TECHNICAL DATA

8588A Reference Multimeter


10.0000010V


Josephson Voltage Standard

Key features

- Digitizing multimeter designed specifically for calibration laboratories.
- More than 12 measurement functions; digitize voltage, digitize current, and external shunts for DC and AC current, consolidating into a single instrument.
- Intuitive user interface with color display and easy-to-navigate menu structure for all configuration.
- Supports minimum of 100,000 readings per second at 4.5 digits across GPIB, USB or Ethernet.

Product overview: 8588A Reference Multimeter

Stability, simplicity and performance by design

The 8588A incorporates exceptional linearity, low noise and stability in the design. This best-in-class long-scale digital reference multimeter guarantees superior 3.5 ppm one-year dc voltage relative accuracy and long-term stability over a wide measurement range and functions.

The 8588A contains the world's most stable voltage references and attenuators custom crafted at Fluke Calibration. These precision components eliminate the need for daily internal self-calibration to compensate for drift when less-precise components are used. Autozeroing also becomes unnecessary because the amplifier offsets are ultra-stable. The 8588A achieves an exceptional 8.5-digit resolution reading in one second, two times shorter than the next best in class, which amounts to considerable productivity improvements.

The 8588A is easy and intuitive to use. It is the ideal lab multimeter for metrologists and calibration laboratory managers who expect and appreciate a straightforward setup that quickly achieves the maximum performance of the instrument.

- 2.7 µV/V (95%), 3.5 µV/V (99%), 1 year relative accuracy, dc voltage without internal self-calibration or auto-adjustments
- 0.5 µV/V (95%), 0.65 µV/V (99%), 24 hour stability, dc voltage
- 7 µΩ/Ω (95%), 9 µΩ/Ω (99%), 1 year, resistance
- 2.02x full scale stretches lower noise floor to higher signal levels to maximize higher accuracies from the instrument
- 200 ns to 100 s aperture setting allows the industry's widest flexibility to control data capture window

Accuracy, offset and stability provide excellent ac performance

The 8588A provides the most accurate true ac rms measurement available in a Fluke Calibration multimeter.

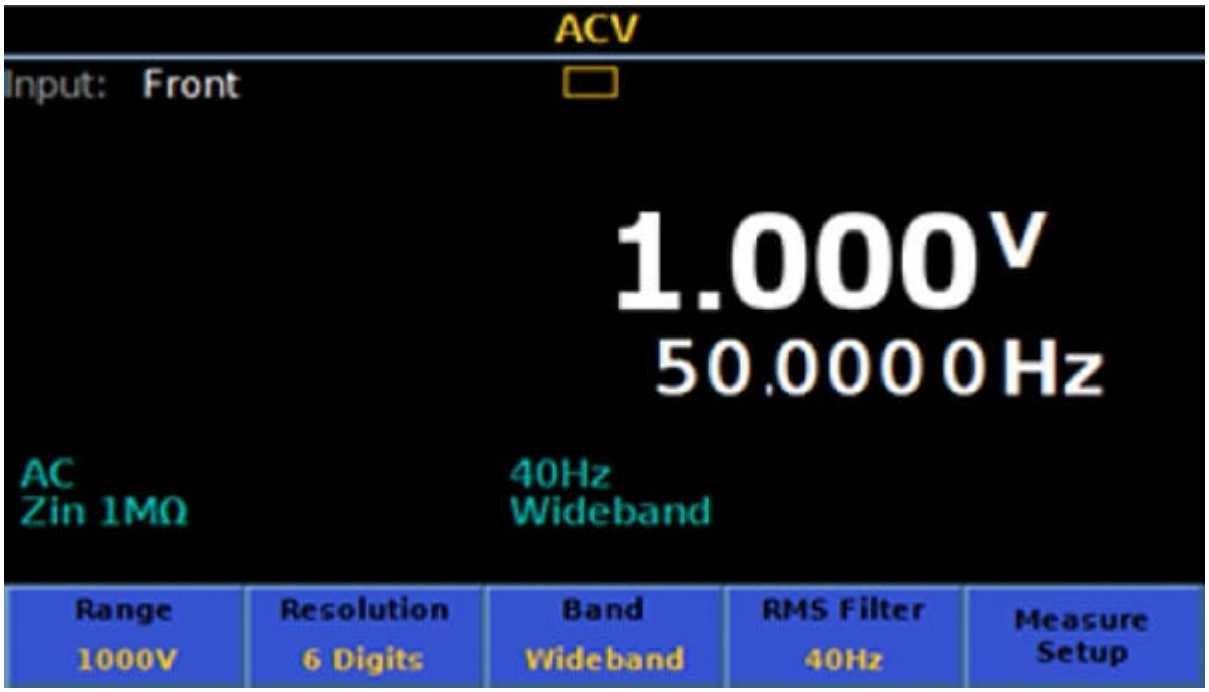
With a 5 mega-samples-per-second sampling analog-to-digital converter and an extraordinarily stable dc analog path, the 8588A achieves remarkable ac rms measurement performance that is ten times faster, two times less noisy, and more sensitive for low level signals than other instruments in this class. It utilizes digital rms calculations to maintain full resolution of a wide dynamic range of digitized signals, so you can see a wide range of measurements clearly.

