

# quantumdata™ 280G/A 18G Generator/Analyzer Test Instrument Set Portable, Feature Rich and Affordable!



**280G Tx Unit**

**280A Rx Unit**

## Benefits

- Shortens time on job site.
- Reduces callbacks and truck rolls.
- Simplifies testing process.
- Verifies network components and design

## Key Features

- Test HDMI and HDBaseT cables, devices, components and entire video distribution networks end to end up to 18G (HDMI).
- Verify hot plug, +5V, EDID, HDCP, Video transmission through a video distribution network.
- Check interoperability between video sources, displays and distribution equipment.
- Diagnose video and protocol failures in cables, video distribution devices and components.
- Simple Pass/Fail test indication on LCD display offers quick “Time-to-Insight.”
- Test reports provide HTML formatted reports of tests performed to demonstrate proper network turn up.
- Handy optional carrying case available

The Teledyne LeCroy 280 HDMI/HDBaseT Video Generator (Tx) and Analyzer (Rx) is small compact, battery powered test set ideally suited for professional A/V integrators and home theatre installers. This feature-rich test set enables you to conduct basic verification and diagnostic tests on HDMI/HDBaseT cables, video distribution networks and individual A/V components. The HDMI input and output ports support testing up to 18 Gbps data rate and 600 MHz pixel rate and the HDBaseT input and output ports support testing up to 300 MHz pixel rate.

The instrument set's features and convenient operation can shorten time on the job site and reduce callbacks by enabling you to run basic verification and diagnostic tests on complex video distribution installations quickly and efficiently.

*This convenient test Instrument set can pay for itself by eliminating truck rolls and shortening time on the job site.*

## Diagnose and Troubleshoot

Installing video distribution networks whether in residences or commercial, industrial or institutional facilities is complex. These installations do not all go well. A variety of failure conditions can occur such as no video, degraded video, flashing video, unexpected video, etc. These failures point to a range of underlying problems.

Whether verifying an HDMI cable or a re-terminated HDBaseT cable run, checking an HDBaseT extender, testing the EDID handling of an HDMI switch, checking HDCP content protection protocols or just verifying a video distribution network end-to-end, this compact, affordable 280 set will save you time on site, reduce callbacks and provide you with assurance that the video distribution network you just installed will run problem free.

