MDM-10X5

5½ and 6½ programmable digital multimeters

3-year warranty

Features

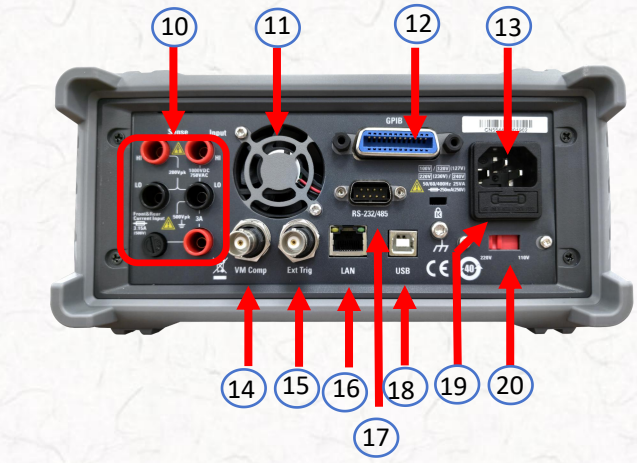
- True six and a half digit (MDM-1065) reading resolution
- The sampling rate is as high as 30K/s, which is conducive to capturing transient signals
- Two sets of input terminals at the front and back, convenient for testing system wiring
- Graphic display functions include bar charts, histograms, trend charts, and data statistics
- Dual display measurement function, capable of simultaneously displaying voltage and frequency measurement values
- Measurement of true effective value of AC voltage and true effective value of AC current
- 0.1 uV (MDM-1065) resolution, easy to operate
- 4.3-inch TFT LCD screen
- Multiple measurement functions: DC voltage 1000V, AC voltage 750V, DC current, AC current, 2-wire resistor, 4-wire resistor, capacitor, diode, connectivity, frequency, cycle, temperature, current range up to 10A
- Support SCPI remote control commands
- Standard interfaces: USB, RS-232, RS-485
- Optional interfaces: LAN, GPIB

Focused on testing instruments for 20 years

Maichuang Electronics has launched four models, MDM-1055, MDM-1055 (G), MDM-1065, and MDM-1065 (G), with high-precision DC current measurement, fast sampling, 12 measurement items (DC voltage/current, AC voltage/current, 2-wire/4-wire resistance, frequency, period, diode, short-circuit buzzer, temperature, capacitance), 6 calculation functions (dB/dBm/Compare/MX+B/Precision and 1/x), and rich communication interfaces (USB Device/Host, RS-232/RS-485, LAN and GPIB optional), providing comprehensive measurement capabilities and higher speed and accuracy. This series adopts a 4.3-inch TFT graphical display screen and a fast sampling rate (30k/s). In addition to traditional digital display, it can also be displayed with bar charts, trend charts or histograms, making the entire measurement process more intuitive and quickly presented in its entirety. Meanwhile, larger memory can also assist in statistical calculations of trend charts or histograms during the measurement process, simplifying tedious trend analysis.

In terms of convenience in use, MDM-1055/MDM-1065 also incorporates rich operational designs. For automatic testing system measurement or remote control applications, MDM-1065 not only provides USB, RS-232/RS-485 as standard communication interfaces, but also offers LAN and GPIB (customer installation options) as options.

Panel Introduction



Standard USB☑ RS232☑ RS485☑

Optional LAN☐ GPIB☐

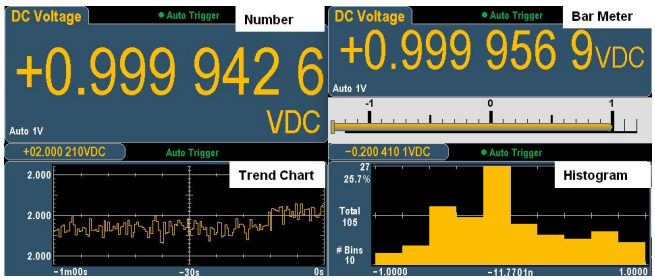
1. USB Host (supports FAT32 file system format and Flash type US flash drive)
2. Help button
3. Preset/Default button
4. 4.3-inch 64K color TFT LCD screen
5. Measurement configuration and instrument operation keys
6. Measurement end
7. Front/rear panel input switch
8. Function keys
9. Power switch
10. Connect the terminal and current input fuse
11. Fan
12. GPIB interface (optional)
13. Power socket
14 VM Comp
15. External trigger input
16. LAN port
17. RS-232/RS-485 interface
18. USB Device Interface
19. Power fuse
20. Voltage selector (110V/220V switching)

