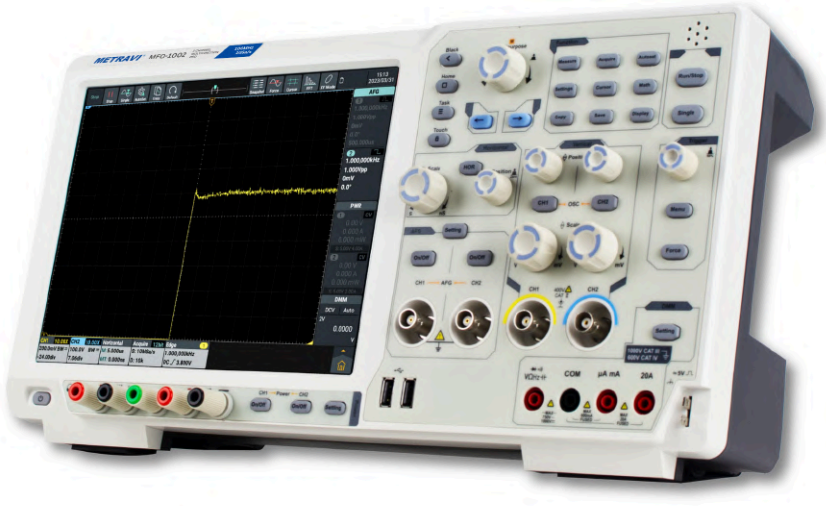
INTRODUCTION

The Metravi MFO-1002 Multifunction Oscilloscope combines the capabilities of a DSO, Arbitrary Function Generator, Power Supply, and Digital Multimeter – all in one compact, versatile instrument.

Designed for engineers, educators, and researchers, this 4-in-1 powerhouse redefines mult -functional testing and analysis.

With advanced trigger support including edge, slope, pulse width, window, interval, timeout, code type, Nth edge, video, and serial bus triggers, it ensures precise and flexible signal analysis.
It also supports FRA chart testing for deeper insights.



Built on an Android-based platform, the MFO-1002 delivers a modern, intuitive experience with more possibilities for integration and usability.

Its 10.4-inch HD capacitive touch display offers crystal-clear visualisation, while support fo external HDMI display, mouse, and keyboard makes complex editing operations seamless.

Expand your teaching, training, and testing capabilities with multi-media integration – including camera, microphone, speakers, and headphones. With a rich set of interfaces (USB host x4, USB device, LAN, HDMI), connectivity and flexibility are built right in.

The Metravi MFO-1002 is more than just an oscilloscope – it's a complete multifunction solution that saves bench space, enhances efficiency, a delivers unmatched versatility.

FEATURES

- **DSO + Arbitrary Waveform Generator + Power Supply + Multi-meter. 4-in-1 Power. Limitless Possibilities.**
- Supports edge trigger, slope, pulse width, window, under amplitude, interval, timeout, code type, Nth edge, video trigger, serial bus trigger etc.
- Supports FRA chart testing
- Android based experience
- Supports external HDMI display, mouse and keyboard, facilitating complex editing operations
- Supports configuring multi-media equipment, such as camera, microphone, speaker an headphone jack, expand more teaching methods
- Rich interface: USB host x4, USB device, LAN, HDMI
- 10.4 inch capacitive touchscreen HD display