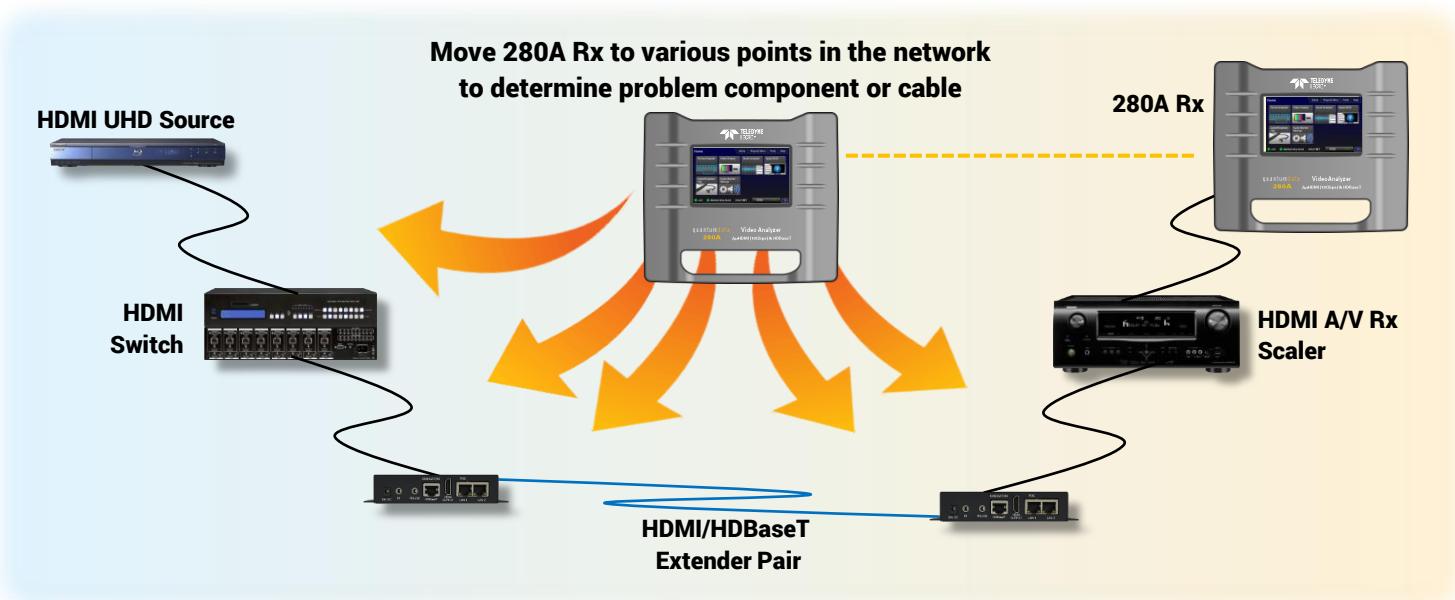
## Ease of Use

The 280's embedded touch screen indicators provide ease of use and fast Time-to-Insight when testing cables and distribution gear and checking interoperability between video components and diagnosing failures.

# SOURCE TESTING OR TESTING DISTRIBUTION NETWORK UPSTREAM

## Verify and Troubleshooting a Video Network Upstream

In the example below the 280A Rx unit serves as a 4K video display to verify various video resolutions, bit depth settings, colorimetry, sampling etc. You can also verify the +5V and emulate an EDID to verify that the upstream network is passing it through to the source properly. HDCP can be verified as well using either HDCP 1.4 or HDCP 2.2. If you encounter problems you can **segment the network** by moving the 280A Rx upstream to run further tests. In this case the 280A Rx can serve either as an HDMI or an HDBaseT sink. Segmenting the network either from the upstream direction or the downstream direction enables you to **determine where the failure occurs**.



## 280A Main Stream

The screenshot shows the main interface of the 280A device. At the top, there is a navigation bar with tabs: Home, Reports Menu, Prefs, and Help. Below the navigation bar are several icons representing different functions:

- Format Analyzer (Icon: Waveform)
- Video Display (Icon: TV)
- Audio Analyzer (Icon: Soundwave)
- Apply EDID (Icon: Computer monitor)
- Cable/Repeater Test (Icon: HDMI cable)
- Audio Monitor Settings (Icon: Gear and speaker)

At the bottom of the main screen, there are status indicators: +5V (green), 3840x2160p 59.94 (green), and HDCP 2.2 (green). To the right, there is a detailed view of the "Format Analyzer" screen.

**Format Analyzer Screen (Right Side):**

- Home, Reports Menu, Prefs, Help tabs.
- Refresh button.
- Video type: HDMI
- Total: 4400 x 2250
- Active: 3840 x 2160
- Frames/sec: 59.9
- Scan type: Progressive
- Bits per comp.: 8
- Color space: YCbCr 4:4:4
- AV Mute Status: Not muted
- HDCP: encrypted

