

MPO-2000B/P Series Specifications

The specifications apply when the MPO-2000B/P series is powered on for at least 30 minutes under +20°C~+30°C.

Model-specific

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| MPO-2102B | Channels | 2 + Ext |
| | Bandwidth | DC ~ 100MHz (-3dB) |
| | Rise Time | 3.5ns (Calculated) |
| | Bandwidth Limit | 20MHz |
| | Python Script Execution (μPy) | Basic version |
| MPO-2104B | Channels | 4 |
| | Bandwidth | DC ~ 100MHz (-3dB) |
| | Rise Time | 3.5ns (Calculated) |
| | Bandwidth Limit | 20MHz |
| | Python Script Execution (μPy) | Basic version |
| MPO-2202P | Channels | 2 + Ext |
| | Bandwidth | DC ~ 200MHz (-3dB) |
| | Rise Time | 1.75ns (Calculated) |
| | Bandwidth Limit | 20MHz/100MHz |
| | Python Script Execution (μPy) | Professional version |
| MPO-2204P | Channels | 4 |
| | Bandwidth | DC ~ 200MHz (-3dB) |
| | Rise Time | 1.75ns (Calculated) |
| | Bandwidth Limit | 20MHz/100MHz |
| | Python Script Execution (μPy) | Professional version |

Common

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| Vertical Sensitivity | Resolution | 8 bit |
| | | :1mV~10V/div |
| | Input Coupling | AC, DC, GND |
| | Input Impedance | 1MΩ// 16pF approx. |
| | DC Gain Accuracy | 1mV: ±5% full scale ≥2mV: ±3% full scale |
| | Polarity | Normal & Invert |
| | Maximum Input Voltage | 300Vrms |
| | Offset Position Range | 1mV/div ~ 20mV/div : ±0.5V 50mV/div ~ 200mV/div : ±5V 500mV/div ~ 2V/div : ±25V 5V/div ~ 10V/div : ±250V |
| Waveform Signal Process | | +, -, ×, ÷, FFT, User Defined Expression |
| | | FFT: Spectral magnitude. Set FFT Vertical Scale to Linear RMS or dBV RMS, and FFT Window to Rectangular, Hamming, Hanning or Blackman. |
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| Trigger | Source | CH1, CH2, CH3*, CH4*, Line, EXT** *4 channel models only. **2 channel models only. |
| | Trigger Mode | Auto (supports Roll Mode for 100ms/div and slower), Normal, Single |
| | Trigger Type | Edge, Pulse Width(Glitch), Video, Pulse Runt, Rise & Fall(Slope), Timeout, Alternate, Event-Delay(1~65535 events), Time-Delay(Duration, 4ns~10s), Bus (UART, I2C, SPI*, CAN, LIN) *This bus decoder is only available on 4 channel models. |
| | Holdoff range | 4ns to 10s |

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| | Coupling | AC, DC, LF rej., Hf rej., Noise rej. |
| | Sensitivity | 1div |
| External | Range | ±15V |
| Trigger | Sensitivity | DC ~ 100MHz Approx. 100mV 100MHz ~ 200MHz Approx. 150mV |
| | Input Impedance | 1MΩ±3%~16pF |
| Horizontal | Timebase Range | 1ns/div ~ 100s/div (1-2-5 increments) ROLL: 100ms/div ~ 100s/div |
| | Pre-trigger | 10 div maximum |
| | Post-trigger | 2,000,000 div maximum. |
| | Timebase Accuracy | ±50ppm over any ≥ 1ms time interval |
| | Real Time Sample Rate | 1GSa/s max. (4ch models); 1GSa/s per channel (2ch models) |
| | Record Length | Max. 10Mpts |
| | Acquisition Mode | Normal, Average, Peak Detect, Single |
| | Peak Detection | 2ns (typical) |
| | Average | selectable from 2 to 512 |
| X-Y Mode | X-Axis Input | Channel 1; Channel 3* *4 channel models only |
| | Y-Axis Input | Channel 2; Channel 4* *4 channel models only |
| | Phase Shift | ±3° at 100kHz |
| Cursors and Measurement | Cursors | Amplitude, Time, Gating available; Unit: Seconds(s), Hz (1/s), Phase (degree), Ratio (%). |
| | Automatic Measurement | 38 sets: Pk-Pk, Max, Min, Amplitude, High, Low, Mean, Cycle Mean, RMS, Cycle RMS, Area, Cycle Area, ROVShoot, FOVShoot, RPREShoot, FPRESshoot, Frequency, Period, RiseTime, FallTime, +Width, -Width, Duty Cycle, +Pulses, -Pulses, +Edges, -Edges, %Flicker, Flicker Idx, FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, Phase. |
| | Cursors measurement | Voltage difference between cursors (ΔV); Time difference between cursors (ΔT) |
| | Auto counter | 6 digits, range from 2Hz minimum to the rated bandwidth |
| Control Panel Function | Autoset | Single-button, automatic setup of all channels for vertical, horizontal and trigger systems, with "Undo Autoset", "Fit Screen"/ "AC Priority" mode, and "Fine Scale" functions. |
| | Save Setup | 20set |
| | Save Waveform | 24set |
| AWG | General | |
| | Channels | 2 |
| | Sample Rate | 200MSa/s |
| | Vertical Resolution | 14bits |
| | Max. Frequency | 25MHz |
| | Waveforms | Arbitrary, Sine, Square, Pulse, Ramp, DC, Noise, Sinc, Gaussian, Lorentz, Exponential Rise, Exponential Fall, Haversine, Cardiac |
| | Output Range | 20mVpp to 5Vpp, HighZ; 10mVpp to 2.5Vpp, 50Ω |
| | Output Resolution | 1mV |
| | Output Accuracy | 2% (1 kHz) |
| | Offset Range | ±2.5V, HighZ; ±1.25V, 50Ω |
| | Offset Resolution | 1mV |
| | Sine | |
| | Frequency Range | 100mHz to 25MHz |

