SDM3065X
Digital Multimeter

Service Manual

SM06036-E02E

SIGLENT TECHNOLOGIES CO.,LTD

Guaranty and Declaration

Copyright

Trademark Information

SIGLENT is the registered trademark of **SIGLENT TECHNOLOGIES CO., LTD**

Declaration

- **SIGLENT** products are protected by patent law in and outside of the P.R.C.
- **SIGLENT** reserves the right to modify or change parts of or all the specifications or pricing policies at company's sole decision.
- Information in this publication replaces all previously corresponding material.
- Any way of copying, extracting or translating the contents of this manual is not allowed without the permission of **SIGLENT**.
- **SIGLENT** will not be responsible for losses caused by either incidental or consequential in connection with the furnishing, use or performance of this manual as well as any information contained.

Product Certification

SIGLENT guarantees this product conforms to the national and industrial standards in China as well as the ISO9001: 2008 standard and the ISO14001: 2004 standard. Other international standard conformance certification is in progress.

General Safety Summary

Review the following safety precautions to avoid personal injuries and prevent damages to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

To Avoid Fire or Personal Injuries

Use Proper Power Cord. Use only the power cord specified for this product and approved by the local regulating body.

Avoid Electric Shock. To avoid injuries or losses of life, do not connect or disconnect probes or test leads while they are connected to a voltage source.

Ground the Product. This product is grounded through the protective terra conductor of the power line. To avoid electric shock, the grounding conductor must be connected to the earth. Make sure the instrument is grounded correctly before connecting its input or output terminals.

Connect the Probe Properly. Do not connect the probe ground lead to a high voltage since it has the isobaric electric potential as ground.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markers on the instrument and check your manual for more information about ratings before connecting.

Use Proper Fuse. Use only the specified fuse.

Do Not Operate Without Covers. Do not operate this instrument with covers or panels removed.

Avoid Circuit or Wire Exposed. Do not touch exposed junctions and components when the unit is powered.

Do Not Operate With Suspected Failures. If you suspect damage has occurred to this instrument, have it inspected by qualified service personnel before any further operation. Any maintenance, adjustment or replacement especially to the circuits or accessories should be performed by SIGLENT authorized personnel.

Keep Product Surfaces Clean and Dry.

Do Not Operate in Wet/Damp Conditions. To avoid electric shock, do not operate the instrument in wet or damp conditions.

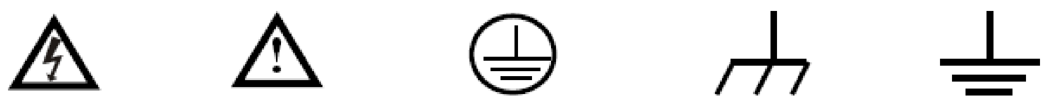
Do Not Operate in an Explosive Atmosphere. To avoid injuries or fire hazards, do not operate in an explosive atmosphere.

Safety Terms and Symbols

Terms on the Product. These terms may appear on the product:

DANGER: Indicates an injury or hazard that may immediately happen.
WARNING: Indicates that there is potential for an injury or hazard.
CAUTION: Indicates damage to the instrument or other property may occur.

Symbols on the Product. These symbols may appear on the product:



Hazardous Voltage	Refer to Instructions	Protective Earth Terminal	Chassis Ground	Test Ground

Catalog

General Features and Specifications

SDM3065X is a multimeter designed with 6½ digit reading resolution and dual-display suited for any application requiring high-precision, multifunction, and automated measurements. It features a combination of basic measurement, multiple math, and display functions, etc.

General Features

- 4.3 inch color TFT-LCD display screen with 480*272 high resolution
- Real 6½ digit reading resolution
- Up to 150 rdgs/s measurement speed
- True-RMS AC Voltage and AC Current measurements
- 1 Gb Nand Flash size, mass storage configuration and data files
- Built-in cold terminal compensation for accurate thermocouple readings
- Supports standard SCPI includes EasyDMM PC software for easy control and data collection
- Supports dual-display function, Chinese and English menu
- Built-in help system, convenient to acquire information
- Supports standard communications buses: USB Device, USB Host, LAN (Optional Accessories: USB-GPIB adapter)
- SDM3065X-SC supports 12 voltage/4 current channel Scanner Card

Specifications

DC Characteristics

Function	Range [2]	Test Current Or Burden Voltage	Accuracy ± (% of reading + % of range) [1] 24Hour[3] TCAL℃ ±1℃	90day TCAL℃ ±5℃	1Year TCAL℃ ±5℃	Temperature coefficient 0℃to （TCAL℃-5℃） （TCAL℃+5℃）to 50℃
DC Voltage	200.0000 mV		0.0020+ 0.0015	0.0030 + 0.0020	0.0040 + 0.0023	0.0005 + 0.0003
	2.000000 V		0.0015 + 0.0004	0.0020 + 0.0004	0.0035 + 0.0006	0.0005 + 0.0001
	20.00000 V		0.0020 + 0.0003	0.0030 + 0.0004	0.0040 + 0.0004	0.0005 + 0.0001
	200.0000 V		0.0020 + 0.0005	0.0040 + 0.0004	0.0050 + 0.0005	0.0005 + 0.0001
	1000.000 V[4]		0.0020 + 0.0005	0.0040 + 0.0008	0.0055 + 0.0008	0.0005 + 0.0001
DC Current	200.0000 μA	< 0.03 V	0.009 + 0.010	0.040 + 0.005	0.050 + 0.005	0.0020 + 0.0026
	2.000000 mA	< 0.25 V	0.007 + 0.001	0.030 + 0.001	0.050 + 0.002	0.0020 + 0.0001
	20.00000 mA	< 0.07 V	0.006 + 0.008	0.030 + 0.005	0.050 + 0.005	0.0020 + 0.0015
	200.0000 mA	< 0.7 V	0.009 + 0.001	0.030 + 0.001	0.050 + 0.002	0.0020 + 0.0001
	2.000000 A	< 0.12 V	0.045 + 0.015	0.080 + 0.005	0.100 + 0.012	0.0050 + 0.0008
	10.00000 A[5]	< 0.6 V	0.090 + 0.002	0.120 + 0.005	0.150 + 0.005	0.0050 + 0.0018
Resistance[6]	200.0000 Ω	1 mA	0.0030 + 0.0031	0.008 + 0.005	0.010 + 0.004	0.0006 + 0.0006
	2.000000 kΩ	1 mA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0006 + 0.0001
	20.00000 kΩ	100 μA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0006 + 0.0001
	200.0000 kΩ	10 μA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0006 + 0.0001
	1.000000 MΩ	2 μA	0.0020+ 0.0010	0.010 + 0.001	0.012 + 0.001	0.0010 + 0.0002
	10.00000 MΩ	200 nA	0.015 + 0.001	0.030 + 0.001	0.040 + 0.001	0.0030 + 0.0005
	100.0000 MΩ	200 nA || 10 MΩ	0.300 + 0.010	0.800 + 0.010	0.800 + 0.010	0.1500 + 0.0002
Diode Test[7]	0～2 V	1 mA	0.002 + 0.009	0.008 + 0.020	0.010 + 0.020	0.0010 + 0.0020
	2～4 V	1 mA	0.002 + 0.010	0.008 + 0.020	0.010 + 0.020	0.0010 + 0.0020
Continuity Test	2000.0 Ω	1 mA	0.002 + 0.010	0.008 + 0.020	0.010 + 0.020	0.0010 + 0.0020

Remarks:

[1] Specifications are for 90-minute warm-up and 100 NPLC integration time. For integration time

<100NPLC, add the appropriate “RMS Noise Adder” listed in the following table.

[2] 10% over range on all ranges except DCV 1000 V and DCI 10 A range.

[3] Relative to calibration standards.

[4] For each additional volt over ± 500 V, add 0.03 mV error.

[5] For continuous current > 7A DC or 7A AC RMS, 30 seconds ON and 30 seconds OFF.

[6] Specifications are for 4–wire resistance measurement or 2–wire resistance measurement using REL operation. Without REL operation, add 0.2 Ω additional error in 2-wire resistance measurement.

[7] Accuracy specifications for the voltage measured at the input terminal only. 1 mA test current is typical. Variation in the current source will create some variation in the voltage drop across a diode junction. Adjustable voltage range ：0～4 V.

Performance Versus Integration Time – 50 Hz (60 Hz) Power-line Frequency

Integration Time	Resolution [1]	NMRR [2]	Readings/s [3]		RMS Noise Adder [4] (% of Range)			
Number of Power line Cycles[5]（NPLC）	(ppm Range)	（dB）	50 Hz	60 Hz	DCV 20 V	DCV 2 V 200 V Resistance 2 kΩ 20 kΩ	DCV 1000 V DCI 2 mA 200 mA	DCV 200 mV Resistance 200 Ω DCI 10 A
0.005(0.006)	2.7	0	10000	10000	0.0006	0.0008	0.0015	0.0040
0.05 (0.06)	1.6	0	1000	1000	0.0004	0.0005	0.0008	0.0025
0.5 (0.6)	1	0	100	100	0.0003	0.0003	0.0006	0.0025
1	0.22	60	50	60	0	0.0001	0.0002	0.0005
10	0.08	60	5	6	0	0	0	0.0002
100	0.035	60	0.5	0.6	0	0	0	0

Remarks:

[1] Typical value. Resolution is defined as the typical 20 V range RMS noise.

