

# Quick Operating Guide & Use Examples

UCD-400  
DisplayPort™ 1.4 Test Device with  
HBR3 Support

# UCD-400 – Versatile Tool for DP 1.4 Users

- Capture and Source up to 8K@30 & 4K@120 video and audio
- Test DP 1.4 / HBR3 Sinks, Sources and Repeaters
- Verify HDCP 1.3 and HDCP 2.2 operation;  
Run HDCP 2.2 Compliance Test
- Monitor link status, set configuration parameters
- USB 3.0 connected
- *UCD Console* GUI for debugging
- High level *TSI API* for easy integration

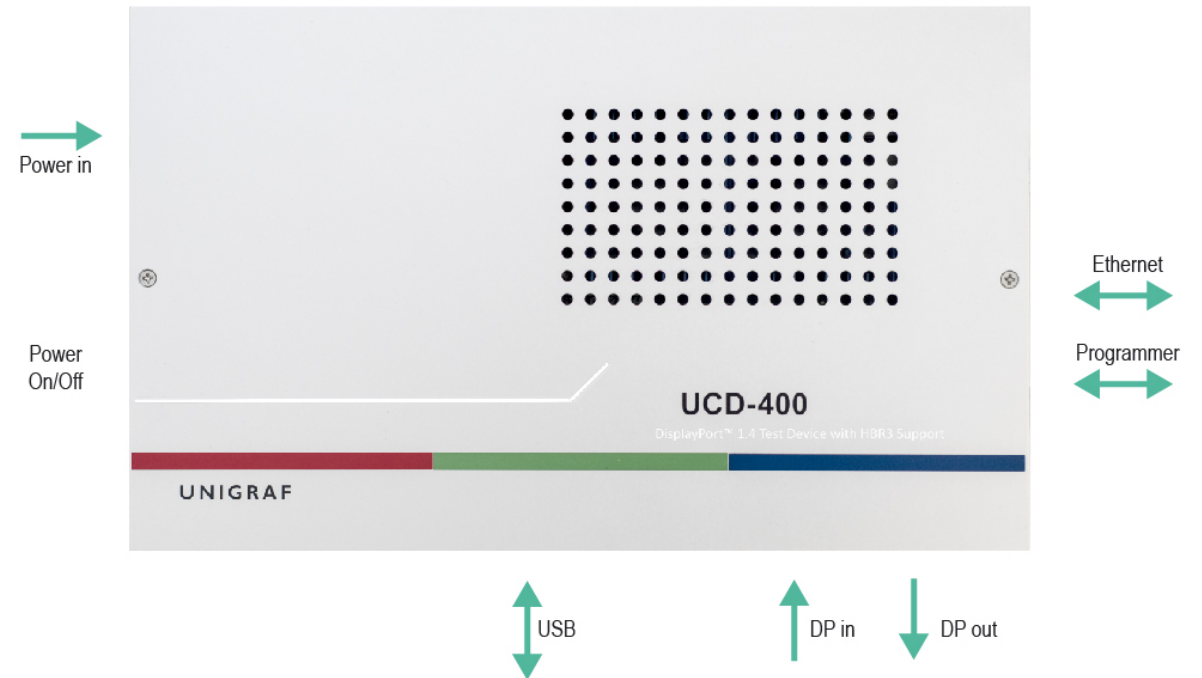


# Software for R&D and Test Automation

- UCD Console GUI
  - ✓ Preview and test application for desktop use
    - Each interface function has a well structured dialog for superior at-a-glance viewability.
  - ✓ GUI for executing bench-top tests
    - Predefined functionality Test Cases
    - Standards based Compliance Tests
- Unigraf TSI API
  - ✓ Test software that provides the system integrator a fast and reliable way for ensuring the functionality of the tested equipment.

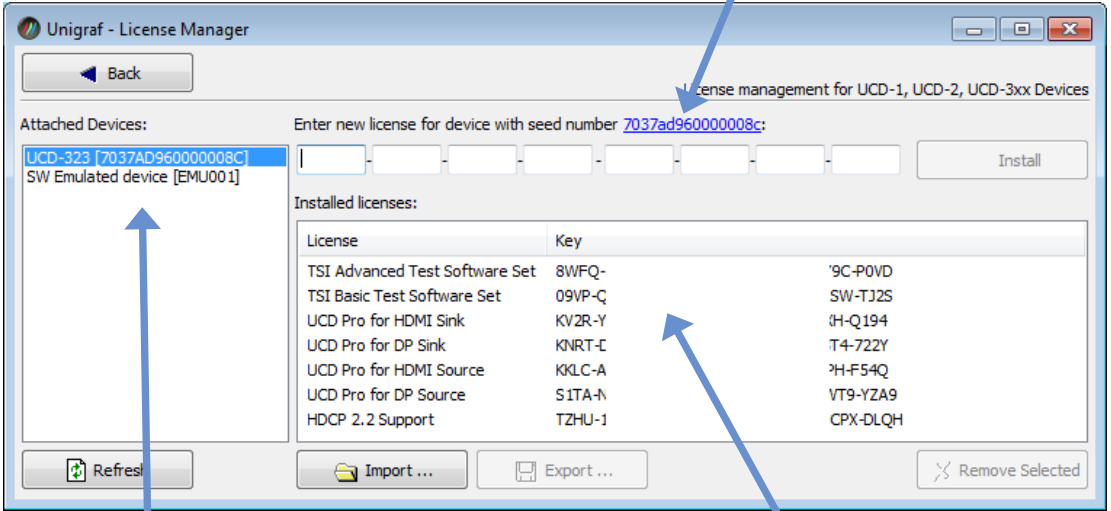
# Connections

Name	Description
DP in	DisplayPort™ 1.4 compliant input from the upstream Source
DP out	DisplayPort™ 1.4 compliant output to the downstream Sink
Power in	+12 Vdc Power Supply Input
Power On/Off	Rocker power switch
USB	USB 3.0 connection to host PC
Programmer	USB interface for configuring the UCD-400 device FW
Ethernet	Ethernet interface for updating the UCD-400 device FW



# Feature Licensing

- Product features are divided to license enabled groups
- *License Keys* are tied to a *Seed Number* in UCD-400 HW
- License Keys can be copied to any number of PCs
- Licenses are managed with *License Manager SW*



The screenshot shows the 'Unigraf - License Manager' window. It features a 'Back' button, a field for 'Enter new license for device with seed number' (with a seed number '7037ad96000008c' and an 'Install' button), and a table of 'Installed licenses'. A list of 'Attached Devices' is on the left, with one device selected. Blue callout boxes with arrows point to the 'Attached Devices' list, the 'Device Seed Number' field, and the 'Installed licenses' table.

