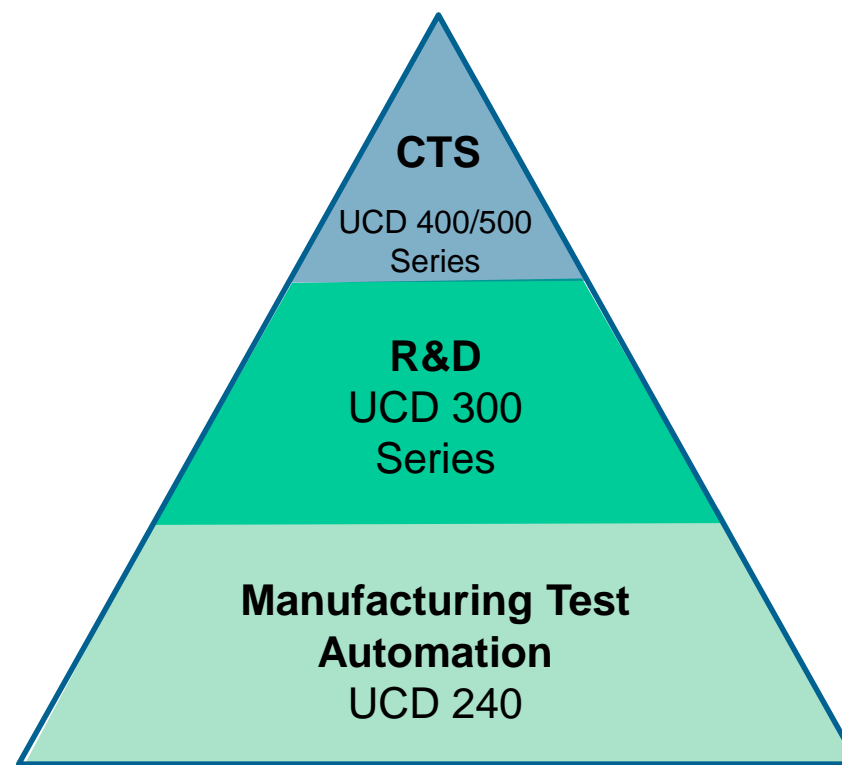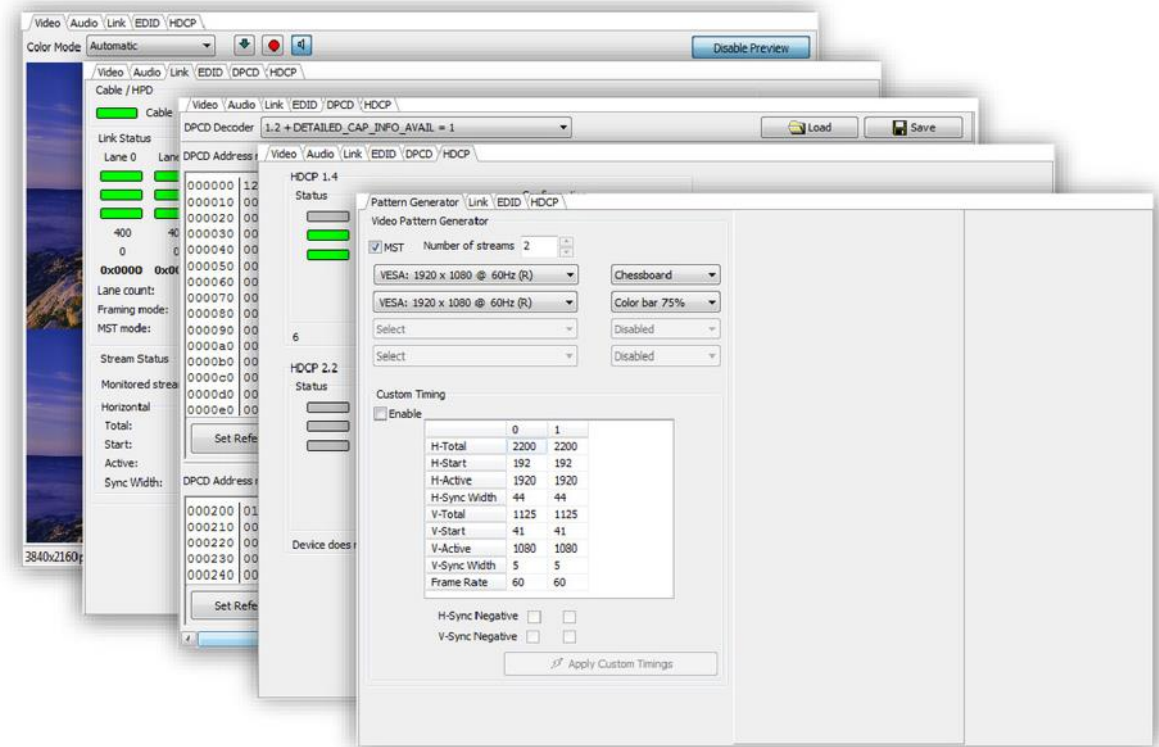# UNIGRAF