[2] Normal mode rejection ratio for power-line frequency ± 0.1%. For power-line frequency ± 1%, subtract 20 dB. For ± 3%, subtract 30 dB.

[3] Maximum rate for DCV, DCI, 2-wire resistance and 4-wire resistance functions.

[4] The basic DC accuracy specifications include RMS noise at 100 NPLC. For <100 NPLC, add “RMS Noise Adder” to the basic DC accuracy specifications.

[5] When Power Supply of frequency is 60 Hz, the cycles is 0.006, 0.06, 0.6,1,10,100 NPLC.

SFDR & SINAD[1]

Function	Range	Spurious-Free Dynamic Range (SFDR)	Signal-to-Noise-and-Distortion (SINAD)
DCV	200 mV	80	75
	2 V	76	80
	20 V	78	72
	200 V	80	78
	1000 V	82	80
DCI	200 uA	90	70

	2 mA	90	80
	20 mA	85	70
	200 mA	80	75
	2 A	70	60

[1] Typical value. -1 dBFS, 1 kHz single tone. 100 us aperture time and auto zero off.

AC Characteristics

Accuracy ± (% of reading + % of range) [1]

Function	**Range** [2]	**Frequency Range**	**24 Hour**[3] T_{CAL}℃ ±1℃	**90 Day** T_{CAL}℃ ±5℃	**1 Year** T_{CAL}℃ ±5℃	**Temperature coefficient** 0℃ to （ T_{CAL}℃-5℃ ）（T_{CAL}℃+5℃）to 50℃
True-RMS AC Voltage [4]	200.0000 mV	3 Hz- 5 Hz	1.00 + 0.03	1.00 + 0.04	1.00 + 0.04	0.100 + 0.004
		5 Hz-10 Hz	0.35 + 0.03	0.35 + 0.04	0.35 + 0.04	0.035 + 0.005
		10 Hz-20 kHz	0.04 + 0.03	0.05 + 0.04	0.06 + 0.04	0.005 + 0.004
		20 kHz-50 kHz	0.10 + 0.05	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
		50 kHz-100 kHz	0.55 + 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	0.20 + 0.02
	2.000000 V	3 Hz- 5 Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.003
		5 Hz-10 Hz	0.35 + 0.02	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	0.005 + 0.003
		20 kHz-50 kHz	0.10 + 0.04	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
		50 kHz-100 kHz	0.55 + 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	0.20 + 0.02
	20.00000 V	3 Hz- 5 Hz	1.00 + 0.03	1.00 + 0.04	1.00 + 0.04	0.100 + 0.004
		5 Hz-10 Hz	0.35 + 0.03	0.35 + 0.04	0.35 + 0.04	0.035 + 0.004
		10 Hz-20 kHz	0.04 + 0.04	0.07 + 0.04	0.08 + 0.04	0.008 + 0.004
		20 kHz-50 kHz	0.10 + 0.05	0.12+ 0.05	0.15 + 0.05	0.012 + 0.005
		50 kHz-100 kHz	0.55 + 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	0.20 + 0.02
	200.0000 V	3 Hz- 5 Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.003
		5 Hz-10 Hz	0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.035 + 0.003
		10 Hz-20 kHz	0.04 + 0.02	0.07 + 0.03	0.08 + 0.03	0.008 + 0.003
		20 kHz-50 kHz	0.10 + 0.04	0.12+ 0.05	0.15 + 0.05	0.012 + 0.005
		50 kHz-100 kHz	0.55 + 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	0.20 + 0.02
	750.0000 V[5]	3 Hz- 5 Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.003

		5 Hz-10 Hz	0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.035 + 0.003
		10 Hz-20 kHz	0.04 + 0.02	0.07 + 0.03	0.08 + 0.03	0.008 + 0.003
		20 kHz-50 kHz	0.10 + 0.04	0.12+ 0.05	0.15 + 0.05	0.012 + 0.005
		50 kHz-100 kHz	0.55 + 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	0.20 + 0.02

Function	Range [2]	Frequency Range	24 Hour[3] TCAL℃ ±1℃	90 Day TCAL℃ ±5℃	1Year TCAL℃ ±5℃	Temperature coefficient 0℃to（TCAL℃-5℃））TCAL℃+5℃）to 50℃
True-RMS AC Current [8]	200.0000 uA	3 Hz- 5 Hz	1.10 + 0.06	1.10 + 0.06	1.10 + 0.06	0.200 + 0.005
		5 Hz-10 Hz	0.35 + 0.06	0.35 + 0.06	0.35 + 0.06	0.100 + 0.005
		10 Hz-5 kHz	0.15 + 0.06	0.15 + 0.06	0.15 + 0.06	0.015 + 0.005
		5 kHz-10 kHz	0.35 + 0.70	0.35 + 0.70	0.35 + 0.70	0.030 + 0.005
	2.000000 mA	3 Hz- 5 Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.005
		5 Hz-10 Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04	0.035 + 0.005
		10 Hz-5 kHz	0.12 + 0.04	0.12 + 0.04	0.12 + 0.04	0.015 + 0.005
		5 kHz-10 kHz	0.20 + 0.25	0.20 + 0.25	0.20 + 0.25	0.030 + 0.005
	20.00000 mA	3 Hz- 5 Hz	1.10 + 0.06	1.10 + 0.06	1.10 + 0.06	0.200 + 0.005
		5 Hz-10 Hz	0.35 + 0.06	0.35 + 0.06	0.35 + 0.06	0.100 + 0.005
		10 Hz-5 kHz	0.15 + 0.06	0.15 + 0.06	0.15 + 0.06	0.015 + 0.005
		5 kHz-10 kHz	0.35 + 0.70	0.35 + 0.70	0.35 + 0.70	0.030 + 0.005
	200.0000 mA	3 Hz- 5 Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5 Hz-10 Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04	0.035 + 0.006
		10 Hz-5 kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
		5 kHz-10 kHz	0.20 + 0.25	0.20 + 0.25	0.20 + 0.25	0.030 + 0.006
	2.000000 A	3 Hz- 5 Hz	1.10 + 0.06	1.10 + 0.06	1.10 + 0.06	0.100 + 0.006
		5 Hz-10 Hz	0.35 + 0.06	0.35 + 0.06	0.35 + 0.06	0.035 + 0.006
		10 Hz-5 kHz	0.15 + 0.06	0.15 + 0.06	0.15 + 0.06	0.015 + 0.006
		5 kHz-10 kHz	0.35 + 0.70	0.35 + 0.70	0.35 + 0.70	0.030 + 0.006
	10.00000 A[6]	3 Hz- 5 Hz	1.10 + 0.08	1.10 + 0.10	1.10 + 0.10	0.100 + 0.008
		5 Hz-10 Hz	0.35 + 0.08	0.35 + 0.10	0.35 + 0.10	0.035 + 0.008
		10 Hz-5 kHz	0.15 + 0.08	0.15 + 0.10	0.15 + 0.10	0.015 + 0.008

Additional Low Frequency Errors (% of reading)				Additional Crest Factor Errors (non-sine wave) [7]	
Frequency	AC Filter			Crest Factor	Error (% of reading)
	＞3 Hz	＞20 Hz	＞200 Hz		
10 Hz-20 Hz	0	0.74	--	1 - 2	0.05
20 Hz-40 Hz	0	0.22	--	2 - 3	0.2
40 Hz-100 Hz	0	0.06	0.73	3 - 4	0.4
100 Hz- 200 Hz	0	0.01	0.22	4 - 5	0.5
200 Hz-1 kHz	0	0	0.18		
＞1 kHz	0	0	0		

Remarks:

[1] Specifications are for 90-minute warm-up, ＞ 3Hz ac filter and sine wave input.

[2] 10% over range on all ranges except ACV 750 V and ACI 10 A ranges.

[3] Relative to calibration standards.

[4] Specifications are for sine wave input >5% of range. For inputs within 1% and 5% of range and <50 kHz, add 0.1% of range additional error. For 50 kHz to 100 kHz, add 0.13% of range additional error.

[5] ACV 750 range limited to $8x10^{7}$ Volt-Hz. For input over 300 V rms, add 0.7 mV error for each additional volt.

[6] For continuous current > DC 7 A or AC RMS 7 A, 30 seconds ON and 30 seconds OFF.

[7] For frequency beow 100 Hz, the specification of slow filter is only for sine wave input.

[8] Specifications are for sine wave input >5% of range. For inputs within 1% to 5% of range, add 0.1% of range additional error. Specifications are typical values for 200 uA and 2 mA, 2 A and 10 A ranges when frequency >1 kHz.

