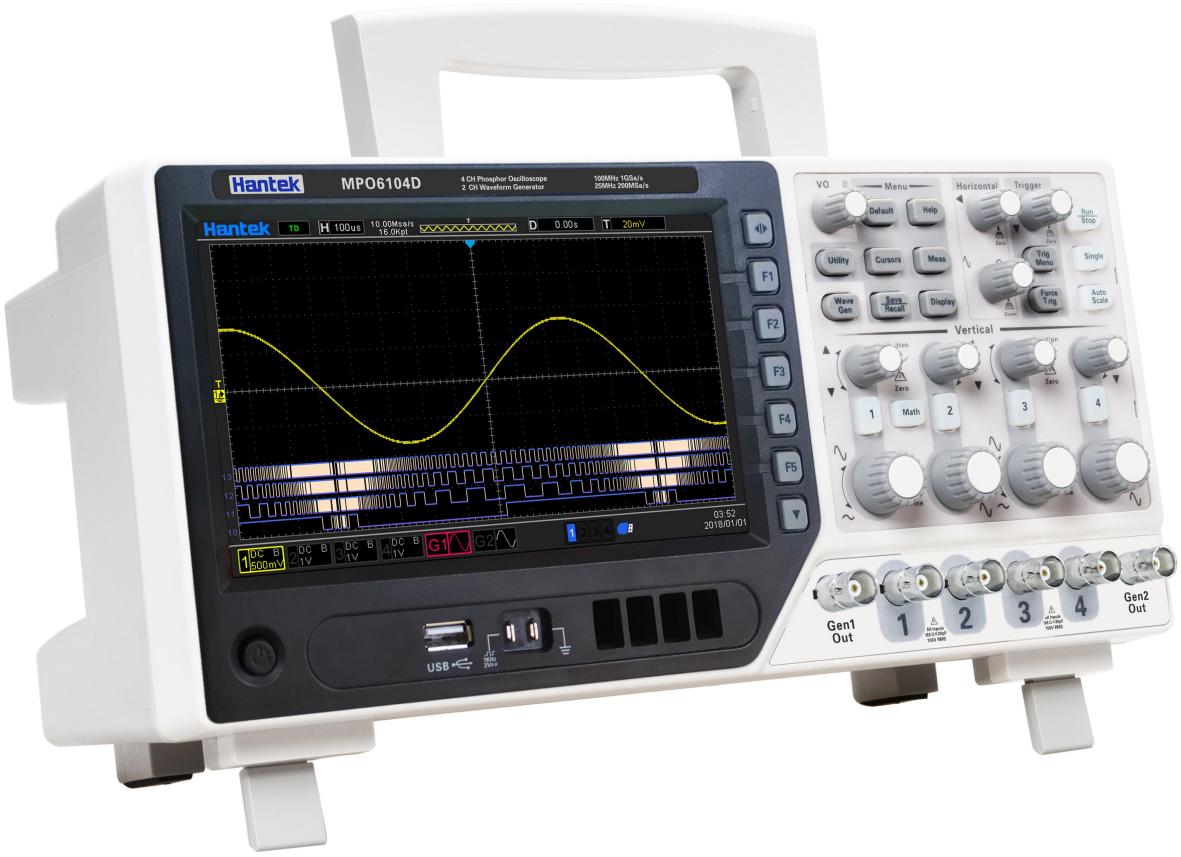
Mixed Signal Oscilloscope

4CH, 100MHz, 1GSa/S, 64M Memory Depth, Up to 400,000 wfm/s Oscilloscope, with 2CH AWG, 16CH Logic Analyzer, with Touch Screen and LAN port

MPO6104D



Accessories



Accessories








Features

- 3 in 1: 4CH Oscillscope, 16CH Logic Analyzer, 2CH Arbitrary Function Waveform Generator.

*** Oscilloscope**

- 4 channels, 100MHz bandwidth, 1GS/s sample rate, 64 Mpts Memory Depth.
- Waveform capture rate up to 400,000 wfm/s (FastAcq Mode), 60,000 wfm/s (DPO Mode).
- Multi-segment acqusition function, maximum redord waveform 80, 000 frames, 256 level grayscale display.
- Low noise, vertical miminum range 500uV/div.
- Over 43 types of auto measurement function (with statistics function).
- Over 16 types of trigger function, including 5 kinds of protocol trigger, and provide 5 serial decode options, UART, LIN, CAN, SPI, IIC decode.
- 5 digit digital voltmeter and 6 digit frequency counter .
- Frequency response analyser (FRA).
- USB and LAN port, with touch screen.

