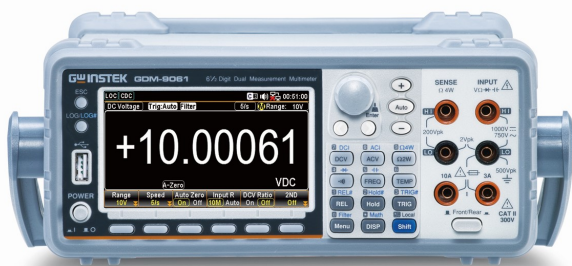


MEASUREMENT EXPLORES~ INSIGHT & EFFICIENCY



GW Instek GDM-906X

6 1/2 Digit Dual Measurement Multimeter

New Product Announcement

This document allows GW Instek's partners to quickly grasp product's main features, FAB and ordering information.

GDM-906X 6 ½ Digit Dual Measurement Multimeter

New Product Announcement



GW Instek launches GDM-906X series 6 ½ digit dual measurement multimeter (2 models: GDM-9061 and GDM-9060), featuring high precision DC voltage accuracy, fast sampling rate, 12 measurement functions (DC voltage/current, AC voltage/current, 2-wire/4-wire resistance, frequency, period, diode, continuity beeper, temperature, capacitance), 6 mathematical functions (dB/dBm/Compare/MX+B/Percent and 1/X) as well as a variety of

communications interfaces (USB device/host, RS-232C, LAN, digital I/O and optional GPIB) to provide comprehensive measurement capabilities, higher speed and accuracy.

The series adopts a 4.3-inch TFT graphical display and a fast sampling rate (GDM-9061: 10k/s, GDM-9060: 1k/s max.). In addition to the conventional digital display, displays can be collocated with bar meter, trend chart or histogram to make the panoramic view of the entire measurement process more completely and quickly presented. At the same time, the internal memory capacity (GDM-9061: 100k, GDM-9060: 10k) can simultaneously facilitate the trend chart or histogram measurement process and perform statistical calculations to simplify the complex trend analysis.

For user-friendly, the GDM-906X series incorporates some ingenious operational ideas, such as numeric soft keys for settings that require numerical input, upper/lower limits, LAN IP operational interfaces or messages, and multiple languages (English / Traditional Chinese/ Simplified Chinese/ Japanese / Korean) to shorten the operational and learning time of the meter.

For ATS measurement or remote control applications, the GDM-906X series provides GPIB (option can be installed at customer site) other than standard communications interfaces: USB, RS-232 and LAN. With respect to software supports, the GDM-906X series provides DMM-Viewer2 to assist users in observing or recording the data from the measurement process. In addition, LabVIEW driver is also provided to facilitate the program requirements of different system integrations.

Measurement Explores ~ Insight & Efficiency

Ideal benchtop partner

The GDM-906X series provides all fundamental measurement functions engineers require to design, develop, and test electronic circuits or products, including voltage, current, resistance, diode, and continuity beeper, frequency, temperature and capacitance. In addition, the series also features mathematical functions (dB, dBm, Compare, MX+B, 1/X and Percent), statistical functions (Min/Max/Average/P-P/STDEV), and a variety of standard communications interfaces. The series can meet specific measurement requirements and complex measurement applications whether for the benchtop operation or to be installed in the system.

	GDM-9061	GDM-9060
DCV Accuracy	0.0035%	0.0075%
Sampling Rate	10k/sec	1k/sec
Memory	100k	10k
Display	Number, Trend Chart, Bar Meter, Histogram	
Function	Voltage/Current : AC, DC Resistance : 2-Wire, 4-Wire Diode, Continuity Frequency, Period Temperature, Capacitance	
Math.	REL, dB, dBm, Compare, MX+B, Percent, 1/X	
STAT.	Min/Max/Average/ P-P, STDEV	
Interface	RS-232C, USB Host/Device, LAN	
Rear Input	Yes	NO

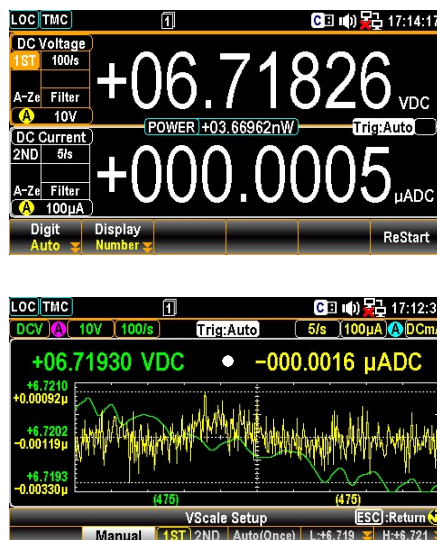
Diverse display mode

In addition to the standard numeric display mode, it also provides a variety of graphical functions such as bar meter, trend chart and histogram, so that the measurement results are no longer just a series of numbers, but a swift insight into the panoramic measurement.



Dual measurements and dual trend lines

The dual measurement function has always been a unique feature of GW Instek digital multimeters, allowing two measurement functions to be performed simultaneously and displaying the test results separately so as to greatly improve the test speed of the multi-functional measurement tasks.



High measurement resolution and high sampling rate

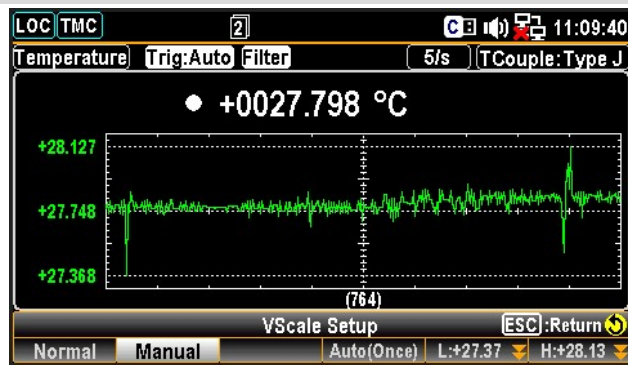
The GDM-906X series provides high resolution of 0.1µV for voltage measurement, 100pA for current measurement, and 100µΩ for resistance measurement to meet the necessary requirements for precision measurement in specific applications. In addition, GDM-9061 is capable of achieving 10k readings per second with a display resolution of 4½ digits, while GDM-9060 achieves 1k measurement readings per second with a display resolution of 5½ digits; such a fast sampling rate is sufficient for current measurement needs.

GDM-9061 Measurement Type ~ DCV/DCI/2W/4W									
Refresh Rate Available									
6½ Resolution			5½ Resolution			4½ Resolution			
5/s	20/s	60/s	100/s	400/s	1.2k/s	2.4k/s	4.8k/s	7.2k/s	10k/s

GDM-9060 Measurement Type ~ DCV/DCI/2W/4W									
Refresh Rate Available									
6½ Resolution			5½ Resolution			4½ Resolution			
5/s	20/s	60/s	100/s	400/s	1k/s	-----	-----	-----	-----

Temperature measurement

The GDM-906X series conducts temperature measurement and is ideal for a variety of temperature sensors, such as thermistors, RTDs, and thermocouples. The GDM-906X's temperature measurement supports commonly used thermocouple types (e.g. J / T / K..., etc.), using voltage measurement terminals as thermocouple inputs, and calculating temperature based on voltage fluctuations; the function can be used as a temperature recorder if collocated with internal memory capacity and the trend chart function.