Product Portfolio

Unigraf Hardware/Software Offering

- Unigraf PC software is currently supported on Windows.

- New PC software is currently being developed to support Windows, MacOS and Linux

- Test automation scripts are already available for Windows, MacOS and Linux.

CTS
UCD 400/500 Series

R&D
UCD 300 Series

Manufacturing Test Automation
UCD 240

Unigraf PC Software – UCD Console

The UCD Console GUI is Unigraf's PC software that enables users to preview, control and run tests for DisplayPort, USB-C, and HDMI devices that are connected to Unigraf's test equipment devices.

Test System Interface (TSI)

The Test System Interface (TSI) is a Software Application Interface (API) that users can run from the terminal window to access all the features of Unigraf's test equipment and test automation applications.

- Unigraf's TSI includes ready-made test scripts for testing e.g. video, audio, link, EDID, and power delivery.

- Suitable for an automated test environment in the production line and R&D testing of DisplayPort, USB-C, and HDMI interfaces.

Typical Use Cases:
DisplayPort 1.4 8K Video Generator & Analyzer, UCD-400

Devices Tested:

- Graphics Chipsets
- 8K TVs, Monitors and Transmitters
- Dolby Vision Testing 8K

Use Cases:

- Official DP compliance testing
- In House CTS Validation
- Driver Regression Testing
- HDCP 2.3 CTS for sinks, sources, and repeaters
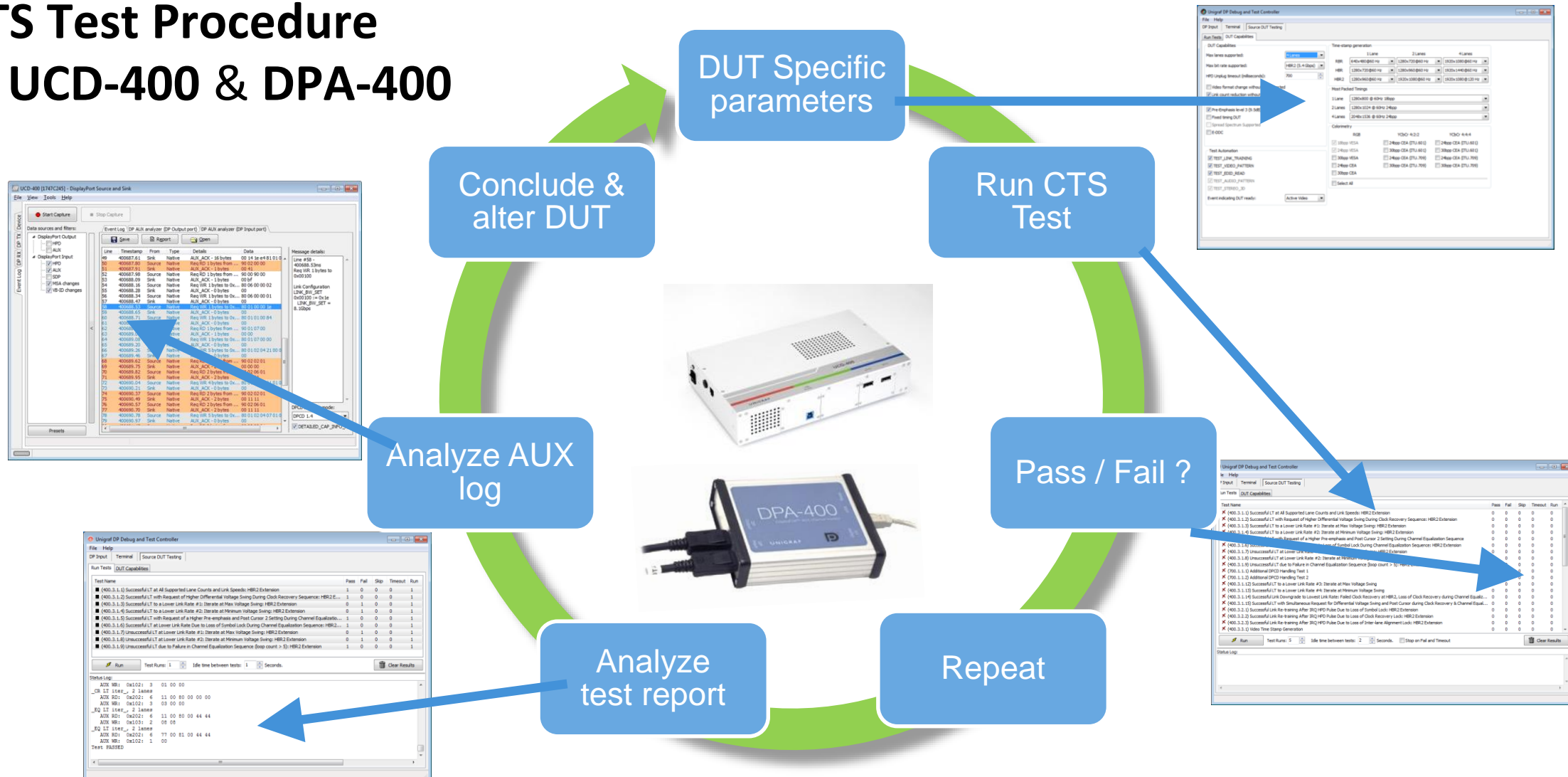- Link Layer 1.4 CTS including DSC
- CTS Test Automation