Attached Devices:

- UCD-323 [7037AD96000008C]
- SW Emulated device [EMU001]

Enter new license for device with seed number 7037ad96000008c:

Installed licenses:

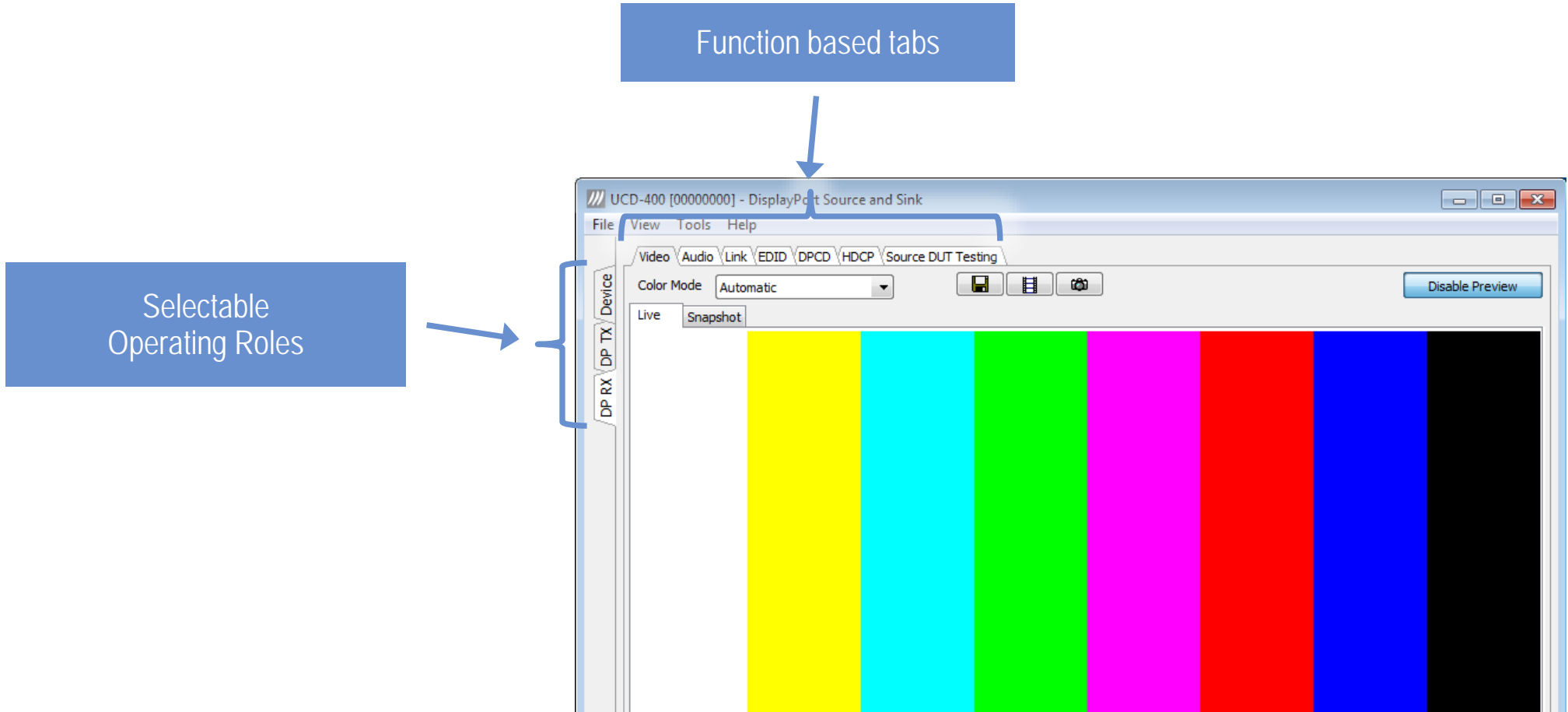
License	Key
TSI Advanced Test Software Set	8WFQ- '9C-P0VD
TSI Basic Test Software Set	09VP-Q SW-TJ2S
UCD Pro for HDMI Sink	KV2R-Y 0H-Q194
UCD Pro for DP Sink	KNRT-C T4-722Y
UCD Pro for HDMI Source	KKLC-A 9H-F54Q
UCD Pro for DP Source	S1TA-N VT9-YZA9
HDCP 2.2 Support	TZHU-1 CPX-DLQH

Attached devices

Device Seed Number

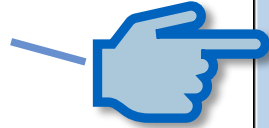
Licenses installed for the selected device