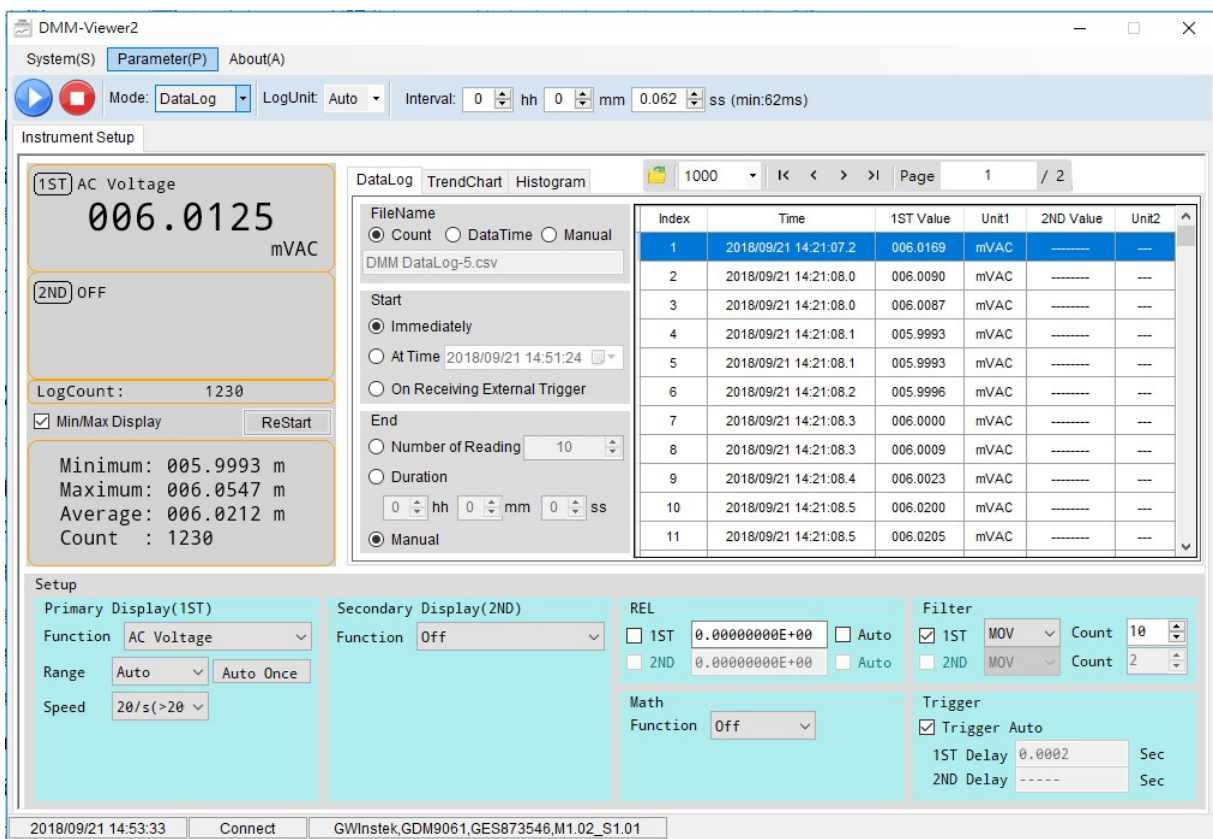
Diverse communications interface and fast transfer rate

For system integration applications, the GDM-906X series is equipped with RS232, USB and LAN as standard communications interfaces, and GPIB is an option (can be installed by customer) to meet the requirements of different system integrations. Data transfer rate is up to 10k readings per second (GDM-9061) or 1k readings per second (GDM-9060) via USB/LAN/GPIB interfaces.



Convenient PC Software

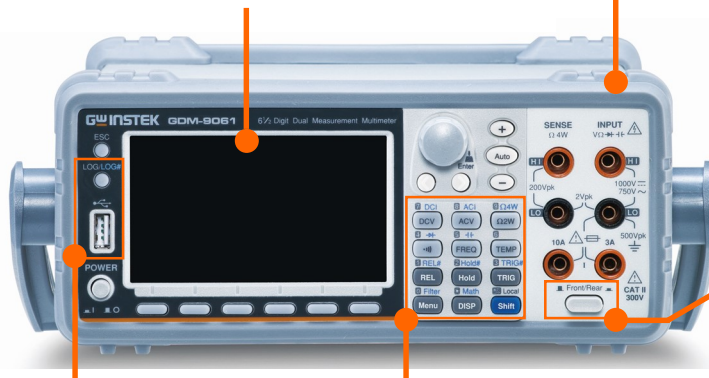
The PC software DMM-Viewer2 is suitable for any computer communications interfaces (RS232C/LAN/USB/ GPIB) provided by the GDM-906X series for long-term data acquisition. The software not only allows users to control the settings of the GDM-906X series but also provides the observation mode or the recording mode for the captured data. For the observation mode, the measurement result is directly presented as the result of the trend chart or the histogram and the result is not saved. For the recording mode, the measurement result is directly saved into the log file, but only the current display is shown in the process. The measured data and trend chart can be viewed after the recording mode is stopped. In addition, the GDM-906X series also provides LabVIEW driver to meet the software application requirements of system integration.



Main Feature

- 6 1/2 digits: 1,200,000 display value (maximum)
- 4.3' TFT Graphic LCD
- DC voltage basic accuracy: 0.0035% (GDM-9061) / 0.0075% (GDM-9060)
- 12 measurement functions: DC voltage, AC voltage, DC current, AC current, 2-wire / 4-wire resistance, frequency, period, diode, continuity beeper, temperature, capacitance
- Sampling rate up to 10k/sec (GDM-9061)
- Dual measurement function, providing two selected parameters for simultaneous measurement
- Graphic display capability, providing histogram, bar meter and trend chart
- Temperature measurement function, supporting RTD, thermistor and thermocouple
- Support multi-language (English / Traditional Chinese / Simplified Chinese / Japanese / Korean)
- Standard interfaces: USB host/device, RS-232C, LAN, Digital I/O
- Optional interface: GPIB

4.3' color TFT display screen, providing multiple display modes. 12 measurement functions can be selected by pressing soft keys, making operations easy and intuitive.



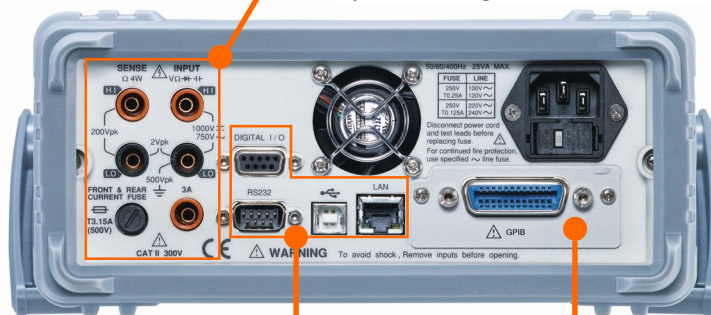
Both 2-Wire and 4-Wire resistance measurements are supported. The low current measurement and high current measurement are made through different inputs.

Front/rear panel input terminal selection switch (for GDM-9061 only)

USB storage function to directly capture the displayed screen (bmp file), or retrieve the internal memory data for the computer to conduct storage or analysis

Numeric soft key function for quick input, such as upper and lower limits

Rear input terminal, suitable for system integration. (GDM-9061 only)



A variety of standard communications interfaces, including USB/RS232/LAN and GPIB (optional) to meet the needs of various system integrations. In addition, the digital I/O port sends out a signal of compared measurement result for external devices control.