DisplayPort 1.4 8K Video Generator & Analyzer, UCD-400

- VESA Certified DP 1.4 Link Layer CTS Test Tool
- DCP Approved HDCP 2.3 CTS Tool
- Up to 8K Reference Sink & Source
- DP 1.4 / HBR3 input and output in one unit
- Cable adapter for USB-C devices testing
- MST support (4 streams)
- DSC Sink, FEC and LTTPR support
- HDCP 1.3 and HDCP 2.3 support

CTS Test Procedure
using **UCD-400** & **DPA-400**

DUT Specific parameters

Run CTS Test

Conclude & alter DUT

Pass / Fail ?

Analyze AUX log

Repeat

Analyze test report

Compliance Test Tools

SW Tool	UCD-400	DPA-400 AUX Monitor	DPR-100 AUX Controller	DPT-200 AUX Controller
DP 1.4 Link Core CTS	✔			
HDCP 2.3 CTS	✔			
Audio CTS	✔			
PHY CTS (AUX Controller)			✔	✔
R&D Debug GUI	✔	✔		
Test Automation	✔	✔		
AUX Monitor	✔	✔		

DPR-100/DPT-200
Companion Tools for
PHY CTS Testing

Product Comparison: Unigraf and Quantum Data

UCD-400

V.S.

QD-980 / M41D

26,500€

37,500€

	UCD-400	QD-980/M41D
Price	Full debugging capability at basic price	-
Flexibility	Higher	-
Easy to use	Easily view test functions and results on user interface	-
VESA/DCP approved	✓	✓
Unique feature	Dolby Vision/Audio testing & LTTPR	More feature for data analysis

Feature Comparison: UCD-400 vs QD-980

Features	UCD-400	QD-980
DP 1.4a Link Layer CTS	✓	✓
HDCP 2.2/2.3 CTS	✓	✓
Display Stream Compression (DSC)	✓	✓
Forward Error Correction (FEC)	✓	✓
Link-Training Tunable PHY Repeaters (LTTPR)	✓	
Video Pattern Testing	✓	✓
Audio CTS Tests	✓	✓
Dolby Vision / Dolby Audio Testing	✓	
DisplayPort Configuration Data (DPCD)	✓	✓
Auxiliary Channel Analyzer (ACA)	✓	✓
DP Multi Stream Transport (MST 4 Streams)	✓	✓
Secondary Data Packets (SDP) Capturing	✓	✓