# UCD Console

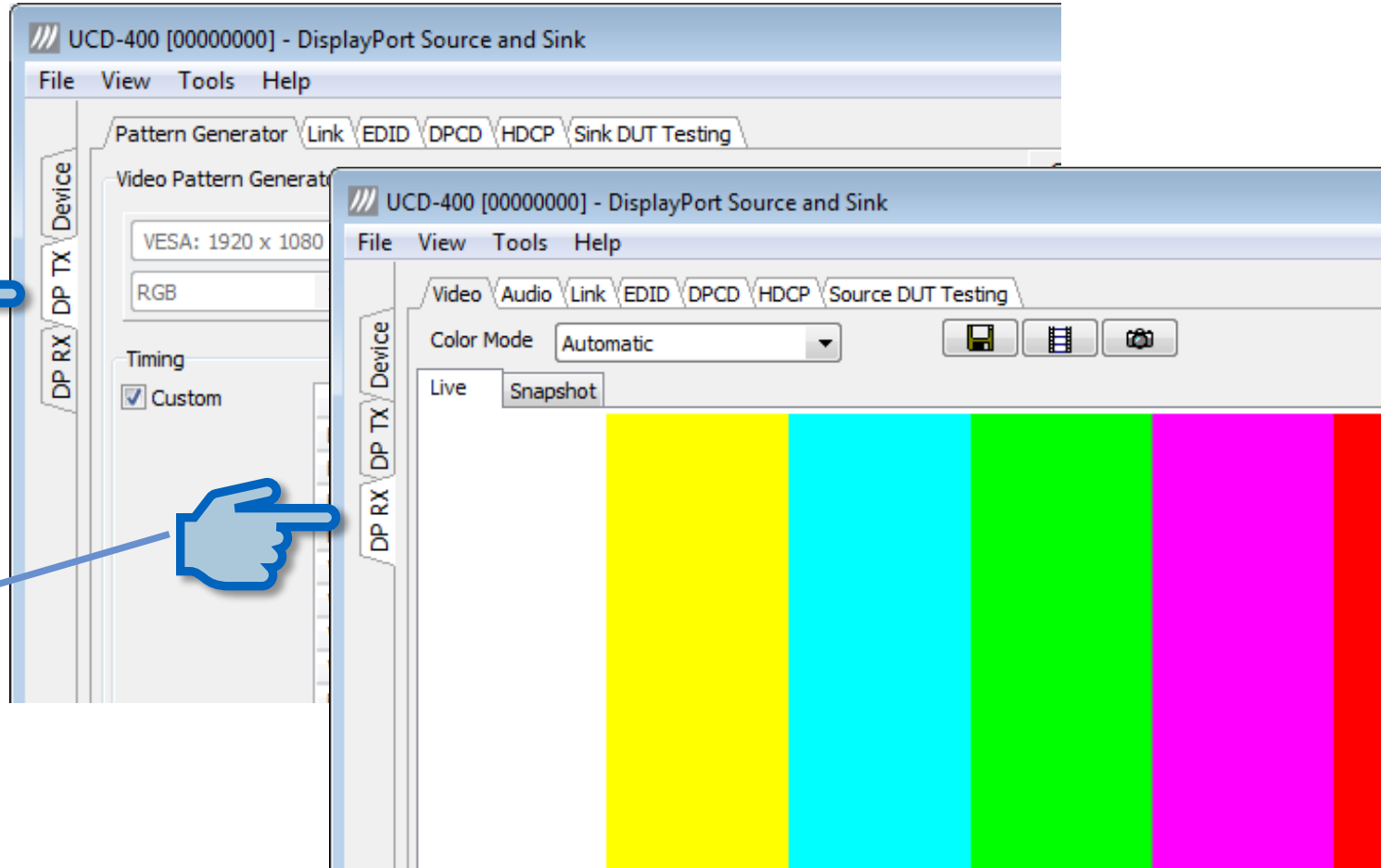


# UCD-400 Roles

Reference Source  
(Test Sink DUT)



Reference Sink  
(Test Source DUT)



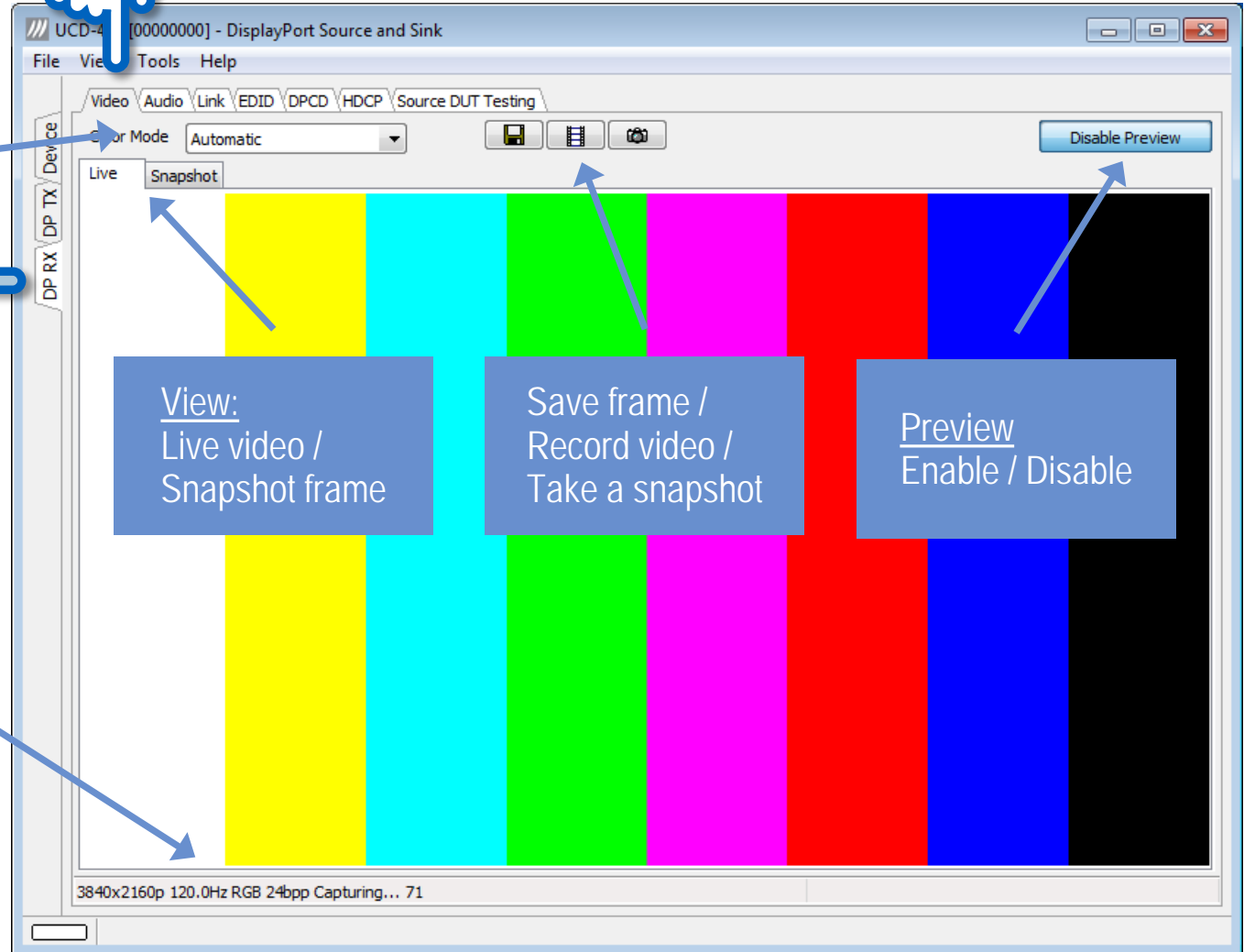
# Video Preview / Capture

Preview color mode

- No conversion
- Automatic
- YCbCr (ITU-709) -> RGB
- SMPTE 170M -> RGB

Detected video:

- Video mode
- Frame Rate
- Color mode
- Frame sequence number



View:  
Live video /  
Snapshot frame

Save frame /  
Record video /  
Take a snapshot

Preview  
Enable / Disable



# Audio Monitor / Capture

- Captured audio channels:  
Signal waveform
- Captured audio channels:  
Frequency spectrum
- Captured audio channels:  
Sound level indicator

UCD-400 [UCD-400] - DisplayPort Source and Sink

File View Tools Help

Video Audio Link EDID DPCD HDCP Source DUT Testing

Spectrum 60 dB [Red Recording Indicator] [No audio playback] [Disable Preview]

DP RX DP TX Device

Start audio recording

Playback  
- No playback  
- Select device

Preview  
Enable / Disable

2 channels; 48000 Hz; 16 bits

24000 Hz

# Link Status

Cable detection  
HPD status

Links status

Stream status:  
Received MSA

The screenshot shows the 'Link' configuration page in the UCD-400 software. Key elements include:

- Cable / HPD:** Shows 'Cable' and 'HPD' status with green indicators. Includes 'Assert', 'Deassert', 'Pulse HPD' (set to 500 msec), and 'Short Pulse' buttons.
- Link Status:** A table showing status for Lane 0, Lane 1, Lane 2, and Lane 3. All lanes are active with a status of 400. Other parameters include Clock Recovery, Symbol lock, Channel equalization, Voltage swing (mVpp), and Pre-emphasis (dB).
- Link Configuration:** Includes 'Max Lanes' (set to 4), 'Max Bitrate, Gbps' (set to 5.40), and 'Other Features' like 'TPS3 Capable' and 'Generate HPD pulse on Apply'.
- Stream Status:**
  - Horizontal:** Total: 7840, Start: 112, Active: 7680, Sync Width: (+) 32
  - Vertical:** Total: 4381, Start: 58, Active: 4320, Sync Width: (-) 5
  - Misc:** Frame Rate, Hz: 29.999, Color Depth: 8, Color Encoding: RGB unsp. (legacy RGB mode)
  - CRC:** Red CRC: 0x3A65, Green CRC: 0xF27C, Blue CRC: 0x832F

HPD control

Link configuration

Control DSC / FEC

Frame CRC



EDID

The screenshot shows the 'UCD-400 [00000000] - DisplayPort Source and Sink' application window. The 'EDID' tab is selected, displaying a table of EDID data. The data is organized into columns for hexadecimal addresses (000000 to 0000f0) and their corresponding values. A hand icon points to the 'Device' tab in the left sidebar, with an annotation 'Edit EDID data as HEX'. Another hand icon points to the 'Load / save as file' button in the 'EDID Files' section. A third hand icon points to the 'Clear / append' button in the 'HEX Editor' section. A fourth hand icon points to the 'EDID Editor ...' button. A fifth hand icon points to the 'Read' button in the 'Sink EDID' section. A sixth hand icon points to the 'Read / Write to HW' button. The 'Sink EDID' section also contains a 'Write' button.

Address	Value
000000	00 ff ff ff ff ff 00 54
000010	34 18 01 04 b5 3d 23 78 3e
000020	0f 50 54 bf ef 80 71 4f 83
000030	b3 00 95 00 d1 c0 4d d0 00 a0 10 70 3e 80 30 20
000040	35 00 5f 59 21 00 00 1a 56 5e 00 a0 a0 29 50
000050	30 20 35 00 5f 59 21 00 00 1a 00 00 00 fd 00 38
000060	4b 1e 86 36 00 0a 20 20 20 20 20 00 00 00 fc
000070	00 55 43 44 2d 33 58 58 20 44 50 0a 20 20 01 d0
000080	02 03 12 11 83 4f 00 00 25
000090	1f c0 00 00 00 00 00 00 00
0000a0	00 00 00 00 00 00 00 00 00
0000b0	00 00 00 00 00 00 00 00 00
0000c0	00 00 00 00 00 00 00 00 00
0000d0	00 00 00 00 00 00 00 00 00
0000e0	00 00 00 00 00 00 00 00 00
0000f0	00 00 00 00 00 00 00 00 00 00 00 00 00 5c

## EDID Editor

Logical tree view  
Click to expand / collapse

Load / save as file

E-EDID Encoder / Decoder

- Collection 1
  - Blocks in collection
    - Block 0 [VESA EDID]
      - Checksum
        - Version
          - Extension flag
          - Vendor & Product ID
          - Basic Display Parameters and Features
          - Display x,y Chromacity coordinates
          - Established timings I and II
          - Manufacturer's Timings
          - Standard Timings
          - 18-Byte data blocks
            - Descriptor 1
            - Descriptor 2
            - Descriptor 3
            - Descriptor 4
      - Block 1 [CEA 861]
        - Checksum
        - CEA Extensions Version
          - Sink Underscans IT video
          - Basic audio
          - YCbCr (4:4:4)

Details of ":\0\Version\Vendor\_Product ID"

Key	Value
ID Manufacturer Name	UFG
ID Product Code	0x4036
ID Serial Number	0x3032344c
Manufacture or Model year	Manufacture Year and Week
Week of manufacture	Week 20
Year of manufacture	Year 2012

Load Save Show Hex Show Log

Edit selected item

# DPCD Editor

The screenshot shows the DPCD Editor window for a device named 'UCD-400'. The interface includes a menu bar (File, View, Tools, Help), a toolbar with 'Load' and 'Save' buttons, and a main display area with two DPCD register address ranges. The top range is from 0x0 to 0x100, and the bottom range is from 0x100 to 0x180. A 'Decoded register content' panel on the right shows the decoded values for the top range, including 'MAX\_LANE\_COUNT [RO] (Maximum number of lanes) = 4'. Annotations include a hand icon pointing to the 'DPCD Decoder' dropdown, a callout 'Set decoder interpretation', a callout 'Two DPCD register address ranges' pointing to the address range inputs, a callout 'Set address range' pointing to the 'Number of bytes to read' field, a callout 'Read / Write to HW' pointing to the 'Set Reference', 'Refresh', and 'Write Changes' buttons, and a callout 'Set as compare reference' pointing to the 'Set Reference' button. A 'Load / save as file' callout points to the 'Load' and 'Save' buttons.