Frequency and Period Characteristics

Accuracy ±（% of Reading）[1] [2]

Function	Range	Frequency Range	**24 Hour**[3] T_{CAL}℃ ±1℃	**90 Day** T_{CAL}℃ ±5℃	**1 Year** T_{CAL}℃ ±5℃	**Temperature coefficient** 0℃to（T_{CAL}℃-5℃）（T_{CAL}℃+5℃） to 50℃
Frequency, Period	200 mV to 750 V	3 Hz – 5Hz	0.07	0.07	0.07	0.005
		5 Hz – 10 Hz	0.04	0.04	0.04	0.005
		10 Hz – 40 Hz	0.02	0.02	0.02	0.001
		40 Hz –300 KHz	0.005	0.006	0.007	0.001
		300 KHz – 1 MHz	0.005	0.006	0.007	0.001

Frequency	Gate Time (Resolution)			
	1s (0.1 ppm)	0.1 s (1 ppm)	0.01 s (10 ppm)	0.001 s (100 ppm)

3 Hz– 5Hz	0	0.12	0.12	0.12
5 Hz– 10 Hz	0	0.17	0.17	0.17
10 Hz–40 Hz	0	0.20	0.20	0.20
40 Hz–100 Hz	0	0.06	0.21	0.21
100 Hz–300 Hz	0	0.03	0.21	0.21
300 Hz–1 kHz	0	0.01	0.07	0.07
＞1 kHz	0	0	0.02	0.02

Remarks:

[1] Specifications are for 90 minutes warm-up, using 1 s gate time.

[2] For frequency ≤ 300 kHz, the specification is the 10% to 110% of range of the AC input voltage. For frequency > 300 kHz, the specification is the 20% to 110% of range of the AC input voltage. The maximum input is limited to 750 V rms or 8 ×10^7 Volts-Hz (whichever is less). The 200 mV range is full range input or input that is larger than the full range. For 20 mV to 200 mV, multiply % of reading error ×10.

[3] Relative to calibration standards.

Capacitance Characteristics

Accuracy±（% of Reading + % of Range）[1]

Function	Range [2]	Test Current	1 Year TCAL℃±5℃	Temperature coefficient 0℃ to（TCAL℃ - 5℃） （TCAL℃ + 5℃）to 50℃
Capacitance	2.0000 nF	10 μA	2 + 2.4	0.05 + 0.06
	20.000 nF	10 μA	1 + 0.1	0.05 + 0.01
	200.00 nF	100 μA	1 + 0.1	0.01 + 0.01
	2.0000 μF	100 μA	1 + 0.1	0.01 + 0.01
	20.000 μF	1 mA	1 + 0.1	0.01 + 0.01
	200.00 μF	1 mA	1 + 0.1	0.01 + 0.01
	2.0000 mF	1 mA	1 + 0.1	0.01 + 0.01
	20.000 mF	1 mA	1 + 0.1	0.01 + 0.01
	100.00 mF	1 mA	3 + 0.1	0.05 + 0.02

Remarks:

[1] Specifications are for 90 minutes warm–up and using REL operation. Additional errors may be caused by non–film capacitors.

[2] Specifications are the 1% to 110% of range on 2nF range and 10% to 110% of range on all other ranges

Temperature Characteristic

Accuracy ±（% of Reading）[1]

Function	Probe Type	Type	Optimum Range	1 Year TCAL℃±5 ℃	Temperature coefficient 0℃ to（TCAL℃ - 5℃）（TCAL℃ + 5℃）to 50℃
Temperature	RTD[2] (R0 is 49Ω to 2.1 kΩ)	α=0.00385	-200℃~660℃	0.16℃	0.01℃
	Thermocouple [3]	B	0℃～1820℃	0.76℃	0.14℃
		E	-270℃～1000℃	0.5℃	0.02℃
		J	-210℃～1200℃	0.5℃	0.02℃
		K	-270℃～1370℃	0.5℃	0.03℃
		N	-270℃～1300℃	0.5℃	0.04℃
		R	-270℃～1760℃	0.5℃	0.09℃
		S	-270℃～1760℃	0.6℃	0.11℃
		T	-270℃～400℃	0.5℃	0.03℃

Remarks:

[1] Specifications are for 90 minutes warm-up. Exclusive of sensor error.

[2] Specification is for 4WR sensor measurement or 2WR measurement using REL operation.

[3] Relative to cold junction temperature, accuracy is based on ITS-90. Built-in cold junction temperature refers to the temperature inside the banana jack and its accuracy is ± 2.5 ℃.

Measurement Rate

Function	Setting	Integration	Readings/s 50Hz（60Hz）
DC Voltage DC Current 2 - wire Resistance 4 - wire Resistance	0.005（0.006） NPLC	100(100) us	10000 (10000)
	0.05（0.06） NPLC	1 (1) ms	1000 (1000)
	0.5（0.5） NPLC	4 (4) ms	100 (100)
	1 NPLC	20(16.7) ms	50 (60)
	10 NPLC	200(167) ms	5 (6)
	100 NPLC	2(1.67) s	0.5 (0.6)
AC Voltage	3 Hz AC Filter		0.5
	20 Hz		2

AC Current	200 Hz		50
Frequency and Period [1]	1 s Gate time		1
	0.1 s		10
	0.01 s		100
	0.001 s		500
Capacitance[2]	100 mF Range		0.5

[1] 20 V range, 1 kHz input.

[2] The measurement period changes with the capacitance under test.

Prepare Information

Before doing performance verifying or procedure adjusting, you should master the following operations to make the multimeter work in a good state or deal with some simple functional problems. The following contents are included in this chapter:

- How to perform functional checks
- How to use self-test routine
- How to recall factory Default settings

Fore more detailed information about multimeter operation, please refer to the User Guide for the SDM3065X.

Functional check

This functional check covers three areas, by which you can verify if the multimeter is working correctly.

Power-on Inspection

Before connecting the instrument to a power source, please select the AC voltage selector on the rear panel of your multimeter according to the power supply. Then connect the power line to the socket on the rear panel of the mutimeter.

Note: To avoid electric shock, make sure that the instrument is correctly grounded to the earth before connecting AC power.

The boot screen will appear after pressing the power-on button.To restore the instrument configuration to factory default settings:

Press **[Shift] > [Utility] > Store/Recall >Set To Defaults**

Default Setup

After setting to defaults, the multimeter should be set to DC voltage measurements. Other default settings are shown in the following table.

Default settings

Menu or System	Option	Default setting
DCV	Range	Auto
	Speed	Slow
	Filter	Off
	Rel	Off
Acquire	Trg Src	Auto
	Delay	Auto
	Samples/Trigger	1
	VMC Out	Pos
Math	Statistics	Hide
	Limits	Off
	dB/dBm	Off
	Ref Value	Off
Display	Display	Number
Hold	Probe Hold	Off

Self Test

The SDM3065X provides self-test functions, including keyboard Test, LCD Test, Beeper Test and Chip Test.

Operating Steps:

1. Press **[Shift] > [Utility] > Test /Admin > Board Test**
2. To test the keyboard:
   Select **keyboard** to enter the key test interface. The on-screen rectanglular shapes represent the keys on the front panel. Test all keys and knobs and you should also verify that all the backlit buttons illuminate correctly.
3. To test the LCD screen:
   Selec **LCD** to enter the screen test interface, the screen shows the message:” Press ‘Change’ to change Press ‘Done’ to exit“. Press **Change** to start the test and observe if the screen has any defects (missing pixels, for example).
4. To test the beeper:
   Press **Beeper** to test the beeper. Under regular circumstance, press **Beeper** once and the instrument will beep one time.
5. Test the chips:
   Press **Chip > Start** to start chip test. Determine whether the chip test passes according to the interface message.

Performance Verification

Use the performance verification tests in this section to verify the measurement performance of the instrument using the instrument's specifications listed in the product data sheet. Performance verification tests are recommended as an acceptance test when you first receive the instrument or after performing calibration. If the instrument fails performance verification, calibration adjustment or repair is required.

Performance verification test items

- Zero Offset Verification
- DC Voltage and DC Current Gain Verification
- Frequency Accuracy Verification
- AC Voltage and AC Current VerificationHigh Current Verification
- Capacitance Verification

Recommended Test Equipment

The recommended test equipment for the performance verification and calibration is listed below. If the exact instrument is not available, substitute calibration standards of equivalent accuracy.

Application	Recommended Equipment
Zero Offset Verification	Keysight 34172B
DC Voltage and DC Current Gain Verification	Fluke 5522A
Frequency Accuracy Verification	Siglent SDG2000X Series Function/Arbitrary Waveform Generator
AC Voltage and AC Current Verification	Fluke 5522A
Capacitance Verification	Fluke 5522A

Performance verification step

1. Connect the calibrator to the input terminals correctly.
2. Configure each function and range in the order shown in the table corresponding to the DMM model number. Provide the input shown in the table.
3. Make a measurement and return the result. Compare measurement results to the test limits shown in the table. (Be certain to allow for appropriate source settling time.)

Test Considerations

- Ensure that the test ambient temperature is stable and between 18°C and 28°C. Ideally the calibration should be performed at 23°C±2°C.
- Ensure ambient relative humidity is less than 80%.
- Allow a 90 minute warm－up period with a copper short connected.
- Ensure the measuring rate is set to “slow” for DCV, ACV, DCI, ACI and 2-Wire/ 4-Wire Resistance measurements.