Optional GPIB can be installed at customer site

Specifications comparison ~ GDM-9061 vs 34461A/34401A

Specifications highlighted in red represent better performance

“X” represents “no such function” or “function not available”

Model	GDM-9061	34461A	34401A (Phase-out)
Key Specification			
Digits	6 1/2	6 1/2	6 1/2
DCV Basic accuracy	35ppm	35ppm	35ppm
Sampling (reading/s) ~ 4 1/2	10,000	1,000	1,000
Storage (internal)	100,000	10,000	512
Measurement			
DCV	100mV~1000V	100mV~1000V	100mV~1000V
ACV	100mV~750V	100mV~750V	100mV~750V
DCI	100μA ~ 3A, 10A	100μA ~ 3A, 10A	10mA ~ 3A
ACI	100μA ~ 3A, 10A	100μA ~ 3A, 10A	1A ~ 3A
2W/4W R	100Ω ~ 100MΩ	100Ω ~ 100MΩ	100Ω ~ 100MΩ
Continuity	Yes	Yes	Yes
Diode	5V	5V	1V
Frequency/period	3Hz ~ 1MHz	3Hz ~ 300kHz	3Hz ~ 300kHz
Temperature	RTD, Thermistor, Thermocouple	RTD, Thermistor	No
Capacitance	1nF ~ 100μF	1nF ~ 100μF	No
Other			
Display	Color, Graph	Color, Graph	VFD
Statistics	histogram, bar meter, trend chart	histogram, bar meter, trend chart	No
Rear Input	Yes	Yes	Yes
Interface			
USB	Std.	Std.	No
LAN	Std.	Std.	No
GPIB	Opt.	Opt.	Std.
RS-232	Std.	No	Std.
DIO	Std.	No	No

(NOTE)

- GDM-9061 provides better sampling speed / storage capacity, frequency, temperature measurement, and complete communications interface
- GDM-9061 is compatible with the commands of the corresponding models.

Specifications comparison ~ GDM-9060 vs 34460A

Specifications highlighted in red represent better performance

“X” represents “no such function” or “function not available”

Model	GDM-9060	34460A
Key Specification		
Digits	6 1/2	6 1/2
DCV Basic accuracy	75ppm	75ppm
Sampling (reading/s) ~ 4 1/2	1,000	300
Storage (internal)	10,000	1,000
Measurement		
DCV	100mV~1000V	100mV~1000V
ACV	100mV~750V	100mV~750V
DCI	100μA ~ 3A	100μA ~ 3A
ACI	100μA ~ 3A	100μA ~ 3A
2W/4W R	100Ω ~ 100MΩ	100Ω ~ 100MΩ
Continuity	Yes	Yes
Diode	5V	5V
Frequency/period	3Hz ~ 1MHz	3Hz ~ 300kHz
Temperature	RTD, Thermistor, Thermocouple	RTD, Thermistor
Capacitance	1nF ~ 100μF	1nF ~ 100μF
Other		
Display	Color, Graph	Color, Graph
Statistics	histogram, bar meter, trend	histogram, bar meter
Rear Input	No	No
Interface		
USB	Std.	Std.
LAN	Std.	Opt.
GPIB	Opt.	Opt.
RS-232	Std.	No
DIO	Std.	No

(NOTE)

1. GDM-9060 provides better sampling speed / storage capacity, frequency, temperature measurement, and a complete communications interface
2. GDM-9060 provides trend chart display
3. GDM-9060 is compatible with the commands of the corresponding models.

Specifications comparison ~ GDM-9061 vs GDM-8261A

Specifications highlighted in red represent better performance

“X” represents “no such function” or “function not available”

Model	GDM-9061	GDM-8261A
Key Specification		
Digits	6 1/2	6 1/2
DCV Basic accuracy	35ppm	35ppm
Sampling (reading/s) ~ 4 1/2	10,000	2,400
Storage (internal)	100,000	10,000
Measurement		
DCV	100mV~1000V	100mV~1000V
ACV	100mV~750V	100mV~750V
DCI	100μA ~ 3A, 10A	100μA ~ 1A, 10A
ACI	100μA ~ 3A, 10A	1mA ~ 1A, 10A
2W/4W R	100Ω ~ 100MΩ	100Ω ~ 100MΩ
Continuity	Yes	Yes
Diode	5V	1V
Frequency/period	3Hz ~ 1MHz	3Hz ~ 300kHz
Temperature	RTD, Thermocouple, Thermistor	RTD, Thermocouple
Capacitance	1nF ~ 100μF	No
Other		
Display	Color, Graph	Two color, VFD
Statistics	histogram, bar meter, trend	No
Rear Input	Yes	No
Interface		
USB	Std.	Std.
LAN	Std.	Opt.
GPIB	Opt.	Opt.
RS-232	Std.	Std.
DIO	Std.	Std.
Scanner	No	Opt.

(NOTE)

1. The production of GDM-8261A will continue but it is recommended only when the customer requires multi-channel scanning.
2. GDM-9061 provides better display, sampling speed/storage capacity, AC current/frequency/diode/temperature/capacitance measurement, and LAN communications interface
3. GDM-9061 provides rear panel input (maximum current: 3A)

Specifications comparison ~ GDM-9061 vs GDM-9060

Specifications highlighted in red represent better performance

“X” represents “no such function” or “function not available”

Model	GDM-9061	GDM-9060
Key Specification		
Digits	6 1/2	6 1/2
DCV Basic accuracy	35ppm	75ppm
Sampling (reading/s) ~ max.	10,000	1,000
Storage (internal)	100,000	10,000
Measurement		
DCV	100mV~1000V	100mV~1000V
ACV	100mV~750V	100mV~750V
DCI	100μA ~ 10A	100μA ~ 3A
ACI	100μA ~ 10A	100μA ~ 3A
2W/4W R	100Ω ~ 100MΩ	100Ω ~ 100MΩ
Continuity	Yes	Yes
Diode	5V	5V
Frequency/period	3Hz ~ 1MHz	3Hz ~ 1MHz
Temperature	RTD, Thermocouple, Thermistor	RTD, Thermocouple, Thermistor
Capacitance	1nF ~ 100μF	1nF ~ 100μF
Other		
Display	Color, Graph	Color, Graph
Statistics	histogram, bar meter, trend chart	histogram, bar meter, trend chart
Rear Input	Yes	No
Interface		
USB	Std.	Std.
LAN	Std.	Std.
GPIB	Opt.	Opt.
RS-232	Std.	Std.
DIO	Std.	Std.

Target Markets and Associated Features

1. System Integration (Integrator / Self-organizing) ~ 50%
2. Industrial /Research (General purpose) ~ 30%
3. Hobbyists and Others ~ 10% each

System Integrator

- Semi-automatic and automatic electrical tests
 - Up to 10k readings/sec (1k readings/sec for GDM-9060) data transfer rate through USB/LAN as well as optional GPIB Interface
 - Command compatible with Keysight 34401A/3446xA

High-end Education & Research organization

- Research Scientists : Electrical and physics experiments
 - Up to 10k readings/sec (1k readings/sec for GDM-9060) data transfer rate through USB/LAN as well as optional GPIB Interface
 - Up to 100k (10k for GDM-9060) measurement readings can be recorded for statistical analysis of maximum, minimum, average value and standard deviation among whole recorded data.
- Engineering Students : Electronic devices and circuits experiments
 - 6 ½ digit resolution, 0.0035% (0.0075% for GDM-9060) DCV accuracy, multiple interfaces and free PC software
 - Various functions, including (ACV, DCV, ACA, DCA, R, Hz, Continuity beeper, Diode test, REL), 2/4 wire resistance, relative and compare measurements for wide range of applications.