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Typical Use Cases:
HDMI 2.1 8K Video Generator & Analyzer, UCD-422

Devices Tested:

- Dolby Vision 8K Testing
- TVs
- Monitors

Use Cases:

- HDCP 2.3 Support
- No limitation to custom video output
  - ✓ HDR , HDR 10+
  - ✓ Customers need to have the decoders for analysis

DOLBY VISION

8K

HDMI 2.1 8K Video Generator and Analyzer, UCD-422

- HDMI 2.1 Test Equipment (FRL)
- Enhanced Gaming Features: VRR, ALLM
- TMDS support
- HDCP 2.3 support
- Dolby Vision Test Tool
- 8K@60 fps support (12 Gbps/channel)
- eARC support *(Estimated Q1/20)*
- DSC support *(Estimated 2020)*

Video Analyzer Software (Estimated Q1/20)

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Typical Use Cases:
USB-C DP Alt Mode 8K Video Generator and Analyzer, UCD-424

- DisplayPort Compliance Testing for USB Type-C Devices
- DP Alt Mode 8K Type-C Devices

8K

USB-C DP Alt Mode 8K Video Generator & Analyzer UCD-424

- DP 1.4 Link Layer CTS support
- HDCP 2.3 CTS support
- Up to 8K support for reference sinks, sources & repeaters
- DP 1.4 / HBR3 input and output in one unit
- USB-C v1.3 input and output with Power Deliver
- Power Delivery: Capable to sink & source 9V
- PD Role swaps supported
- MST support (4 streams)
- DSC Sink, FEC and LTTPR support
- HDCP 1.3 and HDCP 2.3 support

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Typical Use Cases:
USB-C DP Alt Mode 4K Video Generator and Analyzer, UCD-340

Devices Tested:

- Tablets
- Laptops
- Mobile Phones
- Chargers
- Type-C Displays
- VR Glasses
- HDMI to USB-C Dongles and Cables

Use Cases:

- HDCP 2.3 CTS
- Video source and sink
- Power delivery and power load up to 100W
- Cable quality testing

USB-C DP Alt Mode 4K Video Generator and Analyzer, UCD-340

- Test DP Alt Mode video and audio
- Test USB-C Power Delivery with DP Alt Mode
- USB-C and PD2.0 controls
- Power source and load up to 100W
- **Electrical test for DUT connector pins**
- **Cable flip with SW**
- HDCP 1.3 and HDCP 2.3 support
- USB data pass-thru

USB-C 4K Video Analyzer and Generator for Test Automation, UCD-240

- Automated tests for USB-C DisplayPort Alt Mode
- Electrical Test to verify whole USB-C connector with single cable insert
- Test USB 2.0 and USB 3.0
- 4K@60 support
- Set test parameters with provided software
- Easily run tests from the command line
- Unigraf's Test System Interface (TSI) support
- Third Party Test Management Software Support e.g. NI TestStand Support

Typical Use Cases:
USB-C 4K Video Analyzer and Generator for Test Automation, UCD-240

Devices Tested:
- Mobile Phones
- Laptops
- Tablets
- VR Glasses
- Chargers

Use Cases:
- Production Test Automation
- Software Release Testing

Opportunities for USB-C

- PC and Laptop makers: ASUS, Acer, Apple, HP, Lenovo, Dell, VAIO
- Monitor manufacturers: HP, Dell, LG, Samsung
- Mobile phones: HMD (Nokia phones), HTC
- **Cable and converter manufacturers:** BELKIN, ELKA, Luxshare, Moshi
- **VR/AR goggles:** MS Hololens, Varjo (Finland), Google
- **Car Infotainment systems:** Continental, Bosch
- ODM and CEM's: Foxconn, Flextronics and Compal should have many projects

HDMI & DP 4k Video Analyzer, UCD-301

- Compact, USB 3.0 connected test equipment
- HDMI 2.0 and DP 1.2 compliant
- 4K / UHD @ 60 Hz
- Test video, audio and metadata
- Verify electrical continuity of output signals

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Typical Use Cases:
HDMI & DP 4K Video Analyzer, UCD-301

