

# Support Information Only

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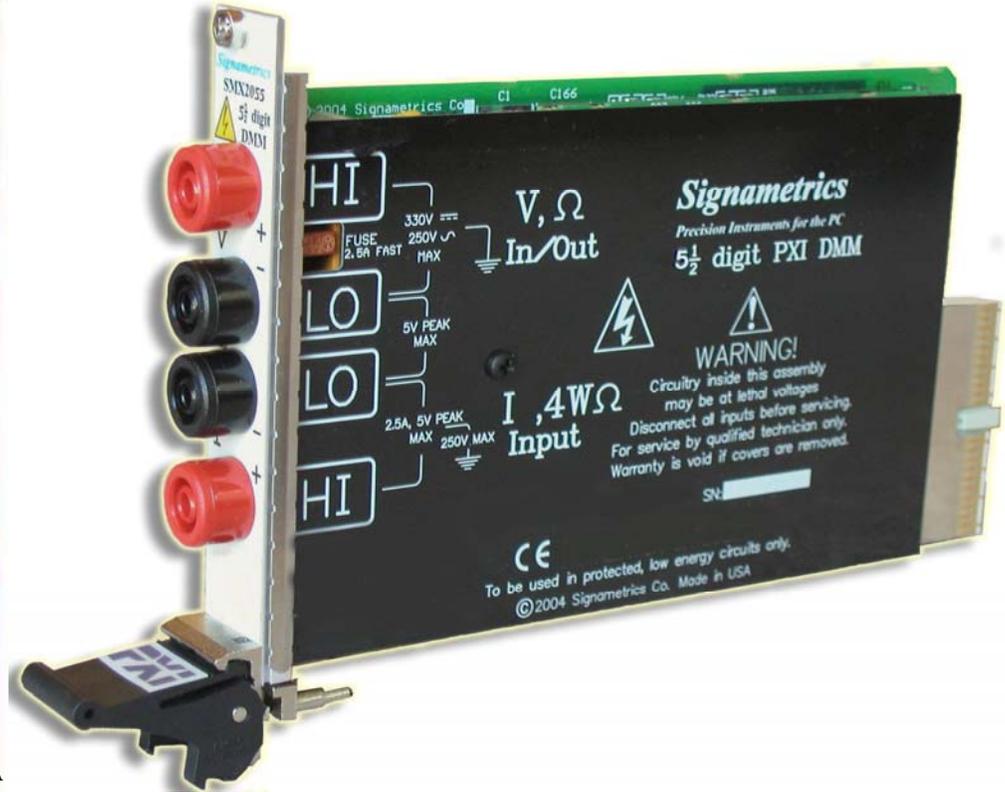
## 5-1/2 Digit PXI Multimeter

### Features

- 5-1/2 Digit Resolution
- + 240,000 count A/D  
**+23,999,9V**
- No Latency Measurements
- Selectable Measurement Rates
  - 1/s to 100/s
- Fast function and range changes
- DC Voltage ranges:
  - 240mV, 2.4V, 24V, 240V
- AC Voltage ranges:
  - 240mV, 2.4V, 24V, 240V
- DC Current Ranges:
  - 2.4mA, 24mA, 240mA, 2.4A
- AC Current ranges
  - 2.4mA, 24mA, 240mA, 2.4A
- Resistance Two-Wire Ranges:
  - 240Ω, 2.4kΩ, 24kΩ, 240kΩ, 2.4MΩ, 24MΩ
- Resistance Four-Wire Ranges:
  - 240Ω, 2.4kΩ, 24kΩ, 240kΩ
- Diode Test:
  - 100nA, 1uA, 10uA, 100uA, 1mA
- True RMS AC
- Input Impedance
  - DCV 10GΩ or 10M
  - ACV 1MΩ || 300pF
  - Current Shunts: 0.1Ω and 10 Ω
- Auto Ranging
- Universal Software driver
  - Linux & Windows
  - Fast to install - tiny footprint
  - Compatible with most S/W
  - Stand alone – no dependencies
  - Exel, Word, Matlab, LabView, C, C++, C#, LabWindows, Visual Basic and more

### A Family of Instruments

The SMX2055 joins a long line of offering of PCI, PXI, and USB DMMs and Switching modules from Signametrics. Combine a Signametrics DMM and a Switch to form a cost-effective test solution. Join hundreds of loyal users who consider these to be the best, and friendliest to use Instruments. Expect these products to perform beyond your expectations.