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TECHNICAL SPECIFICATIONS

FEATURE / FUNCTION		SPECIFICATIONS
Bandwidth		100 MHz
Vertical Resolution		8 bits
Acquisition	Mode	Normal, Peak detect, Averaging
	Real-time Acquisition Rate	Dual Channel; 8 bits; 500 MS/s;
Waveform Refresh Rate		65,000 wfms/s
Channel		2
Display		Multi-level Gray Scale Display & Colour Temperature Display (Uses gray scale to indicate frequency of occurrence,where frequently occurring waveform are bright.)
Input	Input Coupling	DC, AC, grounding
	Input Impedance	1 MΩ±2%, parallel with 15 pF±5 pF
	Probe Attenuation Coefficient	10uX-50kX,step by 1 – 2 - 5， supports custom
	Maximum Input Voltage	1MΩ:≤300 Vrms
	Bandwidth Limit	20MHz, full bandwidth
	Channel – channel Isolation	50 Hz: 100:1 10 MHz: 40:1
	Time Delay between Channel (typical)	150ps
Horizon	Sampling rate range	Dual CH; 8 bits; 0.05 S/s ～500 MS/s
	Interpolation	(Sinx)/x
	Maximum Storage Depth	10M
	Scanning speed (S/div)	2ns/div - 1000s/div,step by 1-2-5
	Relay time accuracy	±20 ppm (typical, environment temperature is +25°C
	Time Interval (△T) Measurement Accuracy (CD～100MHz)	Single: ±(1 interval time+1 ppm×reading+0.6 ns); Average>16: ±(1 interval time +1 ppm×reading+0.4 ns)
Vertical	Vertical Sensitivity	1 mV/div～10 V/div
	Displacement	±2V(1 mV/div - 50 mV/div); ±20 V (100 mV/div - 1 V/div); ±200 V (2 V/div - 10 V/div)
	Analogue Bandwidth	100MHz, 200MHz, 300MHz
	Single Bandwidth	Full bandwidth
	Low Frequency (AC coupling, -3dB)	≥10 Hz (at BNC)
	Rising Time (at BNC,typical)	≤3.5 ns
	DC Gain Accuracy	8 bits mode; 1mV; 4%
	DC Accuracy (average)	Delta Volts between any two averages of ≥16 waveforms acquired with the same scope setup and ambient conditions (△V): ±(3% rdg + 0.05 div)
	Waveform inverted ON/OFF	

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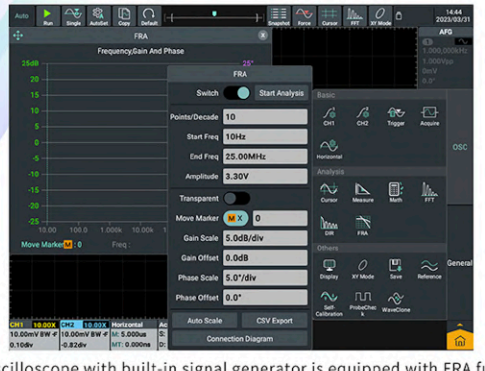
TECHNICAL SPECIFICATIONS

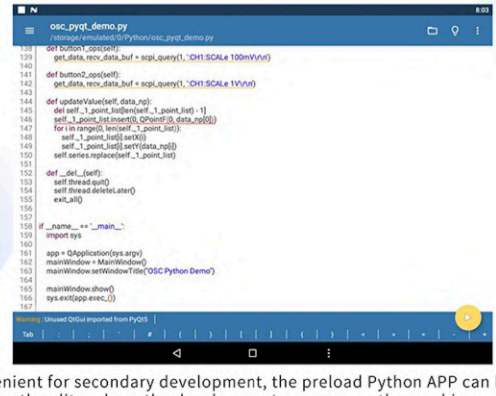
FEATURE / FUNCTION		SPECIFICATIONS
Trigger Type		Edge trigger, video trigger, pulsewidth trigger, slope trigger, under-amplitude trigger, over-amplitude trigger, timeout trigger, Nth edge trigger, logic trigger, RS232/UART, I2C, SPI, CAN and LIN
Trigger Mode		Auto, Normal, Single
Signal System and Line/Field Frequency (Video Trigger Mode)		Support NTSC, PAL and SECAM broadcasting system of any field frequency or line frequency
Measurement	Cursor Measurement	△V, △T, △T & △V between cursors, auto cursor, support XY/FFT/ZOOM window, based on screen percentage
	Auto Measurement	Period,Frequency, +Width, -Width, Rise Time, Fall Time, ScrDuty, +Duty, -Duty, Vavg, Vpp, VRMS, Overshoot, Vmax, Vmin, Vtop, CycRms, Vbase, Vamp, Preshoot, StdDev, +PulseCnt, -PulseCnt, RiseCnt, FallCnt, Area, CycArea, Delay(-), Delay(-), Delay(-), Delay(-), Phase(-), Phase(-),Phase(-), Phase(-), FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF
	Mathematical Operation	+,-,*,/, Intg, Diff, Sqrt, Function operation (Lg / Ln / Exp / And / Sine / Cosine / Tan), User Defined Function, digital filter (low pass, high pass, band pass, band reject)FFT, FFTrms

Frequency Response Analysis (FRA) function



The oscilloscope with built-in signal generator is equipped with FRA function, which can test the frequency response curve or loop stability of the device under test (DUT).