A. Ideal measurement partner

Model	MDM-1055	MDM-1065
Reading Resolution	5½	6½
Sampling rate	30K readings/s	30K readings/s
Memorizer	10K readings/s	10K readings/s
Annual accuracy of DC voltage	150ppm	35ppm
11 measurement functions	AC/DC voltage/AC/DC current/2&4-wire resistance/Frequency/Period/Diode/Direct current/Thermocouple/Temperature	
Standard interface	USB, RS232/485 (single-panel input on both front and back)	

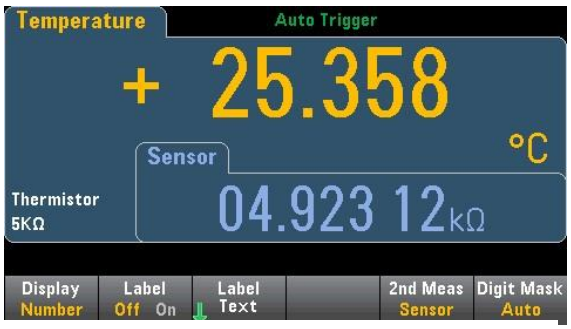
MDM-1055/1065 has all the basic measurement functions required by engineers for the design, development, and testing of electronic circuits or products, including voltage, current, resistance, diodes, short-circuit buzzing, frequency, temperature, and capacitance.
In addition, it also has computational functions (dB, dBm, Compare, MX+B, 1/X, and Percent), statistical functions (Min/Max/Average/P-P/STDEV), and a variety of standard communication interfaces, which can meet specific measurement requirements and complex measurement applications whether used on a desk or in a system.

B. Diverse displays



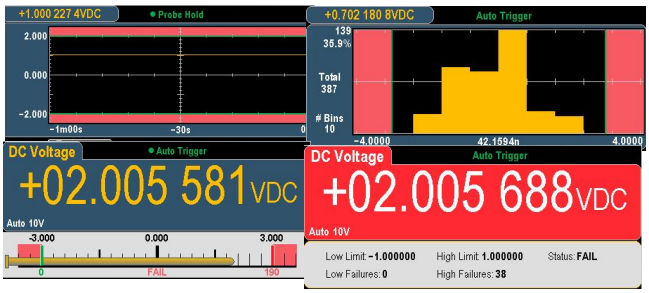
In addition to the standard numerical display mode, it also provides various graphical functions such as bar charts, trend charts, and histograms, allowing measurement results to be more than just a string of numbers, but a quick insight into the overall measurement picture.

C. Auxiliary measurement



Most measurement functions can be used to select and display auxiliary measurement functions. Auxiliary measurements can only be displayed on digital and bar gauge displays. For example, temperature measurement of thermistors (primary) and resistance measurement on thermistors (auxiliary).

D. Mathematical Operations - Limitations



The limit check indicates how many samples have exceeded the specified limit, and also indicates when this limit has been exceeded. The limit area is displayed in light red on the graph. When the limit is not exceeded, the boundary of the limit is displayed in green. When the limit is exceeded, the boundary turns red and the buzzer is activated.

E. Rich communication interfaces

For system integration applications, MDM-1055/1065 is equipped with RS-232/RS-485 and USB as standard communication interfaces, while LAN, GPIB, and rear panel inputs are optional items to meet different usage needs. Through USB/LAN/GPIB communication, data transmission can reach up to 30k readings per second.