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| | Flatness (relative to 1 kHz) | $\pm 0.5\text{dB} < 15\text{MHz}$; $\pm 1\text{dB} 15\text{MHz} \sim 25\text{MHz}$ |
| | Harmonic Distortion | -40dBc |
| | Stray (Non-harmonic) | -40dBc |
| | Total Harmonic Distortion | 1% |
| | S/N Ratio | 40dB |
| | Square/Pulse | |
| | Frequency Range | Square: 100mHz to 15MHz |
| | Rise/Fall Time | < 15ns |
| | Overshoot | < 3% |
| | Duty Cycle | Square: 50% Pulse: 0.4% to 99.6% |
| | Min. Pulse Width | 30ns |
| | Jitter | 500ps |
| | Ramp | |
| | Frequency Range | 100mHz to 1MHz |
| | Linearity | 1% |
| | Symmetry | 0 to 100% |
| Spectrum Analyzer | Frequency Range | DC~500MHz Max, dual channel with spectrogram (based on Advanced FFT). Notice: Frequency which exceeds analog front end bandwidth is uncalibrated. |
| | Span | 1kHz~500MHz (Max.) |
| | Resolution Bandwidth | 1Hz~500kHz (Max.) |
| | Reference Level | -50dBm to +40dBm in steps of 5dBm |
| | Vertical Units | dBV RMS; Linear RMS; dBm |
| | Vertical Position | -12divs to +12divs |
| | Vertical Scale | 1dB/div to 20dB/div in a 1-2-5 Sequence |
| | Displayed Average Noise Level | 1V/div \leftarrow -50dBm, Avg : 16 100mV/div \leftarrow -70dBm, Avg : 16 10mV/div \leftarrow -90dBm, Avg : 16 |
| | Spurious Response | 2nd harmonic distortion < 40dBc 3rd harmonic distortion < 45dBc |
| | Frequency Domain Trace Types | Normal; Max Hold; Min Hold; Average (2 ~ 512) |
| | Detection Methods | Sample; +Peak; -Peak; Average |
| | FFT Windows | FFT Factor: Hanning 1.44 Rectangular 0.89 Hamming 1.30 Blackman 1.68 |