Zero Offset Verification

Input	Function	Range	Error from Nominal (1 years)
Open	DC Current	200 µA	±0.01 µA
		2 mA	±0.04 µA
		20 mA	±1 µA
		200 mA	±4 µA
		2 A	±240 µA
		10 A	±500 µA
Short	DC Volts	200 mV	±4.3 µV
		2 V	±12 µV
		20 V	±80 µV
		200 V	±1 mV
		1000 V	±8 mV
Short	4-wire Ohms	200 Ω	±8 mΩ
		2 kΩ	20 mΩ
		20 kΩ	200 mΩ
		200 kΩ	2 Ω
		1 MΩ	10 Ω
		10 MΩ	100 Ω
		100 MΩ	100 Ω

DC Voltage and DC Current Gain Verification

Input			Error from Nominal (1 years)
Voltage	Function	Range	
-200 mV	DC Volts	200 mV	±12.6 μV
200 mV			
-2 V		2 V	±82 μV
2 V			
10 V		20 V	±480 μV
-20 V			±880 μV
20 V			
-200 V		200 V	±11 mV
200 V			
-500 V		1000 V	±35.5 mV
1000 V			±63 mV

Input			Error from Nominal (1 years)
Current	Function	Range	
200 μA	DC Current	200 μA	±0.12 μA
2 mA		2 mA	±1.04 μA
20 mA		20 mA	±12 μA
200 mA		200 mA	±104 μA
2 A		2 A	±1.12 mA
10 A		10 A	±15.5 mA

Input			Error from Nominal (1 years)
Resistance	Function	Range	
200 Ω	4-wire Ohms	200 Ω	±28 mΩ
2 kΩ		2 kΩ	±220 mΩ
20 kΩ		20 kΩ	±2.2 Ω
200 kΩ		200 kΩ	±22 Ω
1 MΩ		1 MΩ	±130 Ω
10 MΩ		10 MΩ	±4.1 kΩ
100 MΩ	2-wire Ohms	100 MΩ	±810 kΩ

Frequency Accuracy Verification

Input			Error from Nominal (1 years)
Vrms	Frequency	Range	
60 mV	500 kHz	200 mV	±35 Hz
0.3 V	20 Hz	2 V	±0.004 Hz

AC Voltage and AC Current Verification

Input			Error from Nominal (1 years)
Vrms	Frequency	Range	
200 mV	1 kHz	200 mV	±200 µV
	50 kHz		±340 µV
	100 kHz		±1.36 mV
2 V	1 kHz	2 V	±1.8 mV
	50 kHz		±3.4 mV
	100 kHz		±13.6 mV
0.2 V	1 kHz	20 V	±28.16 mV
2 V	1 kHz		±29.6 mV
20 V	45 Hz		±24 mV
	20 kHz		±24 mV
	50 kHz		±40 mV
	100 kHz		±136 mV
200 V	1 kHz	200 V	±220 mV
	50 kHz		±400 mV
	100 kHz		±1.36 V
750 V	1 kHz	750 V	±825 mV
250 V	50 kHz		±750 mV
75 V	100 kHz		±1.8 V

Input			Error from Nominal (1 years)
Irms	Frequency	Range	
200uA	1 kHz	200uA	±0.42 uA
	10 kHz		±0.21 uA
20mA	1 kHz	20mA	±0.042 mA

	10 kHz		±0.21mA
2mA	1 kHz	200mA	±0.282 mA
200mA	1 kHz		±0.28 mA
	10 kHz		±0.9 mA
20mA	1 kHz	2A	±3.23 mA
2A	1 kHz		±4.2 mA
	10 kHz		±21 mA
200mA	1 kHz	10A	±20.3 mA
10A	1 kHz		±25 mA

Capacitance Verification

Input		Error from Nominal (1 years)
Capacitance	Range	
2 nF	2 nF	±0.088 nF
20 nF	20 nF	±0.22 nF
200 nF	200 nF	±2.2 nF
2 μF	2 μF	±22 nF
20 μF	20 μF	±220 nF
200 μF	200 μF	±2.2 μF
2 mF	2 mF	22 μF
20 mF	20 mF	220 μF
100 mF	100 mF	3.1 mF

Calibration Adjusting Procedures

This chapter explains how to adjust the SDM3065X digital multimeter for optimum operating performance. Only qualified personnel should perform this procedure.

Calibration Adjustment Interval

The instrument should be calibrated on a regular interval determined by the accuracy requirements of your application. A 1-year interval is adequate for most applications. Accuracy specifications are warranted only if calibration is made at regular calibration intervals. Siglent Technologies never recommends calibration adjustment intervals beyond two years.

Calibration is Recommended

Whatever calibration interval you select, Siglent Technologies recommends that complete re-calibration should always be performed at the calibration interval. This ensures that the instrument will remain within specifications for the next calibration interval and provides the best long-term stability. Performance data measurement during performance verification tests does not mean that the instrument will remain within these limits unless the calibration adjustments are performed.

Automating Calibration Procedures

The complete adjust procedures can be automated with the use of appropriate automated test instrumentation. The complete instrument configurations specified for each adjustment may be programmed via the remote interface.

The instrument can also be adjusted from the remote interface. Remote adjustment is similar to the local front-panel procedure. A PC can be used to perform the adjustment by first selecting the required function and range. The adjustment command is sent to the instrument and then the adjustment is initiated over the remote interface.

Calibration Adjustment items

- DC Voltage Calibration
- DC Current Calibration
- AC Voltage Calibration
- AC Current Calibration
- 2-Wire Ohms Calibration

- 4-Wire Ohms Calibration
- Capacitance Calibration
- Temperature Calibration

Recommended Test Equipment

The recommended test equipment for the performance calibration is listed below. If the exact instrument is not available, substitute calibration standards of equivalent accuracy.

Calibrator: FLUKE 5522A
High precision digital multimeter：HP3458A
Computer: Windows system, configured with GPIB Instrument Control Devices (like PCI-GPIB), installed the software mentioned below.

Software Environment

1. Python

Make sure you have installed Python 2.7 in your computer. The following modules of Python are required as well: PyVisa1.4, PyQt4 and PyWin32.

2. Microsoft Office

As some calibration data are saved as ".xlsx", it is necessary that you are working with MS Office 2007 or higher.

3. NI VISA

The instrument remote control is based on VISA I/O library which can be derived from NI VISA. You can download the NI-VISA package directly from http://www.ni.com/visa.

4. NI 488.2

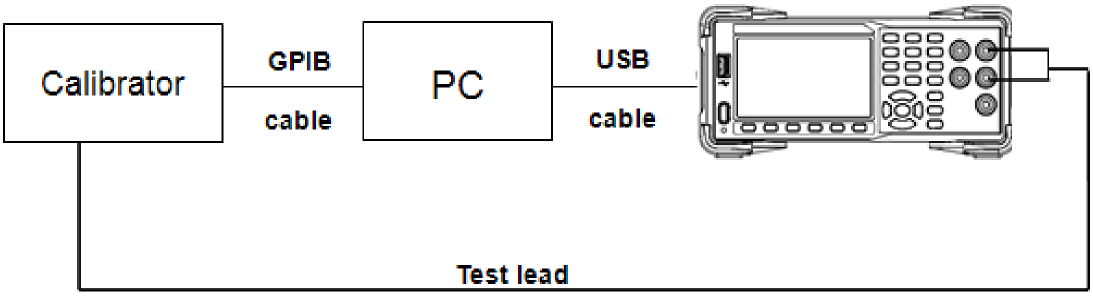
To use GPIB interface , NI 488.2 need to be installed. You can download the **NI 488.2** package directly from http://www.ni.com/nisearch/app/main/p/bot/no/ap/tech/lang/en/pg/1/sn/catnav:du,n8:3.25.123.785,ssnav:ndr/.

Test Considerations

- Ensure that the test ambient temperature is stable and between 18°C and 28°C. Ideally the calibration should be performed at 23°C±2°C.
- Ensure ambient relative humidity is less than 80%.
- Allow a 90 minute warm－up period with a copper short connected.

