

Digital Voltmeter

General Description

The Digital Voltmeter (DVM) is a precise voltage measurement tool with automatic ranging for measurements up to ± 240 Volts. It features automatic offset calibration, variable sample rates, and continuous streaming digitization.

Measurements are displayed in a continuous graph on a self-hosted website, accessible via mobile or desktop browsers. The Thermocouple Reader can be used exclusively using a web browser with no software installation, or can be controlled entirely by Python from a host computer via USB or Ethernet.

A full-bodied anodized aluminum enclosure provides physical protection for the DVMs. Interfacing to the DVM is as simple as plugging in banana cables from your measurement source. A built-in flange with mounting holes assists in field deployment.

In order to take full advantage of the DVM's capabilities, consider using a Tracks to mux up to 16 differential sources to one DVM.



Applications

- Automated Test Systems
- Design Verification
- Rapid Prototyping

Features

- 6 Digit Voltage Measurement Resolution
 - ± 240 V Input with Autoranging
 - USB or Ethernet Control, LXI-Compatible
 - 3 Measurement Ranges
 - Continuous Streaming at 3.6ksps with 1.1kHz Bandwidth
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Absolute Maximum Ratings⁽¹⁾⁽²⁾

T_A = 25C, unless otherwise specified.

Description	Rating
Input, V+ and V-	
Applied Voltage V _{PIN-TO-PIN} ⁽³⁾	±300V
Applied Voltage V _{POSITIVE-PIN-TO-USB-GND} ⁽³⁾	±300V
Applied Voltage V _{NEGATIVE-PIN-TO-USB-GND} ⁽³⁾	±150V

- (1) Stresses beyond those listed may cause permanent device damage. Functional operation range of the device is defined in Recommended Operating Ratings or Electrical Characteristics. Exposure to absolute max ratings for extended periods may reduce device reliability.
- (2) As designed and characterized, not fully tested in production.
- (3) Overvoltage spikes exceeding these voltages may cause irreversible damage to the device

Recommended Operating Ratings

T_A = 25C, unless otherwise specified.

Parameter	Conditions	Min	Typ	Max	Unit
Voltage Input Range	Per the absolute max ratings, a voltage that can be safely applied in any pin configuration is ±150V . For voltages outside this range, refer to the Absolute Maximum Ratings.				

Electrical Characteristics⁽²⁾

T_A = 25C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Calibrated Voltage Reading Range ⁽¹⁾	V _{RANGE}		-240	-	240	V
Input Impedance	R _{IN}	Channel Active	9.8	10.0	10.2	MΩ
Input Capacitance	C _{OFF}	Channel Inactive, V _{IN} = ±300V	-	20	-	pF

- (1) Parameter 100% production tested at T_A = 25C
- (2) As designed and characterized, not fully tested in production unless otherwise specified.
- (3) Factory calibrated.

Accuracy Specifications⁽²⁾⁽³⁾⁽⁴⁾

T_A = 25C or T_{CAL} ±5C, unless otherwise specified.

Function	Range	1 Year ⁽¹⁾
DC Voltage	2.4V	0.014 + 0.0024
	24V	0.016 + 0.0024
	120V	0.020 + 0.0048
	24V	0.016 + 0.0064
	240V	0.020 + 0.0064

- (1) Accuracy Specifications: ±(% of reading + % of range)
- (2) Specifications are after a 30-minute warm-up time.
- (3) With auto-zero enabled.
- (4) Factory calibrated.

Performance Characteristics⁽²⁾

T_A = 25C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Sample Rate Accuracy				±0.2		%
		Across Temperature			±2	%
Bandwidth, -3dB, SINC1 filter		Data Rate: 10sps		4.3		Hz
		Data Rate: 16.6sps		7.3		Hz
		Data Rate: 50sps		22		Hz
		Data Rate: 60sps		27		Hz
		Data Rate: 400sps		177		Hz

		Data Rate: 1200sps	525	Hz
		Data Rate: 3600sps	1440	Hz
		Data Rate: 14400sps	2930	Hz
Bandwidth, -3dB, SINC2 filter		Data Rate: 10sps	3.1	Hz
		Data Rate: 16.6sps	5.2	Hz
		Data Rate: 50sps	16	Hz
		Data Rate: 60sps	19	Hz
		Data Rate: 400sps	127	Hz
		Data Rate: 1200sps	380	Hz
		Data Rate: 3600sps	1100	Hz
		Data Rate: 14400sps	2930	Hz

(2) As designed and characterized, not fully tested in production unless otherwise specified.

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