Signametrics SMX2055 5-1/2 digit Digital Multimeter is a full-featured PXI instrument. It is the lowest priced PXI DMM on the market, yet it is a very capable DMM. It surpasses any plug-in or bench DMM, demonstrating fast measurement rate with great stability and repeatability.

Most 5-1/2 digit DMM's are limited to 110,000 counts. The SMX2055 sports a superb zero latency A/D with 240,000 counts. The significance of having more than twice the dynamic range is manifested in 5-1/2 digits resolution over a much wider range of inputs. Measuring a 14V signal, the SMX2055 will display **14.0000V**, while other DMM's will show **14.000V**. These units are also very quick and easy to install and run. While other DMMs require many hours of installation, the SMX2055 takes minutes to install. Expect to start making measurements in a matter of minutes.

Very high input impedance preserves the DMM accuracy when testing devices with high sources impedance. Four True RMS AC Volts Current ranges make use of an accurate wide band RMS converter circuit.

The SMX2055 is not just low cost, high performance; it is also the most reliable PXI DMM on the market.

Signametrics did not cut corners to create this DMM. We used innovation and technology, resulting in multiple current sources and low test voltage in resistance measurements, in wider-band AC measurements, and we did not skimp on current shunts. Both AC and DC currents have two built in current shunts, not normally found in lower cost DMM's.

The SMX2055 joins our full line of 6-1/2 and 7-1/2 plug-in DMM's and Switching Modules for PXI, USB, and PCI. Signametrics high precision DMM's and Instrumentation quality relay multiplexers will constitute a great foundation for your next test system. Their price-performance is unbeatable. We have confidence you will be satisfied with these products. A 30 day no risk trial period comes with any of our instruments.

## DC Voltage Measurement

- **Input Resistance 240mV, 2.4V Ranges:** >10 GΩ
  - **Input Resistance 24V, 240 V Ranges:** 10.00 MΩ
- Accuracy ± (% of reading + Volts) [1]

Range	Full Scale 5-½ Digits	Resolution	One Year 23°C ± 10°C
240 mV	240.000 mV	1 μV	0.015 + 7 μV
2.4 V	2.40000 V	10 μV	0.014 + 30 μV
24 V	24.0000 V	100 μV	0.02 + 750 μV
240 V	240.000 V	1 mV	0.02 + 3 mV

[1] With measurement rate set to 2rps or lower rate, within one hour from Zero.

For resolution at higher measurement rates, see the following table. Use this table for DC Volts, DC current and Resistance measurements.

## Resolution vs. Measurement rate

Maximum reading rate	Resolution	
2 / second	5-1/2 digits	19 bits
8 / second	5 digits	18 bits
50 / second	4-1/2 digits	17 bits
100 / second	4 digits	16 bits

## DCV Noise Rejection

Normal Mode Rejection, 50, 60, or 400 Hz ± 0.5%; > 90 dB.  
CMRR, with 1 kΩ lead imbalance; > 100 dB.

## DC Current Measurement

- **Number of shunts** Two
- **Burden Voltage** 300mV max.
- **Protected** with 2.5A Fast blow fuse

Accuracy ± (% of reading + Amps) [1]

Range	Full Scale 5-½ Digits	Resolution	One Year 23°C ± 10°C
2.4 mA	2.40000 mA	10 nA	0.07 + 7 μA
24 mA	24.0000 mA	100 nA	0.08 + 9 μA
240 mA	240.000 mA	1 μA	0.07 + 60 μA
2.4 A	2.40000 A	10 μA	0.2 + 160 μA

[1] With measurement rate set to 2rps or lower rate, within one hour from Zero (Relative control).

## Diode Test

- **Test currents** 100 nA, 1 μA, 10 μA, 100 μA and 1 mA
- **Source Voltage compliance** 4V
- **Voltage measurement range** 0V to 2.4V

Test Current	Full Scale 5-½ Digits	Resolution	One Year 23°C ± 10°C
0.1 μA	2.40000 V	10 μV	0.022 + 15 μV
1 μA			0.018 + 12 μV
10 μA			0.015 + 10 μV
100 μA			0.014 + 8 μV
1 mA			0.014 + 8 μV

[1] With measurement rate set to 2rps or lower rate

## Resistance Measurements

- **Number of Current Sources** Five

### 2-Wire

Accuracy ± (% of reading + Ω) [1]

Range [2]	Full Scale 5-½ Digits	Resolution	Source current	One Year 23°C ± 10°C
240 Ω	240.000 Ω	1 mΩ	1 mA	0.02 + 100 mΩ
2.4 kΩ	2.40000 kΩ	10 mΩ	1 mA	0.02 + 200 mΩ
24 kΩ	24.0000 kΩ	100 mΩ	100 μA	0.02 + 1 Ω
240 kΩ	240.000 kΩ	1 Ω	10 μA	0.06 + 20 Ω
2.4 MΩ	2.40000 MΩ	10 Ω	1 μA	0.06 + 200 Ω
24 MΩ	24.0000 MΩ	100 Ω	100 nA	0.2 + 25 kΩ

[1] With measurement rate set to 2rps or lower rate, within one hour from Zero.