Calibration Adjustment step

1. Set up the calibration environment as Shown:



2. Verify the calibrator (Fluke 5522A) with a high precision multimeter (HP 3458A).
   a) Open the "Calibration.xlsx" in the folder "Calibration", then select the corresponding sheet in the "Calibration.xlsx" according to the function of SDM3065X you want to calibrate.

   b) Set the output of the calibrator according to the "Output Setting Value" in the table, then record the calibration value (pay attention to the units) of the high precision multimeter in the table. For example:

DCV		
Range of SDM3065X	**Output Setting Value(v)**	**Calibration Value(v)**
200 mV	-0.2	-0.1999980169
	-0.002	-0.0020000106
	0.002	0.0020000481
	0.2	0.1999982252
2 V	-2	-1.999984059
	-0.02	-0.019999756
	0.02	0.019999681
	2	1.99998635
20 V	-20	-19.99976674
	-0.2	-0.19999803
	0.2	0.199997956

	20	19.99981584
200 V	-200	-199.9983221
	-2	-1.999984996
	2	1.99998693
	200	199.9984292
1000 V	-999	-998.9895336
	-10	-9.999916592
	10	9.999913974
	999	998.9909261

ACV			
Range of SDM3065X	**Output Setting Value**	**Frequency**	**Calibration Value**
	Unit（V）	**Unit（HZ）**	**Unit（V）**
200 MV	0.01	10000	0.009998960553
	0.2	10000	0.2000355753
2V	0.1	10000	0.099980649
	2	10000	2.000537189
20 V	1	10000	0.9998935063
	20	10000	20.00377871
200 V	10	10000	9.998316717
	200	10000	200.0573291
750 V	35	10000	34.98153089
	750	10000	749.6717559999

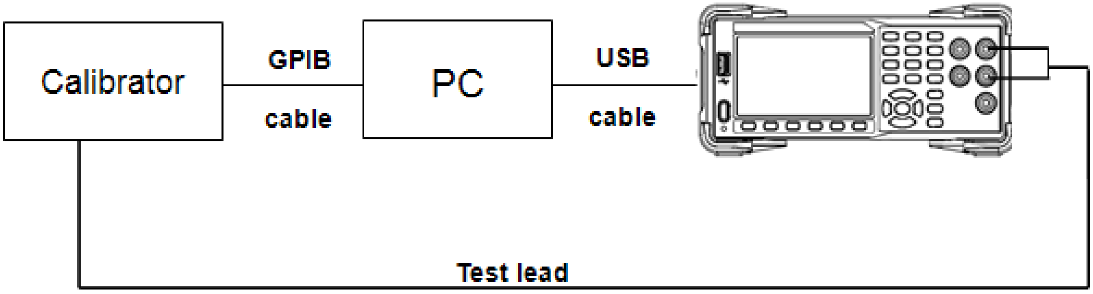
After completion, Save and close the "Calibration.xlsx".

Note:

i. It is unnecessary to calibrate the calibrator if you only want to calibrate the Capacitance and Temperature functions of the SDM3065X

ii. If the "Calibration Value" of the function you want to calibrate is not filled in the table, the calibration script will not work correctly.

3. Connect the Calibrator, PC and SDM3065X digital multimeter as shown below:
    1. Connect the FLUKE5522A to the computer with GPIB cable
    2. Connect the SDM3065X to the computer with USB cable.
    3. Connect the Normal terminals of FLUKE5522A to HI,LO terminals of SDM3065X with banana jack cables



4.Double-click the script XXX_Cal.py in the folder “Script” to calibrate corresponding function.
DCV_Cal: Calibrate DCV function
ACV_Cal: Calibrate ACV function
DCI_Cal: Calibrate DCI function
ACI_Cal: Calibrate ACI function
R2W_Cal: Calibrate 2 wire resistance function
R4W_Cal: Calibrate 4 wire resistance function
CAP_Cal: Calibrate Capacitance function
TEMP_Cal: Calibrate Temperature function

5. During the calibration process, pop-up messages which informs to change the test cables connecting method will appear,
after the operation has completed, click the 'ok' button, the script will go on. Details about the test cables connecting method in different caribration items can be found in "Test cable connection diagram" in the Appendix.

6. The calibration result will be prompted after procedure is done.

Appendix

Test cable connection diagram

Message	SDM3065X	connection	FLUKE5522A	Note
DCV/ACV Calibrate Cable connection:DC/AC voltage	c d	⟹	1 2	
Resistance Calibrate Cable connection: Resistance - two-wire compensation	c d	⟹	1 2	
		⟹	3 4	

Resistance Calibrate Cable connection: Resistance - two-wire **no** compensation	c d	⟹	1 2	
DCI/ACI Calibrate Cable connection: DC/AC current (<3A)	e d	⟹	3 4	
DCI/ACI Calibrate Cable connection:DC/AC current (>3A)	e d	⟹	5 4	
Resistance Calibrate Cable connection: Resistance - four-wire compensation	c d	⟹	1 2	
	a b	⟹	3 4	
Resistance Calibrate Cable connection: Resistance - four-wire **no** compensation	c d a b	⟹	1 2	
Capacitance Calibrate Cable connection: Remove cable from DMM	disconnect		1 2	
Capacitance Calibrate Cable connection: Connect the cable back	c d	⟹	1 2	
Temperature Calibrate Cable connection: Connect K type thermocouple	c d	⟹	+ - （TC）	Connection wiring must match thermocouple type **K**

Assembly Procedures

This chapter describes how to remove the major modules from the SDM3065X. To install the removed modules or replace new modules, please follow corresponding operating steps in reverse order.

Security Consideration

Only qualified personnel should perform the disassembly procedures. Whenever possible, disconnect the power before removing or replacing. Otherwise, personal injuries or damages to the components may occur.

Avoid Electric Shock Hazardous voltages exist on the LCD module and power supply module. To avoid electrical shock, disconnect the power cord from the multimeter, and then wait at least three minutes for the capacitors in the multimeter to discharge before beginning the disassembly.

Preventing ESD Almost all electrical components can be damaged by electrostatic discharge (ESD) during handling. Component damages can occur at electrostatic discharge voltages as low as 50 volts. The following guidelines will help preventing ESD damage when servicing the instrument or any electronic device.

- Disassemble instruments only in a static-free work area.
- Use a conductive work area to reduce static charges.
- Use a conductive wrist strap to reduce static charge accumulation.
- Minimize handling.
- Keep replacement parts in original static-free packaging.
- Remove all plastic, foam, vinyl, paper and other static-generating materials from the immediate work area.
- Use only anti-static solder suckers.

Required Tools

Use these tools to remove or replace the modules in the multimeter

- T10 Torx screwdriver
- 2# phillips screwdriver
- Needle-nose pliers

Assembly Procedures

This chapter describes how to remove the major modules from the SDM3065X multimeter. To install the removed modules or replace new modules, please follow corresponding operating steps in reverse order.

Security Consideration

Only qualified personnel should perform the disassembly procedures. Whenever possible, disconnect the power before removing or replacing. Otherwise, personal injuries or damages to the components may occur.

Avoid Electric Shock Hazardous voltages exist on the LCD module and power supply module. To avoid electrical shock, disconnect the power cord from the multimeter, and then wait at least three minutes for the capacitors in the multimeter to discharge before beginning the disassembly.

Preventing ESD Almost all electrical components can be damaged by electrostatic discharge (ESD) during handling. Component damages can occur at electrostatic discharge voltages as low as 50 volts. The following guidelines will help preventing ESD damage when servicing the instrument or any electronic device.

- Disassemble instruments only in a static-free work area.
- Use a conductive work area to reduce static charges.
- Use a conductive wrist strap to reduce static charge accumulation.
- Minimize handling.
- Keep replacement parts in original static-free packaging.
- Remove all plastic, foam, vinyl, paper and other static-generating materials from the immediate work area.
- Use only anti-static solder suckers.

Required Tools

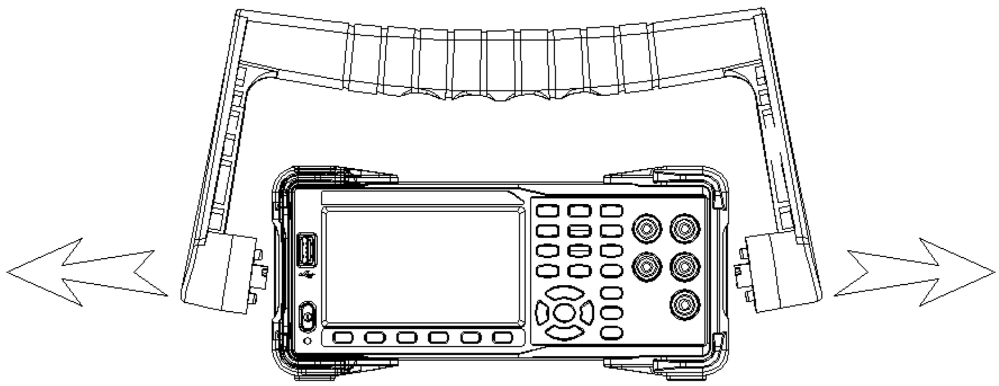
Use these tools to remove or replace the modules in the multimeter:

- T10 Torx screwdriver
- 2# phillips screwdriver
- needle-nose pliers

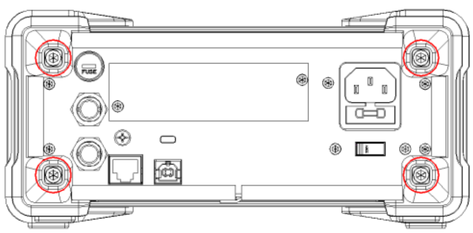
Disassembly Procedures

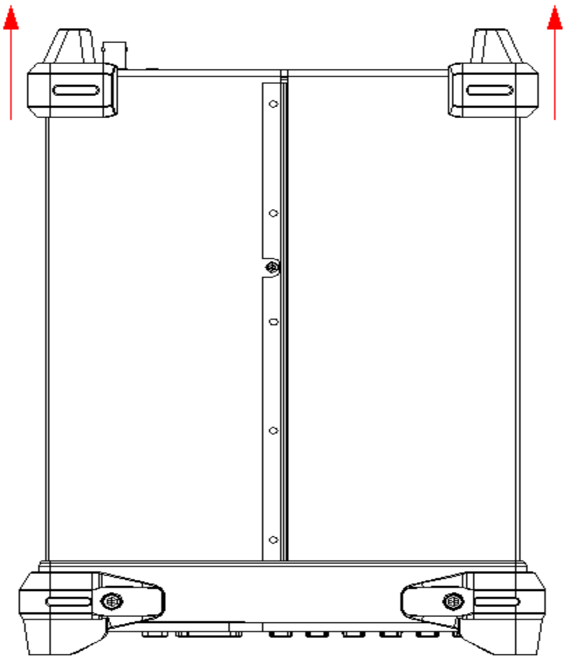
1. Turn off the power and remove all measurement leads and other cables, including the power cord, from the instrument before continuing.

