TELEDYNE LECROY
Everywhereyoulook™

# quantumdata™ 780 Handheld Test Instrument


## Key Features

- **HDMI input and output ports for testing both source display devices as well as cables and distribution networks**
- **Test Ultra High Definition video products supporting 1080p resolutions up to 225 MHz**
- **Video pattern and format library with programmable settings**
- **Protocol tests for digital video sources and displays, including test for HDCP authentication**
- **Protocol logging application auxiliary channel analyzer (ACA) enables real time monitoring of EDID exchanges, HDCP transactions and CEC messages**
- **Passive protocol logging between a source and a sink is also optionally supported**
- **NEW! Report File Creation feature provides html formatted report of tests performed on a project**

**The Teledyne LeCroy quantumdata 780 Handheld Test Instrument is a battery powered portable, handheld digital video generator and analyzer that enables you to run tests on digital video devices and network distribution devices on site or in the R&D lab. The HDMI ports support testing up to 225 MHz pixel rate. Testing these HDMI devices is supported by both an output port and an input port to allow testing of HDMI video sources, displays, audio devices and distribution devices. The 780 also offers a VGA output for testing RGB and component analog.**

## Diagnose and Troubleshoot

The 780 model provide a status bar on the bottom of the touch screen. The status bar provides basic information about what the instrument is transmitting to a display and what it is receiving from a source. The instruments can run quick video audio and protocol tests on individual sources, displays , repeaters, distribution gear as well as cables. Protocol tests include tests for EDID, HDCP authentication, infoframes and timing data. You can place the 780 at any point in a video distribution network and run tests upstream toward the source while emulating a display (or sink). Or you can run tests downstream while emulating a source. Generator reports to demonstrate test series completion.

## Ease of Use

The 780's color touch screen provides ease of use. The rich set of routine tests and diagnostic tests are accessible with just a few touch clicks. You can quickly configure settings on the outputs. A rich command set, available through the USB port supports automated testing.

# SOURCE & NETWORK DIAGNOSTIC TEST FEATURES

## View Incoming Video & Data

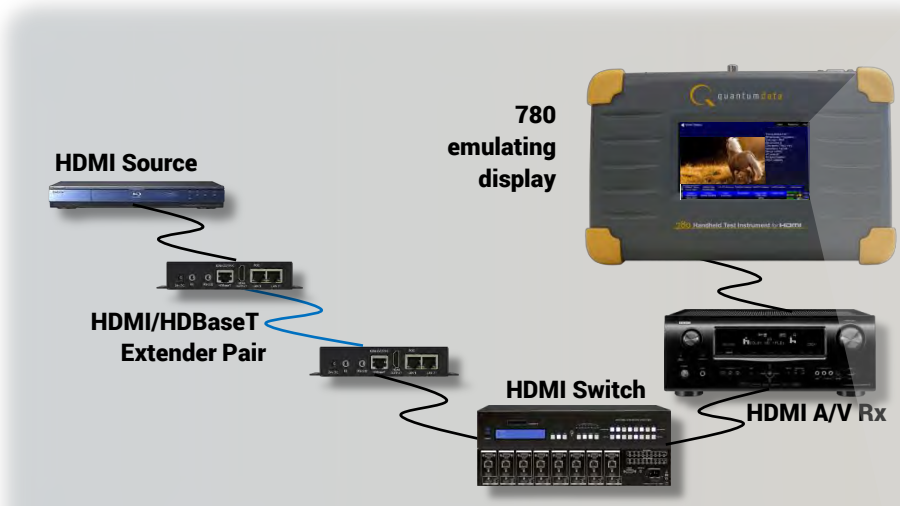
The 780 status bar provides essential information about the incoming video. The Video Display Test shows the incoming video and essential video and audio meta-data. Both provide quick time-to-insight when conducting routine tests or diagnosing interoperability problems.

## Test Response to EDIDs

Many interoperability problems are related to EDIDs. 780 enables you to emulate any EDID to test a source's response. You can use commercial EDIDs or test EDIDs with specific video and audio support. Test with EDIDs with known anomalies.

## View Aux Chan Transactions

Complex interoperability problems require visibility into the auxiliary channel. You can monitor HDMI and HDBaseT Display Data Channel data to view EDID, HDCP and CEC transactions. You can check details of each transaction in the log and distribute the logs to colleagues.