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| DMM | Reading | 5,000 counts |
| | Voltage Input | CAT II 600Vrms, CAT III 300Vrms |
| | | <p>Below are the basic conditions required to operate the DMM within specifications:</p> <p>*Calibration: Yearly.</p> <p>*Operating Temperature Specification: 18~28 °C (64.4~82.4 °F).</p> <p>*Relative humidity: 80%. (Non condensing)</p> <p>*Accuracy: \pm (% of Reading + % of Range).</p> <p>*AC measurement are based on a 50% duty cycle.</p> |
| | DC Voltage | |
| | Range | 50mV, 500mV, 5V, 50V, 500V, 1000V, 6 ranges |
| | Accuracy | 50mV, 500mV, 5V, 50V, 500V, 1000V : $\pm(0.1\% + 0.1\%)$ |
| | Input Impedance | 10M Ω |
| | DC Current | |
| | Range | 50mA, 500mA, 10A, 3 ranges |
| | Accuracy | 50mA, 500mA : $\pm(0.5\% + 0.1\%)$; 10A : $\pm(0.5\% + 0.5\%)$ |
| | AC Voltage | |
| | Range | 50mV, 500mV, 5V, 50V, 700V, 5 ranges |
| | Accuracy | 50mV, 500mV, 5V, 50V, 700V : $\pm(1.5\% + 1.5\%)$ at 50Hz~1kHz |
| | AC Current* | |
| | Range | 50mA, 500mA, 10A, 3 ranges |
| | Accuracy* | 50mA, 500mA : $\pm(1.5\% + 0.1\%)$ at 50Hz~1kHz; 10A : $\pm(3\% + 0.5\%)$ at 50Hz~1kHz |
| | *Measure range: >10mA | |
| | Resistance* | |
| | Range | 500 Ω , 5k Ω , 50k Ω , 500k Ω , 5M Ω , 5 range |
| | Accuracy | 500 Ω , 5k Ω , 50k Ω , 500k Ω , 5M Ω : $\pm(0.3\% + 0.01\%)$ |
| | *Measure range: 50 Ω to 5M Ω | |
| | Diode Test | Maximum forward voltage 1.5V, Open voltage 2.8V |
| | Temperature (Thermocouple)* | |
| | Range | -50°C ~ +1000°C |
| | Resolution | 0.1°C |
| | * Specifications do not include probe accuracy. | |
| | Continuity Beeper | 15 Ω |
| Power Supply | Output Channel | Ch1 & Ch2 |
| | Output Range | 1V~5V/1A; 5V~10V/0.5A; 10V~20V/0.25A Peak current: 1A@250ms |
| | Voltage Step | 0.1V Continuously Adjustable |
| | Output Voltage Accuracy | +/- 3% |
| | Ripple and Noise | 50mVrms |
| Display | TFT LCD Type | 8" TFT LCD WVGA color display |
| | Display Resolution | 800 horizontal \times 480 vertical pixels (WVGA) |
| | Interpolation | Sin(x)/x |

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| | Waveform Display | Dots, vectors, variable persistence (16ms~4s), infinite persistence |
| | Waveform Update Rate | 120,000 waveforms per second, maximum |
| | Display Graticule | 8 x 10 divisions |
| | Display Mode | YT, XY |
| Interface | USB 2.0 Hi-speed Host Port | 1 on the front panel. Supporting USB2.0 Mass Storage Class (FAT32 or NTFS formatted). Professional version (MPO-2000P series) also supports USB CDC ACM Class and USB HID Class |
| | USB 2.0 Hi-speed Device Port | 1 on the rear panel, USBTMC Class is supported. |
| | Ethernet Port (LAN) | RJ-45 connector, 10/100Mbps with HP Auto-MDIX which also supporting TCP sockets communication, the TCP socket communication is using the default 5025 port number. |
| | Web Server | Supporting remote control and monitoring of the oscilloscope in web browser by using the LAN. |
| | Go-NoGo BNC | 5V Max/10mA TTL open collector output |
| | Kensington Style Lock | Rear-panel security slot connects to standard Kensington-style lock. |
| Miscellaneous | Multi-language menu | Available |
| | Operation Environment | Temperature: 0°C to 50°C. Relative Humidity ≤ 80% at 40°C or below; ≤ 45% at 41°C ~ 50°C. |
| | Python Script Execution (μPy) | <p>Maximum number of installable python apps: 100 sets (including the pre-installed Python apps). Note. There is no restriction on script files (*.py).</p> <p>APPs installation capacity limit: 20M byte maximum</p> <p>MQTT Protocol: “Message Queuing Telemetry Transport” is supported which including the “Publish” and “Subscribe” pattern.</p> <p><u>Basic version (MPO-2000B series):</u> *Supporting 1,000 points waveform data processing.</p> <p><u>Professional version (MPO-2000P series):</u> *Supporting USB CDC ACM Class, *USB HID Class, *Python GUI library, *100,000 points waveform data processing.</p> |
| | Component Tester | Providing I-V characteristic curve (tracer) with readout scale. Please refer to the application note for the details. |
| | Time clock | Time and Date, Provide the Date/Time for saved data |

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| Installed APP | Go/NoGo, DVM, DataLog, Digital Filter, Frequency Response Analyzer, Mask, CAN-FD*, USB2.0 (full speed)*, Flexray**, I2S**, USB-PD**, Mount Remote Disk, Demo |
| | *: Available for bus decoder function +: For Professional version (MPO-2000P series) Note: The I2S bus decoder is only available on 4 channel models. |
| Internal Flash Disk | 100M bytes Single-Level Cell memory |
| Dimensions | 384mmX208mmX127.3mm |
| Weight | 3kg |



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