*** Logic Analyzer**

- 16 digital channels (4 channels per group, tally 4 groups).

*** Arbitrary/Function Waveform Generator**

- 2 channels, up to 25MHz frequency, 12 bits resolution, 200MSa/s sample rate.
- 13 types built-in standard waveforms, 4 groups arbitrary waveforms.

Specification

Model	MPO6104D
OSCILLOSCOPE MODE	
Horizontal	
Bandwidth	100MHz
Waveform Interpolation	(sin x)/x
Record Length	Maximum 64M samples per single-channel;
	Maximum 32M samples per dual-channel; Maximum 16M samples for CH3/CH4
SEC/DIV Range	2ns/div~100s/div
	1, 2, 5 sequence
Time Base Mode	Y-T, X-Y, Roll
X-Y Number	One X-Y channel for CH1 and CH2, and one X-Y chanel for CH3 and CH4
Offset from Zero Point	±0.5 div × minmum time base voltage
Sample Rate and Delay Time Accuracy	±25ppm
Clock Drift	≤±5 ppm/year
Delta Time Measurement Accuracy (Full Bandwidth)	Single-shot, Normal mode ± (1 sample interval +100ppm × reading + 0.6ns)
	>16 averages ± (1 sample interval + 100ppm × reading + 0.4ns)
	Sample interval = s/div ÷ 200
Vertical	
AD Converter	Analog channel: 8-bit resolution; Digital channel: 1-bit resolution
VOLTS/DIV Range	500μV/div to 10V/div at input BNC
Position Range	500μV/div~120mV/div, ±1V; 122mV/div~1.2V/div, ±10V; 1.22V/div~10V/div, ±50V
Selectable Analog Bandwidth Limit, typical	20MHz
Low Frequency Response (-3db)	≤10Hz at BNC
Rise Time at BNC, typical	≤3.5ns
DC Gain Accuracy	±3% for Normal or Average acquisition mode, 10V/div to 10mV/div
	±4% for Normal or Average acquisition mode, 5mV/div to 500μV/div Note: Bandwidth reduced to 6MHz when using a 1X probe.
DC Offset Accuracy	±0.1 div±2 mV±1% drift value

Isolation Ratio Among Channels	DC to max. Bandwidth: >40 dB

Acquisition

Real Time Sample Rate	1GSs/s single channel, 500MSa/s dual channel, 250MSa/s (3/4 channel) Note: when enable CH1 and CH2 or CH3 and CH4 simultaneously, equal to enable only one channel
Peak Detect	Analog channels 4ns Note: Digital channels don't support
Average	After N acquisitions on all channels simultaneously, N can be set to 2, 4, 8, 16, 32, 64, 128, 512 or 1024 Note: Digital channels don't support
High Resolution	Max. 12 bits Note: Digital channels don't support
Minimum Pulse Width	8ns
Memory Depth	Maximum 64M samples per single-channel; Maximum 32M samples per dual-channel; Maximum 16M samples for CH3 and CH4

Inputs

Channel	4 analog channels Note: When enable 4 analog channels, cannot enable digital channels; When enable 3 analog channels, digital channel LA1/LA2/LA3/LA4/LA1 LA2/LA3 LA4 can be used simultaneously; When enable just 2 or 1 or 0 analog channels, all digital channels can be used.
Input Coupling	DC, AC or GND Note: Digital channels don't support
Input Impedance, DC coupled	25pF±3 pF, 1MΩ±2%
Supported Probe Attenuation Factors	1X, 10X, 100X, 1000X
Overvoltage Category	300V CAT II
Maximum Input Voltage	$300V_{RMS}$ (10X)

Trigger

Trigger Level Range	±5 div from the center of the screen	
Mode	Auto, Normal, Single	
Level	CH1~CH4	±4 divisions from center of screen
Holdoff Range	8ns ~ 10s	

Trigger Level Accuracy	0.2div × volts/div within ±4 divisions from center of screen

