

# TREK 541A

Electrostatic voltmeter for accurate non-contacting measurements of the electrostatic surface voltage associated with EOS/ESD processes.



The Trek® 541A electrostatic voltmeter provides accurate non-contacting measurements of the electrostatic surface voltage associated with EOS/ESD processes. The instrument is configured with a miniature electrostatic field chopper probe that can be remotely located and easily positioned within process equipment to provide highly accurate, non-contacting, DC-stable, spacing-independent voltage measurements in either ionized or non-ionized environments.

## PRODUCT HIGHLIGHTS

- Chopper probe is DC-stable with or without incident air ion flow
- Drift-free measurements
- LCD screen displays present voltage, the positive peak voltage, the negative peak voltage and additional menu information.
- Visual and audible alarms activate when the preset voltage threshold levels are reached
- Voltage output monitor for remote monitoring or control
- USB and RS232 serial ports
- NIST-traceable Certificate of Calibration provided with each unit
- Optional walking test adapter kits available

## APPLICATIONS

- Semiconductor
- LCD
- Electronic assembly
- ESD-sensitive processes

## AT A GLANCE

### Measurement Range

**Trek 541A-1**  
±1 kVDC or peak AC

**Trek 541A-2**  
±100 VDC or peak AC

### Measurement Accuracy

**Better than ±1% of full scale over  
a probe-to-surface separation of  
2.5 mm ± 1 mm**

### Alphanumeric LCD Display

**20 x 4 characters**

## TREK ELECTROSTATIC VOLTMETER 541A

### TECHNICAL DATA

Performance Specifications		
Measurement Range	Trek 541A-1	0 to ±1 kVDC or peak AC
	Trek 541A-2	0 to ±100 VDC or peak AC
Speed of Response (10 to 90%)	Trek 541A-1	Less than 50 ms for a ±1 kV step
	Trek 541A-2	Less than 50 ms for a ±100 V step
Accuracy	1% of full scale	
Resolution	0.1%	

Monitor Output	
Trek 541A-1	1/100th of the measured voltage
Trek 541A-2	1/10th of the measured voltage
Output Noise	Less than 30 mV rms <sup>1</sup>
Output Impedance	47 Ω

Mechanical Specifications	
Dimensions (H x W x D)	97 x 152 x 204 mm (3.8 x 6 x 8 in)
Weight	0.77 kg (1.7 lb)

Electrical Specifications	
Power	15 VDC ±20%, 800 mA (minimum) adapter with a 2.1 mm DC plug.
Power ON/OFF	Rear panel switch

Environmental Specifications	
Temperature	15 to 35°C (59 to 95°F)
Relative Humidity	5 to 85% RH, noncondensing
Altitude	To 2000 m (6561.68 ft.)

Features		
Alarms	Activated if measured voltage exceeds preset threshold limits; positive/negative limits may be programmed separately	
	Visual	Front-panel LEDs illuminate when thresholds are reached
	Audible	ON/OFF programmable pulsating or continuous tone. (+) and (-) alarms have different tone rates for the pulsating tone selection
	Alarm Relay Output	Form C relay contact with barrier strip terminals; changes state when voltage thresholds are met or exceeded
	Alarm Digital Output	TTL output with a TTL low (0 to 0.8 V) as the alarm "ON" status; TTL high (2.5 to 5.0 V) indicates a normal condition
Reset Button	Resets alarms and peak hold to zero	
Zero Control	Adjustable to produce zero volts when probe coupled to a known zero voltage source	
Alphanumeric LCD Display	20 character by four line (20x4) LCD displays the present voltage and holds the most positive and most negative values	
Ground Receptacle	Banana jack	
Serial Port and USB Port	Provides control of specific functions and acquires sensor data utilizing Advanced Energy software and a PC connected to the RS232 serial port or the USB Type B port (connectors are on back panel)	
Current Output	Provides a current of 4 mA to 20 mA	
Menu ↑↓ Buttons	Select and program menu options - the ↑↓ set the alarm threshold voltages, alarm conditions and alarm reset type	

<sup>1</sup> Measured using the true rms feature of the HP Model 34401A digital multimeter

PROBES

Probe Specifications		
Probe	Miniature electrostatic field chopper probe	
Probe Cable Length	3 m (9.8 ft) nominal	
Probe-to-Surface Separation Distance	2.5 mm ±1 mm (recommended)	
End-View Orientation (Round Body)		
Model	541PR-E	<p>End View Probe Aperture 1.6 mm</p>
Aperture	1.6 mm (0.06 in) D	
Dimensions	9.7 D x 50 mm (0.38 D x 2 in)	
Side-View Orientation (Round Body)		
Model	541PR-S	<p>Side View Probe Aperture 2.3 mm</p>
Aperture	2.3 mm (0.09 in) D	
Dimensions	9.7 D x 53 mm (0.38 D x 2.1 in)	
Side-View Orientation (Square Body)		
Model	541P-S	<p>Side View Probe Aperture 2.5 mm</p>
Aperture	2.5 mm (0.1 in) D	
Dimensions	5.6 D x 50 mm (0.22 D x 2 in)	

REFERENCE NUMBERS

Included Accessories	
24005	Operator's Manual (with software)
F5054R	Universal AC Adapter
N9056	6P/4C Plug
BA108	Serial Cable
N9044	Ground Cord

Optional Accessories	
1K037	Walking Test Adapter, Round Body Probe
1K038	Walking Test Adapter, Square Body Probe



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## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. We design and manufacture highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

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