Electrical and Electronics Manufacturing

- Test Engineers : Manual and semi-automatic electrical functional tests
 - 6 ½ digit resolution, 0.0035% (0.0075% for GDM-9060) DCV accuracy, multiple interfaces and free PC software
 - Various functions, including (ACV, DCV, ACA, DCA, R, Hz, Continuity beeper, Diode test, REL), 2/4 wire resistance, relative and compare measurements for wide range of applications.
- Development Engineers: Electrical/electronic circuit and product verification
 - Up to 100k (10k for GDM-9060) measurement readings can be recorded for statistical analysis of maximum, minimum, average value and standard deviation among whole recorded data.
- Service/Calibration Technicians : Electronic product repair and calibration
 - 6 ½ digit resolution, 0.0035% (0.0075% for GDM-9060) DCV accuracy, multiple interfaces and free PC software
 - ACV, DCV, ACA, DCA, R, Hz, Continuity beeper, Diode test, REL...various functions for wide range of applications

Key Dates for Product Announcement

1. Distributor Announcement & Demo Unit Order and Shipping (5th of October)
2. Global Market Announcement (12th of October)

Service Policy

1. **3 year warranty**
2. **Service Support**

The service instructions in the Service Manual will help distributors repair defective units promptly. Should a board replacement be necessary to fix a defective unit, a board swapping service is provided by Good Will Instrument to facilitate the repairs done at a distribution site.

3. GW Instek continues to provide the after sales support through its website. The most updated version of the service manual and Marcom material for GDM-906X will be posted on the distributor zone of GW Instek Website at <https://www.gwinstek.com>

Specification

General



Note

- All specifications are ensured only under a single display.
- At least 1 hour of warm-up time is required before applying these specifications.
- Make sure that the Sense LO terminal to Input LO is limited to 2Vpk, the Sense HI to Sense LO terminals are limited to 200Vpk and the Input LO to earth is limited to 500Vpk. CAT II 300V. MAX DC1000V, AC 750V

Environment	<ul style="list-style-type: none"> • Operating Environment: Full accuracy for 0 °C to 55 °C • Full accuracy to 80% R.H. at 40 °C Non-condensing • Operating Altitude Up to 2,000 m • Storage Temperature -40 to 70 °C
Line Power	<ul style="list-style-type: none"> • Power Supply: 100 / 120 / 220 / 240 VAC ±10% • Power Line Frequency: 50 Hz / 60 Hz / 400 Hz ±10% • Power Consumption: Max. 25 VA
Mechanical	<ul style="list-style-type: none"> • Dimensions: 88mm(H) x 220mm(W) x 276.6mm(D) (without bumpers for Rack) • Dimensions: 107mm(H) x 266.9mm(W) x 301.8mm(D) (with bumpers for Bench) • Weight (9060): 3.30 kg (7.3 lbs) • Weight (9061): 3.53 kg (7.8 lbs)

GDM-9061 SPECIFICATION

DC Characteristics ^[1]

DC Voltage

Range ^[2]	Input Resistance	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 mV	10 MΩ or >10 GΩ Selectable	0.0030 + 0.0030	0.0040 + 0.0035	0.0050 + 0.0035	0.0005 + 0.0005
1.000000 V	10 MΩ or >10 GΩ Selectable	0.0020 + 0.0006	0.0035 + 0.0007	0.0048 + 0.0007	0.0005 + 0.0001
10.00000 V	10 MΩ or >10 GΩ Selectable	0.0015 + 0.0004	0.0020 + 0.0005	0.0035 + 0.0005	0.0005 + 0.0001
100.0000 V	10 MΩ±1%	0.0020 + 0.0006	0.0035 + 0.0006	0.0050 + 0.0006	0.0005 + 0.0001
1000.000 V	10 MΩ±1%	0.0025 + 0.0006	0.0040 + 0.0010	0.0050 + 0.0010	0.0005 + 0.0001

Accuracy Specifications: ± (% of reading + % of range)

Resistance ^[3]

Range ^[2]	Test Current	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 Ω	1 mA	0.0030 + 0.0030	0.0080 + 0.004	0.0100 + 0.004	0.0008 + 0.0005
1.000000 kΩ	1 mA	0.0020 + 0.0005	0.0080 + 0.001	0.0100 + 0.001	0.0008 + 0.0001
10.00000 kΩ	100 μA	0.0020 + 0.0005	0.0080 + 0.001	0.0100 + 0.001	0.0008 + 0.0001
100.0000 kΩ	10 μA	0.0020 + 0.0005	0.0080 + 0.001	0.0100 + 0.001	0.0008 + 0.0001
1.000000 MΩ	5 μA	0.0020 + 0.0010	0.0080 + 0.001	0.0100 + 0.001	0.0010 + 0.0002
10.00000 MΩ	500 nA	0.0150 + 0.0010	0.0200 + 0.001	0.0400 + 0.001	0.0030 + 0.0004
100.0000 MΩ	500 nA/10 MΩ	0.3000 + 0.0100	0.8000 + 0.010	0.8000 + 0.010	0.1500 + 0.0002

Accuracy Specifications: ± (% of reading + % of range)

DC Current

Range ^[2]	Burden Voltage	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 μA	< 0.011 V	0.010 + 0.020	0.040 + 0.025	0.050 + 0.025	0.002 + 0.003
1.000000 mA	< 0.11 V	0.007 + 0.006	0.030 + 0.006	0.050 + 0.006	0.002 + 0.001
10.00000 mA	< 0.04 V	0.007 + 0.020	0.030 + 0.020	0.050 + 0.020	0.002 + 0.002
100.0000 mA	< 0.4 V	0.010 + 0.004	0.030 + 0.005	0.050 + 0.005	0.002 + 0.001
1.000000 A	< 0.7 V	0.050 + 0.006	0.080 + 0.010	0.100 + 0.010	0.005 + 0.001
3.000000 A	< 2.0 V	0.180 + 0.020	0.200 + 0.020	0.200 + 0.020	0.005 + 0.002
10.00000 A ^[6]	< 0.5 V	0.100 + 0.010	0.120 + 0.010	0.150 + 0.010	0.005 + 0.001

Accuracy Specifications: ± (% of reading + % of range)

Continuity

Range ^[2]	Test Current	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
1 kΩ	1 mA	0.002 + 0.030	0.008 + 0.030	0.01 + 0.030	0.001 + 0.002

Accuracy Specifications: ± (% of reading + % of range)

Diode Test ^[4]

Range ^[2]	Test Current	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
5 V	1 mA	0.002 + 0.030	0.008 + 0.030	0.01 + 0.030	0.001 + 0.002

Accuracy Specifications: ± (% of reading + % of range)

DC Ratio ^[5]

Accuracy Specification: ± (DC Input accuracy + DC Reference accuracy)

Measuring Characteristics

DC Voltage	Input Bias	30pA (Typ, 25°C)	
	Input Protection	1000V on all ranges	
	Measurement Method:	Sigma-delta A/D Converter	
Resistance	Max. Lead Resistance	10% of range per lead for 100Ω, 1 kΩ ranges. 1 kΩ per lead on all other ranges.	
	Input Protection	1000V on all ranges	
	Measurement Method:	Selectable 4-wire or 2-wire ohms. Current source referenced to LO input	
DC Current	Shunt Resistor	100Ω for 100μA, 1mA. 1Ω for 10mA and 100 mA. 0.1Ω for 1A and 3A. 0.01Ω for 10A.	
	Input Protection	External : 3.15A, 500V fuse for 3A; Internal : 6A, 1kV fuse for 3A; Internal : 12A, 1kV fuse for 10A	
Reading Rate (Readings/sec)	Continuity/Diode	Speed	Digits
		60/s	6 1/2
		100/s	5 1/2
	DCV, DCI, Resistance	400/s	4 1/2
		Speed	Digits
		5/s, 20/s, 60/s, 100/s	6 1/2
		400/s, 1.2k/s, 2.4k/s	5 1/2
		4.8k/s, 7.5k/s, 10k/s	4 1/2

[1]. DC Specification: In addition to the availability that requires warm-up of 60 minutes, it must be set in 5/s speed rate (60/s speed rate for Continuity and Diode), A-Zero on.

[2]. The entire range of measurement will pass the set range by 20% except the tests of 1000 DCV, 3 A DC, 10 A DC and diode.