[2] Test voltages at full scale are 2.4V max with the exception of the 240 Ω range which is 240 mV.

### 4-Wire

Accuracy ± (% of reading + Ω) [1]

Range [2]	Full Scale 5-½ Digits	Resolution	Source current	One Year 23°C ± 10°C
240 Ω	240.000 Ω	1 mΩ	1 mA	0.02 + 50 mΩ
2.4 kΩ	2.40000 kΩ	10 mΩ	1 mA	0.02 + 100 mΩ
24 kΩ	24.0000 kΩ	100 mΩ	100 μA	0.02 + 500 mΩ
240 kΩ	240.000 kΩ	1 Ω	10 μA	0.06 + 10 Ω

[1] With measurement rate set to 2rps or lower rate, within one hour from Zero (Relative control).

[2] Test voltages are 2.4V max with the exception of the 240 Ω ranges which is 240 mV.

## AC Voltage Measurements

- **Input Resistance** 1 MΩ, shunted by < 300 pF
- **Max. Crest Factor** 4 at Full Scale, 7 near 10% of range
- **AC coupled** 10 Hz to 100 kHz
- **Typical Settling time** < 0.5 sec to within 0.1% of final value
- **Method True RMS** Accuracy ± (% of reading + Volts) [1]

Range	Full Scale 5-½ Digits [3]	Resolution	Lowest specified Input Voltage	One Year [2] 23°C ± 10°C
240 mV	240.000 mV	1 μV	5 mV	0.2 + 1 mV
2.4 V	2.40000 V	10 μV	20 mV	0.25 + 10mV
24 V	24.0000 V	100 μV	200 mV	0.15 + 100mV
240 V	240.000 V	1 mV	2 V	0.25 + 400mV

[1] With measurement rate set to 2rps or lower rate

[2] Input frequency 47Hz to 10kHz. For other frequencies add error in tabel below

[3] Signal is limited to 8x10<sup>6</sup> Volt Hz Product

### Additional AC Voltage errors

Add the following error if signal frequency is lower than 47Hz or above 10kHz

Range	Signal Frequency	% of reading + Volts
240 mV	20 Hz - 47 Hz	0.75 + 1 mV
	10 kHz - 50 kHz	0.43 + 200μV
2.4 V	20 Hz - 47 Hz	0.75 + 1mV
	10 kHz - 50 kHz	0.45 + 2mV
24V	20 Hz - 47 Hz	0.85 + 20mV
	10 kHz - 50 kHz	0.2 + 15mV
240V	20 Hz - 47 Hz	0.85 + 200mV
	10 kHz - 50 kHz	0.15 + 100mV

**ACV Noise Rejection** Common Mode rejection, for 50 Hz or 60 Hz with 1 kΩ imbalance in either lead, is better than 80 dB.

### AC Current Measurement, True RMS

- **Crest Factor** 4 at Full Scale, 10 at Lowest Specified Current
- **Burden Voltage** 300mV max.
- **Protected** with 2.5 A Fast Blow fuse

Accuracy ± (% of reading + Amps) [1]

Range	Full Scale 5-1/2 Digits	Resolution	Lowest Specified Current	One Year 23°C ± 10°C [2]
2.4 mA	2.40000 mA	10 nA	60 μA	0.3 + 20 μA
24 mA	24.0000 mA	100 nA	300 μA	0.2 + 100 μA
240 mA	240.000 mA	1 μA	3 mA	0.17 + 1 mA
2.4 A	2.40000 A	10 μA	30 mA	0.31 + 10 mA

[1] With measurement rate set to 2rps or lower rate.

