

TEKTRONIX

DPO4104B

The Tektronix DPO4104B is a 1 GHz, 4-channel digital phosphor oscilloscope from the MSO/DPO4000B series, featuring a 5 GS/s sample rate and a 20 Mpoint record length on all channels.

SPECIFICATIONS

General

Interfaces	4x USB 2.0 Host (2 front, 2 rear), 1x USB 2.0 Device (rear), LAN (10/100/1000 Mb/s), XGA Video Port, Auxiliary Input, Auxiliary Out, External Reference In
Display	10.4 in (264 mm) liquid-crystal TFT color display, 1024 x 768 pixels (XGA)

Physical

Power Supply	100 V to 240 V $\pm 10\%$ (50 Hz to 60 Hz), 115 V $\pm 10\%$ (400 Hz), 250 W max
Operating Temperature	0 °C to +50 °C °C
Dimensions (W×H×D)	439 mm × 229 mm × 147 mm mm
Weight	5.0 kg kg

Vertical System

Analog Bandwidth (-3 dB)	1 GHz
Calculated Rise Time (typical)	350 ps
Number of Input Channels	4
Hardware Bandwidth Limits	20 MHz or 250 MHz
Input Coupling	AC, DC, GND
Input Impedance	1 M Ω $\pm 1\%$, 50 Ω $\pm 1\%$
Vertical Resolution	8 bits (11 bits with Hi Res)
Maximum Input Voltage (1 M Ω)	300 Vrms CAT II with peaks $\leq \pm 425$ V
Vertical Sensitivity Range (1 M Ω)	1 mV/div to 10 V/div
Vertical Sensitivity Range (50 Ω)	1 mV/div to 1 V/div
Channel-to-Channel Isolation	$\geq 100:1$ at ≤ 100 MHz, $\geq 30:1$ at > 100 MHz up to 1 GHz
DC Gain Accuracy	$\pm 1.5\%$ for 5 mV/div to 10 V/div, $\pm 2.0\%$ for 2 mV/div, $\pm 2.5\%$ for 1 mV/div
Input Capacitance (1 M Ω)	13 pF ± 2 pF

Horizontal System

Maximum Real-Time Sampling Rate	5 GS/s
Maximum Record Length	20 Mpoints
Maximum Duration at Highest Sample Rate	4 ms
Time Base Range	250 ps to 1000 s
Time Base Accuracy	±5 ppm
Channel-to-Channel Deskew Range	±125 ns

Trigger System

Main Trigger Modes	Auto, Normal, Single
Trigger Coupling	DC, AC, HF Reject, LF Reject, Noise Reject
Trigger Holdoff Range	20 ns to 8 s
Trigger Level Range (Internal Channels)	±8 divisions from center of screen
Trigger Level Range (External/Auxiliary)	±8 V
Trigger Level Range (Line)	Fixed at approximately 50% of line voltage
Standard Trigger Types	Edge, Sequence (B-trigger), Pulse Width, Timeout, Runt, Logic, Setup and Hold, Rise/Fall Time, Video
Optional Serial Bus Trigger Types	Extended Video, I2C, SPI, USB, Ethernet, CAN, LIN, FlexRay, RS-232/422/485/UART, MIL-STD-1553, I2S/LJ/RJ/TDM

Acquisition System

Acquisition Modes	Sample, Peak Detect, Averaging, Envelope, Hi Res, Roll
Peak Detect Minimum Glitch Width	800 ps
Averaging Factor Range	2 to 512 waveforms
Roll Mode Minimum Sweep Speed	Slower than or equal to 40 ms/div
Maximum Waveform Capture Rate	>50,000 wfm/s

Waveform Measurements and Analysis

Automatic Measurements	29 automatic measurements with statistics
Measurement Gating	Screen or Cursors
Waveform Math	Arithmetic, Integrate, Differentiate, FFT, Advanced Algebraic Expressions
Waveform Histograms	Yes (Vertical/Horizontal)
Power Measurements	Optional
Limit and Mask Testing	Optional