Rapid digital filters are more effective than their analog equivalents for faster settling. The digital filters eliminate the dielectric absorption on analog filters, commonly associated with residual slow-tail characteristics. The digital filters effectively shorten settling time to within 6 cycles of the filter frequency and less than 1 ppm of the fully settled

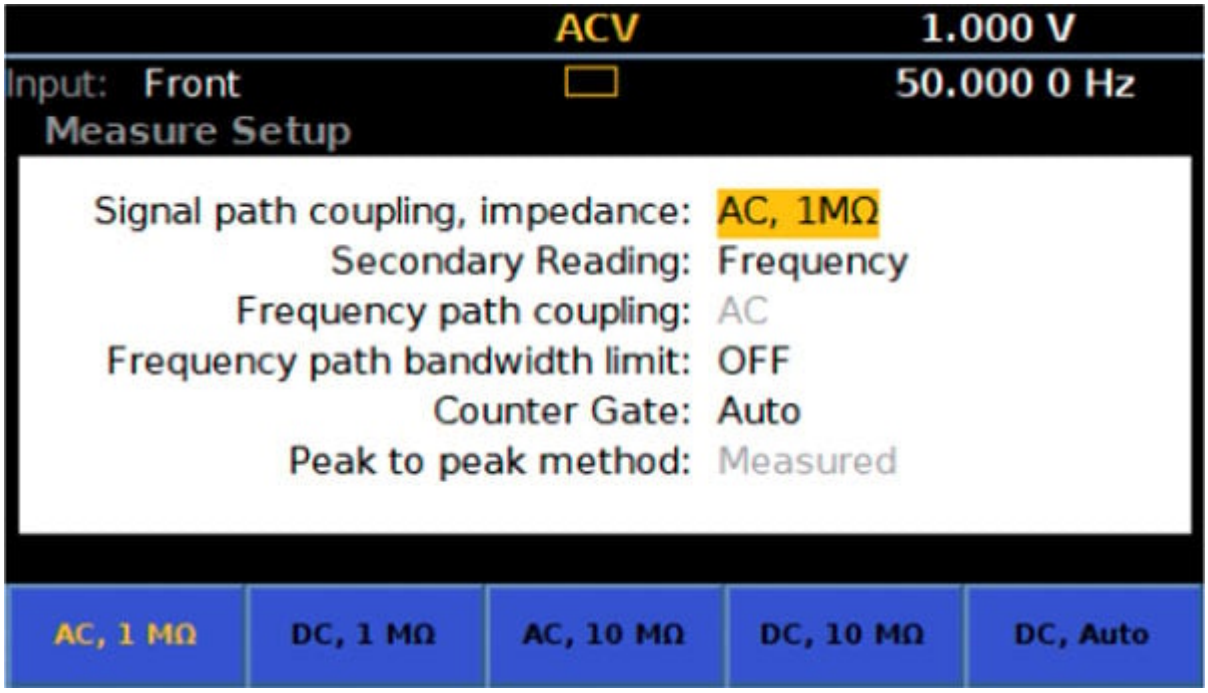
value.This is up to 10 times faster than other long scale precision digital multimeters at low frequencies.

Low noise is achieved from averaging the collected high-resolution digitized data and the inherently stable signal path. De-coupling low level signal sensitivity from temperature drift enables the 8588A to make higher accuracy low-level ac measurements. Therefore, temperature drift, offsets, and long-term instability typically associated with an analog rms converter are eliminated.