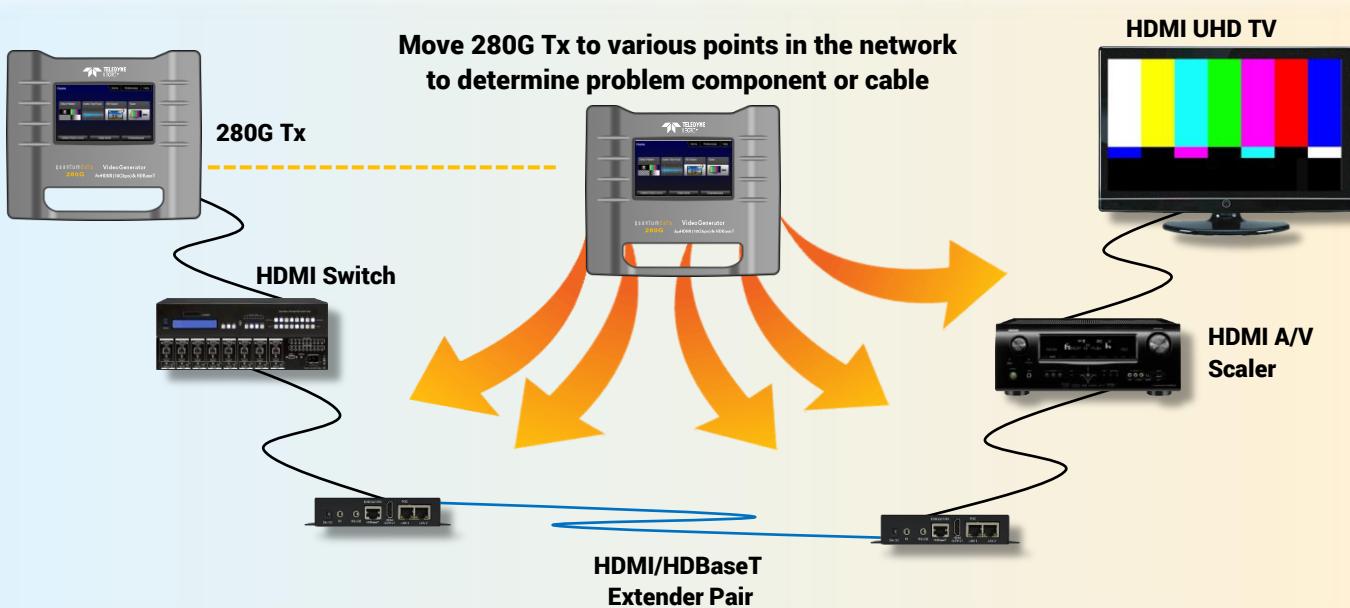
**Video Preview Screens:**

- 280A Video Analyzer Screen:** Shows a scene from a movie with George Clooney and a woman in a red coat.
- 280A Video Display Screen:** Shows a scene from a movie with a man in a dark suit and a woman in a red coat.

# SINK TESTING OR TESTING DISTRIBUTION NETWORK DOWNSTREAM

## Verify and Troubleshooting a Video Network Downstream

In the example below the 280G Tx is placed at the source end. The 280G Tx will serve as an HDMI 4K video source and check various video resolutions and video settings. You can also verify the hot plug voltage and check for a valid EDID. HDCP can be verified as well using either HDCP 1.4 or HDCP 2.2. If you encounter problems you can *segment the network* by moving the 280G Tx downstream to run further tests at various points in the network. In this case the 280G Tx can serve either as an HDMI or an HDBaseT source. Segmenting the network enables you to *determine where the failure occurs—to identify the problem device or cable*.



## 280G Main Stream

**280G Main Stream Software Interface:**

- EDID Test:** Summary: Header is OK. All checksums OK. EDID Ver. 1.3. HDMI: Yes ( PA 1.0.0.0, 48, 36, 30 bit color, 3D supported ). Manufacturer/Product: QDI 10250. Pref. Native Timing: 3840x2160 60.00Hz. SVDs: 480i 480p 576i 576p 720p 1080i 1080p 1080p24 4K50 4K60. Speakers: [ FL/FR ]. PCM 2 ch., [32 44.1 48] kHz @ [16 20 24] bits.
- HDCP Output Test:** Receiver ID = 0x05E7AC43B6. RxCaps = 0x020000 ( ). Authentication, succeeded.
- Result:** PASS
- Other Functions:** Video Pattern, Audio Test Tone, CEC Test (Polling...), Cable/Repeater Test, and various resolution and timing options (e.g., 3840x2160 60Hz, 3840x2160 30Hz).