# HDCP Status

HDCP authentication status

The screenshot shows the 'UCD-400 [1734C239] - DisplayPort Source and Sink' application window. The 'HDCP' tab is selected in the top menu. On the left, a vertical toolbar contains 'DP RX', 'DP TX', and 'Device'. A hand icon points to the 'Device' button. The main area is divided into two sections: 'HDCP 1.3' and 'HDCP 2.2'. Each section has a 'Status' area with four progress bars and a 'Configuration' area with checkboxes and radio buttons. A hand icon points to the top of the window. A blue box labeled 'HDCP authentication status' has an arrow pointing to the 'Active' status bar in the HDCP 2.2 section. Another blue box labeled 'Set HDCP capable' has an arrow pointing to the 'HDCP Capable' checkbox in the HDCP 2.2 configuration area. A third blue box labeled 'Load encryption keys' has an arrow pointing to the 'Production' radio button in the HDCP 2.2 configuration area.

HDCP 1.3

Status

- Active
- Authenticated
- Declared as HDCP capable
- Keys loaded

Configuration

- HDCP Capable
- Keys
  - Production
  - Facsimile - "Test"
  - None

HDCP 2.2

Status

- Active
- Authenticated
- Declared as HDCP capable
- Keys loaded

Configuration

- HDCP Capable
- Keys
  - Production
  - None

# Run Test Cases

The screenshot shows the 'UCD-400 [1727C238] - DisplayPort Source and Sink' window. The 'Source DUT Testing' tab is active, showing a tree view of test sets on the left and a parameter configuration table on the right. A hand icon points to the 'Device' dropdown menu. Another hand icon points to the 'CRC based Video Test Set' in the tree view. A third hand icon points to the 'Test timeout, milliseconds' field in the table. Below the table are 'Load', 'Save', 'More...', 'Capture', and 'Reset' buttons. At the bottom, there is a 'Run' button, a 'Test runs' spinner set to 1, a 'Time between tests, sec' spinner set to 1, and 'Report' and 'Clear' buttons. A hand icon points to the 'More...' button. A fourth hand icon points to the 'Report' button.

Select tests to run

Set test parameters

Load / save parameters

Start test

Select # runs and delay

Additional test parameters

Create a report

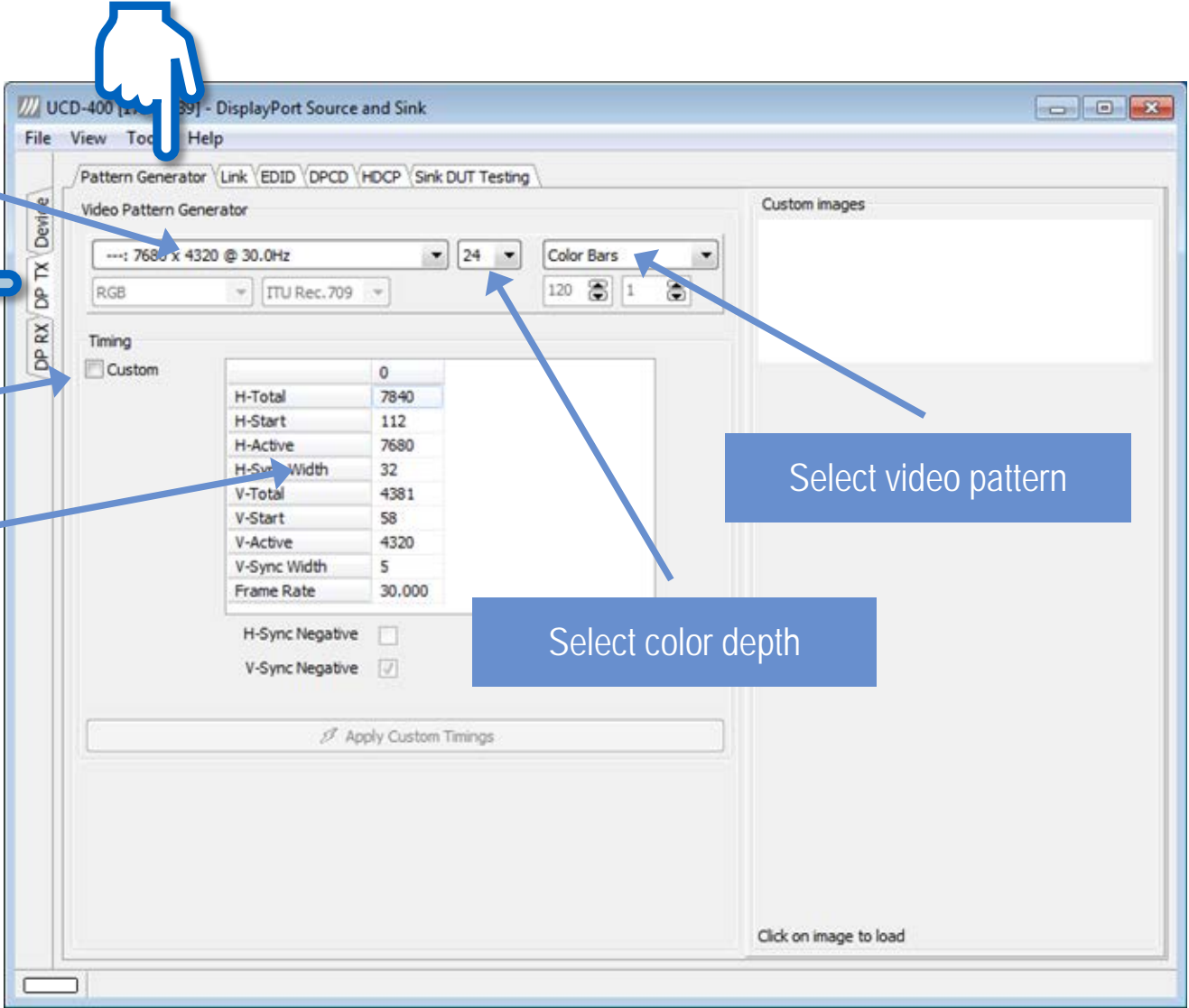
Parameter	Value
Test timeout, milliseconds	100000
Total number of frames	2000
Number of frames to be tested	20
Number of bad frames allowed	2
Reference width	1920
Reference height	1080
Reference refresh rate, Hz	18
Reference tolerance, mHz	0
R value CRC[1]	0xDA1F
G value CRC[1]	0xB9CB
B value CRC[1]	0x2E77
R value CRC[2]	0xDA1F
G value CRC[2]	0xB9CB
B value CRC[2]	0x2E77

