

ELECTROSTATIC DISCHARGE SIMULATOR

**Model 9910P
Model 9910T**

A microprocessor-based system that generates ESD pulses up to $\pm 8\text{kV}$ for testing electronic devices for susceptibility to Electrostatic Discharge (ESD) using HBM, MM and HMM networks featuring automatic testing of up to 128 pin devices with aliveness testing capability after ESD is applied.

Features:

- Voltage range: $\pm 5\text{V}$ to $\pm 8\text{kV}$
- Automatic PinScan™ enabling hands free ESD test execution of the DUT
- Automatic PinCheck™ enabling hands free aliveness test after stimulus with pass/fail report
- Standard built-in R/C networks:
 - HBM (100pf/1,500 Ω) to 8kV
 - MM (200pf/0 Ω) to 1kV
 - HMM (150pf/330 Ω) to 4kV
- Tests up to 64 pin device configuration
- Optional: Test up to 128 pin device configuration
- 9 user programmed test voltages
- Keypad or computer control
- Meets (HBM) MIL STD. 883E, ANSI/ESDA/JEDEC JS-001-2012 (MM) ANSI/ESDAS5.2, JEDEC 22-A115C



Model 9910

Applications:

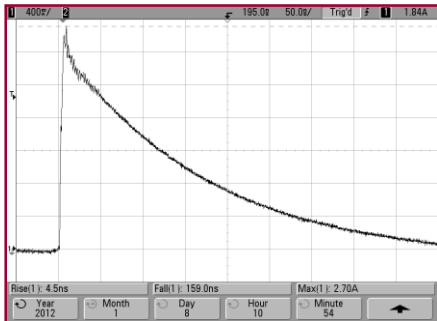
Electrostatic discharge (ESD) has become a significant factor contributing to the disruption of electronic equipment or the premature failure of microelectronic devices in both the field and during the manufacturing process. Sensitivities below 30V are now common. Since it is not always possible to control the environment where electronic devices are used or handled, the burden of product reliability falls upon the manufacturer to design and build equipment with reduced susceptibility to ESD. The ETS Model 9910P ESD Simulator is a valuable tool for developing components for use in today's military, industrial and consumer electronic applications.

The Model 9910P is a bench top auto test system designed for up to 128 pin count devices or small product testing and is ideal for meeting the latest 2-pin testing requirements. This instrument offers ease of device placement and hands off operation while conducting ESD testing. The Model 9910T enables hands off operation while conducting ESD testing with before/after ESD stimulus characterization capability.

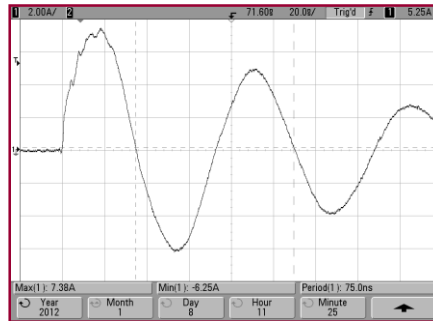
Description:

The Model 9910P and Model 9910T Electrostatic Discharge Simulators are a completely integrated microprocessor-based system used to determine the ESD susceptibility level of electronic devices from $\pm 5V$ to $\pm 8kV$. This enables both models to meet the ESD susceptibility requirement for HBM, MM and HMM. The Model 9910P and Model 9910T use our standard manually operated Model 9910 with automation software control of test sequence via a versatile flying probe mechanism.

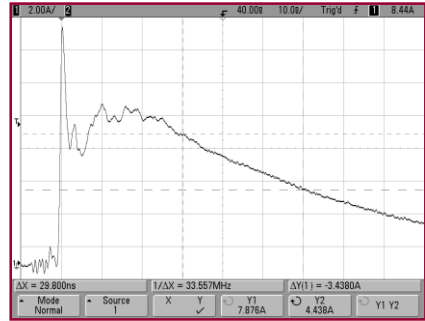
Typical discharge waveforms taken with a Tektronix CT-1 Current Transducer are shown below for Human Body Model (HBM), Machine Model (MM) and Human Metal Model (HMM) at 4kV, 400V and 4kV respectively.



Human Body Model (HBM)
(100pF/1500 Ω)



Machine Model (MM)
(200pF/0 Ω)



Human Metal Model
(330pF/150 Ω)

The Model 9910P and Model 9910T can be operated either manually via the front panel keypad or switched to computer control. Serial communication protocol is provided to interface the Simulator. Voltage is adjustable in 1 Volt increments and up to 9 preset levels from ± 5 to $\pm 8250V$ that can be programmed by the user.

All 9910 models feature a proprietary discharge circuit utilizing mercury high voltage relays to generate the accepted standard stimulus pulse. All models feature selection of built-in HBM, MM or HMM networks

The Model 9910 has two modes of operation are available: A MANUAL mode, where a Discharge is initiated each time the DISCHARGE button is depressed and an AUTO mode, where the number of discharges (0-9) and the discharge interval (1-99 sec.) are selected by the user and activated when the DISCHARGE button is depressed. Typically, each device pin combination is tested at both polarities using 3 discharges at 1 second intervals.

The Model 9910 interfaces with the Device Under Test (DUT) via a universal holding fixture and minigrabber leads that enable connection to any two of the device pins. The standard DUT base provides 64 connections using the 64-pin DIP socket as the connector accommodating everything from a single 64-pin integrated circuit to 32 individual 2-pin devices. An optional DUT base is available enabling up to 128 connections.

The Model 9910P features automated sequencing of pin tests guided by a script. A special DUT base includes a proprietary switching system for automated connection to the DUT pins. The stimulus can be applied between any two pins of the DUT. A laptop computer is included, with a user-friendly system for scheduling timing, voltage, and pin combinations. The testing sequence can be run with no user attention necessary.

The Model 9910T utilizes the sequencing and stimulus capabilities of the 9910P and adds the additional feature of testing the circuit after application of the stimulus. The characteristics of the circuit may be tested before, during, and after application of the stimulus sequence, according to the script.

An optional DUT cover is available to provide an interlocked safety enclosure for the DUTs and test connections during testing.

Specifications:

Control Section:

Range: ± 5 to $\pm 8250V$

HV Adjust: Keypad or computer control

Resolution: $\pm 1V$

Displays: 4-line vacuum fluorescent

Accuracy: Better than 5%

AUTO Mode:

Discharges: 1-9

Interval: 1-99 sec

Computer Interface: Serial communication

Power: Voltage: 90-260VAC, 50/60Hz

Input: IEC Socket with 6' (1.83m) cable with NA Plug

Mechanical:

Dimensions: 19" W x 12" D x 7.5"H (48.24x77.4x19cm)

Flying Probes assembly over DUT Board

Weight: 12-lbs. (5.4kg) (Model 9910 only)

Warranty: One (1) Year

Discharge Section:

HV Switch: Mercury SPST Relays

HBM: 100pf $\pm 5\%$ Cap & 1500 Ω $\pm 1\%$ Resistor to 8kV

MM: 200pf $\pm 5\%$ Cap & 0 Ω Resistor to 1kV

HMM: 150pf $\pm 5\%$ Cap/330 Ω $\pm 5\%$ Resistor to 4kV

Output/Gnd.: Standard .161" (4mm) Banana jack

Cables: 6" (152mm)

HBM, MM HMM: Banana-Minigrabber

Optional:

Model 9910 additional 64-Pin DIP

DUT Programmable Socket Modules:

DIP: 64 and optional 128

Specifications subject to change without notice