Edge Trigger

Slope	Rising, Falling, Risingor Falling
Source	CH1~CH4

Pulse Width

Polarity	Positive, Negative
Condition(When)	<, >, ≠, =
Source	CH1~CH4
Width Range	8ns ~ 10s

Video Trigger

Signal Standard	NTSC, PAL
Source	CH1~CH4
Sync	ScanLine, LinrNum, OddField, EvenField and AllField

Slope Trigger

Slope	Rising, Falling
Condition(When)	<, >, ≠, =
Source	CH1 ~ CH4
Time Range	8ns ~ 10s

Overtime Trigger

Source	CH1~CH4
Polarity	Positive, Negative
Time Range	8ns ~ 10s

Window Trigger

Source	CH1~CH4

Pattern Trigger

Pattern	0: Lower level; 1: High level; X: Ignore
Level	CH1~CH4

Interval Trigger

Slope	Rising, Falling
Condition(When)	<, >, ≠, =
Source	CH1~CH4
Time Range	8ns ~ 10s

Delay Trigger

Slope	Rising, Falling
Condition(When)	<, >, ≠, =
Source	CH1~CH4
Time Range	8ns ~ 10s

Setup & Hold Trigger

Slope	Rising, Falling
Condition(When)	<, >, ≠, =
Source	CH1~CH4
Time Range	8ns ~ 10s

Under Amp

Polarity	Positive, Negative
Condition(When)	<, >, ≠, =
Source	CH1~CH4
Time Range	8ns ~ 10s

UART Trigger

Condition(When)	Start, Stop, Data, Parity Error, COM Error
Source(RX/TX)	CH1~CH4
Data format	Hex (hexadecimal notation)
Condition(When)	<, >, ≠, =
Data Length	1 byte
Data Length	5 bit, 6 bit, 7 bit, 8 bit
Parity Check	None, Odd, Even
Idle Level	High, Low
Baud Rate(Selectable)	110/300/600/1200/2400/4800/9600/14400/19200/38400/57600/115200/230400/380400/460400 bit/s
Baud Rate (Custom)	300bit/s~334000bit/s

LIN Trigger

Condition(When)	Interval Field, Sync Field, Id field, Sync Id Error, Identifier, Id and Data
Source	CH1~CH4
Data format	Hex (hexadecimal notation)
Baud Rate (Selectable)	110/300/600/1200/2400/4800/9600/14400/19200/38400/57600/115200/230400/380400/460400 bit/s
Baud Rate (Custom)	300bit/s~334000bit/s

CAN Trigger

Condition(When)	Start Bit, Remote Frame, Data Frame Id, Frame Id, DataFrame Id A,

	Error Frame, All Error, Ack Error, Overload Fram	
Source	CH1~CH4	
Data format	Hex (hexadecimal notation)	
Baud Rate (Selectable)	10000, 20000, 33300, 500000, 62500, 83300, 100000, 125000, 250000, 500000, 800000, 1000000	
Baud Rate (Custom)	5kbit/s~1Mbit/s	
SPI Trigger		
Source	CH1~CH4	
Data format	Hex (hexadecimal notation)	
Data Length	4, 8, 16, 24, 32	
IIC Trigger		
Source (SDA/SCL)	CH1~CH4	
Data format	Hex (hexadecimal notation)	
Data Index	0~7	
When(Condition)	Start, Stop, No Ack, Address, Data, Restart	
Measurements		
Cursors	Voltage difference between cursors: △V Time difference between cursors: △T Reciprocal of △T in Hertz (1/ΔT)	
Automatic Measurements	Frequency, Period, VMean, VMax, VMin, Pk-Pk, VTop, VMid, VBase, VAmp, VRms, Vovr, Vpre, PVRms, PVMean, RiseT, FallT, PosPW, NegPW, PDuty, NDuty, FRR, FFF, Vfov, Vrpr, BWidth, FRF, FFT, LRR, LRF, LFR, LFF, MaxTime, MinTime, +PhaseTime, -PhaseTime, Variance, +PulseCnt, -PulseCnt, +EdgeCnt, -EdgeCnt, TriggerCnt, CHN_LRR	
DVM	Source	CH1, CH2, CH3, CH4
	Measurement Type	DC RMS
		AC RMS
		DC
	Frequency Counter	Hardware 6 digit frequency counter
LOGIC ANALYZER FUNCTION		
Channel	16 (4 groups, each group 4 channels)	
Trigger Source	Edge, Pulse Width, Overtime, Interval, UART(RX/TX), LIN, SPI, IIC (SDA/SCL)	D1.0~D1.3, D2.0~D2.3, D3.0~D3.3, D4.0~D4.3
	Window	LA1~LA4
Input Impedance/ DC Coupling	8 pF ± 3 pF, 300KΩ ± 2%	