Devices Tested:

- Game Consoles
- Set Top Boxes
- Blu-ray Players

Use Cases:

- Electrical Testing on HDMI
- HDCP 2.3 CTS Testing for Source Devices

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Opportunities for HDMI 2.0

- Set top box makers: Arcadyan, Liteon
- Media Players: Apple TV, Google Chromecast
- Soundbar manufacturers: Tymphany, LG, Samsung
- Cable and converter manufacturers: Barco, Belkin, Luxshare, Moshi
- Game console makers: SONY, MSFT X-box, Nintendo
- Foxconn, Flextronics and Compal should have many projects

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Typical Use Cases:
HDMI & DP 4K Video Analyzer and Generator, UCD-323

Devices Tested:

- Monitors
- TVs
- Dolby Vision 4K
- Game Consoles
- Set Top Boxes
- Blu-ray Players
- Soundbars
- AV Switches
- Converters (DP/HDMI)

Use Case:

- HDCP 2.3 CTS for Sinks and Sources

HDMI & DP 4K Video Analyzer and Generator UCD-323

- HDMI 2.0 and DP 1.2 input and output in one unit

- UHD / 4K compliant test equipment

- DCP Approved HDCP 2.3 CTS Test Tool

- HDCP 1.3 and HDCP 2.3 support

- Sink and source video, audio and configuration parameters

- Approved Dolby Vision & Dolby Digital Plus compatibility test tool

- Approved Dolby Atmos & Dolby Digital Plus compatibility test tool

DPA-400 with the AUX Channel Monitor GUI

- Compatible with all DP versions up to 2.0
  - ✓ Device independent
  - ✓ Can be used between any DP Source and Sink
- Time stamped interaction log
- Detect and parse all DPCD locations
- Decode Sideband Channel Communication messages
- Flexible in MST testing
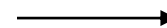- USB controlled & powered, small and light weight
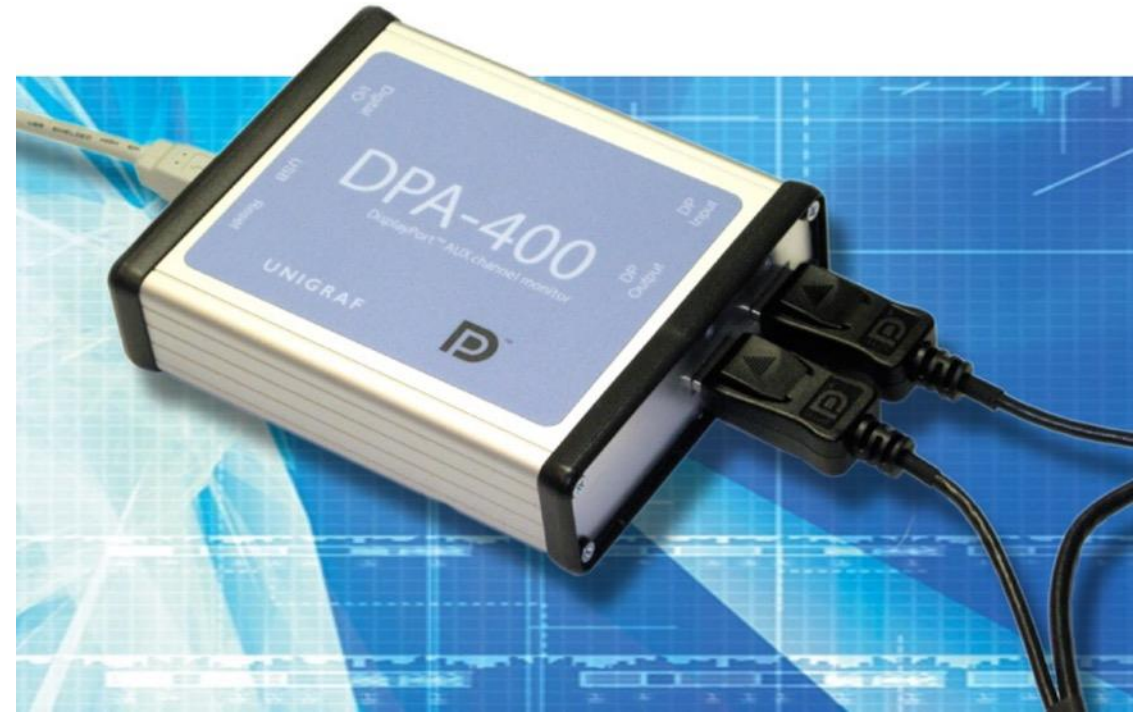
AUX Channel Monitor is mandatory tool for any engineer verifying or debugging Compliance Test or Interoperability