- 60 µV/V (95%), 77 µV/V (99%), 1 year relative accuracy, for the most accurate ac voltage measurement
- 250 µA/A (95%), 323 µA/A (99%), 1 year relative accuracy, ac current
- 15 ms settling time at 1kHz ac filter form 10x faster ac voltage measurement
- 2.02x full scale Vpp, 1.2x full scale rms
- Up to 30 A for peak ac current greatly extends ac current measurement range



AC voltage measurement



AC voltage measurement settings

Usability designed for metrologists by metrologists

The 8588A is the ideal lab multimeter. It streamlines the measurement process while eliminating misunderstandings, with an easy-to-access user interface in English, Chinese, French, German, Japanese, Korean, Russian and Spanish. An intuitive graphical display lets you easily visualize trends, histograms, complex waveforms, and statistics and perform routine metrology tasks quickly. You can perform both real-time and post-capture analysis for short-term and long-term stability, identifying and quantifying drifts, run-around noise and uncertainty analysis without the need for an external computer or software. You can also quickly visualize post-processed frequency domain signals of fundamental and harmonic amplitude and phase content.

Some popular system multimeters have complex menu structures and unintuitive commands, while others lack any user interface, presenting barriers to training and operation. By contrast, the 8588A/8558A feature an easyto- access configuration menu that makes it easy to train new users.

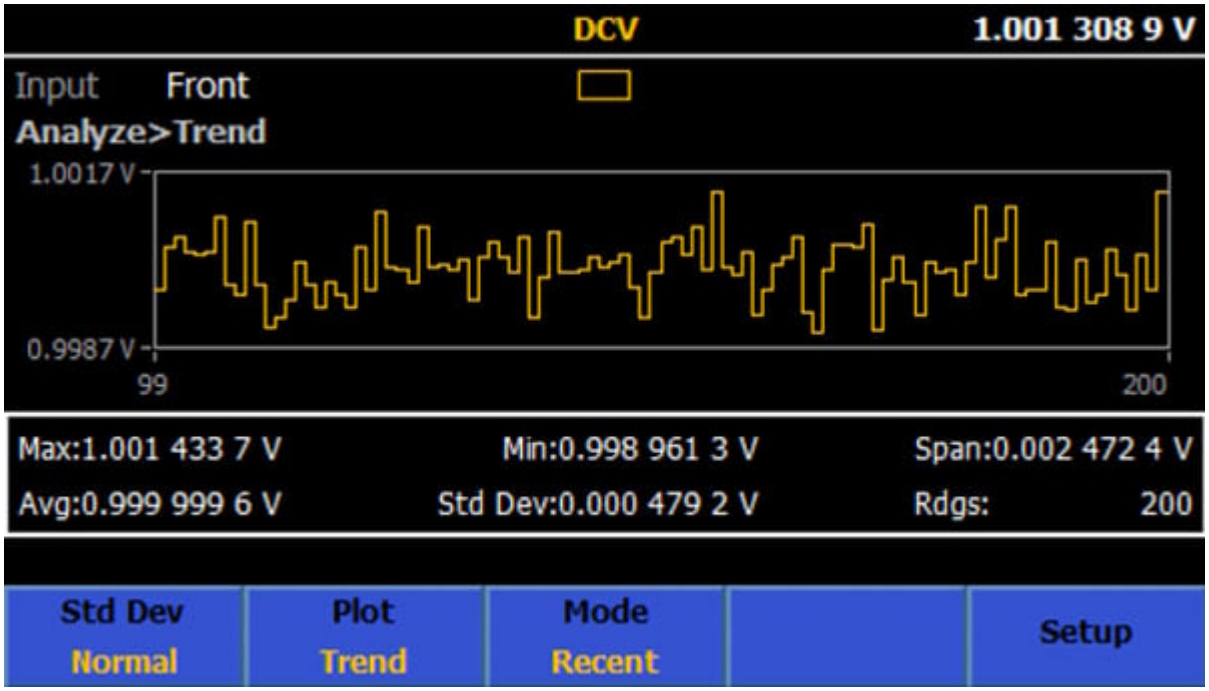
The front panel features many new usability improvements. Visual Connection Management™ output terminals light up to show which terminals are active, guiding the user to make the correct connections. The handles are over-molded for comfort and easy transport.

USB host ports are placed both on the front and rear of the instrument. Use the ports to export data to external memory devices or simplify firmware updates. For remote communication with a PC, choose from Ethernet, GPIB or USBTMC connectors on the rear panel.