[3]. This specification applies to 4-wire resistance measurement, whilst it requires using "REL" function for offset on 2-wire resistance measurement. 2-wire resistance measurement will cause additional error of 0.2 Ω if REL function is not executed.

[4]. This specification applies to the voltage measured from input terminal. 1 mA test current is the typical value. The change of current source leads to the variation in buck of diode junction.

[5]. Accuracy is ± (DC Input accuracy + DC Reference accuracy), where Input accuracy = DC Voltage accuracy for the Input HI to LO (in % of the Input voltage), and Reference accuracy = DC Voltage accuracy for the HI to LO (Sense) Reference (in % of the Reference voltage).

[6]. The 10 A range of measurement is available for the terminals on front panel only. Due to power factor resulting in temperature rise, 2 mA increment per one ampere when input is greater than 5 A rms.

AC Characteristics [1]

True RMS AC Voltage [3][4]

Range ^[2]	Frequency	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 mV	3Hz - 5Hz	1.00 + 0.03	1.00 + 0.04	1.00 + 0.04	0.100 + 0.004
	5Hz - 10Hz	0.35 + 0.03	0.35 + 0.04	0.35 + 0.04	0.035 + 0.004
	10Hz - 20kHz	0.04 + 0.03	0.05 + 0.04	0.06 + 0.04	0.005 + 0.003
	20kHz - 50kHz	0.10 + 0.05	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
	50kHz - 100kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008
1.000000 V to 750.000 V	100kHz -300kHz	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.200 + 0.020
	3Hz - 5Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.004
	5Hz - 10Hz	0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.035 + 0.004
	10Hz - 20kHz	0.04 + 0.02	0.05 + 0.03	0.06 + 0.03	0.005 + 0.003
	20kHz - 50kHz	0.10 + 0.04	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
50kHz - 100kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008
	100kHz -300kHz	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.200 + 0.020

Accuracy Specifications: ± (% of reading + % of range)

True RMS AC Current [4][5]

Range ^[2]	Burden Voltage	Frequency	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 µA / 10.00000 mA	< 0.04 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5Hz – 10Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.035 + 0.006
		10Hz – 5kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
		5kHz – 10kHz	0.18 + 0.04	0.18 + 0.04	0.18 + 0.04	0.030 + 0.006
1.000000 mA / 100.0000 mA	< 0.4 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5Hz – 10Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04	0.035 + 0.006
		10Hz – 5kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
		5kHz – 10kHz	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.030 + 0.006
1.000000 A	< 0.7 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5Hz – 10Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04	0.035 + 0.006
		10Hz – 5kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
		5kHz – 10kHz	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.030 + 0.006
3.000000 A	< 2.0 V	3Hz – 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5Hz – 10Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.035 + 0.006
		10Hz – 5kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.015 + 0.006
		5kHz – 10kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.030 + 0.006
10.00000 A [6]	< 0.5 V	3Hz – 5Hz	1.10 + 0.04	1.10 + 0.04	1.10 + 0.04	0.100 + 0.006
		5Hz – 10Hz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.035 + 0.006
		10Hz – 5kHz	0.15 + 0.04	0.15 + 0.04	0.15 + 0.04	0.015 + 0.006
		5kHz – 10kHz	0.35 + 0.04	0.35 + 0.04	0.35 + 0.04	0.030 + 0.006

Accuracy Specifications: ± (% of reading + % of range)

Additional Crest Factor Errors (non-sine wave)

Crest Factor	Error (% of reading)
1-2	0.05%
2-3	0.15%
3-4	0.30%
4-5	0.40%

Additional Low Frequency Errors (% of reading)

Frequency	Speed		
	1/s (>3 Hz)	5/s (>20 Hz)	20/s (>200 Hz)
10Hz~20Hz	0	0.74	-
20Hz~40Hz	0	0.22	-
40Hz~100Hz	0	0.06	0.73
100Hz~200Hz	0	0.01	0.22
200Hz~1kHz	0	0	0.18
>1kHz	0	0	0

Measuring Characteristics

True RMS AC Voltage	Measurement Method	AC-coupled True RMS – measures the ac component of input with up to 400 Vdc of bias on any range.	
	Crest Factor	Maximum 5:1 at full scale	
AC Bandwidth	Speed	Bandwidth	
	1/s (>3Hz)	3 Hz – 300 kHz (ACI : 3 Hz – 10 kHz)	
	5/s (>20Hz)	20 Hz – 300 kHz (ACI : 20 Hz – 10 kHz)	
	20/s (>200Hz)	200 Hz – 300 kHz (ACI : 200 Hz – 10 kHz)	
	Input Impedance	1 MΩ ± 2%, in parallel with 100 pF	
	Input Protection	750Vrms on all ranges	
True RMS AC Current	Range	Shunt	Burden Voltage
	100μA	100Ω	<0.011V
	1mA	100Ω	<0.11V
	10mA	1Ω	<0.04V
	100mA	1Ω	<0.4V
	1A	0.1Ω	<0.7V
	3A	0.1Ω	<2.0V
	10A	10mΩ	<0.5V
	Input Protection	External : 3.15A, 500V fuse for 3A Internal : 6A, 1kV fuse for 3A Internal : 12A, 1kV fuse for 10A	

Operation Characteristics

Function	Speed	Digits	ACV Bandwidth	ACI Bandwidth
ACV, ACI	1/s (>3Hz)	6 1/2	3 Hz – 300 kHz	3 Hz – 10 kHz
	5/s (>20Hz)	5 1/2	20 Hz – 300 kHz	20 Hz – 10 kHz
	20/s (>200Hz)	4 1/2	200 Hz – 300 kHz	200 Hz – 10 kHz

- [1]. AC Specification: It will be available after 60 minutes of warm-up, sine wave as well as 1/s speed rate.
- [2]. The entire range of measurement will pass the set range by 20% except the tests of 750 ACV, 3 A AC and 10 A AC.
- [3]. Specifications are for sinewave input >5% of range. For inputs from 1% to 5% of range and <50 kHz, add 0.1% of range additional error. For 50 kHz to 100 kHz, add 0.13% of range. The measurement range of 750 ACV is limited within the range of 7.5×10^7 Volt-Hz.
- [4]. Three speed settings provided for low-frequency performance: 1/s (3 Hz), 5/s (20 Hz), 20/s (200 Hz). Additional errors will Not occur for the frequency greater than the filter settings.
- [5]. Specifications are for sinewave input >5% of range, and is beyond 10 μAAC. For inputs from 1% to 5% of range, add 0.1% of range additional error.
- [6]. The 10A range of measurement is available for the terminals on front panel only. Due to power factor resulting in temperature rise, 2 mA increment per one ampere when input is greater than 5 A rms.

Frequency and Period Characteristics

Frequency / Period ^{[1] [2]}

Range	Frequency	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100 mV	3Hz - 5Hz	0.100	0.100	0.100	0.100
to	5Hz - 10Hz	0.050	0.050	0.050	0.035
750 V ^[3]	10Hz - 40Hz	0.030	0.030	0.030	0.015
	40Hz – 1MHz ^[4]	0.006	0.006	0.006	0.015

Accuracy Specifications: \pm (% of reading)

Measuring Characteristics

Frequency and Period	Measurement Method	Reciprocal-counting technique. AC-coupled input using the ac voltage measurement function.
	Voltage Ranges	100 mV rms full scale to 750 V rms. Auto or manual ranging.
Settling Considerations	Errors will occur when attempting to measure the frequency or period of an input following a dc offset voltage change. The input blocking RC time constant must be allowed to fully settle (up to 1 sec) before the most accurate measurements are possible.	
Measurement Considerations	All frequency counters are susceptible to error when measuring low-voltage, low-frequency signals. Shielding inputs from external noise pickup is critical for minimizing measurement errors.	