2. Rotate the handle to the upright position and remove it by pulling outward where it attaches to the case.

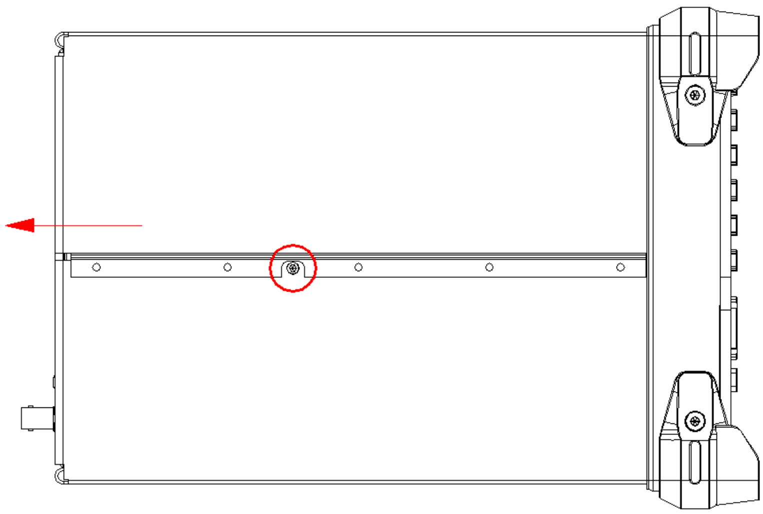


3. Unscrew the four captive screws in the rear bezel and remove the foot pad as indicated by the arrow shown below

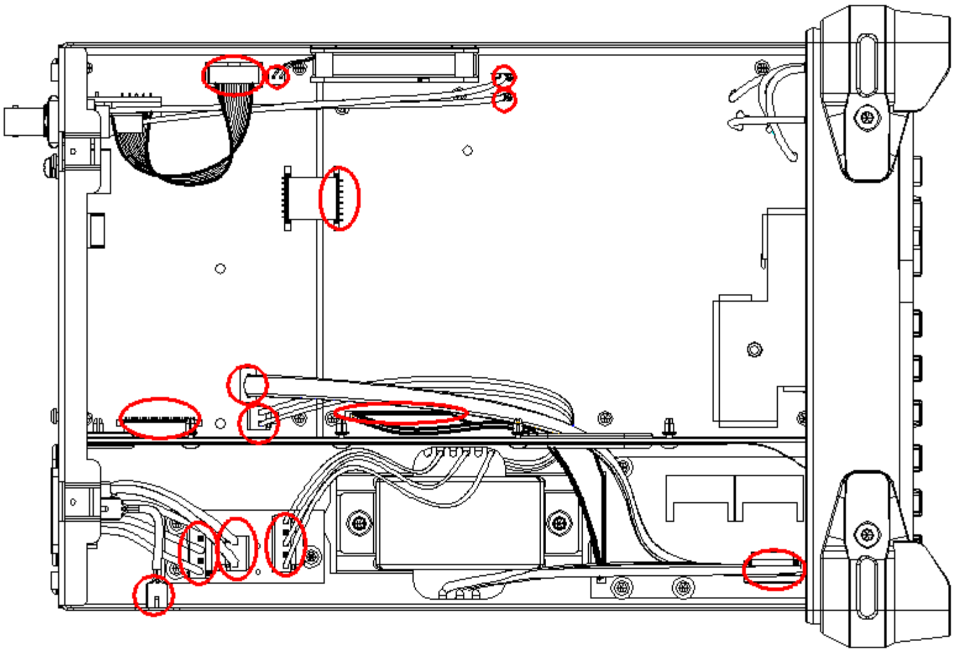




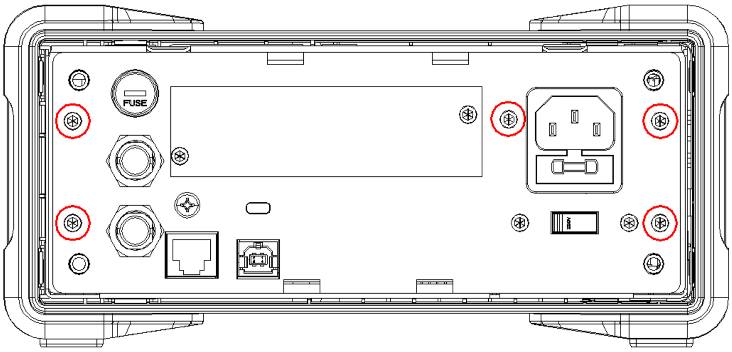
4. Remove the screw on the bottom of the instrument and place it in a safe location for re-assembly. Slide off the instrument cover as indicated by the arrow shown below.



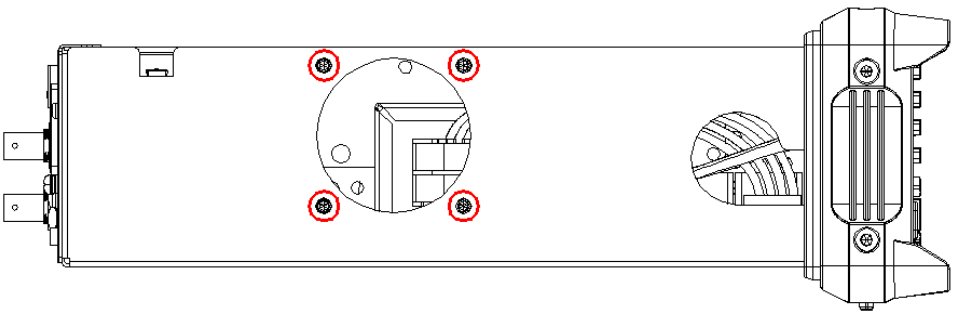
5. Remove the cable plug(in the red circle and yellow box shown below) connected to the main body



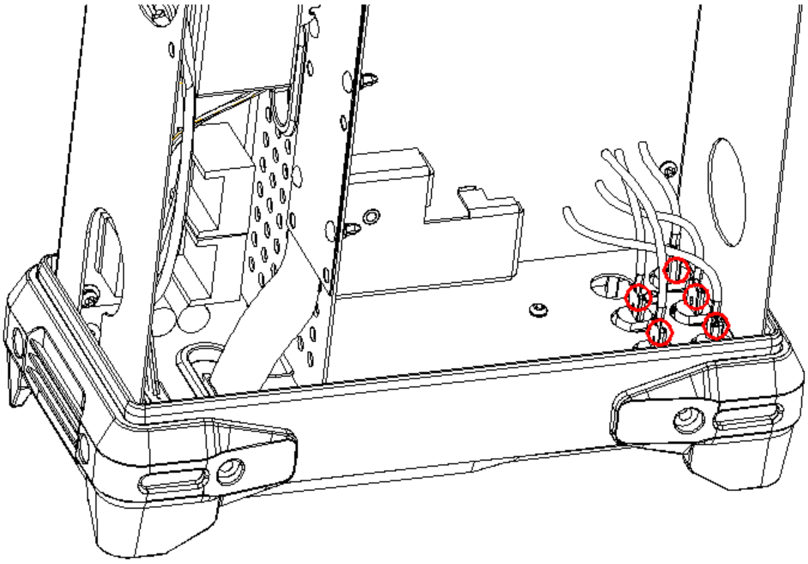
6. Unscrew the 5 captive screws in the rear metal cover and remove the rear metal cover.