Maximum Input Voltage	-25C~25V	
Threshold	Adjustable threshold value for 1 group channels (4 channels)	
Threshold Selection	TTL (1.4 V)	
	5.0 V CMOS (+2.5 V)	
	3.3 V CMOS (+1.65 V)	
	2.5 V CMOS (+1.25 V)	
	1.8 V CMOS (+0.9 V)	
	ECL (-1.3 V)	
	PECL (+3.7 V)	
	LVDS (+1.2 V)	
	0V	
	User defined	
Threshold Range	±7.0V, 10mV step-by-step	
Threshold Accuracy	±(100mV+3% threshold setup)	
Dynamic Range	±5.0V+Threshold	
Minimum Voltage Swing	500 mVpp	
Vertical Resolution	1 bit	

ARBITRARY FUNCTION WAVEFORM GENERATOR MODE

Channel	2	
Sample Rate	200MSa/s	
Vertical Resolution	12 bits	
Max. Frequency	25 MHz	
Standard Waveforms	Sine, Square, Pulse, Ramp, Noise, DC, Sinc, Exponential, Half-distorted, Lorentz, Dual-Tone Multi-Frequency, Gauss, ECG	
Arbitrary Waveforms	Arb 1, Arb 2, Arb 3, Arb 4	
Sine	0.1Hz~25MHz	
Pluse /Square	0.1Hz~10MHz	
Ramp/Sample/Half-distorted/Lorentz/Dual-Tone/ Gauss/ECG	0.1Hz~1MHz	
Exponential	0.1Hz~5MHz	
Arb.	0.1Hz~10MHz	
Waveform Length	8KSa	
Frequency	Accuracy	100 ppm (<10 kHz) 50 ppm (>10 kHz)
	Resolution	0.1Hz or 4 digit, take the larger of the two
Amplitude Output Range	10mV~7Vp-p (High Impedance) 5mV~3.5Vp-p (50Ω)	
DC Offset	Range	±3.5 V Hight Impedance
	Resolution	±1.75 V 50Ω
	Accuracy	2% (1kHz)

Outupt Impedance	50Ω	

General Specifications

Display		
Screen Type	7 inch TFT (diagonal liquid crystal) touch screen	
Display Resolution	800 horizontal by 480 vertical pixels	
Color Display	16000K color (24bit real color)	
Persistence	Min., 1s, 5s, 10s, 30s, infinite	
Display Type	Dot, Vector	
Display Mode	Color temperature, gray scale	
Display Brightness	Adjustable	
Grid Type	Optional	
Grid Brightness	Adjustable	
Interface		
Standard Interface	USB Host, USB Device, LAN	
Probe Compensator Output		
Output Voltage, typical	About 2Vpp into ≥1MΩ load	
Frequency, typical	1kHz	
Power Supply		
Supply Voltage	100-120VACRMS(±10%), 45Hz to 440Hz, CAT II 120-240VACRMS(±10%), 45Hz to 66Hz, CAT II	
Power Consumption	<30W	
Fuse	T, 3.15A, 250V, 5x20mm	
Environmental		
Operating Temperature	0~50 °C (32~122 °F)	
Storage Temperature	-40~+71 °C (-40~159.8 °F)	
Humidity	≤+104℉(≤+40°C): ≤90% relative humidity	
	106℉~122℉ (+41°C ~50°C): ≤60% relative humidity	
Cooling Method	Convection	
Altitude	Operating and Nonoperating	3,000m (10,000 feet)
	Random Vibration	$0.31g_{RMS}$ from 50Hz to 500Hz,
		10 minutes on each axis
	Nonoperating	$2.46g_{RMS}$ from 5Hz to 500Hz
		10 minutes on each axis
Mechanical Shock	Operating	50g, 11ms, half sine
Mechanical		
Dimension	318 x 110 x 150mm (L x W x H)	
Weight	2900g	