Example Source Test Setup

### Video Display Test – View video & metadata

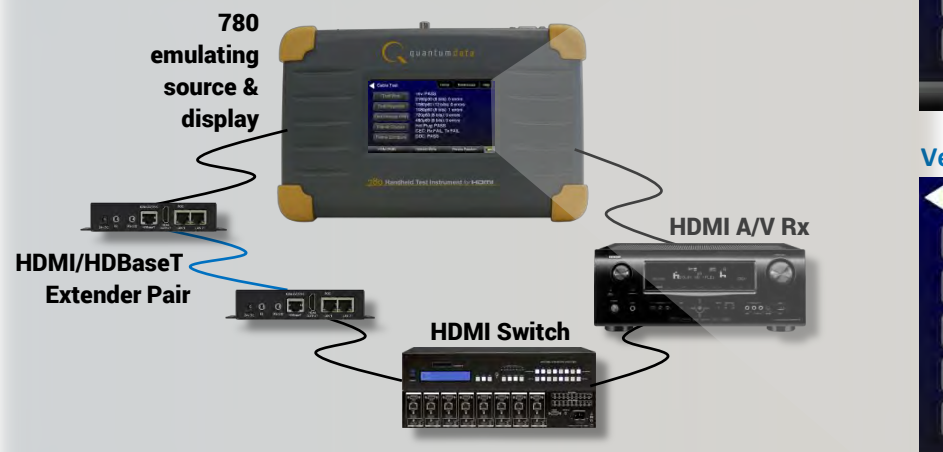

### Format Analyzer – View metadata & timing


## Verify Cable / Network (Loop)

The 780 enables you to test distribution equipment to verify integrity of extenders, matrix switches and distribution amps. You can test individual devices or entire networks including digital video cables.

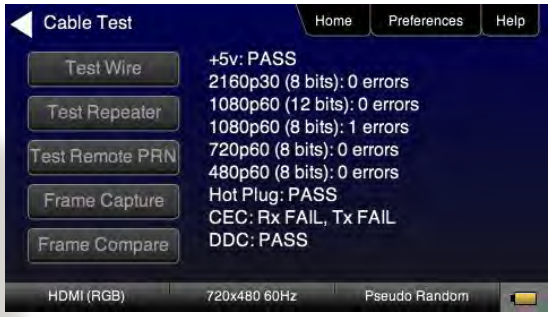
## Verify Video at Far End

The 780 supports testing of installed distribution networks from the far-end at the display.




Example Network Test Setup

### Cable Test - Verify networks and cables




### Verify distribution network from far end

# SINK (DISPLAY) TEST & DIAGNOSTIC FEATURES

## Verify Video

Select from CEA and VESA formats or create your own custom formats including 1080p resolutions with deep color for testing up to 225 MHz. Use the test pattern library to verify specific video display elements. Set bit depth, pixel encoding, colorimetry and sampling parameters. Use industry standard patterns for color calibration. Create custom bitmap test patterns. Scroll bitmaps to test motion artifacts.

## Verify EDID Contents

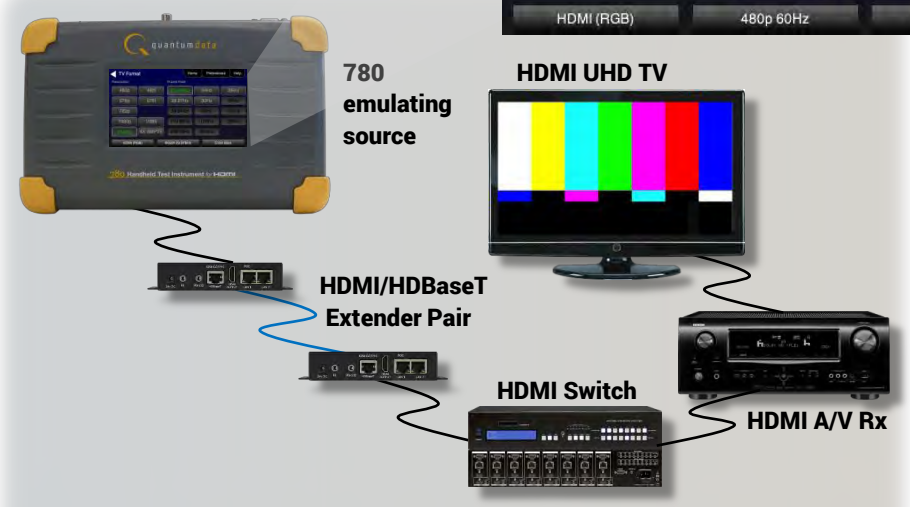
Many interoperability problems are related to EDIDs. You can view the EDID contents of any connected display to verify its audio/video capabilities. You can verify the structure of an EDID and check for compliance. Capture and EDID from a connected display and save it for future testing.