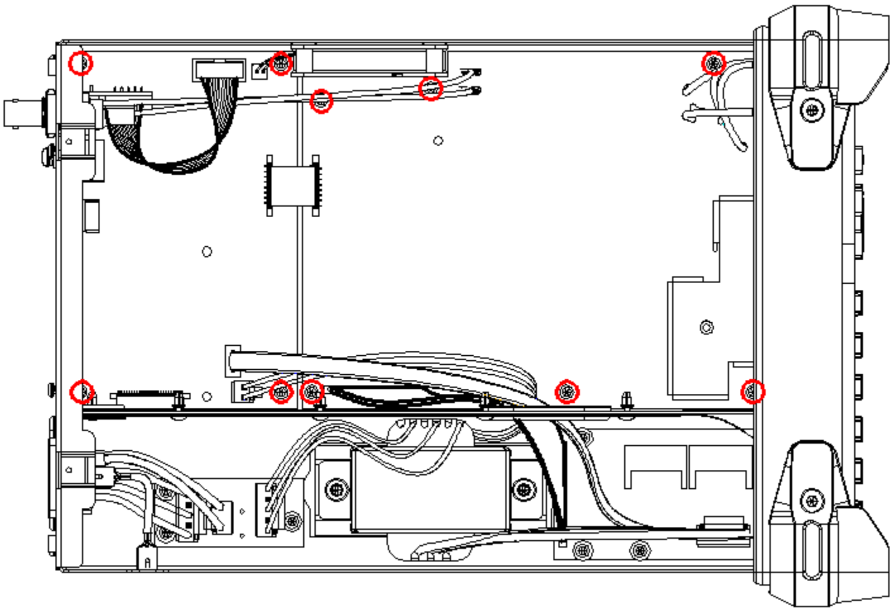
7. Unscrew the 4 screws and remove the fan.



8. Remove the cable plug connected to the front pannel.



9. Remove the cable and unscrew all the screws,then you can remove thePCBA.



This concludes the disassembly procedure. To re-assemble the instrument, reverse the procedure.

Troubleshooting

The internal structure of the multimeter consists of the analog board, main board and power supply board, key and LCD board, and interface board. They are linked through cables or connectors. This chapter explains the main procedures for checking the functionality of these three boards (mainly main board and analog board) by measuring the corresponding test points and checking the signals on specific to help determine the reason for the failure that has been encountered while operating the SDM3065X digital multimeter.

ESD Precautions

While performing any internal test of the multimeter, please refer to the following precautions to avoid damages to its internal modules or components resulting from ESD.

- Only handle circuit boards by the board edges. Do not touch components or the board surface with your fingers.
- Reduce handling of static-sensitive modules when necessary
- Wear a grounded antistatic wrist strap to insulate the static voltage from your body while touching these modules.
- Operate static-sensitive modules only at static-free areas. Avoid handling modules in areas that allow anything capable of generating or holding a static charge.

Required Equipments

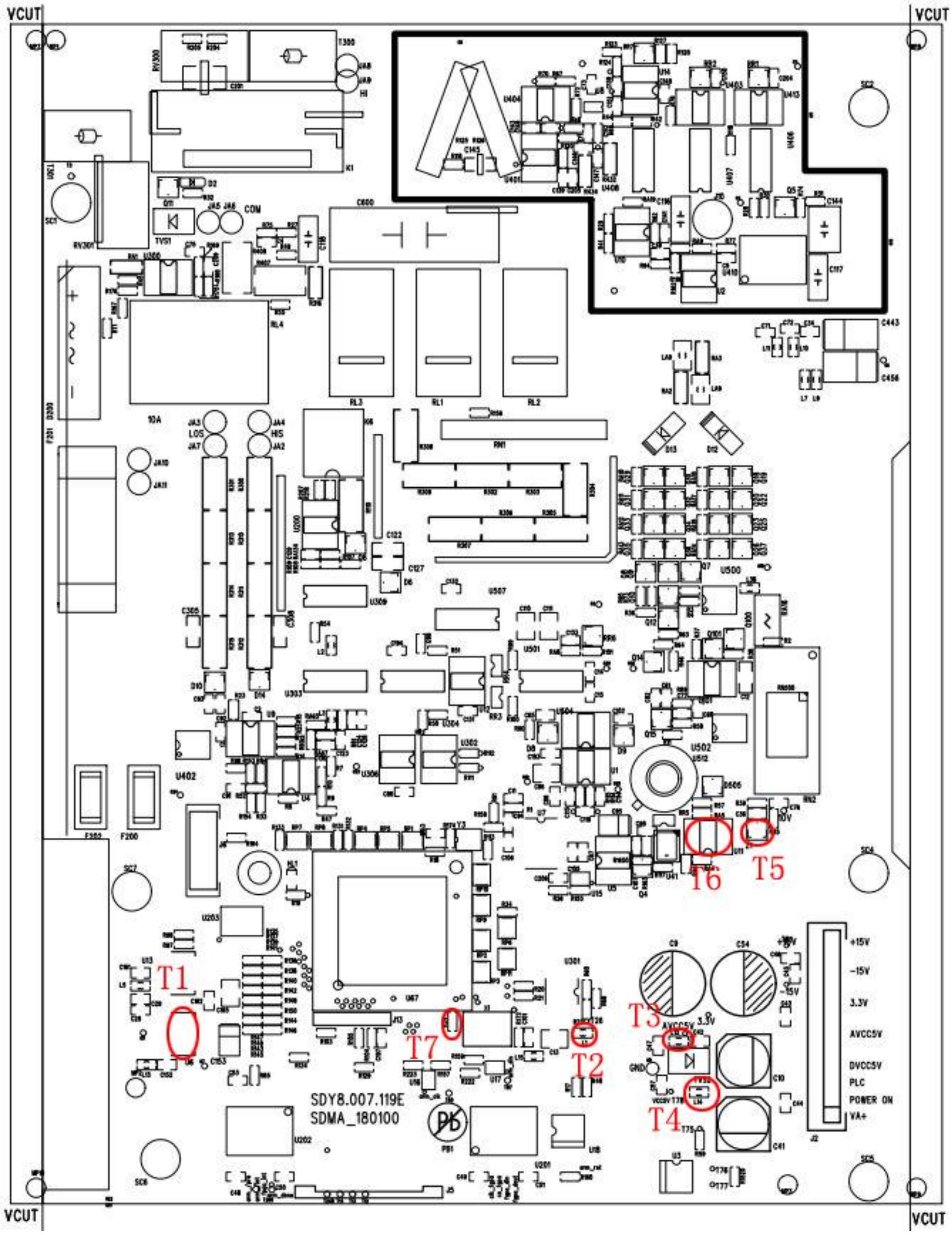
The equipment listed in the table is required to troubleshoot the multimeter.

Table 6-1 required equipment

Equipment	Critical Specifications	Example
Digital Multimeter	Accuracy ±0.05% 1 mV resolution	Siglent SDM3055
Oscilloscope	200 MHz Bandwidth	Siglent SDS2102X

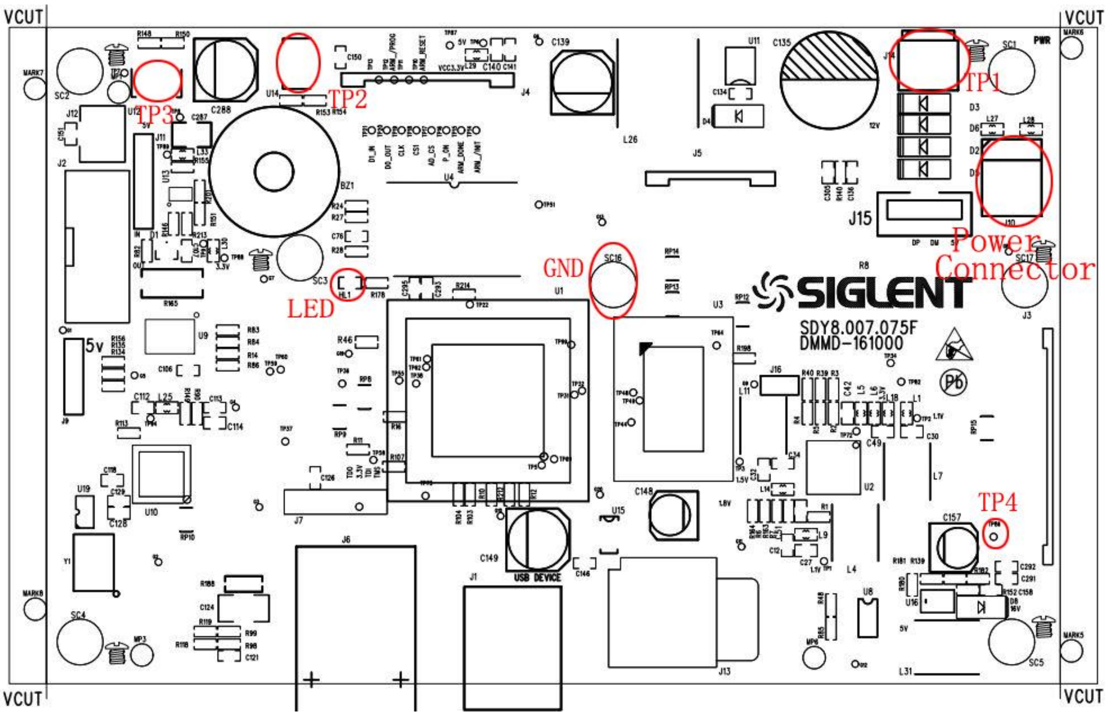
Analog Board Drawing

The analog board is a signal sampling board that converts the analog input into a digital signal. Please refer to the following drawing to quickly locate the test points on the analog board for easy resolution of the failures you encounter.