SCPI supported



Convenient for secondary development, the preload Python APP can be used for directly edit and run the development program on the machine.

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FUNCTION / WAVEFORM GENERATOR		
Bandwidth	50MHz	
Sample Rate	300M Sa/s	
Vertical Resolution	14 bits	
Channel	2	
Waveforms		
Standard Waveforms	Sine wave, square wave, ramp wave, pulse wave, noise	
Arbitrary Waveforms	Exponential rise, Exponential decline, Sin(x)/x, Step Wave, noise etc. 28 build-in waveforms	
Frequency Feature		
Sine Wave	1 μHz to 50 MHz	
Square Wave	1 μHz to 25 MHz	
Ramp Wave	1 μHz to 1 MHz	
Pulse Wave	1 μHz to 10 MHz	
Noise Wave	(-3 dB) 20 MHz (Gaussian white noise)	
Arbitrary Wave (except DC)	1 μHz to 10 MHz	
Frequency Resolution	1 μHz or 7 significant figures	
Frequency Stability	±30 ppm at 0 to 40°C	
Frequency Aging rate	±30 ppm per year	
Amplitude Characteristic		
Output Amplitiude	High Z	2mVpp to 10Vpp
Amplitude Accuracy	±(1% of setting + 1 mVpp)(typical 1kHz sine,0V offset)	
Amplitude Resolution	1mVpp or 4 digits	
DC Offset Range (AC+DC)	High Z	±5 Vpk - Amplitude Vpp/2
	50Ω	±2.5 Vpk - Amplitude Vpp/2
	Note: When offset >2.5Vpp, Amplitude ≥10mV(High Z) When offset >1.25Vpp， amplitude ≥5mV(50Ω)	
DC Offset Accuracy	±(1 % of |setting|+ 1 mV + amplitude Vpp * 0.5%)	
Offset Resolution	1mVpp	
Output Impedance	50Ω(typical)	

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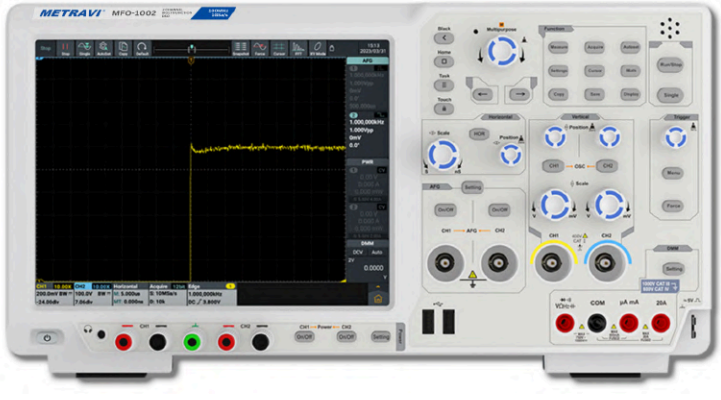
TECHNICAL SPECIFICATIONS