## Verify Audio

You can use the 780 to verify audio on displays or audio systems using programmable LPCM test tones. Set sampling rate, bit depth, amplitude and number of channels. You can select Dolby and DTS compressed audio clips including Dolby TrueHD & DTS Master Audio.

### Video Test – Select formats & parameters


### Audio Test
### Select compressed or LPCM tones


Sink (Display) Test Setup

### EDID Verification Test


## Verify HDCP Authentication

HDCP authentication problems occur in complex digital video distribution networks. Use the HDCP test to quickly check HDCP 1.4 authentication. Enabling and disabling HDCP can quickly reveal the nature of an interoperability problem. Monitor the HDCP transactions during the HDCP test using the Aux Channel Analyzer.

### Aux Channel Analyzer


### HDCP Authentication Test

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## HDMI

| | |
|---|---|
| Version | HDMI 1.4b |
| Standard Formats | VESA (DMT, CVT-R, CVT), CEA |
| Connector | (1) Type A Tx; (1) Type A Rx |
| Protocol | HDMI, DVI |
| Video Colorimetry | ITU-R BT.601-5, ITU-R BT.709-5 |
| Video Max Pixel Rate | 225 MHz (2.25 Gbps/channel TMDS rate) |
| Color Depths | 8, 10, 12 bits |
| Video Encoding / Sampling | RGB, YCbCr; 4:4:4, 4:2:2, 4:2:0 |
| HDCP | Versions 1.4 |
| Audio Formats | LPCM, Dolby (DD, DD+, TrueHD), DTS (ES, HD, Master Audio) |
| Audio LPCM Settings | Sampling rates (32 – 192 kHz); Bits per sample (16, 20, 24) |

## Digital Audio

| | |
|---|---|
| **Connectors** | Optical (JIS FOS); SPDIF (RCA) |
| **Audio Formats** | LPCM, Dolby (DD, DD+), DTS (ES, HD) |
| **Audio LPCM Settings** | Sampling rates (32 – 192 kHz); Bits per sample (16, 20, 24) |

## Analog Video

| | |
|---|---|
| Connector | VGA HD-15 |
| Format Standards | VESA, CEA |
| Video Encoding | RGB, YPbPr |
| Max Pixel Rate | 80 MHz (higher resolutions supported through pixel repetition) |

## Options

| | |
|---|---|
| Cable Test | Test digital video cables and video distribution networks |
| Netwrok Analyzer | Protocol testing of sources and sinks |
| ACA Monitor (emulation) | Monitor aux channel and CEC bus while emulating a source or sink device |
| ACA Monitor (passive) | Monitor aux channel and CEC bus passively between source and sink devices |
| Report File Creation NEW! | Provides html formatted report of tests performed on a project |

## Instrument

| | |
|---|---|
| Battery | 6AA NiMh batteries. 2 hours between charge. Overnight charge required. |
| AC Adapter | 100-120 VAC, 47-63Hz; 0.4 amps max |
| Weight | 3.25 LBS; 1.47 Kg |
| Embedded Display | 480 (H); x 272 (V) resolution; 24 bit RGB color. |
| Tilt Bail | For convenient viewing |
| Size | Height: 2.7 in. (6.98 cm) Width: 9.75 in. (24.76 cm) Depth: 6 in. (15.24 cm) |
| Command Line Control | USB Type B |
| Environmental | Operating Temp: 32 to 104 (F); 0 to 40 (C) |
| File Access | USB Type B (command line / file transfer; SD Card (upgrades / file transfer) |

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