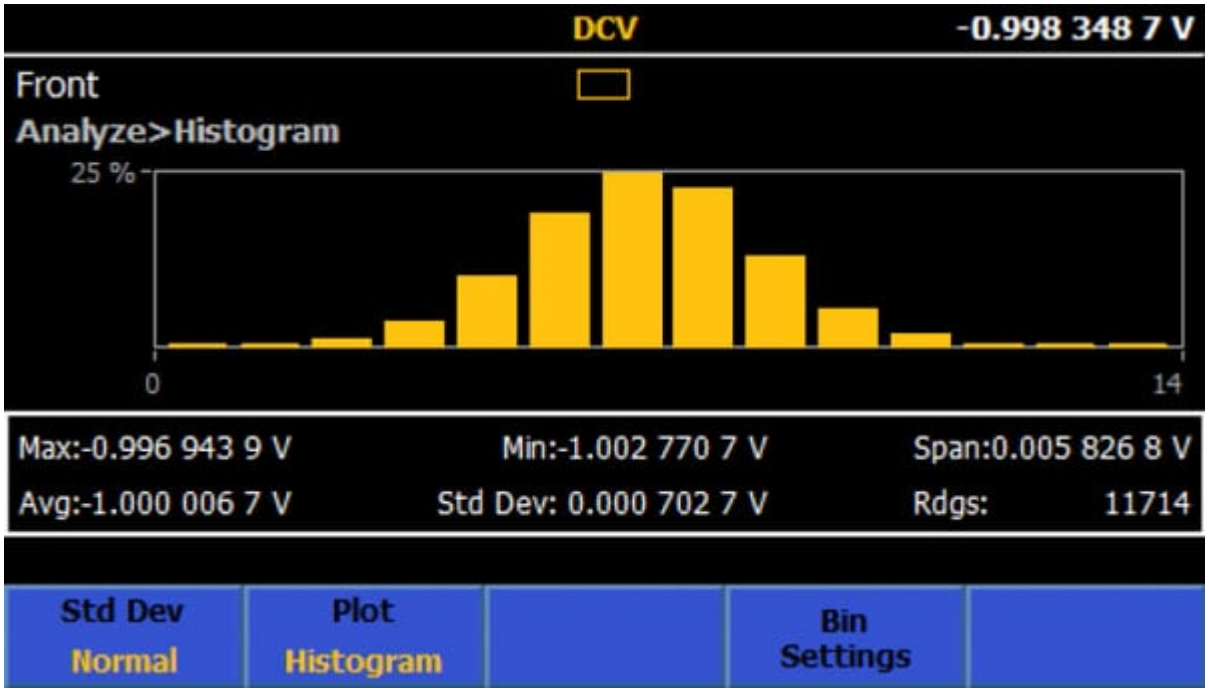
The 8558A/8558A provide full emulation of the Fluke 8508A Reference Multimeter and command compatibility of the Keysight 3458A Digital Multimeter via SCPI commands, making it an ideal replacement for these older instruments.

- Graphical display that enables instantaneous visualization of trend plot, statistical analysis, histogram and FFT.

- GPIB, USBTMC, Ethernet allows industry standard selection of remote interface. • USB thumb drive enables quick and easy data transfer to PC in .csv format.
- SCPI compliant commands with 8508A and 3458A emulation mode simplifies and accelerates system upgrade process to 8588A/8558A
- Programmable front/rear input switching with scan measurement allows ratio, difference and deviation measurements between front and rear terminals in dc voltage, resistance, functions with state-ofthe- art linearity, noise performance, superb transfer uncertainties.
- Capacitance and RF power meter readout from Rohde & Schwarz NRP Series expands the utility of 8588A in calibrating multi-product calibrators for improved productivity in calibration labs.



Trend plot



Analyze: Histogram

The MET/CAL™ Calibration Management Software advantage

The 8588A and 8558A work with Fluke Calibration MET/CAL™ Calibration Software with native MET/CAL support or using 8508A emulation mode to increase throughput up to four times that of traditional manual and multi-product methods while ensuring calibrations are performed consistently every time. This powerful software documents calibration procedures, processes and results for ease in complying with ISO/IEC 17025 and similar quality standards.

Support and services when you need them

Fluke Calibration offers testing, repair and calibration services to meet your needs quickly and at a fair cost while maintaining the high level of quality that you expect. Our electrical calibration laboratories are accredited for conformance to ISO Guide 17025 and we maintain global calibration and repair facilities.

You can enhance warranty protection with a Priority Gold Instrument CarePlan service package.

A Priority Gold Instrument CarePlan includes an expedited annual calibration to reduce downtime by a week and extended warranty to help ensure the best long-term performance from your instruments. Choose from one-year, three-year or five-year CarePlans. (Note: Priority shipping times vary by country. Contact your local Fluke Calibration sales representative for details.)

