 [66   ms]   Ri: 0xf449   Ri': 0xf449   PASS
```

```
267 [66  ms]  Ri: 0xf449  Ri': 0xf449  PASS
268 [65  ms]  Ri: 0xf449  Ri': 0xf449  PASS
269 [66  ms]  Ri: 0xf449  Ri': 0xf449  PASS
270 [65  ms]  Ri: 0x296f  Ri': 0x296f  PASS
271 [65  ms]  Ri: 0x296f  Ri': 0x296f  PASS
272 [66  ms]  Ri: 0x296f  Ri': 0x296f  PASS
273 [66  ms]  Ri: 0x296f  Ri': 0x296f  PASS
274 [64  ms]  Ri: 0x296f  Ri': 0x296f  PASS
275 [52  ms]  Ri: 0x296f  Ri': 0x296f  PASS
276 [49  ms]  Ri: 0x296f  Ri': 0x296f  PASS
277 [48  ms]  Ri: 0x296f  Ri': 0x296f  PASS
278 [48  ms]  Ri: 0x296f  Ri': 0x296f  PASS
    External Rx done flag asserted

Test Item(3A-01) Iteration(1) Test End
    Mute signal output.

================Test Item(3A-01) Iteration(1) Passed================
```

References

This is a list of the standards abbreviations appearing in this document.

Abbreviation	Standards Publication, Organization, and Date
HDCP Specification	*High-bandwidth Digital Content Protection System Interface Independent Adaption Revesion2.2,* 16 October, 2012
HDCP CTS	*High-bandwidth Digital Content Protection System Interface Independent Adaption Revesion2.2 Compliant Test Specification Version1.1,* 14 January 2014

Revision History

Revision A, July 2015

First production release.

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