MDM-1055				
Accuracy technical indicators of DC: ± (% reading+% range)				
Range 1/Frequency	Test current or load voltage	input impedance	1 year	Temperature coefficient/°C
DC voltage			23℃± 5 °C	0℃-18℃
				28℃-55℃
100 mV	—	10 MΩ or >10 GΩ	0.018+0.008	0.0020+0.0008
1 V	—	10 MΩ or >10 GΩ	0.015+0.005	0.0015+0.0008
10 V	—	10 MΩ	0.015+0.005	0.0020+0.0008
100 V	—	10 MΩ	0.015+0.005	0.0020+0.0008
1000 V	—	10 MΩ	0.015+0.005	0.0020+0.0008
Resistance[2]				
100 Ω	1 mA	—	0.050+0.008	0.0060+0.0008
1 KΩ	1 mA	—	0.050+0.008	0.0060+0.0005
10 KΩ	100 μA	—	0.050+0.005	0.0060+0.0005
100 KΩ	10 μA	—	0.050+0.005	0.0060+0.0005
1 MΩ	5 μA	—	0.060+0.005	0.0060+0.0005
10 MΩ	500 nA	—	0.250+0.005	0.0250+0.0005
100 MΩ	500 nA || 10 MΩ	—	2.000+0.005	0.3000+0.0005
Direct current				
100 μA	<0.02 V	—	0.050+0.015	0.007+0.0015
1 mA	<0.2 V	—	0.050+0.007	0.007+0.0010
10 mA	<0.02 V	—	0.050+0.015	0.008+0.0015
100 mA	<0.2 V	—	0.050+0.007	0.008+0.0010
1 A	<0.1 V	—	0.100+0.015	0.012+0.0015
3 A	<0.3 V	—	0.250+0.007	0.015+0.0010
10 A	<0.02 V	—	0.250+0.007	0.015+0.0010
Conduct[3]				
1 KΩ	1 mA	—	0.100+0.100	0.005+0.005
Diode testing[4]				
5V	1 mA	—	0.05+0.03	0.005+0.005
Accuracy technical indicators of AC: ± (% reading+% range)				
True RMS AC voltage[5, 6]	Test current or load voltage	Input impedance	1 year	Temperature coefficient/°C
			23℃± 5 °C	0℃-18℃
				28℃-55℃
100 mV range				
20 Hz-45 Hz	—	—	1.00+0.10	0.02+0.02

45 Hz-10 KHz	—	—	0.20+0.10	0.02+0.02
10 KHz-30 KHz	—	—	1.50+0.30	0.05+0.02
30 KHz-100 KHz[7]	—	—	3.00+0.30	0.1+0.02
1 V 、10 V、100 V and 750 V range				
20 Hz-45 Hz	—	—	1.00+0.10[8]	0.02+0.02
45 Hz-10KHz	—	—	0.20+0.10	0.02+0.02
10 KHz-30 KHz	—	—	1.50+0.30	0.05+0.02
30 KHz-100 KHz[7]	—	—	3.00+0.30[9]	0.1+0.02
True RMS AC current ranging from 6-100 μ A to 10A				
20 Hz-45 Hz	—	—	1.50+0.10	0.02+0.02
45 Hz-1 KHz	—	—	0.50+0.10	0.02+0.02
1 KHz-10 KHz[10]	—	—	2.00+0.20	0.02+0.02
Frequency: Technical specifications ± (% reading+3 coμnts)				
Frequency: Range of 100 mV, 1 V, 10 V, 100 V, and 750 V[11]				
20 Hz – 300 KHz12	—	—	0.02+3	0.005
Frequency resolution				
100 mV、1 V、10 V、100 V 和 750 V 量程 [13]				
Frequency		Resolution		
119.999 Hz		0.001 Hz		
1.19999 KHz		0.00001 KHz		
11.9999 KHz		0.0001 KHz		
119.999 KHz		0.001 KHz		
300.000 KHz		0.001 KHz		
Accuracy technical indicators for temperature and capacitance: ± (% reading+% range)				
Capacitor [14]	Test current or probe type	Input impedance	1 year	Temperature coefficient/°C
			23℃± 5 °C	0℃-18℃
				28℃-55℃
1.000 nF	5 μA	—	1+0.5	0.02+0.001
10.00 nF	5 μA	—	1+0.5	0.02+0.001
100.0 nF	10 μA	—	1+0.5	0.02+0.001
1.000 μF	100 μF	—	1+0.5	0.02+0.001
10.00 μF	1 mA	—	1+0.5	0.02+0.001
100.0 μF	1 mA	—	1+0.5	0.02+0.001