MULTIMETER				
FEATURE / FUNCTION		**RANGE**	**RESOLUTION**	**ACCURACY**
DC Voltage (V)	mV	20.000 mV/200.00 mV	0.001mV	±(0.5%+10dig)
	V	2.0000V/20.000V/200.00V	0.1mV	±(0.3%+5dig)
		1000.0V	0.1V	±(0.5%+5dig)
AC Voltage (V)	mV	20.000 mV/200.00 mV	0.001mV	±(0.8%+10dig)
	V	2.0000V/20.000V/200.00V	0.1mV	±(0.8%+10dig)
		750.0V	0.1V	±(1%+10dig)
DC Current (A)	µA	200.00µA/2000.0µA	0.01µA	±(0.5%+10dig)
	mA	20.000mA/200.00mA	0.001mA	±(0.5%+10dig)
	A	20.000A [1]	0.001A	±(2%+10dig)
AC Current (A)	µA	200.00µA/2000.0µA	0.01µA	±(0.8%+10dig)
	mA	20.000mA/200.00mA	0.001mA	±(0.8%+10dig)
	A	20.000A [1]	0.001A	±(2.5%+10dig)
Resistance (Ω)		200.00Ω / 2.0000kΩ / 20.000kΩ / 200.00kΩ / 2.0000MΩ / 20.000MΩ	0.01Ω	±(0.8%+10dig)
		100.00MΩ	0.01 MΩ	±(5%+10dig)
Capacitance (F)		2.0000nF / 20.000nF / 200.00nF / 2.0000µF / 20.000µF	0.1pF	±(4%+10dig)
		200.00µF / 2.0000mF / 20.000mF [2]	0.01µF	±(4%+10dig)

[1] When measuring current, for 10 A to 15 A, the measuring duration should not be over 2 minutes within 10 minutes, and in this 10 minutes, no other current should flow through except within the measuring duration; for 15 A to 20 A, the measuring duration should not be over 10 seconds within 15 minutes, and in this 15 minutes, no other current should flow through except within the measuring duration.

[2] When measuring big capacitance, the measuring duration should be over 30 seconds

Note:
1. Standard conditions: The environment temperature is 18°C to 28°C, the relative humidity is less than 80%.
2. When measuring AC voltage/current or capacitance, accuracy guarantee range is 5% to 100% of the range.
3. When measuring resistance and capacitance, the influence of the resistance reactance of the pen itself on the measured value should be considered.



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TECHNICAL SPECIFICATIONS

FEATURE / FUNCTION	SPECIFICATIONS
POWER SUPPLY	
Rated Output	
Voltage	0.1～15V
Current	0.1～3A
Power	15W
Load Regulation	
Voltage	≤0.1%+3mV
Current	≤0.1%+3mA
Power Regulation	
Voltage	≤0.1%+3mV
Current	≤0.1%+3mA
Noise & Ripple	
Voltage (Vp-p)	≤10mVp-p
Voltage (rms)	≤2mV rms
Current (rms)	≤5mA rms
Settings Regulation	
Voltage	10mV
Current	10mA
Read Back Regulation	
Voltage	10mV
Current	1mA
Setting Accuracy (25°C ±5°C)	
Voltage	≤0.8%+10mV
Current	≤1%+8mA
Read Back Accuracy	
Voltage	≤0.3%+10mV
Current	≤0.3%+8mA
Response Time	
Transient recovery time (50% ～ 100% rated load)	≤1ms
Protect Function	
OVP	0～16V
OCP	0～3.1A

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GENERAL SPECIFICATIONS

Display	19999 Counts; 10.4" Coloured TFT LCD; 1024×768 Pixels Multi-touch Capacitive Touchscreen
Frequency Response (Hz)	(40 - 1000) Hz
Sample rate for digital data	3 times/second
Auto Ranging	Yes
True Virtual Value	Yes
Diodes Test	Yes
On-off Buzzer	Yes
Data Hold	Yes
Relative Measurement	Yes
Input Protection	Yes
Input Impedance	≥10 MΩ
Communication Interface	HDMI USB dev*1 USB Host *4 Trig Out(P/F) EXT Trig In LAN interface Earphone jack
Power Supply	100V – 240 VACRMS, 50/60 Hz, CAT II
Fuse	2 A, T class, 250 V
Environmental Temperature	Working temperature:0°C ～ 40°C Storage Temperature:-20°C ～ +60°C
Environmental Relative Humidity	≤90%
Operating Altitude	Operating: 3,000m; Non-operating: 15,000m
Cooling Method	Fan cooling
Dimensions	421 mm × 221 mm × 115 mm (L*H*W)
Weight	Approx. 4.25 kg (without accessories)
Interval Time for Calibration	One year is recommended for the calibration interval period

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