quantumdata

VIDEO TEST INSTRUMENTS

The Quantum Data 882D is programmable test instrument packed with features for video and audio testing of HDMI®, dual link DVI, high speed analog displays (up to 400MHz) and a composite analog output for testing standard definition TVs. (NEW!) The HDMI output also supports 3D testing in accordance with HDMI 1.4a standard. The 882D can optionally be equipped with a single link SDI output.

KEY FEATURES + BENEFITS

HDMI
Single link (up to 165 MHz)
(NEW!) 3D pattern testing HDMI 1.4a

Dual link DVI
Dual link (up to 330 MHz).

HDCP
Production keys included with HDMI and DVI signals.

Component Analog
Up to 400 MHz.

SDI / HD-SDI (Optional)
Single link.

graphics SDK
Create complex patterns based on your specifications using C++ software development kit.

easy to use
Access powerful features easily using intuitive user interface.

DUT-based setup
Specify device under test to automatically set up instrument.

multiple configurations
Save and restore different instrument configurations for different users or applications.

local pattern storage
Store multiple custom images (.bmp, .jpg and .png) images in instrument.

comprehensive timing + patterns
Include extensive library of standard timings and patterns. Add your own custom timings and patterns.

central administration
Update and configure all networked instruments from a single computer.

network control
Fully control instrument from any network location with web browser or Telnet client.

881D/882D

APPLICATION TESTS

Formats

Format file types	XML
Standard formats	Over 200 formats for testing IT, CE, military and other display test applications
Custom formats	Graphical format editor
HDMI 1.4a 3D Testing	Frame Packing, Side-by-side, Top-and Bottom, Line Alternative, L+Depth

Patterns

Pattern file types	Custom object (.o) files, BMP, JPEG, PNG
Standard patterns	Over 200 standard static and dynamic images included for testing CRTs and FPDs
Custom patterns	Graphics SDK to create complex patterns
HDMI 1.4a 3D Testing	Standard test patterns and 3D custom bitmaps
Internal data storage	15 MB

HDCP

HDMI and DVI	Authentication and encryption of uncompressed HDMI and DVI signals

HDMI InfoFrames (882D only)

HDMI	Verify InfoFrames sent to display

HDMI Pixel Repetition (882D only)

HDMI	Test gaming formats with variable horizontal resolution

HDMI Active Format Descriptor (AFD) (882D only)

HDMI	Verify HDMI content mapping

HDMI Audio Tests

Rate	Vary audio sampling rate to test sink handling
Frequency	Vary audio frequency to test sink handling
Amplitude	Vary audio amplitude to test sink handling

EDID Read

HDMI, DVI, VGA	Auto-configuration of generator format list
Data channels	
Physical	I2C per VESA E-DDC
Protocols	DDC2B, E-DDC & DDC/CI (reads E-EDID Ver 1.3)

EDID Testing

HDMI, DVI, VGA	Reads EDID from display and presents as displayed image

EDID Compliance Testing (882D only)

HDMI	HDMI EDID processing

DV Swing Test

HDMI, DVI	Vary TMDS digital video signal swing in 4mV increments from 150 to 1560 mVp-p (programmable)

Scrolling Image Test

All interfaces	Scroll any static image

Special Sync Tool

Analog video	Trigger scope or inspection camera anywhere in video

Test Sequences

Create test sequences with unlimited number of steps; each step defines a video format, image, sync, gating and duration (0.1 sec to 24 hours, or frames)

General Specifications

Size (mm)	330 W, 87 H, 284 D
Humidity	30 to 80% RH (non-condensing)
Operating temp.	0 to 40° C
AC Mains	
Frequency	47 to 63 Hz
Voltage	90–264 VAC