Display and User Interface

Display Type	10.4-inch (264 mm) liquid-crystal TFT color display
Display Resolution	1,024 horizontal × 768 vertical pixels (XGA)
Waveform Display Formats	YT, simultaneous XY/YT
Waveform Styles	Vectors, Dots, Variable Persistence, Infinite Persistence
Graticules	Full, Grid, Solid, Cross Hair, Frame, IRE, mV

Connectivity and Ports

Front-Panel USB Host Ports	2x USB 2.0 High-speed
Rear-Panel USB Host Ports	2x USB 2.0 High-speed
USB Device Port	1x USB 2.0 (supports USBTMC, GPIB via TEK-USB-488, PictBridge)
LAN Port	RJ-45 (10/100/1000 Mb/s)
External Video Output	DB-15 female XGA connector
Auxiliary Output	Rear-panel BNC (configurable as Trigger Out, Reference Clock Out, or Limit/Mask Event Out)
External Reference Input	10 MHz ±1% range
Probe Compensator Output	Amplitude: 2.5 V, Frequency: 1 kHz
Kensington Lock Slot	Yes
LXI Compliance	LXI Class C, V1.3

Power and Environmental

Power Supply Voltage	100 to 240 V ±10%
Power Supply Frequency	50 to 60 Hz (100 to 240 V), 400 Hz ±10% (115 V)
Power Consumption	250 W maximum
Storage Temperature	-20 °C to +60 °C
Operating Altitude	Up to 3,000 meters
Non-Operating Altitude	Up to 12,192 meters

Physical Specifications

Height	229 mm
Width	439 mm
Depth	147 mm

Interfaces

Probe Interface	TekVPI probe interface supporting active, differential, and current probes
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Search and Navigation

Search and Navigation	Wave Inspector® controls with dedicated front-panel pan, zoom, play/pause, and search buttons
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Environmental

Operating Humidity	10% to 90% RH at up to +40 °C, 10% to 60% RH from +40 °C to +50 °C
Non-Operating Humidity	5% to 90% RH at up to +40 °C, 5% to 55% RH from +40 °C to +60 °C
Operating Vibration	0.31 g RMS, 5 Hz to 500 Hz, 10 minutes per axis, 3 axes
Non-Operating Vibration	2.46 g RMS, 5 Hz to 500 Hz, 10 minutes per axis, 3 axes
Operating Shock	30 g, 11 ms, half-sine

Compliance

Safety Compliance	UL61010-1, CAN/CSA-C22.2 No. 61010-1, EN61010-1, IEC61010-1
Electromagnetic Compatibility	2004/108/EC, EN61326-1 Class A, EN61326-2-1

Signal Acquisition System

Vertical Resolution (HiRes Mode)	Up to 11 bits at 250 MS/s or slower
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Probes

Standard Probes Included	4× TPP1000 (1 GHz, 10X, 3.9 pF passive voltage probes)
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Interfaces & Connectivity

Optional GPIB Control	Supported via TEK-USB-488 Adapter
LAN Interface Speed	10/100/1000 Mb/s (Gigabit Ethernet)
External Reference Input Frequency	10 MHz ±10 Hz (amplitude 150 mV p-p to 5 V p-p)
Probe Compensator Output Voltage	0 to 2.5 V
Probe Compensator Output Frequency	1 kHz

Software & Remote Control

Web-based Remote Control	e*Scope (built-in via LAN interface)
Software Compatibility	OpenChoice Desktop, IVI drivers

Display

Display Size	10.4 in (264 mm) diagonal
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Signal Analysis

FFT Windows	Rectangular, Hamming, Hanning, Blackman-Harris
USB 2.0 Serial Bus Triggering & Analysis	Low-speed, Full-speed, and High-speed (High-speed on 1 GHz models only)

TECHNOLOGY

Digital Phosphor

APPLICATIONS

Electronic design, debug, serial bus analysis, and power measurement