# Video Pattern Generator

Select standard video mode

Use custom timings

View / edit video mode details



Select video pattern

Select color depth



# Link Status

HPD status

Link status

Set link voltage level override

The screenshot shows the 'UCD-400 [1734C235] DisplayPort Source and Sink' software window. The 'Link' tab is active, displaying various configuration options. A hand cursor points to the 'Link' tab. The 'HPD' section shows a green bar and the text 'Asserted'. The 'Link Status' section shows four lanes (Lane 0 to Lane 3) with green bars and values of 400 mVpp and 3.5 dB. The 'Link Configuration' section shows 'Number of Lanes' set to 4 and 'Bit rate, Gbps' set to 8.10. The 'Output Level' section shows 'Voltage Swing, mVpp' set to 400 and 'Pre-Emphasis, dB' set to 0. The 'Link Pattern' section shows 'Active video' selected. The 'CRC' section shows Red CRC: 0x9A78, Green CRC: 0xD0D6, and Blue CRC: 0x0DBF. The 'FEC' section shows 'Enable' checked. A 'Link training' button is visible. A hand cursor points to the 'Link training' button.

Set link configuration

Select stream pattern

Enable FEC

# HDCP Status

HDCP authentication status

The screenshot shows the 'UCD-400 [1727C238] - DisplayPort Source Sink' application window. The 'HDCP' tab is selected in the top navigation bar. On the left, a vertical toolbar contains 'DP RX', 'DP TX', and 'Device'. The main area is divided into two sections: 'HDCP 1.3' and 'HDCP 2.2'. Each section has a 'Status' area with four indicators and a 'Configuration' area with checkboxes and radio buttons. A blue hand cursor points to the 'HDCP' tab. Another blue hand cursor points to the 'Device' button in the toolbar. A blue box labeled 'HDCP authentication status' has an arrow pointing to the 'HDCP 2.2' status indicators. A blue box labeled 'Enable encryption' has an arrow pointing to the 'Enable encryption' checkbox in the 'HDCP 2.2' configuration area.

Version	Status	Configuration
HDCP 1.3	Active	<input type="checkbox"/> Enable encryption
	Authenticated	<input type="checkbox"/> Authenticate
HDCP 2.2	Active	<input checked="" type="checkbox"/> Enable encryption
	Authenticated	<input checked="" type="checkbox"/> Authenticate