SPECIFICATIONS

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HDMI

Connector	One HDMI Type A
Links	Single (165 MHz)
Video	
TMDS protocols	DM 1.0 and HDMI 1.1
Encoding	RGB or YCbCr (only RGB in DVI mode)
Sampling modes	4:4:4 or 4:2:2 (only 4:4:4 in DVI mode)
Bits/component	8, 10 or 12 (only 8 in DVI mode)
Clocks per pixel	1 or 2
Pixel repetition	1 to 10 using interactive test image
TMDS differential swing	150–1560 mVp-p (programmable)
Quantization modes	Full w/optional gamma correction ITU-R BT.709-5 Part 1, Sec 6.10 SMPTE 296M Sec 7.12 under/overshoot
Colorimetry	Legacy HDTV SMPTE 260M-1999 Table 1, ITU-R BT.601-5 Sec 3.5.1 and ITU-R BT.709-5 Sec 4.2-1125
Content fitting methods	All AFD cases (Shoot & Protect, Over-scan, Under-scan, Letterbox/Pillarbox, Anamorphic Squeeze)
Aspect ration	
Content	4:3, 14:9, 16:9
Embedded	4:3, 16:9
Format (coded)	4:3, 16:9
Format timings	All EIA/CEA-861-C formats All E-EDID sink-requested < 81 MHz
Data (island) packet generator types	General control packet, audio samples, ACR data, InfoFrames, null frame
InfoFrame types generated	AVI, SPD, AUD, MPG, GIF (generic)
Audio	
Streams	4
Channels	8
Bits per sample	16
Sampling rates	32.0, 44.1, 48, 88.2, 176.4, 192 kHz
Stream type	IEC 60958-3 Consumer LPCM (IEC61937 possible with external source)
Audio content	FL and FR
Mixer mux	Sinewave or external audio
Embedded sonic data generator	
Channels	4
Waveform	Sinewave
Amplitude	-96.3 to 0.0 dBFS
Frequency Change	20 Hz to 20 kHz
Controls	Mute, amplitude, frequency
External audio interface	
Type	SPDIF input (coaxial)
Amplitude	As received
Connector	VGA w/special SPDIF I/O
Cable	75 ohm special VGA-to-RCA

DVI

Connector	DVI dual link
Links	Dual link 25MHz-330MHz
Encoding	RGB (4:4:4 with 8-bits/component)
TMDS differential swing	150–1560 mVp-p (programmable)

Analog Composite

Connectors	CVBS (BNC) and S-Video
Encoding	NTSC and PAL
Sample rate	24.55-29.50 MHz
Pixel rate	12.27-14.75 MHz
Pixel aspect ratio	Standard or square
Swing	1000 mVp-p fixed w/programmable calibration
Calibration	Self-calibration with internal reference

SDI / HD-SDI (Optional)

Connector	BNC 75 ohm
Links	Single
Bit stream	1.485 Gb/s and 1.485/1.001 Gb/s
Encoding	4:2:2
Bits/component	10-bits/component
Sampling mode	YCbCr
Signal swing	800mV
Standards	SDI - SMPTE 259M; HD-SDI - SMPTE 292M-C

Analog Component

Connector	DVI-I
Color encoding	RGB, YPbPr (unfiltered)
Video levels	
Video swing	0-1000 mV
Sync swing	0-400 mV (bi-level), 0-800 (tri-level)
Video setup	0-100 IRE
Calibration	Self-calibration with internal reference
Protection	Buffered with 75 ohm isolation
Internal data storage	15 MB

Digital Sync

Outputs	HS, VS and Special Sync
Swing	> 2V fixed into 75 ohm

Pixel Clock

Frequency range	
Analog component	5.16-400MHz
HDMI/DVI	25-165 MHz (single-link)
Step	Less than 0.1 Hz
Accuracy	50 ppm (electronically adjustable to <5 ppm with external frequency counter)

Horizontal Timing

Frequency range (kHz)	
Analog composite	15.734 or 15.625
HDMI / DVI	8-1000
Total pixels (max)	65,535
Active pixels (max)	4096
Blank pixels (min)	
HDMI	138 (worst case)
DVI	128
Step pixels	
HDMI/DVI	1

Vertical Timing

Frequency range	1-650 Hz
Total lines (max)	4095 progressive, 8193 interlaced and segmented
Active lines (max)	4096
Blank lines (min)	1 to Total-1
Step lines	1
Scan types	Progressive, interfaced, segmented
Composite sync types	ORed, Serrated, Serrated and Equalized, Tri-level

Video Memory

Size	8,192,000 pixels at 32-bits/pixel 32,768,000 pixels at 8-bits/pixel
Maximum width	8192 pixels at 32 bits/pixel 16,384 pixels at 8 bits/pixel
Color depth	32 (24-bit TrueColor) up to 200 MHz8 bits up to 250 MHz

Administration

Physical user interface (selection keys and display)	
Control interfaces	RS-232 serial AT 10/100 BaseT Ethernet (TCP/IP, FTP,Telnet) GPIB
Browser-based virtual control panel to manage from any network location	
Create custom Microsoft Windows-based applications using Quantum Data SDK (includes API documentation, sample application & source)	
PCMCIA slot	Compact Flash card to boot generator, backup generator configuration, copy generator configuration to other generators, and store patterns

Specifications are based on hardware and firmware revisions available as of July 2008, and are subject to change without notice. HDMI, the HDMI logo and High-Definition Multimedia interface are trademarks or registered trademarks of HDMI \ Licensing LLC.

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