Specifications: 8588A Reference Multimeter

8588A complete specifications
8558A complete specifications

Key feature and specification comparison	8588A	8558A
DC voltage	100 mV – 1000 V	100 mV – 1000 V
AC voltage	10 mV – 1000 V, 1 Hz – 10 MHz	10 mV – 1000 V, 1 Hz – 10 MHz
Resistance, LoI, HV	1 Ω - 10 GΩ	1 Ω - 10 GΩ
DC current	10 uA – 30 A	10 uA – 2 A
AC current	10 uA – 30 A, 1 Hz to 100 kHz	10 uA – 2A, 1 Hz to 100 kHz
Digitize V	100 mV - 1000 V, 5 MSamples/s, up to 20 MHz BW	100 mV - 1000 V, 5 MSamples/s, up to 20 MHz BW
Digitize I	10 uA - 30 A, 5 MSamples/s, up to 4 MHz BW	10 uA - 2 A, 5 MSamples/s, up to 4 MHz BW
Frequency (V, I, BNC)	1 Hz to 10 MHz, 1 Hz to 100 kHz, 10 Hz to 100 MHz	1 Hz to 10 MHz, 1 Hz to 100 kHz, 10 Hz to 100 MHz
Temperature	PRT / Thermocouple (ext CJC)	PRT / Thermocouple (ext CJC)
Capacitance	1 nF – 100 mF	No
RF power	R&S NRP Series	No
Ext. dc current and ac current	A40B current shunt and other shunts	No
Graphical display	Yes	Yes
Visual Connection Management ®	Yes	Yes
Programmable front/rear input switching	Yes	Yes
Ratio difference, deviation - ohms, voltage, current	Yes	Yes
Exteal 10 MHz ref clock, 50 Ω/Hi-Z	Yes	Yes
A40B and other shunt asset management	Yes	No
GPIB 488.2, Etheet, USB TMC	Yes	Yes
SCPI command compatibility	Yes	Yes
3458A emulation, 8508A emulation	Yes	Yes
Volatile memory	15 million	15 million
Level and other trigger	Yes	Yes
FFT onboard	Yes	No
Reading rates: 5 MS/s into memory, bus: 100 kS/s at 4.5 digits, 1 rdg/s at 8.5 digits	Yes	Yes

Function			8588A uX/X of reading + uX/X of range		8558A uX/X of reading + uX/X of range	
			95%	**99%**	**95%**	**99%**
DC voltage	10 V	relative	2.7 + 0.05	3.5 + 0.06	4.0 + 0.06	5.2 + 0.08
		absolute	2.8 + 0.05	3.6 + 0.06	4.1 + 0.06	5.3 + 0.08
AC voltage	10 V, 1 kHz	relative	60 + 5	77 + 6.5	80 + 10	103 + 13
		absolute	64 + 5	83 + 6.5	90 + 10	116 + 13
Resistance	10 kΩ	relative	7 + 0.5	9 + 0.6	10 + 0.6	13 + 0.7
		absolute	7.2 + 0.5	9.2 + 0.6	10.3 + 0.6	13.3 + 0.7
DC current	1 mA	relative	6.5 + 4	8.4 + 5	9 + 5	12 + 6
		absolute	7.6 + 4	10 + 5	9.8 + 5	13 + 6
AC current	1 mA, 1 kHz	relative	250 + 50	323 + 65	300 + 100	387 + 129
		absolute	260 + 50	335 + 65	310 + 100	400 + 129
Frequency	BNC,1 kHz	relative	0.5 uHz/Hz	0.5 uHz/Hz	0.5 uHz/Hz	0.5 uHz/Hz
Temperature	PRT 100 Ω	relative	± 5 mK	± 5 mK	± 5 mK	± 5 mK
Capacitance	1 uF	relative	400 + 100	516 + 129	N/A	N/A
		absolute	406 + 100	523 + 129	N/A	N/A

95% 1 year relative specification. Fluke Calibration guarantees to 99% confidence interval k=2.58. For 99%, multiply by (2.58/2).

Looking for lower specs? See our other benchtop multimeters:

Bench Multimeter Selection Guide

Model	Resolution	Accuracy	Application
8588A	8.5	2.7 µV/V 95% confidence level, 1 year relative accuracy	Metrology
8558A	8.5	4.0 µV/V 95% confidence level, 1 year relative accuracy	High-Speed Automation
8845A/8846A	6.5	Basic V dc accuracy of up to 0.0024 %	Bench
8808A	5.5	Basic V dc accuracy of 0.015 %	Bench

Ordering information

8588A

Reference Multimeter

Includes:

- Meter
- 8588A-LEAD KIT-OSP General purpose probe kit & pouch with 2x 4-way shorting PCB

8558A

8.5 Digit Multimeter

Includes:

- Meter
- 8588A-LEAD KIT-OSP General purpose probe kit & pouch with 2x 4-way shorting PCB

Fluke. *Keeping your world up and running.®*

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