# Run Test Cases

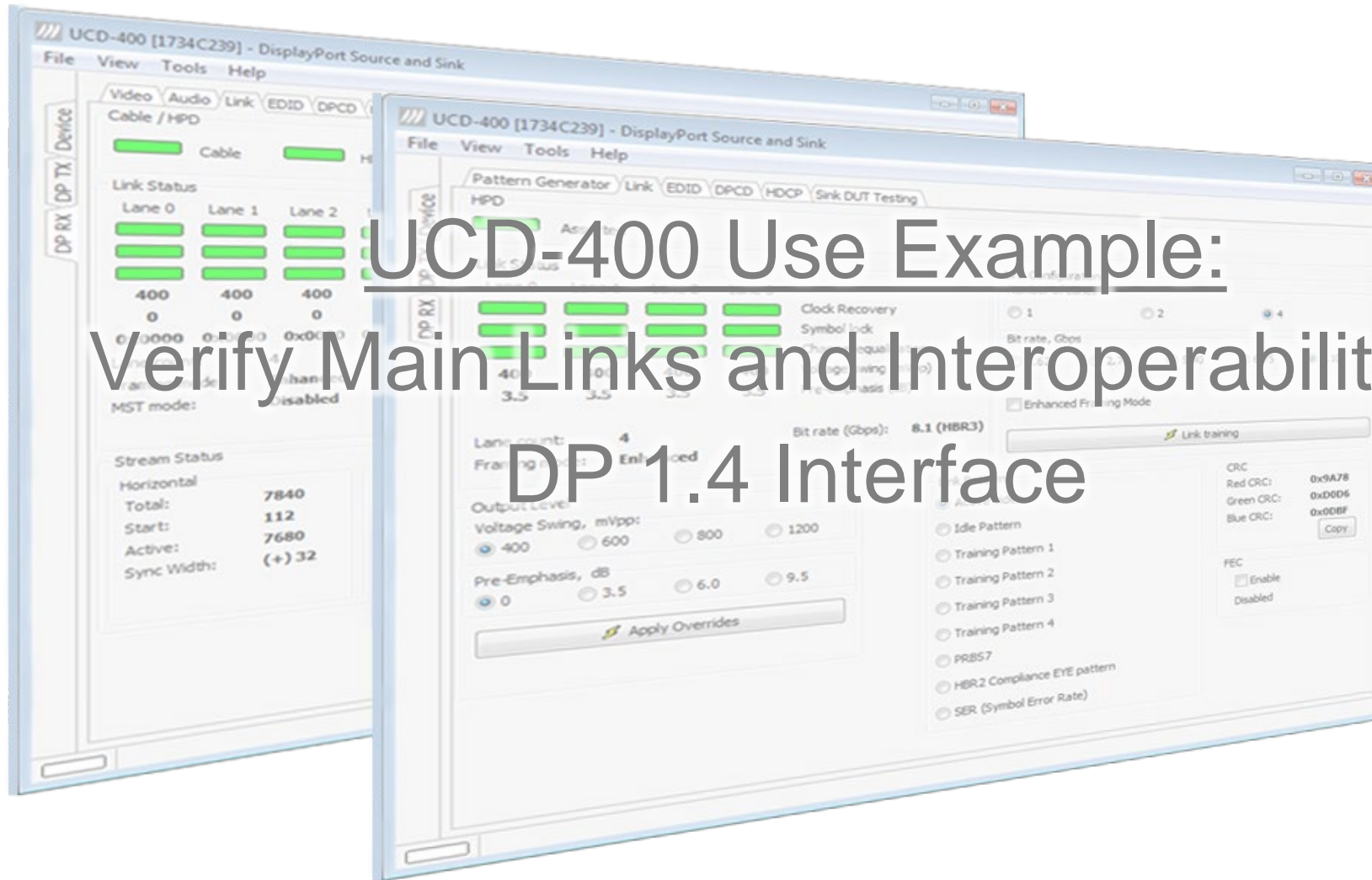
Select tests to run

Start test

Test results

The screenshot shows the UCID-400 software interface with several annotations:

- A hand icon points to the "Device" tab in the left sidebar.
- An arrow points from the "Select tests to run" box to the "HDCP 2.2 CTS 2C Test Set" in the main window.
- An arrow points from the "Set test parameters" box to the "Test timeout, milliseconds" input field, which is set to "100000".
- An arrow points from the "Load / save parameters" box to the "Load" button.
- An arrow points from the "Start test" box to the "Run" button.
- An arrow points from the "Test results" box to the "Test runs" and "Time between tests, sec" fields.
- An arrow points from the "Select # runs and delay" box to the "Test runs" and "Time between tests, sec" fields.
- An arrow points from the "Create a report" box to the "Report" button.



UCD-400 Use Example:  
Verify Main Links and Interoperability of DP 1.4 Interface

# Agenda: Four Basic Tests

- Verify HBR3 LT manually
- Link Training test
  - ✓ Test LT at all supported link counts and link rates
- Verify proper link training and video mode (4K@p60)
  - ✓ Use pre-designed EDID to force the desired mode
- Run video stability test
  - ✓ Verify CRC (check-sum) of 2000 captured frames

# Verify LT Manually

UCD-400 [1734C] DisplayPort Source and Sink

File View Tools Help

Pattern Generator Link EDID DPCD HDCP Sink DUT Testing

HPD:  Asserted

Lane 0	Lane 1	Lane 2	Lane 3	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Recovery
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Symbol lock
400	400	400	400	Channel equalization
3.5	3.5	3.5	3.5	Voltage swing (mVpp)
				Pre-emphasis (dB)

Link Configuration

Number of Lanes:  1  2  4

Bit rate, Gbps:  1.62  2.70  5.40  6.75  8.10

Enhanced:

Link training:

Output Level

Voltage Swing, mVpp:  400  600  800  1200

Pre-Emphasis, dB:  0  3.5  6.0  9.5

Apply Overrides

Link Pattern

Active wave

Idle Pattern

Training Pattern 1

Training Pattern 2

Training Pattern 3

Training Pattern 4

PRBS7

HBR2 Compliance EYE pattern

SER (Symbol Error Rate)

1 Verify Clock Recovery

2 Verify CH\_EQ, Sym\_Lock, Lane Align

Reference Source / Link

UCD-400 [1734C] DisplayPort Source and Sink

File View Tools Help

Video Audio Link EDID DPCD HDCP Source DUT Testing

Cable / HPD:  Cable  HPD  Assert  Deassert  Pulse HPD 500 Length, msec  Short Pulse

Lane 0	Lane 1	Lane 2	Lane 3	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Clock Recovery
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Symbol lock
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Channel equalization
400	400	400	400	Voltage swing (mVpp)
0x0000	0x0000	0x0000	0x0000	Pre-emphasis (dB)

Link Configuration

Max Lanes:  1  2  4

Max Bitrate, Gbps:  1.62  2.70  5.40  6.75  8.10

Other Features

TPS3 Capable

Generate HPD pulse on Apply

DSC

FEC capable Not capable

DSC enable Disabled

Update Link Status

Stream Status

Horizontal	Vertical	Misc	CRC
Total: 7840	Total: 4381	Frame Rate, Hz: 29.999	Red CRC: 0x3A65
Start: 112	Start: 58	Color Depth: 8	Green CRC: 0xF27C
Active: 7680	Active: 4320	Color Encoding: RGB unsp. (legacy RGB mode)	Blue CRC: 0x832F
Sync Width: (+) 32	Sync Width: (-) 5		Copy

1 Verify Clock Recovery

Reference Sink / Link

# Link Training Test

- Test:  
Link Training at All Supported Lane Counts and Link Rates
- Part of LL CTS

UCD-400 [1727C238] - DisplayPort Source and Sink

File View Tools Help

Video Audio Link EDID DPCD HDCP Source DUT Testing

Device  
DP TX  
DP RX

- ▷ CRC based Video Test Set
- ▲ Link Test Set
  - ▷ Link Training at All Supported Lane Counts and Link Rates
  - ▷ DP 1.4 Link Layer CTS
  - ▷ HDCP 2.2 CTS 1A Test Set
  - ▷ HDCP 2.2 CTS 1B Test Set

Test timeout, milliseconds	5000
Max lanes count supported by DUT	4
Max lane rate supported by DUT in 0.27Gbps	20
Reserved for DUT Capabilities flags	0
Reserved for DUT Test automation capabilities flags	0
Long HPD pulse duration, milliseconds	1000
Link training start timeout, milliseconds	5000
Delay between test cycles, milliseconds	3000

1 Set parameters. Run test

Run Test runs 1 Time between tests, sec 1

2 Verify result

```

0029.367.132: Source DUT completes Link Training
0029.367.235: Delay 3.000 seconds before next test cycle
0032.367.573: Set MAX_LINK_RATE = 14h, MAX_LANE_COUNT = 4
0032.367.665: Long HPD pulse (1000 ms)
0033.368.504: Wait until Source DUT makes link training
0033.413.242: Source DUT completes Link Training
0033.413.313: Test PASSED: "Link Training at All Supported Lane Counts and Link Rates"
***** Completed *****