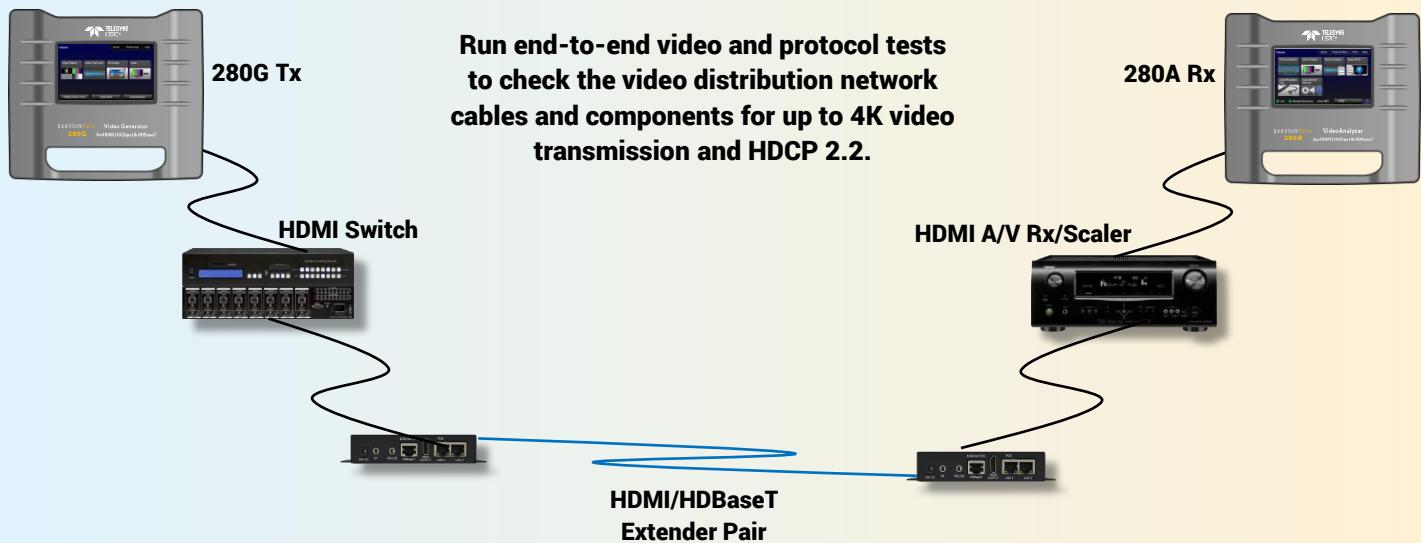
**280G EDID Test Screen**

**280G HDCP 2.2 Test Screen**

# APPLICATIONS – QUALIFYING NETWORK INFRASTRUCTURE

## Verifying a Video Link End-to-End

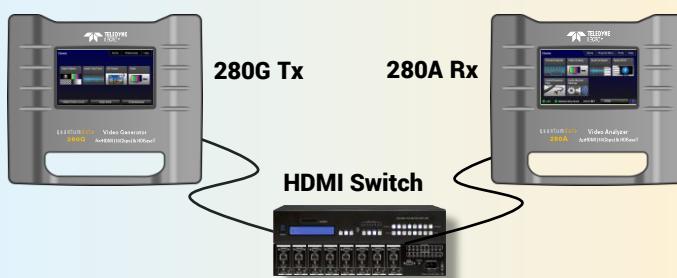
The 280 Installation test set enables installers to *check a video distribution network* prior to the delivery of the video source and display components. The 280G Tx device can be placed at the source end and the 280A Rx device at the far end where the display will be mounted. A series of tests can be run to verify the link bandwidth capability up to 4K@60Hz even if the link will only be transmitting 1080p initially. This enables you to *future proof the link*. The test set can *test for basic signal integrity* and even *test protocols* such as HDCP (content protection) and EDID. When failures occur individual component devices and cables can be tested separately.



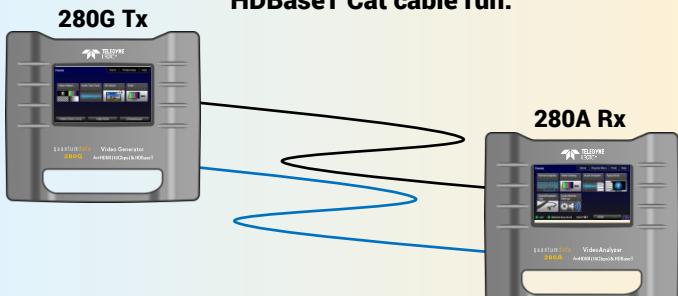
## Verify Individual Cables, Devices and Components

If you encounter a distribution link problem during qualification testing (above), the 280 test set enables you to test each distinct element: cables, extender, switches, scaler etc. to quickly identify the root cause of a link failure. Here are just a few examples below:

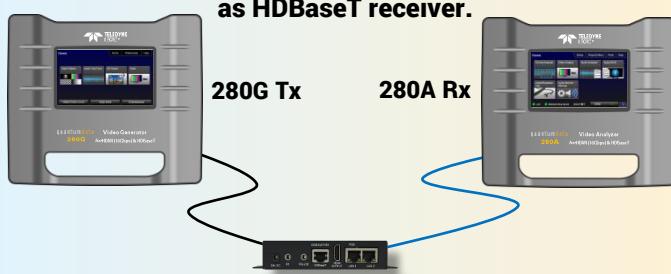
**Test HDMI switch and HDMI cables for EDID, HDCP and video formats.**



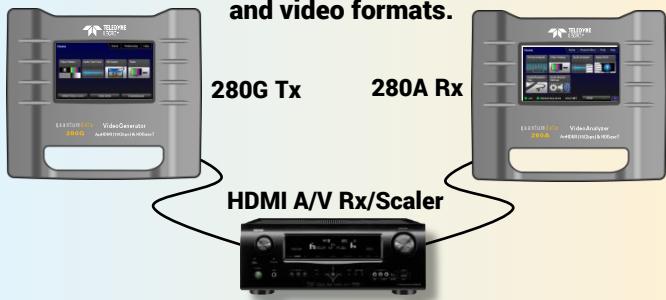
**Test signal quality of HDMI or HDBaseT Cat cable run.**



**Test HDMI/HDBaseT extender. 280G Tx serves as HDMI source; 280A Rx serves as HDBaseT receiver.**



**Test HDMI scaler for EDID, HDCP and video formats.**



# SPECIFICATIONS

## HDMI

Version	HDMI 2.0
Standard Formats	VESA (DMT, CVT-R, CVT), CEA
Connector	(1) Type A 280G; (1) Type A 280A
Protocol	HDMI, DVI
Video Colorimetry	ITU-R BT.601-5, ITU-R BT.709-5, BT.2020 (Rx only)
Video Max Pixel Rate	18G bps data rate; 600 MHz pixel rate (upscaled from 1080p)
Video Encoding / Sampling	RGB, YCbCr; 4:4:4, 4:2:2, 4:2:0
HDCP	Versions 1.4 & 2.2
Audio Formats	2Channel LPCM

## HDBaseT

Version	HDBaseT 1.0
Standard Formats	VESA (DMT, CVT-R, CVT), CEA
Connector	(1) 8P8C (RJ-45) Tx; (1) RJ-45 Rx
Video Colorimetry	ITU-R BT.601-5, ITU-R BT.709-5
Video Max Pixel Rate	300 MHz
Video Encoding / Sampling	RGB, YCbCr; 4:4:4, 4:2:2, 4:2:0
HDCP	Versions 1.4 & 2.2
Audio Formats	2Channel LPCM

## Tests Supported

280G Transmitter	Select from common standard CEA and VESA formats
- Video Format Test	Select from several test patterns; patterns above 1080p are up-scaled to 4K
- Video Pattern Test	Check hot plug voltage from connected sink (e.g. UHD TV)
- Hot plug detect	Verify HDCP; select version 1.4 or 2.2
- HDCP active	View summary of EDID contents of connected sink or entire downstream network
- EDID Test	Generate LPCM audio test tone to check continuity end-to-end
- Audio Test	
280A Receiver	
- Video Format Test	Verify incoming video timing from a UHD source
- Video Test	View incoming video on embedded screen; view pixel values up to 150MHz pixel rate
- +5V	Check +5V from a UHD source
- HDCP Active	Verify HDCP operation; version 1.4 or 2.2
- EDID Test	Emulate EDIDs to test response of source or entire upstream network
- Link / Cable Test	Test HDMI or HDBaseT cable runs
- Audio Test	Verify LPCM audio end-to-end

## Instrument (each unit)

AC Adapter/Charger	100-120 VAC, 47-63Hz
Battery	Minimum 4 hours continuous use on 8 hour charge
Micro SD Card Slot	For saving and retrieving test reports, EDIDs and software upgrade files
LCD Display	480 (H) x 272 (V) resolution; 4.3" diagonal
Weight (each unit)	0.95 LBS (0.358 Kg)
Size (each unit)	Height: 7.1 in. (18.04 cm) Width: 7.4 in. (18.79 cm) Depth: 1.25 in. (3.18 cm)
Environmental	Operating Temp: 32 to 104 (F); 0 to 40 (C)



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