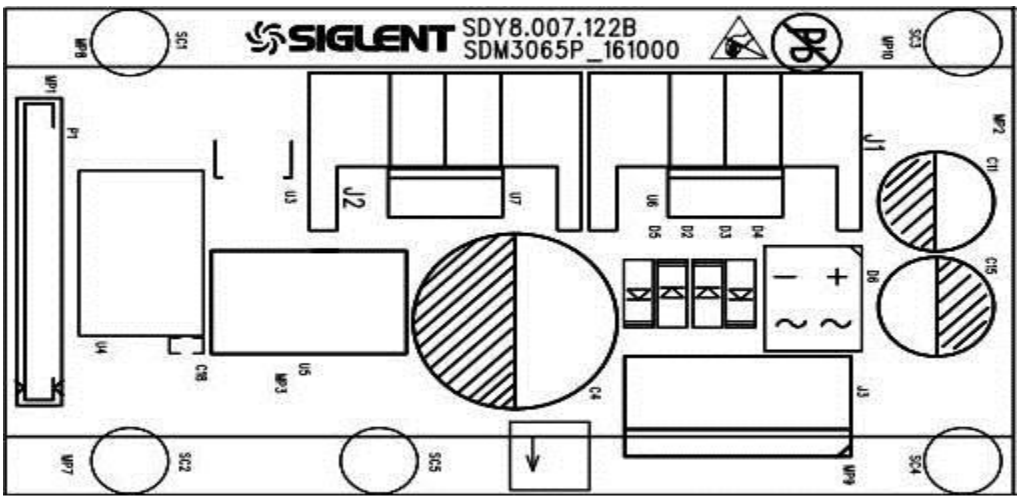
Main Board Drawing

The main board is used to control and manage the whole internal system of the multimeter. It completes the GUI function, controlling and configuration function for analog board as well as man-machine interaction. Please refer to the following drawing to quickly locate the test points on the main board for easy resolution of the failures you encounter.



Power Board Drawing

The main function of the power board is to convert the AC voltage to DC voltage and supply power to the analog board and main board.



Check the Power Supply

There are two power connectors through which the power board and main board can be supplied electricity. For the power board, there are three voltage test points on its power connector. For the main board, there is one test point.

Before performing the power supply testing procedure, please make sure that the multimeter is grounded correctly through the protective lead of the power cord. Take care not to touch or even disassemble the power supply module without any safety precautions, or you may probably suffer from electric shock or burn. Here are procedures for testing the power supply:

1. Disconnect the power cord of the multimeter and then check whether the fuse has been burnt out.
2. Remove metal shell of the multimeter using a driver, and then disconnect the power connector connected to the main board.
3. Focus on the Power Connector for the power board, which contains five pins from Pin 1 to Pin 5. You can test the adjacent pins that are marked with Blue, Brown, Yellow and White to check whether the AC voltage value is within the corresponding specified range using a digital multimeter. The voltage parameters to be tested are listed in table below:

Table 6-2 Test AC voltages for the power board power connector

Pins	Voltage value (V)	Error limit (V)
Blue to Blue	8	±1
Yellow to Brown	16	±2
White to Yellow	16	±2

Table 6-3 Test AC voltage for the main board power connector

Pins	Voltage value (V)	Error limit (V)
Black to Black	8	±1

If each tested voltage value is within the corresponding spec range referring to the table above, then the power supply works normally. Otherwise, it proves to be faulted, please return it to the factory to have it repaired or contact SIGLENT.

Note: *The main power supply provides an input fuse to protect against the danger of fire in the event of a failure of the power supply circuitry. However,* *this fuse will not fail ("open" or "blow") in normal power supply operation except that after a significant overload occurs. Replace the entire main power supply assembly if the input fuse fails.*

Check the Analog Board

If it is desired to remove the analog board from the metal shelf inside the multimeter, you'd better place it on a clean, insulated mat. Here are procedures for testing the analog board:

1. Several types of connectors are used on the analog board. Check to make certain that all of these are connected properly.
2. After checking these connectors, then connect the multimeter to AC power and power it on. Check if the voltage values at all test points are within the specified range using a digital multimeter. The voltage parameters to be tested are listed in table 5-3:

Voltage Check

Test the voltage points on the analog board in the table below. To locate the test points, please refer to the drawing of the analog board. If not each tested voltage value is within the corresponding spec range referring to table 5-4, it proves to be faulted, please return it to the factory to have it repaired or contact SIGLENT.

Table 6-4 Test DC voltages of the analog board

Test point	Name	Test pin	Voltage value (V)	Error limit (V)
T1	U6	1	0 (GND)	
T2	L1	1 or 2	+3.3	±0.2
T3	L12	1 or 2	+5	±0.2
T4	L14	1 or 2	+5	±0.2
T5	Z1	3	+15	±0.5
T6	U11	4	-15	±0.5

Analog board Clock Check

Analog board clock is the internal system clock of the multimeter. To verify if the clock on the analog board works normally, please test the clock frequency listed below using an oscilloscope.

Table 6-5 Clock Source of the analog Board

Test point	Name	Pin	Frequency	Stability
T7	R24	1 or 2	50 MHz	±25 ppm

Check the Main Board

If the main board does need to be removed from the metal shelf located inside the multimeter, place it on a clean, insulated mat. Testing procedures for the main board are as follows:

1. Several types of connectors are located on the main board. Check if all these are connected properly.
2. Make sure that the connectors on the main board are properly connected, then connect the multimeter to AC power and turn it on. Check if the voltage values at all test points are within the spec range using a digital multimeter. The voltage parameters to be tested are listed in table 5-6:

Voltage Check

Test the voltage points on the main board in the table below. To locate the test points, please refer to the drawing of the main board. If not each tested voltage value is within the corresponding spec range referring to table 5-6, it proves to be faulted, please return it to the factory to have it repaired or contact SIGLENT.

Table 6-6 Test DC voltages of the main board

Test point	Name	Pin	Voltage value (V)	Error limit (V)
TP1	J14	1	+8.6	±2
TP2	U14	4	+3.3	±0.1
TP3	U12	4	+5	±0.2
TP4	TP86	Solder	+16	±2
GND	SC16			

Microprocessor Check

Observe the LED light on the main board, which indicates the working state of microprocessor chip. If the light turns on, then the corresponding codes have been loaded successfully and the chip is in an operating state. Otherwise, there may be a problem with it.

Quick Guide for General Failures

The general hardware failures are described in the following. Reading the following information can help you quickly handle some easy hardware failures with more convenience.

1. **No start-up after pressing the Power button:**

   (1) Check if the power cord is correctly connected.
   (2) Check if the power button is usable.
   (3) Check whether the fuse has been burned out. If the fuse is blown, please replace with a fuse of the same rating.
   (4) Check the connection between the power supply and the main board.
   (5) If the instrument still does not work normally, please contact SIGLENT.

2. **The instrument starts up with a dark screen:**

   (1) Check the connection between the keypad circuit board and the main board.
   (2) If the instrument still does not work normally, please contact SIGLENT.

3. **No response after pressing any button or abnormal display of the screen:**

   (1) Check the connection between the keypad circuit board and the main board.
   (2) If the instrument still does not work normally, please contact SIGLENT.

Maintenance

Maintenance Summary

SIGLENT warrants that the products it manufactures and sells are free from defects in materials and workmanship for a period of three years from the date of shipment from an authorized **SIGLENT** distributor. If a product proves defective within the respective period, **SIGLENT** will provide repair or replacement as described in the complete warranty statement.

To arrange for service or obtain a copy of the complete warranty statement, please contact your nearest **SIGLENT** sales and service office.

Except that as provided in this summary or the applicable warranty Statement, **SIGLENT** makes no warranty of any kind, express or implied, including without limitation the implied warranties of merchantability and fitness for a particular purpose. In no case shall **SIGLENT** be liable for indirect, special or consequential damages.

Repackaging for Shipment

If the unit needs to be shipped to **SIGLENT** for service or repair, be sure:

1. Attach a tag to the unit identifying the owner and indicating the required service or repair.
2. Place the unit in its original container with appropriate packaging material for shipping.
3. Secure the container with strong tape or metal bands.

If the original shipping container is not available, place your unit in a container which will ensure at least 4 inches of compressible packaging material around all sides for the instrument. Use static-free packaging materials to avoid additional damage to your unit.

Contact SIGLENT

SIGLENT TECHNOLOGIES CO., LTD

Address: 3/F, NO.4 building, Antongda Industrial Zone, 3rd Liuxian Road, 68th District, Baoan District, Shenzhen, P.R. China

Tel：0086-755-3688 7876
E-mail: sales@siglent.com
http://www.siglent.com

SIGLENT Technologies America, Inc

Address: 6557 Cochran Rd Solon, Ohio 44139
E-mail: info@siglent.com
http://www.siglentamerica.com

SIGLENT Technologies EuropeGmbH

Address: Liebigstrasse 2-20, Gebaeude 14, 22113 Hamburg Germany
E-Mail: info-eu@siglent.com
http://www.siglenteu.com