[2] For input frequency 47Hz to 1kHz. For other frequencies add the error in the tabel below

### Additional AC Current measurement errors

Add the following error for signal frequencies lower than 47Hz or greater than 1kHz

Range	Signal Frequency [1]	% of reading
2.4 mA	20 Hz - 47 Hz	0.88
	1 kHz - 10 kHz	0.12
24 mA	20 Hz - 47 Hz	0.84
	1 kHz - 10 kHz	0.24
240 mA	20 Hz - 47 Hz	0.8
	1 kHz - 10 kHz	0.2
2.4 A	20 Hz - 47 Hz	0.55
	1 kHz - 10 kHz	0.2

### Selectable Measurement Rates

Rate (/sec)	Symbol	Code	Power line Rejection		
			50Hz	60Hz	400Hz
1	RATE_1	1	√	√	√
2	RATE_2	2	√	√	√
3	RATE_3	3	√	√	
7	RATE_7	7	√	√	
14	RATE_14	14	√	√	√
27	RATE_27	27			√
55	RATE_55	55		√	√
100	RATE_100	100	√		√

### Other Specifications

#### Temperature Coefficient over 0°C to 50°C Range

Less than 0.1 x accuracy specification per °C At 23°C ± 10°C

#### Hardware Interface

Single PXI/cPCI 3U slot

#### Overload Protection (voltage inputs)

300 VDC, 250 VAC

#### Isolation

300 VDC, 250 VAC from Earth Ground

#### Maximum Input (Volt x Hertz)

8x10<sup>6</sup> Volt x Hz normal mode

input (across Voltage HI & LO). 1x10<sup>6</sup> Volt x Hz

Common Mode input (from Voltage HI or LO relative to

Earth Ground).

#### Safety Designed to IEC 1010-1, Installation Category II.

#### Calibration

Calibrations are performed in a computer at 23°C

internal temperature rise. All calibration constants are

stored on board the DMM and in a text file.

#### Temperature Range Operating

-10°C to 65°C

#### Temperature Range Storage

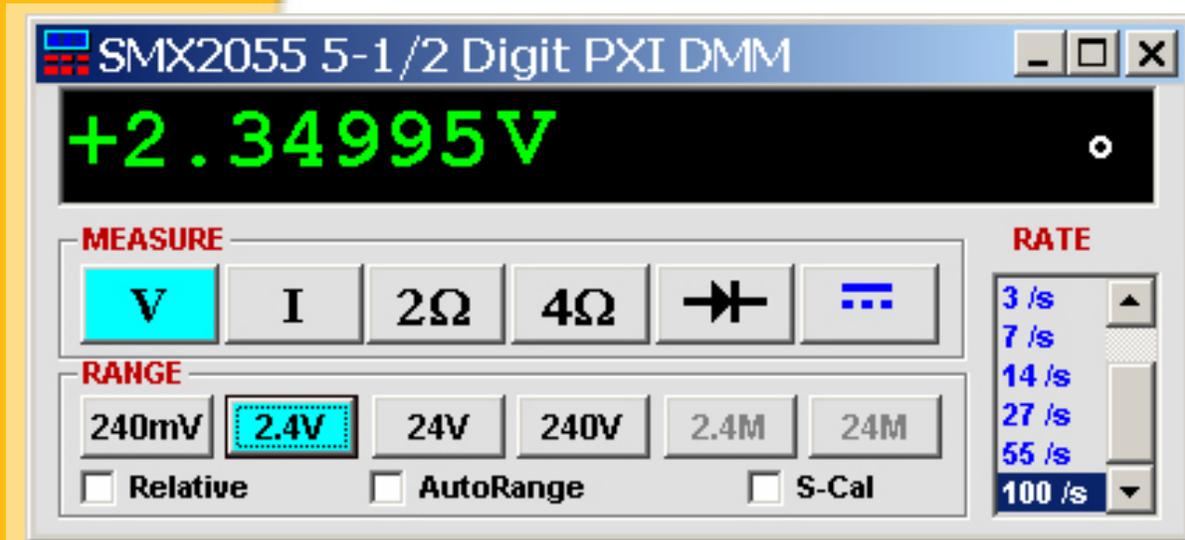
-40°C to 85°C

#### Size

Single 3U PXI or CompactPCI slot

#### Power

+5 volts, 200 mA



## Accessories

Several accessories are available for the SMX2055 DMM. These can be purchased directly from Signametrics, or one of its approved distributors or representatives. These are some of the accessories available:

- DMM probes SM-PRB
- DMM probe kit SM-PRK
- Deluxe probe kit SM-PRD (\$95.00).
- Shielded SMT Tweezers Probes SM-PRSMT
- Multi Stacking Double Banana shielded cable 36" SM-CBL36, 48" SM-CBL48.
- 10A AC and DC Current shunt SM10A
- Extended 3 Year warrantee (does not include calibration).

**Signametrics reserves the rights to change any or all of the above without notice, and at any time.**

**See manual for more detailed specifications.**