Operation Characteristics

Function	Gate Time	Digits
	1 s	6 1/2
Frequency, Period	100 ms	5 1/2
	10 ms	4 1/2

[1]. This specification will be available after 60 minutes of warm-up and sine wave input, unless stated otherwise.

This specification applies to 1s gate time.

[2]. This specification is available when both sine wave and square wave input ≥ 100 mV. For the input of 10 mV to 100 mV, the % of reading error needs to be multiplied by 10 times.

[3]. The amplitude range is from 10% to 120% and is lower than 750 ACV.

[4]. The input ≥ 60 mV, for 300 k ~ 1 MHz, within 100mV range.

Temperature Characteristics [1]

(Exclusive of probe errors.)

RTD (Accuracy based on PT100):

(100Ω platinum [PT100], D100, F100, PT385, PT3916, or user type)

Range	Resolution	1 Year (23°C±5°C)	Temperature Coefficient 0°-18°C & 28°-55°C
-200 °C ~ -100 °C	0.001 °C	0.09 °C	0.004 °C / °C
-100 °C ~ -20 °C	0.001 °C	0.08 °C	0.005 °C / °C
-20 °C ~ 20 °C	0.001 °C	0.06 °C	0.005 °C / °C
20 °C ~ 100 °C	0.001 °C	0.08 °C	0.005 °C / °C
100 °C ~ 300 °C	0.001 °C	0.12 °C	0.007 °C / °C
300 °C ~ 600 °C	0.001 °C	0.22 °C	0.009 °C / °C

Thermocouples (Accuracy based on ITS-90)

Type	Range	Resolution	90 day / 1 Year (23°C±5°C)*	Temperature Coefficient 0°-18°C & 28°-55°C
E	-200 to +1000 °C	0.002 °C	0.2 °C	0.03 °C / °C
J	-210 to +1200 °C	0.002 °C	0.2 °C	0.03 °C / °C
T	-200 to +400 °C	0.002 °C	0.3 °C	0.04 °C / °C
K	-200 to +1372 °C	0.002 °C	0.3 °C	0.04 °C / °C
N	-200 to +1300 °C	0.003 °C	0.4 °C	0.05 °C / °C
R	-50 to +1768 °C	0.01 °C	1 °C	0.14 °C / °C
S	-50 to +1768 °C	0.01 °C	1 °C	0.14 °C / °C
B	+350 to +1820 °C	0.01 °C	1 °C	0.14 °C / °C

*Relative to simulated junction

Thermistor (2.2 kΩ, 5 kΩ, 10 kΩ or User Type)

Range	Resolution	90 day / 1 Year (23°C±5°C)*	Temperature Coefficient
-80 ° to 150 °C	0.01 °C	0.01 °C	0.003 °C / °C

Operation Characteristics

Function	Speed	Digits
	5/s	6 1/2
TCO / RTD / Thermistor	20/s	5 1/2
	60/s	4 1/2

[1]. The actual measurement range and test lead error will be constrained by the adopted test lead. The test lead accuracy adder covers all errors of measurements and ITS-90 temperature change.

Capacitance Characteristics

Capacitance [1]

Range	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
1.000 nF	2.00 + 2.00	2.00 + 2.00	2.00 + 2.00	0.05 + 0.01
10.00 nF	2.00 + 1.00	2.00 + 1.00	2.00 + 1.00	0.05 + 0.01
100.0 nF	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
1.000 µF	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
10.00 µF	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
100.0 µF	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01

Accuracy Specifications: ± (% of reading + % of range)

Measuring Characteristics

Capacitance	Measurement Method Input Protection	DC recharge & discharge 500 Vpeak on all ranges
	<p>The capacitor under test (Cx) is charged using a constant current source. The time to charge Cx is recorded. The capacitor is then discharged using a known resistance and the discharge time is recorded. The value of the resistance depends on the capacitance range that is selected. The charge and discharge time is used to calculate the capacitance of Cx if the selected capacitance range is equal to or less than 10 nF. Only the charge time is used to calculate the capacitance of Cx if the selected capacitance range is equal to or greater than 100 nF.</p> <p>As measuring capacitance with the DMM is effectively a DC measurement, the measured capacitance tends to be higher than what is measured by LCR meters.</p> <p>For best measurement results, first perform a zeroing of the test leads when the cables are “open” to compensate for the test lead capacitance.</p>	

[1]. Specifications are for film Capacitance inputs that are greater than 10% range

GDM-9060 SPECIFICATION

DC Characteristics ^[1]

DC Voltage

Range ^[2]	Input Resistance	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 mV	10 MΩ or >10 GΩ Selectable	0.0040 + 0.0060	0.0070 + 0.0065	0.0090 + 0.0065	0.0005 + 0.0005
1.000000 V	10 MΩ or >10 GΩ Selectable	0.0030 + 0.0009	0.0060 + 0.0010	0.0080 + 0.0010	0.0005 + 0.0001
10.00000 V	10 MΩ or >10 GΩ Selectable	0.0025 + 0.0004	0.0050 + 0.0005	0.0075 + 0.0005	0.0005 + 0.0001
100.0000 V	10 MΩ±1%	0.0030 + 0.0006	0.0065 + 0.0006	0.0085 + 0.0006	0.0005 + 0.0001
1000.000 V	10 MΩ±1%	0.0030 + 0.0006	0.0065 + 0.0010	0.0085 + 0.0010	0.0005 + 0.0001

Accuracy Specifications: ± (% of reading + % of range)

Resistance ^[3]

Range ^[2]	Test Current	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 Ω	1 mA	0.004 + 0.0060	0.011 + 0.007	0.014 + 0.007	0.0006 + 0.0005
1.000000 kΩ	1 mA	0.003 + 0.0008	0.011 + 0.001	0.014 + 0.001	0.0006 + 0.0001
10.00000 kΩ	100 μA	0.003 + 0.0005	0.011 + 0.001	0.014 + 0.001	0.0006 + 0.0001
100.0000 kΩ	10 μA	0.003 + 0.0005	0.011 + 0.001	0.014 + 0.001	0.0006 + 0.0001
1.000000 MΩ	5 μA	0.003 + 0.0010	0.011 + 0.001	0.014 + 0.001	0.0010 + 0.0002
10.00000 MΩ	500 nA	0.015 + 0.0010	0.020 + 0.001	0.040 + 0.001	0.0030 + 0.0004
100.0000 MΩ	500 nA/10 MΩ	0.300 + 0.0100	0.800 + 0.010	0.800 + 0.010	0.1500 + 0.0002

Accuracy Specifications: ± (% of reading + % of range)

DC Current

Range ^[2]	Burden Voltage	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 μA	< 0.011 V	0.010 + 0.020	0.040 + 0.025	0.050 + 0.025	0.0020 + 0.0030
1.000000 mA	< 0.11 V	0.007 + 0.006	0.030 + 0.006	0.050 + 0.006	0.0020 + 0.0005
10.00000 mA	< 0.04 V	0.007 + 0.020	0.030 + 0.020	0.050 + 0.020	0.0020 + 0.0020
100.0000 mA	< 0.4 V	0.010 + 0.004	0.030 + 0.005	0.050 + 0.005	0.0020 + 0.0005
1.000000 A	< 0.7 V	0.050 + 0.006	0.080 + 0.010	0.100 + 0.010	0.0050 + 0.0010
3.000000 A	< 2.0 V	0.180 + 0.020	0.200 + 0.020	0.200 + 0.020	0.0050 + 0.0020

Accuracy Specifications: ± (% of reading + % of range)

Continuity

Range ^[2]	Test Current	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
1 kΩ	1 mA	0.003 + 0.030	0.011 + 0.030	0.014 + 0.030	0.001 + 0.002

Accuracy Specifications: ± (% of reading + % of range)

Diode Test ^[4]