The technical indicators are valid after 90 minutes of preheating, setting the integration time to 10 or 100 NPLC, and enabling automatic zeroing. The calibration temperature is between 18 ℃ and 28 ℃. The technical indicators are valid after 90 minutes of preheating, setting the integration time to 10 or 100 NPLC, and enabling automatic zeroing. The calibration temperature is between 18 ℃ and 28 ℃.

1. Except for 1000 DCV and 3A/10A, all ranges have a 20% over range.
2. The technical specifications are applicable for 4-wire or 2-wire resistance measurement (NULL zeroing). If there is no NULL reset, the 2-wire resistance measurement will add an additional error of 0.2 Ω.
3. The continuity threshold is fixed to be less than 10 Ω. Only available in fast mode.
4. The technical specifications only apply to the voltage measured at the input terminal. Only available in fast mode.
5. Except for 750V AC and ACI 3A/10A, all ranges have a 20% over range.

6. Technical indicators refer to the technical indicators when the input signal is a sine signal and the amplitude of the input signal is greater than 5% of the range, except for the 750 V range. At 750 V range, the input signal must be greater than 50 Vrms.
When the input signal frequency is greater than 30 KHz and the input signal is less than 10% of the range, additional errors need to be added. If the frequency is between 30 KHz and 100 KHz, an additional error of 0.003% of the range needs to be added for every 1 KHz.
8. Input<200 Vrms
9. Input<300 Vrms
10. The indicator is applicable when the frequency is less than 5KHz. When the frequency is greater than or equal to 5KHz, the indicator is a typical value, which applies to all levels of true effective value AC current.
When a 0.5 Vrms signal is input in the 100 mV/1 V range, frequencies up to 1 MHz can be measured.
12. Technical specifications apply to all ranges with input signals greater than 10% * range, except for specially specified ranges. The 100mV range indicator refers to the input signal at full range or the input signal between 100mV-120mV. When the input signal is between 10 mV and 100 mV, multiply the indicator by 10.
When the 0.5 Vrms signal input is in the 100 mV/1 V range, frequencies up to 1 MHz can be measured.
14. All ranges have a 20% over range.

MDM-1065						
Range [2]/Frequency		24 hour 3	9 0 day	1year	2 year	Temperature
DC voltage		TCAL±1℃	TCAL±5℃	TCAL±5℃	TCAL±5℃	coefficient/℃[4]
100 mV		0.0030+0.0030	0.0040+0.0035	0.0050+0.0035	0.0065+0.0035	0.0005+0.0005
1 V		0.0020+0.0006	0.0030+0.0007	0.0040+0.0007	0.0055+0.0007	0.0005+0.0001
10 V		0.0015+0.0004	0.0020+0.0005	0.0035+0.0005	0.0050+0.0005	0.0005+0.0001
100 V		0.0020+0.0006	0.0035+0.0006	0.0045+0.0006	0.0060+0.0006	0.0005+0.0001
1000 V		0.0020+0.0006	0.0035+0.0010	0.0045+0.0010	0.0060+0.0010	0.0005+0.0001
True RMS AC voltage [2, 5, 6]						
100mV、1V、10V、100V and 750V range						
5 Hz - 10 Hz		0.35+0.02	0.35+0.03	0.35+0.03	0.35+0.03	0.035+0.003
10 Hz-20 KHz		0.04+0.02	0.05+0.03	0.06+0.03	0.07+0.03	0.005+0.003
20 KHz-50 KHz		0.10+0.04	0.11+0.05	0.12+0.05	0.13+0.05	0.011+0.005
50 KHz-100 KHz		0.55+0.08	0.60+0.08	0.60+0.08	0.60+0.08	0.060+0.008
100 KHz-300 KHz		4.00+0.50	4.00+0.50	4.00+0.50	4.00+0.50	0.200+0.020
Resistance [7]	Test current					
100 Ω	1 mA	0.0030+0.0030	0.008+0.004	0.010+0.004	0.012+0.004	0.0006+0.0005
1 KΩ	1 mA	0.0020+0.0005	0.008+0.001	0.010+0.001	0.012+0.001	0.0006+0.0001
10 KΩ	100 μA	0.0020+0.0005	0.008+0.001	0.010+0.001	0.012+0.001	0.0006+0.0001
100 KΩ	10 μA	0.0020+0.0005	0.008+0.001	0.010+0.001	0.012+0.001	0.0006+0.0001
1 MΩ	5 μA	0.002+0.001	0.008+0.001	0.010+0.001	0.012+0.001	0.0010+0.0002