Companion Tools for DP PHY Test Automation

DPR-100/DPT-200 to be used with:
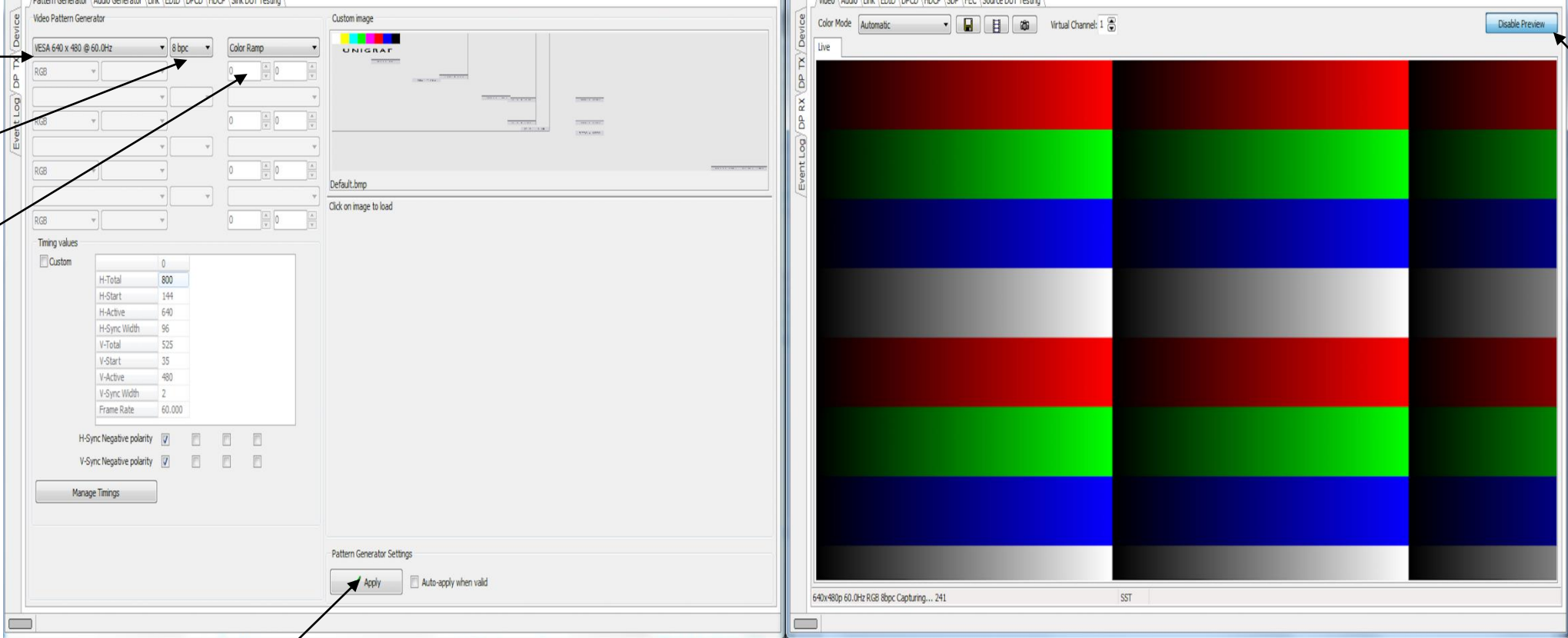
- Keysight DSO90000A, DSAV1604A or DSA 90000 X-Series Infiniium oscilloscopes
- Tektronix oscilloscopes

Video Pattern Generator – UCD Console GUI

Transmitter (TX) Side

Receiving (RX) Side

Select Video Timings

Select Bits Per Color

Select Pattern

Apply Video Pattern Generator to RX Side

Enable / Disable Preview of Video Pattern

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CAPTURING THE WORLD