Range ^[2]	Test Current	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
5 V	1 mA	0.003 + 0.030	0.011 + 0.030	0.014 + 0.030	0.0010 + 0.0020

Accuracy Specifications: ± (% of reading + % of range)

DC Ratio ^[5]

Accuracy Specification: ± (DC Input accuracy + DC Reference accuracy)

Measuring Characteristics

DC Voltage	Input Bias	30pA (Typ, 25°C)	
	Input Protection	1000V on all ranges	
	Measurement Method:	Sigma-delta A/D Converter	
Resistance	Max. Lead Resistance	10% of range per lead for 100Ω, 1 kΩ ranges. 1 kΩ per lead on all other ranges.	
	Input Protection	1000V on all ranges	
	Measurement Method:	Selectable 4-wire or 2-wire ohms. Current source referenced to LO input	
DC Current	Shunt Resistor	100Ω for 100μA, 1mA. 1Ω for 10mA and 100 mA. 0.1Ω for 1A and 3A.	
	Input Protection	External : 3.15A, 500V fuse for 3A; Internal : 6A, 1kV fuse for 3A	
Reading Rate (Readings/sec)	Continuity/Diode	Speed	Digits
		60/s	6 1/2
		100/s	5 1/2
	DCV, DCI, Resistance	400/s	4 1/2
		Speed	Digits
5/s, 20/s, 60/s, 100/s	6 1/2		
400/s, 1k/s	5 1/2		

- [1]. DC Specification: In addition to the availability that requires warm-up of 60 minutes, it must be set in 5/s speed rate (60/s speed rate for Continuity and Diode), A-Zero on.
- [2]. The entire range of measurement will pass the set range by 20% except the tests of 1000 DCV, 3 A DC and diode.
- [3]. This specification applies to 4-wire resistance measurement, whilst it requires using "REL" function for offset on 2-wire resistance measurement. 2-wire resistance measurement will cause additional error of 0.2 Ω if REL function is not executed.
- [4]. This specification applies to the voltage measured from input terminal. 1 mA test current is the typical value. The change of current source leads to the variation in buck of diode junction.
- [5]. Accuracy is ± (DC Input accuracy + DC Reference accuracy), where Input accuracy = DC Voltage accuracy for the Input HI to LO (in % of the Input voltage), and Reference accuracy = DC Voltage accuracy for the HI to LO (Sense) Reference (in % of the Reference voltage).

AC Characteristics [1]

True RMS AC Voltage [3][4]

Range ^[2]	Frequency	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 mV	3Hz - 5Hz	1.00 + 0.03	1.00 + 0.04	1.00 + 0.04	0.100 + 0.004
	5Hz - 10Hz	0.38 + 0.03	0.38 + 0.04	0.38 + 0.04	0.035 + 0.003
	10Hz - 20kHz	0.07 + 0.03	0.08 + 0.04	0.09 + 0.04	0.005 + 0.003
	20kHz - 50kHz	0.13 + 0.04	0.14 + 0.05	0.15 + 0.05	0.011 + 0.005
	50kHz - 100kHz	0.58 + 0.08	0.63 + 0.08	0.63 + 0.08	0.060 + 0.008
1.000000 V to 750.000 V	100kHz -300kHz	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.200 + 0.020
	3Hz - 5Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.004
	5Hz - 10Hz	0.38 + 0.02	0.38 + 0.03	0.38 + 0.03	0.035 + 0.003
	10Hz - 20kHz	0.07 + 0.02	0.08 + 0.03	0.09 + 0.03	0.005 + 0.003
	20kHz - 50kHz	0.13 + 0.04	0.14 + 0.05	0.15 + 0.05	0.011 + 0.005
50kHz - 100kHz	50kHz - 100kHz	0.58 + 0.08	0.63 + 0.08	0.63 + 0.08	0.060 + 0.008
	100kHz -300kHz	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.200 + 0.020

Accuracy Specifications: ± (% of reading + % of range)

True RMS AC Current [4][5]

Range ^[2]	Burden Voltage	Frequency	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100.0000 µA / 10.00000 mA	< 0.011 V, < 0.04 V	3Hz - 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5Hz - 10Hz	0.38 + 0.04	0.38 + 0.04	0.38 + 0.04	0.035 + 0.006
		10Hz - 5kHz	0.13 + 0.04	0.13 + 0.04	0.13 + 0.04	0.015 + 0.006
		5kHz - 10kHz	0.20 + 0.04	0.20 + 0.04	0.20 + 0.04	0.030 + 0.006
1.000000 mA / 100.0000 mA	< 0.11 V, < 0.4 V	3Hz - 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5Hz - 10Hz	0.33 + 0.04	0.33 + 0.04	0.33 + 0.04	0.035 + 0.006
		10Hz - 5kHz	0.13 + 0.04	0.13 + 0.04	0.13 + 0.04	0.015 + 0.006
		5kHz - 10kHz	0.18 + 0.04	0.18 + 0.04	0.18 + 0.04	0.030 + 0.006
1.000000 A	< 0.7 V	3Hz - 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5Hz - 10Hz	0.33 + 0.04	0.33 + 0.04	0.33 + 0.04	0.035 + 0.006
		10Hz - 5kHz	0.13 + 0.04	0.13 + 0.04	0.13 + 0.04	0.015 + 0.006
		5kHz - 10kHz	0.18 + 0.04	0.18 + 0.04	0.18 + 0.04	0.030 + 0.006
3.000000 A	< 2.0 V	3Hz - 5Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5Hz - 10Hz	0.38 + 0.04	0.38 + 0.04	0.38 + 0.04	0.035 + 0.006
		10Hz - 5kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.015 + 0.006
		5kHz - 10kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.030 + 0.006

Accuracy Specifications: ± (% of reading + % of range)

Additional Crest Factor Errors (non-sine wave)

Crest Factor	Error (% of reading)
1-2	0.05%
2-3	0.15%
3-4	0.30%
4-5	0.40%

Additional Low Frequency Errors (% of reading)

Frequency	Speed		
	1/s (>3 Hz)	5/s (>20 Hz)	20/s (>200 Hz)
10Hz~20Hz	0	0.74	-
20Hz~40Hz	0	0.22	-
40Hz~100Hz	0	0.06	0.73
100Hz~200Hz	0	0.01	0.22
200Hz~1kHz	0	0	0.18
>1kHz	0	0	0

Measuring Characteristics

True RMS AC Voltage	Measurement Method	AC-coupled True RMS – measures the ac component of input with up to 400 Vdc of bias on any range.	
	Crest Factor	Maximum 5:1 at full scale	
AC Bandwidth	Speed	Bandwidth	
	1/s (>3Hz)	3 Hz – 300 kHz (ACI : 3 Hz – 10 kHz)	
	5/s (>20Hz)	20 Hz – 300 kHz (ACI : 20 Hz – 10 kHz)	
	20/s (>200Hz)	200 Hz – 300 kHz (ACI : 200 Hz – 10 kHz)	
	Input Impedance	1 MΩ ± 2%, in parallel with 100 pF	
	Input Protection	750Vrms on all ranges	
True RMS AC Current	Range	Shunt	Burden Voltage
	100μA	100Ω	<0.011V
	1mA	100Ω	<0.11V
	10mA	1Ω	<0.04V
	100mA	1Ω	<0.4V
	1A	0.1Ω	<0.7V
	3A	0.1Ω	<2.0V
	Input Protection	External : 3.15A, 500V fuse for 3A Internal : 6A, 1kV fuse for 3A	

Operation Characteristics

Function	Speed	Digits	ACV Bandwidth	ACI Bandwidth
ACV, ACI	1/s (>3Hz)	6 1/2	3 Hz – 300 kHz	3 Hz – 10 kHz
	5/s (>20Hz)	5 1/2	20 Hz – 300 kHz	20 Hz – 10 kHz
	20/s (>200Hz)	4 1/2	200 Hz – 300 kHz	200 Hz – 10 kHz

- [1]. AC Specification: It will be available after 60 minutes of warm-up, sine wave as well as 1/s speed rate.
- [2]. The entire range of measurement will pass the set range by 20% except the tests of 750 ACV and 3 A AC.
- [3]. Specifications are for sinewave input >5% of range. For inputs from 1% to 5% of range and <50 kHz, add 0.1% of range additional error. For 50 kHz to 100 kHz, add 0.13% of range. The measurement range of 750 ACV is limited within the range of 7.5×10^7 Volt-Hz.
- [4]. Three speed settings provided for low-frequency performance: 1/s (3 Hz), 5/s (20 Hz), 20/s (200 Hz). Additional errors will Not occur for the frequency greater than the filter settings.
- [5]. Specifications are for sinewave input >5% of range, and is beyond 10 μAAC. For inputs from 1% to 5% of range, add 0.1% of range additional error.