10 MΩ	500 nA	0.015+0.001	0.020+0.001	0.040+0.001	0.060+0.001	0.0030+0.0004
100 MΩ	500 nA ‖ 10 MΩ	0.300+0.010	0.800+0.010	0.800+0.010	0.800+0.010	0.1500+0.0002
DC current internal resistance voltage drop						
100 μA	<0.11 V	0.010+0.020	0.040+0.025	0.050+0.025	0.060+0.025	0.0020+0.0030
1 mA	<0.11 V	0.007+0.006	0.030+0.006	0.050+0.006	0.060+0.006	0.0020+0.0005
10 mA	<0.05 V	0.007+0.020	0.030+0.020	0.050+0.020	0.060+0.020	0.0020+0.0020
100 mA	<0.5 V	0.010+0.004	0.030+0.005	0.050+0.005	0.060+0.005	0.0020+0.0005
1 A	<0.7 V	0.050+0.006	0.080+0.010	0.100+0.010	0.120+0.010	0.0050+0.0010
3 A	<2.0 V	0.180+0.020	0.200+0.020	0.200+0.020	0.230+0.020	0.0050+0.0020
10 A[8]	<0.5 V	0.050+0.010	0.120+0.010	0.120+0.010	0.150+0.010	0.0050+0.0010
Capacitance [15]						
1.0000 nF		0.50+0.50	0.50+0.50	0.50+0.50	0.50+0.50	0.05+0.05
10.000 nF		0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
100.00 nF		0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
1.0000 μF		0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
10.000 μF		0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
100.00 μF		0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
Range [2]/Frequency		24 hour [3]	9 0 day	1year	2 year	Temperature coefficient/℃[4]
		TCAL±1℃	TCAL±5℃	TCAL±5℃	TCAL±5℃	
True effective value AC current [2, 6, 9]		Internal resistance voltage reduction				
100 μA、1 mA、10 mA and 100 mA range				<0.011, <0.11, <0.05, <0.5 V		
3 Hz-5 KHz		0.10+0.04	0.10+0.04	0.10+0.04	0.10+0.04	0.015+0.006
5 KHz-10 KHz(typical value)		0.10+0.04	0.10+0.04	0.10+0.04	0.10+0.04	0.030+0.006
1 A range	<0.7 V					
3 Hz-5 KHz		0.10+0.04	0.10+0.04	0.10+0.04	0.10+0.04	0.015+0.006
5 KHz-10 KHz（typical value）		0.10+0.04	0.10+0.04	0.10+0.04	0.10+0.04	0.030+0.006
3 A range	<2.0 V					
3 Hz-5 KHz		0.23+0.04	0.23+0.04	0.23+0.04	0.23+0.04	0.015+0.006
5 KHz-10 KHz（typical value）		0.23+0.04	0.23+0.04	0.23+0.04	0.23+0.04	0.030+0.006
10 A range [8]	<0.5 V					
3 Hz-5 KHz		0.15+0.04	0.15+0.04	0.15+0.04	0.15+0.04	0.015+0.006
5 KHz-10 KHz（typical value）		0.15+0.04	0.15+0.04	0.15+0.04	0.15+0.04	0.030+0.006
Conduct						
1 KΩ		0.002+0.030	0.008+0.030	0.010+0.030	0.012+0.030	0.0010+0.0020
Diode testing [10]						
5 V		0.002+0.030	0.008+0.030	0.010+0.030	0.012+0.030	0.0010+0.0020