```

Reference Sink / Source DUT Testing

# Link Training and

# Video Mode

**1** Load & program pre-designed EDID for 4K@120 Hz & 5K@60 Hz

Reference Sink / EDID

**2** Verify Link Training

**3** Verify Video mode

Stream Status	
Horizontal	Vertical
Total: 4000	Total: 2222
Start: 112	Start: 32
Active: 3840	Active: 2160
Sync Width: (+) 59	Sync Width: (-) 5

Reference Sink / Link



# Video Stability Test

**1** Load & program pre-designed EDID for 4K@120 Hz & 5K@60 Hz

UCD-400 [00000000] - DisplayPort Source and Sink

EDID Data:

000000	00 ff ff ff ff ff ff 00 10 ac b6 40 00 00 00 00
000010	0c 17 01 04 b5 3c 22 78 3a 72 25 ac 50 33 b7 26
000020	0b 50 54 21 08 00 81 00 b3 00 d1 00 a9 40 81 80
000030	d1 c0 01 01 01 01 56 5e 00 a0 a0 29 50 30 20
000040	35 00 55 50 21 00 00 1a 00 00 00 ff 00 00 00 00
000050	00 00 00 00 00 00 00 00 00 00 00 00 fc 00 44
000060	45 4c 4c 20 55 50 32 37 31 35 4b 0a 00 00 00 fd
000070	00 1d 4b 1f b4 36 01 0a 20 20 20 20 02 b6
000080	02 03 4b 7f b0 05 84 03 01 12 13 14 16 07 90 1f
000090	20 22 5d 5f 60 61 62 64 65 66 5e 63 02 06 11 15
0000a0	26 0f 07 07 07 07 00 83 01 00 00 e2 00 ff 72 03
0000b0	0c 00 10 00 78 44 20 40 84 01 02 03 04 00 00 00
0000c0	00 e3 05 ff 01 45 0f 00 80 19 00 8c 0a d0 8a 20
0000d0	e0 2d 10 10 3e 98 00 c4 8e 21 00 00 18 8c 0a 8e
0000e0	14 51 f0 16 00 26 c4 30 00 c4 8e 21 00 00 9f 00
0000f0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 7d
000100	70 12 79 00 00 03 01 c b4 9a 01 84 ff 4d 68 01
000110	18 80 60 00 df 10 3d 00 2f 00 08 00 bc 79 01 04
000120	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
000130	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
000140	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
000150	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
000160	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
000170	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

EDID Files: Load ..., Save as ...

HEX Editor: Clear, Append file ...

EDID Editor ...

Sink EDID: Read, Write

Reference Sink / EDID

**2** Set parameters

**3** Run test

**4** Verify result

UCD-400 [1727C238] - DisplayPort Source and Sink

Test parameters:

Test timeout, milliseconds	100000
Total number of frames	2000
Number of frames to be tested	20
Number of bad frames allowed	2
Reference width	1920
Reference height	1080
Reference bpp	24
Frame rate, mHz	0
Frame rate tolerance, mHz	0
Value CRC[1]	0xB69E
Value CRC[1]	0xB33E
Value CRC[1]	0x1AB3
Value CRC[2]	0x0000
Value CRC[2]	0x0000

Run button

Test runs 1, Time between tests, sec 1

Test results log:

```

0000.007.748: Stage 3: - synchronization...
0000.015.857: Reference frame has crc : 0xdbaf, 0x2d78, 0x5a71
0000.015.984: done.
0000.016.026: Stage 4: - gathering information...
0016.682.438: 2000 frames were tested.
0016.682.543: 0 mismatches were found.
0016.682.615: Test PASSED: "CRC based single frame video stability test"
----- Completed -----
    
```

Reference Sink / Source DUT Testing

# UCD-400 Specifications

- Input DP 1.4 (8K@30 Hz, 4K@120 Hz)
- Output DP 1.4 (8K@30 Hz, 4K@120 Hz)
- Maximum pixel clock 1,332 MHz
- HDCP 1.3 and HDCP 2.2 support
- Computer Interface USB 3.0
- Operating System Windows 10, 8 and 7
- Power Input +12 Vdc (AC/DC converter included)
- Module Size 280 x 200 x 80 mm
- Weight 1.2 kg

# UCD-400 Features: DisplayPort Reference Source (DPTx)

Pattern Generator	Fixed and custom Video Timings Fixed and custom Video Patterns
Link	Link Status (Clock Recovery, Symbol Lock, Voltage swing, Pre-emphasis, Lane count, Link rate, Framing mode) HPD Status: (Asserted / De-asserted) Set link configuration: (Lane count, Link Rate, Framing mode, Clock mode) FEC Feature
EDID	Read / Write, Save / Load, EDID Editor
DPCD	Read / Write, Save / Load, Decoded DPCD content
HDCP	HDCP 1.3 and HDCP 2.2 Support Control: (Enable / Disable, authenticate only, Encryption Enable / Disable) Status: (Authentication status, Encryption status)
Sink Device Testing	Execute TSI Tests Execute HDCP 2.2 CTS for testing DP Sink DUT

# UCD-400 Features: DisplayPort Reference Sink (DPRx)

Video	Preview, Capture, Store frame and video Video status
Audio	Monitor and graphical preview, Capture audio. Audio Status
Link	Link Status, Set Link Configuration Stream Status (video, audio) HPD Status, Assert / De-assert, Long /Short Pulse FEC Feature, DSC Decoder
EDID	Read / Write, Save / Load, EDID Editor
DPCD	Read / Write, Save / Load, Decoded DPCD content
HDCP	HDCP 1.3 and HDCP 2.2 Support Control: (Enable / Disable, Authenticate only, Encryption Enable / Disable) Status: (Authentication status, Encryption status)
Source Device Testing	Execute TSI Tests Execute DP LL CTS Execute HDCP 2.2 CTS for testing DP Source DUT

Thank You!



[www.unigraf.fi](http://www.unigraf.fi)  
[www.unigraf-china.cn](http://www.unigraf-china.cn)  
info@unigraf.fi