Frequency and Period Characteristics

Frequency / Period ^{[1] [2]}

Range	Frequency	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
100 mV	3Hz - 5Hz	0.100	0.100	0.100	0.100
to	5Hz - 10Hz	0.050	0.050	0.050	0.035
750 V ^[3]	10Hz - 40Hz	0.030	0.030	0.030	0.015
	40Hz – 1MHz ^[4]	0.006	0.006	0.006	0.015

Accuracy Specifications: \pm (% of reading)

Measuring Characteristics

Frequency and Period	Measurement Method	Reciprocal-counting technique. AC-coupled input using the ac voltage measurement function.
	Voltage Ranges	100 mV rms full scale to 750 V rms. Auto or manual ranging.
Settling Considerations	Errors will occur when attempting to measure the frequency or period of an input following a dc offset voltage change. The input blocking RC time constant must be allowed to fully settle (up to 1 sec) before the most accurate measurements are possible.	
Measurement Considerations	All frequency counters are susceptible to error when measuring low-voltage, low-frequency signals. Shielding inputs from external noise pickup is critical for minimizing measurement errors.	

Operation Characteristics

Function	Gate Time	Digits
	1 s	6 1/2
Frequency, Period	100 ms	5 1/2
	10 ms	4 1/2

[1]. This specification will be available after 60 minutes of warm-up and sine wave input, unless stated otherwise.

This specification applies to 1s gate time.

[2]. This specification is available when both sine wave and square wave input ≥ 100 mV. For the input of 10 mV to 100 mV, the % of reading error needs to be multiplied by 10 times.

[3]. The amplitude range is from 10% to 120% and is lower than 750 ACV.

[4]. The input ≥ 60 mV, for 300 k ~ 1 MHz, within 100mV range.

Temperature Characteristics [1]

(Exclusive of probe errors.)

RTD (Accuracy based on PT100):

(100Ω platinum [PT100], D100, F100, PT385, PT3916, or user type)

Range	Resolution	1 Year (23°C±5°C)	Temperature Coefficient 0°-18°C & 28°-55°C
-200 °C ~ -100 °C	0.001 °C	0.09 °C	0.004 °C / °C
-100 °C ~ -20 °C	0.001 °C	0.08 °C	0.005 °C / °C
-20 °C ~ 20 °C	0.001 °C	0.06 °C	0.005 °C / °C
20 °C ~ 100 °C	0.001 °C	0.08 °C	0.005 °C / °C
100 °C ~ 300 °C	0.001 °C	0.12 °C	0.007 °C / °C
300 °C ~ 600 °C	0.001 °C	0.22 °C	0.009 °C / °C

Thermocouples (Accuracy based on ITS-90)

Type	Range	Resolution	90 day / 1 Year (23°C±5°C)*	Temperature Coefficient 0°-18°C & 28°-55°C
E	-200 to +1000 °C	0.002 °C	0.2 °C	0.03 °C / °C
J	-210 to +1200 °C	0.002 °C	0.2 °C	0.03 °C / °C
T	-200 to +400 °C	0.002 °C	0.3 °C	0.04 °C / °C
K	-200 to +1372 °C	0.002 °C	0.3 °C	0.04 °C / °C
N	-200 to +1300 °C	0.003 °C	0.4 °C	0.05 °C / °C
R	-50 to +1768 °C	0.01 °C	1 °C	0.14 °C / °C
S	-50 to +1768 °C	0.01 °C	1 °C	0.14 °C / °C
B	+350 to +1820 °C	0.01 °C	1 °C	0.14 °C / °C

*Relative to simulated junction

Thermistor (2.2 kΩ, 5 kΩ, 10 kΩ or User Type)

Range	Resolution	90 day / 1 Year (23°C±5°C)*	Temperature Coefficient
-80 ° to 150 °C	0.01 °C	0.01 °C	0.003 °C / °C

Operation Characteristics

Function	Speed	Digits
	5/s	6 1/2
TCO / RTD / Thermistor	20/s	5 1/2
	60/s	4 1/2

[1]. The actual measurement range and test lead error will be constrained by the adopted test lead. The test lead accuracy adder covers all errors of measurements and ITS-90 temperature change.

Capacitance Characteristics

Capacitance [1]

Range	24 Hour TCAL ± 1 °C	90 Day TCAL ± 5 °C	1 Year TCAL ± 5 °C	Temperature Coefficient/°C
1.000 nF	2.00 + 2.00	2.00 + 2.00	2.00 + 2.00	0.05 + 0.05
10.00 nF	2.00 + 1.00	2.00 + 1.00	2.00 + 1.00	0.05 + 0.01
100.0 nF	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
1.000 µF	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
10.00 µF	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01
100.0 µF	2.00 + 0.40	2.00 + 0.40	2.00 + 0.40	0.05 + 0.01

Accuracy Specifications: ± (% of reading + % of range)

Measuring Characteristics

Capacitance	Measurement Method Input Protection	DC recharge & discharge 500 Vpeak on all ranges
	<p>The capacitor under test (Cx) is charged using a constant current source. The time to charge Cx is recorded. The capacitor is then discharged using a known resistance and the discharge time is recorded. The value of the resistance depends on the capacitance range that is selected. The charge and discharge time is used to calculate the capacitance of Cx if the selected capacitance range is equal to or less than 10 nF. Only the charge time is used to calculate the capacitance of Cx if the selected capacitance range is equal to or greater than 100 nF.</p> <p>As measuring capacitance with the DMM is effectively a DC measurement, the measured capacitance tends to be higher than what is measured by LCR meters.</p> <p>For best measurement results, first perform a zeroing of the test leads when the cables are “open” to compensate for the test lead capacitance.</p>	

[1]. Specifications are for film Capacitance inputs that are greater than 10% range

Ordering information

- GDM-9061 6 1/2 (1200000 counts) Digit Dual Measurement Multimeter**
- GDM-9060 6 1/2 (1200000 counts) Digit Dual Measurement Multimeter**

Included Accessories

Safety Instructions x 1, Power cord x 1
USB cable GTL-246 x 1, Test lead GTL-207A x 1
CD x1(including the complete user manual, upgrade program and PC software, DMM-Viewer2)

Option

Opt.1 GPIB card
(* GPIB can be installed at customer site)

Optional Accessories

- GTL-205 Temperature Probe Adapter with Thermal Coupling (K-type), approx. 1000mm
GTL-234 RS-232C Cable, 9-pin female-female cable, approx. 2000mm
GTL-248 GPIB Cable, approx. 2000mm
GTL-308 4Wire Type (+shield) Test lead, approx. 1500mm
GRA-422 Rack Mount Kit

Should you have any questions on the GDM-906X announcement, please don't hesitate to contact us.

Sincerely yours,

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