DC ratio (typical value)					
(Normalized precision input)+(Normalized reference precision)					
Temperature 11					
PT100(DIN/IEC751)	Probe accuracy+0.05℃				
5 KΩ Thermistor	Probe accuracy+0.1℃				
Frequency: Technical specifications ± (% reading)[12,13]					
100mV、1V、10V、100V and 750V range [14]					
3 Hz-10 Hz	0.1	0.1	0.1	0.1	0.1
10 Hz-100 Hz	0.03	0.03	0.03	0.03	0.035
100 Hz-1 KHz	0	0.008	0.01	0.01	0.015
1 KHz-300 KHz	0.002	0.006	0.01	0.01	0.015
Square wave [15]	0.001	0.006	0.01	0.01	0.015
Additional gating time error ± (% reading)[13]					
Frequency	1second	0.1 second	0.01 second		
3 Hz-40 Hz	0	0.2	0.2		
40 Hz-100 Hz	0	0.06	0.2		
100 Hz-1 KHz	0	0.02	0.2		
1 KHz-300 KHz	0	0.004	0.03		
Square wave [15]	0	0	0		

For DC: The technical indicators are valid after 60 minutes of preheating, setting the integration time period to 10 or 100 PLC, and enabling automatic zeroing. For communication: Technical indicators are effective after 60 minutes of preheating, using slow AC filtering, and sine wave.

2. Except for 1000DCV, 750ACV, 10ADC, 3AAC, 10AAC, and diode testing, all ranges have a 20% over range.

3. Relative to calibration standards.

4. Add a coefficient for every 1 degree (℃) outside the TCAL ± 5 ℃ range.

5. The technical specifications are effective when the sine wave input is greater than 5% of the range and greater than 1mVrms. The range of 750ACV is limited to 8 × 107V-Hz. If the input signal frequency is less than 50KHz and the sine wave input is between 1% and 5% of the entire range, the indicator needs to add an additional 0.1% error. When the frequency is between 50KHz and 100KHz, the indicator needs to add an additional 0.13% error.

6. Low frequency performance: Three filter settings are available: 3Hz, 20Hz, and 200Hz. Exceeding the frequency set by the filter has been specified and no additional errors will occur.

7. The technical specifications are applicable for 4-wire or 2-wire resistance measurement (NULL zeroing). If there is no NULL reset, the 2-wire resistance measurement will add an additional error of 0.2 Ω.

The 8.10A range is only provided on the front-end connector. Add 2mA base current value to each amplifier, or input current>5Arms.

9. The technical specifications are effective when the sine wave input is greater than 1.5% range and greater than 10 μ AAC.

10. The technical specifications are applicable to the voltage measured at the input terminal. 1mA test current is a typical value. The variation of the current source will cause a

change in the voltage drop at the diode node.

11. The selected probe will limit the actual measurement range and measurement error. The probe accuracy includes all measurement and ITS-90 temperature conversion errors. PT100Ro can be set to 100 Ω± 5 Ω to eliminate the original probe error.

12. Unless otherwise specified, the technical specifications are valid after 60 minutes of preheating and with sine wave input. The technical specifications are applicable for a 1-second gating time (7 digits).

13. Suitable for sine wave and square wave inputs ≥ 100mV. For input signals ranging from 10mV to 100mV, multiply the indicator by 10 (i.e. enlarge the reading indicator by 10 times).

14. The amplitude range is 10% to 120%, below 750ACV.

15. The square wave input is specified as 10Hz-300kHz.

Contact Us
MATRIX TECHNOLOGY INC.
National Free Service Hotline: 86-755-2836-4273
Website: www.szmatrix.com
Email:sales@szmatrix.com
Address: 6th Floor, Building C, Huachuangda Cultural and Technological Industrial Park, Haihui Road, Bao'an District, Shenzhen

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